













A  
MONOGRAPH  
OF THE  
PETRELS

(ORDER TUBINARES)

BY

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WITH HAND-COLOURED PLATES  
BY J. G. KEULEMANS

IN FIVE PARTS

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*The Publishers much regret the unavoidable delay, occasioned by the serious illness of the Author, which has occurred in the issuing of this Part. Every effort is being made to recover the time thus lost, and it is hoped that the remaining Parts of the Work will be published with due regularity.*

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## 51. PRIOFINUS CINEREUS (*Gm.*)

(GREAT GREY SHEARWATER.)

(PLATE 41.)

- Cinereous Petrel*, Latham, Gen. Syn., III., Pt. II., pp. 395, 405 (1785).  
*Procellaria cinerea*, Gm., Syst. Nat., I., p. 563 (1788); Lath., Ind. Orn., II., p. 824 (1790); Buller, Birds New Zeal., p. 305 (1873).  
*Procellaria melanura*, Bonn., Enc. Méth., I., p. 79 (1790).  
*Puffinus cinereus*, Steph. in Shaw's Gen. Zool., XIII., p. 227 (1826); Lawrence in Baird's Birds N. Amer., p. 835 (1858); A. O. U. Checklist, N. Amer. Birds, 2nd Ed., p. 33 (1895).  
*Procellaria hæsitata* (nec Kuhl), Forster, Descr. An., Ed. Licht., p. 208 (1844); Gould, Birds Austr., VII., Pl. 47 (1848).  
*Priofinus cinereus*, Jacq. et Pucher., Voy. Pole Sud, Zool., III., p. 145 (1853); Elliot, New and Unfig. Birds N. Amer., II., Pl. 60, Fig. 2 (1868); Giglioli, Faun. Vertebr. Oceano, p. 34 (1870); Baird, Brewer & Ridgway, Water-Birds N. Amer., p. 375 (1884); Salvin, Cat. Birds Brit. Mus., XXV., p. 390 (1896).  
*Adamastor typus*, Bp., Consp. Av., II., p. 187 (1855).  
*Puffinus kuhlii* (nec Boie), Cass., Pr. Acad. Philad., 1862, p. 327.  
*Procellaria adamastor*, Schl., Mus. Pays-Bas, VI., Procell., p. 23 (1863).  
*Adamastor cinereus*, Coues, Pr. Acad. Philad., 1864, pp. 119, 142; Gould, Handb. Birds Austr., II., p. 446 (1865); Salvin, Voy. "Challenger," Zool., II., p. 143 (1881); Buller, Birds New Zeal., 2nd Ed., II., p. 241 (1888).  
*Æstrelata hæsitata* (nec Kuhl), Hutton, Ibis, 1869, p. 352.  
*Priofinus melanurus*, Coues, Key N. Amer. Birds, p. 330 (1872); Ridgway, Pr. U. S. Nat. Mus., III., p. 209 (1880).

Schistaceo-cinereus, pileo vix saturatiore: remigibus et rectricibus nigricantibus: facie laterali et colli lateribus cinereis: genis et corpore subtus toto pure albis: subcaudalibus, subalaribus, et axillaribus saturate cinereis.

I HAVE followed Salvin (*Cat. Birds Brit. Mus.*, XXV., p. 390) in adopting the name of *Priofinus cinereus* for this species. Although the original description given by Latham

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does not altogether agree with the bird, it is now so universally recognised under this name that it is not desirable to change it.

The synonymy, however, as given by Salvin (*l.c.*), requires some revision. He omits the earlier references to Latham's "Glacial Petrel" (*Procellaria gelida* of Gmelin), and, owing to a *lapsus calami*, repeats some of the references already recorded under the heading of *Puffinus kuhli* (*Cat.*, p. 375). To the latter species belongs the "Puffin cendré" of Brisson's "Ornithologie" (VI., p. 134, Pl. XII., Fig. 1). Buffon's "Petrel cendré" is the common Fulmar (*Fulmarus glacialis*). D'Aubenton's "Puffin" is *Puffinus kuhli*, as already recorded by Salvin (*t.c.*, p. 375). All the above-mentioned references must be eliminated from the synonymy of *Puffinus cinereus*.

Latham's description of his "Cinereous Petrel" in his "General Synopsis" (III., Pt. II., p. 405) is as follows:—"Size of the Fulmar: length,  $20\frac{1}{4}$  inches. All the upper-parts of the plumage dark ash-colour; crown of the head and forehead, palest; beneath, from chin to vent, white; tail, rounded in shape, black; the under-part of the feathers, pale ash-colour; bill yellowish, with black sutures; legs bluish, webs pale yellow; toes and claws pale; irides, ash-colour."

This description accords best with the species now known as *Puffinus cinereus*, but is not altogether accurate, as the colour of the head and forehead can scarcely be said to be paler than the back, for they are, in reality, somewhat darker. The colour of the bill and feet are correctly described.

In the "Supplement" to the "General Synopsis" (II., p. 335, 1802), Latham again describes a "Cinereous Petrel," but I do not consider this to be identical with his "Cinereous Petrel" of 1785. It is said to come from Port Jackson, and to be "wholly dusky-black; but the sides of the head, the neck, and all beneath are ash-colour; the bill and legs dull yellow." He further remarks:—"In a specimen of this we observed the whole of the under-parts, from the breast to the vent, occupied by an ash-coloured down." This individual must have been a young bird, and therefore not *Puffinus cinereus*, which does not breed in Australian waters.

The original type of Latham's "Cinereous Petrel," though said by him to be in the British Museum, and doubtless one of the Petrels brought back by Captain Cook, is no longer there, but it may well have been the original of Forster's Drawing (No. 92), from which Latham apparently derived the colour of the bill and feet. There is another supposed species, the "Glacial Petrel" of Latham, or *Procellaria gelida* of Gmelin, which has been separated by such good authorities as Professor Elliot Coues and Professor Robert Ridgway under the name of *Puffinus*, or *Adamastor gelidus* (Gm.). Salvin, however, failed to see any difference between the Pacific and Atlantic specimens of *Puffinus*, and recognised but a single species, in which conclusion I agree.

Although it is evident that Salvin intended to unite *Puffinus gelidus* with *P. cinereus*, he has accidentally omitted to record the earlier references to the "Glacial Petrel" in his synonymy of *P. cinereus* in the "Catalogue of Birds." I have not

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included them in the list given above, as I do not consider the two birds to be identical.

Latham's description of his "Glacial Petrel" is as follows:—"Length, 19 inches; bill,  $1\frac{3}{4}$ ; tube which covers the nostrils on the top of upper mandible, and end of lower, black; the edges of both are of the same colour; the top of the head, taking in the eyes, and the hind-part of the neck to the shoulders, pale bluish ash-colour; the rest of the upper-parts dusky black; chin, fore part of neck, and breast, white; from thence to the vent, pale ash-colour; legs and webs blue, claws black, sole of foot white. Inhabits the Antarctic Circle, with many other species, chiefly found among the ice" (Latham, *Gen. Syn.*, III., Pt. II., p. 399).

On this description Gmelin founded his name of *Procellaria gelida* (*Syst. Nat.*, I., p. 564), which was admitted by Latham (*Ind. Orn.*, II., p. 822).

The late Professor Elliot Coues in his "Monograph of the Petrels" (*Proc. Acad. Nat. Sci. Philad.*, 1864, pp. 119, 142) recognised two species of *Priofinus*, or, as he then called the genus, *Adamastor*.

One he identified as *P. cinereus* (Gm.) and the second, from the Antarctic Ocean and the Cape of Good Hope, he called *P. gelidus* (Gm.). To the latter, it should be noted, he added as a synonym *Procellaria flavirostris* of Gould, a species which is now generally recognised to be a race of *P. kuhli*.

The *Priofinus gelidus* of Professor Coues is said to have the under-surface of the wings white, whereas *P. cinereus* has grey axillaries and under wing-coverts. No example of *Priofinus* that I have examined has white on the upper tail-coverts, but this is a well-marked feature of *Puffinus kuhli*, and in this species also the axillaries and under wing-coverts are white.

The question with regard to *P. flavirostris* of Gould could have been settled, did we but know where his type was to be found. Mr. Witmer Stone has very kindly made a search for it among the Petrels of the Gould Collection in the Museum of the Philadelphia Academy, and he informs me that no specimen labelled *P. flavirostris* was ever received from Mr. Gould. This is probably due to the fact that the species was described from the Cape seas, and might not have been considered by Gould as belonging to his Australian Collection, which passed into the hands of the Academy.

Dr. Robert Ridgway, in his "Manual of North American Birds" (2nd Ed., p. 58, 1896), also separated the two species of *Priofinus* with the following characters:—

"*P. cinereus*.—Above ashy-grey, more or less tinged with brown, darker on the top of the head, quills, and tail-feathers; lower parts white, except the under wing-coverts and tail-coverts, which are deep smoky-greyish; bill, light yellowish, with deep black culmen and nasal tubes, the side of the lower mandible also mostly black; wing, 12.25–13.50 inches; culmen, 1.75–1.85; depth of bill in front of nostril, .50–.55; tarsus, 2.25–2.30; middle toe, with claw, 2.90."

"*P. gelidus*.—Above brown, the upper tail-coverts tipped with white; wings and tail blackish; lower parts white, including the under wing-coverts and tail-coverts;

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bill yellowish, passing into dusky at tip; wing, 15 inches; tarsus, 2.35; middle toe and claw, 3.15."

In the "Checklist of North American Birds" (2nd ed., p. 33) the Californian specimen referred to by Lawrence in the "Birds of North America" (1858, p. 835) is recorded as *Puffinus cinereus*, and not *P. gelidus*.

Professor Giglioli, who has written an instructive memoir on the geographical distribution of Petrels, the result of personal observation during the voyage of the "Magenta," states that, in his opinion, examples of *Priofinus* from the Pacific have a somewhat larger and stouter bill, both mandibles verging on bluish-grey, with the apex light horn-colour, and with a black groove. The upper-parts of the head, and the under tail-coverts, are more dusky.

*Priofinus cinereus* is a bird of the Southern Oceans, where it enjoys a very widely extended range. Most of the specimens examined by me have been from the Cape seas; others were procured by Mr. T. Parkin in Lat. 39° 51' S., Long. 8° 49' E. (*Bull. B. O. C.*, X., p. cvi.). The late Nikolai Hanson met with the species in Lat. 39° 55' and 42° 23' S.; Long. 3° 16' and 20° 32' E.; in October, 1898 (Sharpe, *Rep. Voy. "Southern Cross," Aves*, p. 142), and the Earl of Crawford obtained it in Lat. 35° 20' S.; Long. 9° 43' E.

A single example was also procured by the Scottish Antarctic Expedition near the island of Ascension, which is at present the most northerly occurrence recorded. Further specimens were observed by the naturalists on board the "Scotia" between Lat. 60° S. and Gough Island (Eagle Clarke, *Ibis*, 1907, p. 329), by Dr. A. B. Meyer in Lat. 38° S., Long. 12° W., not far from Tristan da Cunha (Salvin, *Cat. Birds Brit. Mus.*, XXV., p. 391), and by the late Commander Sperling in the Mozambique Channel (*Ibis*, 1868, p. 293).

The species was also obtained by Macgillivray during the voyage of the "Rattlesnake" in the South Indian Ocean in Lat. 37° S., Long. 53¼° E., in April, 1847; and again in Lat. 35½° S., Long. 85° E., on the 2nd of July in the same year (Salvin, *Cat. Birds Brit. Mus.*, XXV., p. 391).

Professor Giglioli records *P. cinereus* during the voyage of the "Magenta" to the north-east of Amsterdam Island, between Lat. 42° 51' S., Long. 10° 15' E., and Lat. 27° 49' S., Long. 96° 32' E., on the voyage from Batavia to Melbourne, and in Bass's Straits; also in the Bay of Peñas, in Western Patagonia, as well as in the Straits of Magellan. Gould mentions the bird between Lat. 30° and 55° S., Long. 36° 30' to 154° W. Hutton reports it as plentiful off the coast of New Zealand, but Buller never saw an example, and none of the museums in the island possessed specimens, when he wrote. The late Captain Fairchild procured this Petrel between Wellington and the Chatham Islands (Buller, *Suppl. Birds N.Z.*, I., p. 106). Layard mentions it off New Caledonia, and on the homeward voyage of the "Discovery" it was seen in Lat. 58° S., Long. 160° E. Darwin obtained *P. cinereus* near Tierra del Fuego, Chiloe, Callao Bay in

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Peru, and the mouth of the Plate River. It is believed to breed in September on Kerguelen Island, the authority being Lieut. R. Harris, R.N., who was wrecked there in 1832.

The Great Grey Shearwater, or Black-tailed Petrel, as it is called by the American naturalists, is of large size, and differs in its habits from many of the true Shearwaters. Professor Giglioli says that it can be distinguished, even at a long distance, by its more dipping flight, which Mr. Robert Hall compares with the wheeling motions of an Albatros. Darwin relates his experience of this Shearwater when on the "Beagle," and says that it frequented the retired inland Sounds in very large flocks, although occasionally two or three might be seen out at sea. He writes:—"I do not think I ever saw so many birds of any sort together, as I once saw of these Petrels behind the island of Chiloe. Hundreds of thousands flew in an irregular line for several hours in one direction. When part of the flock settled on the water, the surface was blackened; and a cackling noise proceeded from them as of human beings talking in the distance. At this time the water was in parts coloured by clouds of small crustacea. . . . At Port Famine, every morning and evening, a long band of these birds continued to fly with extreme rapidity up and down the central parts of the channel, close to the surface of the water. Their flight was direct and vigorous, and they seldom glided with extended wings in graceful curves, like most other members of this family. Occasionally they settled for a short time on the water; and they thus remained at rest during nearly the whole of the middle of the day. When flying backwards and forwards at a distance from the shore, they evidently were fishing, but it was rare to see them seize any prey. They were very wary, and seldom approached within gunshot of a boat or of a ship; a disposition strikingly different from that of most of the other species. The stomach of one, killed near Port Famine, contained seven prawn-like crabs, and a small fish. In another, killed off the Plata, there was the beak of a small cuttle-fish. I observed that these birds, when only slightly winged, were incapable of diving."

That they are able to dive, however, is proved by the observations of Dr. E. A. Wilson, who says that they "drop suddenly beneath the surface of the water, with their wings spread, to seize some scrap of food. They unhesitatingly go completely under, and reappear with their wings still spread." Sir Walter Buller also confirms this diving habit.

*Adult.* General colour above ashy-grey, with obsolete margins of hoary-grey to the feathers of the upper-surface, these margins whiter on the scapulars, which are a little more dusky than the back; wing-coverts like the back, the median and greater series darker brown, with hoary-grey margins; bastard-wing, primary-coverts, and quills dusky-brown, shaded with ashy-grey; innermost secondaries browner, like the scapulars, and, like the latter, narrowly fringed with whitish; tail-feathers black, ashy-grey on the inner webs; crown of head dusky-black, greyer towards the nape, the

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hind-neck and sides of neck being slaty-grey; the upper part of the back ashy-grey, mottled with concealed white bases to the feathers; lores and sides of face dusky black, washed with ashy-grey; fore-part of cheeks browner; hind cheeks and entire under-surface of body pure white, the sides of the body mostly ashy-brown; under tail-coverts ashy-brown, those near the vent for the most part white; axillaries and under wing-coverts ashy-brown, the central coverts rather more hoary in appearance, many of the coverts being edged with ashy-grey; quills dark brown below, ashy-grey on the inner webs; "bill perfectly black on the ridge, changing to horn-colour on the hook, and having a black line down the middle of the lower mandible, widening out on meeting the unguis, which is dull horn-colour; legs and feet greyish flesh-colour, shaded with slaty-grey on the heel and on the outer side of the tarsus and toes; interdigital webs yellowish, with grey edges" (Buller, *Suppl. Birds New Zeal.*, I., p. 106). Total length about 19.5 inches; culmen, 2.0; wing, 13.1; tail, 4.3; tarsus, 2.3; middle toe and claw, 3.2.

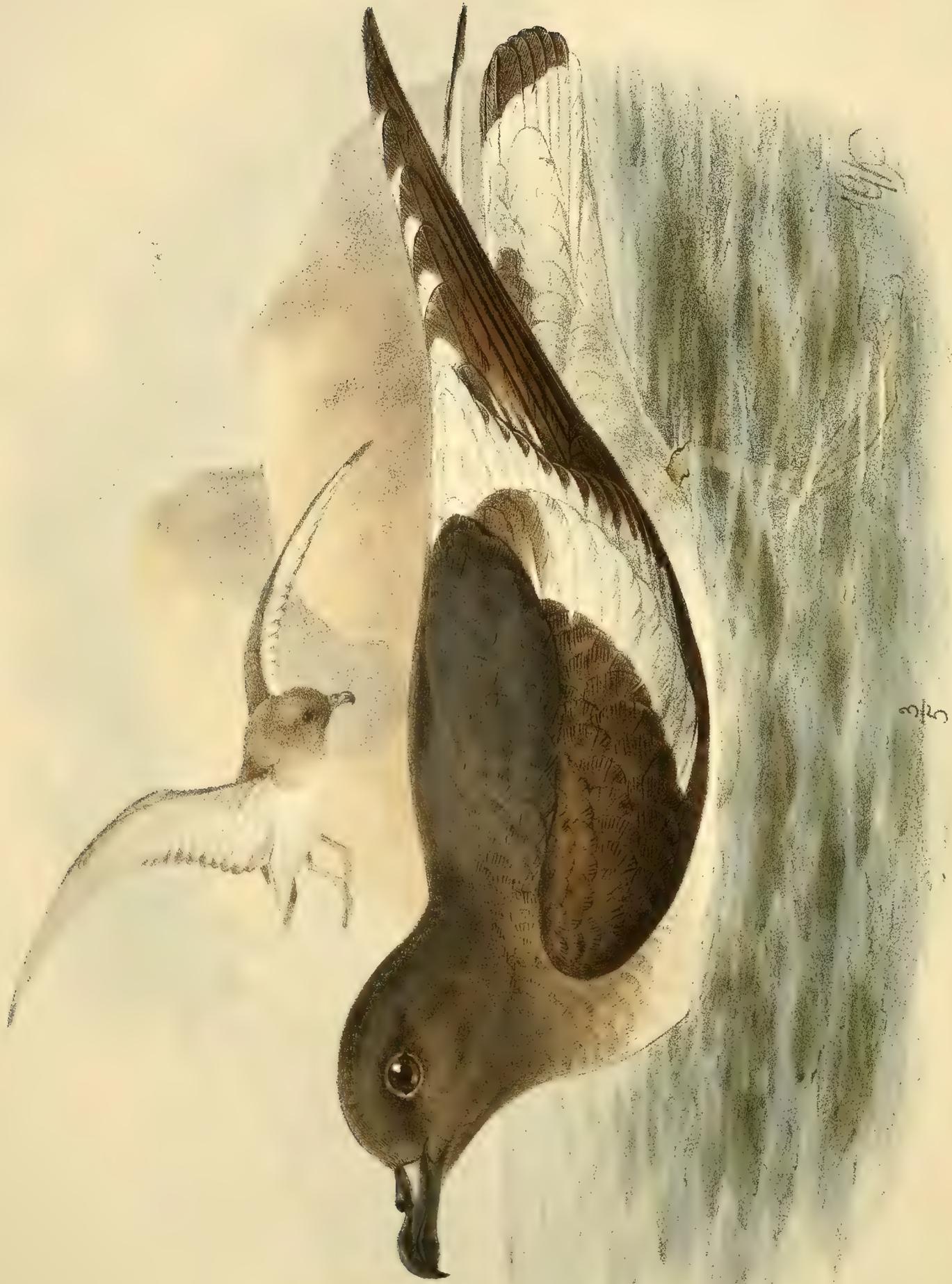
The colour of the soft parts varies to a considerable extent. The late Nikolai Hanson states that specimens obtained by him in October, in the Cape seas, had the "bill horn-colour, yellowish on the upper mandible from the nostrils to the tip; feet, including the webs, grey; iris dark brown" (Sharpe, *Rep. Voy. "Southern Cross,"* Aves, p. 142, 1902). Professor Giglioli (*Faun. Vertebr. Oceano*, p. 34) gives the following notes made on specimens procured in the Atlantic and Indian Oceans, during the voyage of the "Magenta" by the late Dr. De Filippi:—"Maxilla of the palest green, almost white, the nasal tubes and culmen black; mandible pale horn-colour, with a black line near the edge, widening at the base of the bill and near the culmen, the nail horn-colour; feet, pale bluish, the toes underneath, and the interdigital membrane, dusky on the margin; iris grey."

Dr. E. A. Wilson gives the soft parts as follows:—"Iris dark brown; upper bill dark greyish horn-colour, the latericorn pale and yellowish, and in some birds, even bright yellow, the mandible greyish-horn at the tip, but otherwise pale yellow, both on the cutting edge and on the sides, a darker line dividing these parts; legs and toes grey, or fleshy-grey, the webs fleshy-pink, or even red by transmitted light, but otherwise grey or fleshy-grey; claws blackish horn-colour; inside of mouth fleshy-red, the palate, fauces, and tongue abundantly supplied with sharp horny papillæ."

Darwin says that "half of the lower mandible and the legs were blackish; the web between the inner toes, with the exception of the margin, was reddish-lilac-purple, the rest being blackish."

The specimen described above was obtained in the South Atlantic by Mr. H. King, and was given to us by the late Howard Saunders. The bird figured is the one procured by Dr. A. B. Meyer in the South Atlantic. Both were in our own collection, and are now in the British Museum.





## 52. THALASSŒCA ANTARCTICA (*Gm.*).

(ANTARCTIC FULMAR.)

(PLATE 42.)

*Antarctic Peterel*, Cook, Second Voyage, I., p. 257; Forster, Voy. I., p. 108 (1777); id., Icon. ined., 95; Lath., Gen. Syn., III., Pt. II., p. 400 (1785).

*Le Petrel Antarctique ou Damier brun*, Buff., Hist. Nat. Ois., IX., p. 151 (1783).

*Procellaria antarctica*, Gm., Syst. Nat., I., p. 565 (1788); Lath., Ind. Orn., II., p. 822 (1790); Reichenow, Deutsche Südpolar Exped., IX., Zool., I., p. 554 (1908).

*Daption antarcticum*, Steph. in Shaw's Gen. Zool., XIII., p. 242 (1826).

*Thalassœca antarctica*, Reichenb., Syst. Av., p. IV. (1852); Bp., Consp. Av., II., p. 192 (1855); Coues, Pr. Acad. Philad., 1866, pp. 31, 192; Buller, Birds New Zeal., 2nd ed., II., p. 229 (1888); Salvin, Cat. Birds Brit. Mus., XXV., p. 392 (1896); Saunders, Antarctic Man., Birds, pp. 229, 236 (1901); Sharpe, Rep. Coll. "Southern Cross," Aves, p. 143 (1902); Wilson, Nat. Antarctic Exped. Zool., II., Aves, p. 82 (1906); Eagle Clarke, Ibis, 1906, p. 169, 1907, p. 334.

*Fulmarus antarcticus*, Gray, Handl. Birds, III., p. 105 (1871); Ridgway, Man. N. Amer. Birds, p. 58 (1887).

*Priocella antarctica*, Sharpe, Voy. "Erebus and Terror," I., Birds, App., p. 37, Pl. XXXIII. (1875).

*Acipetes antarctica*, W. A. Forbes, Rep. Voy. "Challenger," Zool., IV., Pt. XI., p. 59 (1882).

Brunnea, vix cinereo adumbrata: supracaudalibus externis et rectricibus albis, his nigro fasciatim terminatis: tectricibus alarum dorso concoloribus, majoribus pure albis, remigibus primariis nigris, intus albis: facie laterali cum colli pectorisque lateribus et gutture toto, brunneis: corpore reliquo subtus pure albo: tectricibus alarum albis, marginalibus brunneis.

THIS very distinct species was first discovered by Captain Cook, and is mentioned by Forster, in his account of the second voyage of the celebrated navigator, as a new Petrel

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found within the Antarctic Circle, of a brown colour, with a white belly and rump, and a large white spot on the wings, which he called the "Antarctic Petrel." Many of these birds were subsequently seen and shot, but unfortunately none fell into the ship.

The naturalists on board the "Erebus" and "Terror" obtained specimens in Lat. 77° 40' S., Long. 179° E.; the bird was also encountered by the "Discovery" in November, 1901, in Lat. 61° 46' S., Long. 140° E., and again at Cape Adare in January, 1902. The "Southern Cross" Expedition likewise met with it immediately on entering the Pack Ice, but it disappeared when the ship was fast in the pack. It was observed again on the northward voyage in Lat. 65° 33' S., Long. 165° 48' E. During a hurricane in February, 1899, Nikolai Hanson mentions having seen a large number of a brown-backed Petrel off South Victoria Land (*Rep. Voy. "Southern Cross,"* p. 93), but its farthest record south was by the "Discovery" in Lat. 78° S. Observations of this Petrel were made by the "Belgica" Expedition, and examples of both sexes were obtained by the "Challenger" on the ice barrier in June, 1874 (Salvin, *P. Z. S.*, 1878, p. 737). The Scottish Antarctic Expedition noted only a few specimens at the South Orkney Islands, but, it was thought by members of the expedition that *P. antarctica* might breed on the east side of the Ferguslie Peninsula, on Laurie Island, together with the Cape and Snowy Petrels (Eagle Clarke, *Ibis*, 1906, p. 169). Numbers were seen at Saddle Island, March, 1903, and between Lat. 60° and 72° S., and Long. 16° and 44° W., and not less than twenty specimens were shot on March 14th at Coats Land in Lat. 74° S., when the "Scotia" was locked in the ice. Previously to this, thousands were seen in company with McCormick's Skuas, Giant and Snowy Petrels, and Arctic Terns, but the bird was not observed on this occasion farther north than Lat. 68° 26' S., Long. 16° 11' W.

The course of the "Magenta" seems to have been northward of the range of *Thalassæca antarctica*, which is not mentioned by Professor Giglioli in his account of the birds observed during that celebrated voyage, though specimens were procured by Zelebor, on the "Novara," to the south of Cape Horn (Pelz., *Reis. Novara, Vög.*, p. 47).

The British Museum contains an example from Cape Horn, formerly in our collection, and Dr. Wilson, of the "Discovery," noticed *T. antarctica* in the Pacific, soon after leaving New Zealand and until within four days of his arrival off Cape Horn (Wilson, *Nat. Antarctic Exped.*, II., p. 83).

Beyond the usual observations connected with the distribution of the Antarctic Petrel, no notes of any consequence have been published as regards its habits, from which we may gather that they do not differ from those of other Fulmars and Shearwaters. The birds may be seen congregating in numbers, Hanson having noticed as many as a hundred together, while Mr. Bruce, on the "Scotia," speaks of flocks of thousands. Mr. Borchgrevinck states that when approaching Cape Adare, in South Victoria Land, during gales the birds swept low over the land like a cloud; few

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were observed in the summer, but in the autumn they sailed about in the air at a great height.

No authentic eggs of the species are known, nor has the nesting place been discovered. Mr. Borchgrevink believes that South Victoria Land and Geikie Land were likely spots, while Dr. Wilson thinks that the newly-discovered Scott Island, or the Balleny Islands, may be the breeding places of this Fulmar. According to the naturalists of the "Scotia" it was also probably nesting on the South Orkney Islands.

*Adult male.* General colour above sooty-black, with a slight ashy shade, the feathers of the back having obsolete ashy margins; hind-neck and mantle somewhat mottled with white or light-brown bases to the feathers; wing-coverts like the back, the median series tipped with ashy-white; the greater coverts pure white; primary-coverts black; quills black, white on the inner web for nearly its entire length, the secondaries white at the base of both inner and outer webs, the black being gradually reduced to a terminal mark on the inner secondaries, and disappearing towards the long innermost secondaries, which are entirely pure white; shafts of the first four primaries white; rump and upper tail-coverts like the back, but many of the latter mottled with white bases to the feathers, some of the lateral ones being white with a blackish tip; head uniform sooty-black, as also the sides of the face; lores more ashy; eyelid white above and below; under-surface of body pure white, with a patch of sooty-brown feathers on each side of the fore-neck; the throat light sooty-brown, with white bases to the feathers, producing a mottled appearance; axillaries and under wing-coverts pure white, with a broad black bar round the bend of the wings, extending down to the lower primary-coverts; quills white below, with a blackish tip, the black increasing in extent towards the secondaries; "bill blackish; legs, feet, and interdigital webs bluish-grey; claws blackish; iris dark brown" (E. A. Wilson). Total length about 16 inches; culmen, 1.5; wing, 11.3; tail, 4.4; tarsus, 1.75; middle toe and claw, 2.45.

Dr. Pirie states that in specimens obtained by the "Scotia" the tarsus and outer toe were greyish, the other toes and the webs paler and washed with yellow (Eagle Clarke, *Ibis*, 1907, p. 335).

*Adult female.* Similar to the male. Total length about 15 inches; culmen, 1.5; wing, 12; tail, 4.5; tarsus, 1.7; middle toe and claw, 2.2.

The only difference in plumage that I can discover in a series is that some birds are much paler brown than others. This is explained by Dr. E. A. Wilson in his notes on the species in the "National Antarctic Expedition" (Vol. II., Aves, p. 83).

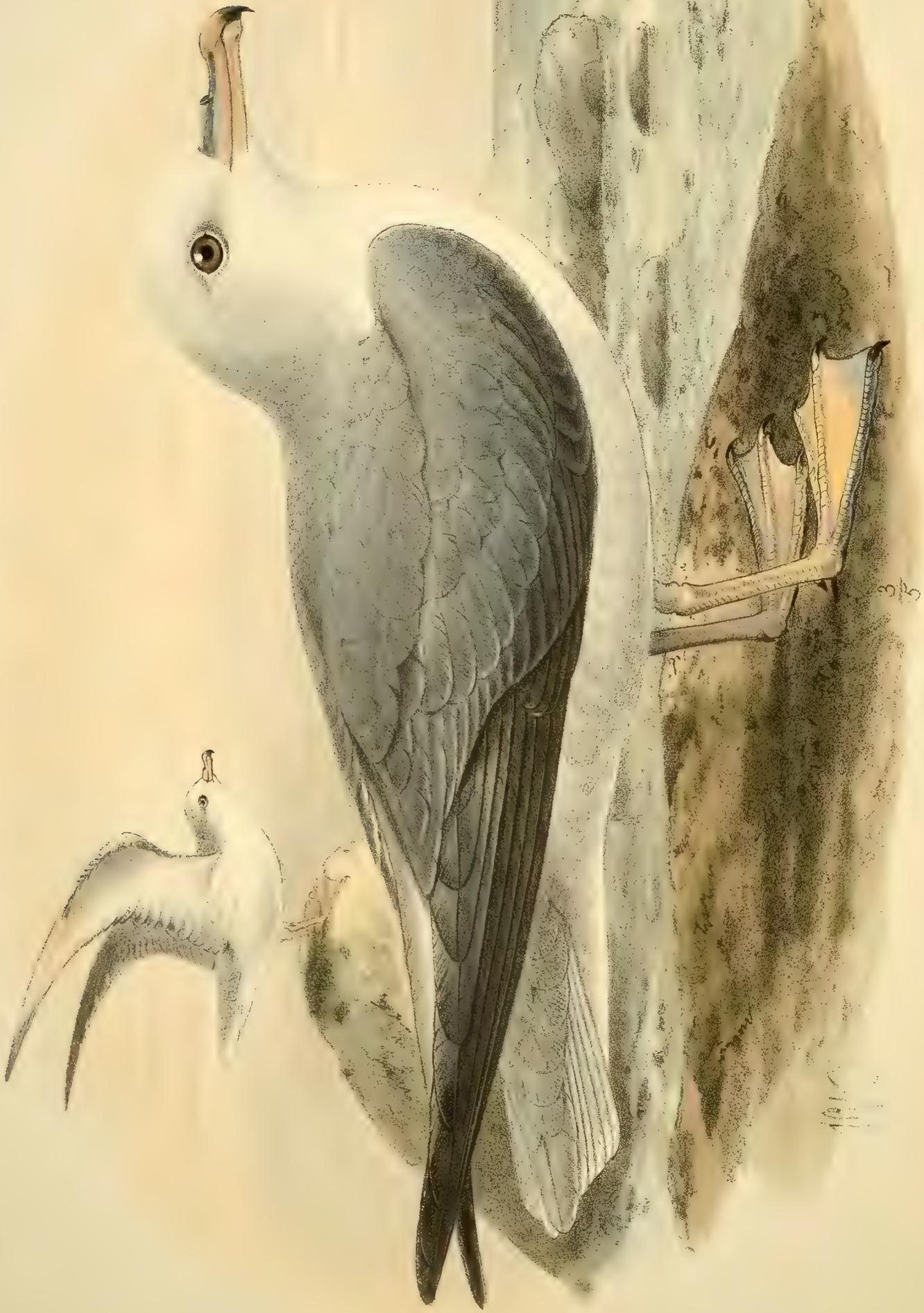
The wear and tear of plumage is a peculiar feature in Antarctic birds, and *T. antarctica* proves no exception to this rule. Dr. Wilson points out that a freshly moulted bird has its head, back, and wings of a deep chocolate brown, with pure white on the wing- and tail-coverts; but, when the nesting season is over and the summer

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sun has done its work, the rich brown fades and a pale buff colour takes its place. During the autumn moult in January and February, the birds assume a mottled plumage, and the dark feathers gradually emerge from the faded ones. For further notes on this subject see Mr. Eagle Clarke's paper on the birds of the Scottish Expedition (*Ibis*, 1907, p. 334).

The male described was procured by Dr. E. A. Wilson off the Balleny Islands on the 2nd of March, 1904, and the female off Cape Adare on the 11th of January, 1902, during the voyage of the "Discovery." The figure is drawn from the specimen in our collection from Cape Horn (sp. *a* of Salvin's *Catalogue of Birds*) which is in freshly moulted plumage.





## 53. PRIOCELLA GLACIALOIDES (*Smith*).

(SILVERY-GREY FULMAR.)

(PLATE 43.)

- Procellaria glacialis* (nec Linn.) Forster, Icon. ined., 91; id., Descr. Anim., p. 25 (1844); Walker, P. Z. S., 1863, p. 378.
- Fulmar Petrel*, var. A., Lath., Gen. Syn., III., Pt. 2, p. 405 (1785).
- Procellaria glacialis*, var.  $\beta$ ., Gm., Syst. Nat., I., p. 563 (1788).
- Fulmarus antarcticus* (nec Gm.) Steph., in Shaw's Gen. Zool., XIII., p. 236 (1826).
- Procellaria tenuirostris* (nec Temm.) Audub., Orn. Biogr., V., p. 333 (1839).
- Procellaria glacialoides*, Smith, Ill. Zool. S. Afr., Aves, Pl. 51 (1840); Buller, Birds New Zeal., p. 301 (1873).
- Priocella garnoti*, Hombr. and Jacq., Voy. Pole Sud., III., p. 148, Pl. 32, figs. 43-46 (1853).
- Procellaria garnoti*, Gray, Gen. Birds, III., p. 648 (1844).
- Thalassoica glacialoides*, Bp., Consp. Av., II., p. 191 (1856); Buller, Birds New Zeal., 2nd ed., II., p. 228 (1888).
- Thalassoica glacialoides a polaris*, Bp., Consp. Av., II., p. 192 (1855).
- Thalassoica glacialoides  $\beta$  tenuirostris*, Bp., t.c., p. 192 (1855).
- Thalassoica tenuirostris*, Bp., Comptes Rend., XLII., p. 768 (1856); Sharpe, Phil. Trans., Vol. 168, p. 123 (1879).
- Thalassoica polaris*, Bp., Comptes Rend., XLII., p. 768 (1856).
- Procellaria smithi*, Schlegel, Mus. Pays-Bas, VI., Procell., p. 22 (1863).
- Fulmarus glacialoides*, Gray, Handl. Birds, III., p. 105 (1871).
- Fulmarus tenuirostris*, Coues, Key N. Amer. Birds, p. 328 (1872).
- Priocella tenuirostris*, Ridgway, Pr. U. S. Nat. Mus., III., p. 209 (1880).
- Priocella glacialoides*, Baird, Brewer and Ridgway, Water-Birds N. Amer., II., p. 373 (1884); Salvin, Cat. Birds Brit. Mus., XXV., p. 393 (1896); Sharpe, Rep. Voy. "Southern Cross," p. 145 (1902); Eagle Clarke, Ibis, 1906, p. 170; 1907, p. 335; Wilson, Nat. Antarctic Exped., II., Birds, p. 84 (1907); Reichenow, Deutsche Südpolar Exped., IX., Zool, pp. 480, 552 (1908).

Clarè cinerea: cauda cinerea: remigibus nigris, primariis intus albis: secundariis cinereis dorso concoloribus: pileo antico albo, postice cinereo: genis et corpore subtus

## MONOGRAPH OF THE PETRELS.

pure albo, hypochondriis imis cinereis: subalaribus et axillaribus albis, his terminaliter cinereo lavatis.

THIS graceful Fulmar, which, in its silvery-grey plumage, so much resembles the Fulmar of the northern hemisphere, is widely distributed over the southern oceans, and the following extract from Professor Reichenow's recently published memoir on the birds obtained by the German Antarctic Expedition, under the leadership of Dr. E. von Drygalski, records the geographical distribution of the species (*Deutsche Südpolar Exped.*, IX., Zool., I., p. 553):—"South Georgia, nesting; South Shetland Islands, Feb.; Joinville Island, Dec.; Paulet Island, Aug.; Louis Philippe Land, Dec., breeding (Andersson, *Wiss. Ergebn. Schwed. Südpolar Exped.*, V., Lief. 2, p. 43, 1905); South Orkney Islands, Nov., March; Weddell Sea, 71° 22' S., March (Scottish Antarctic Exped.); Bouvet Island, Nov.; Kerguelen Island, May (McCormick); Edge of the Pack Ice, below 64° 14' S. Lat., and 55° E. Long., in Kaiser Wilhelm II. Land (Vanhöffen); Ross Sea (Wilson); Pack Ice below 63° 3' S. Lat., and 161° 42' E. Long., Dec., Feb. (Hanson); 66° S. Lat., Feb. (Voyage of the "Challenger"); 70° 40' S. Lat., 102° W. Long., March (Belgian Antarctic Exped.); Palmerston Archipelago, Feb. (French Antarctic Exped.).

It will be seen from the above list of localities that the species is found in the neighbourhood of the Antarctic Pack Ice from August to March, and I am of Dr. Wilson's opinion that it is a migratory bird, as it has been observed in the southern seas during the summer months, December, January, and February, while its furthest northern records occur during the southern winter, when it retires to the open sea. Dr. Wilson observed it in June and July, and saw a few examples the day before entering the Pack Ice in Lat. 59° 18' S., Long. 138° 2' E., while it gradually increased in numbers as a northerly course was taken to the Macquarie Islands, as far as Lat. 57° 25' S., Long. 151° 45' E., but from January, 1902, to February, 1904, none were seen. The birds were not observed near the coast of Victoria Land during the winter spent by the "Discovery" in McMurdo Sound, but they again became abundant towards the Balleny Islands, about Lat. 67° S., again disappearing on crossing the Antarctic Circle. Dr. Wilson considered the above-named islands a likely breeding-place, as large numbers were seen there, and he believes that they may be found nesting on Scott Island, in Ross' Sea. It will therefore be noticed that *P. glacialisoides* does not habitually frequent the ice, but keeps almost entirely to the open ocean. Dr. Wilson says that on the voyage from New Zealand to Cape Horn, in a higher latitude than is usually taken, the species was met with on June 19th, and two days later *Thalassæca antarctica* followed the ship, and remained with it till within a few days of Cape Horn, while *P. glacialisoides* accompanied the expedition in considerable numbers through the Straits of Magellan to Port Stanley, in the Falkland Islands, which was reached on July 22nd. During the whole of this time no ice was sighted.

## PRIOCELLA GLACIALOIDES.

Gould, who gives a beautiful figure of this Fulmar in his "Birds of Australia," frequently saw *P. glacialoides* off the Cape of Good Hope, and also between Sydney and Cape Horn (*Handb. Birds of Australia*, II., p. 458). Three examples from the islands to the south of New Zealand are in the Rothschild Collection, and Sir W. Buller also procured specimens from Otago and Nelson, while Mr. Sandager met with it on the beach at Moeraki, on October 1st (Buller, *Suppl. Birds New Zeal.*, I., p. 108).

The species is recorded from the coasts of southern Queensland, New South Wales, Tasmania, and Western Australia (Campbell, *Nests and Eggs of Austr. Birds*, II., p. 897, 1901; Hall, *Key Birds of Austr.*, p. 93, 1899). The British Museum possesses specimens from Kerguelen and Valparaiso, while Professor Giglioli, during the voyage of the "Magenta," records it from Callao in Peru, in August 1867, the birds following the ship all down the coast of Chili to Cape Tres Montes, in Patagonia; it was also seen in the Channel between Wellington Island and Western Patagonia.

Professor Ridgway informs us that this Petrel extends northward on the Pacific coast of America to the Columbia River, and a skeleton, supposed to be of this species, was picked up at Catalina Island by Dr. Cooper. I have also recorded it in the "Biologia," from Mazatlan.

The original specimen of *P. glacialoides* was obtained off the Cape of Good Hope by Sir Andrew Smith, and Mr. W. L. Selater traces it as far north in the Atlantic as St. Helena.

Although so much has been written concerning the distribution of *Priocella*, very little has been made known with regard to its habits, which probably resemble those of other Fulmars. It is said to fly higher above the water, and to rest more frequently than the smaller species. It feeds on dead animal matter, when it can be procured, and Dr. Townsend found in the stomach of a bird that he examined, some oil and the remains of a cuttle-fish.

*Adult male.* General colour above pearly-grey, the wing-coverts like the back; bastard-wing darker grey; primary-coverts blackish, washed externally with pearly-grey; quills blackish, white for the greater part of the inner web of the primaries, which are also shaded with ashy-grey; secondaries pearly-grey, white on the inner web, the innermost secondaries entirely pearly-grey, a few of them having a blackish mark near the end; tail-feathers pearly-grey; head entirely white, slightly shaded with pearly-grey on the nape and hind-neck, and on the ear-coverts; lores, cheeks, and entire under-surface of body pure white, with a pearly-grey shade on the lower flanks; axillaries pure white, the longest ones with a pearly-grey tip; under wing-coverts also pure white, mottled round the bend of the wing with ashy-grey; quills sooty-brown below, white for the greater part of the inner web. Total length about 18 inches; culmen, 1.8; wing, 13.0; tail, 4.6; tarsus, 1.95; middle toe and claw, 2.6.

Dr. Pirie, who was on the "Scotia," has made a coloured drawing of the soft parts of this Fulmar, as follows:—"Maxilla and mandible tipped with black, the middle

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portion of the bill pale flesh-coloured, and the base and nares light cobalt-blue. The feet are pale flesh-colour, the webs washed with yellow, and the claws black. The iris is dark brown, and the pupil blue-black" (Eagle Clarke, *Ibis*, 1907, p. 336). These colours are more or less confirmed by other observers.

The description is taken from a male bird from Valparaiso, obtained by Admiral Markham. The bird figured in the plate is a specimen from Mazatlan, both being in our own collection.





MAJAJQUEUS ÆQUINOCTIALIS

## 54. MAJAEQUEUS ÆQUINOCTIALIS (*Linn.*).

(WHITE-CHINNED BLACK FULMAR.)

(PLATE 44.)

- The Great Black Peteril*, Edwards, Nat. Hist. Birds, II., p. 89, Pl. 89 (1747).  
*Le Puffin du Cap de Bonne Espérance*, Brisson, Orn., VI., p. 137 (1760).  
*Procellaria fuliginosa* (nec Gm.) Solander, MSS.; Parkinson, Icon. ined., No. 19;  
Salvin in Rowley's Orn. Misc., I., p. 232 (1876).  
*Procellaria æquinoctialis*, Linn., Syst. Nat., I., p. 213 (1766).  
*Petrel-Puffin brun*, Buff., Hist. Nat. Ois., X., p. 163 (1786).  
*Black Petrel*, Lath., Gen. Syn., III., Pt. 2, p. 398 (1785).  
*Puffinus æquinoctialis*, Steph. in Shaw's Gen. Zool., XIII., p. 229 (1826).  
*Procellaria nigra*, Forster, Descr. Anim., p. 26 (1844).  
*Procellaria conspicillata*, Gould, Ann. and Mag. Nat. Hist., XIII., p. 362 (1844);  
id., Birds Austr., Fol. vii., Pl. 46 (1848); Reichenow, Deutsche Südpolar  
Exped. Vög., p. 482, Fig. 16 (1908).  
*Majaqueus conspicillatus*, Bp., Consp. Av., II., p. 200 (1856); Coues, Pr. Acad.  
Philad., 1864, pp. 118, 142; Gould, Handb. Birds Austr., II., p. 445 (1865);  
Giglioli, Faun. Vertebr. Oceano, p. 36 (1870).  
*Majaqueus æquinoctialis*, Bp., Consp. Av., II., p. 200 (1856); Coues, Pr. Acad.  
Philad., 1864, pp. 118, 142; Giglioli, Faun. Vertebr. Oceano, p. 35 (1870);  
Sharpe, Phil. Trans., Vol. 168, p. 119 (1879); Moseley, Notes Nat.  
"Challenger," pp. 137, 208, 254 (1879); Salvin, Cat. Birds Brit. Mus., XXV.,  
p. 395 (1896); Mathews, Handl. Birds Austr., p. 17 (1908).  
*Puffinus conspicillatus*, Pelz., Reis. Novara Vög., p. 143 (1865).  
*Fulmarus æquinoctialis*, Gray, Handl. Birds, III., p. 108 (1871).  
*Fulmarus conspicillatus*, Gray, Handl. Birds, III., p. 108 (1871).

Niger: mento et gula summa, genisque rarius, purè albis.

THE first description of this species, familiarly known to sailors as the "Cape Hen," was published by George Edwards in 1747. His figure fairly represents the bird, but gives no indication of the white chin, which is a marked characteristic.

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Edwards believed that his specimen came from the Cape seas, and Brisson, without seeing it, described the bird as "Le Puffin du Cap de Bonne Espérance." On these two descriptions and upon Edwards' figure, Linnæus founded his name of *Procellaria æquinotialis*, which has since been the recognised designation of the Black Fulmar of the Cape seas.

The white on the chin proves, however, to be a variable character, for, after examining the large series in the British Museum I find that the amount of white, though varying among individuals, increases with the eastward distribution of the species, till, in Australian specimens, not only do white chins and cheeks frequently exist, but in some specimens two white bands are likewise found on the head.

This latter form has been named *M. conspicillatus* by Gould, who gives a beautiful figure in his "Birds of Australia." Although at first sight this would seem to be a distinct species, further examination proves that the Australian birds also vary to a considerable extent, and as intermediate forms exist, neither Salvin nor I have been able to separate them, although they have been considered to be distinct by such good authorities as Professor Giglioli, Dr. Elliot Coues, and Dr. Reichenow.

Among the records of the occurrence of this species in the Cape seas, we have one of John Macgillivray, who met with it on the voyage of the "Rattlesnake," in Simon's Bay, in March, 1847. Dr. E. A. Wilson, during the voyage of the "Discovery," noticed this Fulmar in Lat. 38° S., Long 1° E. (*Nat. Antarctic Exped.*, II., Aves, p. 86), and he also records it from False Bay. Layard says that it is resident in Table Bay, leaving only to breed in the southern spring of the year (Sharpe, ed. Layard, *Birds S. Africa*, p. 766). It is also said to occur to the northward of the Cape on both east and west coasts. Dr. Wilson further states that *M. æquinotialis* was abundant in the South Atlantic Ocean, and from October onwards it accompanied the ship until November 9th, when it disappeared in Lat. 52° S., Long. 120° E.

The Earl of Crawford, in the "Venus," met with the species in Lat. 34° 39' S., Long. 8° 51' E., in September and October, 1874. The late Nikolai Hanson obtained a specimen in Lat. 42° 23' S., Long. 20° 32' E. (Sharpe, *Rep. Voy. "Southern Cross,"* p. 146), and again in Lat. 44° 23' S., Long. 72° 5' E. Giglioli records it from Lat. 42° 55' S., Long. 36° 31' E., to Lat. 35° 1' S., Long. 85° E.

An example was procured by the Scottish Antarctic Expedition at Gough Island, and further specimens obtained in these seas are in the British Museum. Gould, who mentions considerable numbers in the neighbourhood of Tristan da Cunha (*Handbook Birds Austr.*, II., p. 446), noticed this bird in the South Atlantic and South Pacific Oceans, but states that it was most plentiful between the 25th and 50th degrees of South Latitude, and especially about the islands of St. Paul and Amsterdam, and from thence to Tasmania. Mr. A. J. Campbell confirms this statement as regards Tasmania, and mentions *M. æquinotialis* as an inhabitant also of the seas of New South Wales (*Nests and Eggs Austr. Birds*, II., p. 897).

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Although this species does not occur in New Zealand waters, it has been found in the Auckland Isles, from whence Buller obtained several examples (*Suppl. Birds New Zealand*, I., p. 109).

Professor Giglioli, who recognised *M. conspicillatus* as a distinct form, first saw it in September, 1867, in Lat. 35° S., Long 89° 41' W., when it accompanied the "Magenta" till within sight of Valparaiso, and in the following November the same species was observed at Cape Stokes, in Patagonia, and was found abundant in the neighbourhood of the Falkland Isles, and to the north of Lat. 45° S.

As regards the white chin-spot, specimens from the southern coasts of South America closely resemble those from the Cape in that particular. I have examined three examples in the British Museum, two collected by Dr. Copping at Valparaiso, and one from Coquimbo, in Chile, obtained by Admiral Markham. None of these have any white on the cheeks or crown of the head.

Some birds from Kerguelen Island have the white chin-spot extended across the middle of the cheeks, but the markings are not symmetrical, and in one female, obtained by the "Challenger" Expedition, the white is extended and forms an irregular spot on the left cheek, while the right cheek is, with the exception of two white feathers, entirely black.

According to Professor Giglioli, *M. æquinoctialis* may be recognised, even at a distance, from *M. conspicillatus*, by its beautiful pale yellow bill and slightly smaller size; it lacks the white bands on the head which are a characteristic, though not always a constant, feature of *M. conspicillatus*. He considers the latter to be a larger bird, with blackish instead of yellow tips to the mandibles, and with white bands across the head.

As admitted by Professor Giglioli, the white markings on the head of *M. conspicillatus* are not constant, and, after comparing the large series at my disposal, I do not find the evidence as to the larger size of the Australian birds reliable, as in the true *M. æquinoctialis* the wing varies from 14.2 (Cape seas) to 15.6 inches (Valparaiso), whereas the examples of the so-called *M. conspicillatus* in the British Museum are decidedly smaller, having a wing of only 14 to 14.4 inches.

Birds from the Cape seas have a large white chin-spot, the white frequently extending to the cheeks, a little in front of the level of the eye, and sometimes to the base of the lower mandible. This marking on the cheek is not a constant character, and is not even always symmetrical, the white being often more developed on one side than on the other, as shown in a specimen obtained by the Earl of Crawford in Lat. 34° 39' S., Long. 8° 51' E., which has the white chin, and a small patch on the left cheek below the eye, but no white on the right cheek.

Examples procured in the South Indian Ocean are identical with those from the Cape, although one individual obtained by Nikolai Hanson, in Lat. 44° 23' S., Long. 72° 5' E., has a white chin-spot, and only a single white

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feather on either cheek, while another captured at the same time has no white feathers on the cheeks.

A female from Auckland resembles the birds from Chile; and one from Tasmania is also similar, neither having any white on the cheeks.

In Australian birds there is a band of white across the crown, varying in width, which in one specimen is almost united to a similar band extending along the cheeks behind the ear-coverts, nearly joining on the occiput. Another example has a narrow white band across the crown, and a few white spots on the face, not forming any distinct band. A third specimen, presented to the British Museum by Sir George Grey, has a white chin, but the base is black; the forepart of the cheeks is black also, the rest of the cheeks white, forming a wide band, as far as the sides of the occiput. Across the crown is a broad band of white with a white patch on the lores. The white on the sides of the face is not symmetrical.

The colour of the bill apparently varies considerably, and, according to Professor Giglioli, is a strong character for the separation of *M. æquinoctialis* from *M. conspicillatus*, but from the dried specimens in the British Museum I have been unable to find any confirmatory evidence.

Mr. M. J. Nicoll states that in a specimen from Table Bay the bill was "greenish-yellow, and with black streaks on both mandibles, the tarsi and toes black, with a whity-brown patch on each web."

In the Gough Island example, the naturalists of the "Scotia" record the following colours:—"Yellowish bill, with the basal part of the culmicorn, the margins contiguous to the latericorn, and its tip black; the distal plate and the narrow median plate of the mandible, black."

Gould mentions the Australian form, *M. conspicillatus*, as having the nostrils and sides of the mandibles yellowish horn-colour; culmen, tips of both mandibles, and a groove running along the lower mandible, black; feet, black.

An Auckland Island specimen, procured by Mr. Bethune, had the "bill, when fresh, with the upper mandibles and the tubes blue, the culmen and unguis black, and the lower edge of the lower mandible flesh-coloured" (Buller, *Suppl. Birds New Zealand*, p. 110). It will be seen that there is a marked difference, as here recorded, in the colour of the bill of specimens from various localities, but to what it is due I am unable to say.

The flight of *M. æquinoctialis* much resembles that of the Albatros, and the birds may be seen for hours at a time following the wake of a ship with their apparently motionless wings outstretched, occasionally wheeling to pick up the refuse on the surface of the water. The natural food consists of mollusca, crustacea, seaweed, and cuttlefish, the beaks and remains of which are frequently found in the stomach. The "Cape Hen," like other Petrels, has a strong musky odour, which remains permanently in the dried skins.

## MAJAEUS ÆQUINOCTIALIS.

Among the best-known breeding places are the Auckland Isles, the Crozets, and Kerguelen Island. In the latter place Mr. Eaton found *M. æquinoctialis* in holes, similar to those of a rabbit, on the sloping sides of a hill, frequently containing an inch or two of water at the entrance. The nesting-chamber is spherical in shape and rather large; the nest itself is composed of mud and pieces of plants arranged in the form of an inverted saucer, three or four inches high, slightly hollowed out on the top, a space being left between its base and the sides of the chamber.

A single smooth white egg is laid, nearly equally pointed at both ends, and measuring about 3.2 by 2.1 inches. Both sexes take part in the incubation, the males by day and the females by night. During the period previous to nesting, the birds make an extraordinary cackling noise in their burrows at night, and the sound of approaching footsteps or other disturbance will cause them to renew it during the daytime. When dug out from their nest, if handled, the birds utter a high-pitched cry, and frequently inflict a severe wound with their beak and claws. They make no attempt to fly, unless chased, but after waddling about, return to the burrow and commence scratching away the obstruction at the entrance which has blocked it, taking but little notice of strangers so long as they remain quiet.

*Adult.* General colour above and below sooty-brown, a little lighter on the under-surface; quills and tail-feathers blacker; a triangular spot of white on the chin. Total length about 22 inches; culmen, 2.1; wing, 14.2; tail, 4.5; tarsus, 2.35; middle toe and claw, 3.1.

The bird described is in our collection from the Cape of Good Hope, that figured is from Valparaiso, obtained by Dr. Coppinger.

## 55. MAJAQUEUS PARKINSONI (*Gray*).

(PARKINSON'S BLACK FULMAR.)

(PLATE 45.)

*Procellaria æquinoctialis*, partim, Gray, List Anseres, etc., Brit. Mus., p. 160 (1844, nec Linn.).

*Procellaria parkinsoni*, Gray, Ibis, 1862, p. 245; Buller, Birds New Zeal., p. 302 (1873).

*Majaqueus parkinsoni*, Coues, Pr. Acad. Philad., 1866, p. 192; Buller, Birds New Zeal., 2nd ed., II., p. 242 (1888); Salvin, Cat. Birds Brit. Mus., XXV., p. 397, Pl. V. (1896).

*Puffinus parkinsoni*, Pelz., Reis. Novara, Zool., I, Vög., p. 144 (1869).

*Fulmarus parkinsoni*, Gray, Handl. Birds, III., p. 108 (1871).

*M. æquinoctiali* similis, sed valde minor, et albedine gulari vel faciali nulla distinguendus.

GRAY'S type of *Procellaria parkinsoni* was presented to the British Museum by Miss Rachel Stone, who gave many specimens to that institution at a time when it possessed but a poor collection of New Zealand birds.

The species is distinguished from *M. æquinoctialis* by its smaller size and entirely black colour, the white on the chin, or sides of the face, being absent. The late G. R. Gray recognised the difference, and bestowed on the *Majaqueus* from New Zealand the name of *M. parkinsoni*, in honour of Sydney Parkinson, who accompanied Sir Joseph Banks on Captain Cook's first voyage round the world, and who died during the expedition (Sharpe's *History of the Collections in the British Museum*, II., *Birds*, p. 173).

Although *M. parkinsoni* is generally known as an inhabitant of New Zealand seas, it extends its range to Australian waters, where Mr. A. J. Campbell records it from Tasmania and New South Wales.

The late Sir W. Buller gives a very complete account of this Fulmar in New Zealand, from which I have made the following extract:—

This species, which appears to be peculiar to New Zealand seas, is by no means uncommon in the Hauraki Gulf, resorting to the Little Barrier and adjacent islands





## MAJAEUS PARKINSONI.

to breed. It is diurnal in its habits, hunting in the open sea like an Albatros. . . . The stomachs of several which were examined contained blubber-like matter, and the sharp-pointed beak of some cephalopod. It breeds in communities, often resorting for that purpose to the tops of low mountains far removed from the sea. The Maoris soon discover these breeding-places, and not only collect the young, but capture large numbers of the old birds by lighting fires on calm nights, and thus decoying them to their destruction. *M. parkinsoni* is also said to breed on the coast ranges north of Manukau, and on the Cape Colville peninsula, and on many of the islands off the eastern shore. Mr. Reischek found it nesting under the root of a tree, near the top of Waikomiti Hill, fully twelve miles from the sea; he likewise met with it on the Little Barrier, principally on the tops of the hills about the centre of the island, generally in natural cavities adapted to the wants of the bird. When not breeding, two were often associated in the same hole, but when the nest contained an egg, the female only remained in charge. In the month of November he saw the old birds cleaning out and adapting the hole selected, and collecting dry leaves and pieces of moss to form a nest, which is usually placed in a depression at the end of the cavity. These breeding-holes are generally from one to two feet deep. At the end is the nest-chamber, measuring about two feet in extent, and about half that in width. The birds breed at the end of November, and the young are hatched at the end of December or beginning of January. Except in the breeding season, when they may be seen about the island in the early morning and late in the evening, these birds are only met with far out at sea, and at about a hundred miles from land great numbers are sometimes met with at one time.

Salvin's description of the species is as follows (*Cat. Birds Brit. Mus.*, XXV., p. 397):—"Very similar to *M. æquinoctialis*, but smaller; the bill not nearly so stout, and the entire plumage, including the chin, sooty black. Total length about 18 inches; wing, 13.2; central rectrices, 4.3; lateral ones, 3.6; tarsus, 2.2; middle and outer toes, 2.65; inner toe, 2.1."

The description and figure are taken from the type-specimen in the British Museum.

## 56. ÆSTRELATA MACROPTERA (*Smith*).

(LONG-WINGED FULMAR.)

(PLATE 46.)

- Procellaria fuliginosa* (nec Gm.) Kuhl, Beitr., p. 142, Fig. 6 (1820); Salvin in Rowley's Orn. Misc., I., p. 238 (1876).  
*Procellaria macroptera*, Smith, Ill. Zool. S. Afr. Birds, Pl. 52 (1840).  
*Procellaria atlantica*, Gould, Ann. and Mag. Nat. Hist., XIII., p. 362 (1844).  
*Puffinus pacificus*, Gray, Gen. Birds, III., p. 647 (1844).  
*Pterodroma fuliginosa* (nec Gm.) Bp., Comptes Rend., XLII., p. 768 (1856).  
*Pterodroma atlantica*, Bp., Consp. Av., II., p. 191 (1855); Gould, Handb. Birds Austr., II., p. 449 (1865).  
*Pterodroma macroptera*, Bp., Consp. Av., II., p. 191 (1855); Gould, Handb. Birds Austr., II., p. 449 (1865); Giglioli, Faun. Vertebr. Oceano, p. 39 (1870).  
*Æstrelata fuliginosa* (nec Gm.) Coues, Pr. Acad. Nat. Sci. Philad., 1866, pp. 157, 171; Buller, Birds New Zeal., 2nd ed., II., p. 221 (1888).  
*Æstrelata macroptera*, Coues, *t.c.*, pp. 155, 171; Sharpe, ed. Layard's Birds S. Africa, p. 766 (1884).  
*Æstrelata gouldi*, Hutton, Ibis, 1869, p. 351.  
*Procellaria gouldi*, Hutton, Cat. Birds New Zeal., p. 47 (1871); Buller, Birds New Zeal., p. 308 (1873).  
*Fulmarus atlanticus*, Gray, Handl. Birds, III., p. 107 (1871).  
*Fulmarus macropterus*, Gray, *t.c.*, p. 107 (1871).  
*Æstrelata atlantica*, Ridgway, Man. N. Amer. Birds, p. 66 (1887).  
*Majaqueus gouldi*, Buller, Birds New Zeal., 2nd ed., II., p. 245 (1888).  
*Æstrelata fuliginosa* (nec Gm.) Salvin, Ibis, 1888, p. 360.  
*Æstrelata macroptera*, Salvin, Cat. Birds Brit. Mus., XXV., p. 399 (1896); Mathews, Handl. Birds Austr., p. 17 (1908).

Omnino fuliginoso-brunnea, vix griseo adumbrata: fronte, facie laterali et gula schistaceo lavatis: primariis intus basin versus griseo-fuliginosis.

IN arranging the species of the genus *Æstrelata*, Salvin divided them, according to

PLATE I. THE COMMON NODDY.



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## ÆSTRELATA MACROPTERA.

the aspect of the quill-lining, into two main sections. Those that had the outer primary dark below form one division, while those which had more or less white towards the base of the inner web are relegated to another. Thus *Æstrelata macroptera* and *Æ. aterrima* are placed in the first section, at a distance from *Æ. solanderi*, which is also a sooty-brown Fulmar. Professor Reichenow has recently published a revision of the southern species of *Æstrelata* (*Deutsche Südpolar Exped.*, IX., Zool., I., pp. 483-486), in which he places *Æ. macroptera* in close juxtaposition to *Æ. solanderi* and *Æ. brevirostris*, considering the dark character of the plumage to be of more importance than the greater or lesser amount of white on the inner surface of the first primary, and I agree with him that *Æ. macroptera* and *Æ. solanderi* are very closely allied.

The species was first described by Sir Andrew Smith from the Cape seas, where he believed it to be a rare bird, but I have been unable to discover his typical specimen in the British Museum. Gould, writing in 1844, considered that there were two forms of these sooty-brown Fulmars, and described one as *Procellaria atlantica*, stating that it frequented both the Atlantic and Pacific Oceans, and might be observed by every passing ship between our shores and the Cape of Good Hope. Of his other species, he relates that it was a fairly abundant bird in the Tasmanian seas, differing from *P. atlantica* in its larger size, longer wings, and greyer face, and therefore apparently identical with *P. macroptera* of Smith (*Handb. Birds Austr.*, II., p. 449). Captain Hutton points out that the bird which Sir A. Smith named *P. macroptera* had, according to that author, no grey on the face, but a white circle round the eye and reddish-brown legs and feet, in both of which points it differed from Gould's bird.

The grey face which Gould insisted upon is of no value as a character, and I have no doubt that Giglioli and Salvin were quite right in recognising only one species. I imagine that the grey tint on the face and throat in this bird is a sign of adult plumage, and it is quite certain that it fades and bleaches, for in one specimen in the British Museum from the South Atlantic (Gould) the throat is whitish.

The range of the Long-winged Fulmar is very extensive, as may be gathered from the record of Professor Giglioli, when naturalist on board the "Magenta" (*Faun. Vertebr. Oceano*, p. 39). The species was first seen near the Crozet Islands (Lat. 38° 22' S., Long. 47° 42' E.), and it followed the ship till nearing S. W. Australia, and thence through Bass's Straits to Port Jackson, as well as in the Pacific from the New Zealand seas to the neighbourhood of Valparaiso.

Mr. A. J. Campbell confirms its appearance in the seas of New South Wales, Victoria, New Zealand, and in the Southern Ocean (*Nests and Eggs Austr. Birds*, II., p. 902).

The following notes are compiled from Buller's "Birds of New Zealand" (2nd ed., II., p. 245), and from Mr. Campbell's account of its incubation.

Among the breeding places in New Zealand is one sixty miles inland from Opotiki; likewise the island of Karewa, in the Bay of Plenty; Whale Island; the islands in the Hauraki Gulf; and on the coast of Manukau. *Æ. macroptera* breeds plentifully on the

## MONOGRAPH OF THE PETRELS.

Little Barrier, usually seeking holes at the base of the cliff near the sea, though the nests near Opotiki prove that sea cliffs are not indispensable. The birds breed in companies, sometimes four or five pairs occupying the same cavern, though each nest is placed at the end of a separate burrow, some three or four feet in length, and terminating in an oval chamber considerably smaller than that formed by *Majaqueus parkinsoni*.

Numbers of the birds may be seen swarming about the cliffs after sunset, uttering their cry of "Ohi, Ohi," but always circling in the air before they enter the burrows, which, during the night, they frequently leave and return to again.

The female performs the duty of incubation, while the male wanders about; but, when the young bird is hatched, she remains with it a few days, and after that both parents go out to sea before sunrise, and remain absent till sunset, when they again circle round the burrow and call to the young bird, who replies before they enter. The ceremony of feeding is made to the accompaniment of a whimpering noise.

The eggs are much sought after for the purposes of food, and dogs are employed to hunt out the nests. According to some authorities, the dogs are severely punished by the birds, while others say that, unless taken hold of, the latter retire to the furthest corner of the burrow.

The single white egg, varying from 2.6 inches by 1.75 inches to 2.75 inches by 1.95 inches, is placed on a small heap of dry leaves, but very little care is bestowed on the nest itself.

*Adult male.* General colour above sooty-brown, with a grey shading on the back, which is much clearer on the sides of the face, forehead, and throat; quills and tail-feathers black, the primaries dull ashy at the base of the inner web, not forming a white base; the base of the body-feathers evidently white; "bill and feet black" (Buller). Total length about 15 inches; culmen, 1.35; wing, 11.6; tail, 4.6; tarsus, 1.65; middle toe and claw, 2.25.

The late Sir Walter Buller describes the nestling as being "covered with dingy slaty-grey down, the black feathers first appearing on the head, and in four or five parallel series on the cheeks. The down is long, thick, and fluffy, especially on the under-parts, and the bill and feet are perfectly black." He adds: "There is a full-grown fledgling in the Auckland Museum, in which the plumage is as in the adult, but with long thick down of a sooty-grey colour still adhering to the breast, and some paler-coloured down on the throat."

The specimen described and figured was obtained by Gould in Lat. 31° 45' S., Long. 5° 43' W.; it was formerly in our collection, and is now in the British Museum. As pointed out by Professor Giglioli (*l.c.*) the bill varies considerably in size.





J.G. Keulemans del. et lith.

ÆSTRELATA AERRIMA.

Harhart imp

## 57. *ÆSTRELATA ATERRIMA* (Bp.).

(MASCARENE BLACK FULMAR.)

(PLATE 47.)

*Pterodroma aterrima*, Bp., *Consp. Av.*, II., p. 191 (1855); *id.*, *Comptes Rend.*, XLII., p. 768 (1856).

*Procellaria aterrima*, Schl., *Mus. Pays-Bas.*, VI., *Procell.*, p. 9 (1863); *id.* & Pollen, *Faun. Madag.*, Ois., p. 144 (1868); Hartl., *Vög. Madag.*, p. 375 (1877).

*Æstrelata aterrima*, Coues, *Pr. Acad. Nat. Sci. Philad.*, 1866, pp. 158, 171.

*Æstrelata aterrima*, Salvin, *Cat. Birds Brit. Mus.*, XXV., p. 401 (1896); Reichenow, *Deutsche Südpol. Exped.*, IX., *Zool.*, I., p. 485 (1908).

*Æ. macroptera* similis, sed multo minor, et tarso (in exuvie) flavicante, minimè nigro.

THIS small race of *Æ. macroptera*, distinguished by the yellowish colour of the tarsi and basal half of the toes, is apparently confined to the seas around the Mascarene Islands.

It was originally described by Bonaparte from the island of Bourbon, or Réunion, and specimens from this locality are in the Leyden and Paris Museums.

The only other example that I know of, came from the St. Denys Museum, in Mauritius, and was given in exchange to Professor Alfred Newton, by whom it was bequeathed to the University Museum of Cambridge.

Grandidier and Milne-Edwards believed that *Æ. aterrima* was to be found in the seas off Madagascar; but its occurrence in West Africa, as stated by Bonaparte, must be a mistake (Hartlaub, *Vög. Madag.*, p. 375).

In Réunion this Fulmar is known by the name of *Fouquet*, but, though occurring in considerable numbers, it is difficult to obtain, as during the day it frequents holes and crevices in the rocks, only leaving them between sunset and sunrise in search of food at sea. The Creoles informed Dr. Pollen that the birds cannot see at all in the light, and that the glare of a fire, placed close to the nesting-hole, will so confuse them that they may be easily captured when they emerge at night-time from their retreat.

Bonaparte, in describing the species, states that the feet are "half black and white," and the bill intensely black. Schlegel speaks of the Leyden Museum specimen

## MONOGRAPH OF THE PETRELS.

as having the feet "yellow, passing into black on the anterior portions of the toes with their membranes"; while, according to Coues, the tarsi are "light-coloured, passing into black on the terminal portion of the toes."

The figure in the Plate is taken from the specimen in the Cambridge Museum, kindly lent me by Professor Harmer. It should be noted that this example exhibits an extraordinary number of filo-plumes on the head, neck, and mantle. Total length about 13.5 inches; culmen, 1.15; wing, 10.0; tarsi, 1.5; middle toe and claw, 1.8.





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## 58. *ÆSTRELATA LESSONI* (*Garnot*).

(WHITE-HEADED FULMAR.)

(PLATE 48.)

*Procellaria vagabunda*, Solander MSS. ; teste Salvin, Cat. Birds Brit. Mus., XXV., p. 401 (1896).

*Procellaria lessoni*, Garnot, Ann. Sci. Nat., VII., p. 54, Pl. 4 (1826) ; Gould, Birds Austr., Fol. VII., Pl. 49 (1848) ; Buller, Birds New Zeal., p. 303, Pl. 29, fig. 2 (1873).

*Puffinus sericeus*, Less., Man. d'Orn., II., p. 402 (1828) ; Salvin, Ibis, 1875, p. 374.

*Procellaria leucocephala*, Forster, Descr. Anim., ed. Licht., p. 206 (1844).

*Puffinus lessoni*, Reichenb., Syst. Av. Natatores, Pl. 20, fig. 339 (1850).

*Æstrelata leucocephala*, Bp., Consp. Av., II., p. 189 (1855) ; Gould, Handb. Birds Austr., II., p. 451 (1865).

*Adamastor sericeus*, Bp., Consp. Av., II., p. 188 (1855).

*Æstrelata lessoni*, Cass., Pr. Acad. Philad., 1862, p. 327 ; Sharpe, Phil. Trans., CLXVIII., p. 126 (1879) ; Buller, Birds New Zeal., 2nd ed., II., p. 219 (1888) ; Salvin, Cat. Birds Brit. Mus., XXV., p. 401 (1896) ; Grant, Ibis, 1905, p. 554.

*Æstrelata lessoni*, Coues, Pr. Acad. Philad., 1866, pp. 142, 170 ; Giglioli, Faun. Vertebr. Oceano, p. 40 (1870).

*Fulmarus lessoni*, Gray, Handl. Birds, III., p. 106 (1871).

Primariis intus cineraceis : subtus pure alba : capite undique albo, plaga anteculari nigra.

THE White-headed Fulmar was described from the neighbourhood of the Falkland Islands by Dr. Garnot, one of the naturalists on board the "Coquille." In his paper on the birds of these islands he gives a full description of the species, which he named after his friend Lesson, who was also a member of the same celebrated expedition. The figure which accompanies his description is not quite accurate, but it leaves no doubt as to the identity of the species.

Since the visit of the "Coquille" to the Falkland Islands, I cannot find any record of the occurrence of *Æ. lessoni* in the seas of eastern South America, nor has it

## MONOGRAPH OF THE PETRELS.

apparently been noticed by any of the recent South Polar expeditions in South Georgia, South Orkney Islands, or the region visited by the "Scotia."

*Æ. lessoni* is, however, met with in the Cape seas, and a female presented to the British Museum by Sir George Grey was obtained in Lat. 36° 39' S., Long. 10° 3' E. (spec. *i.* of Salvin's *Catalogue of Birds*, XXV., p. 402). Professor Giglioli observed the species on March 12th, 1866, in Lat. 42° 55' S., Long. 36° 31' E., and on the 15th of the same month in Lat. 43° 05' S., Long. 42° 04' E. (*Faun. Vertebr. Oceano*, p. 40). The late Captain Hutton noticed it in Lat. 43° 14' S., Long. 102° 41' E., and thence to New Zealand (*Ibis*, 1867, p. 188), where Buller says it was very scarce, as he only once obtained an example, which was found in a dying state in the surf near Kaipara Head. Another was procured on Antipodes Island by the Earl of Ranfurly, by whom it was presented to the British Museum. Gould mentions this Fulmar during his voyages, but beyond recording the capture of a single individual between Hobart Town and Sydney, he does not give any precise localities. Specimens were obtained during the voyage of the "Rattlesnake," below south-western Australia, in Lat. 40 $\frac{3}{4}$ ° S., Long. 125 $\frac{1}{2}$ ° E. (spec. *g. h.* of Salvin's *Catalogue of Birds*, XXV., p. 402).

In the South Pacific Ocean, Macgillivray, on the "Rattlesnake," obtained this bird in Lat. 44° S., Long. 110 $\frac{1}{2}$ ° W. Professor Giglioli says that, on the voyage of the "Magenta" across the Pacific, he first observed it in Lat. 38° 36' S., Long. 164° 46' W., on June 9th, 1867, and it followed the ship intermittently up to the 24th of that month, to Lat. 39° 38' S., Long. 125° 58' W., on which day some eight or nine specimens were captured. The bird was noticed up to July 28th (Lat. 37° 37' S., Long. 108° 01' W.), and on the journey from Callao to Valparaiso in Lat. 37° 09' S., Long. 79° 23' W. (*Faun. Vertebr. Oceano*, p. 40).

Very little has been recorded of the habits of this Fulmar, but the Rev. A. E. Eaton, who found it breeding on Kerguelen Island, states that it flew about at night uttering unearthly shrieks. It nests in a short dry burrow about the size of a rabbit's hole, which is usually excavated in the *Azorella*. The entrance is frequently strewn with the green shoots of *Acæna*, and the passage terminates in a large chamber, in which there is no real nest, and if a hand be incautiously introduced to feel for the single egg, it is severely bitten by the old bird. The breeding places were found from the sea-shore to an altitude of 300 feet, and also on the landward side of a hill, near a fresh-water lake.

*Adult male.* General colour above light ashy-grey, with hoary-grey margins to the feathers; the longer scapulars and the wing-coverts and inner secondaries darker than the back, inclining to slaty-black, with obsolete margins of ashy; quills blackish, washed with grey, and more or less ashy-brown on the whole of the inner web; lower rump and upper tail-coverts pearly-grey, lighter than the back, with distinct white edges to the feathers; centre tail-feathers ashy-grey, white near the ends; remainder for the most part white, either entirely ashy-grey

### CESTRELATA LESSONI.

along the outer web, or mottled with ashy vermiculations, mostly confined to the latter; head white, shading off into light ashy-grey on the hind-neck and sides of neck, these parts varied with dusky-grey cross-lines, imparting a waved appearance; fore-part of crown and lores pure white; a patch of black in front of the eye, encircling the latter, and extending a little beyond it; cheeks and sides of face white, mottled with a few blackish and ashy-grey crossbars; entire under-surface of body pure white, including the under tail-coverts; sides of fore-neck and chest light ashy-grey, not extending across the latter; sides of neck mottled with cross-lines of dull ashy; sides of body faintly streaked with ashy-grey shaft-lines; under wing-coverts dark ashy-brown, with hoary whitish margins, the feathers round the edge of the wing rather darker, but not forming a conspicuous black band; axillaries ashy-grey, white for the basal half, the smaller ones white, freckled with ashy-grey towards the ends; quills dusky-brown below, grey along the inner web, which is edged with hoary white; the secondaries entirely ashy-grey below; "bill black; tarsi and half the toes and webs fleshy-white; tips of toes and their webs black; iris black" (J. Gould). Professor Giglioli states that the bill is black, the tarsi and basal half of the feet are flesh-colour, the remainder black; the iris brown.

The specimen mentioned above from Antipodes Island (January 13th, 1906) had the "iris black; legs and feet flesh-colour, the terminal half of the outside web black." Dr. Kidder gives the colours as follows:—"Tarsus and foot fleshy-pink, black along the upper-surface of the digits, and on the web near the claw; irides very dark brown." Sir Walter Buller says that the colour of the tarsus and a portion of the feet are "dull yellow; the outer toe of each foot and a diagonal patch across the webs black." Total length about 18 inches; culmen, 1.55; wing, 12.0; tail, 5.8; tarsus, 1.7; middle toe and claw, 2.5.

The specimen described is in the Rothschild Collection, and was obtained on Kerguelen Island, on January 10th, 1898. The bird figured is from the Antarctic seas, and is now in the British Museum.

## 59. ÆSTRELATA HÆSITATA (*Kuhl*).

(CAPPED FULMAR.)

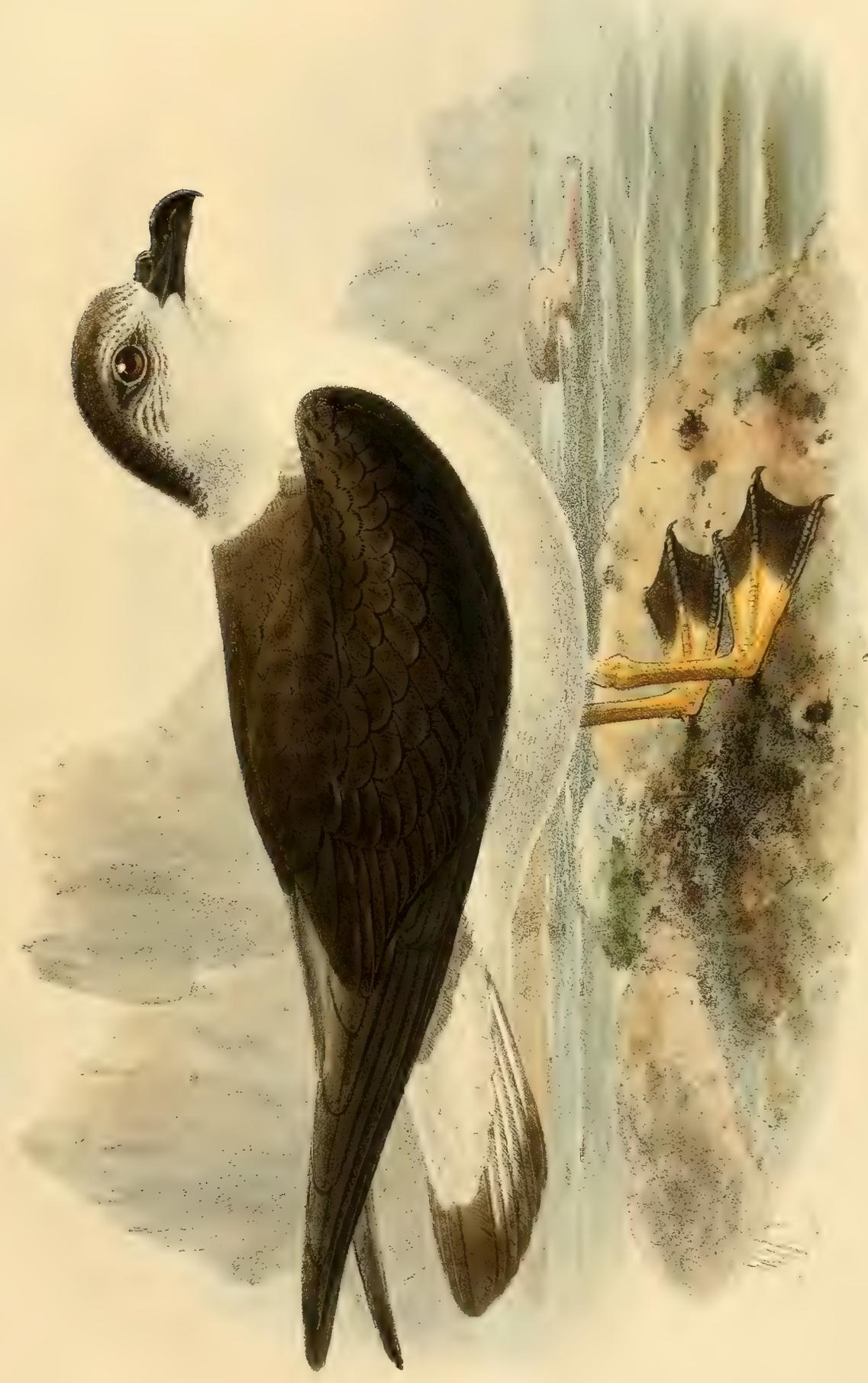
(PLATE 49.)

- Procellaria hasitata*, Kuhl, Beitr., p. 142 (1820); Temm., Pl. Col., Pl. 416 (1826).  
*Procellaria hæsitata*, Yarr., Brit. Birds, Suppl., p. 63 (1845); Newton, Zool., 1852, p. 3691; id., Ibis, 1859, p. 372.  
*Procellaria diabolica*, Lafr., Rev. Zool., 1844, p. 168; Lawr., Pr. U. S. Nat. Mus., I., p. 451 (1878).  
*Procellaria meridionalis*, Lawr., Ann. Lyc. N. Y., IV., p. 475 (1848), V., p. 220 (1852); id. in Baird, Cass. and Lawr., Birds N. Amer., p. 827 (1860).  
*Procellaria rubritarsi*, Gould, Zool., 1852, p. 3692.  
*Puffinus hasitata*, Reichenb., Syst. Av. Natatores, Pl. 12, fig. 336 (1850).  
*Æstrelata diabolica*, Bp., Consp. Av., II., p. 189 (1855).  
*Æstrelata hæsitata*, Bp., Comptes Rend., XLII., p. 768 (1856); Coues, Pr. Acad. Philad., 1866, pp. 139, 170.  
*Fulmarus meridionalis*, Bp., Comptes Rend., XLII., p. 768 (1856).  
*Æstrelata hæsitata*, Newton, Ibis, 1870, p. 277; Saunders, ed. Yarr. Brit. Birds., IV., p. 8 (1884); id., Man. Brit. Birds, p. 713 (1889); Baird, Brewer and Ridgw., Water-Birds N. Amer., II., p. 394 (1884); Feilden, Tr. Norf. and Norw. Nat. Hist. Soc., V., p. 24 (1890).  
*Fulmarus hæsitatus*, Gray, Handl. Birds, III., p. 106 (1871).  
*Diablotin*, Lawr., Pr. U. S. Nat. Mus., I., p. 68 (1878); id., Auk., 1891, p. 61.  
*Æstrelata sp.* Lawr., Pr. U. S. Nat. Mus., I., p. 488 (1878).

Supra fumoso-brunnea: supracaudalibus albis: pileo nigro: collo postico albo: corpore toto subtus albo.

ALTHOUGH we have several accounts of the nesting of *Æ. hæsitata* in the West Indies in former days, there is no recent record of its breeding there, but, as occasional specimens may still be met with, it is probable that Guadeloupe and Dominica are still nesting haunts.

During the winter months it wanders northwards, and eleven specimens have been recorded by Professor J. A. Allen from North America (*Auk*, 1904, p. 383, Pl. 22).





## ŒSTRELATA HÆSITATA.

Occasionally, however, it extends its range to Europe, as is proved by the capture of a bird at Swaffham, Norfolk, in April, 1850. There is also a specimen in the Boulogne Museum, said to have been shot near the town, but its history is not considered authentic (Saunders' *Manual*, 2nd ed., p. 745). A supposed example, reported to have been killed in the county of Zips, in Hungary, is in the museum at Buda-Pest, but on being submitted to Dr. Sharpe for examination, was pronounced to be *Œ. incerta* (*Bull. B. O. C.*, VIII., p. xxvi., 1899).

Colonel H. W. Feilden, in the "Transactions" of the Norfolk and Norwich Naturalists' Society (Vol. V., pp. 24-39, 1890), relates that specimens were sent by L'Herminier from Guadeloupe to the Paris Museum, and three to Baron de Lafresnaye, one of these last being subsequently received in exchange by the University Museum at Cambridge. Professor Newton was therefore able to identify the species as *Procellaria diabolica*, or "Le Diablotin," as it was named by L'Herminier. Père du Tertre, who wrote a book on the Natural History of the West Indian Islands (Paris, 1666-1671), thus called the bird in consequence of its ugliness.

*Œ. hæsitata* is described as a very rare bird, nocturnal in its habits, and frequenting rabbit-like burrows, in which the eggs are laid. The old birds, when leaving the nest at night, utter a mournful cry as they go out to sea. The flesh was much prized as an article of food, and the native hunters have been known to return with a dozen or more birds hung round their necks.

In 1696 Père Labat landed in Guadeloupe, and shortly after his arrival he accompanied four black hunters to the breeding-places of the "Diablotin," which he also mentions as occurring in Dominica. The "Diable" arrived in the month of September in Guadeloupe, where the birds occupied their burrows in pairs till the end of November, when they all disappeared, and were not seen again until about the middle of January. Only a single male or female remained in the holes till the month of March, when the female was found with "two" nestlings, covered with a thick yellow down, and resembling little balls of fat. The young birds are able to fly at the end of May, when they disappear, and are not seen again till September, at which season they return with great regularity.

Colonel Feilden records a third visit to the "Soufrière" of Guadeloupe by Sieur Froger, who published an account of his voyage to the Antilles and South America, at Amsterdam in 1715. He relates that the negroes procured specimens of the "Diablotin" for food, and how they suffered from the cold of the high mountains.

The late G. N. Lawrence requested his friend Mr. Colardeau to see if the "Diablotin" still inhabited the island of Guadeloupe, and learned that though it was still believed to exist, the old hunting parties with dogs and negroes were things of the past. In 1791 Mr. Thomas Atwood wrote a history of the island of Dominica, and compared the "Diablotin" to an Owl from its nocturnal habits and its Owl-like

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cry. Mr. F. A. Ober, an enthusiastic American naturalist, made a special expedition to the highlands of that island to search for the nesting-places, but was unsuccessful. The next attempt was made by Colonel Feilden himself, with Admiral Markham and other friends, and accompanied by some negroes who had actually taken the birds in former years. They ascended the Morne au Diable in Dominica, but, though the burrows under the roots of trees still remained, no traces of the bird could be found.

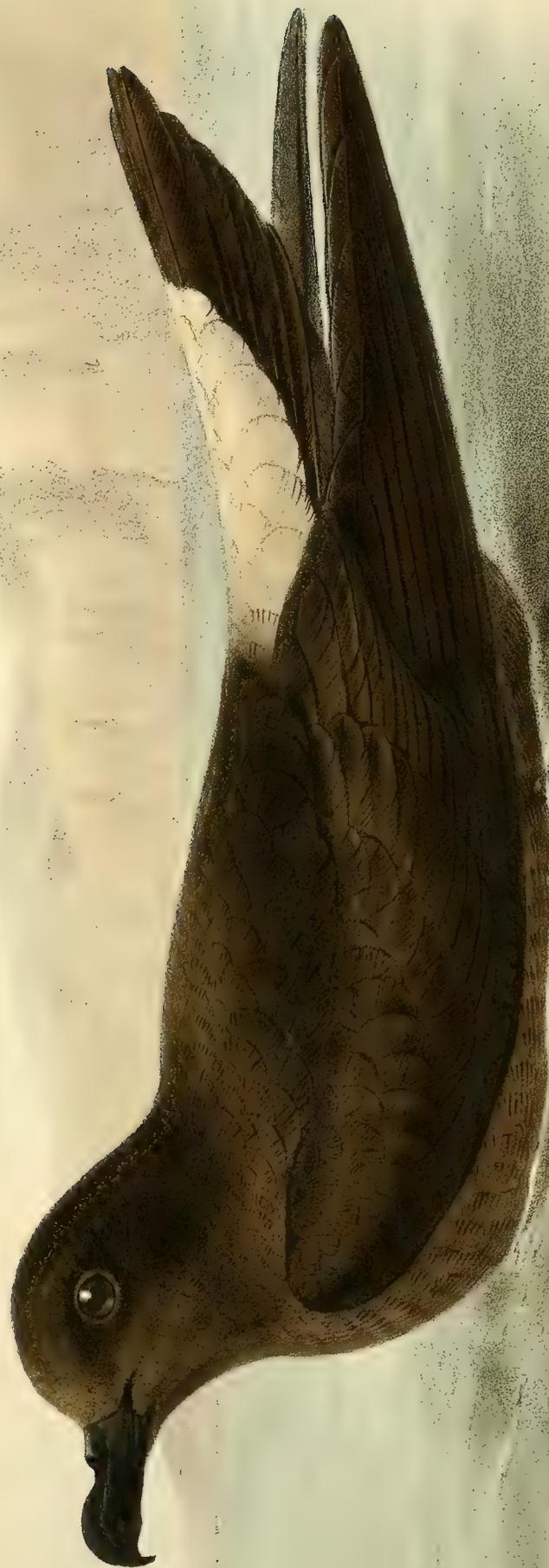
Writing in 1906, Mr. W. Hyatt Verrill, in his pamphlet entitled "Addition to the Avifauna of Dominica," says that *Æ. hæsitata* is a rare species near the coast, but not uncommon on the fishing grounds, and in Martinique and Guadeloupe Channels. One specimen was captured on board a steamer on September 12th, 1904.

An example in the British Museum, the type of Gould's *Procellaria rubritarsi*, is said to have come from Hayti. The species is apparently not yet extinct, as wandering individuals continue to be captured in northern latitudes, but it is doubtless doomed to speedy destruction in those islands where the Mongoose and Opossum have been introduced.

*Adult.* General colour above dark brown, the feathers with obsolete margins of lighter brown, the longer scapulars and the upper wing-coverts rather blacker than the back, with scarcely perceptible lighter brown edges to the feathers: quills black, the primaries ashy-brown on the inner webs, with the base inclining to white, the inner secondaries rather browner; rump and basal upper tail-coverts black; lateral upper tail-coverts at the base of the tail, and all the long coverts of this series white; tail-feathers black, white at the base, especially on the inner web; crown of head black, forming a cap; forehead and lores white, the centre of the former black, mottled with white edges to the feathers; sides of face white, the feathers in front of the eye black, and spotted with black below the latter; cheeks and sides of neck pure white, extending in a broad white collar round the hind-neck, which has a few brown-tipped feathers in the centre; entire under-surface of body pure white, including the under tail-coverts; under wing-coverts black, forming a broad band round the whole of the bend of the wing, the median and greater coverts pure white; axillaries white; under-surface of the quills black, grey on the inner webs, which have white bases. Total length about 14.5 inches; culmen, 1.25; wing, 11.4; tail, 5.0; tarsus, 1.5; middle toe and claw, 2.0.

The description and figure are taken from the specimen in the British Museum. It was originally presented to the Zoological Society by Mr. J. Hearne, and is believed to have come from Hayti.





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## 60. *ÆSTRELATA JAMAICENSIS* (*Bancr.*).

(BLUE-MOUNTAIN FULMAR.)

(PLATE 50.)

- The larger dark Petterill, or Shearwater*, Browne, Nat. Hist. Jamaica, p. 482 (1789).  
*Procellaria jamaicensis*, Bancroft, Zool. Journ., V., p. 81 (1829).  
*Blue-Mountain Duck*, Gosse, Birds of Jamaica, p. 437 (1847).  
*Pterodroma caribbæa*, Carte, P. Z. S., 1866, p. 93, Pl. X.  
*Æstrelata (Pterodroma) caribbæa*, Giglioli and Salvad., Ibis, 1869, p. 66.  
*Fulmarus caribbæus*, Gray, Handl. Birds, III., p. 107 (1871).  
*Æstrelata caribbæa*, Scl. and Salvin, Nomencl. Av. Neotr., p. 149 (1873); Rothschild, Extinct Birds, p. 157, Pl. 37 (1907).  
*Æstrelata jamaicensis*, A. and E. Newton, Handb. Jamaica, 1881, p. 117; D. Morris, Nature, XXV., p. 151 (1881); Salvin, Cat. Birds Brit. Mus., XXV., p. 403 (1896).  
*Æstrelata jamaicensis*, Ridgway, Man. N. Amer. Birds, p. 66 (1887).

Nigricanti-brunnea, vix griseo adumbrata: alis caudaque nigris: supracaudalibus et rectricibus basaliter albis: corpore subtus fuliginoso-brunneis, subcaudalibus pallidioribus: subalaribus nigricantibus.

THE species which we now know as *Æ. jamaicensis* was first observed by Dr. Patrick Browne in 1789, who speaks of his "larger dark Petterill," and describes it as "*Sterna* 2, major, fusca, humile volans," plentiful and somewhat smaller than a pigeon, of a dark blackish colour, and flying so close to the water that it is frequently hidden between the waves.

Dr. Bancroft, writing in 1829 to the Editors of the "Zoological Journal," informs them that he is sending the skin of a Petrel which had been hunted by a dog from a hole in the summit of the Blue Mountains. Some numbers were to be met with, but they were difficult to obtain, as the burrows were only found in the crevices of almost inaccessible mountains. The birds probably resort there during the breeding season, as they only fly about in the evening, when it is supposed that they go out to sea. Dr. Bancroft further states that, as the species had not been observed elsewhere, "it might, if new, be called *Procellaria jamaicensis*."

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There cannot be the smallest doubt that the Petrel secured by Bancroft was *Æstrelata jamaicensis*, as understood at the present day, and he doubtless intended that the Editors of the "Zoological Journal" should publish a description of it under his proposed name of *Procellaria jamaicensis*. Unfortunately, however, the Editors contented themselves with publishing the notes only, in which there is no exact description or diagnosis of the bird which Bancroft had forwarded to them.

There is, however, no question that, in the strict letter of the law, Bancroft's name of *P. jamaicensis* becomes a *nomen nudum*, and that of *Pterodroma caribbæa* of Dr. Carte should be adopted, as it is accompanied by a description and figure of the species. Salvin used Bancroft's name because it had been widely applied, and there can be no doubt as to the identity of the bird he wrote about.

The Blue-Mountain Fulmar, or "Duck," as it is sometimes called, is generally supposed to be confined to the island of Jamaica, but in a pamphlet published by Mr. A. Hyatt Verrill, in 1906, entitled "Addition to the Avifauna of Dominica," he states that it is not uncommon, and breeds at La Birne, Pointe Guignarde and Lance Bateaux, as well as at Morne Rouge and Scott's Head. The musky odour of these birds is very pronounced in the vicinity of the cliffs, where they nest in crevices.

Mr. Verrill observed a number of large Petrels, or Petrel-like birds, in the vicinity of Charlotteville and Roseau, but never managed to shoot one, as they only appeared after dark. A comparison of the Dominica birds, recorded by Mr. Verrill as *Æ. jamaicensis*, with typical birds from Jamaica, is decidedly necessary, as the species is believed to be nearly extinct in the latter island, and its breeding in Dominica would be an interesting and welcome fact.

Dr. Carte, in describing his *Pterodroma caribbæa* in 1866, quotes some notes from Mr. W. T. March:—

"It is a night-bird, living in burrows in the marly clefts of the mountains at the east and north-east end of the island. The burrows form a gallery six to ten feet long, terminating in a chamber sufficiently commodious to accommodate the pair; from this they sally forth at night, flying over the sea in search of food (fishes), returning before dawn. It is often seen on moonlight nights, and at sunrise, running about the neighbourhood of its domicile, and sometimes crossing the road, regardless of the labourers going to their work. I know nothing of its nidification." The above particulars have been corroborated by Mr. Gosse, who obtained his information from Mr. Hill.

This Fulmar is also mentioned by Sir Daniel Morris as having been found in holes under trees, or in burrows in the cinchona plantations, and in the unfrequented woods in the Blue Mountains, at elevations of from 6,000 to 7,000 feet; but though a careful search had been made, and a reward offered for them, for the last two years, neither nests nor eggs had been found. Colonel Feilden made a special visit to the mountains for it, in company with natives who were acquainted with the bird, but discovered

## ÆSTRELATA JAMAICENSIS.

only their disused burrows ; and I myself made inquiries when in Jamaica a few years ago, and was informed that the bird no longer existed in the island, having been exterminated by the Mongoose.

*Adult.* General colour above sooty-brown, with a grey shade caused by the dark slaty margins to the feathers ; the longer scapulars, wing-coverts, and secondaries sooty-brown, with a faint edging of grey to the secondaries and greater wing-coverts ; primaries black, with a slight shading of grey, the inner webs for the most part ashy-brown ; upper tail-coverts light ashy-grey, with white bases, the centre ones blackish, forming a patch, the longer coverts white, with an ashy tinge ; tail-feathers blackish-brown ; crown of head like the back, but slightly darker, with a shade of grey on the forehead and sides of face ; under-surface of body entirely dull ashy-brown, the chin and upper-throat decidedly grey ; abdomen and under tail-coverts hoary-grey, the longer ones with dusky tips ; under wing-coverts blackish-brown, with a slight grey shade ; quills blackish below, ashy-grey on the inner webs, and on the lower surface of the secondaries ; bill and feet entirely black (in skin). Total length about 15 inches ; culmen, 1.15 ; wing, 10.6 ; tail, 5.0 ; tarsus, 1.45 ; middle toe and claw, 2.05.

The two other specimens in the British Museum are browner than the one described. Some of the long upper tail-coverts are ashy-grey or creamy-white.

The bird figured is from a cinchona plantation in Jamaica, and was given to us by Professor Newton : the one described was obtained by Mr. Hill, and is in our collection.

## 61. CESTRELATA ROSTRATA (*Peale*).

(PEALE'S FULMAR.)

(PLATE 51.)

- Procellaria rostrata*, Peale, U. S. Expl. Exped., pp. 296, 338, Pl. 82 (1844); Cass., U. S. Expl. Exped., pp. 412, 451, Pl. 41 (1858).  
*Procellaria desolata* (nec Gm.) Jacq. et Pucher., Voy. Pole Sud, Zool., III., p. 138.  
*Thalassidroma rostrata*, Hartl., J. f. O., 1854, p. 169.  
*Æstrelata rostrata*, var. *a*, Bp., Consp. Av., II., p. 189 (1855); Coues, Pr. Acad. Philad., 1866, pp. 144, 170.  
*Æstrelata desolata*, Bp., Consp. Av., II., p. 189 (1855).  
*Rhantistes rostrata*, Bp., Comptes Rend., XLII., p. 768 (1856).  
*Procellaria (Æstrelata) rostrata*, Gray, Cat. Birds Trop. Isl. Pacific Ocean, p. 56 (1859).  
*Fulmarus rostratus*, Gray, Handl. Birds, III., p. 106 (1871).  
*Cestrellata rostrata*, E. L. and L. C. Layard, Ibis, 1878, p. 264.  
*Cestrelata rostrata*, Wigglesw., Abhandl. Mus. Dresden, 1890-91, No. 6, p. 82 (1891); Salvin, Cat. Birds Brit. Mus., XXV., p. 404 (1896).

Subtus alba: pileo, dorso, et supracaudalibus concoloribus: subalaribus saturate brunneis: gutture et præpectore dorso concoloribus: rostro crasso.

THIS species was described by the late Titian Peale from examples obtained by him during the U. S. Exploring Expedition, at Tahiti, in the Society Islands. Mr. Wigglesworth (*Aves Polyn.*, p. 82) identifies the *Procellaria desolata* of Jacquinot and Pucheran with *C. rostrata* (Peale), and if this surmise be correct, the Caroline Islands must be included as within its range. Mr. E. L. Layard and his son Leopold made excellent collections of the birds of New Caledonia, and record *C. rostrata* as the commonest Petrel of the seas in that vicinity, but they seem never to have obtained any adult birds, though they sent several specimens of the nestlings to England. Two of these nestlings are in the British Museum, and though Salvin (*Cat. Birds Brit. Mus.*, XXV., p. 405) says that their determination is quite uncertain, I am inclined to think that they have been rightly referred to *C. rostrata*, although, until adult specimens have been procured from New Caledonia, it will be impossible to





## CESTRELATA ROSTRATA.

speak with certainty. Both the nestlings in the British Museum have white under-parts, and the bill is somewhat stout.

According to Messrs. Layard, the bird breeds on the small rocky islands, and they also believe that it nests in the mountains of the interior. Several nestlings, in various stages of plumage, were received by them from a small island off "Ueu," which is separated from the main island by the celebrated Wodin Passage, and forms the southernmost end of New Caledonia (*Ibis*, 1882, p. 538).

Layard further mentions that he obtained from Père Montrouzier nine young birds in the downy stage, which he describes as being white below and grey above, where the feathers were beginning to show. Bill, legs, and feet black, the webs between the toes, buff. These nestlings were sent on April 11th, 1877, and on September 20th the same correspondent forwarded an older bird, with the primaries just showing. This latter was sooty-grey, including the throat and chest, the rest of the under-parts white. Bill black, the tip of the lower mandible white; feet and legs pale flesh-colour, with a black patch commencing half-way up the outside edge of the tarsus and extending downwards, over the joint, to the centre and exterior toes as far as the first joint, then across the whole foot, including the web (*Ibis*, 1882, p. 539).

Wiglesworth has included the islands of Aneiteum in the New Hebrides among the habitats of this species, on the authority of Macgillivray (*cf. Abhandl. Mus. Dresden*, 1890-91, No. 6, p. 82). He quotes a reference to Macgillivray's paper in the "Zoologist" for 1860 (p. 7133), but, on referring to it, I cannot find any mention of *Æ. rostrata*.

On the island of Tahiti these birds were found by Peale breeding in holes, at an elevation of some 6,000 feet, during the month of October. They were nocturnal in their habits, and but few were seen abroad during daylight; about sunset they sallied forth, and went out to sea in search of food for their young, the food being rarely found near the coast.

The egg, according to the Messrs. Layard, is naturally white, but is frequently more or less stained with the yellow clay of the hole in which it is laid. Axis, 2.0 inches; diam., 1.6 (*Ibis*, 1882, p. 539).

Peale's description is as follows:—"Head, neck, back, wings, and tail, sepia-brown, lightest on the throat and breast; lower part of the breast, belly, and vent, white; wings darker than the back; quills sooty; tail cuneate; upper tail-coverts brown, lower coverts white, tipped with pale brown; bill deeply furrowed, very strong and black; irides brown; feet pale flesh-colour beneath, and on the inner side, but margined with black; toes and connecting membrane black, excepting a small flesh-coloured spot at the base of the inner membrane. Total length, 16 inches."

Salvin's description of the species is copied from that of Professor Coues. His diagnosis in the "Catalogue of Birds" is as follows:—"Quill-lining dark; under-surface white; crown and upper tail-coverts dark, like the back; under wing-coverts

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dark, as also the throat and fore-neck; general colour of upper surface rich sooty-brown."

I am unable to state the origin of the specimen here figured, as Salvin left no memoranda on the subject. There are no adult birds in any museum in this country, so that it is probable that the Plate was drawn from an example lent by the Paris Museum, or from the actual type in the U. S. National Museum. From both these institutions many valuable specimens of Petrels were lent for the purposes of the present work.





## 62. ÆSTRELATA PARVIROSTRIS (*Peale*).

(PHOENIX ISLANDS FULMAR.)

(PLATE 52.)

*Procellaria parvirostris*, Peale, U. S. Expl. Exped., VIII., pp. 298, 338, Pl. 41 (1848);  
Cass., U. S. Expl. Exped., pp. 411, 451 (1858).

*Rhantistes parvirostris*, Bp., Comptes Rend., XLII., p. 768 (1856).

*Æstrelata parvirostris*, Coues, Pr. Acad. Philad., 1866, p. 146.

*Fulmarus parvirostris*, Gray, Handl. Birds, III., p. 106 (1871).

*Æstrelata parvirostris*, Buller, Birds New Zeal., 2nd ed., II., p. 224 (1888); Lister,  
P. Z. S., 1891, p. 295; Wiglesw., Abhandl. Mus. Dresden, 1890-91, No. 6,  
p. 82 (1891); Salvin, Cat. Birds Brit. Mus., XXV., p. 405 (1896).

*Æ. rostratæ* similis, sed minor, rostro debiliore.

It has been difficult for me to define the characters which separate *Æ. parvirostris* from *Æ. rostrata*. Two specimens of the former in the British Museum from the Phoenix Islands do not agree with the Plates published by Peale in 1848, and by Cassin in 1858. I possess one of the original copies of the 1848 edition of the United States Exploring Expedition, which is an extremely rare book, as the bulk of the edition was destroyed by fire—hence the re-publication of the work by Cassin in 1858. In my copy of the 1848 edition, and in the 1858 edition in the British Museum, the colour of the figures of *Æ. rostrata* and *Æ. parvirostris* has faded into a brown tint, whereas the species are described by Peale as “dark fuliginous,” and the general aspect of *Æ. parvirostris* is certainly blackish.

Salvin, in his “Key to the Species of *Æstrelata*” (*Cat. Birds Brit. Mus.*, XXV., p. 398), separates the two on the score of size only, *Æ. rostrata* having a wing of 11 inches, and *Æ. parvirostris* a wing of 10.5 inches. This is a difference of small moment in the family of Petrels, and the female of *Æ. parvirostris* from Canton Island in the British Museum has a wing of 10.8 inches in length, thus nearly equalling that of *Æ. rostrata*.

The specimens at my disposition are not enough for me to determine the differential characters of the two species, but it is difficult to believe that they can be held

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distinct on such a trifling difference in the length of wing above recorded, and I should not be surprised if they are ultimately found to be identical.

Peale discovered *Æ. parvirostris* on Puka Puka, *i.e.*, Honden, or Dog Island, in the Low or Paumotu Archipelago of the Pacific Ocean, and it was also met with on Christmas Island by Mr. Streets (*Bull. U. S. Nat. Mus.*, 1877, No. 7, p. 30), who found it breeding there in January. The nests are placed on the ground under low bushes, being merely a hole scooped out for the egg, which is large, rotund-elliptical, with a smooth, white, and translucent shell. The birds are such close sitters that nothing will induce them to leave their eggs, and if removed from their nests they instantly returned to their duty (Streets, *l.c.*).

*Adult male.* General colour above black, with concealed greyish-white bases to the feathers; wings and tail black, like the back; crown of head, sides of face, throat and fore-neck, black; base of the feathers of the throat white, affording a mottled appearance; remainder of under-surface of body pure white, the sides of the breast and flanks black; thighs and under tail-coverts white, some of the outer coverts mottled with dark slaty-grey on the outer webs; under wing-coverts and axillaries blackish, as also the under aspect of the quills, the inner webs being slightly more ashy, with white at the base, the primaries also edged with white along the inner web; "bill black; feet white, with black webs; iris brown" (J. J. Lister). Total length about 12.5 inches; culmen, 1.15; wing, 10.4; tail, 4.1; tarsus, 1.3; middle toe and claw, 1.7.

*Adult female.* Similar to the male in colour. Total length about 12.5 inches; culmen, 1.1; wing, 10.9; tail, 4.35; tarsus, 1.3; middle toe and claw, 1.8.

The descriptions of the male and female have been taken from a pair of birds obtained by Mr. J. J. Lister on Canton Island. It was probably from one of these individuals that Salvin had the Plate prepared.

It should be noticed that, in the male from the Phoenix Islands, numerous white filoplumes are visible on the nape, hind-neck, and sides of neck.





ŒSTRELATA INCERTA

## 63. *ÆSTRELATA INCERTA*, Schlegel.

(SCHLEGEL'S FULMAR.)

(PLATE 53.)

*Æstrelata inexpectata* (nec Forster), Bp., Consp. Av., II., p. 189 (1855).

*Procellaria incerta*, Schl., Mus. Pays-Bas, VI., Procell., p. 9 (1863).

*Æstrelata incerta*, Coues, Pr. Acad. Nat. Sci. Philad., 1866, pp. 147, 170; Giglioli and Salvad., Ibis, 1869, p. 66; Gigl., Faun. Vertebr. Oceano, p. 41 (1870).

*Æstrelata hæsitata* (nec Kuhl), Eagle Clarke, Ibis, 1884, p. 202.

*Æstrelata incerta*, Buller, Birds New Zeal., 2nd ed., II., p. 220 (1888); Wigglesw., Abhandl. Mus. Dresden, 1890-91, No. 6, p. 82 (1891); Salvin, Cat. Birds Brit. Mus., XXV., p. 405 (1896); Sharpe, Bull. B. O. C., VIII., p. 25 (1899).

Brunnea, facie laterali, gutture et præpectore cinerascentioribus, his albo basaliter variegatis: corpore reliquo subtus albo: subcaudalibus brunneis, basin versus albis: subalaribus et axillaribus saturatè brunneis.

BONAPARTE identified this species with the *Procellaria inexpectata* of Forster (*Descr. Anim.*, p. 204), but, if the latter should ever be properly determined, it would probably prove to be the *Æstrelata gularis* of Peale (*cf.* Sharpe, *Hist. Coll. Brit. Mus.*, II., p. 187).

Schlegel's name of *P. incerta* is the first to be accompanied by a proper description, and must therefore be applied.

This Fulmar has been principally obtained in the Cape Seas, but has a wide range in the southern oceans, as may be seen from the following statement. A specimen in the British Museum, presented by Mr. W. J. Brown, was procured in Lat. 36° S., Long. 10° E., on August 25th, 1888. Dr. A. B. Meyer obtained another on September 8th in Lat. 39° S., Long. 9° E. (Salvin, *Cat. Birds Brit. Mus.*, XXV., p. 406), and Mr. T. Parkin met with *Æ. incerta* in Lat. 39° 51' S., Long. 8° 49' E., on December 2nd, 1890 (*Bull. B. O. C.*, X., p. cvi., 1900).

During the voyage of the "Magenta" Professor Giglioli observed this species from the Straits of Magellan to Montevideo, from December 12th to 15th, 1867, and again it occurred in Lat. 30° 36' S., Long. 45° 14' W. On April 8th it was once more encountered in the South Indian Ocean in Lat. 33° 06' S., Long. 91° 04' E., and on the 10th of the same month in Lat. 28° 44' S., Long. 95° 52' E.

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Buller records *Æ. incerta* as an inhabitant of the New Zealand Seas, but does not consider it more plentiful than its ally, *Æ. lessoni* (*Birds New Zealand*, 2nd ed., II., p. 220, 1888). In the Leyden Museum is a specimen said by Schlegel to have come from Australian waters; it was obtained from the Maison Verreaux in 1863, and a young bird in down received at the same time was said to be from New Caledonia. I am inclined to doubt the correctness of the latter identification.

As is the case of other Petrels, *Æ. incerta* occasionally wanders far northward, since a specimen was obtained in 1870, near the village of Zolinki, in the county of Zips, in North Hungary. This bird, which is now in the Hungarian National Museum at Budapest, was identified by Von Pelzeln as an immature *Æstrelata hæsitata*, as recorded by Mr. Eagle Clarke (*Ibis*, 1884, p. 202). Dr. Von Madarász, however, very kindly sent the specimen to England, and Dr. Bowdler Sharpe identified it as undoubtedly *Æ. incerta*.

No notes on the habits of Schlegel's Fulmar have been published, in fact, very little is known about the species, and it is by no means unlikely that *Æ. incerta* may be only the dark phase of *Æ. lessoni*. I consider this to be a more probable solution than that it should be the young of *Æ. lessoni*, as the late Professor Elliot Coues once suggested (*Pr. Acad. Philad.*, 1866, p. 147). In addition to the similarity in dimensions, *Æ. incerta* has the blackish mark in front of and round the eye, which is such a conspicuous feature in *Æ. lessoni*, and this tends to confirm my belief that it is the brown phase of the last-named bird.

*Adult.* General colour above brown, with a slight shade of ashy; scapulars rather darker and more blackish-brown towards their ends; wing-coverts rather darker brown than the back, the greater series washed with ashy-grey externally; primary-coverts and quills blackish, the primaries ashy on their inner webs, the secondaries dark brown, like the scapulars; crown of head, sides of face and cheeks brown like the back, with a blackish shade extending from the fore-part of the eye over the ear-coverts; throat and fore-neck brown, the former mottled with white bases to the feathers, and rather paler and more ashy-brown; remainder of under-surface from the fore-neck downwards pure white, the sides of the body very slightly washed with ashy-brown; under tail-coverts brown, with white bases, the central ones for the most part white, with brown centres towards the ends of the feathers; under wing-coverts and axillaries dark brown; quills dusky-brown below, more ashy along the inner web. Total length about 18 inches; culmen, 1.6; wing, 12.7; tail, 5.3; tarsus, 1.7; middle toe and claw, 2.4.

The specimen described and figured is an adult bird obtained by Dr. A. B. Meyer in the Cape Seas, formerly in our collection, and now in the British Museum.





CÆSTRELATA MOLLIS

## 64. ÆSTRELATA MOLLIS (*Gould*).

(SOFT-PLUMAGED FULMAR.)

(PLATE 54.)

*Procellaria mollis*, Gould, Ann. and Mag. Nat. Hist., XIII., p. 363 (1844); id., Birds Austr., VII., Pl. 50 (1848).

*Æstrelata mollis*, Bp., Consp. Av., II., p. 190 (1855); Coues, Pr. Acad. Philad., 1866, pp. 150, 170; Gould, Handb. Birds Austr., II., p. 453 (1865); Giglioli, Faun. Vertebr. Oceano, p. 42 (1870).

*Rhantistes mollis*, Bp., Comptes Rend., XLII., p. 768 (1856).

*Fulmarus mollis*, Gray, Handl. Birds, III., p. 107 (1871).

*Æstrelata mollis*, Salvin, Ibis, 1877, p. 480; id., Voy. "Challenger," Zool., II., p. 144 (1881); Sharpe, Phil. Trans., Vol. 168, p. 128 (1879); Salvin, Cat. Birds Brit. Mus., XXV., p. 406, pt. (1896).

Supra cinerea: fronte et facie laterali albis, fusco maculatis: plumis circum-ocularibus et regione parotica nigris: subtus alba, præpectore plus minusve cinerascente: subalaribus et axillaribus cinerascenti-fuscis.

GOULD described this species as very abundant between Lat. 20° and 40° S., and from Long. 175° E.—22° W., and it appears to be plentifully distributed in the Cape Seas and the South Indian Ocean. It is more numerous in the Atlantic than in the Pacific, but although he did not observe it within sight of Australia, Gould had no doubt that the bird occurred there, as he saw many examples off the islands of Amsterdam and St. Paul (*Handb. Birds Austr.*, II., p. 453), where a specimen was obtained during the voyage of the "Novara" (Pelzeln, *Reis. Novara, Zool.*, I., *Vög.*, p. 146, 1865).

*Æ. mollis* was observed by Mr. M. J. Nicoll, the naturalist on board the "Valhalla," when off Tristan da Cunha (*Ibis*, 1906, p. 674), and the "Challenger" Expedition procured two specimens on Nightingale Island on October 17th, 1873 (Spec. *e. f.* of Salvin, *Cat. Birds Brit. Mus.*, XXV., p. 407). Hutton states that the species does not occur on Prince Edward Island, nor on Kerguelen (*Ibis*, 1865, p. 287). A specimen in the

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British Museum is, however, believed to have been obtained there by the Antarctic Expedition in 1844, and Mr. Robert Hall says that, although he collected no examples on Kerguelen, *Æ. mollis* was often observed following the brig (*Ibis*, 1900, p. 24). Dr. Husker, on the voyage of the "Gazelle," procured a young female from the above-mentioned island, and a female from Lat. 32° 11' S., Long. 59° 41' E., as well as an adult male from Lat. 33° 26' S., Long. 79° 42' E. (*J. f. O.*, 1876, p. 329).

Two specimens from Lat. 29° 45' S., Long. 15° 3' W., were captured by Gould. They are the original types, and were obtained to the westward of the Cape of Good Hope. The species has been recorded by Vanhöffen, during the voyage of the German Deep-Sea Expedition, from Lat. 44° S., Long. 12° E. (*J. f. O.*, 1901, p. 320), and Nikolai Hanson obtained a specimen in Lat. 42° 23' S., Long. 20° 32' E., on October 24th, 1898 (Sharpe, *Rep. Voy. "Southern Cross,"* p. 147, 1902).

The Earl of Crawford met with it in Lat. 37° 59' S., Long. 29° 18' E. (Spec. *g* of Salvin's *Cat. Birds*, XXV., p. 407), and Mr. T. Parkin in Lat. 39° 51' S., Long. 8° 49' E. (*Bull. B. O. C.*, X., p. cvi.).

The British Museum contains a specimen procured by Macgillivray in Lat. 34° 43' S., Long. 4° 0' W., on February 24th.

Hutton observed *Æ. mollis* during a voyage from London to New Zealand in 1866, on April 5th, in Lat. 34° 11' S., Long. 22° 52' W., from which time it was common every day until May 10th, in Lat. 40° 20' S., Long. 63° 30' E. It then disappeared until May 17th, in Lat. 39° 38' S., Long. 85° 36' E., when one bird was seen for three days, taking its final departure on May 20th in Lat. 42° 23' S., Long. 97° 40' E. It was most numerous between Lat. 35° 40' S., Long. 4° 28' W., and Lat. 39° 30' S., Long. 25° E. (*Ibis*, 1867, p. 188).

Professor Giglioli, on the "Magenta," mentions the species as having been seen on February 25th, 1866, in the South Atlantic Ocean (Lat. 42° 47' S., Long. 3° 26' E.), where it was abundant. It accompanied the ship from this date to March 20th (Lat. 40° 42' S., Long. 53° 20' E.), and again during the passage from Batavia to Melbourne till May 4th, when the entrance to Port Phillip was reached (*Faun. Vertebr. Oceano*, p. 42).

Buller says that there is a series of this species in the Auckland Museum from Sunday Island, in the Kermadecs, two of the specimens being in a dark stage of plumage (*Birds New Zeal., Suppl.*, I., p. 112, 1905). I have, however, never seen an example from these islands: the Rothschild Museum does not contain one, nor did the Earl of Ranfurly send any to the British Museum.

A large number of these Fulmars were observed off Gough Island by the Scottish Antarctic Expedition, and Mr. Eagle Clarke writes (*Ibis*, 1905, p. 262):—"This is probably the 'Paddy Unker' of Comer's visit, when one egg was procured (*Verrill, Tr. Conn. Acad.*, IX., p. 449)."

Messrs. E. L. and L. C. Layard state that the birds, which may be heard calling

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overhead at night, and are never seen during the day, breed in burrows in great numbers about the summit of Mont Mou, in New Caledonia. The eggs in February were almost ready for hatching, and were of a dirty white stained with red earth, slightly pointed at one end, not oval; axis, 2.1 inches, diam., 1.6 (*Ibis*, 1882, p. 539).

*Æ. mollis* is said by nearly all the naturalists who have observed it to be very rapid in its flight, which is peculiar from the singular manner in which the bird holds its wings, somewhat bent back like those of a Sandpiper; it generally flies at some height above the water.

In the stomach of several specimens examined by Giglioli many beaks of cephalopods were found.

*Adult female.* General colour above slaty-grey, with lighter and nearly imperceptible margins of pale ash-colour; longer scapulars, and the wing-coverts more of a blackish-brown, the greater wing-coverts and scapulars shaded with ashy-grey, and having narrow, and more or less obsolete, fringes of hoary-white; quills blackish-brown, ashy for the greater part of the inner web, the secondaries blackish-brown, externally shaded with ashy-grey like the greater coverts, and, like the latter, fringed with hoary-white; lower back and rump a little more dusky than the rest of the back; upper tail-coverts and tail ashy-grey, dusky-brown on the inner webs of some of the rectrices, the three outer tail-feathers mostly white on their inner webs, and vermiculated with ashy-grey; crown of head browner and darker than the back, with a shade of ashy-grey; base of forehead slightly mottled with white; lores, sides of face, and cheeks white, sparsely spotted with dusky grey tips to the feathers; ear-coverts dusky-brown like the head, the feathers round the eye and a patch below the latter, black, extending over the fore-part of the ear-coverts; throat and entire under-surface of body, pure white; sides of fore-neck uniform ashy-grey like the sides of the neck; the lower throat and centre of upper fore-neck barred with wavy lines of dark ashy-grey, forming a broken and not very distinct collar; on the sides of the body a few similar wavy bars of ashy-grey, sometimes taking the form of arrow-head markings; under tail-coverts white; under wing-coverts dark slaty-brown with white margins, the marginal coverts darker and blacker; axillaries dark slate-colour, with distinct terminal fringes of white, the bases white, and some axillaries white, freckled all over with slaty-grey; quills blackish below, the inner webs slaty-grey almost for their entire length, the primaries edged internally with white, the secondaries entirely slaty-grey below; "bill black; feet livid flesh-colour, with a brown spot on the membrane; iris dull chestnut-brown" (MSS. note on specimen). Total length about 12.5 inches; culmen, 1.0; wing 8.8; tail, 3.7; tarsus, 1.3; middle toe and claw, 1.75.

According to Giglioli, the bill is black, the tarsus and the basal third of the feet flesh-colour, the remainder black; the iris brown.

*Æ. mollis* shows considerable variation in the amount of grey which forms the

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collar on the fore-neck, some of the birds having this band very distinct, while in others it is all but absent. One specimen in the British Museum is totally grey underneath, excepting for a little white on the throat (spec. *k* of the *Catalogue of Birds*): this is the dark phase of the species. Another bird (spec. *n* of the *Catalogue of Birds*) is entirely white on the under-surface from the chin to the under tail-coverts, and between this and the grey phase exists every variation in the amount of grey mottling on the fore-neck, the chest, and sides of the body.

The description is taken from a female bird in typical plumage from Lat. 37° 14' S., Long. 10° 5' W., in the Rothschild Collection. The specimen figured is from the South Atlantic Ocean (spec. *a* of the *Catalogue of Birds*) from our collection.

## 65. *ÆSTRELATA FEÆ*, *Salvadori*.

(FEA'S FULMAR.)

*Procellaria mollis* (nec Gould) Harcourt, Ann. and Mag. Nat. Hist., (2) XV., p. 438 (1855).

*Æstrelata mollis* (nec Gould) Dalgleish, Ibis, 1890, p. 386; Hartwig, J. f. O., 1893, p. 11; Salvin, Cat. Birds Brit. Mus., XXV., p. 406, pt. (1896); Dresser, Birds Eur. Suppl., p. 411, Pl. 721, pt. (1896).

*Æstrelata feæ*, Salvad., Ann. Mus. Civic. Genov. (2), XX., p. 305 (1899); id., Ibis, 1900, p. 302, 1904, p. 166; Jourdain, Bull. B. O. C., XIX., p. 37 (1907).

*Æ. molli* similis, sed gastræo purè albo, præpectore minime cinereo vermiculato.

THE Fulmar of Madeira and the Cape Verde Islands has been generally identified with *Æ. mollis* (Gould), but, in 1900, Count Salvadori pointed out that the bird from these islands in the North Atlantic was distinct from that of the southern oceans. Having received specimens from the Cape Verde Islands from the well-known traveller, Signor Leonardo Fea, Count Salvadori described this Fulmar as *Æstrelata feæ*, and stated that it was somewhat larger than *Æ. mollis*, that the under-surface was entirely white, without a grey band across the fore-neck, and that the flanks were more mottled with grey. Although supposed to be confined to the Cape Verdes and Madeira, it is not improbable that *Æ. feæ* will yet be found in the Canaries, for, being nocturnal in habits, it easily escapes observation.

From an examination of the specimens in the Rothschild Collection and in the British Museum, I consider that Count Salvadori was justified in separating the Fulmar of the North Atlantic from *Æ. mollis*, since the geographical distribution of the species is very different, *Æ. mollis* not crossing the Equator, and being only found as far north as the 20th or 30th parallel (*Ibis*, 1900, p. 302).

I have not seen any specimens from the Cape Verde Islands, but the Madeira birds have no sign of a grey chest-band, and are pure white below, from the chin to the under tail-coverts. The series before me does not confirm the larger size of *Æ. feæ*, which has a wing measuring from 9.6 to 9.8 inches, whereas the examples of *Æ. mollis* vary from 9.5 to 10.5 inches. No distinction between the two forms exists with regard to the grey mottling of the sides of the body, but, as a rule, the bill is more slender in *Æ. feæ*.

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Signor Fea met with the species on São Nicolao, in the Cape Verde Archipelago where it was called "Gon-gon" by the natives. Lieutenant Boyd Alexander failed to observe it during his expedition to these islands, but several specimens were obtained by Padre Ernesto Schmitz in Madeira, where a small colony was found nesting in holes at an elevation of 3,000 feet, the nests being lined with coarse grass and feathers from the birds' own breasts.

It has been recorded by Mr. J. J. Dalglish (*Ibis*, 1890, p. 386; id., *Pr. Roy. Phys. Soc. Edinb.*, XI., p. 27, 1899), and Dr. Hartwig (*Ornis*, VII., pp. 182, 187, 1891) from Porto Santo, Deserta Grande, Ilho do Baixo, and Ilho de Cal.

The Rev. F. C. R. Jourdain says that the eggs obtained by Padre Schmitz differ considerably in size from those of other species which breed at Madeira, and approach most closely those of *Puffinus anglorum*, from which, however, they can be at once distinguished by their much lighter weight (*Bull. B. O. C.*, XIX., pp. 37, 38, 1907).

*Adult.* General colour above dull slate-grey, the feathers slightly blackish at the ends; the scapulars decidedly blacker; upper wing-coverts blackish, more or less washed with grey; primary-coverts and quills blackish, slightly washed with grey, the primaries ashy on the inner webs, the inner secondaries blackish-brown, with indistinct dusky cross-bars; upper tail-coverts and tail-feathers light slaty-grey; the middle of the rump blackish, the sides slaty-grey; the lateral tail-feathers for the most part white, the two outermost freckled with ashy-grey on the outer web, the third rectrix ashy-grey along the outer web, and slightly vermiculated with grey on the inner web, the fourth rectrix ashy-grey, and having the inner web minutely freckled with white, the central rectrices entirely ashy-grey; crown of head and sides of head a little darker and more dusky than the back, and only slightly washed with grey; forehead and lores white, with a few blackish spots on the former; feathers in front of the eye black, overspreading the ear-coverts; cheeks white, with a few frecklings of ashy-grey, where they adjoin the ear-coverts; entire under-surface of body pure white, with no freckled collar across the fore-neck; sides of chest uniform ashy-brown, accompanied by a few frecklings of the same, these being more distinct on the sides of the body; under tail-coverts pure white; under wing-coverts black, the central median and greater coverts slaty-grey, as also the inner webs of the primary-coverts; the basal axillaries white, the longer ones slaty-grey slightly mottled with white; quills dusky below, ashy-grey along the inner webs. Total length about 14 inches; culmen, 1.0; wing, 10.0; tail, 4.15; tarsus, 1.25; middle toe and claw, 1.6.

The amount of ashy frecklings on the sides of the body varies considerably, being sometimes very fine and scarcely distinguishable, whereas it occasionally takes the form of coarse dusky-grey frecklings and vermiculations.

The specimen described is a female from São Antonio, Madeira, obtained by Padre Schmitz on June 12th, 1906, and now in the Rothschild Collection.





## 66. ÆSTRELATA MAGENTÆ, *Gigl. and Salvad.*

(GIGLIOLI'S FULMAR.)

(PLATE 55.)

*Æstrelata magentæ*, Giglioli and Salvadori, Atti Soc. Ital. Sci. Nat., XI., p. 451 (1868); iid., Ibis, 1869, pp. 61, 66; Giglioli, Faun. Vertebr. Oceano, p. 41 (1870); id., Viagg. "Magenta," pp. 843, 884 (1875); Ridgway, Man. N. Amer. Birds, p. 64 (1887).

*Æstrelata magentæ*, Salvin in Rowley's Orn. Misc., I., p. 251, Pl. 30 (1876); id., Cat. Birds Brit. Mus., XXV., p. 407 (1896).

*Æ. molli* similis, sed supra nigricans et fascia frontali nulla distinguenda.

I HAVE not seen an example of *Æ. magentæ*, but the typical specimen was lent by Count Salvadori in 1876 to Salvin, who figured it in Rowley's "Ornithological Miscellany," and at the same time the accompanying Plate was drawn for this work. Salvin does not appear to have made any description of this specimen, but simply reproduced the original of Professor Giglioli and Count Salvadori.

I am not aware that any second example of *Æ. magentæ* has been obtained, and, judging from the published figures and the description, I am inclined to agree with Salvin that its place is near *Æ. mollis*. Such, however, was not the opinion of the describers, who compared it with *Æ. rostrata*, Peale, and said that it had "a robust bill, as in that species, although not so high at the base, being broader than high. The frontal feathers advance abruptly as far as the base of the nasal tubes. It differs also in the darker and blacker colour of the upper-parts, the edges of each feather in certain lights being distinctly lighter and wanting that sepia-brown tint so characteristic of *Æ. rostrata* (cf. Cassin, *Orn. U. S. Expl. Exped.*, 1858, p. 412, Pl. 41). Our species, besides, has a white throat, and the forehead washed with silky white, which extends laterally and posteriorly as far as over the eyes; this is an important diagnostic character. Besides the last feature, it differs from *P. incerta* of Schlegel in its much darker upper-parts, its well-marked jugular band, its white under tail-coverts, and its smaller dimensions" (Giglioli and Salvadori, *Ibis*, 1869, p. 62).

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The authors do not state whether they compared the type of *Æ. magentæ* with a specimen of *Æ. rostrata* of Peale. *Æ. magentæ* is described as "intense fusco-nigra," and Peale's species is said by him to be "capite, collo, corporeque supra fuliginosis," which is scarcely intended to be "sepia-brown," as the birds appear now in the Plates of Peale's original work of 1848, and Cassin's reproduction of the same in 1858. In both these editions the figures of *Æ. rostrata* and *Æ. parvirostris* have faded to a sepia-brown colour, but in recent specimens of the latter species, the upper-surface is nearly black, and doubtless the same would be the case with *Æ. rostrata*.

Salvin, when figuring the type in the "Ornithological Miscellany," considered it nearly related to *Æ. mollis*, and wrote:—"Beside the dimensions, are to be noticed the dark under-surface of the wings and the uniform dark colour of the primaries below. The light lateral margin to the frontal feathers forms, too, the superciliary mark." This is not well illustrated in Salvin's Plate in the "Miscellany," nor in that accompanying the present "Monograph," drawn by Keulemans at the same time, and from the same specimen.

Professor Giglioli records the species on three separate occasions in the Pacific Ocean, during the voyage of the "Magenta," firstly, on July 22nd, 1867, in Lat. 39° 38' S., Long. 125° 58' W. ; and again on the 2nd and 3rd of August in Lat. 32° 23' S., Long. 92° 39' W. ; it was last seen on the 31st of the same month in Lat. 26° 07' S., Long. 88° 50' W. It was always a rare bird, solitary in its habits, and having a more rapid flight than any of its congeners (*Faun. Vertebr. Oceano*, p. 41).

The following is a translation of the original description:—

Above intense dusky-black, the feathers under certain lights with paler margins ; the wings, tail, sides of body, under wing-coverts, and a jugular band, dusky-black ; the region in front of the eye deeper in tint ; forehead pervaded with a silky white colour, almost silvery, more conspicuous laterally ; throat, breast, and abdomen white ; lateral under tail-coverts tinged with ashy, the shafts dusky at the tip ; bill black ; feet flesh-colour ; toes and webs black, except the basal part, which is of the same colour as the tarsus ; iris brown (Giglioli and Salvadori, *l.c.*).

Salvin gives the following measurements:—Total length about 14 inches ; bill from front, 1.25 ; from gape, 1.85 ; wing, 12.0 ; tail, 5.0 ; tarsus, 1.6 ; middle toe and claw, 2.2.

## 67. *ÆSTRELATA WORTHENI*, *Rothschild*.

(WORTHEN'S FULMAR.)

*Æstrelata wortheni*, Rothschild, Bull. B. O. C., XII., p. 62 (1902).

*Æstrelata wortheni*, Rothschild and Hartert, Nov. Zool., IX., p. 414 (1902).

*Æ. magentæ* similis, sed minor, nigricantior: fronte et loris schistaceo-nigris distinguenda.

THE type of this species was obtained by Mr. R. W. Beck on January 2nd, 1901, in the Pacific Ocean, not far from the Galapagos Islands. It was afterwards described by the Hon. Walter Rothschild, who sent the specimen to the Turin Museum, where Count Salvadori compared it with the type of *Æ. magentæ*, to which it is doubtless closely allied. In their paper on the "Birds of the Galapagos Islands," the Hon. Walter Rothschild and Dr. Hartert point to the following differences:—The general colour of *Æ. wortheni* above is darker, somewhat blacker than in *Æ. magentæ*. The dimensions are less, and the bill smaller and weaker, and the primaries narrower than in the type of *Æ. magentæ* (*Nov. Zool.*, IX., p. 414). The authors also give comparative measurements, but these do not entirely agree with my own computation, and I think that there must be a mistake as regards the length of the wing.

*Adult female (type)*.—General colour above black, with obsolete dusky margins to the feathers, all of which have white bases; wing-coverts black, the greater coverts ashy-brown externally; quills black, ashy-brown on the inner webs; tail black; crown of head black, the forehead and lores with an obsolete shading of grey; lores, sides of face and cheeks, black, with a narrow line of white skirting the upper and lower eyelids; base of chin black; throat white, slightly spotted with dusky tips to some of the feathers; across the lower throat and fore-neck a broad band of black, shading into ashy-grey; remainder of under-surface of body white; a patch of black on the sides of the breast, and another on the lower flanks; under tail-coverts white, the long lateral ones ashy-brown either towards the ends, or along the greater part of the outer web, which, with the inner web, is occasionally marked inside and out with bars of the same colour; under wing-coverts and axillaries black; the primary-coverts

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and primaries also black, with concealed white bases, the primaries edged with white along the inner web; bill entirely black; tarsus and basal half of toes flesh-colour; tarsus dusky at base; distal half of toes and outside of outer toe blackish. Total length about 12.5 inches; culmen, 1.05; wing, 11.0; tail, 4.5; tarsus, 1.35; middle toe and claw, 1.75.

My description is taken from the type in the Rothschild Collection.





## 68. *ÆSTRELATA PHÆOPYGIA*, *Salvin.*

(DARK-RUMPED FULMAR.)

(PLATE 56.)

*Procellaria alba* (nec Gm.) Bloxam in Byron's Voyage, p. 252 (1826); Dole, Pr. Bost. Soc. Nat. Hist., XII., p. 308 (1869); id., Hawaiian Almanac, 1879, p. 55.

*Procellaria (Æstrelata) alba* (nec Gm.) Gray, Cat. Birds Trop. Isl. Pacif. Oc., p. 56 (1859).

*Æstrelata phæopygia*, Salvin, Tr. Z. S., IX., p. 507, Pl. 88, fig. 1 (1876); id., Cat. Birds Brit. Mus., XXV., p. 407 (1896); Wilson and Evans, Av. Haw., p. 213, Pl. 63 (1894).

*Æstrelata sandwichensis*, Ridgway, in Baird, Brewer, and Ridgway, Water-Birds N. Amer., II., p. 395 (1884).

*Æstrelata sandwichensis*, Ridgway, Pr. U. S. Nat. Mus., IX., p. 95 (1886), XI., p. 104 (1888).

*Æstrelata phæopygia*, Ridgway, Man. N. Amer. Birds, p. 65 (1887); id., Pr. U. S. Nat. Mus., XIX., p. 648 (1897); Rothschild and Hartert, Nov. Zool., VI., p. 198 (1899); Bryan, Key Birds Hawaiian Group, p. 12 (1901).

*Æstrelata phæopygia sandwichensis*, Rothschild, Avif. Laysan, III., p. 289 (1900).

Media : ala 11.9-12.0 : subtus alba : notæo nigricante, fronte lata lorisque albis : subalaribus albis, marginalibus latè nigris : remigibus infra nigris, pogonio interno basaliter albo.

THE single example from the Sandwich Islands which I have been able to examine, was presented by the Museum of Christiania to the British Museum, and was obtained by Mr. Knudsen near Hawaii. It was originally described by Professor Ridgway in 1884 as *Æ. sandwichensis*, but after referring the type to Salvin, they both came to the conclusion that the Sandwich Island bird was identical with *Æ. phæopygia* of the Galapagos (*Pr. U. S. Nat. Mus.*, XI., p. 104, 1888), and with this I agree. Although there is no specific difference between birds from the two localities, there is some variation in the marking of the axillaries, which are occasionally suffused with dark

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slate-colour, like that found on the sides of the breast at the base of the axillaries, while in other individuals there is a patch of slaty-black near the thighs. These markings, however, vary greatly in extent, and apparently gradually disappear on the axillaries, which become entirely white.

*Æ. phæopygia* was described by Salvin from Chatham Island in the Galapagos Archipelago. Two specimens were procured by Captain Kellett and Lieutenant Wood during the voyage of the "Pandora," which they presented to the British Museum. The Webster-Harris Expedition to the Galapagos furnished examples from the following islands, Albemarle, Wenman, Indefatigable, Barrington, and Charles (Rothschild and Hartert, *Nov. Zool.*, VI., p. 198). Professor Ridgway likewise records the capture of the species in the Galapagos Archipelago in July and August, 1891 (*Pr. U. S. Nat. Mus.*, XIX., p. 648). Mr. Rothschild has recently referred the Fulmar of Laysan to *Æ. sandwichensis*, but having examined the series of skins in his museum I find that they cannot be separated from *Æ. phæopygia* of the Galapagos.

*Adult.* General colour above dusky-brown, slightly varied with grey on the back and scapulars, which are ashy-grey on the margins of the feathers; wing-coverts dusky-brown, without grey edgings; quills blackish, the secondaries tinged with grey on their outer webs, the primaries exhibiting some white towards the base of the inner web, and showing a narrow white margin for nearly the whole length; lower back and rump dusky-brown, like the back, slightly tinged with grey on the margins of the feathers; upper tail-coverts and tail-feathers dusky-brown, with white bases; head a little darker than the back, but not forming a distinct cap; feathers below the eye and ear-coverts black; forehead, lores and cheeks pure white, mottled with small black spots, where the black and white join; sides of neck black, and similarly freckled and mottled with black spots and bars; throat and under-surface of body pure white, with a few small streaks and arrow-head marks of ashy-grey on the sides of the body; the sides of the upper breast ashy-brown; under wing-coverts white, with a broad blackish-brown band round the edge of the wing, somewhat relieved by whitish edges to the feathers; axillaries white, with a dusky bar near the end of the feathers; quills dusky-brown below, with a considerable amount of white on the inner webs of the primaries; "bill black; feet light bluish flesh-colour; lower portion of about half the webs and toes black, this colour extending along the outer toe and one fourth of an inch up the tarsus; iris brown" (Webster-Harris). Total length 16.3 inches; culmen, 1.3; wing, 11.9; tail, 5.5; tarsus, 1.55; middle toe and claw, 2.0.

The specimen described and figured is Salvin's typical example in the British Museum.





*GASTRELATA BREVIPES*

Tringidae

## 69. CESTRELATA BREVIPES, Peale.

(WHITE-THROATED FULMAR.)

(PLATE 57.)

- Procellaria brevipes*, Peale, U. S. Expl. Exped., VIII., pp. 294, 337, Pl. 80 (1848).  
*Procellaria torquata*, Macgill., Zool., XVIII., p. 7132 (1860).  
*Procellaria cookii* (nec Gray) Cass., U. S. Expl. Exped., VIII., pp. 414, 451 (1858).  
*Procellaria desolata* (nec Gm.) Schl., Mus. Pays-Bas, VI., Procell., p. 13 (1863).  
*Æstrelata cooki* (nec Gray) Coues, Pr. Acad. Philad., 1866, p. 152.  
*Æstrelata desolata* (nec Gm.) Coues, Pr. Acad. Philad., 1866, p. 155 ; Gigl. and Salvad., Ibis, 1869, p. 66.  
*Fulmarus aneiteimensis*, Gray, Handl. Birds, III., p. 107 (1871, nom. nud.).  
*Æstrelata leucoptera* (nec Gould) Salvin, Ibis, 1876, p. 393 ; Finsch, P. Z. S., 1879, p. 16 ; Salvad., Orn. Papuasia, III., p. 466 (1882).  
*Æstrelata leucoptera* (nec Gould) Ridgway, Man. N. Amer. Birds, p. 65 (1887).  
*Æstrelata torquata*, Salvin, Ibis, 1888, p. 359, 1891, p. 411, Pl. 9 ; Harting, Zool., 1890, p. 454.  
*Æstrelata brevipes*, Stejneger, Pr. U. S. Nat. Mus., XVI., p. 617 (1893).  
*Æstrelata brevipes*, Salvin, Cat. Birds Brit. Mus., XXV., p. 408 (1896) ; Sharpe, Handb. Brit. Birds, IV., p. 173, Pl. CLII. (1897).

Minor : subtus alba, interdum grisescens : gutture tamen semper albo : subalaribus mediis albis, tectricibus marginalibus nigris, fasciam latam nigram quasi formantibus : primariis infra cinerascenti-brunneis, intus minimè albis : pileo nigricante.

PEALE procured this species during the U.S. Exploring Expedition, on March 21st, 1839, in Lat. 68° S., Long. 95° W. Some years later Macgillivray obtained several specimens on the island of Aneiteum, in the New Hebrides. Some of these he forwarded to England with the name *aneiteimensis* attached, which title was published by G. R. Gray in his "Handlist of Birds." As however no description accompanied this title, it became a *nomen nudum*, and is not available. In 1860 Macgillivray himself published a good description of the species (Zool., XVIII., p. 7132), and named it *Procellaria torquata*, but recently the bird has been found to be identical with *Æ. brevipes* (Peale).

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Macgillivray (*l.c.*) says that it is not confined to Aneiteum, as he saw it on various occasions off the coasts of Tanna and Erromango, and was assured by one of the natives of the former island that it bred about twelve miles to the south of Port Resolution.

*Æ. brevipes* is also found in the Fiji Islands, some examples having been obtained in the hills of Viti Levu by the late Dr. Kleinschmidt in May, 1878. There are specimens in our own collection and that of the Hon. Walter Rothschild.

In the Leyden Museum is an example, formerly in the Bullock Collection, said to have come from the Antarctic Seas; a second from Aneiteum, where it is called "Katébu" by the natives, evidently obtained by Macgillivray; and a third from Ternate, in the Moluccas, procured by Dr. Bernstein. Dr. Otto Finsch has also recorded the species from Duke of York Island (*P. Z. S.*, 1879, p. 16).

In 1893 Dr. Stejneger recorded a specimen from the Province of Mutsu, in the Japanese island of Hondo, another in the Leyden Museum, said to have been obtained in the seas of Kamtschatka (Schl., *Mus. Pays-Bas*, VI., *Procell.*, p. 13), was identified by Schlegel as *Æ. desolata* (Gm.), which is generally admitted to be a *Prion*. Hence the range of the species has been given by some authors as extending to the Island of Desolation, or Kerguelen, but of this there is no confirmation.

A wonderful instance of the wandering habits of these small Fulmars is seen in the case of the example of *Æ. brevipes*, shot in the British Islands between Borth and Aberystwith, in the winter of 1899. This specimen is now in the British Museum, to which it was presented by Mr. Willis Bund, K.C.

Peale says that the flight of *Æ. brevipes* is swift, wild, and irregular; and that the bird evinced no partiality for the vicinity of the ship, which was lying-to in a dense fog, a time when Petrels usually congregated to glean the offal thrown overboard.

*Adult male.* General colour above dark ashy-grey, the feathers dusky, with broad grey margins, which incline to hoary-grey on the actual edges; the longer scapulars blackish; on the rump a patch of black feathers; wing-coverts black, the greater series externally ashy-grey, with white fringes; bastard-wing, primary-coverts and quills black, the inner webs of the primaries ashy-brown, the secondaries externally ashy-grey, and white towards the base of the inner web; long upper tail-coverts ashy-grey, the basal coverts black like the rump-patch; crown of head and nape slightly blacker than the back; forehead white, with a few small black spots; lores and cheeks white; feathers below and around the eye, and ear-coverts, black; throat and under-surface of body white, with a patch of dark ashy-grey on the sides of the chest, of the same colour as the sides of the neck; the centre of the fore-neck and breast minutely freckled with ashy-grey, which is less marked on the sides of the body and flanks; axillaries white, with a little ashy-grey freckling on some of the feathers; under wing-coverts white with more or less freckling of ashy-grey, but the marginal coverts black, with white fringes; quills dusky-brown below, ashy-brown on the inner webs, which have white margins; "bill black; feet pale flesh-colour, the toes black at their

## ŒSTRELATA BREVIPES.

ends ; iris brown" (Peale). Total length about 10.5 inches ; culmen, 0.9 ; wing, 8.5 ; tail, 3.8 ; tarsus, 0.95 ; middle toe and claw, 1.15.

In the specimen from Ternate, according to Dr. Bernstein, the feet were "yellowish-white, but two-thirds of the anterior part of the toes with the membrane were blackish." I have but little doubt that the colour of the feet varies with age and season.

*Œ. brevipes* has a dark phase, like so many of the Fulmars, and this was first noticed by Macgillivray, who pointed out that some specimens were white below, with a broken grey collar on the chest, whereas others were grey from the chest downwards, the throat alone being white. He attributed these differences to age, but Salvin (*Ibis*, 1891, p. 413) has shown that this is not the case, as young birds of many Petrels, still carrying remains of nestling-down, have the plumage of the adults.

The description is taken from an adult male, obtained by Kleinschmidt in the interior of Viti Levu, in the collection of the Hon. Walter Rothschild. The figures have been drawn from two examples in our collection, from Aneiteum, procured by Macgillivray ; they show both light and dark phases.

## 70. *ÆSTRELATA HYPOLEUCA*, *Salvin.*

(BONIN ISLANDS FULMAR.)

(PLATE 58.)

*Æstrelata hypoleuca*, Salvin, *Ibis*, 1888, p. 359; Seebohm, *P.Z. S.*, 1889, p. 586; id., *Ibis*, 1890, p. 105; id., *Birds Japan. Emp.*, p. 269 (1890); Salvin, *Cat. Birds Brit. Mus.*, XXV., p. 409 (1896); Rothschild, *Avif. Laysan*, pt. 1, p. 49, Pl. 30 (1893).

*Æstrelata hypoleuca*, Stejn., *Pr. U. S. Nat. Mus.*, XVI., p. 617 (1893).

Minor: subtus purè alba: subalaribus schistaceo-nigris, centralibus tantum albis: tectricibus inferioribus primariorum quoque schistaceis, minimè albis: primariis intus, basin versus, schistaceo-brunneis, haud albis.

THIS is another of the smaller species of Fulmar, allied to *Æ. mollis* and *Æ. brevipes*, but differing from the former in its smaller size, slenderer bill, and white axillaries, as well as in the larger amount of white on the under wing-coverts; in *Æ. mollis* the latter are entirely dark, as also are the longer axillaries, while in *Æ. hypoleuca* the under-surface is white, without any of the grey which is seen on the chest of *Æ. mollis* and *Æ. brevipes*. From the latter *Æ. hypoleuca* is distinguished by the lesser amount of white on the under wing-coverts, and the ashy-grey colour of the lower primary-coverts, these being pure white in *Æ. brevipes*.

It was first described by Salvin from a specimen in the British Museum, procured by Mr. H. J. Snow in Krusenstern Island, in the Marshall group (*Ibis*, 1888, p. 359).

*Æ. hypoleuca* was afterwards met with by the late P. A. Holst in the island of Nakandoshima, one of the Parry group of the Bonin Islands, and has since been recorded by Dr. Stejneger from the Province of Mino, in the island of Hondo (*Pr. U. S. Nat. Mus.*, XVI., p. 617). In the collection of the Hon. Walter Rothschild there are some specimens from the Liu Kiu Islands.

According to Mr. Walter K. Fisher, *Æ. hypoleuca* breeds in the island of Laysan, and may be found nesting in burrows throughout the area covered with tall grass and deep sand, as far as the edge of the open plain, where the nests are replaced by those of *Puffinus cuneatus*, which form a smaller ring within





## ÆSTRELATA HYPOLEUCA.

a huge colony of *Æstrelata*, encircling the central lagoon. Nothing further is recorded of its habits.

*Adult male.* General colour above dark ashy-grey, with indistinct margins of hoary-grey, the long scapulars blackish towards their ends; feathers of the mantle and crown of head slightly browner than the back, and having white bases, producing a mottled appearance; wing-coverts black, slightly washed with ashy-grey, more distinct on the greater series, all the greater coverts having white fringes; bastard-wing, primary-coverts, and quills black, the primaries ashy-brown on the inner web, the secondaries dark ashy-grey, white towards the base of the inner web; tail-feathers ashy-brown, blackish towards the ends; crown of head blackish-brown, the forepart mottled with black centres and white fringes to the feathers; lores and base of forehead white, with a few black spots, which also occur on the forepart of the cheeks; sides of face and ear-coverts black, with a small streak of white above and below the eye, which is otherwise entirely surrounded with black; cheeks and entire under-surface of body pure white, including the tail-coverts; axillaries pure white; under wing-coverts for the most part black, but with the inner, median, and the whole of the greater series of coverts, white, forming a patch across the middle of the lower coverts; some of the outer greater coverts ashy towards their ends; under primary-coverts and quills below blackish, ashy-brown on the inner webs, with narrow hoary-grey edges, the secondaries with white bases to the inner webs; "bill black; tarsi bluish pink; iris dark brown, the pupil blue" (P. A. Holst). Total length about 10.5 inches; culmen, 0.9; wing, 8.75; tail, 4.15; tarsus, 1.1; middle toe and claw, 1.35.

The figure in the Plate is drawn from the type-specimen in the British Museum, and the bird described is in the collection of the Hon. Walter Rothschild, and came from the Liu Kiu Islands.

## 71. ÆSTRELATA NIGRIPENNIS, *Rothschild.*

(KERMADEC FULMAR.)

(PLATE 59.)

*Æstrelata cooki* (nec Gray) Cheeseman, Trans. N. Zeal. Inst., XXIII., p. 224 (1891).

*Æstrelata nigripennis*, Rothschild, Bull. B. O. C., I., p. lvii. (1893); id., Ibis, 1893, p. 571; Hutton, P. Z. S., 1893, p. 750; Buller, Tr. New Zeal. Inst., XXVII., p. 123 (1895); Salvin, Cat. Birds Brit. Mus., XXV., p. 409 (1896); Buller, Birds New Zealand, Suppl., I., p. 113 (1905).

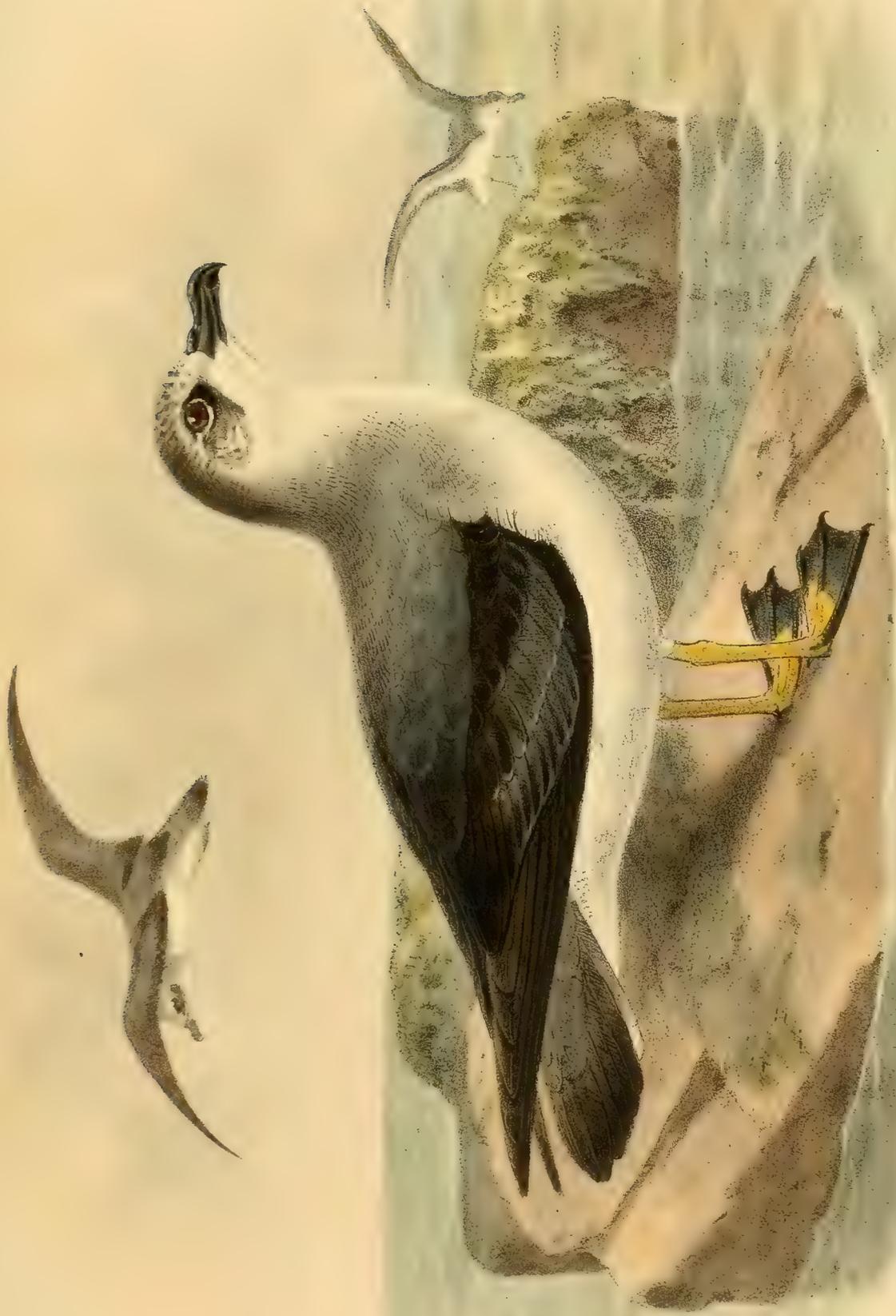
Minor: ala 8-7: subalaribus albis, extus nigro fasciatis: pileo et dorso cinereis concoloribus.

*Æ. nigripennis* was first described by the Hon. Walter Rothschild from a bird in his large series from the Kermadec Islands. It belongs to the smaller species of the genus *Æstrelata*, and is allied to *Æ. cooki* and *Æ. defilippiana*, but differs in having a short, stout and wide bill, and in the almost total absence of white on the inner webs of the outer primaries beneath, the under wing-coverts, with the exception of rather a wide margin, being white, as well as the axillaries. Its habitat, so far as we know, is confined to the Kermadec Archipelago, where it is not uncommon; but as the bird only arrives there in November and leave in April, it is probable that it will be found elsewhere.

*Æ. nigripennis* was met with on Curtis Island by the Earl of Ranfurly (*cf.* Ogilvie-Grant, *Ibis*, 1905, p. 555), and is known to breed on Meyer Island, and more sparingly on Sunday Island, in company with *Puffinus assimilis*.

The single egg is laid in a burrow, sometimes extending over a yard in length. Those obtained by Mr. Bell measured 2 inches in length by 1.5 in breadth.

*Adult.* General colour above light ashy-grey, the feathers obsoletely fringed with hoary-white, these margins being scarcely perceptible; the scapulars rather darker than the back, the longer ones being blacker, slightly washed with ashy-grey; on the lower rump a patch of blackish feathers, the median basal upper tail-coverts also blackish; remainder of upper tail-coverts light ashy-grey, with obsolete white margins; wing-coverts black, the greater series slaty-grey, with narrow white fringes; quills black, white for the greater part of the inner web, the secondaries externally slaty-grey, with



BOOBIA LATA BOUCHARDIER



### CESTRELATA NIGRIPENNIS.

white fringes; tail-feathers slaty-grey, blackish-brown at the ends, and on the inner web, the outer feather for the most part white on the inner web, which is blackish-brown towards the tip, the outer web entirely mottled with slaty-grey; crown of head slightly darker ashy-grey than the back, the feathers with obsolete white fringes; forehead and feathers over the eye white, the latter with black centres producing a spotted appearance, the adjoining portions of the crown being similarly spotted; lores and cheeks pure white; sides of face white, spotted with black below the eye, which is enclosed in a patch of black; under-surface of body pure white, including the under tail-coverts; the sides of the neck mottled with bars of light ashy-grey, continued on to the sides of the breast in frecklings and vermiculations of the same colour; axillaries white; under wing-coverts white, including the under primary-coverts, some of them edged with black, as also a few of the outermost of the greater series; marginal under wing-coverts black, extending round the edge of the wings; quills black below, white towards the base of the inner web. Total length about 12.0 inches; culmen, 1.0; wing, 8.7; tail, 3.8; tarsus, 1.1; middle toe and claw, 1.5.

The description is taken from one of the typical specimens in the Rothschild Collection.

## 72. *ÆSTRELATA BREVIROSTRIS* (*Less.*).

(KERGUELEN FULMAR.)

(PLATE 60.)

*Procellaria lugens*, Parkinson, Icon. ined., Nos. 21, 22; Salvin in Rowley's Orn. Misc., I., p. 235 (1876).

*Procellaria grisea* (nec Gm.) Kuhl, Beitr., Zool., p. 144, fig. 9 (1820); Schl., Mus. Pays-Bas, VI., Procell., p. 12 (1863).

*Procellaria brevirostris*, Lesson, Traité d'Orn., p. 611 (1831); Gray, List Anseres Brit. Mus., p. 163 (1844).

*Pterodroma macroptera* (nec Smith) Bp., Consp. Av., II., p. 191 (1855).

*Rhantistes unicolor*, Bp., Comptes Rend., XLII., p. 768 (1856).

*Æstrelata grisea* (nec Gm.) Coues, Pr. Acad. Philad., 1866, pp. 148, 170.

*Fulmarus griseus* (nec Gm.) Gray, Handl. Birds, III., p. 107 (1871).

*Æstrelata kidderi*, Coues, Bull. U. S. Nat. Mus., No. 2, p. 28 (1875); Kidder, op. cit., No. 3, p. 15 (1876).

*Procellaria mollis* (nec Gould) Cab. and Reichen., J. f. O., 1876, p. 329.

*Æstrelata brevirostris*, Salvin in Rowley's Orn. Misc., I., p. 235 (1876); id., P. Z. S., 1878, p. 738; id., Rep. Voy. "Challenger," Zool., II., p. 145 (1881); Sharpe, Phil. Trans., Vol. 168, p. 124 (1879); Salvin, Cat. Birds Brit. Mus., XXV., p. 409 (1896); Hall, Ibis, 1900, p. 24; Sharpe, Rep. Voy. "Southern Cross," p. 148 (1902); Vanhöffen, J. f. O. 1905, p. 505; Eagle Clarke, Ibis, 1907, p. 337.

*Æstrelata brevirostris*, Ridgway, Man. N. Amer. Birds, p. 66 (1887); Reichenow, Deutsche Südpolar Exped., 1901-1903, Bd. IX., Zool., I., p. 555 (1908).

Omnino schistaceo-grisea: primariis intus cineraceis, minime albis: subalaribus et axillaribus schistaceis, illis albido marginatis: rostro valde compresso.

THIS Fulmar is recognised by its entirely slaty-grey plumage and compressed bill. The axillaries and under wing-coverts are also slaty-grey, with whitish edges to the feathers, the lower primary-coverts and inner webs of the quills being paler grey, but without white.



2/10



## ŒSTRELATA BREVIROSTRIS.

Dr. Kidder, the naturalist of the U. S. Transit of Venus Expedition, met with this species breeding during the month of October on Kerguelen Island, which appears to be its headquarters (*Bull. U. S. Nat. Mus.*, No. 3, p. 15), and the Rev. A. E. Eaton found it nesting in November and December, but less plentifully than *Œ. lessoni*, at Observatory Bay, which was the station of the British Expedition.

Dr. Vanhöffen, during the voyage of the "Gauss," states that it was observed as far south as 59° on the way from Kerguelen to Kaiser Wilhelm II. Land, and on the northward voyage in Lat. 57° S., or about 200 nautical miles south of Heard Island. Mr. Eagle Clarke (*Ibis*, 1907, p. 337) records its occurrence in the Antarctic Ocean, where it was discovered for the first time by the Scottish Expedition on March 20th, 1904. It occurred in Lat. 69° 33' S., Long. 15° 19' W., during the northward voyage from Coats Land towards Gough Island, and it was likewise observed till March 25th, when it was last seen in Lat. 65° 58' S., Long. 11° 24' W.

The British Museum contains a specimen from Tristan da Cunha, given by Captain Carmichael (*Salvin, Cat. Birds Brit. Mus.*, XXV., p. 410). Nikolai Hanson, during the voyage of the "Southern Cross," procured a single example on October 24th, 1898, in Lat. 42° 23' S., Long. 20° 32' E. (*Sharpe, Rep. Voy. "Southern Cross,"* p. 148).

Mr. Robert Hall relates that he found a burrow on January 25th, in Greenland Harbour, Kerguelen Island, which branched out in different directions at the end of a long tunnel. One end contained a *Majaqueus æquinoctialis*, the other terminated in a dome-shaped cavity, in which was found a Kerguelen Fulmar, both birds being without eggs. In another district the nests were placed in the vicinity of lakes, and the holes were excavated in clay soil. During the early part of the breeding season these holes were flooded with water, which might be seen trickling out, giving the appearance of a deserted burrow, but later the ground dried up.

According to the Rev. A. E. Eaton, the nest is composed of damp and decayed vegetable matter, comprising sprigs of *Acæna* and *Azorella*, tufts of *Festuca erecta*, etc. It is two or three inches in height, and slightly concave. The first nest was found on November 8th, and the embryo was tolerably advanced in growth. In January, in a branch of a *Majaqueus* burrow was a nestling, which seemed to be the young of *Œ. brevirostris*; the *Majaqueus* egg was in the chamber of the main burrow, to which there was only one entrance (*Sharpe, Phil. Trans.*, Vol. 168, p. 125).

*Adult.* General colour above dull slaty-grey, most of the feathers with hoary-grey bases; wing-coverts greyish-black, with slaty-grey margins to the feathers, imparting a general slaty-grey appearance to the wing-coverts, the median and greater series clearer slaty-grey on their edges; quills blackish, shaded externally with ashy-grey, the inner web inclining to ashy-brown; tail-feathers slaty-black; crown of head like the back, scarcely a shade darker, but not so distinctly washed with grey; sides of face and ear-coverts dull slaty-grey, with a blackish shade before the eye; entire under-surface of body slaty-grey, slightly paler and more lavender-grey on the lores,

## MONOGRAPH OF THE PETRELS.

cheeks, and throat ; under tail-coverts slaty-grey ; under wing-coverts dull slate-colour, with blackish shafts and hoary margins to the feathers ; primary-coverts and quills below slaty-grey ; axillaries slaty-grey, with narrow white fringes at the tips ; “ bill black ; feet purplish-grey ; claws black ; iris dark brown, with a blue-black pupil ” (Dr. Pirie). Total length about 13.0 inches ; culmen, 1.0 ; wing, 10.1 ; tail, 3.6 ; tarsus, 1.4 ; middle toe and claw, 1.8.

Nikolai Hanson recorded the following colours for the species :—“ Bill grey ; feet and webs black ; iris dark brown.” The nestling is clothed in sooty-brown down, and the underlying plumage is similar to that of the adult bird.

The specimen described was obtained by the Antarctic Expedition in Kerguelen Island, and the bird figured is from Christmas Harbour, Kerguelen Island, procured by Dr. McCormick, and formerly in our collection.





## 73. *ÆSTRELATA SOLANDRI* (*Gould*).

(SOLANDER'S FULMAR.)

(PLATE 61.)

*Procellaria melanopus*, Natterer (nec Gm.) teste Gould, Handb. Birds Austr., II., p. 450 (1865).

*Procellaria solandri*, Gould, P. Z. S., 1844, p. 57; id., Ann. and Mag. Nat. Hist., XIII., p. 363 (1844).

*Cookilaria solandri*, Bp., Consp. Av., II., p. 190 (1855).

*Pterodroma solandri*, Gould, Handb. Birds Austr., II., p. 450 (1865).

*Æstrelata solandri*, Coues, Pr. Acad. Nat. Sci. Philad., 1866, pp. 148, 170; Gigl. and Salvad., Ibis, 1869, p. 66; Reichenow, Deutsche Südpolar Exped., IX., Zool., I., p. 485 (1908).

*Fulmarus solandri*, Gray, Handl. Birds, III., p. 107 (1871).

*Æstrelata solandri*, Salvin, Cat. Birds Brit. Mus., XXV., p. 410 (1896).

*Æstrelata solanderi*, Mathews, Handl. Birds Austral., p. 17 (1908).

Major: omnino fuliginoso-brunneus, gastræi plumis basaliter albis: primariis intus basin versus albis.

A SINGLE specimen, the type of his *Pterodroma solandri*, was procured by Gould in Bass's Straits on March 13th, 1839, and is now in the British Museum. It was not figured in his great work on the "Birds of Australia," but is included in his later "Handbook." This is a large, dark-plumaged species, resembling *Æ. macroptera*, but much exceeding it in size of bill and length of wing and the base of the inner web of the primaries is white.

As only one specimen of *Æ. solandri* has been obtained, I am inclined to think that it may be a dark phase of some other species, but to which it belongs it is at present difficult to determine. Possibly it is a dusky form of *Æ. lessoni*, for the dimensions are nearly the same, but the dark tarsi and feet do not coincide with the light colours of the latter bird. I have, therefore, figured and described the type-specimen, and must leave the identification of the species to future ornithologists.

Gould says that he showed the typical example of *Æ. solandri* to the celebrated

## MONOGRAPH OF THE PETRELS.

Johann Natterer, of Vienna, who was disposed to identify it with *Procellaria melanopus* of Solander, but with this conclusion Gould did not agree, and named the species after Solander himself.

Gould further considered that it was not a fully mature bird, but in my opinion it is perfectly adult, as, indeed, it was so considered by Salvin.

*Adult male.* General colour above black, slightly shaded with grey, less distinctly on the head, which is darker than the back, where the feathers are dull slaty-grey with blackish edges, becoming less distinct on the lower back, rump, and upper tail-coverts; marginal and outer median wing-coverts dull slaty-grey, with dusky edges towards the tips and along their outer webs; bastard-wing and primary-coverts, black, brown on the inner web, and white towards the base; tail-feathers blackish, slightly tinged with ashy-grey; sides of face and cheeks dark brown, with a white streak below the eye; the base of the forehead, lores and cheeks white, mottled with brown spots; under-surface of body dusky brown, strongly shaded with slaty-grey, slightly mottled with white spots on the throat, and with larger ones on the breast, mostly concealed; under wing-coverts blackish, the axillaries like the breast, but of a more ashy-brown; quills dusky below, with the base of the inner webs of the primaries and primary-coverts white; "bill, tarsi, toes, and membranes black" (J. Gould). Total length about 18 inches; culmen, 1.55; wing, 11.8; tail, 5.4; tarsus, 1.2; middle toe and claw, 2.4.

The description and figure are taken from the typical specimen in the British Museum.





CESTRELATA EXTERNA

## 74. *ÆSTRELATA EXTERNA*, *Salvin*.

(JUAN FERNANDEZ FULMAR.)

(PLATE 62.)

*Æstrelata externa*, Salvin, *Ibis*, 1875, p. 373 ; id., *Cat. Birds Brit. Mus.*, XXV., p. 411.

*Æstrelata externa*, Ridgw., *Man. N. Amer. Birds*, p. 68 (1887).

Major : ala 11.5 poll. : primariis intus, basin versus, conspicue albis : subalaribus et axillaribus albis : margine alari quoque alba, vix nigro maculata.

*Æ. externa* is a larger species than *Æ. hypoleuca* and its allies, and shows much more white on the under-surface of the quills. Its nearest ally is undoubtedly *Æ. cervicalis*, which, though of the same size, differs in several particulars, as will be noticed in my article on that species.

Although more than thirty years have elapsed since Salvin described the bird, I am not aware of any other specimens having been procured. The types, consisting of an adult bird and a full-grown nestling, were obtained by Mr. Leybold on the island of Masafuera, in the Juan Fernandez group. Nothing has been recorded of its habits.

*Adult.* General colour above ashy-grey, the feathers being blackish, with broad ashy-grey margins, all the feathers having white bases, which are most distinct on the hind-neck and upper mantle, with dusky tips ; wing-coverts black, the greater series externally grey, except at the base, which is white ; primaries black, the inner ones dark slaty-grey, with black shafts and tips, all the quills white for the greater part of the inner web ; secondaries slaty-grey, white for the greater part of the inner web, and narrowly fringed with hoary-white like the greater coverts ; innermost secondaries dark brown like the scapulars ; rump and central upper tail-coverts black, the lateral ones white with broad tips of brown or ashy-brown, the longer upper tail-coverts slaty-grey with concealed white bases ; tail-feathers slaty-grey, the inner webs browner, and also the tips, the outer feathers white at the base of the inner web, more extended on the outermost feathers, which are also slightly freckled with grey ; crown of head blackish, tinged with grey ; forehead and lores white, with a few blackish spots adjoining the crown ; sides of face white, with a few black spots and streaks ; upper and lower eyelid

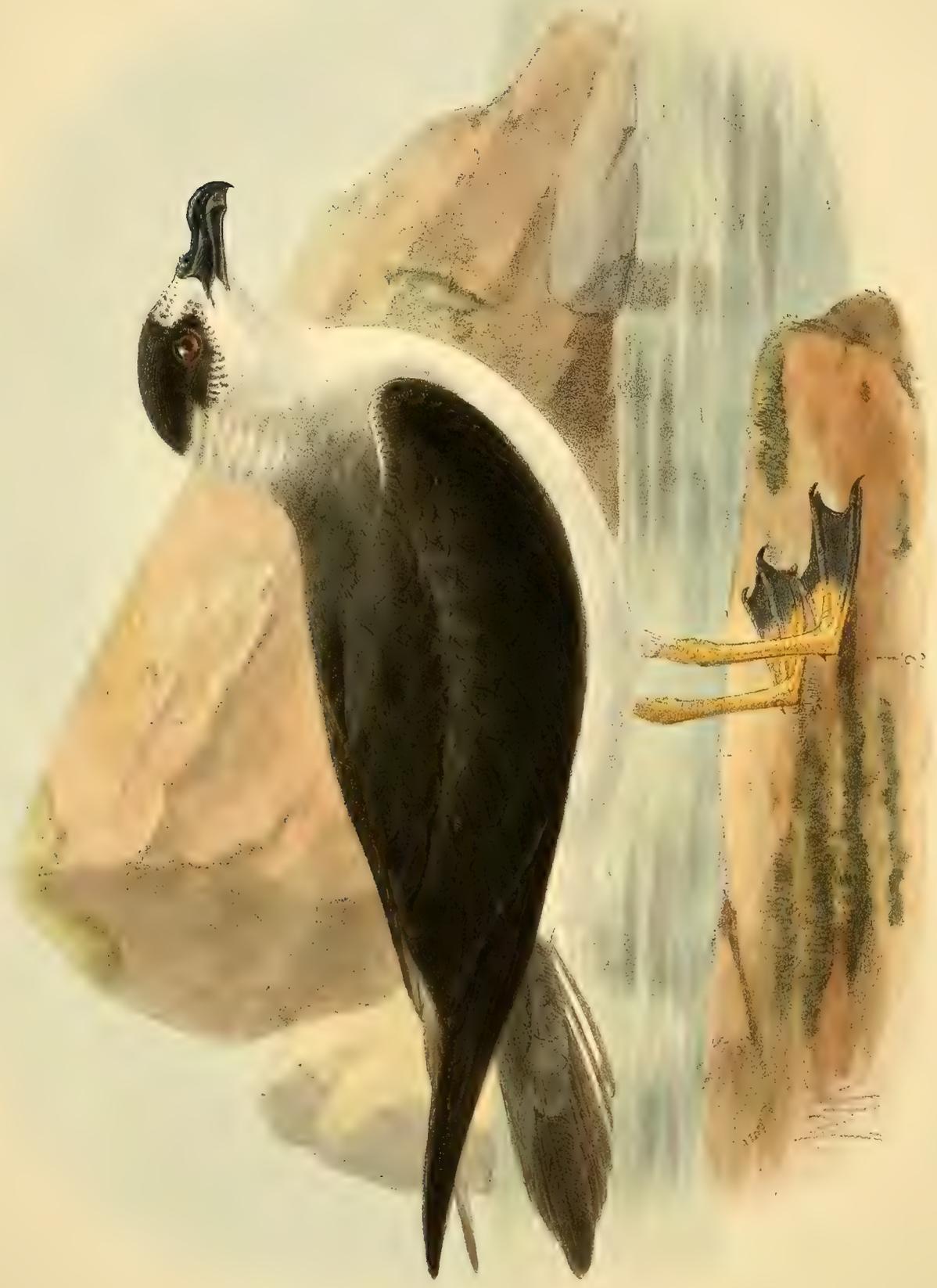
## MONOGRAPH OF THE PETRELS.

white, feathers in front of and below the eye black, extending over the ear-coverts, which have a few white streaks; cheeks and entire under-surface pure white, including the under wing-coverts and axillaries; edge of the wing slightly mottled with black spots; on the lower flanks above the thighs, a patch of feathers with broad black tips; quills blackish below, white for the greater part of the inner webs, which are more or less shaded with grey; bill black; tarsi and base of toes, yellow in skin, the terminal half black. Total length about 15.5 inches; culmen, 1.4; wing, 11.5; tail, 4.7; tarsus, 1.4; middle toe and claw, 1.9.

A young bird still more or less covered with long ashy down, but showing feathers beneath it, is somewhat whiter on the under-parts. The plumage of the nestling seems to be very like that of the adult.

The description and figure in the Plate are taken from the type-specimen.





## 75. *ÆSTRELATA CERVICALIS*, *Salvin*.

(SUNDAY-ISLAND FULMAR.)

(PLATE 63.)

*Æstrelata cervicalis*, Salvin, Ibis, 1891, p. 192 ; id., Cat. Birds Brit. Mus., XXV., p. 411, Pl. VI. (1896) ; Buller, Birds New Zeal., Suppl. I., p. 114, Pl. IV. (1905).

*Æstrelata* sp. Cheeseman, Tr. New Zeal. Inst., XXIII., p. 224 (1891).

*Æ. externæ* similis, notæo saturatiore, sed subalaribus marginalibus nigricantibus fasciam nigram formantibus, et rectricibus exterioribus duabus fere albis distinguenda.

SALVIN described *Æ. cervicalis* from a specimen obtained in the Kermadec Islands by Captain Carpenter, of the whaling barque "Costa Rica Packet," and presented by him to the British Museum. It has since been obtained in the same islands by the Earl of Ranfurly, Mr. Cheeseman, and others, and a considerable series procured by Mr. H. H. Travers is in the Rothschild Collection.

Salvin (*l.c.*) says that the species is most nearly allied to *Æ. phæopygia*, but is distinguished by its much stouter bill, white hind-neck, and the more distinct grey margins to the feathers of the back. It is also allied to the section of *Æstrelata*, of which *Æ. hæsitata* is the best-known example, but may be readily distinguished by its larger bill and dark uropygium ; it has, however, the nearly pure white hind-neck of *Æ. hæsitata*, thus differing from *Æ. phæopygia*, but agrees, nevertheless, with that bird in having the dark rump. The size of the bill separates *Æ. cervicalis* from both those birds. A distinguishing feature of these three forms is the colour of the primaries beneath, which are black over the whole of the exposed portion of the inner webs, and only become white under the larger coverts.

Other species of *Æstrelata* allied to *Æ. cervicalis* are *Æ. magentæ* and *Æ. externa*. But, in the former, the forehead is grey to the base of the bill, and the latter has a longer and thinner bill, the exposed portion of the inner webs of the primaries beneath, near the larger coverts, being white.

In the "Catalogue of Birds" Salvin lays stress upon the white base to the inner webs of the outer primaries, the length of the wing, and the dark band round its edge. Mr. Ogilvie-Grant, who examined five Kermadec specimens, considers the best

## MONOGRAPH OF THE PETRELS.

character for distinction to be the black band round the edge of the wing (*Ibis*, 1905, p. 554).

Salvin pointed out that the upper-parts of *Æ. cervicalis* are much darker than those of *Æ. externa*, and this is the case in adult birds, though in our series from the Kermadecs there are some examples, evidently young birds, nearly as light as the type of *Æ. externa*. There are also two specimens before me, one of each species, with the down still upon them, and in both the feathers on the back and upper wing-coverts are paler and broadly margined with grey; these characters are evidently therefore an indication of youth.

*Æ. cervicalis* is, so far as is known, confined to the Kermadec Islands. Mr. Cheeseman says (*Tr. New Zeal. Inst.*, XXIII., pp. 216 and 226) that the bird arrives about the end of September and remains till the end of June, being one of the last Petrels to leave. Its breeding-place is usually near the mountain-top in some dark gully filled with palms and tree-ferns, amongst the roots of which the burrow is generally made. It is nocturnal and solitary in its habits, more than one nest being seldom found in the same locality. An egg sent to the Auckland Museum by Mr. Day measured 2.5 inches in length, and 1.9 inch in breadth, and was pure white.

Having examined large series of this species, I consider that *Æ. cervicalis* and *Æ. externa* must be recognised as distinct, the more so as their habitats are so far apart from each other, and they have not been found in any intervening locality. Compared with *Æ. externa*, *Æ. cervicalis* is darker on the head and back, the tail-feathers are much lighter below, the two outer rectrices being for the most part white, while the marginal under wing-coverts are either entirely black or mottled with black.

In our figure of this bird the feathers of the upper-back and the greater series of coverts have been drawn rather too dark, as these parts generally have greyish margins to the feathers, the coverts likewise being fringed with hoary-white. These are characters which obtain in the majority of specimens, and the darker birds, such as the one figured, are by no means so common, but are probably the most fully adult.

*Adult* (type of species). General colour above black, shaded with grey, and having slaty-grey edges to all the feathers of the upper-parts, excepting the scapulars and wing-coverts, which are black; the greater wing-coverts black, shaded with grey, and edged externally with slaty-grey, and with hoary-white near the ends; bastard-wing, primary-coverts, and quills black, the primaries ashy-brown on the inner web, which is white for a considerable distance from the base; secondaries externally slaty-grey, with a narrow fringe of hoary-white, like the greater wing-coverts, the innermost secondaries black like the longer scapulars; lower back and centre of rump black; sides of rump and upper tail-coverts slaty-grey, with black shaft-lines and paler ashy edges at the end of the feathers; centre tail-feathers slaty-black, the lateral ones slaty-grey externally, and white on the inner web, which is freckled with grey at the end; crown of head black, the nape-feathers white with black tips; hind-neck and sides of

## CESTRELATA CERVICALIS.

neck white, with dusky-grey tips, producing a mottled appearance ; forehead and lores pure white, mottled with black centres to the frontal feathers where they adjoin the black crown ; sides of face and ear-coverts black, with white bases to the feathers ; cheeks and entire under-surface of body pure white, with a patch of ashy-grey on the sides of the fore-neck, the feathers being white at the base and with an ashy-grey margin, before which is a subterminal blackish shade ; axillaries pure white, as well as the greater part of the under wing-coverts, with a broad band of black, or black and white feathers round the edge of the wing ; lower primary-coverts nearly all white, the outermost blackish, like the quills below, the inner webs of which are greyish, white towards the base, and fringed with white along the edge ; “ bill black ; tarsi and basal half of toes with their webs flesh-colour, the terminal half and claws black ” (Buller). Total length about 16.5 inches ; culmen, 1.45 ; wing, 11.7 ; tail, 5.2 ; tarsus, 1.55 ; middle toe and claw, 2.0.

*Nestling*, with the down still on the back of the head, flanks, and crissum. The colours of the plumage resemble those of the adult, but are lighter. The feathers of the back are more broadly margined with light grey, as also are those of the uropygium. The upper wing-coverts, both greater and median, are margined with grey, and the feathers of the wings and tail are lighter than in the adult. On the other hand, the yellow of the feet and tarsi is much darker (Buller, *Birds New Zeal., Suppl.*, I., p. 114).

The description is taken from the typical specimen in the British Museum, and the Plate is drawn from the same bird.

## 76. *ÆSTRELATA NEGLECTA* (*Schlegel*).

(PHILLIP'S FULMAR.)

(PLATE 64.)

- ? *White-breasted Petrel*, Lath., Gen. Syn., III., pt. 2, p. 400 (1785).  
? *Norfolk Island Petrel*, Lath., Gen. Syn., Suppl., II., p. 334 (1802).  
? *Procellaria alba*, Gm., Syst. Nat., I., p. 565 (1788); Lath., Ind. Orn., II., p. 822 (1790).  
? *Procellaria grisea* (nec Gm.) Bonn., Enc. Méth., I., p. 75 (1790).  
? *Procellaria variegata*, Bonn., Enc. Méth., I., p. 78 (1790).  
*Daption album*, Steph. in Shaw's Gen. Zool., XIII., p. 246 (1826).  
*Rhantistes raolensis*, Bp., Comptes Rend., XLII., p. 768 (descr. nulla, ex Gould MSS.).  
*Procellaria phillipii*, Gray, Ibis, 1862, p. 246.  
*Procellaria neglecta*, Schl., Mus. Pays-Bas, VI., Procell., p. 10 (1863); Finsch, P. Z. S., 1879, p. 15.  
*Æstrelata neglecta*, Coues, Pr. Acad. Philad., 1866, pp. 147, 170.  
*Procellaria mollis* (nec Gould) Finsch, J. f. O., 1870, p. 373, 1874, p. 207.  
*Fulmarus albus*, Gray, Handl. Birds, III., p. 106 (1871).  
*Æstrelata neglecta*, Salvad., Ann. Mus. Civic. Genov., XVIII., p. 411 (1882); id., Orn. Papuasia, III., p. 465 (1882); Buller, Birds New Zeal., 2nd ed., II., p. 224 (1888); Salvin, Cat. Birds Brit. Mus., XXV., p. 412 (1896).  
*Æstrelata phillipi*, Hutton, P. Z. S., 1893, p. 755.  
*Æstrelata leucophrys*, Hutton, P. Z. S., 1893, p. 752, Pl. 63.  
*Æstrelata neglecta*, var. Hutton, P. Z. S., 1893, p. 754.

Media : ala 11.0–11.2 : notæo brunneo, gastræo griseo, vel albo : primariis intus albis : axillaribus et subalaribus cinerascanti-brunneis.

THIS Fulmar is remarkable for its variable colour, some examples being for the most part white, while others are entirely grey. These two phases of plumage are so unlike each other that the birds might very well be taken for different species. Buller, indeed, at one time thought that the dark birds were the young of the white-headed form, but there can now be no question that they represent a dark phase of plumage, as



*Booby*

BOOBIA BOOBIA

Hartman imp.



## ŒSTRELATA NEGLECTA.

seen in other species of *Œstrelata*. The white phase was described as a distinct species by the late Captain Hutton, under the name of *Œ. leucophrys*, but no doubt Salvin was right in referring this bird to *Œ. neglecta*. If any further proof of their identity were needed, it is supplied by the notes given by Buller in his "Supplement" (I., p. 115), stating that Mr. Bethune, the engineer on board the "Hinemoa," found both light and dark birds breeding together on Sunday Island, in the Kermadecs. The male was the so-called *Œ. leucophrys* and the female *Œ. neglecta*. He also found them paired on other occasions. Buller records that the legs and feet of the dark birds are brownish-black, whereas in the light form the tarsus was yellowish, and the toes "sandalled" with black.

Both light and dark forms have a conspicuous white quill-lining, with the shafts of the primaries also conspicuously white, and this character serves to distinguish Phillip's Fulmar from its allies.

The headquarters of *Œ. neglecta* appear to be the Kermadec Islands, where it breeds, extending also across the Pacific to Juan Fernandez, whence we have a specimen collected by Admiral A. H. Markham in March, 1881. It does not, however, appear in Professor Giglioli's list of the Petrels observed during the voyage of the "Magenta."

I have examined a large number of specimens in the Rothschild Collection from the Kermadec group, obtained by Mr. Cheeseman and Mr. H. H. Travers, and the British Museum has a considerable series from the same locality, which was visited by the Earl of Ranfurly (*cf.* Ogilvie-Grant, *Ibis*, 1905, p. 555). The types in the Leyden Museum represent the dark phase, and are also from the Kermadecs, and were received from the Maison Verreaux. Macgillivray procured a number on Raoul Island, where the birds were breeding, and to these the name of *Œ. raolensis* was given by Gould, but it was not published, though adopted by Bonaparte (*Comptes Rend.*, XLII., 1856, p. 765). Here again no description was given, so that it becomes a *nomen nudum*.

Although the range of this species was supposed to be confined to the Pacific Ocean, we find in the second volume of "British Birds" (p. 14) that Messrs. Robert Newstead and T. A. Coward record a specimen at Tarporley, in Cheshire, on April 1st, 1908, which, though picked up dead under a tree, was in an excellent state of preservation. This bird was afterwards brought to the British Museum, where I had an opportunity of examining it, and found it to be a dark-phased example of *Œ. neglecta*.

The following descriptions comprise both the dark and the light plumages of the species:—

*Adult* (dark phase: = *Œ. neglecta*, Schl.). General colour above dusky-brown, with a slight ashy shade, produced by the scarcely distinguishable slaty-grey margins to the feathers, the longer scapulars blacker and more resembling the inner secondaries, all the feathers of the upper surface having concealed white bases; wing-

## MONOGRAPH OF THE PETRELS.

coverts like the back, and having the same obsolete shade of slaty-grey; quills blackish-brown, more or less white towards the base; the primaries with white shafts for a great part of their length, especially on the outer feathers, which show a great extent of white along their inner web; tail-feathers blackish, white at the base, like the adjoining upper tail-coverts; crown of head like the back, showing similar white bases to the feathers, when disturbed; lores and base of forehead, as well as the sides of the face, dusky-brown, but more distinctly shaded with slaty-grey; under the eye a line of white; entire under-surface of body brown, washed with slaty-grey, the under tail-coverts blacker, and having white bases like the tail-feathers; under wing-coverts and axillaries dark brown; quills blackish-brown below, with the inner web white for two-thirds of its length, the secondaries also with concealed white bases; "bill and legs black" (Buller). Total length about 14.5 inches; culmen, 1.2; wing, 11.0; tail, 4.0; tarsus, 1.45; middle toe and claw, 2.0.

*Adult* (white phase: = *Æ. leucophrys*, Hutton). General colour above dark brown, much mottled with white bases to the feathers, which have evident margins of paler ashy-brown; the longer scapulars blackish, like the inner secondaries; wing-coverts dark brown like the back, and having obsolete margins of paler brown; quills blackish, white at the base and for a great extent of the inner webs of the primaries, which have white shafts for a great part of their extent; upper tail-coverts and tail-feathers blackish, with white bases; crown of head and hind-neck much paler than the back, and more mottled, the feathers having brown centres with blackish shaft-lines and hoary-whitish margins, the fore-part of the crown having a spotted appearance; base of forehead, lores, feathers over the eye and sides of face, pure white, with a shade of brown in front of the eye and towards the sides of the neck; entire under-surface of body pure white, shaded with ashy-brown on the sides of the neck and chest, the feathers having faint ashy-brown subterminal bands; across the fore-neck a slight indication of brown shading near the ends of the feathers; on the sides of the body a slight shade of brown; under tail-coverts white, either freckled with dark brown towards the ends, or with the terminal third uniform dark brown; under wing-coverts and axillaries dark brown, the outer greater-coverts and the primary-coverts white towards the base of the inner web; quills blackish-brown below, white for more than half of the inner webs of the primaries. Total length about 15.5 inches; culmen, 1.25; wing, 11.2; tail, 4.0; tarsus, 1.5; middle toe and claw, 2.2.

Between the two phases described above, numbers of intermediates occur.

The specimens described are from the Kermadec Islands, obtained by Mr. Dannefaerd, and now in the Rothschild Collection. The figure represents the light phase, and is taken from an example procured by Lieut. Macfarlane in the Eastern South Pacific Ocean.





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77. CESTRELATA ARMINJONIANA, *Gigl. and Salvad.*

(ARMINJON'S FULMAR.)

(PLATE 65.)

*Procellaria sandaliata*, Gray, Gen. Birds, III., p. 648 (1844, ex. Solander MS. : descr. nulla) ; Salvin, in Rowley's Orn. Misc., I., p. 238 (1876).

*Rhantistes sandaliata*, Bp., Comptes Rend., XLII., p. 768 (1856).

*Æstrelata arminjoniana*, Giglioli and Salvadori, Atti Soc. Ital. Sci. Nat., XI., p. 452 (1868) ; id., Ibis, 1869, pp. 62, 66 ; Giglioli, Faun. Vertebr. Oceano, p. 42 (1870).

*Æstrelata arminjoniana*, Salvin, in Rowley's Orn. Misc., I., pp. 234, 252, Pl. 31 (1876) ; id., Cat. Birds Brit. Mus., XXV., p. 413 (1896).

*Æstrelata mollis* (nec Gould), Saunders, P. Z. S., 1880, p. 164.

*Æstrelata armingoniana*, Nicoll, Ibis, 1906, p. 671.

*Æstrelata wilsoni*, Sharpe, Bull. B. O. C., XII., p. 49 (1902) ; id., Ibis, 1904, p. 216 ; Nicoll, Ibis, 1906, p. 671.

*White-breasted Petrel*, Wilson, Ibis, 1904, p. 212.

Primariis externis pogonii interni basin versus albis : corpore subtus albo, interdum brunneo : subalaribus brunneis : fronte brunnea, pileo concolori, minime alba.

*Æ. arminjoniana* belongs to the group containing *Æ. neglecta* and other allied species, which have a white base to the inner web of the first primary. It is distinguished from *Æ. heraldica* and *Æ. gularis* by its dark forehead, in which respect it resembles *Æ. trinitatis*, but differs in its white under-surface, and in the colour of the feet and toes.

THE species was first discovered during the cruise of the "Magenta," in January, 1868, in Lat. 28° 56' S., Long. 36° 24' W., and was obtained later off the island of South Trinidad, in the Atlantic Ocean, by Professor Giglioli, who, with Count Salvadori, named it after Captain Victor Arminjon, of the Royal Italian Navy, who then commanded the vessel. Although many specimens were shot when the "Magenta"

## MONOGRAPH OF THE PETRELS.

lay becalmed about five miles off the island, only two skins were prepared, as it was then supposed to be a well-known species.

Professor Giglioli points out in his essay on the geographical distribution of the vertebrates of the southern ocean, that this species, though bearing some relation to *Æ. mollis*, is smaller and more slender in appearance, and is without the white forehead.

The Earl of Crawford brought back a specimen of this Petrel which was killed with a stick on South Trinidad Island in 1874, and was erroneously ascribed by Howard Saunders to *Æ. mollis*.

Dr. Wilson, of the "Discovery," procured light and dark specimens from the same island in September, 1901, and Dr. Sharpe, believing the latter to be distinct, named it *Æ. wilsoni* (*B. O. C.*, XII., p. 49, 1902). He compared it with *Æ. arminjoniana*, but found it was darker, and had a larger bill. Dr. Wilson mentions that the birds were very abundant, and nested on the island, some having dark breasts, while others were white beneath, but all had pink legs and feet.

Mr. Nicoll, who accompanied Lord Crawford on a second visit to South Trinidad Island in 1905, and procured examples of both light and dark birds, throws doubt on their belonging to different species. He thought that the dark birds were immature, but inasmuch as many were breeding, it is evident they were adult. After examining the series in the British Museum, which contains both forms, I have come to the conclusion, in which Dr. Sharpe agrees, that they belong to the same species, and they must therefore bear the name of *Æ. arminjoniana*. The dark form is very similar to *Æ. trinitatis*, but the latter may always be distinguished by its black legs and feet; in *Æ. neglecta* the tarsi and base of the webs are yellow.

There is a young bird in the downy stage in the British Museum in which white feathers are appearing on the breast, showing that the dark plumage does not indicate an immature bird.

According to Dr. Wilson, the nest is only a saucer-like depression placed on a ledge in the soft rock, where the single white egg is deposited. On skinning one of these Fulmars, he observed a capacious hollow in the abdomen sufficiently large to hold the egg, which is as big as that of a fowl:—Axis, 2.4 inches; diam., 1.75.

*Adult male.* General colour above ashy-black, the feathers of the back from the nape downwards mottled with white bases; scapulars and wing-coverts blackish, washed with slaty-grey, the greater coverts for the most part slaty-grey, with dusky margins; quills dusky-black, ashy-brown for the greater part of the inner web, the secondaries blackish for the greater part, ashy-brown towards the ends of the inner webs, or mottled, with blackish vermiculations, mostly at the end of the outer web; upper tail-coverts and tail blackish, with a slight ashy shade; crown of head and sides of face like the back, the feathers below the eye and the ear-coverts slightly mottled with white bases to the feathers; throat white, slightly mottled, with dull ashy bars,

## ŒSTRELATA ARMINJONIANA.

with which most of the feathers are tipped ; remainder of under-surface of body white, with a broad collar of ashy-brown across the fore-neck, continued down the sides of the upper breast and sides of the body ; on the latter a few bars of ashy-brown, and also a few similar bars below the pre-pectoral collar ; on the flanks a few blackish shaft-streaks, causing a streaked appearance ; under tail-coverts slaty-black, with white bases and narrow white fringes at the ends, some of the basal coverts white, with a double or single bar of ashy-grey near the end ; under wing-coverts dark brown, shaded with ashy, some of the inner median and greater coverts for the most part white ; primary-coverts white at the base ; quills dusky-brown below, more ashy on the inner web, which is white towards the base and margins of the primaries, and extends for the greater part of the inner web of the secondaries ; “ bill black ; tarsi and base of toes flesh-colour ; rest of toes, webs, and whole of outer side of outer toe, black ” (M. J. Nicoll). Total length about 15.0 inches ; culmen, 1.15 ; wing, 11.6 ; tail, 4.9 ; tarsus, 1.35 ; middle toe and claw, 1.85.

*Adult female.* Similar to the male. Wing, 11.5 inches ; culmen, 1.2 ; tarsus, 1.45 ; middle toe and claw, 1.95.

In both white and grey-breasted phases the soft parts are of the same colour, as follows :—“ Bill black ; tarsi and base of toes pink, the outer toe and the terminal portion of the other toes and outer part of the webs, black ; iris dark brown ” (E. A. Wilson).

The descriptions are taken from a pair of birds procured by Mr. M. J. Nicoll during the cruise of the “ Valhalla.” The Plate is drawn from the typical specimen in the Royal Zoological Museum of Turin.

78. *ÆSTRELATA TRINITATIS*, *Gigl. and Salvad.*

(SOUTH TRINIDAD FULMAR.)

(PLATE 66.)

*Æstrelata trinitatis*, Giglioli and Salvadori, Atti Soc. Ital. Sci. Nat., XI., p. 454 (1868);  
iid., Ibis, 1869, pp. 65, 66.

*Æstrelata (Pterodroma) trinitatis*, Giglioli, Faun. Vertebr. Oceano, p. 40 (1870).

*Æstrelata trinitatis*, Salvin in Rowley's Orn. Misc., I., p. 253, Pl. 32 (1876); id.,  
Cat. Birds Brit. Mus., XXV., p. 413 (1896); Wilson, Ibis, 1904, p. 213;  
Sharpe, Ibis, 1904, p. 215; Nicoll, Bull. B. O. C., XVI., p. 103 (1906);  
id., Ibis, 1906, p. 672.

*Æ. arminjonianæ* similis, sed subtus fuliginosa, et pedibus omnino nigris  
distinguenda.

THIS Fulmar was discovered during the voyage of the "Magenta," and found abundantly by Professor Giglioli in January, 1868, in the neighbourhood of South Trinidad Island, where it was also observed by Dr. E. A. Wilson on the "Discovery," and Mr. M. J. Nicoll on the "Valhalla."

The bird is of dull plumage, and was compared by its original describers to *Æ. macroptera*, to which it bears a general resemblance, but differs in having a white base to the inner web of the first primary, and was, on that account, placed by Salvin in a separate section of the genus *Æstrelata*. It is also allied to *Æ. arminjoniana*, but may be distinguished by its entirely black tarsi and toes.

Professor Giglioli points out that *Æ. trinitatis* is, moreover, a smaller bird than *Æ. macroptera*, with wings proportionately longer, and the bill decidedly smaller and weaker, in addition to many other minor points of difference. Dr. Wilson, who visited South Trinidad Island on September 13th, 1901, and obtained eggs, but no young birds, states that *Æ. trinitatis* was found breeding in small colonies, apart from, and much higher up on the ledges and cliffs than its white-breasted ally *Æ. arminjoniana*. In January, 1905, Mr. Nicoll obtained both young and old birds, but reported that *Æ. trinitatis* was not nearly so abundant as *Æ. arminjoniana*, and was only met with on the higher parts of the island.





## CESTRELATA TRINITATIS.

The nests of both species were simply small saucer-shaped hollows in the overhanging parts of crumbling rocks. The single egg is white, and measures:—Axis, 2.5 inches; diam., 1.85; which is very large for the size of the bird.

*Adult male.* General colour above sooty-brown, almost black, with white bases to the feathers of the upper-surface; wing-coverts and scapulars, as well as the secondaries, like the back, the primary-coverts and primaries slightly darker, the inner web for the most part ashy-brown; tail-feathers, sooty-brown; crown of head, sides of face, throat and entire under-surface of body also sooty-brown, all the feathers with concealed white bases which are most conspicuous on the throat; the feathers of the under-surface obsoletely margined with lighter brown; under tail-coverts slightly blacker than the breast; under wing-coverts and axillaries dark brown, a little deeper than the brown of the breast; lower greater-coverts and primary-coverts white, ashy-brown towards the ends; quills dark brown below, the inner webs ashy, white towards the base, and fringed with white along the inner web; “bill, tarsi and toes black; iris black” (M. J. Nicoll). Total length about 14.4 inches; culmen, 1.25; wing, 11.1; tail, 4.5; tarsus, 1.4; middle toe and claw, 1.95.

*Adult female.* Does not differ in plumage from the male. Wing, 11.4 inches.

A nestling procured by Mr. Nicoll is covered with sooty-grey down.

The adult male and female are described from specimens obtained by Mr. Nicoll. The figure in the Plate is drawn from the type-specimen kindly lent to Salvin by the authorities of the Royal Museum of Turin.

## 79. ÆSTRELATA HERALDICA, *Salvin.*

(CHESTERFIELD ISLANDS FULMAR.)

(PLATE 67.)

*Procellaria leucoptera* (nec Gould) Schl., Mus. Pays-Bas, VI., Procell., p. 12 (1863).

*Fulmarus philippii* (nec Gray, 1862) Gray, Handl. Birds, III., p. 106 (1871).

*Æstrelata heraldica*, Salvin, Ibis, 1888, p. 357; id., Cat. Birds Brit. Mus., XXV., p. 414 (1896).

Media: ala 11.1: subtus alba, gutture imo, præpectore et hypochondriis fuscocineraceo fimbriatis: subalaribus nigricanti-brunneis, majoribus albis apicem versus nigricantibus: primariis nigricantibus, intus conspicuè albis: fronte nigro maculato.

THIS species was described by Salvin from Chesterfield Islands, in the South-western Pacific, to the west of New Caledonia. Besides the type in our collection, which was obtained by Macgillivray, there is another in the British Museum from the same source.

*Æ. heraldica* is distinguished by the very conspicuous white quill-linings, and the blackish under wing-coverts, the greater series of which are white with ashy-black ends. The lores, cheeks, and under-surface are white, with numerous cross vermiculations of a dull ashy colour which are continued on the sides of the body.

I have found no other locality for the species beyond Chesterfield Islands, for though Salvin quotes Schlegel's *Procellaria leucoptera* from Ternate (*Mus. Pays-Bas*, VI., *Procell.*, p. 12) as this bird, the description does not agree with *Æ. heraldica*, and the locality, "Ternate," seems improbable.

*Adult* (type). General colour above dark brown, washed with slaty-grey, the feathers having obsolete margins of the same colour; longer scapulars blacker, like the inner secondaries; wing-coverts black, with a shade of slaty-grey on the greater series; primary-coverts and quills blackish, the primaries white internally, the secondaries whitish towards the base; upper tail-coverts black, white for more than the basal half; tail-feathers black, white at the base, and for a little distance up the inner web; crown of head like the back, slightly mottled with white where the bases





## CESTRELATA HERALDICA.

show through, all the feathers having obsolete narrow margins of grey; forehead mottled, with white margins and ashy-grey centres to the feathers; lores white; sides of face white, mottled with ashy-black, the ear-coverts nearly uniform black; the feathers below the eye spotted with black; a white line below the eye; cheeks white, with a few ashy-brown bars; throat and under-surface of body pure white, with an ashy-shade across the fore-neck and sides of neck, the feathers of the latter with hoary-grey margins, those of the lower throat and fore-neck being narrowly barred with ashy-brown, forming a thickly barred collar across the fore-neck; sides of body washed with ashy-grey and more or less barred with dusky-brown; a patch of ashy-brown feathers on the lower flanks above the thigh; under tail-coverts white, with black bars near the ends of the feathers, some of which are freckled along the outer web; axillaries blackish, with white bases; under wing-coverts blackish, with white edges, the greater series and the primary-coverts for the most part white, with dusky-brown ends; quills blackish below, with the basal half of the inner web white; bill black; tarsi and toes orange-yellow (in skin), terminal third of toes black. Total length about 14.0 inches; culmen, 1.1; wing, 11.1; tail, 4.4; tarsus, 1.3; middle toe and claw, 1.8.

The description and figure are taken from the typical specimen in our collection.

## 80. CESTRELATA GULARIS (*Peale*).

(MOTTLED FULMAR.)

(PLATE 68.)

*Procellaria inexpectata*, Forster, Descr. Anim., p. 204 (1844); Hutton, P. Z. S., 1893, p. 753.

*Procellaria gularis*, Peale, U. S. Expl. Exp., p. 299 (1848).

*Æstrelata gularis*, Bp., Comptes Rend., XLII., p. 768 (1856); Giglioli, Faun. Vertebr. Oceano, p. 44 (1870); Ridgway, Man. N. Amer. Birds, p. 67 (1887).

*Procellaria mollis* (nec Gould) Cass., U. S. Expl. Exped., p. 410 (1858).

*Procellaria affinis*, Buller, Tr. N. Zeal. Inst., VII., p. 215 (1875).

*Æstrelata affinis*, Buller, Birds New Zeal., 2nd ed., II., p. 223, Pl. 41, fig. 1 (1888).

*Æstrelata gularis*, Coues, Key N. Amer. Birds, 2nd ed., p. 780 (1884); Baird, Brewer and Ridgway, Water-Birds N. Amer., II., p. 397 (1884); Salvin, Ibis, 1888, p. 358; id., Cat. Birds Brit. Mus., XXV., p. 414 (1896); Buller, Suppl. Birds New Zeal., I., p. 117 (1905).

*Æstrelata inexpectata* (Forster); Sharpe, Hist. Coll. Brit. Mus., II., p. 187 (1906).

Media: ala 9.9–10.0: primariis intus fere omnino albis: subalaribus et tectricibus primariorum inferioribus pure albis, marginalibus nigricantibus fasciam latam formantibus: axillaribus cineraceis, basin versus albis: gutture albo: gastræo reliquo cinerascete: subalaribus albis.

THERE is in the Banksian Collection of Drawings a coloured figure (Pl. 97), by George Forster, of a Fulmar, with the name of *Procellaria hæsitata* affixed to it, apparently in Solander's handwriting. This drawing has since been identified by Dr. Bowdler Sharpe (*l.c.*) as *Procellaria inexpectata* of Forster, who gives a very fair description of the species, and adds "Fig. pict. G.," indicating that his son George had drawn the figure. Although this identification had already been hinted at by Captain Hutton (*P. Z. S.*, 1893, p. 753), Salvin did not follow his suggestion, and preferred Peale's name of *gularis*, which he considered more certain, and in this I agree.

This species was also called *Æ. affinis* by Buller, but Salvin, suspecting that it might





## CESTRELATA GULARIS.

be *Æ. gularis* of Peale, sent a specimen of *Æ. affinis* to Mr. Ridgway, who compared it with Peale's type and found it identical.

Peale, in his original description, gives the breast as "plumbeous." He also says that the "primaries and spurious wings are nearly black, with brown shafts," no mention being made of the white on the inner webs of the quills, which is such a conspicuous feature.

In the "Catalogue of Birds" Salvin quoted the description (presumably taken from Peale's type) given by Mr. Ridgway in his "Manual." Here we find that the inner webs of the primaries are "abruptly white for at least the inner half, with the shafts of the quills dark brown."

*Æ. gularis* is a very appropriate name, for the white throat is a conspicuous feature, standing out in strong relief from the grey under-surface of the bird. In many respects it is allied to *Æ. heraldica*, but has more white on the inner webs of the primaries. This character also separates *Æ. gularis* from *Æ. mollis*, to which it otherwise bears a certain resemblance, particularly in the black in front of, and below, the eye; but it is distinguished from both *Æ. mollis* and *Æ. heraldica* by its grey breast and abdomen.

Peale says this Fulmar was found among icebergs, buffeting the storms and fogs of the Antarctic regions. He saw but few examples, and only obtained a single specimen, on March 21st, while the ship "Peacock" was enveloped in a fog, in Lat. 68° S., Long. 95° W. It occurs in the New Zealand seas, and Buller mentions many places whence he had received specimens; among these are the Spencer Mountains in the Province of Canterbury. Mr. Percy Seymour discovered a nesting colony at Preservation Inlet, and, according to Buller, the species has also been found on the Auckland Islands.

*Adult male.* General colour above dark slate-colour, mottled on the back of the head, neck, and mantle with white bases to the feathers; back and scapulars somewhat lighter slaty-grey, with hoary-white fringes to the feathers, the longer scapulars darker; centre of the rump and central short upper tail-coverts dark slaty-grey, with blackish margins and shafts; lateral upper tail-coverts light ashy-grey, with white bases; tail-feathers also ashy-grey, white at the extreme base, the two outer ones grey on the outer webs, the inner webs white, more or less freckled with grey; wing-coverts slaty-black, including the marginal-coverts, bastard-wing and primary-coverts, the latter slaty-grey on the inner web, and fringed with white, the median-coverts and the greater series lighter and more ashy-grey, with white edges; the greater coverts with concealed white bases; quills slaty-black, the inner primaries rather more ashy, the secondaries light ashy-grey like the greater-coverts, with the base white, extending for a considerable part of the inner web; the secondaries fringed with white, like the greater-coverts; all the primaries white for the greater part of the inner web; head slightly browner than the back; the forehead mottled with black feathers edged with white; lores white, as also a small streak below the eye;

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feathers in front of the eye and round the latter black, extending over the ear-coverts; sides of face blackish, mottled with white; throat and fore-neck pure white, with a slight indication of vermiculated ashy-brown bars, continued on to the breast, which is also white, with ashy-brown tips to the feathers; lower breast and abdomen ashy-brown with white bases to all the feathers; thighs, vent, and under tail-coverts white, with a few ashy-brown bars; sides of body for the most part white, but freckled with bars of ashy-brown; axillaries white, with a few vermiculated bars of ashy-brown near the end, the longer ones white for the basal part, the terminal half ashy-grey, with white ends; under wing-coverts white, the marginal ones slaty-black, the outer greater series mostly white, freckled with black bars; quills ashy-black below, the primary-coverts and the greater part of the inner webs conspicuously white; "bill black; feet dull yellow, the outer toe and interdigital membranes black" (Buller). Total length about 14.0 inches; culmen, 1.05; wing, 9.9; tail, 4.0; tarsus, 1.35; middle toe and claw, 1.6.

*Adult female.* Like the male. Total length about 14.0; wing, 10.1; tarsus, 1.3; middle toe and claw, 1.65.

The nestling is covered with sooty-grey down, not perceptibly whiter below.

The birds above described were received from Mr. Percy Seymour. The figure is drawn from an example presented by the Hon. Walter Rothschild to the British Museum.

## 81. *ÆSTRELATA FISHERI*, *Ridgway*.

(FISHER'S FULMAR.)

*Æstrelata fisheri*, Ridgway, Pr. U. S. Nat. Mus., V., p. 656 (1883); Coues, Key N. Amer. Birds, 2nd ed., p. 780 (1884); Baird, Brewer and Ridgway, Water-Birds N. Amer., II., p. 396 (1884); Ridgway, Pr. U. S. Nat. Mus., VIII., p. 18 (1885); Salvin, Cat. Birds Brit. Mus., XXV., p. 415 (1896).

*Æstrelata fisheri*, Ridgway, Auk, XII., p. 319, Pl. 4 (1895); A. O. U. Checkl. N. Amer. Birds, p. 103 (1886).

*Æ. gulari* similis, et subtus cinerascens, sed pileo albo, fusco-cinereo maculato: rectricibus duabus externis fere omnino albis, haud extus cineraceis: hypochondriis albis, minime cinereo fasciatis.

I HAVE had no opportunity of seeing the only known example of this species, which was procured on June 11th, 1882, by Mr. William J. Fisher, on Kadiak Island, Alaska, and is now in the U. S. National Museum at Washington. There is no account of its habits or nidification.

From its grey under-surface, *Æ. fisheri* is evidently closely allied to *Æ. gularis*, but although Mr. Ridgway compares it also with *Æ. defilippiana* in his paper in the "Auk," 1895, p. 321, the under-surface of the body is white in the latter bird, and it has several other distinct characters.

In the Plate accompanying the memoir, *Æ. fisheri* is depicted as having a white head with dusky-grey spots, which is very different from the uniform dull slate-colour of the head in *Æ. gularis*. Salvin has published the following summary of the characters of the two species, sent to him by Mr. Ridgway for the "Catalogue of Birds":—

"*Æ. fisheri* differs conspicuously from *Æ. gularis* in the very much lighter colour of the upper-parts, the mantle being lighter, not darker, than the No. 7 grey of my 'Nomenclature of Colours.' The upper tail-coverts and tail still paler, while the entire nape and pileus are white, the former marked with crescentic bars, and the latter more sparsely with cordate and sagittate spots of slate-colour; the white edgings of the greater wing-coverts and secondaries are much broader, and the inner web of the

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lateral tail-feathers is wholly pure white, the outer web also white, with grey bars. Notwithstanding the much paler coloration of the upper-parts, however, the soft brownish-grey of the under-parts is quite as dark in *Æ. fisheri* as in *Æ. gularis*, and occupies just about the same area; but the well-defined bars on the flanks seen in the latter seem to be quite absent in *Æ. fisheri*."

The following description is copied from that given by Mr. Ridgway in his "Manual," and was reproduced by Salvin in the "Catalogue of Birds" (p. 415):—

"Inner webs of primaries abruptly white for at least the inner half; wing more than 9 inches. Top of the head white, spotted with greyish. Back and scapulars fine bluish-grey, or plumbeous; lesser wing-coverts slaty-blackish; greater and middle coverts slate-grey, broadly margined with white; tail mostly white, irregularly barred and vermiculated with grey; lores, cheeks, chin, throat, middle of chest, and under tail-coverts immaculate pure white; a blackish spot immediately beneath the eye; sides of the neck and chest densely mottled, and vermiculated with ash-grey and white, but the former prevailing; lower breast, belly, sides and flanks smoky plumbeous superficially, but the feathers all pure white immediately beneath the surface. Wing, 10.15 inches; tail, 4.0 (graduated for 0.9); culmen, 1.0; tarsus, 1.25; middle toe with claw, 1.7."

## 82. *ÆSTRELATA SCALARIS*, *Brewster*.

(SCALED FULMAR.)

*Æstrelata gularis* (nec Peale), Brewster, Bull. Nutt. Orn. Club, VI., p. 94 (1881).

*Æstrelata scalaris*, Brewster, Auk, III., p. 390 (1886); Ridgway, Man. N. Amer. Birds, p. 68 (1887).

*Æstrelata scalaris*, Salvin, Cat. Birds Brit. Mus., XXV., p. 416 (1896).

*Æ. fisheri* similis, sed notæi plumis et tectricibus alarum albo terminatis et marginatis distinguenda.

THE single known example of this species was procured in April, 1880, at Mount Morris, Livingston Co., New York, and is now in the collection of Mr. William Brewster, who first identified it as *Æ. gularis* (Peale), but in 1886 came to the conclusion that it was a distinct species, and named it *Æstrelata scalaris*.

“This Petrel,” writes Mr. Brewster, “differs from *Æ. fisheri* in having a stouter, more strongly-hooked bill, much shorter nasal tubes, less white on the forehead, crown, and wings, the inner two pairs of tail-feathers perfectly plain on both webs, and the outer three pairs with faint sparse mottling on the inner webs only. From both *Æ. fisheri* and *Æ. gularis* it differs in having the feathers of the back, as well as the greater and middle wing-coverts, tipped and edged with white, giving the back a scaled appearance, and on the wings forming distinct bands. Neither *Æ. fisheri* nor *Æ. gularis* shows any trace of white on the back, and neither has anything approaching well-defined wing-bands. The nostril-tubes in *Æ. scalaris* are apparently shorter and more prominent than in *Æ. gularis*, their superior outline straighter, the ends more squarely cut off, and less deeply incised. . . .

“Despite the wide dissimilarity in colouring, the bird under consideration is clearly more closely related to *Æ. gularis* than to any other known species. They may prove to be merely the dark and light extremes of a species subject to dichromatism.”

The following description of the original specimen was published by Mr. Ridgway in his “Manual,” and copied by Salvin in the “Catalogue of Birds” (p. 416).

“Inner webs of primaries abruptly white for at least the inner half. Wing more than 9 inches. Above, including the whole top of the head, dark bluish-grey, the

## MONOGRAPH OF THE PETRELS.

feathers of the back and scapulars broadly bordered terminally with ashy-white, the middle and greater wing-coverts similarly marked; chin, throat, chest, centre of breast, and under tail-coverts, plain white; rest of the lower parts vermiculated and irregularly barred with slaty-grey or plumbeous, this becoming uniform and somewhat darker on the belly; tail chiefly plain light brownish-grey. Wing, 9.88 inches; tail, 3.95; culmen, 1.03; depth of bill at base, 0.46; tarsus, 1.37; middle toe with claw, 1.7 (Ridgw., *Man. N. Amer. Birds*, p. 68, 1887).





## 83. ŒSTRELATA LEUCOPTERA (*Gould*).

(WHITE-WINGED FULMAR.)

(PLATE 69.)

*Procellaria leucoptera*, Gould, P. Z. S., 1844, p. 57.

*Procellaria cooki* (nec Gray), Gould, Birds Austr., VII., Pl. 51 (1846).

*Cookilaria leucoptera*, Bp., Consp. Av., II., p. 190 (1855).

*Rhantistes velox* (Solander), Bp., Comptes Rend., XLII., p. 768 (1856).

*Œstrelata leucoptera*, Gould, Handb. Birds Austr., II., p. 454 (1865).

*Œstrelata leucoptera*, Salvin, Ibis, 1876, p. 393, note: Salvad., Orn. Papuasias, III. p. 466 (1882); Salvin, Cat. Birds Brit. Mus., XXV., p. 416 (1896).

Minor: ala 8.5–8.65: pileo nigricante: dorso cineraceo: subalaribus et axillaribus et remigibus intus, pure albis.

*Œ. leucoptera* was discovered by Gould on Cabbage Tree Island, at the mouth of Port Stephen Harbour, in New South Wales, and he was informed that it bred in abundance on one of the small islands in the vicinity. Gould frequently saw this bird during his passage from Sydney to Cape Horn, but it was most numerous between the coast of Australia and the northern part of New Zealand, though Sir Walter Buller does not mention it in his "Birds of New Zealand." Gould describes it as one of the most beautifully formed species of the genus, and says it is easily distinguished by its white abdomen and under wing-coverts, which show to great advantage when the bird is seen on the wing from below; it seldom, however, rises higher than the vane of the ship. The species was not observed in the Pacific by Professor Giglioli during the voyage of the "Magenta," but was obtained by Mr. Filhol in the Fiji Islands (Salvin, *Ibis*, 1876, p. 393, note), and a specimen was procured by Dr. Hübner on Duke of York Island; Schlegel also identified a Fulmar, captured by Dr. Bernstein at Ternate, as belonging to this species (*Mus. Pays-Bas*, VI., *Procell.*, p. 13).

This Fulmar differs from its allies, *Œ. cooki* and *Œ. defilippiana* in the black colour of the head and sides of neck, which extends over the mantle and partly down

## MONOGRAPH OF THE PETRELS.

the sides of the breast. In the two species above mentioned the head is bluish-grey, like the back.

The range of *Æ. leucoptera* is given by Mr. A. J. Campbell (*Nests and Eggs Austr. Birds*, II., p. 907) as the "seas of South Queensland, New South Wales, Victoria, South and West Australia, and Tasmania."

*Adult.* General colour above dark slaty-grey, the feathers of the back edged with black, and with white bases; head and hind-neck uniform blackish, with obsolete margins of dark slaty-grey; scapulars slaty-grey with black ends; lower back, rump, and upper tail-coverts light slaty-grey, with a patch of black in the centre of the rump and median upper tail-coverts; wing-coverts black, the greater series slaty-grey with white margins; bastard-wing, primary-coverts and quills, black, with a slight shade of ashy-grey on the inner primaries, which have a good deal of white on the inner web; secondaries ashy-grey like the greater coverts, and similarly fringed with hoary-white, the inner webs being also for the most part white; tail-feathers slaty-grey, blackish on the inner web, the two outer feathers having the inner web whitish, freckled with dull ashy dots and vermiculations; forehead white, mottled with black centres; lores and sides of face white, spotted with black before and below the eye, as well as on the hinder cheeks; the feathers immediately surrounding the eye black, overspreading the ear-coverts; sides of neck black, as also the sides of the upper breast, which have a slight shade of ashy; under-surface of body white, including the under tail-coverts, with a freckling of grey on the lower flanks; under wing-coverts white, the marginal coverts slaty-black; axillaries white; the lower primary-coverts pure white; quills ashy-brown below, with a good deal of white along the inner web; "bill black; tarsus and basal half of the interdigital membrane fleshy-white; remainder of the toes and interdigital membrane black" (J. Gould). Total length about 12.0 inches; culmen, 1.05; wing, 8.65; tail, 3.7; tarsus, 1.15; middle toe and claw, 1.5.

The description and figure are taken from one of the type specimens presented to us by Gould, and now in the British Museum.





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## 84. ÆSTRELATA DEFILIPPIANA, *Gigl. and Salvad.*

(DEFILIPPI'S FULMAR.)

(PLATE 70.)

*Æstrelata defilippiana*, Giglioli and Salvadori, Atti Soc. Ital. Sci. Nat., XI., p. 455 (1868); iid., Ibis, 1869, pp. 63, 66.

*Æstrelata (Cookilaria) defilippiana*, Giglioli, Faun. Vertebr. Oceano, p. 43 (1870).

*Æstrelata defilippiana*, Salvin, in Rowley's Orn. Misc., I., p. 255, Pl. 33 (1876); id., Cat. Birds Brit. Mus., XXV., p. 417 (1896).

Minor: ala 9.0-9.3: pileo cinereo, dorso concolori: ala subtus fere alba, axillaribus et remigibus intus pure albis: margine alari nigro, fasciam nigram interruptam formante.

*Æ. defilippiana* is very closely allied to the following species, *Æ. cooki*, and may yet prove to be identical with it, in spite of the difference of habitat; they both differ from *Æ. leucoptera* and *Æ. longirostris* in having the head blue-grey like the back, and in the absence of a black cap. Salvin separates *Æ. defilippiana* on the strength of its having a shorter and stouter bill.

Dr. Giglioli and Count Salvadori, in their original descriptions, compare this Fulmar with *Æ. gularis*, but with this species it has little in common, for the latter is grey below, with a white throat.

I have examined several specimens of *Æ. cooki* and *Æ. defilippiana*, and find them difficult to separate: the latter is perhaps lighter and more pearly-grey above, and appears in the dried skins to have darker feet. The culmen varies in length from 1.0-1.15 inch, and the depth of the bill at the nostrils is 0.3-0.35 inch.

The range of this species, as at present known, is confined to the western coast of South America, and that of *Æ. cooki* to New Zealand and Australia, and so far neither species has been recorded from the intervening area.

*Æ. defilippiana* was first seen in the wake of the "Magenta" on August 5th, 1867; it followed the ship up to August 10th, in Lat. 18° 4' S., Long. 79° 35' W., not far from the Peruvian coast. It reappeared again during the cruise from Callao to Valparaiso

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in September (Gigl. and Salvad., *Ibis*, 1869, p. 63). Dr. Coppinger met with the species on St. Ambrose Island on July 21st, 1879 (Sharpe, *P. Z. S.*, 1881, p. 11), and a female was obtained by Admiral Markham off the coast of Chile (Salvin, *P. Z. S.*, 1883, p. 431).

Nothing has been recorded of the habits of this bird beyond the statement of Dr. Giglioli that its flight resembled that of a *Prion*.

*Adult.* General colour above bluish-grey, with narrow hoary-white margins to the feathers; the longer scapulars black towards the ends; wing-coverts black, the greater series slaty-grey on the outer webs; bastard-wing, primary-coverts, and quills black, the last white on the inner webs, the secondaries externally ashy-grey, like the greater coverts, and fringed with white like the latter; the innermost secondaries rather blacker, resembling the longer scapulars; on the centre of the rump a small patch of blackish feathers; upper tail-coverts bluish-grey, fringed with white at the tips; tail-feathers ashy-brown, the outermost white, freckled with ashy-brown on the inner web, the penultimate white on the outer web, freckled with ashy-brown; the third feather for the most part ashy-brown, but with a few white frecklings; crown of head bluish-grey, like the back, and with similar white fringes to the feathers; forehead and lores pure white, the former slightly spotted posteriorly with blackish bases to the feathers; feathers round the eye blackish, with a narrow streak of white above the latter; sides of face, cheeks, and entire under-surface of body pure white, including the thighs and under tail-coverts; on the sides of the fore-neck a patch of bluish-grey feathers, like the back, and similarly fringed with white; axillaries and under wing-coverts white, excepting for a black band round the entire bend of the wing, broken up here and there with white; lower primary-coverts pure white; quills blackish below, the inner web white for its inner half to within a short distance of the tip; "bill black; tarsi pale blue; toes black, the webs yellow, dusky towards the ends; iris brown" (H. H. Giglioli). Total length about 10.0 inches; culmen, 1.15; wing, 9.0; tail, 3.2; tarsus, 1.15; middle toe and claw, 1.5.

Dr. Coppinger describes the tarsi as of a "lavender-colour."

The dimensions in the series in the British Museum are as follows:—

			Male.				Female.
Wing	..	..	8.85—9.4	..	..	..	9.05—9.1
Culmen	..	..	1.15	..	..	..	1.1
Middle toe and claw	..	..	1.4—1.45	..	..	..	1.4—1.45

The description and figure are taken from a specimen in our collection received in exchange from the Turin Museum, and one of the co-types of the species. It is labelled "Tipo," and is from Valparaiso.





## 85. CESTRELATA COOKI (*Gray*).

(COOK'S FULMAR.)

(PLATE 71.)

*Procellaria cookii*, Gray, in Dieffenbach's New Zeal., II., p. 99 (1843); id., Voy. "Erebus and Terror," I., Birds, p. 17, Pl. 35 (1846); Buller, Birds New Zeal., p. 307 (1873).

*Cookilaria velox*, Bp., Consp. Av., II., p. 190 (1855).

*Rhantistes cooki*, Bp., Comptes Rend., XLII., p. 768 (1856).

*Æstrelata cooki*, Gould, Handb. Birds Austral., II., p. 456 (1865).

*Procellaria velox*, Pelz., Reis. Novara, Zool., I., Vög., p. 146 (1869).

*Fulmarus cooki*, Gray, Handl. Birds, III., p. 106 (1871).

*Æstrelata cooki*, Buller, Birds New Zeal., 2nd ed., II., p. 217 (1888); Salvin, Cat. Birds Brit. Mus., XXV., p. 417 (1896); Mathews, Handl. Birds Austral., p. 17 (1907).

Minor: ala 8.75-9.1: rostro tenuiore, culmine 1.0-1.15: pileo cinereo, dorso concolori.

COOK'S FULMAR belongs to the group of small species comprising *Æ. leucoptera*, *Æ. longirostris*, and *Æ. defilippiana*. The blue-grey head, uniform with the back, proclaims its affinity to the last named species, the other two having black heads.

The range of *Æ. cooki* is apparently not very extensive, as it is, at present, only known from the New Zealand and Australian Seas. It was described by the late George Robert Gray from New Zealand, and the type specimen is in the British Museum. Sir Walter Buller states that this Fulmar is mainly found in the North Island, at the northern extremity of which it was met with by Mr. Reischek, who likewise records it from the Little Barrier and Larger Chicken Islands, though it was rare in both places. According to Mr. A. J. Campbell (*Nests and Eggs Aust. Birds*, II., p. 908), the species is also found in the seas of Queensland and New South Wales.

The difference between *Æ. defilippiana* and *Æ. cooki* has been pointed out under the former species.

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This Fulmar was not known to Buller when he wrote his first edition of the "Birds of New Zealand," but after its publication several examples were received by him from the Hauraki Gulf and other localities, though not from the South Island. The following notes on the habits of *Æ. cooki* are taken from the second edition. The dark wings, contrasting with the light plumage of the body, enable these birds to be easily distinguished in flight from all other Petrels; they fly low, sometimes skimming the water with slanting wings, at others touching it with their feet and resting to pick up some small object before again taking wing. Reischek met with it at the northern extremity of the island, on the Little Barrier and Larger Chicken Reefs, but states that it was rare, as during several months' sojourn he only obtained about a dozen specimens. Some of these he opened, and found that their stomachs contained nothing but small seeds and sea-weed, the oily matter so common in other Petrels being absent.

*Æ. cooki* deposits a single egg at the end of a long and tortuous burrow, usually in sloping ground. The burrow invariably terminates in two chambers, opposite each other, one occupied by the bird, the other by a Tuatara Lizard (*Sphenodon*), which has long since disappeared from the mainland. Mr. Reischek says that the lizard guards the burrow, actively defending both the Petrel and the egg; it attacked and fiercely bit his hand when he attempted to interfere with them, so much so, that he found it necessary to remove the lizard before handling the egg or young. This observation is also confirmed by Captain Mair's experience on Karewa Island, in the Bay of Plenty. The breeding season commences early in October, and the eggs are laid in the beginning of November; they are white and smooth, but not glossy, and measure 1.9 inch in length by 1.5 in breadth.

*Adult* (type of species). General colour above slaty-grey, with indistinct margins of lighter grey, scarcely visible; longer scapulars black, like the inner secondaries; on the centre of the rump a patch of black feathers, margined with grey; upper tail-coverts ashy-grey, with lighter grey margins; tail-feathers ashy-brown, slightly blackish towards the ends, and with concealed white bases, the two outermost white, ashy-brown along the outer web, which is slightly freckled towards the end, the third rectrix freckled with ashy-brown and white on both webs, with two-thirds of the outer web ashy-brown; wing-coverts black, the greater series slightly shaded with ashy; bastard-wing, primary-coverts, and quills black, the latter white on their inner webs; crown of head like the back, the forehead and lores white, as also the sides of the face, mottled with small spots of black on the hinder forehead, below the eye, and on the ear-coverts; above the eye a narrow streak of white; eyelid and feathers in front of the eye black, extending below the eye on to the ear-coverts; cheeks and under-surface of body pure white, the sides of the neck ashy-grey, like the back, extending down on the sides, and breaking up into grey bars on the latter; the flanks with hair-like shaft-lines; axillaries and under wing-coverts pure white, with a

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black band much broken up, extending round the bend of the wing; "bill black; feet pale purplish blue, with the webs a little darker, and yellowish; iris black" (Buller). Total length about 10.5 inches; culmen, 1.1; wing, 9.1; tail, 3.6; tarsus, 1.2; middle toe and claw, 1.6.

There seems to be very little variation in colour and markings in the series of *Æ. cooki* which I have examined.

The bird figured is from New Zealand; the specimen described is the type, and both are now in the British Museum.

## 86. *ÆSTRELATA LONGIROSTRIS*, Stejneger.

(JAPANESE FULMAR.)

*Æstrelata leucoptera* (nec Gould) Stejneger, Pr. U. S. Nat. Mus., XIV., p. 490 (1891).

*Æstrelata longirostris*, Stejneger, Pr. U. S. Nat. Mus., XVI., p. 618 (1893).

*Æstrelata longirostris*, Salvin, Cat. Birds Brit. Mus., XXV., p. 418 (1896).

*Æ. leucopterae* similis: pileo nigro: dorso clare cinereo: subalaribus et axillaribus, remigibusque intus, pure albis, fascia subalari marginali interrupta nigra.

THIS small Fulmar is allied to *Æ. leucoptera*, and resembles it in having a black head, contrasting with the blue-grey back, but the black does not extend over the sides of the neck; the under wing-coverts and axillaries, as well as the quill-lining, are pure white, with an interrupted marginal band of black.

It was originally described by Dr. Stejneger (*l.c.*) from a specimen obtained in the Province of Mutzu, in the Island of Hondo, and preserved in the Science College Museum of Tokio. He compares it with *Æ. brevipes*, but I consider it more closely allied to *Æ. leucoptera*, and Salvin, who never saw a specimen and copied Stejneger's description, also located the species in the same vicinity. I am the more confident that this affinity is correct, having examined two specimens lent me by the Hon. Walter Rothschild, and obtained on the Bonin Islands by Mr. Owston's collectors.

Nothing has been published regarding the habits of this species.

*Adult.* General colour above light bluish-grey, with distinct whitish edges to the feathers; scapulars slaty-grey, with black tips, the longer scapulars conspicuously black at the ends, and resembling the wing-coverts; lower back and upper tail-coverts bluish-grey, with a patch of blackish feathers on the rump; the grey upper tail-coverts white at the extreme base and edged with white at the tip; all the lesser and marginal wing-coverts black, the median coverts slaty-grey, with black edges; greater coverts lighter and of a more bluish-grey, with narrow white margins; bastard wing, primary coverts and quills black, the quills ashy-grey on the inner webs, which have a long wedge-shaped white mark; the secondaries bluish-grey, white on the inner webs, and fringed with white at the tips, the innermost secondaries dusky-black;

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tail-feathers brown, more or less ashy towards the base, the lateral ones ashy-grey, somewhat freckled with white, the outermost white, ashy-grey along the outer web; crown of head black, somewhat overspreading the hind-neck, and encircling the eye, and extending along the upper edge of the ear-coverts; forehead white, spotted with black in the centre; lores, and feathers above the fore-part of the eye, sides of face, cheeks, and entire under-surface of body pure white, with a patch of ashy-grey feathers extending over the sides of the fore-neck and chest; under wing-coverts and axillaries pure white, with a somewhat broken band round the edge of the wing, composed of black or dark ashy-grey feathers; quills blackish below, slightly more ashy on the inner webs, these being white for more than half their length, thus forming a conspicuous white quill-lining. Total length about 10.5 inches; culmen, 0.95; wing, 8.1; tail, 3.9; tarsus, 1.1; middle toe and claw, 1.35.

The description is taken from one of the specimens in the Rothschild Museum.

## 87. *ÆSTRELATA AXILLARIS*, *Salvin.*

(CHATHAM ISLANDS FULMAR.)

(PLATE 72.)

*Æstrelata axillaris*, Salvin, Bull. B. O. C., I., p. xxxiii. (1893); id., Ibis, 1893, p. 264; H. O. Forbes, Ibis, 1893, p. 542; Salvin, Cat. Birds Brit. Mus., XXV., p. 418, Pl. VII. (1896).

*Æ. minor*: ala, 8.4: supra schistacea, pileo vix saturatiore: subalaribus mediis et majoribus albis, reliquis marginalibus late nigris: axillaribus nigris.

THIS species belongs to the smaller section of the genus *Æstrelata*, in which the outer primary shows some white towards the base of the inner web, and the wing does not exceed 8.5 inches in length. From *Æ. cooki* and the other allied forms, *Æ. axillaris* is distinguished by having the axillaries black.

The original specimens of *Æ. axillaris* were obtained by the late Mr. Hawkins on the south-east island of the Chatham Group, on May 8th, 1892, and were described by Salvin in 1893, who considered the birds to be somewhat immature. The Hon. Walter Rothschild also possesses several specimens collected by Mr. Dannefaerd on the Chatham Islands, to which the bird is mostly confined. Buller, in his "Supplement to the Birds of New Zealand," mentions a specimen which was picked up on the Wairarapa plains (*Suppl. Birds New Zealand*, I., p. 119).

*Adult male.* General colour above slaty-grey with dusky-blackish margins to the feathers, the longer scapulars more conspicuously black towards their ends; wing-coverts blackish, washed with ashy-grey, especially on the greater series; bastard-wing, primary-coverts, and quills black, the latter white for a great part of the inner web, less distinct on the secondaries, which are externally ashy-grey, with hoary-white margins like the greater wing-coverts; lower back, rump, and upper tail-coverts paler ashy-grey with blackish shaft lines, not distinct on the upper tail-coverts, which have lighter grey margins; tail-feathers slaty-grey, with black shafts, the outer feather slightly mottled with ashy-brown and white frecklings; crown of head slightly darker than the back; forehead white, mottled with black spots in the centre; lores and



J. G. Kuhlmann del. et lith.

CESTRIBATA A. SIBILLARIS

Booby



## CESTRELATA AXILLARIS.

feathers above the fore-part of the eye white, plentifully marked with tiny lines and dots of black; feathers round the eye black, extending along the upper edge of the ear-coverts; sides of face, cheeks, and entire under-surface of body pure white, with a patch of slaty-grey on the sides of the lower throat and fore-neck extending towards the centre of the latter, but not forming a pectoral band; axillaries black, with white bases and fringes, the smaller ones white with blackish tips; under wing-coverts for the most part black, enclosing a white patch formed by the median and greater coverts, and the primary coverts; quills blackish below, with a large wedge-shaped mark of white on the inner webs of the primaries, forming a continuous patch with the white under wing-coverts; "bill black; feet flesh-colour, toes and webs for the most part black" (Salvin). Total length, 11.5 inches; culmen, 0.95; wing, 8.4; tail, 3.85; tarsus, 1.1; middle toe and claw, 1.5.

*Adult female.* Similar to the male. Total length about 11.0 inches; wing, 8.4.

The description is taken from a pair of birds collected by Mr. H. H. Travers in the Chatham Islands, and the figures are drawn from the type specimens in the British Museum.

## 88. PAGODROMA NIVEA (*Gm.*).

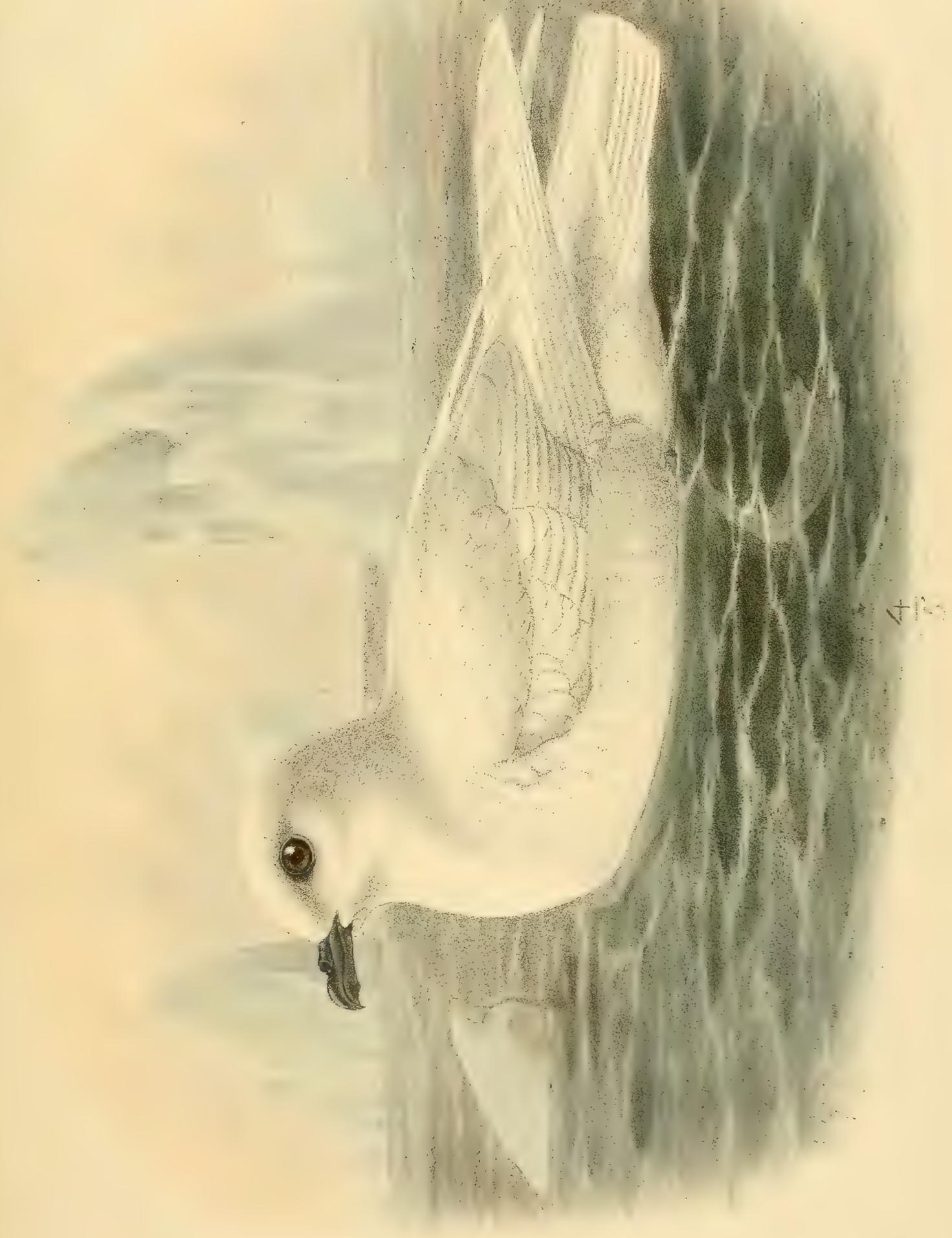
(SNOWY PETREL.)

(PLATE 73.)

- Snowy Petrel*, Forster, *Voy. I.*, p. 96 (1777); Lath., *Gen. Syn.*, III., pt. 2, p. 408 (1785).  
*Le Pétrel blanc ou de neige*, Buff., *Hist. Nat. Ois.*, X., p. 153 (1786).  
*Procellaria nivea*, Gm., *Syst. Nat.*, I., p. 562 (1788); Lath., *Index Orn.*, II., p. 825 (1790); Kuhl, *Beitr.*, p. 145 (1820); Peale, *U. S. Expl. Exped. Birds*, p. 245, Pl. 81 (1848).  
*Daption niveum*, Steph., in Shaw's *Gen. Zool.*, XIII., pt. 81, p. 243 (1826).  
*Pagodroma nivea*, *a. major*, Bp., *Consp.*, II., p. 192.  
*Pagodroma nivea*, *b. minor*, Bp., *Consp.*, II., p. 192.  
*Pagodroma nævia*, Bp., *Comptes Rend.*, XLII., p. 768 (1856).  
*Pagodroma nivea*, Coues, *Pr. Acad. Philad.*, 1866, pp. 160, 171; Sharpe, *Voy. "Erebus" and "Terror," I.*, *Birds, App.*, p. 37, Pl. 34 (1875); Salvin, *P. Z. S.*, 1878, p. 737; id., *Voy. "Challenger," Zool.*, II., pt. 8, p. 144 (1881); id., *Cat. Birds Brit. Mus.*, XXV., p. 419 (1896); Sharpe, *Rep. Voy. "Southern Cross,"* p. 148 (1902); Eagle Clarke, *Ibis*, 1906, p. 170, Pl. III., fig. 1, Pl. XI., fig. 1, id., 1907, p. 336; Wilson, *Nat. Antarct. Exped., Zool.*, p. 88 (1907); Reichenow, *Deutsche Südpolar Exped., Bd., IX., Zool., I.*, p. 557 (1907).  
*Pagodroma nivea minor*, Schl., *Mus. Pays-Bas*, VI., *Procell.*, p. 16 (1863); Pagenst., *J. B. Wiss, Anst. Hamburg*, II., p. 21 (1885); Steinen, *Intern. Polarf. Deutsche Exped., II.*, p. 278 (1890).  
*Fulmarus niveus*, Gray, *Handl. Birds*, III., p. 107 (1871).  
*Pagodroma novægeorgica*, Steinen, *Intern. Polarf. Deutsche Exped., II.*, p. 250 (1890).

*Nivea*: *statura variabili insignis.*

THE SNOWY Fulmar, or Ice Petrel, is most frequently seen within the limit of the Antarctic Ice Belt, and has a more southern distribution than any other bird, with the exception of the Emperor Penguin. During the southern winter it migrates northwards, in order to obtain food in the open leads of water, but it is rarely seen at any distance from the Ice Belt. Professor Reichenow has recently given a summary of



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## PAGODROMA NIVEA.

the distribution of the species, as follows :—“ South Georgia, breeding (von d. Steinen, Andersson, May to August); South Orkney Islands, November, breeding; Coats Land (Bruce); S. Shetlands, January to March (teste H. Saunders); Cumberland Gulf, May; Uruguay Island, December (eggs); Cockburn and Lockery Islands, breeding; Robertson Island, February (Andersson); Paulet Island, James Ross Island, Louis Philippe Land (Klinckowström); Cockburn Island, breeding (Ross); McMurdo Sound (Wilson); Cape Adare (Hanson); Victoria Land, February (McCormick); Gaussberg, near Bouvet Island, breeding November, December (Vanhöffen); Booth Island, October (French Antarctic Expedition).”

The above records prove that *P. nivea* is found throughout the entire area of the Antarctic Continent, as known at present, and that it has been invariably observed in the Pack Ice by all the different exploring expeditions. Nikolai Hanson and H. B. Evans, the naturalists on board the “Southern Cross,” obtained several specimens in 1898, in Lat. 62° 52' to 65° 3' S., and Long. 159° 25' to 161° 42' E., and at Cape Adare in South Victoria Land, where numbers were seen flitting about the summits of the most inaccessible cliffs (Sharpe, *Rep. Voy. “Southern Cross,”* p. 149). The birds accompanied the “Discovery” until its winter quarters in McMurdo Sound were reached, but this was so far south that there were only a few stragglers seen, and of these none remained to breed. *P. nivea* was, however, recorded by the sledge parties on the Ice Barrier some seventy miles to the south of the open water. After leaving Cape Adare and passing south, large flocks of Snowy Petrels flew about the ship, alternating, but not mingling with, flocks of *Thalassœca antarctica*. The appearance of the two species was singularly different, the former flying independently, with their white forms glistening against the blue sky, whilst the latter flew in unison, wheeling and turning like Starlings. Whilst following in the wake of the ship, many birds were captured by hanging lengths of strong thread to the halyards, which, becoming entangled in their wings, made them an easy prey.

The Snowy Petrel has been known to range as far north as the Falkland Islands, whence specimens, now in the British Museum, were obtained by the first Antarctic Expedition, and also by Macgillivray during the voyage of the “Rattlesnake” in 1850. Mr. Eagle Clarke (*Ibis*, 1907, p. 336) gives the extreme southern limit of *P. nivea*, observed by the Scottish Antarctic Expedition, as from Lat. 59° 44' to 74° 1' S., off Coats Land, the *ultima thule* of the voyage; it was abundant in summer on the South Orkney Islands, and by far the most numerous of the few species which remained there during the winter. When in flocks around the ship, which it often followed all day long, it was seen to capture fish, at, or near, the surface of the water. Mr. Eagle Clarke states that during the summer some 20,000 Snowy Petrels were observed in Laurie Island alone, frequenting the precipitous sea cliffs, which form their breeding haunts, while Mr. Bernacchi says that the birds nest high up on the mountain sides of South Victoria Land. Dr. McCormick, of the

## MONOGRAPH OF THE PETRELS.

“Erebus” and “Terror” Expedition procured this Petrel off Mt. Erebus, in February, 1841, and on the following day at the nearest point they reached to the Magnetic Pole (Salvin, *Cat. Birds Brit. Mus.*, XXV., p. 420).

The nest, consisting of a few small stones and a little earth, is placed under rocks, in caves, or the crevices of steep cliffs facing the sea, at altitudes varying from a few feet to several hundred feet above the sea level.

The single white egg is laid in December, and young birds have been taken at the end of January. The parents, when approached, do not fly away, but retreat a short distance and defend themselves by ejecting at the intruder, to a distance of from six to eight feet, the oily contents of their stomach. The smell is most offensive, and clings for days to any material with which it comes in contact. Eggs measure: Axis, 2.01–2.38, diam., 1.35–1.67.

*Both sexes.* Snowy-white: “bill black; feet and webs grey; iris dark brown” (Hanson).

*Male.* Total length, 14–16 inches; culmen, .8–1.05; wing, 10.1–12; tail, 4.3–5.1; tarsus, 1.3–1.5.

*Female.* Total length, 14 inches; culmen, .7–.95; wing, 9.8–11.8; tail, 5.2; tarsus, 1.5.

Dr. Bowdler Sharpe, in his report on the collections of the “Southern Cross” Expedition (p. 149), points out that the extraordinary variation in size exhibited by a series of the Snowy Petrels is not due to a difference of sex, the males measured by him having a wing of 10.1 to 11.8 inches, and the females 9.8 to 11.8 inches. The variation in size of bill, too, is also very marked, and is not a sexual distinction.

Several specimens in the British Museum series have the outer web of the first primaries somewhat dusky, especially towards the end of the quill; these are probably young birds.

The male and female described were captured in the Pack Ice during the voyage of the “Southern Cross.” The specimen figured is from the Ice Barrier, and was procured by the “Challenger” Expedition.





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## 89. BULWERIA BULWERI (*Jard. and Selby*).

(BULWER'S FULMAR.)

(PLATE 74.)

- Procellaria bulwerii*, Jardine and Selby, Ill. Orn., II., Pl. 65 (1828).  
*Procellaria anjinho*, Heineken, Edinb. Journ. Sci., New Series, I., p. 231 (1829).  
*Procellaria bulwerii*, R. T. Lowe, Zool. Journ., V., p. 384 (1831).  
*Puffinus columbinus*, Webb and Berth., Hist. Nat. Canar., II., p. 44 (1844).  
*Procellaria columbina*, Webb and Berth., op. cit., Pl. 4, fig. 2 (1844).  
*Thalassidroma bulwerii*, Gould, Birds Eur., V., Pl. 449 (1837).  
*Bulweria bulweri*, Bp., Cat. Met. Ucc. Eur., p. 81 (1842); Baird, Brewer, and Ridgw., Water-Birds N. Amer., II., p. 398 (1884); Ridgw., Man. N. Amer. Birds, p. 69 (1887); Salvin, Cat. Birds Brit. Mus., XXV., p. 420 (1896).  
*Bulwer's Petrel*, Yarrell, Brit. Birds, III., p. 513 (1843).  
*Thalassidroma columbina*, Reichenb., Syst. Av. Natatores, Pl. 19, fig. 2727.  
*Bulweria columbina*, Brehm, Naum., 1855, p. 296; Saunders, 4th ed., Yarrell, Brit. Birds, IV., p. 34 (1884).  
*Æstrelata bulweri*, Coues, Pr. Acad. Philad., 1866, pp. 158, 171.  
*Fulmarus bulweri*, Gray, Handl. Birds, III., p. 108 (1871).  
*Fulmarus anjinho*, Gray, Handl. Birds, III., p. 108 (1871).  
*Procellaria macgillivrayi* (nec Gray), Tristram, Ibis, 1881, p. 252.  
*Æstrelata bulweri*, Coues, Checkl. N. Amer. Birds, 1882, p. 126.

Fuliginoso-nigra, gastræo pallidiore: facie laterali et gutture cinereo lavatis: tectricibus alarum majoribus et secundariis extus cinerascenti-brunneis, plagam alarem formantibus.

THIS species was described by Jardine and Selby, from a Madeira specimen sent by Dr. Bulwer to Sir W. Jardine, under the name of *Procellaria bulweri*, but almost at the same time Dr. Heineken also described an example from Madeira as *P. anjinho*. As Jardine's description appeared in undated parts of the "Illustrations of Ornithology," some doubt arose as to which was the older name. Mr. Davies Sherborne in 1894, claimed priority for Dr. Heineken's name, *P. anjinho*, but more recently Mr. Richmond

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proved that the name *P. bulweri* was published in 1828, while that of *P. anjinho* appeared in 1829. A full account of the controversy is given in Mr. Fisher's paper on the birds of Laysan, in the "Bulletin of the U. S. Fish Commission," Vol. XXIII., p. 794. A further reason for adopting Jardine's name is that Heineken described his bird as having a forked tail, while that of *P. bulweri* is cuneiform.

Bulwer's Fulmar breeds, according to Dr. Heineken, in the Madeira and Canary groups of islands; the birds arrived in March and begin to lay early in June. The young are hatched in July, and after September but few are seen till the following spring. These birds are purely nocturnal in habits and although very rarely found in flocks like Shearwaters, remain almost constantly at sea, except during the breeding season; they may then be found in considerable numbers on the Desertas, whence many eggs, now in the British Museum, were procured by Padre Schmitz.

During my visit to the Little Deserta in 1871, I found *B. bulweri* breeding in some numbers, for the most part at the foot of the cliffs under the fallen rocks (*Ibis*, 1872, p. 223). Mr. Ogilvie-Grant obtained specimens on Deserta Grande (*Ibis*, 1890, p. 443); he observed them on Lime Island, Porto Santo, and on the Great Salvages, but in all these places the nesting season had not commenced (*Ibis*, 1896, pp. 54-55). Mr. Meade-Waldo found them under similar conditions in the Canary Islands, where it was called by the natives "Tahoce negro" (*Ibis*, 1893, p. 207).

Several specimens of *P. bulweri* have been captured in England, or picked up dead on the coast. One obtained at Ure, near Tanfield in Yorkshire, was exhibited by Professor Newton at a meeting of the Zoological Society in November, 1887. Others were taken at Scarborough in 1849, at Beachy Head in 1903, and a female at St. Leonards in 1904; while a fifth was picked up at St. Leonards in a dying state on February 4th, 1908. Mr. Ridgway considers the claim of *P. bulweri* to be an American species very doubtful. It is said to occur off the coast of Greenland, the Leyden Museum possessing a specimen believed to have been sent from there by the missionaries (Schlegel, *Mus. Pays-Bas*, VI., *Procell.*, p. 9, 1863); though said to occur in the Bermudas Mr. Ridgway considers it very rare.

The species is also recorded from Nikko, in Japan, as well as from the Volcano and Bonin Islands, and it passes down the Chinese coast on migration, since an example was procured at Chapel Island, Amoy, in 1894; there are two fine specimens from Foochow in the British Museum presented by Mr. C. B. Rickett. *B. bulweri* likewise occurs in the Hawaiian Islands, and is stated by the Hon. W. Rothschild to be very common on French Frigate Island, where it was found by Mr. H. Palmer breeding under the shells of dead turtle which had been heaped up by a shipwrecked crew. When Mr. Palmer visited Laysan, the breeding season was over, and the birds only came ashore at night (Rothsch. *Avif. Laysan*, pt. I., p. 51). This Fulmar was also found breeding in considerable numbers on Necker Island, and Bird Island. It was recorded from the Marquesas Islands by the late Canon Tristram under the name of

## BULWERIA BULWERI.

*B. macgillivrayi*, but Dr. Stejneger examined the specimen, and had no doubt that it was *B. bulweri*. Dr. H. O. Forbes kindly sent this bird to me for examination, and I fully concur in Dr. Stejneger's determination.

The nest is usually concealed under boulders, or in holes in the rocks, where a few old bones or feathers of a Tern frequently supply the place of sticks or grass for the nest. Here the single white egg is laid, though Mr. Fisher relates that on one occasion on Necker Island two eggs were found in the same hole, possibly belonging to different birds.

*Adult.* Above sooty-black, rather paler beneath; chin and throat tinged with grey; the greater wing-coverts greyish brown, forming a distinct patch. Bill black; iris dark brown; tarsi and feet blackish, except the outer third of the webs, which is pale flesh colour; tail cuneate; wing, 1.75; tarsus, 1.05-1.1; middle toe and claw, 1.15-1.35; culmen, .85-.95.

The description is taken from a bird procured by Mr. Ogilvie-Grant; the figure is from a Madeira specimen from our collection, now in the British Museum.

## 90. BULWERIA MACGILLIVRAYI (*Gray*).

(MACGILLIVRAY'S FULMAR.)

(PLATE 75.)

*Thalassidroma (Bulweria) macgillivrayi*, Gray, Cat. Birds Trop. Isl. Pacific Ocean, p. 56 (1859).

*Æstrelata macgillivrayi*, Coues, Pr. Acad. Philad., 1866, pp. 159, 171.

*Thalassidroma macgillivrayi*, Finsch and Hartl., Faun. Central-Polyn., p. 242 (1867).

*Fulmarus macgillivrayi*, Gray, Handl. Birds, III., p. 108 (1871).

*Bulweria macgillivrayi*, Ridgway, Man. N. Amer. Birds, p. 69 (1887); Wiglesw. Abhandl. Mus. Dresden, 1890-91, VI., p. 82 (1891); Salvin, Cat. Birds Brit. Mus., XXV., p. 421 (1876).

*B. bulweri* similis sed omnino major, plaga alali cinerascence nulla : rostro et pedibus validioribus, distinguenda.

THIS species is closely allied to Bulwer's Fulmar, but may easily be distinguished by its stronger and thicker bill and its longer and stouter legs and feet, as well as by the absence of the greyish patch on the wing-coverts. Macgillivray's Fulmar is only known from a single specimen, procured by Dr. Rayner at Ngau, one of the Fiji Islands, during the voyage of H.M.S. "Herald." As previously mentioned, the late Canon Tristram identified a bird from the Marquesas Islands as *B. macgillivrayi*, but it was afterwards conclusively proved by Dr. Stejneger to belong to *B. bulweri*.

We have as yet no notes on the habits of this species.

*Adult male* (type of species). Sooty-black above and below, the throat not being perceptibly greyer than the back, the median and greater wing-coverts wanting the grey patch found in *B. bulweri*. Total length, 11.2 inches; culmen, 1.05; wing, 8.2; tail, 3.35; tarsus, 1.3; middle toe and claw, 1.6.

The description and figure are taken from the type in the British Museum.









## 91. MACRONECTES GIGANTEUS (*Gm.*),

(GIANT FULMAR.)

(PLATE 76.)

*Quebrantahuessos*, Bougainville, Voy., p. 68 (1771); Forster, Voy., II., p. 517;  
Pernety, Voy. Isl. Malouines (Engl. Transl.), p. 214, Pl. XV., fig. 12 (1777).

*Osprey Petrel*, Forster, Observ., p. 202 (1778).

*Le très-grand Pétrel, ou Quebranta Huessos*, Buff. Hist. Nat. Ois., X., p. 157 (1786).

*Mouton*, Pernety, Voy., I., p. 15, Pl. 8, fig. 3.

*Giant Petrel*, Latham, Gen. Syn., III., pt. 2, p. 396, Pl. 100 (1785); Hanson, Rep.  
"Southern Cross," pp. 82-91 (1902).

*Procellaria gigantea*, Gm. Syst. Nat., I., p. 563 (1788); Kuhl, Beitr., p. 140 (1820).

*Fulmarus giganteus*, Steph. in Shaw's Gen. Zool., XIII., p. 237 (1826).

*Procellaria ossifraga*, Forster, Descr. Anim., p. 343 (1844).

*Ossifraga gigantea*, Jacq. et Pucher., Voy. Pole Süd, Zool., III., p. 148 (1853); Coues,  
Pr. Acad. Philad., 1866, p. 32; Giglioli, Faun. Vertebr. Oceano, p. 48 (1870);  
Buller, Birds New Zeal., p. 297 (1873); Sharpe, Phil. Trans., Vol. 168, p. 142  
(1879); Baird, Brewer and Ridgway, Water-Birds N. Amer., II., p. 363  
(1884); Buller, Birds New Zeal., 2nd ed., II., p. 225 (1888); Sharpe, Rep.  
"Southern Cross," Aves, p. 153 (1902); Wilson, Nation. Antarctic Exped.,  
II., Birds, p. 93 (1907).

*Macronectes giganteus*, Richmond, Proc. Biol. Soc. Washington, XVIII., p. 76 (1906);  
Reichenow, Deutsche Südpol. Exped., IX., Zool., I., p. 551 (1908).

*Macronectes gigantea*, Menegaux, Exped. Antarct. Francaise, Ois., p. 59 (1907).

THIS bird is figured in the Plate as *Ossifraga gigantea*, but we have here adopted the name *Macronectes giganteus*, as Mr. Richmond has recently shown that the former is antedated by *Ossifraga* of N. Wood in 1835.

It is remarkable that, as in the case of the common Fulmar of the north, its great southern representative has occasionally, but very rarely, a pure white phase of plumage, many of the nearly white birds having a sprinkling of dark feathers. Mr. Hall found young birds with shining black plumage emerging from the grey down, a fact which he believes to have been hitherto unobserved (*Ibis*, 1900, p. 27). There is,

## MONOGRAPH OF THE PETRELS.

however, a wide range of colour throughout the species, for birds vary from light grey to white, flecked with a few dark feathers. We have no reason to suppose that these birds of various phases of plumage do not interbreed, but from observations made by Dr. Wilson we learn that a larger percentage of light coloured birds exists in the ice regions than in those of a more temperate zone.

The "Giant Fulmar," the "Stinker," or the "Nelly" of the sailors, and the "Glutton" of the sealers, is a large and powerful bird, equalling in size some of the smaller Albatroses. It is widely distributed in the southern oceans, where it was discovered by Captain Cook, who obtained an example in Kerguelen Island, which was subsequently described by Latham.

During the cruise of the "Magenta" Professor Giglioli met with this bird in the South Atlantic and the South Pacific, as well as in the South Indian Oceans (*Faun. Vertebr. Oceano*, p. 48). It breeds on the islands of the southern seas, and also in certain places on the Antarctic Continent, the nesting places having been discovered by the recent Antarctic expeditions, and Professor Reichenow gives the following localities:—Graham Land (Eaton, Kidder, etc.), Crozet Islands (Armson), South Georgia, (Swedish Expedition in November), South Orkneys (Scottish Antarctic Expedition), and to these may be added Antipodes Island and the Snares (Captain Bolton). The northern range of the species is usually confined to about the 30° of S. latitude, but individuals have been observed at Callao by Professor Giglioli, at Monterey in California, and Audubon received a specimen from Mr. Townsend from as far north as the Columbia River (Baird, Brewer and Ridgway, *Water-Birds of N. America*, 1895, p. 363), and a single specimen is recorded in the A. O. U. Checklist from the coast of Oregon.

Examples of this Fulmar were procured by Captain Cook on Desolation or Kerguelen Island, also from Staten Island, off Tierra del Fuego, whence a specimen, now in the British Museum, was obtained by Dr. Coppinger. Admiral Markham also met with it at Coquimbo, in Chili, and another specimen was obtained by Mr. Nicoll in Valparaiso Bay (*Ibis*, 1904, p. 52). The birds were frequently met with between the Falkland Islands and Montevideo. It has indeed been observed by nearly all the recent Antarctic expeditions, and Dr. Bruce, of the "Scotia," noted it at their farthest point south in latitude 74° 5' in March, 1904, when the vessel was fast in the Pack Ice. Gould says that a white form of the Giant Fulmar followed the ship for three weeks during his voyage from the Cape to Tasmania; at Recherche Bay, in D'Entrecasteaux Channel, he saw thousands of these birds sitting on the water waiting for blubber and other refuse from the whaling station (*Handb. Birds Austr.*, II., p. 443). There is a specimen from Norfolk Island in the British Museum, presented by Dr. Crowfoot.

*M. giganteus* well deserves its name as the "Vulture of the Seas," as it feeds chiefly upon carrion, and is most destructive to young Penguins and Petrels, frequently

## MACRONECTES GIGANTEUS.

digging the latter out of their holes and devouring them. On Kerguelen Island the birds were seen soaring all day on the look-out for food, and no sooner was an animal killed than numbers appeared as if by magic. They are evidently well aware of the proceedings of the sealers, who kill the sea-elephant and take off the skin and blubber, rejecting the carcass. The Fulmars settle down all round in a group, a dozen or so together, and fight among themselves as to who should have the first bite; like Vultures, too, they gorge themselves with food till they are unable to fly. Moseley came across half-a-dozen together at Christmas Harbour, which, when chased by the men, took to the water, while others rapidly disgorged their food to enable them to fly. A story is told by Mr. A. H. Guillemard of a sailor picked up at sea who had his arms badly lacerated while defending his head from the attack of an Albatros, which was more probably a *Macronectes*.

In Latitude 66° 3' S., and Longitude 39° 40' W., numbers of these birds were seen from the "Scotia" feeding on the carcass of a dead whale; the stomach of one captured there contained also crustaceans.

This bird has the unpleasant habit of the Snowy Petrel and others, of defending itself by discharging the contents of its stomach at the intruder. The Rev. A. E. Eaton describes a young bird which, if annoyed, would squirt oil to a distance of a yard. The skulls of two "Blue Petrels" were found inside a specimen of *Macronectes*; these were probably captured on shore, as it is scarcely possible that such a heavy bird as the Giant Fulmar could capture a *Prion* when in full flight. Mr. Robert Hall also records that he found the tongues of *Prions* and Penguins in the stomachs of young birds (*Ibis*, 1900, p. 28). Although resembling an Albatros in general size and appearance, it is obvious that this species has a more heavy and laboured flight, and Gould observes that when on the wing the white bill is very conspicuous.

The nests found by the naturalists of the "Scotia" on Laurie Island, consisted of piles of small angular stones, and were about two feet in diameter. One of the birds was found sitting even before the egg was laid, the other was standing close alongside (Eagle Clarke, *Ibis*, 1906, p. 172, Pl. XI., fig. 2). In Kerguelen Island Mr. Robert Hall says the nests were three feet in diameter, consisting only of hollows in the sand, among the broken stems of *azorella*.

The roughly granulated eggs are oval, plain white, and without gloss; they measure, length, 3.85-4 inches; width, 2.35-2.7.

*Adult male.* General colour above slaty-brown, with paler brown edges to the feathers; wing-coverts like the back, with lighter ashy-brown margins to the lesser coverts; quills blackish-brown, the primaries with whitish shafts; tail-feathers dark brown, with the shafts whity-brown towards the base; head dark brown, feathers slightly mottled with blackish bases and sandy coloured margins; throat dull white, mottled with bars of brown on the lower throat; remainder of under-surface of body

## MONOGRAPH OF THE PETRELS.

from the fore-neck downwards slaty-brown, with ashy-brown edges to the feathers; under wing-coverts paler brown, the greater series and the quill-lining rather more ashy; "bill pale yellowish horn-colour, the unfeathered skin-folds at the gape and junction of the bill and feathers, bluish-grey; iris brown, with yellowish radiating streaks; skin of eyelids bluish grey; legs\* and toes grey, with a pale yellowish tinge; web fleshy grey; nails blackish horn" (E. A. Wilson). Total length, 33 inches; culmen, 4.1; wing, 21.0; tail, 7.7; tarsus, 3.8; middle toe and claw, 5.4.

The specimen described is from Cape Adare, obtained by the "Southern Cross" Expedition; that figured is from Coquimbo Bay, procured by Admiral Markham. Both are now in the British Museum.

\* In the Plate the legs and feet are represented as blackish.





J. G. Keulemans del. et lith.

FULMARS GIACIALIS.

Hannar: 1877.

## 92. FULMARUS GLACIALIS (*Linn.*).

(COMMON FULMAR.)

(PLATE 77.)

*The Fulmar*, Martin, *Voy. St. Kilda*, p. 55.

*Le Pétrel cendré*, Brisson, *Orn.*, VI., p. 143, Pl. 12, fig. 2 (1760); Buff., *Hist. Nat. Ois.*, IX., p. 302, Pl. 20 (1783).

*Procellaria glacialis*, Linn., *Syst. Nat.*, p. 213 (1766).

*Le Fulmar, ou Pétrel-Puffin gris-blanc de l'île St. Kilda*, Buff., *Hist. Nat. Ois.*, IX., p. 325, Pl. 22 (1783).

*Pétrel de l'île de St. Kilda*, Daubent., *Pl. Enl.*, X., Pl. 59 (1786).

*Fulmar Petrel*, Lath., *Gen. Syn.*, III., pt. 2, p. 403 (1785).

*Fulmarus glacialis*, Steph. in Shaw's *Gen. Zool.*, XIII., pt. 1, p. 234, Pl. 27 (1826); Dresser, *Birds Eur.*, VIII., p. 535, Pl. 617 (1878); Baird, Brewer and Ridgway, *Water-Birds N. Amer.*, II., p. 366 (1884); Saunders, ed. 4, Yarrell, *Brit. Birds*, IV., p. 1 (1884); id., *Man. Brit. Birds*, p. 751 (1899); Salvin, *Cat. Birds Brit. Mus.*, XXV., p. 425 (1896).

*Procellaria hiemalis*, C. L. Brehm, *Vög. Deutschl.*, p. 800 (1831).

*Procellaria minor*, Kjærbo., *J. f. O.*, 1854, p. lix.; id., *Danm. Fugle, Suppl.* (2), p. 324, Pl. 7, fig. 7 (1852).

*Procellaria borealis*, Brehm, *Naum.*, 1855, p. 296.

*Fulmarus glacialis b. minor*, Bp., *Consp. Av.*, II., p. 187 (1855).

*Fulmarus minor*, Bp., *Comptes Rend.*, XLII., p. 768 (1856).

Ad. (*forma typica*). Cinereus, scapularibus terminaliter paullo saturatoribus: primariis nigricantibus, rhachidibus albis: pileo et collo undique, corporeque subtus toto pure albis: rostro sordido, apice flavo, tubulis nasalibus nigricantibus.

Ad. (*forma saturator*). Omnino murino-cinerascens, subtus pallidior.

THE Common Fulmar, which ranges from the North Atlantic to the Arctic Ocean, breeds abundantly on St. Kilda, off the west coast of Scotland, and has been said to do so on Soa; it is apparently extending its range, as it is now plentiful on the Faroe Islands, from whence we have no record of its nesting before the year 1839.

## MONOGRAPH OF THE PETRELS.

Howard Saunders states that *F. glacialis* began to nest on Foula in the Shetlands in June, 1878, and that it has now spread to Papa Stour, Esha Ness, and two places in Unst, while in the summer of 1898 it had reached the Noup of Noss (*Man. Brit. Birds*, 2nd ed., p. 751). The discovery has been made during the last few years that the Fulmar is extending its breeding range, especially in some parts of Scotland. A very good summary of the recent records is given by Messrs. H. F. Witherby and N. F. Ticehurst in the magazine "British Birds" (Vol. II., pp. 373-375). The bird is now known to nest on the Flannan Islands, Barra, the Orkney Islands, Fair Isle, and on the coasts of Sutherlandshire and Caithness. Professor Newton, who mentions four or five breeding stations in Iceland, says that *F. glacialis* was also very common in Spitsbergen, where it was breeding on the Alkenhorn (*Ibis*, 1865, p. 511). Possibly the birds winter in this locality, as Mr. Arnold Pike, who stayed at Danes Gat, near Amsterdam Island, from 1888 to 1889, observed one on February 20th.

Dr. Malmgren found thousands breeding on the north side of Brandywein Bay, as well as on Bear Island, and other nesting localities recorded are Eckman Bay, in Spitsbergen (Trevor-Battye, *Ibis*, 1897, p. 595), Whale's Point and Deevie Bay, Ryk-ys, and King Charles' Islands, in July. In Olga Straits, though not uncommon, it did not appear to breed (A. Walter, J. f. O., 1890, p. 246).

Dr. Nansen and Mr. Johansen on their adventurous journey across the ice, observed *F. glacialis* on May 29th, 1895, in Lat. 82° 30' N., and again on June 16th, when approaching Franz Josef Land from the north-east; also early in August on the Isles of Hvidten Land, and on Frederick Jackson Island, in the month of September. On June 3rd, 1876, Nansen found it breeding at Cape Fisher. Dr. Neale, who accompanied the voyage of the "Eira," considered this Fulmar to be migratory in Franz Josef Land, as it remained at Cape Flora as late as October 28th, 1881, and returned the following spring on April 24th. Dr. W. S. Bruce, on the Jackson-Harmsworth Expedition, says that the last "Molly," as this bird was called, was seen by Mr. Wilson on October 6th, 1896, and not again till April 7th, 1897. These birds were breeding abundantly at the east end of Mabel Island, on the basaltic crags on May 5th, and both Dr. Bruce and Dr. Koetlitz saw others at Cape Forbes, which probably bred there. In 1895 the Fulmars arrived April 21st, and left again on September 18th.

In the neighbourhood of Novaya Zemlya, Lutkë Land, and Goose Land, Mr. H. J. Pearson saw this Fulmar on July 2nd, 1895 (*Ibis*, 1896, p. 225; 1898, pp. 204, 207). In Russian Lapland he found it at Sviatonoskaia Bay on the side of Sviatoi Nos (*Ibis*, 1896, p. 213), and in the Kara Sea Mr. H. L. Popham records the species from Lat. 74° 8' N., Long. 77° 40' E.

During the voyage of the "Fox" *F. glacialis* was observed by Dr. David Walker near Cape Farewell, and it continued with the ship to the northern limits of the Expedition (*Ibis*, 1860, p. 165).

## FULMARUS GLACIALIS.

The species apparently frequents both coasts of Greenland, and Colonel Feilden says that it breeds in myriads at Ovifak, but all the birds seen were of the white-breasted form, a subject which will be treated of later. Many birds followed the "Alert" and the "Discovery" until they entered the Pack Ice off Cape Sabine. Together with Lieut. Parr, on June 26th, Colonel Feilden noticed one of these birds on the coast of Grinnell Land, in Lat. 82° 30' N., the same latitude as that in which Nansen also recorded this Fulmar. A few days later a dead bird was picked up about two miles further north, but the species was not again observed till the ships returned to Baffin's Bay, in September, 1876, where it was abundant. *F. glacialis* is met with off the north-east coast of Labrador, and descends in winter to the fishing banks of Maine and Massachusetts, and has also occurred in European waters as far south as Lat. 43°.

*F. glacialis* has a light and a dark phase of plumage; some intermediate examples also occur, while occasionally pure white individuals are met with. The light form is more abundant in the southern area of its range, but in Greenland and the north of Iceland the dark phase is said to be predominant, and breeds in incredibly large numbers. It has been asserted that the dusky birds are immature, but this cannot be the case, since there are two specimens in the British Museum with down still adhering to the feathers: both of these birds have white heads and under sides; moreover, the dark forms are also found breeding together.

There is considerable variation in the size of individuals, and the birds from Greenland and the American coast have been separated under the name of *F. minor*, Kjærbo, but after close examination of a large series, I find no tangible difference in measurement, and agree with Dr. Coues that no ground for separation exists.

No bird is more thoroughly oceanic in habit than this Fulmar, which lives exclusively at sea, often at a great distance from land, and only visits some desolate rock to rear its young.

These birds fly with great buoyancy and rapidity, and when at sea are usually seen skimming the surface of the waves; they are extremely fond of whale-blubber, and though only a few may be in sight when a whale is captured, as soon as the flensing process is commenced, they fly in from all quarters, and follow the track of the ship in such numbers that the sea around the vessel is completely covered with them; when the fragments do not float away fast enough, they approach so near the scene of operations, that many are killed with boat-hooks, and may even be taken by the hand. These Fulmars glut themselves to such an extent as to be unable to fly, in which case if not relieved by disgorging, they retire to the nearest piece of ice till digestion restores their powers, and enables them to return to the banquet with the same zest as ever.

Macgillivray, writing in 1852, and Elwes in the "Ibis" of 1869, give excellent accounts of the habits and nesting of this Fulmar in St. Kilda, where it breeds in countless numbers, and plays an important part in the island, forming the chief support

## MONOGRAPH OF THE PETRELS.

of the inhabitants. Puffins and Fulmars abound there, and breed upon the face of the high cliffs, which on Conachan rise to an elevation of 1200 feet; they are so numerous on the wing that they almost obscure the distant view, and produce the effect of a heavy snowstorm. Every inch of the grass ledges is occupied with nests, composed of shallow structures excavated in the turf and lined with dry grass and withered tufts of sea-pink (*Armeria maritima*), in which the single egg is laid. Those found on Conachan by Elwes were marked with reddish spots and speckles, but others obtained elsewhere were spotless. The birds were tame enough to be taken by the hand, but on being seized would vomit a quantity of amber-coloured oil, emitting an evil and singularly penetrating smell.

Fulmar-oil is one of the most valuable products of the island, and the best is obtained by surprising the old birds upon their nests, and after placing them head downwards between the knees, the bill is opened, and the bird is made to disgorge a tablespoonful or more of oil into the dried gullet and stomach of a Gannet, which is used as a reservoir for the purpose.

Early in August the natives descend the rocks, by means of ropes, in search of the young Fulmars; these, when boiled, furnish a quantity of fat, which is preserved in casks in solid form. The old birds, too, are much esteemed as articles of food on account of their subcutaneous fat, of which the natives are inordinately fond. The feathers of the breast are said to be unusually thick and close, but on the stomach there is a bare hollow space about the size and shape of an egg.

*Adult male.* Above silvery-grey, the longer scapulars dark grey towards the tips; wing-coverts darker grey than the back, the marginal coverts also darker; quills blackish, with ashy-grey margins and white shafts; secondaries ashy-grey, like the wing-coverts; lower back and rump ashy-grey, like the mantle; upper tail-coverts and tail-feathers lighter, rather paler and more silvery-grey, with white shafts and white tips to the feathers; head and neck all round pure white; the hind-neck also white, extending to the mantle, the feathers of which have ashy-brown tips, producing a mottled appearance; sides of face and under-surface of body pure white, with a blackish shade in front of the eye; under wing-coverts also white, the marginal and primary-coverts ashy-grey; quills light ashy-grey below, paler on the inner webs. Total length, 17 inches; culmen, 1.6; wing, 13.5; tail, 4.9; tarsus, 2.15; middle toe and claw, 2.9.

The colour of the bill and feet are differently described by various writers. Howard Saunders gives the following note:—"Forepart of the bill yellow, the sides yellowish-white, the nasal tubes olive-colour; legs and feet ash-colour."

Gould, in his "Birds of Great Britain," figures the upper mandible as very pale blue, including the nasal tubes, the nail yellowish, and the lower mandible orange. He does not say whether these colours were taken from a freshly killed example.

Macgillivray, in his "British Birds" (V., p. 430), says that recently killed

## FULMARUS GLACIALIS.

specimens from St. Kilda had the bill bluish-yellow of different shades, notched with darker patches and streaks ; legs pale flesh-coloured, darker on the outer surface of the outer toe. These colours agree very well with those of a fresh specimen killed off the Butt of Lewes in the month of February, 1909, and sent me for comparison by the Duchess of Bedford.

Salvin, in the "Catalogue of Birds," says :—"Bill dark, the tip of the maxilla and the lower edge of the mandible yellow ; feet yellowish flesh-colour."

*Adult female.* Similar to the male. Wing, 13.1 inches ; culmen, 1.5 ; tarsus, 2.05 ; middle toe and claw, 2.6.

The dark phase of the Common Fulmar is dull ashy-grey, with the primaries somewhat darker ; under-surface of the body slightly paler ; bill rather more dusky than in the light phase. Gould figures a Yorkshire specimen in Mr. J. H. Gurney's Collection, and gives the bill as grey with a pinkish shade, the nostrils black, and the nail pale yellow.

The male and female described are from St. Kilda, the male procured by Mr. Theodore Walker, and the female by Mr. C. Dixon on June 6th, 1884 ; both are in the British Museum. The dark phase is figured from a North Sea specimen, and the white phase from a bird procured by Captain D. Gray in the North Atlantic (Lat. 75° 25' N., Long. 10° W.). The light phase is taken from a specimen formerly in the Seebohm Collection and now in the British Museum.

## 93. FULMAREUS GLUPISCHA, Stejneger.

(PACIFIC FULMAR.)

(PLATE 78.)

*Procellaria glacialis*, Pall. (nec Linn.), Zoogr. Rosso-Asiat., II., p. 312 (1811).

*Procellaria pacifica* (nec Gm.), Audub., Orn. Biogr., V., p. 331 (1839).

*Fulmarus pacificus* (nec Gm.), Bp., Comptes Rend., XLII., p. 768 (1856); Coues, Pr. Acad. Philad., 1866, p. 28.

*Fulmarus glacialis a. pacificus*, Bp., Consp. Av., II., p. 187 (1856).

*Fulmarus glacialis*, var. *pacificus*, Coues, Key. N. Amer. Birds, p. 327 (1872).

*Fulmarus glacialis* (nec Linn.), Seebohm, Ibis, 1879, p. 25; id., Birds Japan. Emp., p. 268 (1890).

*Fulmarus glacialis pacificus*, Coues, Checkl. N. Amer. Birds, p. 125 (1882).

*Fulmarus glacialis glupischa*, Stejneger, Auk, I., p. 234 (1884); id., Bull. U. S. Nat. Mus., No. 29, p. 91, Pl. 6, figs. 1, 2 (1885); Baird, Brewer and Ridgway, Water-Birds N. Amer., II., p. 366 (1884).

*Fulmarus glupischa*, Salvin, Cat. Birds Brit. Mus., XXV., p. 427 (1896).

Ad. (*forma typica*). *F. glacialis* similis, sed rostro aurantiaco-flavo: tubulis nasalibus quoque aurantiaco-flavis distinguendus.

Ad. (*forma saturatior*). *F. glacialis* similis, sed saturate brunneus, nec cinereus, et tubulis nasalibus aurantiaco-flavis semper distinguendus.

AUDUBON described this species under the name of *Procellaria pacifica*, and the bird was known for many years as *Fulmarus pacificus*. In 1884, however, Dr. Stejneger pointed out that the same name had been given to a Petrel by Gmelin in 1788, and since the title of *pacifica* was pre-occupied, he proposed to substitute that of *glupischa*, founded on the "Glupisch," as the bird is called by the natives of the Commander Islands.

Like the Common Fulmar, this Pacific representative is said to possess a light and a dark phase of plumage. In both plumages, however, *F. glupischa* is easily recognisable by its entirely yellow bill. In other respects the light, or grey and white,





## FULMAREUS GLUPISCHA.

phase of *F. glupischa* is similar to the light phase of *F. glacialis*. The British Museum does not possess a specimen of this form of *F. glupischa*, and it was also unknown to Salvin when he wrote his monograph of the Petrels in the "Catalogue of Birds." There are, however, two specimens in the Rothschild Museum from Pacific Grove in Monterey Co., California. Dr. Hartert kindly informs me that they are of a purer white on the head and neck than the examples of *F. glacialis* in the Tring Collection, and have the mantle, rump, wings, and tail, light grey. The wing is slightly shorter, and the bill (in the dried skin) is nearly uniform wax-yellow, without any olive on the lower mandible.

The dark phase of *F. glupischa*, of which I have seen several examples, is of a deeper and browner shade than the grey phase of *F. glacialis*. The entirely yellow bill, however, is a character of the dark phase of *F. glupischa*, as it is of the light one.

The Pacific Fulmar does not extend so far north as its ally, *F. rodgersi*, but frequents both sides of the North Pacific Ocean. It was found by Von Schrenk off the mouth of the Amur River, and Taczanowski records it off the shores of Eastern Siberia (*Mém. Acad. St. Pétersb.*, XXXIX., p. 1064).

Major Barrett-Hamilton (*Ibis*, 1900, p. 279) found this Fulmar, but only in the brown phase, which is the prevalent one in the Western Pacific, numerous in almost all parts of the Bering Sea, and of the Pacific generally, north of about Lat. 45°. It came quite close to the shore both at the Commander Islands and at Robben Reef, but he did not observe it inside the mouth of Avacha Bay.

On Copper Island and Bering Island, in the Commander group, Dr. Stejneger says that the "Glupisch" is one of the commonest summer visitors, breeding in high and steep rocky bluffs and promontories boldly rising out of the sea, three hundred to eight hundred feet high. On Copper Island Dr. Stejneger (*l.c.*) met with the dark form breeding in thousands, but he did not find a single perceptibly lighter bird, although a small colony of the white form was breeding in the neighbourhood, but separate from the dark one: nor were there any of the white phase apparently darker than usual, and, in no case, were the light and dark birds paired together.

In the British Museum are several specimens from the Kurile Islands, collected by Captain Blakiston and Mr. H. J. Snow, and there is also an example obtained by Captain Kellett and Lieutenant Wood at Petropaulovsk, in Kamtschatka.

This Fulmar ranges along the entire Pacific coast of North America, and I have examined specimens from Pacific Grove and San Diego in California. According to the A. O. U. "Checklist of North American Birds," its range is said to extend to Western Mexico.

Dr. Stejneger says that the eggs are dull white, without spots; they measure from 2.7 to 2.95 inches by 1.9 inch.

*White phase.* Similar to *F. glacialis*, but distinguished by its orange-yellow bill.

*Dark phase.* General colour ashy-grey, lighter below, all the feathers with

## MONOGRAPH OF THE PETRELS.

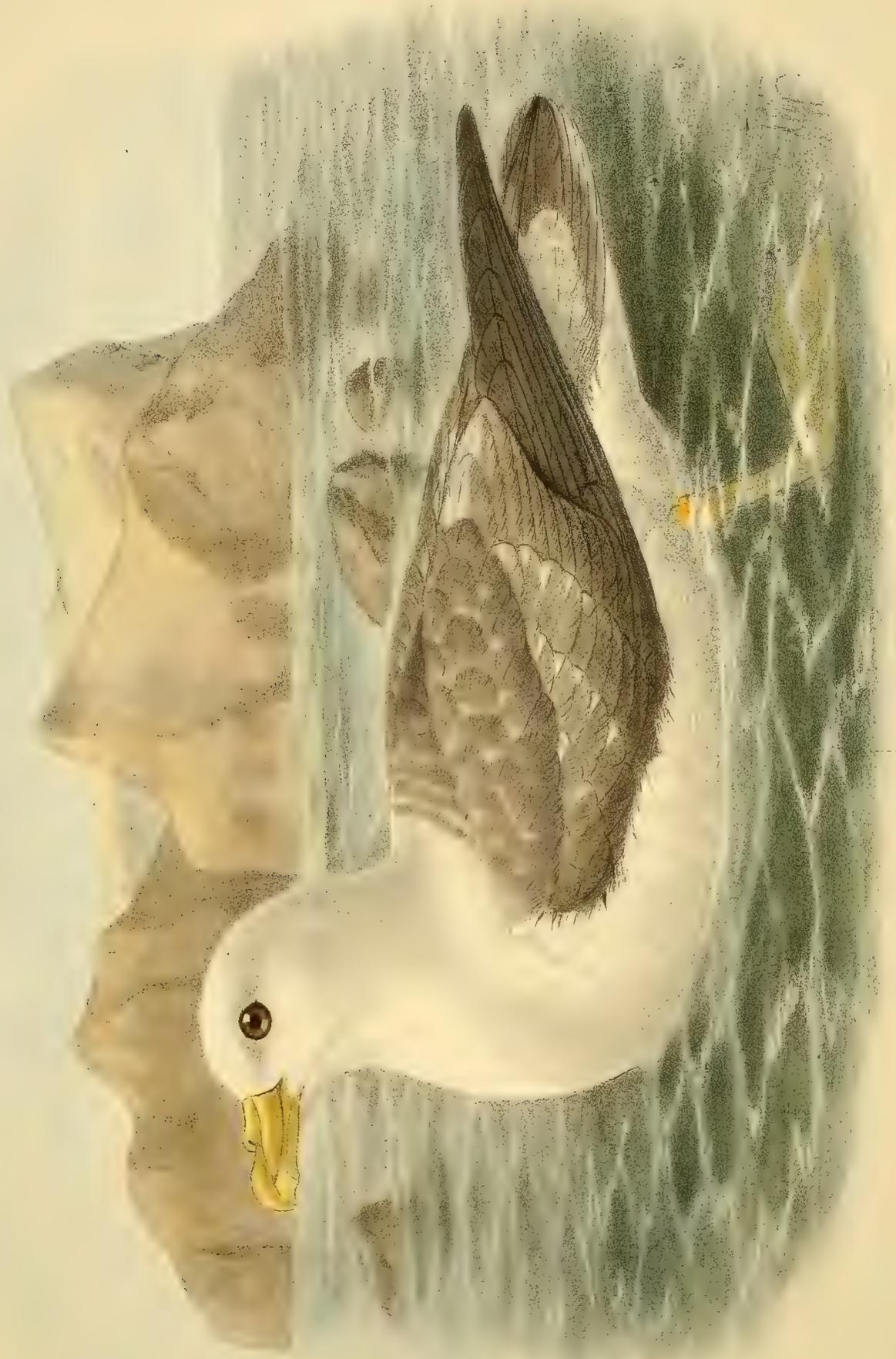
paler ashy margins; quills dusky black; tail-feathers ashy-grey; in front of the eye a blackish shade; "bill greenish-white, black before the tube" (H. W. Henshaw). Total length, 16.0 inches; culmen, 1.4; middle toe and claw, 2.6; wing, 12.25; tail, 4.4; tarsus, 1.85.

The Plate of *F. glupischa* was drawn before Dr. Stejneger's note on the colour of the soft parts was published, and when these details were more or less unknown. The actual colour of the bill and feet are recorded by him (*Bull. U. S. Nat. Mus.*, No. 29, p. 95, 1885):—"Bill greenish-white with the sutures and the space between the nostrils and the nail, as also the tip of the latter, blackish; feet dirty white, with a faint greenish-blue tinge; the joints and the outside of the tarsus, as also the webs, except the base, blackish; tarsus behind, and toes below, black." Other specimens described by him show that the colour of the soft parts varies considerably.

The description is taken from a specimen of the dark phase collected by Mr. H. W. Henshaw at San Diego, on December 8th, 1884.

N.B.—Since writing the above I have received for examination, through the kindness of the Director of the Smithsonian Institution at Washington, a specimen of the light-coloured form of *F. glupischa*; it bears out the characters recorded above, and does not appear to differ from *F. glacialis*, except in the colour of the bill. The specimen measures 16.5 inches; wing, 12.3; culmen, 1.5; tarsus, 2.05; middle toe and claw, 2.7; tail, 4.6.





## 94. FULMAREUS RODGERSI, *Cassin.*

(RODGERS' FULMAR.)

(PLATE 79.)

*Fulmarus rodgersii*, Cass., Pr. Acad. Philad., 1862, p. 326; Coues, op. cit., 1866, p. 29; Salvin, Cat. Birds Brit. Mus., XXV., p. 427 (1896).

*Fulmarus glacialis*, var. *rodgersi*, Coues, Orn. Pribylof Isl., p. 261 (1874).

*Fulmarus glacialis* (nec. Linn.), H. W. Elliott, Seal Islands, Alaska, p. 131 (1882).

*Fulmarus glacialis rodgersi*, Coues, Checkl. N. Amer. Birds, p. 125 (1882); Baird, Brewer and Ridgway, Water-Birds N. America, II., p. 367 (1884).

*P. glacialis* similis, sed rostro aurantiaco-flavo: dorso cinereo, plumis basaliter albis, et rhachidibus albis, quasi variegatis: secundariis albis, extus et apicem versus fusco-griseis: uropygii plumis et supracaudalibus plerumque albis, fusco-griseo terminatis.

*F. rodgersi* was named by the late John Cassin from a specimen said to have been obtained in the South Indian Ocean (*Pr. Acad. Philad.*, 1862, p. 326) by Commodore John Rodgers, commander of the United States North Pacific Exploring Expedition; but Dr. Elliott Coues corrected this statement, though the exact locality was not then known (*Pr. Acad. Philad.*, 1866, p. 29).

Rodgers' Petrel, or "Lupus," as it is called by the natives, is an inhabitant of the Pribylof Islands, where it is said to be the only representative of the *Procellariinae*; it is abundant over all the deep water areas of the Bering Sea, extending into the Arctic Ocean to the vicinity of the Ice Pack. It rarely visits the eastern shores from the mouth of the Kusoquim to the head of Norton Bay, the shallow and muddy water apparently not providing the food on which the bird subsists. On the western coasts, in the neighbourhood of Plover Bay and Lawrence Island, thence north through the Bering Straits, and along the Siberian shore, the birds were seen in abundance during the visit of the "Corwin," while the shallow character of the water on the American coast north of the Straits again failed to attract the birds. It was noticed that areas sometimes frequented by large numbers of *F. rodgersi* would on other occasions be absolutely devoid of them (Nelson, *Cruise of the "Corwin,"* p. 112). This Fulmar

## MONOGRAPH OF THE PETRELS.

is stated by Mr. Loomis to frequent the Californian Seas in summer, which is its furthest recorded southern range. A specimen in the British Museum was obtained in the Kurile Islands.

Nelson relates that in September, 1881, in the harbour of Ounalaska, hundreds of light-coloured birds of this species were seen in company with an equal number of sooty-brown, or blackish-brown Petrels of the same size but of an allied species; these immense flocks covered acres of water, the calm sea rendering the birds apparently helpless, and as the "Corwin" steamed along, they merely flapped clumsily along the surface of the water in their futile attempts to rise.

*F. rodgersi* repairs to the cliffs on the south and east shores of St. George's Island for the purpose of breeding; it arrives early in the season, and having selected a suitable rocky ledge, without any attempt at a nest, lays a single large white egg, and immediately commences the process of incubation. This Fulmar is one of the most devoted of waterfowl, for it will sooner allow itself to be killed while sitting than take flight at the approach of an intruder. The natives lower themselves over the cliffs and gather large numbers of eggs, which are much prized as articles of food; in form they are said to be more elongate than those of *F. glacialis*, and the shell is covered with minute points and raised fossæ.

The chick has been compared to a puffball of white down, gaining its first plumage in six weeks, and at the end of the season resembling its parents, though much darker on the back and scapulars.

As an article of food the flesh is most unpalatable, and, like others of its race, this species has the disgusting habit of vomiting the contents of the stomach at an intruder. Several of the precipitous islands of Bering Sea are breeding places of *F. rodgersi*, and the cliffs of Herald Island are eminently suitable nesting places, but the hasty visit of the "Corwin" did not allow time for a careful search, though the abundance of birds in the vicinity of the island renders it probable that they breed there.

Among the specimens in the British Museum is one from Bering Island obtained by Major Barrett-Hamilton, which is interesting, as Dr. Stejneger only found *F. glupischa* on the Commander Islands. The egg measures 2.9 inches in length and 1.9 in breadth. Messrs. Dall and Bannister give a very fair representation of the bird in the "Transactions of the Chicago Academy of Sciences," showing very plainly the white inner secondaries tipped with dusky-grey.

*Adult.* Similar to *F. glacialis*, but slightly more leaden-grey on the back and wings, the inner secondaries white, broadly edged and tipped with dusky-grey; the back slightly mottled with white, due to the white bases and shafts of the feathers; rump and upper tail-coverts for the most part white, with broad ends of dusky-grey; "bill entirely yellow, the base of both mandibles dusky; legs yellow, the tarsus tinged behind with dusky" (Dall and Bannister). Total length

## FULMARUS RODGERSI.

about 18.5 inches; culmen, 1.45; wing, 11.3; tail, 5.2; tarsus, 2.0; middle toe and claw, 2.6.

In two of the specimens examined by me the bill is orange or dusky yellow, with a black border on the forehead, and the anterior margin of the nasal tube is also black, as well as the space between it and the unguis. One of these birds has some grey on the crown, which may be the sign of immaturity, as it is accompanied by a certain amount of grey on the under-parts.

No dark form of the species has yet been discovered.

The specimen figured is a male procured by Mr. H. W. Elliott on St. George's Island, while that described is from the North Pacific, obtained by Captain Kellett and Lieutenant Wood; both are now in the British Museum.

## 95. DAPTION CAPENSIS (*Linn.*).

(CAPE FULMAR.)

(PLATE 80.)

*Pintado Petrel*, Dampier, Voy. III., p. 66, fig. 1 (1729); Forster, Voy. I., p. 489 (1777); Lath., Gen. Syn., III., pt. 2, p. 401 (1785).

*White and Black-spotted Peteril*, Edwards, Nat. Hist. Birds, II., p. 90, Pl. 90, fig. 1 (1747).

*Le Pétrel tacheté appelé vulgairement Damier*, Brisson, Orn., VI., p. 146 (1760).

*Procellaria capensis*, Linn., Syst. Nat., I., p. 213 (1766).

*Le Pétrel blanc et noir, ou le Damier*, Buff., Hist. Nat. Ois., X., p. 146 (1786).

*Daption capensis*, Steph. in Shaw's Gen. Zool., XIII., pt. 1, p. 241, Pl. 28 (1826); Gould, Birds Austr., VII., Pl. 53 (1843); Coues, Pr. Acad. Philad., 1866, pp. 162, 171; Giglioli, Faun. Vertebr. Oceano, p. 46 (1870); Buller, Birds New Zeal., p. 299 (1873); Sharpe, Phil. Trans., Vol. 168, p. 118 (1879); Salvin, Cat. Birds Brit. Mus., XXV., p. 428 (1896).

*Procellaria punctata*, Ellman, Zool., 1861, p. 7473.

*Fulmarus capensis*, Gray, Handl. Birds, III., p. 107 (1871).

*Calopetes capensis*, Sundev., Av. Meth. Tent., p. 142 (1872).

*Daptium capense*, Coues, Checkl. N. Amer. Birds, p. 126 (1882); Saunders, ed. 4, Yarrell, Brit. Birds, IV., p. 11 (1884).

*Daptrion capensis*, Tacz., Orn. Pérou, III., p. 465 (1886).

*Daption capense*, Seebohm, Ibis, 1888, p. 309; Reichenow, Deutsche Südpolar Exped., IX., Zool., I., p. 553 (1908).

Ad. Fuliginoso-niger, albo variegatus: scapularibus et secundariis albis, nigro terminatis: facie laterali et gutture fuliginoso-nigris: corpore reliquo subtus albo.

THE Cape Fulmar, often called the "Cape Pigeon," occurs in large flocks in the South Atlantic and South Pacific Oceans, and is a familiar object to those who travel to the Cape and Australia, though seldom seen north of the Equator. It is found on both coasts of South America, but is more commonly recorded from the Atlantic than the Pacific side. The breeding haunts of *D. capensis* are in the far south, and it has been



BOOBY. APPENDIX.



## DAPTION CAPENSIS.

met with on the Antarctic continent itself. Captain Hutton gives the usual northern limit of this Fulmar as Lat.  $27^{\circ}$  S., but individuals occasionally follow a ship to  $24^{\circ}$  and even  $17^{\circ}$  S. Lat., which is farther north than is recorded by Layard and Gould; the latter observed it first in July, 1838, in Lat.  $26^{\circ} 54'$  S., and Long.  $31^{\circ} 20'$  W., and he found it very plentiful till he doubled the Cape of Good Hope. Large numbers were also seen off the island of St. Paul on August 18th, and in King George's Sound on September 8th (Gould, *Handb. Birds Austr.*, II., p. 470).

Professor Giglioli on board the "Magenta" found it scarce in the South Atlantic and Indian Oceans between February and April, but Sperling says that between the Cape and Zanzibar it is the commonest of the large Petrels (*Ibis*, 1868, p. 293). During the breeding season this bird is absent from the Cape Seas. In the Indian Ocean its most northerly range is recorded by Mr. A. O. Hume, who mentions a specimen obtained between Ceylon and Madras by Mr. Theobald (*Ibis*, 1870, p. 438). Professor Giglioli states that *D. capensis* is abundant in the seas of Western Australia, from Lat.  $37^{\circ} 09'$ , Long.  $108^{\circ} 45'$  E., as far as the entrance of Port Phillip. The birds followed the ship from New Zealand across the Pacific to Callao, and continued with it to the Straits of Magellan, and thence into the Atlantic to Lat.  $40^{\circ} 40'$  S., Long.  $55^{\circ} 05'$  W. Cunningham records it from Rio Janeiro, and Aplin from Banda Oriental, Lat.  $34^{\circ} 12'$  S., Long.  $54^{\circ} 54'$  W. (*Ibis*, 1894, p. 212). Howard Saunders observed the species near Valparaiso, and mentions that it ranges farther north than the Albatros. Other localities recorded are Juan Fernandez and Mas-afuera Islands, and a specimen in the British Museum taken off Payta, in Peru, is probably its farthest northern range. Though it is supposed that the species nests in Tristan da Cunha, we have no evidence that it does so, and Hutton points out that it was not mentioned by Captain Carmichael (*Ibis*, 1865, p. 287).

Lieutenant Harris did not find *D. capensis* breeding on Prince Edward or Kerguelen Islands, but the first eggs were taken on the latter island by the "Challenger" Expedition, and others more recently by Mr. Robert Hall. The bird was also found by Professor Vanhöffen on the Crozets, Possession, Heard, and Bouvet Islands, in November and December, also on Kaiser Wilhelm Land, Lat.  $66^{\circ} 2'$  S., Long.  $89^{\circ} 38'$  E. It has been recorded from the New Zealand Seas, on Chatham, Campbell, and the Auckland Islands, as well as on the Snares and Antipodes Islands, but though Hutton believed that it nested on the two last no breeding places were found.

In the South Orkney Islands an interesting account of the breeding of this species is given by Mr. Eagle Clarke, and a good series of eggs was obtained by the Scottish Antarctic Expedition, and Dr. Bruce further records it from the Weddell Sea as far south as  $71^{\circ} 50'$  S. Dr. Pirie states that about 20,000 birds resorted to Laurie Island for the purpose of nesting, and they were found in hundreds all along the coast. On Saddle Island they also nested; there the species is only a summer visitor, and is absent from May till September, and only once was a flock seen flying northwards after April

## MONOGRAPH OF THE PETRELS.

21st, 1903. The first spring migrants appeared on October 1st, but they were not numerous till after the 23rd of that month (Eagle Clarke, *Ibis*, 1906, p. 174).

*D. capensis* was found nesting in the Gerlache Canal by the naturalists of the Swedish Antarctic Expedition, who also observed it on Louis Philippe Land in August, and on Paulet Island from October to April, as well as east of Graham Land, Lat. 64° 30' S., Long. 50° 37' W., in January, and in the South Shetland Islands in November (Anderson), South Georgia (in May), while Von der Steinen believes that it breeds there during that month. Ross saw flocks of the young of this Fulmar in the Pack Ice off Victoria Land, January 14th, 1841. No nests were found there by N. Hanson and H. Evans, the naturalists of the "Southern Cross" Expedition, though many specimens were obtained from December to February, and it is probable that the species breeds there. The most southerly occurrence they noted was Lat. 65° S., Long. 161° E.

The "Cape Pigeon" has occurred in Europe, and Mr. J. H. Gurney (*Ibis*, 1901, p. 404) gives the following list of the specimens recorded:—One killed near Hyères in October, 1844, by M. Besson (teste Degland); two at Bercy, near Paris; two in the Department of Sarthe (Gentil); and one near Dunkerque in 1880 (Van Kempen). Mr. Howard Saunders (*Man. Brit. Birds*, p. 750) enumerates three British examples: one from near Dublin, on October 30th, 1881 (A. G. More, *Ibis*, 1882, p. 346); one from Bournemouth (Rev. M. A. Mathew, *Zool.*, 1894, p. 396); and a third from the Dovey, Wales, in 1879 (Salter, *Zool.*, 1895, p. 254). Mr. Saunders doubted if any of these occurrences were due to natural wanderings of the birds, and it must be remembered that Captain Hutton relates (*Ibis*, 1867, p. 188) that he was informed by a sailor on board one of the Australian mail steamers that he once took half-a-dozen Cape Pigeons alive (feeding them on salt pork) as far as the English Channel, but having a difference with the steward of the ship, who was part owner, he let them all fly away.

*D. capensis* is conspicuous by reason of its mottled plumage; in habits it is somewhat confiding, and individuals may be caught off ships by means of a landing-net; when liberated on deck they run with outstretched wings, and even at sea Professor Giglioli says the bird cannot rise without first running along the surface of the water, and thus gaining an impetus. Like other Petrels, these birds defend themselves by ejecting the contents of their stomachs to a distance of six or eight feet with remarkable precision.

The Cape Pigeon, unlike most of its allies, utters a distinct cry, strong and raucous—cac-cac, cac-cac, cac—increasing in rapidity, but during the period of courtship the birds coo and cluck, and continue, Dr. Pirie says, their love-note, though to a less degree, throughout the period of incubation. They make a great noise when attacking a dead seal, the fat of which they are very fond. Mr. Robert Hall, who observed their habits on Kerguelen Island, says that the nests are placed in holes in stony places in the cliffs, about fifty feet above the sea-level, no lining of grass or weeds being used. He noticed a pair of adult birds in a sheltered spot without eggs or young, and one bird was busily

## DAPTION CAPENSIS.

engaged in placing little stones around with its bill, as if to form a more comfortable nesting place (*Ibis*, 1900, p. 28).

On Laurie Island the nests, composed of stones and earth, were placed on the exposed ledges of cliffs from twenty to one hundred feet above the sea-level, some were close together, but isolated nests were not uncommon. They were robbed of the eggs on December 5th, and when visited again on December 12th, the birds were still found sitting on their empty nests. According to observations made by the naturalists of the Scottish Expedition, the period of incubation was about forty-two days. The birds sat close for a month, then disappeared for ten days, and upon their return proceeded to lay their single white egg, which is large for the size of the parent. Those obtained in the South Orkney Islands are oval in form, measuring on an average 62.35 by 43.11 mm. (Eagle Clarke, *Ibis*, 1906, p. 175). Three specimens in the British Museum, presented by Dr. W. S. Bruce, measure : axis, 2.25 by 1.7 inches ; 2.45 by 1.55 ; 2.66 by 1.75.

*Adult.* General colour above black with a slaty gloss ; the head and mantle entirely black, the feathers of the latter with concealed white base ; the scapulars, back and central upper tail-coverts white, with conspicuous black spots at the ends of the feathers ; tail-feathers white, with the terminal third black, forming a broad band : lesser and marginal wing-coverts black, the median and inner greater coverts white, with black spots at the ends like the scapulars ; bastard-wing and primary coverts black ; primaries black with a large extent of white on the inner web ; the third primary with a patch of white on the base of the outer web, increasing in extent towards the innermost primaries, which are entirely white, excepting towards the ends of the quills, which are black ; outer secondaries entirely white, the innermost white with a large black spot at the ends, thus resembling the scapulars ; entire sides of face, ear-coverts, and sides of neck, black like the head ; under-surface of body pure white, with the chin black, the throat mottled with black-tipped feathers, as also the sides of the chest ; under tail-coverts white, with a black spot at the ends ; under wing-coverts white, with a broad black band round the edge of the wing ; lower primary-coverts white, the outer ones black, with white bases ; some of the greater coverts, with black spots at the ends ; axillaries white, many of them spotted with black at the tip ; primary quills blackish below, with a conspicuous lining of white.

An examination of the large series of Cape Fulmars in the collection of the British Museum reveals the fact that, although the general colour and markings are the same throughout all the birds, there are certain differences which are difficult to explain. Some birds have the throat pure white, while with others it is black, and between these two extremes there is every variation.

Many examples have a white throat, thinly sprinkled with blackish spots, which are larger in other individuals, until the black predominates, and the bases only of the feathers are white.

## MONOGRAPH OF THE PETRELS.

So many specimens are without any record of the date of capture, that it is difficult to account for the variation with any certainty, but amongst those specified, I find that the birds with pure white throats were obtained in May, June and July, which are the winter months, while the black-throated birds were captured in October and November, when the breeding season is approaching; hence, I infer that the changes of plumage are seasonal. In connection with the above change, the black-throated birds also have an entirely black mantle, while in white-throated specimens the feathers of the mantle have white bases. As the series before me exhibits every possible intermediate gradation between the two phases, it is possible that the change is accomplished without any direct moulting of the feathers of the throat, and that the black spots, at first minute and occupying the tip of the feather, gradually spread until the whole of it is black.

Mr. Eagle Clarke (*Ibis*, 1906, p. 176) draws attention to the fact that adult specimens obtained by the Scottish Antarctic Expedition in the Weddell Sea and the South Orkney Islands presented two types of plumage. One of these, captured in February, was probably an old bird in weathered plumage, and had a brown cast over the black feathers, with white bases to those of the mantle; in the second form the bases were dusky, and the dark portion of the plumage was slaty-black; while a male taken in December was intermediate between the two.

The chick, when five days old (January 18th, 1904), was slate-grey above, paler and more sooty on the under side (Eagle Clarke, *t.c.*).

*Young.* According to Mr. Robert Hall the full grown nestlings were covered with greyish down above, and greyish-white below, with the bill black.

The bird described is in our collection, and the specimen figured is from St. Ambrose Island, where it was obtained by Dr. Coppinger.





## 96. HALOBÆNA CÆRULEA (*Gm.*).

(BLUE PETREL.)

(PLATE 81.)

- Blue Petrel*, Forster, Voy. I., p. 91; Lath., Gen. Syn., III., pt. 2, p. 415 (1785).  
*Another Blue Peterel*, Cook, Voy. I., p. 32.  
*Procellaria cærulea*, Gm., Syst., Nat., I., p. 560 (1788); Gould, Birds Austr., VII., Pl. 52 (1847); Buller, Birds New Zeal., p. 306 (1873).  
*Pachyptila cærulea*, Illiger, Prodr., p. 275 (1811).  
*Procellaria forsteri*, Smith, Ill. Zool. S. Afr., Aves, Pl. 53 (1849).  
*Procellaria similis*, Forster, Descr. Anim., p. 59 (1844).  
*Halobæna cærulea*, Bp., Comptes Rend., XLII., p. 768 (1856); Gould, Handb. Birds Austr., II., p. 457 (1865); Sharpe, Phil. Trans., Vol. 168, p. 141 (1879); Buller, Birds New Zeal., 2nd ed., II., p. 214 (1888); Salvin, Cat. Birds Brit. Mus., XXV., p. 431 (1896); Reichenow, Deutsche Südpolar Exped., IX., Zool., I., p. 557 (1908).  
*Halobæna typica*, Bp., Comptes Rend., XLII., p. 768 (1856).  
*Fulmarus cæruleus*, Gray, Handl. Birds, III., p. 107 (1871).  
*Procellaria velox*, Solander MSS.; Salvin in Rowley's Orn. Misc., I., p. 238 (1876).  
*Prion cæruleus*, Reichenow, Vög. Afrikas, X., p. 31 (1900); W. L. Sclater, Faun. S. Afr. Birds, IV., p. 488 (1906).

Ad. Pulchre cinerascenti-cinerea: subtus alba; rectricibus late albo terminatis.

IN colour and markings *H. cærulea* resembles the species of the genus *Prion*, but differs from them in the shape of the tail, which forms a distinguishing character.

It has also been separated from *Prion* by reason of the supposed absence of the lamellæ near the base of the upper mandible; a close examination, however, shows that the lamellæ are present, though very minute, so that this character does not hold good; but I cannot unite the two genera, as has been done by Reichenow and W. L. Sclater, on account of the difference in the tail, which in *Halobæna* is square, while in *Prion* it is wedge-shaped. *H. cærulea* is also distinguished from the other Blue Prions by the white tips to the tail-feathers.

## MONOGRAPH OF THE PETRELS.

The species occurs in the southern areas of the Pacific, Atlantic, and Indian Oceans. Salvin gives its range as between Lat. 40° and 60° S., but since the publication of the "Catalogue of Birds in the British Museum," the recent Antarctic Expeditions have extended our knowledge of its distribution to Lat. 70° S.

Dr. Bruce and the naturalists on board the "Scotia" observed this species in the far south, and procured ten specimens, enabling Mr. Eagle Clarke to indicate its range, which may easily be confounded with that of *Prion banksi*, when the birds are recorded as "Blue Petrels" only.

The same expedition was the first to notice *H. cœrulea* beyond the Antarctic Circle. It was found in the Weddell Sea, Lat. 69° 33' S., whilst other "Blue Petrels" believed to be of this species were seen down to Lat. 71° 28' S. (*Ibis*, 1907, p. 329).

No specimens were obtained north of Lat. 64° 29' S., but here two examples of *H. cœrulea* and one of *P. banksi* were procured on February 25th, 1904, and eight of the former were taken in March (1903 or 1904), Lat. 68° and 69° 30', Long. 12° 49' and 35° 29' W.

It is also probable that this was the species mentioned by Ross as having been seen in the Weddell Sea, and there can be but little doubt that it was the bird met with by Weddell himself on February 28th, 1823, a little further west in Lat. 73° S., when he says the sea was covered with birds of the "Blue Petrel kind." He further mentions it as occurring in the South Shetlands, but this has not been confirmed by recent observers (*Ibis*, 1907, p. 341).

The bird appears to be specially characteristic of the Weddell Sea, but somewhat local in its most southern range. It was not obtained by the "Scotia" in the South Orkneys during the summer, nor anywhere in the vicinity. A specimen, now in the British Museum, was obtained by Sir A. Smith in the Cape Seas, but its occurrence there is somewhat rare, though individuals are occasionally driven north by gales, as instanced by the capture of a bird at East London (W. L. Sclater, *Fawn. S. Afr. Birds*, IV., p. 488).

On Tristan da Cunha and Gough Island it was not observed by the Scottish Antarctic Expedition, though Gould says that numbers were seen between these islands and the coast of America on June 12th, 1840, Lat. 41° S., Long. 34½° W. Professor Vanhöffen on the "Gauss" records *H. cœrulea* in considerable numbers near Bouvet Island, and on Kerguelen Island it was found breeding, as described by the Rev. E. A. Eaton and Dr. Kidder.

Gould on his voyage to Australia first noticed the species in Lat. 39° 23' S., Long. 54° E. As the ship proceeded the birds increased in number and were very plentiful off the coast of Tasmania. More were seen between Hobart Town and South Australia and Sydney, and in the beginning of May, 1840, it was very abundant off the north-east coast of New Zealand; but though so numerous there, specimens are rare in collections, and the only examples mentioned by Sir Walter Buller are one in the

## HALOBÆNA CÆRULEA.

Auckland Museum and another obtained by Mr. C. H. Robinson at Cape Campbell (*Birds New Zeal.*, 2nd ed., II., p. 214, 1888). In the Rothschild Museum is a female collected by Mr. H. H. Travers on the Macquarie Islands in November, 1899. Gould recorded the species from Cape Horn, and an example he procured there is now in the British Museum.

During the voyage of the "Discovery" Dr. E. A. Wilson first saw *H. cærulea* on October 24th, 1901, Lat. 45° S., Long. 48° E., when, in spite of a heavy sea, high wind, and occasional snow storms, numbers were seen flying round the ship, and continued with it until the denser Ice Pack was reached, Lat. 62° S., Long. 140° E., on November 16th and 17th, 1901.

On the homeward voyage the birds accompanied the "Discovery" between Lat. 58° and 60° S., and Long. 135° W. (Wilson, *Antarctic Exped.*, II., *Birds*, p. 104, 1907).

Graeffe found this Petrel in the Fiji Islands (Hartl. and Finsch, *Faun. Centrapolyn.*, p. 246) and Layard recorded it from Vanua Levu and Viti Levu; he believed that it was found off the island of Samoa, as well as in the seas of New Caledonia.

Although generally resembling the Whale-birds (*Prion*), Gould says that *H. cærulea* presents a "more square appearance" in flight; but little has been recorded of the habits of this species at sea. That it breeds in Kerguelen Island we know, from the excellent accounts of its nesting given by the Rev. A. E. Eaton and Dr. Kidder. The latter found this Petrel inhabiting the hills in the neighbourhood of the American Observatory Station. These hills, apparently quite deserted by day, became alive at night with *H. cærulea* and a species of diving Petrel (*Pelecanoides*), which flew about the rocks and hummocks of *Azorella*, and filling the air with their cry, which much resembled the cooing of pigeons. The birds seldom flew over the water, but confined themselves to the neighbourhood of their burrows, alighting and taking wing again like swarms of bats. The noise they made was incessant, coming as often from the air as from the burrows below. After the middle of November the noise lessened, from which Dr. Kidder inferred that it was connected with the season of pairing, but the object of the nocturnal flight was inexplicable, as there were no night-flying insects on the island.

The burrows were excavated beneath the mounds of *Azorella*, which grows in dense masses, often several feet in diameter. The tortuous burrows were connected below, and terminated in large dry chambers, lined with fine roots, fibres, twigs, ferns, or leaves of the Kerguelen tea (*Accena affinis*). Here the single egg was laid and covered with powdered earth or leaves, while limpet and mussel shells were often found close by. Two birds were usually found in each burrow, when the expedition first arrived, but after the egg was laid, only a single bird, usually a female, remained (Kidder, *Bull. U. S. Nat. Mus.*, No. 2, p. 34).

The egg measures from 1.9 to 2 inches in length by 1.45 to 1.55 inches in breadth;

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five collected in Kerguelen by the Rev. A. E. Eaton vary from a broad oval to an elliptical form, some are smooth and plain white, others, however, are marked with numerous very minute rufous dots over the greater portion of the shell.

*Adult.* General colour above greyish-blue, the longer scapulars darker grey towards the ends, with pearly-grey or white edges; wing-coverts like the back, with the marginal and lesser coverts ashy-black, like the adjoining scapulars, the greater series edged with hoary-white; bastard-wing blackish; primary-coverts ashy black; primaries blackish externally, the inner webs hoary-white, shading into grey towards the ends, which are black; inner primaries and secondaries greyish-blue with black shafts, the inner webs for the most part white, the secondaries also edged externally with white; lower back, rump, upper tail-coverts and tail-feathers greyish-blue like the back; the tail-feathers broadly tipped with white, before which is a sub-terminal shade of ashy-black; crown of head, nape, and hinder-neck, as well as the sides of the latter, slaty-black, extending in front of the eye and below the latter, and along the upper line of the ear-coverts; forehead, lores, sides of face, and ear-coverts, pure white, the feathers between the forehead and the vertex mottled with black centres and white margins to the feathers; entire under-surface of body pure white, the sides of the chest and upper breast greyish-blue like the back; under wing-coverts, axillaries, and quill-linings pure white; "bill dull blackish-brown, with a stripe of blue-grey along the lower part of the lower mandible; tarsus and toes delicate blue, interdigital membrane fleshy-white, traversed with red veins" (J. Gould). Total length, 11.0 inches; culmen, 1.1; wing, 8.3; tail, 3.7; tarsus, 1.3; middle toe and claw, 1.55.

The description and figure of this bird are taken from a specimen procured near Cape Horn, formerly in our collection, and now in the British Museum.





## 97. PRION VITTATUS (*Gm.*).

(BROAD-BILLED BLUE FULMAR.)

(PLATE 82.)

*Vittated Petrel*, Forster, Voyage I., p. 153.

*Blue Peterel*, Cook, Voy. I., p. 30.

*Pétrel bleu*, Buff., Hist. Nat. Ois., X., p. 155 (1786).

*Broad-billed Petrel*, Lath., Gen. Syn., III., pt. 2, p. 414 (1785).

*Procellaria vittata*, Gm., Syst. Nat., I., p. 560 (1788).

*Procellaria forsteri*, Lath., Ind. Orn., II., p. 827 (1790).

*Prion vittatus*, Lacép., Mém. Inst., 1801, p. 514 ; Gould, Birds Austr., VII., Pl. 55 (1844) ; id., Handb. Birds Austr., II., p. 474 (1865) ; Giglioli, Faun. Vertebr. Oceano, p. 44 (1870) ; Buller, Birds New Zeal., p. 312 (1873) ; Sharpe, Phil. Trans., Vol. 168, p. 135 (1879) ; Buller, Birds New Zeal., 2nd ed., II., p. 212 (1888) ; Salvin, Cat. Birds Brit. Mus., XXV., p. 432 (1896).

*Pachyptila vittata*, Illig., Prodr., p. 275 (1811).

*Procellaria latirostris*, Vieill., Enc. Méth., p. 81 (1823).

*Pachyptila forsteri*, Steph. in Shaw's Gen. Zool., XIII., pt. 1, p. 251 (1826).

*Prion forsteri*, Reichenb., Av. Syst. Nat. Natatores, Pl. 15, fig. 777 (1850).

*Prion magnirostris*, Gould, P. Z. S., 1862, p. 125.

*Prion australis*, Potts, Tr. N. Zeal. Inst., V., p. 205 (1872) ; id., Ibis, 1873, p. 85.

Ad. Cyanescenti-cinereus, pileo saturatiore : subtus albus : rostro lateraliter arcuato, latissimo : rostri lamellis valde indicatis distinguenda.

OF the genus *Prion* four species are recognised. They are alike in plumage and markings. There is very little difference in the dimensions except in the bill, and in the development of the lamellæ at the base of the upper mandible, but with respect to these characters great individual variation is displayed.

*Prion vittatus* has the largest bill, its sides being distinctly bowed and graduating towards the tip. *P. banksi* has the bill bowed on the sides, but it is smaller. I have, however, examined some specimens which could not be referred with certainty either to *P. vittatus* or *P. banksi*, but were intermediate between the two.

*P. ariel* and *P. desolatus* have the sides of the bill straighter, but as in the case of *P. vittatus* and *P. banksi*, it is not always possible to separate the two species definitely.

In 1879 Dr. Bowdler Sharpe gave a review of the genus *Prion*, and recognised

## MONOGRAPH OF THE PETRELS.

four forms, which he distinguished with difficulty. In 1896 Salvin admitted the same number of species, but relied principally on the presence or absence of lamellæ in the bill, and in their more or less pronounced development. The same four species are admitted by Professor Reichenow, and after a prolonged study, I think that, for the present at least, no alteration is advisable. I must, however, state that, in the large series which I have examined in the British Museum and in the Rothschild Collection, it has been impossible to define, from the characters of the width of the bill and its lamellæ, where one species ends and another begins, the connection between the broad-billed *Prion vittatus* and the thin-billed *P. desolatus* being practically complete, if a large series is examined.

So far as is known, no two forms of these Blue Petrels nest on the same island, but our knowledge is so limited that it would be unwise to alter the present determination.

*P. vittatus* is exceedingly difficult to identify when only described as a species of "Whale-bird" or "Blue Petrel," as they are called by sailors and travellers in the accounts of their voyages, and consequently where no specimens have been obtained at the time, it is impossible to say whether the bird observed was *Prion vittatus* or *P. banksi*. Thus *P. vittatus* is said to breed abundantly in holes on the island of Tristan da Cunha, and also on the Crozets, but the only specimen I have seen from the latter group of islands was *P. banksi*, and this is the species which is thrown up in numbers on the shores of Cape Colony after a storm. It should further be noted that some adult and young birds brought by Captain Armson from the Crozets and given to Mr. E. L. Layard, were identified by him as *P. banksi* (*Ibis*, 1867, p. 460). *P. vittatus* is also said to breed on the basaltic cliffs of Heard Island and Inaccessible Island.

A single specimen was obtained by the Scottish Antarctic Expedition on Gough Island, where great numbers of Blue Petrels were seen in the vicinity, but others which were shot were carried off by the voracious Skuas (Eagle Clarke, *Ibis*, 1905, p. 263).

This *Prion* is included as an inhabitant of the Mascarenes Seas by the Rev. J. Sibree (*Ibis*, 1892, p. 273).

A specimen from Marion Island, collected by the "Challenger" Expedition, and another obtained by Lord C. Campbell near the Crozet Islands during the same voyage, were referred by Salvin to *Prion vittatus*, but they seem to be *P. banksi*, though I admit that they are somewhat intermediate as regards the shape of the bill. The true *P. vittatus*, together with the eggs, was obtained by Macgillivray on St. Paul Island; these may be accepted as the first authenticated eggs of the Broad-billed *Prion*. The species does not breed on Kerguelen Island, where *P. desolatus* seems to take its place, but it must occur in the vicinity, as the Rev. A. E. Eaton found the skull of *Prion vittatus* in the stomach of a Giant Petrel. The German Expedition on the "Gazelle" met with the Broad-billed *Prion* at Kerguelen Island, but the American "Transit of Venus" Expedition did not see it, nor did Mr. Hall recognise the species on the island.

## PRION VITTATUS.

A specimen of *P. vittatus* procured by Macgillivray during the voyage of the "Rattlesnake," at the eastern entrance to Bass's Straits on July 11th, 1847, is in the British Museum, where also there are several examples from New Zealand. Here, according to Buller, numbers of these birds perish on the shores after a storm, as is the case with *P. banksi* and *P. desolatus*, but the three forms are seldom found at the same time, from which Buller infers that the flocks are separate.

Mr. Potts found this species, which he described as *Prion australis* from Foveaux Straits, breeding on Papatea, or Green Island, and he procured both eggs and young birds (*Ibis*, 1873, p. 85).

It nests on the Chatham Islands, whence Mr. H. H. Travers has forwarded eggs, and others have been found there by Dr. H. O. Forbes (*Ibis*, 1893, p. 542).

The broad-billed *Prion* likewise nests on the Auckland Islands, as the Rothschild Collection contains some downy nestlings from this locality; the species was also obtained on Campbell Island by Dr. Filhol.

A specimen of *P. vittatus* was obtained by Dr. E. A. Wilson during the Antarctic voyage of the "Discovery" in Lat. 45° S., Long. 40° 57' E.; and another example procured in the Pack Ice in Lat. 61° 46', Long. 140° 12' E., also seems to be referable to this species, but the bird obtained by Dr. Davidson of the relief ship "Morning," in Lat. 67° S., Long. 179° E., is in my opinion *P. banksi*, though it has a bill very like that of *P. ariel*.

The species probably occurs throughout the South Pacific Ocean, for Professor Giglioli says that on December 6th, 1867, a day after leaving the Straits of Magellan, in Lat. 51° 55', Long. 66° 69' W., several large Prions, with exceedingly broad bills, were seen following the "Magenta" for several hours. The sea was so rough that none could be caught, but no doubt could be entertained as to their identity (*Faun. Vertebr. Oceano*, p. 44).

The situation of the nesting place has not been described, but is doubtless like that of the better-known *P. desolatus*.

An egg from the Chatham Islands, according to Captain Hutton, is white, and measured 2 by 1.5 inches. Dr. H. O. Forbes describes it as yellowish-white, of an elongate, ellipsoid shape, and sometimes wider at one end than the other. Dimensions of four specimens: 2.2 by 1.39 inches; 1.91 by 1.40; 1.80 by 1.30; 1.88 by 1.40 (*Ibis*, 1893, p. 542).

All Blue Petrels seem to have very similar habits; they are seldom seen singly, but more often in small parties, and sometimes in immense numbers, as is proved by the wholesale destruction of these birds after a severe storm. The four forms appear to keep separate, but occasionally they are seen in company, and among the swarms of one species which are washed up ashore, there are generally to be found a few of another species. The *Prions* are much more gregarious than other Petrels, and the flight of *P. vittatus* is described by Professor

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Giglioli as quite different from that of *Æstrelata*, being swift but irregular, the wings being frequently opened and shut rapidly, recalling the flight of certain Doves, especially that of the Turtle Dove. It feeds chiefly on cephalopods.

*Adult.* General colour above blue-grey, the long scapulars black towards the ends, which are broadly tipped with white; wing-coverts like the back, edged with paler grey, the lesser and marginal coverts blackish, as also the bastard-wing, primary-coverts and primaries, the latter white or greyish along the inner web; inner primaries slaty-grey, blackish towards the ends; secondaries lighter grey, the innermost blackish for the greater part of the outer web; on the rump a patch of black; sides of the rump, upper tail-coverts and tail-feathers blue-grey, the centre ones with a broad black bar, disappearing towards the outermost feathers, which have black ends and black shafts; crown of head darker grey, the feathers having dusky centres, more distinct towards the forehead, where the centres to the feathers are smaller; lores greyish, the feathers below the eye greyish-white, slightly spotted with ashy; the ear-coverts bluish-grey, blackish along the upper edge; cheeks and under-surface of body pure white, the sides of the foreneck and sides of chest blue-grey; the lower flanks and under tail-coverts light blue-grey, the bases of the latter white, the long coverts black, with ashy bases; under wing-coverts, axillaries, and quill-linings pure white. Total length: 11.5 inches; culmen, 1.3; breadth of bill, 0.8; wing, 8.4; tail, 3.9; tarsus, 1.25; middle toe and claw, 1.75.

A specimen from Pitt's Island, Chatham Group, has the soft parts thus recorded on the label:—"Bill light blue, deepening into black on the sides of the nostrils and at the tip, with a black line along the sides of the under mandible;\* feet beautiful light blue; iris dark brown." The example obtained off Gough Island by the naturalists of the Scottish Antarctic Expedition had the soft parts as follows:—"Lower plate of mandible pale blue, and the remainder of the bill black; tarsus and toes cobalt-blue; webs black."

The measurements of a series of specimens in the British Museum are as follows:—

Length of culmen, 1.2–1.4 inch (♂ 1.2–1.3; ♀ 1.3).

Breadth of culmen, 0.6–0.9 inch (♂ 0.65–0.9; ♀ 0.6).

Wing, 7.5–8.2 inches (♂ 7.35–8.1; ♀ 7.5).

Tarsus, 1.25–1.45 inch (♂ 1.25–1.45; ♀ 1.4).

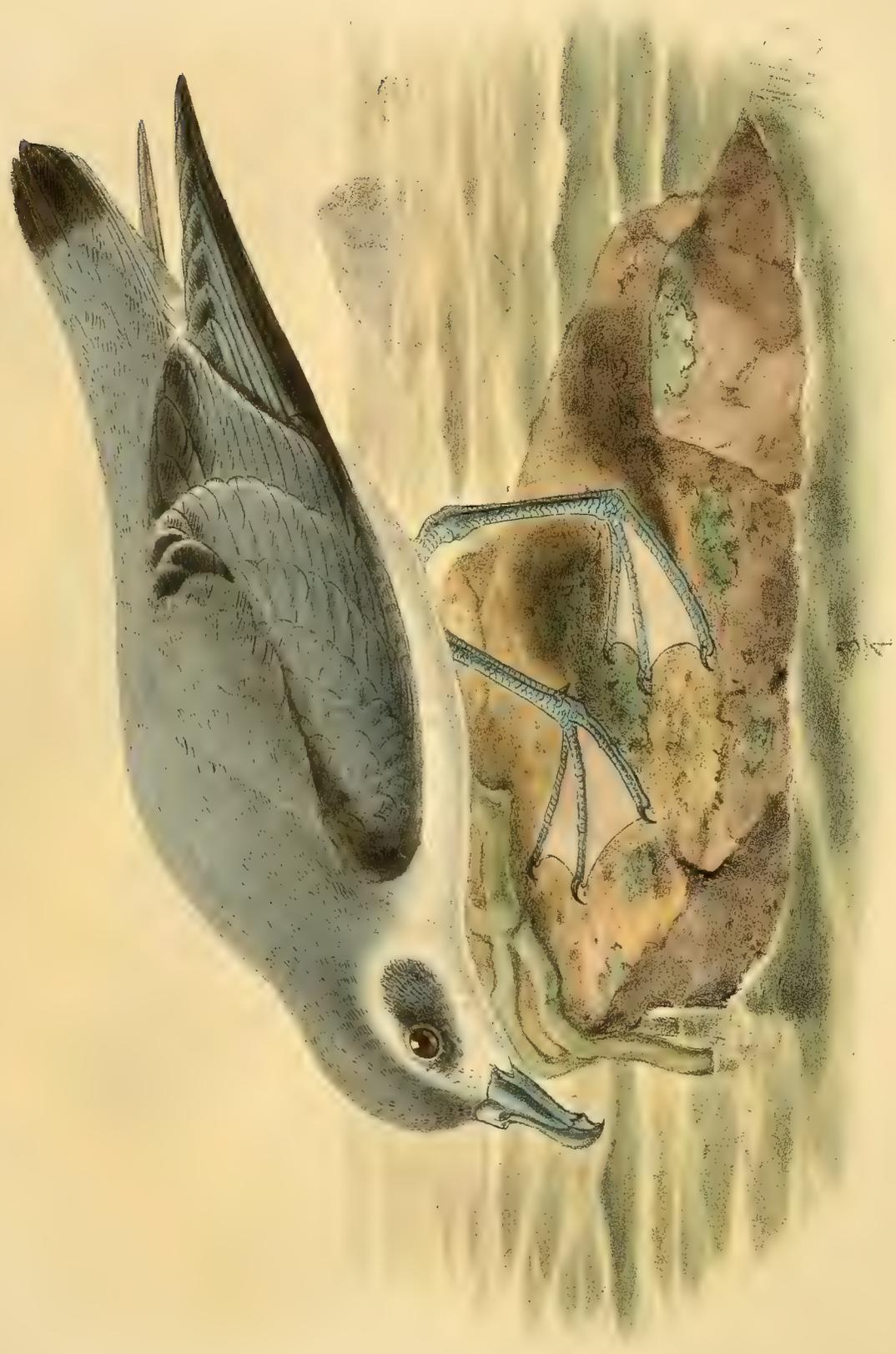
Middle toe and claw, 1.45–1.65 inch (♂ 1.45–1.6; ♀ 1.6).

From the few examples in the British Museum which are sexed, the female appears to be a trifle smaller than the male.

The bird described was captured by Dr. G. A. Davidson during the expedition of the relief ship "Morning," November 11th, 1902. The figure is taken from a New Zealand specimen in our collection.

\* In a drawing of a fresh specimen from Gough Island obtained by the Scottish Antarctic Expedition, the bill is represented as black; the lower part of the lower mandible only is grey-blue.





## 98. PRION BANKSI (*Smith*).

(BANK'S BLUE PETREL.)

(PLATE 83.)

*Pachyptila banksi*, Smith, Ill. Zool. S. Africa, Birds, Pl. LV. (1849).

*Prion banksi*, Gould, Ann. and Mag. Nat. Hist., XIII., p. 366 (1844); id., Handb. Birds Austr., II., p. 474 (1865); Gigl., Faun. Vertebr. Oceano, p. 44 (1870); Buller, Birds New Zeal., p. 311 (1873); 2nd ed., II., p. 211 (1888); Salvin, Cat. Birds Brit. Mus., XXV., p. 434 (1896); Sharpe, Rep. Coll. "Southern Cross," p. 159 (1902); Wilson, Nat. Antarctic Exped., II., Aves, p. 106 (1907); Reichenow, Deutsche Südpolar Exped., IX., Zool., I., p. 556 (1908).

*Prion rossii*, Gray, List Anseres Brit. Mus., p. 165 (1844).

*Procellaria banksii*, Schlegel, Mus. Pays-Bas, VI., Procell., p. 17 (1863).

*Pseudoprion banksii*, Coues, Pr. Acad. Philad., 1866, pp. 166, 172.

*Pachyptila vittata* (nec Gm.), Cab. and Reichenow, J. f. O., 1876, p. 328.

*Prion* sp., Hume, Str. F., II., p. 317 (1874); V., p. 304 (1877).

*P. vittato* similis, vix minor: pileo dorso concolori, vix fuscescentiore: sed rostro debiliore, lateraliter minus arcuato, et lamellis maxillaribus minus obviis distinguendus.

ALTHOUGH there is very little real difference in colour between *P. banksi* and *P. vittatus*, the former is of a paler blue-grey, and the head is more uniform with the back, not dusky as in *P. vittatus*. The bill is bowed laterally towards the tip, but is never so broad as in the last-named species: the lamellæ, though always present, are not so strongly developed, nor so much in evidence when the bill is closed.

Specimens of *P. banksi*, in the British Museum, give the following measurements, which may be compared with those of *P. vittatus* :—

Length of Culmen.	Breadth of Culmen.	Wing.	Tarsus.	Middle toe and claw.
1.1–1.2	0.5–0.6	7.3–7.6	1.2–1.35	1.5–1.6

Bank's Blue Petrel is stated by Gould (*l.c.*) to be found in the temperate latitudes of both the Atlantic and Pacific Oceans.

## MONOGRAPH OF THE PETRELS.

Professor Giglioli during the voyage of the "Magenta," records the species as having been met with on February 16th, 1866, in Lat. 42° 53' S., Long. 26° 11' W., and on March 4th in Lat. 42° 51' S., Long. 10° 15' E.; one example was again seen, accompanied by several *P. turtur* (= *P. desolatus*), on March 20th, in Lat. 41° S., Long. 66° 04' E. On July 6th, while in the Pacific Ocean, in Lat. 37° 46' S., Long. 174° 48' W., more birds reappeared, and remained till July 27th, in Lat. 38° 06' S., Long. 111° 50' W.; again it was observed in September on the journey from Callao to Valparaiso, and followed the ship till within sight of Aconcagua, Chile.

This species is abundant in the Cape Seas, where the type was obtained by Sir Andrew Smith, and other records of its occurrence are Table Bay (Layard), Pondo Land, where the birds were often driven inland in rough weather (Shortridge), Natal, where hundreds of dead and dying birds were washed ashore during a great gale in August, 1862 (Gurney, *Ibis*, 1864, p. 355), and in similar conditions, others were found at the mouth of the Zambesi River (*Ibis*, 1864, p. 338) by Sir John Kirk, who further reports these birds in the Mozambique Channel, and as abundant off the Seychelles, whilst Dr. Dickinson found them off the Comoro Islands.

Further records are from Lat. 41° S., Long. 46° E.; Lat. 43° S., Long. 107° E.; Lat. 44° S., Long. 138° E. (Layard, *Ibis*, 1867, p. 460). Captain Armson obtained specimens in the Crozets, and a bird collected there by Mr. Ring is undoubtedly *P. banksi*. Professor Vanhöffen records the species in Lat. 56° S., Long. 30° E., and Dr. Husker from Kerguelen, but hitherto the only Prion I have seen from that island is *P. desolatus*. Specimens of *P. banksi* were procured, in Lat. 42° 23' S., Long. 20° 32' E. (N. Hanson; Sharpe, *Rep. Voy. "Southern Cross,"* p. 159); Lat. 35° 20' S., Long. 9° 43' W. (Earl of Crawford); Lat. 35° S.; Long. 0½° E. (Macgillivray); Lat. (Sir George Grey) 35° 1' S., Long. 6° 15' E.

The species has been traced across the South Indian Ocean to Australia, and is apparently generally distributed on both sides of that Continent, whence it ranges to the New Hebrides and Celebes; a skeleton from the latter locality has been recorded by Salvin in the "Catalogue of Birds of the British Museum," XXV., p. 434; but it was not mentioned by Dr. Meyer and Mr. Wigglesworth in their "Birds of Celebes."

The British Museum contains specimens from New Zealand, where Hutton considered *P. banksi* to be the commonest species, but Sir W. Buller did not agree, and thought *P. turtur* (*P. desolatus*) more plentiful, as it occurred on every part of the coast, where *P. banksi* was rare.

Dr. Wilson, of the "Discovery," found *P. banksi* on Macquarie Island, and in the Auckland Islands, where it was breeding; this is at present the only authentic account of its nesting (*Nat. Antarct. Exp. Birds*, p. 106).

Banks' Blue Petrel is also recorded from the Antarctic regions, and Dr. H. O. Forbes mentions a specimen in the Liverpool Museum procured by Sir J. Hooker during the voyage of the "Erebus" and "Terror" off Victoria Land in Lat. 74° S. (*Bull. Liverp.*

## PRION BANKSI.

*Mus.*, II., p. 48, 1899), but it was not observed in this locality by the naturalists of the "Southern Cross." Dr. Davidson, of the relief ship "Morning," obtained an example in Lat. 67° S., Long. 179° E., on November 25th, and Dr. Wilson says that the birds were numerous in December between New Zealand and the ice of Ross's Sea, but they were not seen after the "Discovery" had entered the Ice Pack. Other localities mentioned are Kaiser Wilhelm II. Land (Vanhöffen), just without the Antarctic Circle, on March 18th, 1903, and between it and Kerguelen Island; South Georgia, November to March (Swedish Expedition); South Orkneys (Bruce): no nests were found there, but it is probable that *P. banksi* breeds in these islands. The species was also captured in the Weddell Sea on February 25th and 26th, 1904 (Eagle Clarke, *Ibis*, 1907, p. 342), and in the Ice Pack, Lat. 59° 42' S., Long. 34° 14' W., on February 9th, 1903; these were the only examples procured by the Scottish Antarctic Expedition on their first voyage, though more were obtained on the second.

Nothing of any moment appears to have been published respecting the habits of *Prion banksi*, they are doubtless similar to those of the other species of *Prion*. At sea they assemble in large flocks, in which Professor Giglioli says there are sometimes found examples of *Prion desolatus* and *P. ariel*.

*Adult male.* Very similar to *P. vittatus*, but with a smaller bill, as before mentioned. Ashy-blue above and pure white below; head and nape a little darker and more dusky than the back; marginal wing-coverts ashy-black; longer scapulars black towards the ends, and margined with pearly-grey; bastard-wing, primary-coverts and outer primaries black, the inner webs of the latter hoary-white, becoming grey towards their ends, which are black; inner primaries and secondaries pearly-grey, with white margins; lower back, rump, upper tail-coverts and tail-feathers ashy-blue, the centre feathers with broad black ends, the outer ones narrowly tipped with white; lores and sides of face pure white; over the eye a slight indication of a white stripe; in front of the eye a black spot; feathers below the eye and ear-coverts dark slaty-grey; under-surface of body, under wing-coverts, axillaries, and quill-linings pure white. Total length, 10.0 inches; culmen, 1.1; width of bill, 0.6; wing, 7.8; tail, 3.6; tarsus, 1.2; middle toe and claw, 1.55.

Professor Giglioli gives the colour of the bill and feet as follows:—"Bill turquoise lead-colour, with the margins and tip whitish; tarsi and toes clear turquoise-blue, with the interdigital membrane yellowish-white; iris brown." Mr. Shortridge states that the bill is "blue and slate-colour," the legs "slaty-blue," the iris black. The naturalists of the Scottish Antarctic Expedition record the colour of the bill and feet as bluish-grey, and the iris as brown.

The male described was procured by Nikolai Hanson in Lat. 42° 23' S., Long. 20° 32' E., during the "Southern Cross" Expedition. The specimen figured is probably one from our collection, but I cannot identify the bird selected.

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In a coloured sketch made by Dr. Pirrie, of the "Scotia," of a fresh specimen of *P. banksi*, obtained about midway between the South Orkneys and Thule Island, the bill is bluish-grey, but the nasal tubes and culmen to the tip of the unguis, are depicted as black; the bluish-grey colour being restricted to the lateral plate of the upper, and the whole of the lower, mandible. A sketch of *P. vittatus* also made during the Scottish Expedition, represents the bill of this bird as blackish, with the exception of the lower plate of the under mandible, which alone is bluish-grey; the tip and upper margin of the under mandible are black. This difference in the colour of the bills of the two species, if constant, may prove a better character for their separation than any of those hitherto put forward. I can, however, detect no difference in the colour of the bills of these birds in preserved specimens.





## 99. PRION DESOLATUS (*Gm.*).

(DOVE-LIKE BLUE PETREL.)

(PLATE 84.)

*Brown-banded Petrel*, Lath., Gen. Syn., III., pt. 2, p. 409 (1785).

*Procellaria desolata*, Gm., Syst. Nat., p. 562 (1788); Kuhl. Beitr., p. 143 (1820).

*Procellaria turtur*, Parkinson, Icon. ined., 15; Kuhl, Beitr., p. 143 (1820); Smith, Ill. Zool., S. Africa, Birds, Pl. LIV. (1840); Sharpe, Hist. Coll. Brit. Mus., II., p. 175 (1906).

*Procellaria fasciata*, Bonnat., Enc. Méth., I., p. 79 (1790).

*Daption desolatum*, Steph. in Shaw's Gen. Zool., XIII., pt. 1, p. 244 (1826).

*Prion turtur*, Gould, Ann. and Mag. Nat. Hist., XIII., p. 366 (1844); id., Birds Austr., VII., Pl. 54 (1844); id., Handb. Birds Austr., II., p. 472 (1865); Buller, Birds New Zeal., p. 309 (1873); id., op. cit., ed. 2, II., p. 209 (1888).

*Æstrelata desolata*, Bp., Comptes Rend., XLII., p. 768 (1856).

*Pseudoprion turtur*, Coues, Pr. Acad. Philad., 1866, pp. 166, 172.

*Pseudoprion desolatus*, Coues and Kidder, Bull. U. S. Nat. Mus., No. 2, p. 32 (1875).

*Pachyptila turtur*, Cab. and Reichenow, J. f. O., 1876, p. 328.

*Prion desolatus*, Salvin, P. Z. S., 1878, p. 738; Sharpe, Phil. Trans., Vol. 168, p. 137 (1879); Salvin, Cat. Birds Brit. Mus., p. 434 (1896); Reichenow, Deutsche Südpolar Exped., IX., Zool., I., p. 556 (1908).

*Prion dispar*, Vanhöffen, J. f. O., 1905, p. 505.

*P. vittato* et *P. banksi* similis, sed rostro multo tenuiori et rostri lamellis prope basin fere obsoletis.

THOUGH resembling the other members of the genus in colour and markings, this species has quite a slender bill, with a straight outline, when seen from above, and not bowed towards the tip as in *P. vittatus* and *P. banksi*. The lamellæ are much reduced in size and number, and are confined to the base of the maxilla: even when the bill is open, they are very difficult to see, and are invisible when it is closed. The colour of the head is scarcely any darker than the back.

Gould also says that *P. desolatus* may be distinguished from *P. banksi* by the

## MONOGRAPH OF THE PETRELS.

delicate blue tint of the upper surface. There is, however, considerable variation in this respect, as also in the blackish stripe which extends behind the eye down the sides of the neck, and is sometimes distinct, but at other times scarcely perceptible.

No actual limits as to width of bill can be drawn between *P. vittatus* and *P. banksi*, neither can the exact differences in the proportions of the bills of *P. banksi*, *P. brevirostris*, and *P. desolatus* be defined. There seems indeed to be a perfect gradation between all these Blue Petrels, and it is impossible to say where one form ends and the other commences.

The following are the measurements of a series of *P. desolatus* in the British Museum :—

Length of Culmen.	Breadth of Culmen.	Wing.	Tarsus.	Middle toe and claw.
0.9–1.05	0.45–0.5	7.1–7.4	1.2–1.35	1.3–1.6

This species was discovered during Captain Cook's first voyage, and a specimen captured in Lat. 59°, was figured by Sydney Parkinson. On this drawing, which is only a pencilled outline, in the Banksian Collection of pictures in the British Museum, the name of *Procellaria turtur* was founded by Kuhl. The oldest name, however, is that of *P. desolata* of Gmelin, founded on the "Brown-banded Petrel" of Latham, described from an example in Sir Joseph Banks' Collection, and procured on Desolation, or Kerguelen, Island: it is doubtless the specimen obtained by Captain Cook.

Examples of this and the allied species have a band of black across the upper-surface of the body which, according to Gould, looks like a black W when the wing is expanded. It seems strange that Latham named the bird the "Brown-banded Petrel," but it should be noticed that Dr. E. A. Wilson states that *P. banksi*, as seen from the "Discovery," in some lights completely lost its blue colour, and appeared to be pale brown, conveying the idea that two different Petrels of the same size composed the flock (*Nat. Antarctic Exped.*, II., Aves, p. 106).

Gould believed that this Blue Petrel traversed the whole surface of the Atlantic and Pacific Oceans, between the 30th and 50th degree of south latitude, as he saw and frequently killed specimens while sailing within the above limits; he also shot it in company with *P. banksi*, and it appears to have a similar range, being equally numerous in the temperate latitudes of the Pacific and the Atlantic Oceans.

During the voyage of the "Magenta" Professor Giglioli found this *Prion* sometimes in small, and at other times in large numbers. The first was seen on March 16th, 1866, in Lat. 42° 54' S., Long. 44° 46' E.; up to the 18th of that month there were fewer seen. Four days later many hundreds were observed in Lat. 41° S., Long. 66° 04' E. On the journey between Batavia and Melbourne this Blue Petrel was noticed from April 23rd in small parties (Lat. 37° 22' S., Long. 112° 5' E.) till the 28th of the same month Lat. 39° 36' S., Long. 126° 25' E.; in the Pacific the species was scarcer, a single example being captured in Lat. 36° 36' S., Long. 89° 54' W. On November

## PRION DESOLATUS.

7th a great flock of these birds passed the ship in Lat. 40° 39' S., Long. 78° 51' W. *P. desolatus* apparently predominated in the Indian Ocean, and *P. banksi* in the Pacific.

In Australia it is said by Mr. A. J. Campbell to occur in the seas of South Queensland, New South Wales, Victoria, South and West Australia, and Tasmania (*Nests and Eggs Austr. Birds*, II., p. 916). According to Buller, the species is abundant off the coasts of New Zealand, and great numbers perish during tempestuous weather, when they are driven ashore. Mr. Reischek found the birds breeding on Little Barrier Island and the "Chickens"; he procured fresh eggs on November 1st, and found young birds in December. It has also been recorded as nesting on the island of Kapiti, in Cook's Strait, by Mr. Percy Seymour.

The late Captain Hutton said that *P. desolatus* breeds on Antipodes Island, and Buller received nestlings from outlying rocks of the Chatham group. Mr. H. H. Travers found the species on the last named islands in immense numbers, breeding in holes in the ground.

Buller relates that the birds are very active on the wing, rarely settling on the water, but hovering over the rolling billows, and dancing in the trough of the sea. Sometimes they poise their bodies like butterflies over a flower, at other times cleaving the air with the swiftness of a meteor, but always intent on the capture of the small marine animals on which they feed. He further states that he has seen these birds on the wing in flocks of many hundreds, and they suffer more than any other Petrel in stormy weather, at which time the coasts are often strewn with the bodies of dead and dying birds. He mentions that he has revived some of the birds by placing them in the pocket of his overcoat, and has kept them alive for several days. On the approach of night they always became more animated, seeking the darker corners of the room, and fluttering about in an excited manner, with a rapid twittering note, from which Buller concluded that the species was nocturnal in habits. During the daytime, the eyes were always half closed, imparting a peculiar fretful expression to the face. On taking one in his hand and inserting its bill in a glass of water, it would at once commence to move its feet, as if in the act of swimming or treading the water. Before rising from a plane surface, the birds always ran for a few feet with the wings outstretched, so as to give the body an impetus, and they never seemed to tire of climbing over the armchairs or other inclined surfaces in the room, using both wings and feet in this operation (Buller, *Birds New Zeal.*, p. 309, 1873).

*P. desolatus* breeds on Kerguelen Island, where the Rev. A. E. Eaton found it in scarcely conceivable numbers. The birds were silent during the day, unless disturbed, when they commenced to coo, but their note, when in flight, he describes as "u-u, u-u, u-u." On calm nights at the end of October and beginning of November their mingled cries and the rustling of their wings as they flew, produced a low continuous murmur like the sound of distant street traffic in a large town (Sharpe,

## MONOGRAPH OF THE PETRELS.

*Phil. Trans.*, Vol. 168, p. 137). Mr. R. Hall (*Ibis*, 1900, p. 29) relates that he saw *P. desolatus* in countless numbers in Royal Sound, Kerguelen Island, where they breed, frequently in old rabbit holes. The nests are composed of stalks of coarse seaweed, with stems of limp grass in the centre; the eggs are clear white when fresh.

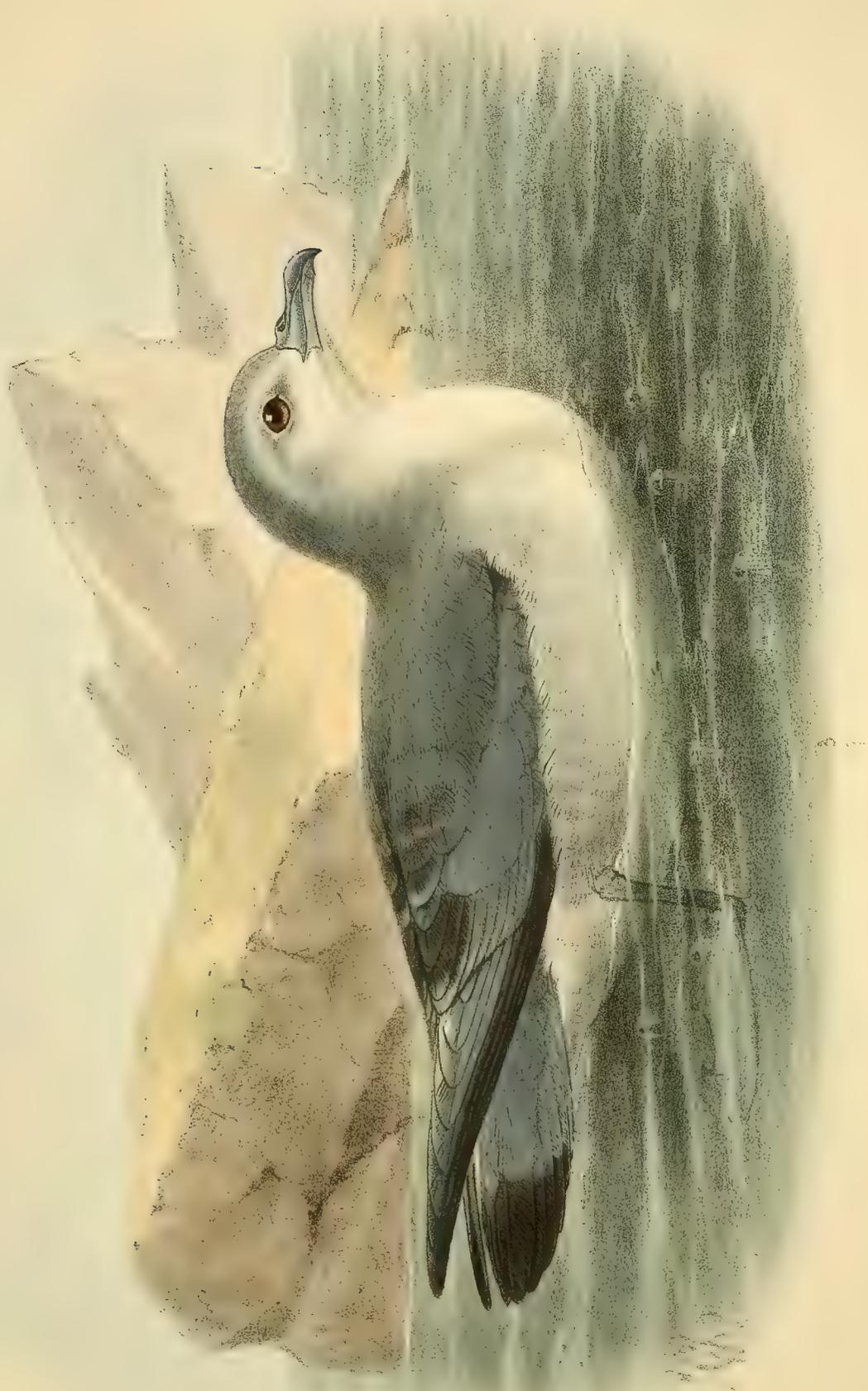
Mr. E. W. Oates gives the measurements, Axis, 1.8–2.05 inches, diameter, 1.24–1.46.

*Adult male.* Similar to *P. banksi*, but of a slightly paler and more delicate bluish-grey, the head not being perceptibly darker than the back, and the dusky grey streak from the eye along the upper edge of the ear-coverts not quite so pronounced; "bill bluish-grey, darker on the sides, and inclining to black at the base; legs and feet light blue, tinged with green in front, the webs whitish-grey; iris brownish-black" (Buller). Total length about 10.5 inches; culmen, 1.05; wing, 7.25; tail, 3.55; tarsus, 1.2; middle toe and claw, 1.5.

*Adult female.* Similar to the male. Total length, 10.2 inches; wing, 7.2; tarsus, 1.2; middle toe and claw, 1.35.

The male described is from Royal Sound, Kerguelen Island, collected by the Rev. A. E. Eaton; the female is from Betsy Cove, Kerguelen Island (*Voy. H.M.S. "Challenger"*). The specimen figured is a male, also from Betsy Cove, and all three examples are in the British Museum.





J.C. Keulemans del. et lith.

PRION ARIEI.

Hanhar: imp.

## 100. PRION BREVIROSTRIS, *Gould.*

(SHORT-BILLED BLUE PETREL.)

(PLATE 85.)

*Prion ariel*, Gould, Ann. and Mag. Nat. Hist., XIII., p. 366 (1844: descr. nulla); id., Handb. Birds Austr., II., p. 473 (1865); Giglioli, Faun. Vertebr. Oceano, p. 45 (1870); Buller, Birds New Zeal., 2nd ed., II., p. 213 (1888); Salvin, Cat. Birds Brit. Mus., XXV., p. 436 (1896).

*Prion brevirostris*, Gould, P. Z. S., 1855, p. 88, Pl. 93; Buller, Suppl. Birds New Zeal., I., p. 125 (1905); Reichenow, Deutsche Südpolar Exped., IX., Zool., I., p. 557 (1908).

*Procellaria ariel*, Gray, Ibis, 1862, p. 247; Schl., Mus. Pays-Bas, VI., Procell., p. 18 (1863).

*Pseudoprion ariel*, Coues, Pr. Acad. Philad., 1866, pp. 166, 172.

*Pseudoprion brevirostris*, Coues, t.c., pp. 167, 172.

*Pachyptila ariel*, Cab. and Reichen., J. f. O., 1876, p. 328.

Ad. *P. desolato* similis, pulchre cyanescenti-cinereus, pileo dorso concolori, haud fuscescentiore: rostro parviore, brevior, tamen crassior distinguendus.

THIS species is closely allied to *P. desolatus*, and resembles it in colour; the chief difference lies in the shorter and stouter bill of *P. brevirostris*, which varies greatly in size, the sides not being bowed in towards the tip, while the lamellæ are evanescent.

The head and back are alike in colour, and no sign of a darker cap is visible; the under tail-coverts seem to be more blue-grey and are less white towards the base than in *P. desolatus*. This appears however to be a variable character, and I do not attach much importance to it, or to the supposed greater extent of black at the end of the tail.<sup>4</sup>

The following is a summary of the measurements of the series in the British Museum:—

Culmen.	Width of Culmen.	Wing.	Tarsus.	Middle Toe and Claw.
0.88–0.98	0.35–0.4	6.3–7.35	1.1–1.3	1.4–1.55

Gould's name for this *Prion* must be changed, as although he quotes his

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description of *P. ariel* as occurring in a paper published in the "Proceedings of the Zoological Society," it is not to be found there, and it therefore becomes a *nomen nudum*. As Professor Reichenow points out, the bird must now be designated *P. brevirostris*. Although Sir Walter Buller separated the two forms under the names of *P. ariel* and *P. brevirostris*, I can see no difference between the type specimen of the latter from Madeira and the ordinary specimens from Australian Seas usually called *P. ariel*.

Gould found the species not uncommon in Bass's Straits, whence Mr. A. J. Campbell has also recorded it from North-East Island in the Kent group; it was breeding plentifully in the crevices of rocks and under the densely matted stems and roots of pig-face weed, but no account of the eggs was given. Nests have been met with in other parts of the Straits, notably on Albatros Rock, where Messrs. D. Le Souëf and H. P. C. Ashworth found them in 1894, also on Craggy Island and other spots (Campbell, *Nests and Eggs Austr. Birds*, II., p. 918, 1901). Eggs were procured by Mr. Percy Seymour on the Brothers Island in Cook's Straits.

There are several examples from New Zealand in the British Museum, and the Rothschild Collection contains two specimens in down from the Chatham Islands.

*P. brevirostris* is said to be distributed over the Southern Oceans between Lat. 35° and 60° S., and during the voyage of the "Magenta" Professor Giglioli obtained a specimen out of a flock of *P. banksi* on July 22nd, 1867, Lat. 38° 39' S., Long. 128° 58' W. (*Faun. Vertebr. Oceano*, p. 45).

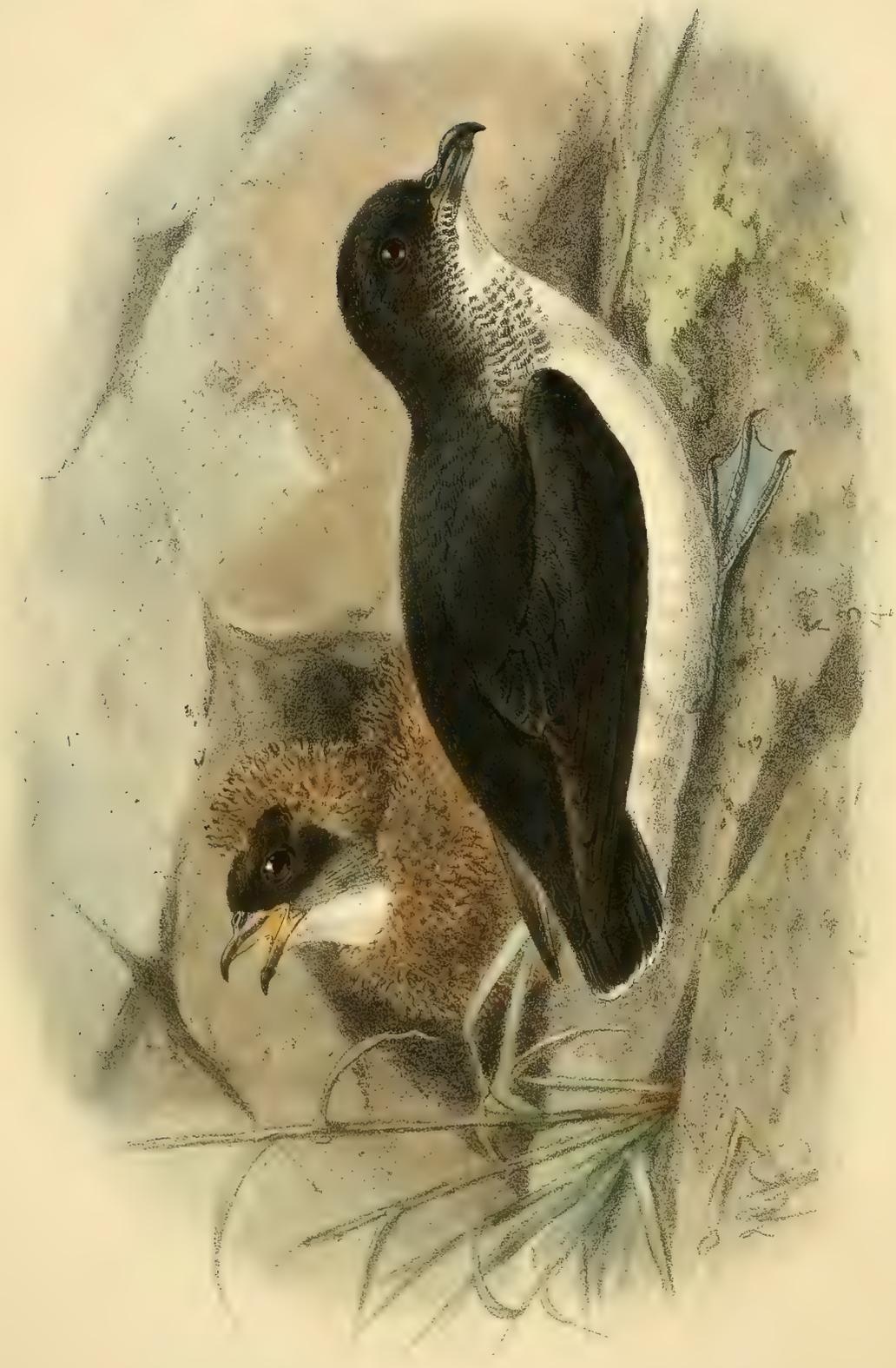
The series in the British Museum shows that it is found in the South Indian Ocean, and a specimen from Kerguelen Island certainly belongs to *P. brevirostris* and not to *P. desolatus*. The species extends apparently from the Cape as far north as Madeira, where Gould procured his type of *P. ariel*, now called *P. brevirostris*.

*Adult.* Although in other respects resembling *P. desolatus*, the stoutness of the bill in *P. ariel* easily distinguishes it from the former; the bill is also straight along the sides, not bowed inwards towards the tip, and both species agree in having the head exactly like the back, with no sign of a dusky crown; the dusky mark in front of the eye and the blackish streak along the upper edge of the ear-coverts are very faintly indicated. Total length about 9.5 inches, culmen, .85; wing, 7.1; tail, 3.3; tarsus, 1.2; middle toe and claw, 1.35.

The description and figure are taken from one of the typical specimens of *P. ariel*, received by us in exchange from Gould (spec. e of the British Museum "Catalogue of Birds," XXV., p. 436). \*

The Plate is lettered *Prion ariel*, which was the title generally received when the figure was drawn.





## 101. PELECANOIDES URINATRIX (*Gm.*).

(DIVING PETREL.)

(PLATE 86.)

- Diving Petrel*, Forster, *Voy. I.*, p. 189 ; Lath., *Gen. Syn.*, III., pt. 2, p. 413 (1785).  
*Procellaria urinatrix*, Gm., *Syst. Nat.*, I., p. 560 (1788) ; Kuhl, *Beitr.*, p. 145 (1820).  
*Pelecanoides urinatrix*, Lacép., *Mém. de l'Inst.*, III., p. 517 (1801) ; Coues, *Pr. Acad. Philad.*, 1866, p. 190 ; Buller, *Birds N. Zeal.*, p. 313 (1873) ; *id.*, *op. cit.*, 2nd ed., II., p. 207 (1888) ; Salvin, *Cat. Birds Brit. Mus.*, XXV., p. 437 (1896).  
*Haladroma urinatrix*, Illiger, *Prodr.*, p. 274 (1811) ; Gould, *Handb. Birds Austr.*, II., p. 483 (1865).  
*Procellaria bérard*, Quoy et Gaimard, *Voy. "Uranie," Zool.*, p. 135, Pl. 37 (1824).  
*Haladroma berardi*, Temm., *Pl. Col.*, Pl. 517 (1831).  
*Pelecanoides berardi*, Gould, *Voy. "Beagle," II.*, *Birds*, p. 138 (1841) ; Coues, *Pr. Acad. Philad.*, 1866, p. 190 ; Buller, *Birds N. Zeal.*, p. 314 (1873) ; *id.*, *op. cit.*, ed. 2, II., p. 208 (1888).  
*Procellaria tridactyla*, Forster, *Descr. Anim.*, p. 149 (1844).  
*Puffinuria urinatrix*, Gould, *Birds Australia*, VII., Pl. 60 (1844).

Niger : subtus pure albus, hypochondriis tantum cineraceis vel cineraceo lineatis.

THE Diving Petrel was first discovered in Queen Charlotte's Sound, New Zealand, during Captain Cook's second circumnavigating voyage, and the original specimen was figured by George Forster in the series of drawings which he executed for Sir Joseph Banks. There are several examples in the British Museum from New Zealand, and Buller states that he found the species in large flocks and extraordinarily plentiful, especially in the Hauraki Gulf, where it occurs at all seasons of the year (*Birds New Zeal.*, p. 314). Other breeding places recorded by Buller are, Stephen's Island in Cook's Straits, Karewa Island off Tauranga, the small islets off the Great Barrier Island, and also on the Hen and Chickens.

Captain Hutton states that *P. urinatrix* occurs on the Auckland Islands (*Ibis*, 1869, p. 352), and young birds in down were procured there during the voyage of the "Erebus" and "Terror." The Rothschild Collection contains an example

## MONOGRAPH OF THE PETRELS.

from the same locality obtained in the month of March, which has a grey neck, similar to one from Stewart Island, obtained in December, 1814. The same collection includes two birds from the Macquarie Islands captured in October, 1899, but both have pure white throats. Mr. Campbell says that *P. urinatrix* is found in the seas of New South Wales, Victoria, and South Australia (*Nests and Eggs Austr. Birds*, p. 919), and Gould observed that it was very abundant in Storm Bay, Tasmania.

*P. urinatrix* occurs again in the Straits of Magellan, and I am unable to perceive any difference in specimens from the extreme south of South America and those from New Zealand. No species of *Pelecanoides* is recorded by Wilesworth from the Pacific Ocean in his "Aves Polynesiæ," nor has *P. urinatrix* been met with in the South Indian, or South Atlantic Oceans. On Kerguelen and the Crozet Islands *P. exsul* only has been found, but Professor Giglioli during the voyage of the "Magenta" shot two specimens of *P. urinatrix* in the Channels of Western Patagonia, and a few days later procured a third example, at Playa Parda, near the western entrance to the Magellan Straits.

These birds are seldom seen in the open sea, but among the few instances mentioned is one by Dr. E. A. Wilson of the "Discovery," which probably referred to *P. exsul* (*vide infra*), and another by Gould (*Handb. Birds Austr.*, p. 483), who observed a species of *Pelecanoides* about 20° east of New Zealand; it was feeding on some small animals close to the surface of the water, now diving and rising again, skimming close to the surface, and then flying off in a straight line with a quick fluttering motion of the wings.

The British Museum contains specimens of a *Pelecanoides* from South America, which, following Salvin, I refer to *P. urinatrix*. In addition to the Falkland Islands birds in the Museum, there are others from Cockle Cove, Antonio Island, and Wood's Bay in the Straits of Magellan, obtained by Dr. Coppinger, during the cruise of H.M.S. "Alert," and others were procured by H.M.S. "Challenger" in Cove Harbour, Messier Channel (Salvin, *Cat. Birds Brit. Mus.*, XXV., p. 438). Darwin, in the "Voyage of the 'Beagle'" (II., p. 138), says that the bird was common in the deep and quiet creeks and inland seas of Tierra del Fuego, and on the west coast of Patagonia as far north as the Chonos Archipelago; only once did he observe it on the open sea, between Tierra del Fuego and the Falkland Islands. Mr. M. J. Nicoll, during the cruise of the "Valhalla," obtained specimens in Molyneux Sound, Smythe's Channel. Dr. E. A. Wilson also records a *Pelecanoides* in the Straits of Magellan in July (*Nat. Antarct. Exped.*, *Aves*, p. 107), and Captain Crawshay includes the species in the avifauna of Tierra del Fuego, a specimen having been blown ashore in Useless Bay (*Birds of Tierra del Fuego*, p. 143).

The Diving Petrel well deserves its name from its distinctive habits, while in consequence of its weak flight, it is chiefly an inhabitant of the still waters of sheltered bays.

Although widely differing in structure, *P. urinatrix*, in appearance, closely resembles

## PELECANOIDES URINATRIX.

the Little Auk (*Mergulus alle*) of the northern oceans, and has the same habit of diving, fishing and flying. How great is the resemblance may be gathered from the fact, that labels attached to the specimens procured by the first Antarctic Expedition were simply labelled "Auk." Darwin wrote:—"No one seeing this bird for the first time, thus diving like a Grebe, and flying in a straight line, by the rapid movements of its short wings, like an Auk, would believe that it was a member of the family of Petrels, the greater number of which are eminently pelagic in their habits, do not dive, and whose flight is usually most graceful and continuous." He believed that the birds seldom take wing during the daytime if undisturbed, but in the evenings he observed them at Port Famine flying in straight lines from one part of the Sound to another.

The food of the Diving Petrel seems to be of a varied character, consisting of small marine animals, which it takes from the surface of the water, and fish, for which it dives (*cf.* Nicoll, *Ibis*, 1904, p. 47), while Buller once found spores, apparently of a seaweed, in the crop of a bird (*Birds New Zeal.*, 2nd ed., II., p. 207).

The single white egg is laid in a burrow scraped out by the birds themselves, from six to eight inches deep, under ground or under a ledge of rock.

*Adult male.* General colour above glossy-black, with a faint tinge of purplish-blue, the inner scapulars greyish on their inner webs and at the ends, forming an indistinct line of ashy-grey on each side of the mantle; wing-coverts and quills entirely black, with indistinct margins of white on the secondaries; tail-feathers black, the outer ones indistinctly margined with greyish-white; crown of head like the back, the lores, sides of face and ear-coverts sooty-black, the cheeks ashy-grey, like the lower throat; chin and upper throat and remainder of under-surface of body pure white; sides of the fore-neck and chest indistinctly barred, the feathers having a subterminal bar of dull ashy-grey, edged with white; sides of body shaded with grey, forming a patch on the lower flanks, where the feathers have dusky shaft-streaks and white margins; under wing-coverts ashy-white, with an interrupted band of dusky-brown round the bend of the wing; axillaries dusky-brown, with black shafts, and whitish tips; quills dusky-brown below, rather more ashy on the inner webs. Total length, about 8 inches; culmen, 0.6; wing, 4.7; tail, 1.55; tarsus, 0.9; middle toe and claw, 1.2.

A nestling in the British Museum which still retains some of its down, is emerging from it into the first full plumage, which resembles that of the adult, and the back has a decided gloss of a dull purplish tint; the secondaries are distinctly edged with hoary-white near the ends; tail-feathers black, narrowly edged with hoary-white, which is more distinct on the outermost; crown of head like the back; lores and sides of face white, the feathers transversely barred with slaty-grey, but less distinctly on the cheeks; throat and under-surface of the body pure white, the feathers on the sides of the breast mottled with ashy-grey bases; flanks also slightly mottled with ashy-grey, with which colour many of the feathers are subterminally marked; under wing-coverts pure white; axillaries slaty-grey, edged with white.

## MONOGRAPH OF THE PETRELS.

Buller recognised two forms of *Pelecanoides* in New Zealand, one being the true *P. urinatrix* and the other *P. berardi*. Of the latter, he examined four specimens in the Paris Museum, all of which had yellowish legs and feet; he remarks, however, that he does not place much confidence in this character, and as I find that in some of our specimens the feet are yellowish, I imagine that this is due to the way in which they dry when the skins are preserved. Apparently there is a slight difference in the colour of the bill and feet of birds from New Zealand when compared with those from Australia. Buller (*Birds New Zeal.*, 2nd ed., II., p. 207) writes:—"Legs and feet cobalt, tinged with green, the webs bluish-white; bill black; iris black." Gould's notes are as follows:—"Tarsi and toes beautiful light blue; bill black, the base of the cutting edge of the upper mandible, and a line along the lower edge of the lower mandible, blue-grey; iris very dark greyish-brown."

With these may be compared the description given by Mr. M. J. Nicoll of a specimen shot by himself in Molyneux Sound, Straits of Magellan:—"Tarsi and toes bluish-grey, with a black line down the back of the tarsus; webs black; iris black." It will be noticed that the webs are described as black, and if this difference could be established, it might prove that the South American birds are distinct from those inhabiting Australasian waters. I notice that the Molyneux Sound bird is black on the sides of the face, and the sides of the fore-neck and chest, and shows but little tint of grey; other birds from the Straits of Magellan are grey on the sides of the face and ear-coverts, and are not black as in the one above noticed. I am not able to account for these differences, as the Molyneux Sound specimen seems to be fully adult, and has the scapular streaks pure white, not greyish. An example procured by Darwin during the voyage of the "Beagle" had the legs of a "flax-flower blue."

In regard to the affinity of *P. urinatrix* with *P. exsul* of Kerguelen Island and the Crozets, I wish to point out that the only character for their separation consists in the greater amount of grey mottling on the throat, neck, and sides of the body in *P. exsul*. Among the series from Kerguelen Island, there is not one which has a pure white chest, such as is generally seen in birds from New Zealand. In the last-named locality, however, many grey-throated birds occur, and such specimens have been referred by Salvin and others to *P. exsul*.

I have not had a sufficiently large series at my disposal to satisfy myself as to the meaning of the presence or absence of grey on the throat in these two forms of *Pelecanoides*. The nestlings from the Auckland Islands prove that in the first plumage, after the shedding of the down, the throat is pure white.

The grey band along the sides of the mantle varies in extent, being in some specimens very distinct, and in others obsolete. The white edgings to the secondaries are also pronounced in some individuals and evanescent in others. I imagine that these white-edged quills are the sign of young birds, as they are strongly in evidence in the nestlings from the Auckland Islands.

## PELECANOIDES URINATRIX.

There is considerable variation in size among the specimens of *P. urinatrix* in the British Museum, and the following dimensions are found in a series of over twenty examples:—Wing, 4.6–5.2 inches; culmen, 0.6–0.7; tarsus, 0.9–1.1; middle toe and claw, 1.0–1.35.

The description is taken from a specimen procured by Nikolai Hanson at Stewart Island, New Zealand, but I am unable to identify the bird selected by Salvin for the Plate.

## 102. PELECANOIDES EXSUL, *Salvin.*

(KERGUELEN DIVING PETREL.)

(PLATE 87.)

*Pelecanoides urinatrix* (nec Gm.), Coues and Kidder, Bull. U. S. Nat. Mus., No. 2, p. 36 (1875); Kidder, op. cit., No. 3, p. 17 (1876); Sharpe, Phil. Trans., Vol. 168, p. 114 (1879); Salvin, Voy. "Challenger," II., pt. VIII., p. 146 (1880).

*Haladroma urinatrix* (nec Gm.), Cab. and Reichen., J. f. O., 1876, p. 328.

*Pelecanoides exsul*, Salvin, Cat. Birds Brit. Mus., XXV., p. 438 (1896).

*Pelecanoides dacunhæ*, Nicoll, Bull. B. O. C., XVI., p. 103 (1906); id., Ibis, 1906, p. 674.

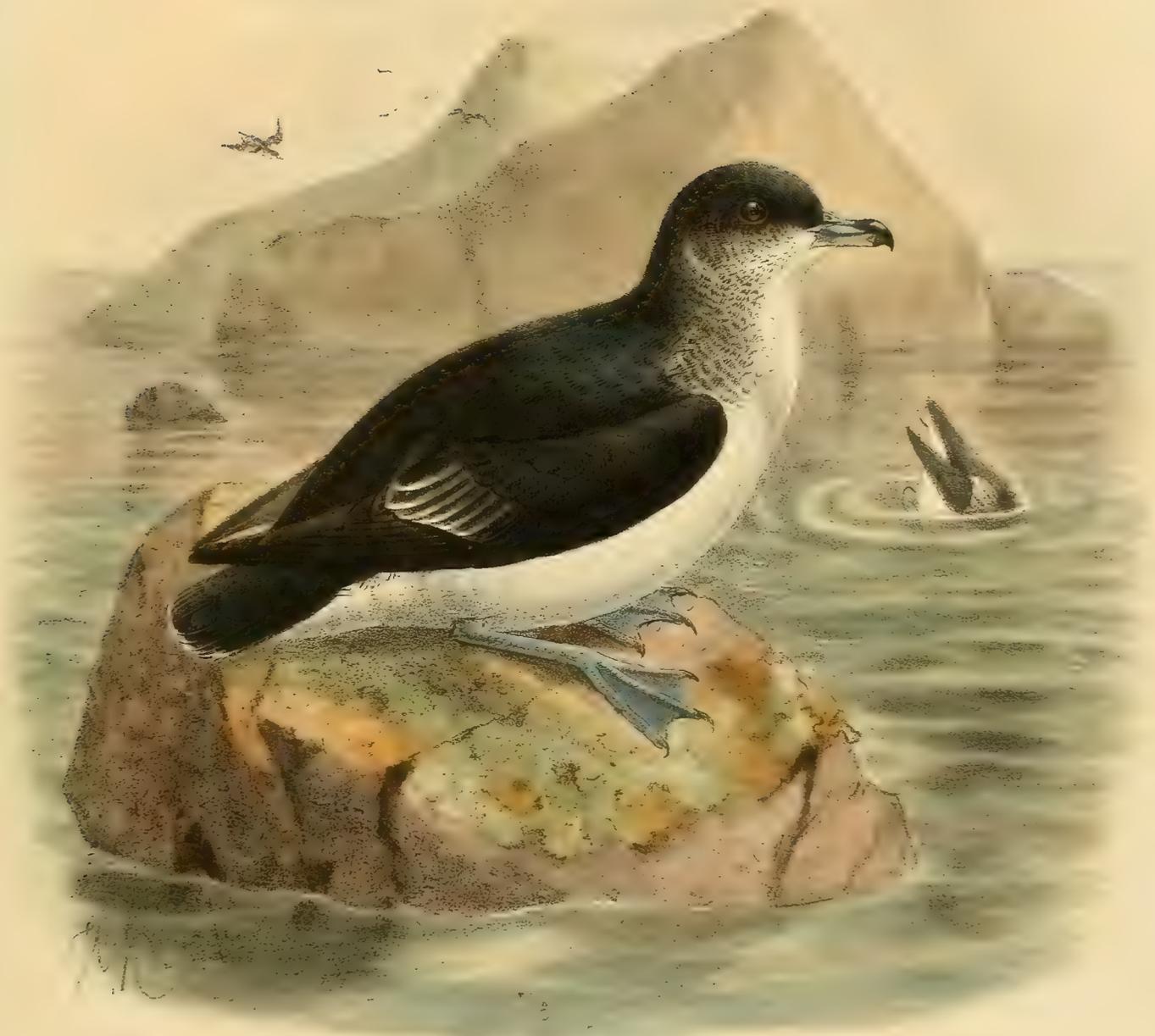
*P. urinatrix* similis, sed gutture et præpectore, colli lateribus, hypochondriis et subalaribus griseis distinguendus.

SALVIN separated the Diving Petrel of Kerguelen Island from the well-known *P. urinatrix* of the New Zealand seas, on account of the grey mottling on the throat and flanks. His description runs:—"Similar to *P. urinatrix*, but the feathers of the sides of and middle of the throat with a blackish subterminal grey bar; flanks mottled with grey, each feather with a grey shaft; under wing-coverts also grey, with white edges and dark shafts. Sexes alike."

Salvin gives no dimensions, so I have not been able to determine from which specimen in the British Museum his description was taken, but I have no doubt that it was from a Kerguelen example; he also includes the birds from the Crozet Islands under the heading of *P. exsul*.

Tristan da Cunha must also be added as a habitat, for I am not able to separate the birds described by Mr. M. J. Nicoll as *Pelecanoides dacunhæ* from *P. exsul*. This, too, was doubtless the species observed by the naturalists of the Scottish Antarctic Expedition off Gough Island (Eagle Clarke, *Ibis*, 1905, p. 264).

Although Diving Petrels are not often found in mid-ocean, Dr. E. A. Wilson records *P. exsul* as seen from the "Discovery," in the middle of September, about Lat. 30° S., in the Atlantic, and again in the Indian Ocean to Long. 122° E., and as far south as Lat. 51°. According to Salvin its range extends to New Zealand, as he recorded two specimens in the "Catalogue of Birds," one from New Zealand



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## PELECANOIDES EXSUL.

itself, and the other from the Auckland Islands (p. 439). Here *P. exsul* meets the range of *P. urinatrix*, and the question arises whether they are really distinct species. The latter, it is true, has a white throat, while that of the Kerguelen bird is grey, but it has yet to be proved whether these differences of plumage are not due to age, season, or mere variation. Dr. Reichenow unites the two forms in his most recent Memoir (*Deutsche Südpolar Exped.*, IX., Zool., I., p. 558).

Notes on the breeding of *P. exsul*, on Kerguelen Island, have been published by the late Professor Moseley, the Rev. A. E. Eaton, Dr. Kidder, and Mr. Robert Hall, and from them we learn that during calm weather, large flocks are sometimes seen which cover acres in extent, so that the surface of the sea is black with the birds. Dr. Kidder states that a single white egg is laid in a burrow on the hillside, generally in the same locality as that of *Halobæna cærulea*, but the nesting-tunnel is shorter.

When the British "Transit of Venus" Expedition reached Kerguelen Island, the Diving Petrels had already begun to pair, and the Rev. A. E. Eaton records the first egg as taken on the 31st of October. Before it was laid both birds were to be found in the nesting-chamber, making a moaning noise during the daytime.

It should be noted that Mr. Nicoll, when describing the bird from Tristan da Cunha under the name of *Pelecanoides dacunhæ*, noticed some difference in habit and mode of flight as compared with that of other Diving Petrels, which he had seen in the Straits of Magellan, and which were doubtless *P. urinatrix*. Superficially the birds were alike, but *P. dacunhæ* seemed to be much smaller, and to have a considerably greater power of flight. On several occasions he saw the birds rise off the water, and fly out of sight, whereas the species of the Magellan Straits would drop again after a short flight of about fifty yards. The Diving Petrels of Tristan da Cunha are exposed to rough weather and breaking waves, and have, in consequence, continually to take wing to avoid being drowned, and this fact may account for their greater powers of flight. On leaving the "Valhalla" in pursuit of specimens, Mr. Nicoll met with his *P. dacunhæ*, which became more numerous as he approached the land. Half a mile from the shore the birds were on all sides of the boat, continually appearing close to it, but instead of diving again, they at once took flight, and disappeared at great speed (Nicoll, *Voy. Nat.*, p. 68).

The Rev. A. E. Eaton, who was naturalist to the British "Transit of Venus" Expedition, alludes in his notes to the remarkable resemblance of the Diving Petrels to the Little Auk (*Mergulus alle*) of the Northern Hemisphere. The Auk, however, during the breeding season usually flies and fishes in small flocks, consisting of six or more birds, and nests in communities of considerable size, which are exceedingly noisy. Diving Petrels, on the other hand, fish and fly for the most part in pairs, and nest sporadically.

The burrows on Kerguelen Island were about the size of those of the English

## MONOGRAPH OF THE PETRELS.

Sand-Martin or Kingfisher; they were in dry banks and slopes, where the soil was easily penetrable, and terminated in an enlarged chamber, on the floor of which the egg was deposited without any attempt at a nest. Some of the burrows branched from the main tunnel, but were without terminal enlargements, and were not apparently put to any use by the birds.

Eggs from Kerguelen Island in the British Museum are described by Mr. Oates (*Cat. Birds' Eggs Brit. Mus.*, I., p. 161, 1901) as white, measuring: Axis, 1.3–1.55 inch; diameter, 1.1–1.3.

As with *P. urinatrix*, there is considerable difference in the size of individuals of the present species, and in a series of more than twenty specimens, the dimensions are as follows:—Wing, 4.3–5.0 inches; culmen, 0.55–0.7; tarsus, 0.95–1.1; middle toe and claw, 1.1–1.35.

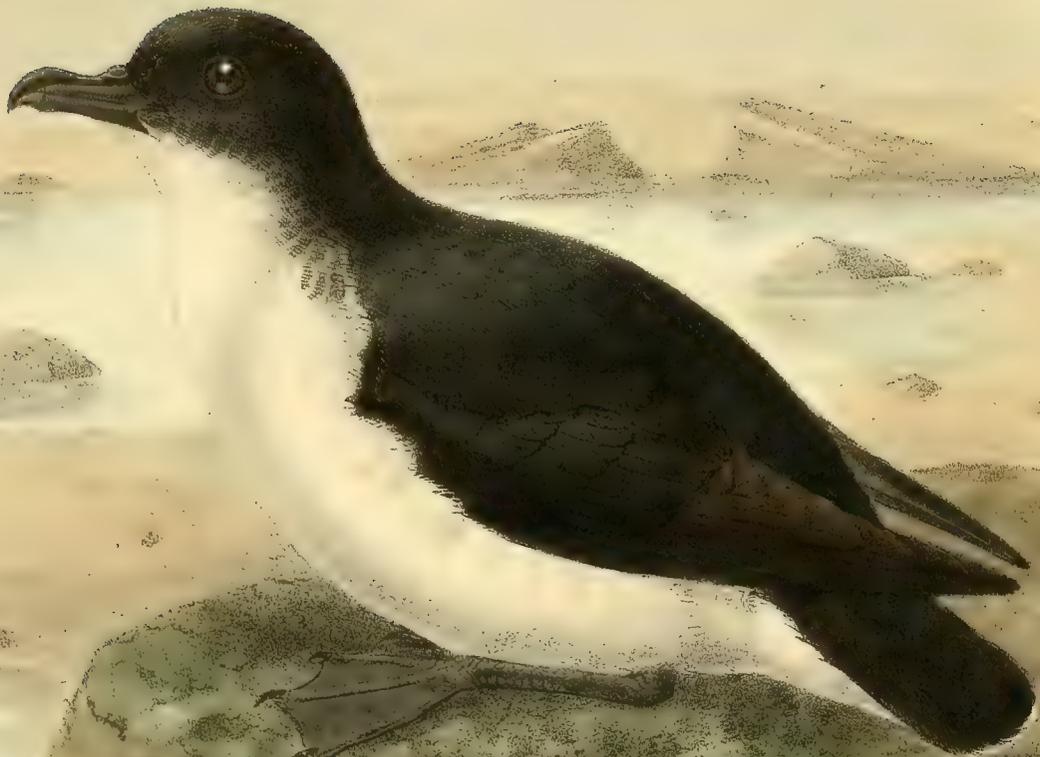
*Nestling.* Covered with pale silvery-grey down, the under-surface pure white.

This stage of downy plumage is followed by a second, in which the down continues until the bird is of the size of the adult. This second downy stage is much darker than the first, and is of a dark sooty-grey colour, lighter and more ashy below. On the feathers of the head and back can be seen traces of the silvery down of the former stage, the sooty-grey feathers having a silvery-grey tip attached to the end of the shaft, the dark plumes having pushed the silvery-grey ones out of their original position and taken their place.

It is interesting to note that in another downy young bird, the wings are nearly full-grown, and the secondaries are edged with white, which may be taken as a sign of an immature bird.

The nestlings described above are both from the Chatham Islands, collected by Mr. H. H. Travers and lent by the Hon. Walter Rothschild.





3

PELECANOIDES GARNOTTI.

## 103. PELECANOIDES GARNOTI (*Lesson*).

(GARNOT'S DIVING PETREL.)

(PLATE 88.)

*Puffinuria garnoti*, Lesson, Voy. "Coquille," I., pt. 2, p. 730, Pl. 46 (1826).

*Pelecanoides garnoti*, Gould, Voy. "Beagle," II., Birds, p. 139 (1841); Coues, Pr. Acad. Philad., 1866, p. 190; Sharpe, Phil. Trans., Vol. 168, p. 115 (1879); Salvin, Voy. "Challenger," II., pt. VIII., p. 146 (1880); id., Cat. Birds Brit. Mus., XXV., p. 439 (1896).

*Halodroma garnoti*, Tschudi, Faun. Peruan. Orn., p. 54 (1845); Tacz., Orn. Pérou, III., p. 465 (1886).

*P. urinatrix* similis, sed valde major, rostro et pedibus robustioribus nigris distinguendus.

THIS species of Diving Petrel is decidedly larger than *P. urinatrix* and *P. exsul*, and was considered by Dr. Elliott Coues (*Bull. U. S. Nat. Mus.*, No. I., p. 37) to be identical with the former, but the series examined by me is sufficient to show that the large size, and especially the massive bill and foot of *P. garnoti*, point to its being a distinct form, and I have no hesitation in separating it specifically from *P. urinatrix*.

The habitat of *P. garnoti* is also somewhat restricted, as it is only found off the west coast of South America, and does not extend to the Straits of Magellan, where *P. urinatrix* is abundant.

Lesson, in the account of the voyage of the "Coquille," says that the species was found in large companies along the coast of Peru, and we have two specimens in our collection from Callao. Darwin records it from Iquique (Lat. 20° 12'), and examples were obtained by Bridges off the coast of Chile, while others were observed by Admiral Markham in Coquimbo Bay in November, 1881 (Salvin, *Cat. Birds Brit. Mus.*, XXV., p. 439). A specimen obtained by Captain Brett near Valparaiso is also recorded by Salvin (*l.c.*), and during the voyage of the "Valhalla" Mr. M. J. Nicoll procured other examples in the same locality, and relates that the bird was common and more easily obtained than *P. urinatrix*, which he had met with in the Straits of Magellan (*Ibis*, 1904, p. 52).

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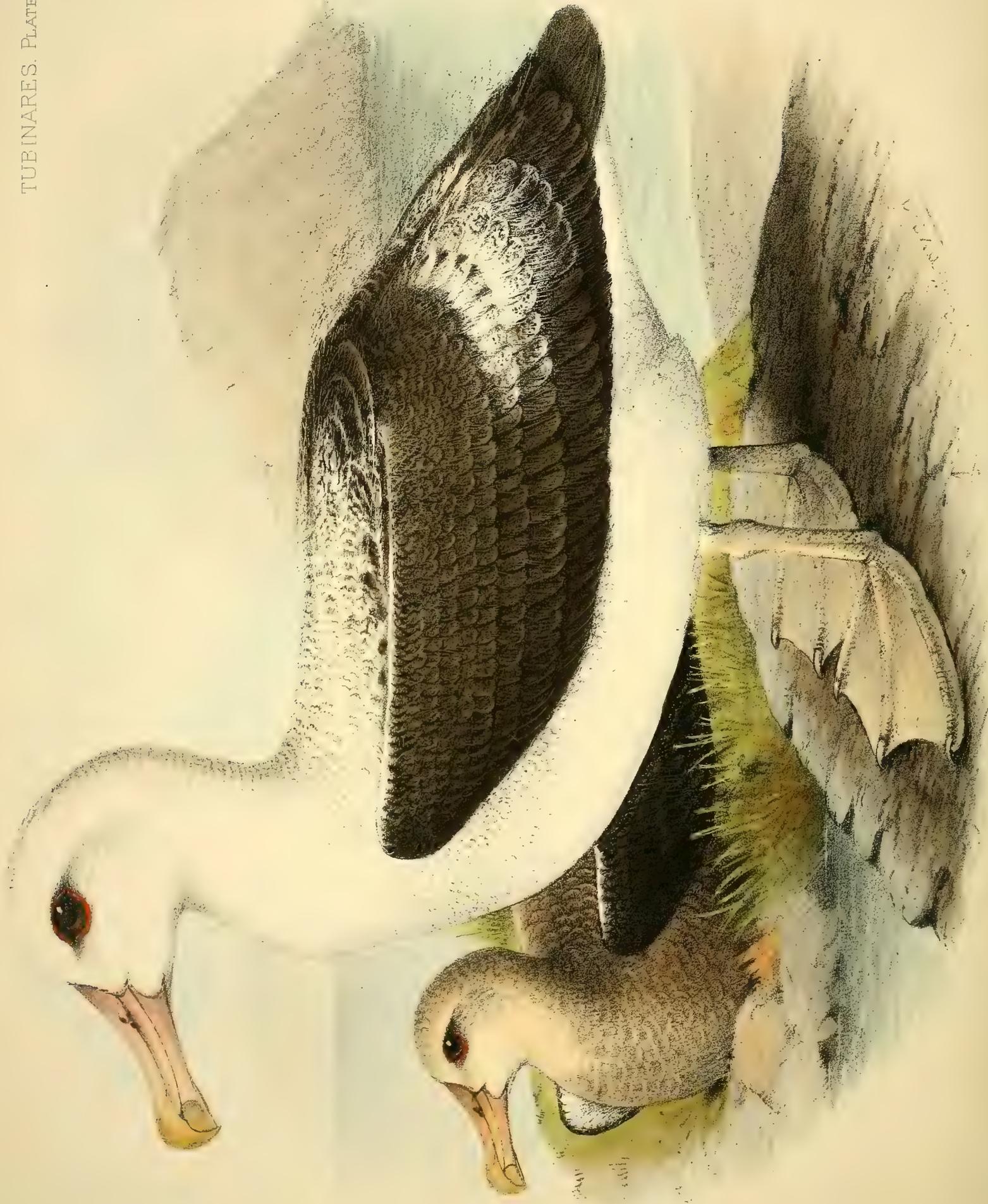
In his original description of the bird, which he named in honour of his colleague Dr. Garnot, Lesson says that it flew in a straight line, skimming the surface of the water, into which it suddenly dropped and dived in search of the small fishes which constitute its food.

Eleven specimens in the British Museum give the following average dimensions :— Wing, 5.35–5.75 inches; culmen, .70–.85; tarsus, 1.2–1.3; middle toe and claw, 1.45–1.6.

*Adult female.* General colour above glossy-black, some of the scapulars ashy-grey or ashy-white, forming an irregular band on each side of the mantle; wings black; tail-feathers black, inclining to ashy-brown at the ends; crown of head, lores, sides of face and ear-coverts black, the latter slightly marked with grey; cheeks, throat, and under-surface of body pure white; on the sides of the fore-neck a patch of dark slaty-grey; sides of body also slaty-grey, varied on the flanks with white bases and tips to the feathers; under wing-coverts white, dark brown round the edge of the wing; axillaries slaty-grey like the flanks; quills dusky below, rather more ashy on the inner web; “bill black; tarsi and toes blue-grey in front, black behind; outer toe and webs black” (M. J. Nicoll). Total length, about 9.0 inches; culmen, 0.8; wing, 5.45; tail, 1.45; tarsus, 1.3; middle toe and claw, 1.5.

The specimen described is a female from Valparaiso Bay, procured by Mr. M. J. Nicoll. The bird figured was not specified by Salvin, but it must have been one in our collection.





## 104. DIOMEDEA EXULANS, *Linn.*

(WANDERING ALBATROS.)

(PLATE 89.)

*The Man of War Bird*, Albin, N. H. Birds, III., p. 76, Pl. 81 (1740).

*The Albatross*, Edwards, N. H. Birds, II., p. 88, Pl. 88 (1747).

*L'Albatros*, Briss., Orn., VI., p. 126 (1760); Buff., Hist. Nat. Ois., X., p. 173, (1786).

*Diomedea exulans*, Linn., Syst. Nat., I., p. 214 (1766); Gould, Birds Austr., VII., Pl. 38 (1844); id., Handb. Birds Austr., II., p. 427 (1865); Giglioli, Faun. Vertebr. Oceano, p. 49 (1870); Buller, Birds New Zeal., p. 289 (1873); Baird, Brewer, and Ridgway, Water-Birds N. Amer., II., p. 347 (1884); Salvin, Cat. Birds Brit. Mus., XXV., p. 441 (1896); Sharpe, Rep. "Southern Cross," Aves, p. 160 (1902); Wilson, Nat. Antarctic Exped., II., Aves, p. 108 (1907).

*L'Albatros du Cap de Bonne Espérance*, D'Aubent., Pl. Enl., X., Pl. 237.

*Wandering Albatross*, Pennant, Arctic Zool., II., p. 506; Lath., Gen. Syn., III., pt. I., p. 304 (1785).

*Chocolate Albatross*, Lath., Gen. Syn., III., pt. I., p. 308 (1785).

*Diomedea spadicea*, Gm., Syst. Nat., I., p. 568 (1788); Lath., Ind. Orn., II., p. 790 (1790).

*Diomedea exulans*, Lesson, Man. d'Orn., II., p. 350 (1828).

*Diomedea epomopha*, Lesson, Man. d'Orn., II., p. 351 (1828).

*Diomedea albatrus* (nec Pall.), Forster, Descr. An., p. 27 (1844).

*Diomedea adusta*, Tschudi, J. f. O., 1856, p. 157; Bp., Consp., II., p. 185 (1855).

Ad. Alba, notæo albo, schistaceo vel brunnescenti-nigro vermiculatim transfasciato: pileo albo, plaga nigricanti-brunnea verticali plerumque notato: cauda alba, nigro terminata: gastræo albo, lineis nigricantibus transversim fasciato: ala nigricante, maculis paucis albis notata, regione olecranali latiore alba distinguenda.

Pull. duvedine grisescente indutus.

THE history of the Wandering Albatros is difficult to relate, owing to the fact that early observers failed to recognise more than one species, whereas

## MONOGRAPH OF THE PETRELS.

recent research tends to prove that under the common title of *D. exulans* three distinct forms, as now generally accepted, were included, viz., the true *D. exulans*, frequenting the Atlantic, Indian, and Pacific Oceans; *D. regia*, of the New Zealand area; and *D. chionoptera*, inhabiting the Cape Seas and the South Indian Ocean. The specific differences between *D. exulans*, *D. regia* and *D. chionoptera* are given in detail below.

Museums, both at home and abroad, contain comparatively few examples of Albatroses, and without an exhaustive series of carefully collected specimens, it is impossible to compile a correct history of *D. exulans*, or of the two allied species. My conclusions have been drawn from the series in the British Museum, supplemented by that in the Tring Museum, which has been placed at my disposal by the Hon. Walter Rothschild; these together indicate the various stages of plumage through which the birds pass. The Tring Museum contains a nestling of *D. exulans* exhibiting the slaty or purplish-grey down, as described by Sir Walter Buller, the nestling-down of *D. regia* and *D. chionoptera* being pure white. *D. exulans* passes through a succession of plumages, beginning with a brown phase, the head having always a certain amount of white, the general colour gradually becoming greyer, till it finally reaches the adult white stage with blackish vermiculations on the neck and back: these progressive phases are said to occupy from five to seven years, though the exact time must be more or less conjectural.

The Campbell Island specimens of *D. regia* in the British Museum prove that the bird passes from the stage of a downy white nestling directly to a white plumage, scarcely distinguishable from that of the adult, and the absence of vermiculations on the back forms a further distinctive character for the separation of the species.

The nestling of *D. chionoptera* is said to be covered with a pure white silky down, and in its first stage of plumage is described as a brown bird like the young of *D. exulans*.

Gould, who did not perceive the difference between *D. exulans* and its two allies, says that the Wandering Albatros, which is widely distributed over the whole of the Southern Oceans, is abundant between the 30th and 60th degrees of S. Latitude, though not confined to any one part. He first observed the species on the 24th July, 1838, in Lat. 30° 38' S., Long. 20° 43' W., and thence continuously until his arrival in Storm Bay, Tasmania; he says that it was most plentiful near the Cape and St. Paul's Island (*Handb. Birds Austr.*, II., p. 427); it may, however, have been *D. chionoptera* in the last-named locality.

Professor Giglioli, in the excellent map published in the "Fauna Vertebrata nell' Oceano" (p. 49), shows the distribution of *D. exulans* as he observed it during the voyage of the "Magenta," and gives the following account:—

"On the journey from Montevideo to Batavia the commonest Albatros in sight

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was *Diomedea exulans*. We first met with it on the 5th of February, 1866, in Lat. 36° 30' S., Long. 52° 46' W., a little to the north of Montevideo. The last was seen on the 8th of April in Lat. 34° 29' S., Long. 87° 45' E., so that for two months it was our constant companion, along a tract of about 7000 miles.

“On our voyage from Batavia to Melbourne we saw the first of this species on the 21st of April in Lat. 37° 09' S., Long. 108° 45' E., when it accompanied us to the entrance of Port Phillip. It re-appeared in numbers in Bass's Straits, and followed us as far as Sydney Heads, the two promontories which enclose the harbour.

“In the Pacific *D. exulans* followed from the time of our leaving Sydney on June 25th, 1867, up to the 6th of August, Lat. 25° 36' S., Long. 85° 47' E., and was very abundant on the 1st of July in sight of Cape Otou and the island of Manawatawi, New Zealand. On the voyage from Callao it was met with less frequently from the 16th of September, 1867 (Lat. 36° 25' S., Long. 86° 02' W.), till the 27th of the same month, when it was again seen near Juan Fernandez (Lat. 36° 47' S., Long. 79° 21' W.). It was plentiful on the 7th of November in Lat. 40° 39' S., Long. 79° W., accompanying the ship as far as the Gulf of Peñas. Finally, it was frequently observed in the Atlantic from the 13th of December (Lat. 42° 24' S., Long. 57° 21' W.) to the 15th of that month (Lat. 39° 20' S., Long. 53° 20' W.). This species was equally common in the Atlantic, Indian, and Pacific Oceans, appearing in the latter to approach more nearly to the Equator than other sea-birds.”

A large snowy-white Albatros was also recorded by Professor Giglioli as having been seen on the 28th of February, 1868, in Lat. 43° 21' S., Long. 5° 26' E.; it accompanied the ship till the 2nd of April (Lat. 40° 08' S., Long. 79° 22' E.), a distance of 3500 miles. The bird was doubtless *D. chionoptera*, and this observation apparently constitutes the first intimation that a second species of large Albatros inhabited the Cape Seas.

Dr. Reichenow considers that the range of *D. exulans* extends throughout the South Atlantic, Indian, and Pacific Oceans, northwards to 20° and 30° S. Lat., and southwards to the South Polar ice (*Deutsche Südpolar Exped.*, IX., *Zool.*, I., p. 472, 1908).

In the Indian Ocean *D. exulans* was procured by the Earl of Crawford in Lat. 34° S., Long. 4° 20' E., in September, and again in Lat. 39° 40' S., Long. 32° 19' E., in October. Layard (*Ibis*, 1863, p. 249) says that it was common in Lat. 32° 50' S., Long. 29° 50' E., and also (*Ibis*, 1867, p. 252) notes it in Lat. 32° 55' S., Long. 9° 47' E.

There are specimens of *D. exulans* from the Cape Seas in the British Museum (Salvin, *Cat. Birds Brit. Mus.*, XXV., p. 442), and Mr. T. Parkin obtained an example in Lat. 39° 51' S., Long. 8° 49' E. (*Bull. B. O. C.*, X., p. cvi., 1900). Commander Sperling gives the northern limit of this Albatros's range as 27°

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S. Lat., while Captain Hutton says that it seldom penetrates northward beyond 30° S. Lat.

Dr. E. A. Wilson states that on the voyage of the "Discovery" the first Wandering Albatros, a young bird in brown plumage, was seen on the 18th of September, 1901, in Lat. 31° S., Long. 22° W. Several birds, mostly immature, were noticed from the 19th to the 23rd of the same month, and others up to the 3rd of October. From the 17th of October, two days out from Simon's Bay, and thenceforth until the end of November, adult and immature birds followed the ship till it reached the edge of the Ice Pack. After leaving New Zealand many more of these Albatroses were observed, both young and old birds being plentiful during the southern journey, until the 2nd of January, when the ice was sighted. *D. exulans* disappeared when the ship entered the Ice Pack, and was not met with further south than 65° S., although it has been recorded from off Ross's Great Ice Barrier. On the return voyage of the "Discovery" to New Zealand, Mr. Wilson says that, except *D. exulans*, every common form of Albatros was observed as soon as, or even before, the ship left the immediate neighbourhood of the ice; although *D. exulans* had before been abundant in the same seas in December, very few indeed were seen in March.

Mr. Nikolai Hanson, the zoologist of the "Southern Cross" expedition, frequently noticed the Wandering Albatros in the Cape Seas, and again on the voyage to Tasmania. He also records it from Lat. 69° 13' S., when the ship had left the Ice Pack for the open sea.

Sir Walter Buller (*Birds New Zeal.*, p. 291) says that this species is very common in the seas round New Zealand, though he had never heard of its breeding on any of the outlying rocks. Eggs from the Auckland Islands were presented to the British Museum by Sir George Grey and Dr. R. McCormick, and Captain Fairchild found both *D. regia* and *D. exulans* nesting there, but the colonies occupied a distinct area, apart from one another.

Captain Hutton states that the breeding season commenced on Antipodes Island in the middle of January, and the species was found nesting on Adam Island in the Auckland group in the first week of the same month. Birds were obtained which still showed some dark brown feathers on the crown, and were therefore not fully adult (Ogilvie-Grant, *Ibis*, 1905, p. 557).

Dr. H. O. Forbes (*Ibis*, 1893, p. 541) records the breeding of this species on the Chatham Islands, the chief nesting-places being the rocky islets off Pitt's and Wharekauri Islands, Pyramid Rock, the Sisters, and the Forty-fours. The eggs and young are collected in thousands by the Maoris for purposes of food.

*D. exulans* has been recorded on several occasions from South America. Mr. Nicoll observed it in the neighbourhood of the islands of Martin Vas during the cruise of Lord Crawford's yacht "Valhalla" (*Ibis*, 1906, p. 673),

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and again between the islands of South Trinidad and Tristan da Cunha, as well as near Montevideo, in Lat. 33° S., Long. 50° 3' W. It has been observed in the Straits of Magellan, and a specimen obtained near Valparaiso by Captain Brett is in the British Museum (Salvin, *Cat. Birds Brit. Mus.*, XXV., p. 443).

Mr. Nicoll was informed that it nested on Inaccessible Island in the Tristan da Cunha group (*Ibis*, 1906, p. 675). Mr. F. Stoltenhof, who resided on Tristan for two years, says that the Albatroses alighted on the highest portion of Inaccessible Island in the latter part of November, avoiding the high tussock grass, from which they rise with difficulty. They made a circular nest, slightly concave at the top, about three feet high, and broader at the bottom (Baird, Brewer, and Ridgway, *Water-Birds N. Amer.*, p. 349). Mr. Comer states that *D. exulans* is common on Gough Island and breeds there, laying at the end of December, eggs being plentiful by the 3rd of January. He considered that the Gough Island birds were smaller than those from Kerguelen Island, and the South Orkneys (Verrill, *Tr. Conn. Acad.*, IX., p. 437, 1895). I have not been able to examine specimens from Tristan da Cunha and Gough Island, and cannot state whether the Albatros from these Islands is *D. exulans* or *D. chionoptera*.

Sufficient evidence has, however, been brought forward to enable us to trace the range of *D. exulans* in the Southern Oceans, and to show that it is a bird of very wide distribution. The only authentic nesting-places of the species are Antipodes Island and other islands of the New Zealand area, as the other accounts of the breeding of *D. exulans* refer either to *D. regia* or *D. chionoptera*.

The Wandering Albatros has been reported to occur in European waters on several occasions, but it would be well to re-examine the specimens which have been preserved, as some other species may have been mistaken for *D. exulans*, which seldom, if ever, crosses the Equator. It has been said to occur in Tampa Bay, Florida, and off the coast of Washington, but these records are both unsatisfactory (A. O. U. Checklist, 2nd ed., p. 326, 1895). Mr. J. F. Green says (*Ocean Birds*, p. 4) that he knows of several instances of Albatroses having been conveyed across the Line in a ship, and allowed to fly on the northern side. Such birds would be likely to take a northerly course, which might account for the occurrence of the species in Europe, but I think in all probability this observation refers to Mollymawks.

In Professor Reichenow's memoir on the birds of the German South Polar Expedition, we are told by Dr. Hüsker that the Albatros flies with extraordinary rapidity, and glides through the air like a ship under sail. On seeing any object it fancies, it becomes restless, drops its legs, thrusts forward the fore-part of the body in a clumsy manner, drawing in its neck at the same time, and thus drops to the water, hovering a moment with outstretched wings until the balance is recovered.

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It then swims after and seizes the object, which it has missed in its descent, but rises with difficulty, for it is only after a considerable run upon the water that the power of flight is recovered. In rough weather it hovers continually, but in a slight breeze greater use is made of the wings.

*D. exulans* breeds in gigantic colonies on isolated islands, making its nest of closely packed dry and green grass, and like other Petrels, laying but a single egg.

The food consists, according to Captain Hutton, of oceanic mollusca, small crustaceans, medusæ, and the refuse thrown overboard from ships, but he never found the remains of fish. Dr. Wilson, during the voyage of the "Discovery," relates that in the stomach of one of the specimens captured was the undigested remains of a Roman Catholic tract, with a portrait of the late Cardinal Vaughan.

A paper by the late Captain Hutton in the "Ibis" for 1903 (pp. 81-88) is probably the best that has been published on the flight of the Albatros, and it is accompanied with some very characteristic illustrations of flying birds, which have been reproduced by Sir W. Buller in the "Supplement to The Birds of New Zealand."

With regard to the distances which Albatroses are supposed to cover in their flight, not many authentic records are available, but one instance has been given by Mr. Frank M. Chapman in the "Auk" for 1895 (p. 291), which is of special interest. "The Museum of Brown University possesses a specimen of a Wandering Albatros bearing the following note on its label:—'December 8th, 1847. Ship "Euphrates," Edwards, New Bedford, 16 months out, 2300 bls. of oil, 150 of it sperm. I have not seen a whale for four months. Lat. 43° 00' S. Long. 148° 40' W. Thick, foggy, with rain.' On the reverse side is written:—'This was taken out of small bottle tied to the neck of a "Goney" on the coast of Chile by Hiram Luther, captain of the whaling barque Cachelot, on the 20th of December, 1847, in Lat. 45° 50' S., Long. 78° 27' W.;' so that the bird must have travelled at least 3400 miles in twelve days."

Dr. E. A. Wilson, in his report on the "Discovery" collections, says:—"When on the wing the feet are folded together at full length under the tail, extending beyond its longest feathers, thus giving the impression of a markedly wedge-shaped tail, with a white terminal border. In reality, the tail is bordered with black at the extremity, and the appearance of white beyond the black is due to the extended feet."

Much has been written concerning the breadth of the wing in the flying Albatros, and Buller records one with an expanse of 17 feet as having been placed on record. His own largest specimens measured 14 feet across, and Captain Hutton gives the average breadth as 10 feet, the smallest being 9 and the largest 12 feet.

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(*Birds New Zeal.*, Ed. 2, II., p. 189). Mr. Frank Green, who has measured over one hundred specimens, says that the expanse rarely exceeds 11 feet (Green, *Ocean Birds*, p. 5), which corresponds with a mounted example in the British Museum.

Mr. J. Buckland relates that during the early part of the breeding season the birds stand in pairs or small groups, bowing or rubbing their bills together, apparently quite indifferent to the presence of a stranger.

Mr. Buckland's article, originally published in the "English Illustrated Magazine," entitled "A Remarkable Fast," is reproduced by Sir Walter Buller in his "Supplement to The Birds of New Zealand" (I., pp. 131-133). He apparently refers to two species of Albatros, as he mentions the birds of Antipodes Island (*i.e.*, *D. exulans*), Auckland Islands (*i.e.*, *D. regia* or *D. exulans*) and Campbell Island (*i.e.*, *D. regia*). The nestling, according to Mr. Buckland, is fed by the old birds until it becomes so fat that it exceeds the parents in weight, and then the latter leave their young for four months, or more. During their absence the nestling gets no food, but subsists entirely on its own fat, which statement if true, is probably without a parallel in natural history. When the parents return, they fondle their young for a short time, after which they turn them out, and proceed to repair their nests and recommence the process of incubation. It is said that the young birds are still unable to fly when their parents return and recommence nesting. They walk about in the neighbourhood of the nests, and ultimately accompany their parents to sea, when the next brood is fully grown.

Mr. Comer confirms the statement that the young Albatroses are unable to fly till they are ten months old, adding that not more than five per cent. ever leave their nests, so many being killed by the Skuas and Giant Petrels.

The two eggs in the British Museum are described by Mr. Oates (*Cat. Eggs Brit. Mus.*, I., p. 162), as "white, very sparingly stippled with reddish-brown at the larger end." They measure respectively 4.85 by 3.1; 5.25 by 3.02.

*Nestling.* There are two specimens from the Auckland Islands in the Tring Museum. One is clothed in light grey down, whiter on the head and fore-part of the body; the other, also a full-grown nestling, is covered with pale slaty-grey down. The first plumage, which is fully developed under the downy covering, shows that the upper-surface is blackish brown, including the crown and the under-surface; the wing is black. A young fledgling examined by Sir Walter Buller had the bill white and the feet pale grey (*Suppl. Birds New Zeal.*, I., p. 130).

Mr. Reischek believes that it takes five years for the Albatros to attain its fully adult plumage, and though this is probable, there is insufficient evidence to establish the fact. The following is a description of what I believe to be the first stages of plumage after the bird emerges from its down-clad condition.

*Young.* Dark brown above, the feathers with lighter brown margins, the

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mantle, neck, and crown of head paler brown; entire sides of face, cheeks and throat, white; longer scapulars and wing-coverts darker than the back, and inclining to blackish; quills black, the outer primaries with pale yellow shafts; secondaries also blackish, the greater part of the inner web white towards the base: inner secondaries greyish-brown on the inner web; lower back, rump, and upper tail-coverts brown; tail-feathers blackish-brown, white at the extreme base, where the shafts are yellow; under-surface of body lighter brown than the back, the feathers of the lower throat and chest with paler brown margins; the breast and abdomen paler and more ashy-brown than the chest, with white bases to the feathers; under tail-coverts very dark brown, like the flanks; axillaries white, most of them with brown at the ends; under wing-coverts white, with a broken band of black round the edge of the wing; quills blackish below, white or greyish towards the base of the inner web of the secondaries; "bill whitish horn-colour; feet fleshy-white; iris brownish black." Total length, about 40 inches; culmen, 5.8; wing, 25.0; tail, 7.5; tarsus, 4.35; middle toe and claw, 6.3.

That all young birds follow the same sequence in their change towards the adult stages of plumage I should not like to affirm, but the process follows the same general lines. Sometimes the sides of the face are pure white, like the throat, at other times they are brown, but in the latter case the ear-coverts are more or less mottled with white, indicating a progress towards the next stage, when the ear-coverts are white. As the young birds proceed towards maturity, if one may judge from a specimen in the British Museum, procured in the Cape Seas by Mr. E. M. Langworthy, the second plumage is similar to that described above, but has more distinct sandy-brown margins to the feathers of the upper-surface, especially on the neck; evidences of the forthcoming adult plumage are also to be seen in the presence of some pure white plumes, having the characteristic zigzag vermiculation of the fully adult bird on the back and fore-neck. This specimen has the forehead and sides of the crown, and sides of the face, white, but the ear-coverts are brown like the head. The under-surface is brown, as in the young specimen described, but on the abdomen are traces of zigzag bars, showing that a barred stage of plumage is foreshadowed even in the brown stage.

Some of the brown birds are distinctly paler on the breast and abdomen, others are apparently passing from a dark to a sandy brown under-surface. In Mr. Rothschild's Collection are two specimens, which, though to all appearance immature, have a perfectly white breast and abdomen. In some birds which are apparently adult, and have even been procured off the nest, there are indications of immaturity, in the brown blotches on the back, and the dark patch on the crown. The zigzag transverse bars are coarse, and unlike the slender vermiculations indicating a very old bird, in which the head is pure white.

Having traced the immature brown-coloured bird to the white fully adult

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*D. exulans*, it remains to be discovered whether there is not a further stage, when the zigzag bars entirely disappear and the back and mantle are pure white, like the head. If this were the case, the adults of *D. regia* and *D. chionoptera* would be indistinguishable from those of *D. exulans*, as they were considered to be until recent times.

*Adult male.* White above, with no vermiculations on the crown, which has however, a sooty-brown patch, more or less broken up; the hinder-neck obscurely, but the rest of the upper-surface plainly vermiculated with ashy or brown zigzag bars, the bases of the feathers being white; scapulars white, with rather coarser transverse wavy lines, the longer ones white, broadly black at the ends and on the outer web, the inner webs dotted with dusky brown spots; wing-coverts almost entirely slaty-black, mottled with white along the edge of the wing, the inner coverts black with white bases, somewhat mottled with brown spots, many of the inner greater coverts slaty-black on the outer, white on the inner webs, several of the median and greater coverts either margined or tipped with white; quills black, the primaries with yellow shafts, the inner webs of the secondaries for the most part white; the inner greater and median coverts white, forming with the adjacent inner secondaries a large olecranal\* patch of white; tail-feathers for the most part white with scarcely any zigzag bars, and the greater part of the outer web black; sides of face and entire under-surface of body pure white, with zigzag bars on the sides of the breast; "bill whitish with a faint pink blush, the tip of both upper and lower mandibles being yellowish; legs, toes and webs greyish white, when viewed by transmitted light, fleshy pink, claws whitish; iris dark brown; both upper and lower eyelids bright scarlet" (E. A. Wilson). Total length, about 4 feet; culmen, 6.75; wing, 26.0; tail, 8.0; tarsus, 5.0; middle toe and claw, 7.3.

The colour of the eyelid, as recorded by different observers, varies considerably. A pair of birds obtained by Nikolai Hanson in the Cape Seas had the eye-lid bluish-grey, whereas, as will be noticed above, Dr. E. A. Wilson gives it as bright scarlet (*Nat. Antarctic Exped.*, II., *Aves*, p. 108). The three birds here mentioned have been examined by me, and they are undoubtedly *D. exulans*, and quite adult. The eyelid is described by Gould as "bare, fleshy and of a pale green colour."

The bird described is fully adult, while another specimen, not quite so old, has a dark brown patch on the crown, as in the younger individuals. The second specimen, also from Nikolai Hanson's Collection, has a distinct brown patch on the head; the tail is black, as also the wing, the white olecranal patch not being present.

Several naturalists have commented on the presence of a reddish tinge on the sides of the neck in the adult Albatros. Buller (*Birds New Zeal.*, 2nd ed., II., p. 192)

\* I have adopted the term suggested by Mr. Pycraft. It is intended to indicate the large oval patch of white which occurs in the region of the elbow-joint in Albatroses. This patch is formed by the white bases of the innermost secondaries, and the coverts overlapping this region.

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describes a perfectly mature example from a fresh skin at the Canterbury Museum, in which the whole of the head and neck, as well as the upper and lower parts of the body, are of the purest white. On each side of the nape there was a broad longitudinal mark, of a beautiful roseate pink, about six inches in length by two in breadth, which faded soon after death, and ultimately disappeared altogether in the dried skin. Another specimen obtained at the same time showed similar traces of this feature, but in a very diminished degree, and Buller concluded that it was only to be met with in very old birds, or at some particular season of the year. Mr. Sanford mentions that some specimens he examined had a beautiful rose-coloured powder, covering the white plumage in December; this is evanescent, and will either rub off or change to a dirty brown in the preserved specimen. The beak is also of a delicate rose-colour at the same season, and Captain Fairchild likewise says that two birds, apparently a male and female, obtained near the Chatham Islands in September, had blood-red marks on the sides of the neck (Buller, *Suppl.*, I., p. 129).

The adult described is the bird collected by Nikolai Hanson in the Cape Seas, as above recorded, and the same specimen is figured in the Plate.





DIOMEDEA REGIA

J. G. Keulemans lith.

Hanhart imp.

## 105. DIOMEDEA REGIA, *Buller*.

(ROYAL ALBATROS.)

(PLATE 90.)

*Diomedea exulans*, pt. (nec Linn.), Buller, Birds New Zeal., 2nd Ed., II., p. 189 (1888); Filhol, Mém. Acad. France, Miss. de l'Île Campbell, III., pt. 2, p. 44 (1885).

*Diomedea exulans* (nec Linn.), Reischek, Tr. N. Zeal. Inst., XXI., p. 126 (1889); Buller, op. cit., XXII., p. 340 (1890).

*Diomedea regia*, Buller, Tr. N. Zeal. Inst., XXIII., p. 234 (1891), XXIV., p. 68 (1892), XXV., p. 76 (1893), XXVII., p. 120 (1895); Salvin, Cat. Birds Brit. Mus., XXV., p. 443 (1896); Berg, Comun. Mus. Nac. Buenos Ayres, I., No. 8, p. 283 (1901); Ogilvie-Grant, Ibis, 1905, p. 557; Buller, Suppl. Birds New Zeal., I., p. 138 (1905).

Ad. *D. exulanti* similis, sed notæo purè albo, minime fusco-brunneo transfasciato; scapularibus tantum griseo transfasciatis; gastræo quoque purè albo, minime fusco transfasciato distinguenda: cauda pure alba.

*Pull.* duvedine pure alba, minime grisea indutus.

*Diomedea regia* was until recently considered by ornithologists to be a form of *D. exulans* in very old plumage, for in the fully adult stage the two species closely resemble each other; recent observations have, however, led to their separation on the following grounds:—The nestling of *D. regia* is clothed in pure *white* down, which persists until the young bird is nearly of the same size as the parent, and the first plumage after the down is shed can scarcely be distinguished from that of the adult bird. *D. exulans*, on the other hand, has the nestling clothed in *grey* down, and the first full plumage of the young bird is brown, and it takes several years before it attains an almost pure white livery, during which time cross-bars are never entirely absent on the mantle and back, whereas in *D. regia*, if the cross-bars are present at all, they are almost obsolete.

The Royal Albatros frequents the seas and coasts of New Zealand, and breeds on the Auckland and Campbell Islands: from the latter an immature specimen, now in

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the British Museum, was obtained by Captain Ayscough of H.M.S. "Ringdove," October 20th, 1899. Adult and young specimens were also presented to the Museum by Sir George Newnes from the "Southern Cross" Expedition, and were obtained by Captain Jensen when visiting the above islands.

During the voyage of the "Erebus" and "Terror," Dr. McCormick procured some specimens in 1840 on Enderby Island in the Auckland group, but the late Captain Hutton states (*Ibis*, 1905, p. 557) that the species is no longer to be found there, but breeds now at the east end of Adam Island, one of the same group. Buller, in the "Supplement" to his "Birds of New Zealand" (I., p. 140), mentions that Captain Fairchild had found both *D. regia* and *D. exulans* breeding on the Auckland Islands, but occupying quite separate localities. The season of incubation is different, *D. regia* hatching out its young when *D. exulans* is only commencing to lay its eggs. On the Auckland Islands Captain Bollons states that *D. regia* breeds in the middle of November, and eggs in an advanced state of incubation were obtained by the Earl of Ranfurly on the 18th of January, 1901.

How far the range of this Albatros extends to the eastward or westward of New Zealand yet remains to be proved by future investigators. A specimen from the neighbourhood of Mar del Plata, in the Province of Buenos Ayres, has been recorded by Dr. C. Berg (*l.c.*). Here it might have been expected that the Atlantic species, *D. chionoptera*, would have been found; the bird is said, however, to be *D. regia*.

Many travellers, without obtaining examples whereby they might have verified the species, have recorded white Albatroses at sea, both in the Atlantic and Pacific Oceans. Dr. Wilson, during the voyage of the "Discovery," saw what he believed to be *D. regia* on March 11th, 1904, in Lat. 56° S., Long. 164° E. He states that between New Zealand and Cape Horn neither *D. exulans* nor *D. regia* was observed, but in the South Atlantic one of the two was seen quite close to the Falkland Islands, and another large and remarkably white Albatros was observed a little further north (*Nat. Antarct. Exped.*, II., pp. 110, 111). Sir Walter Buller records the appearance of a large white Albatros during four successive days while crossing the Pacific; he believed it to be *D. regia* and estimated the distance traversed by the bird at 970 miles, if measured in a straight line.

The habits of this species are similar to those of *D. exulans*, which have been already described. The nest is a mere collection of loose material placed in any convenient depression on the ground. Four eggs from the Auckland Islands, now in the British Museum, are of a yellowish white, only one has any rufous marking at the larger end. They measure: axis, 4.8-5.65 inches; diameter, 3.1-3.2.

*Nestling.* Covered with pure white down, of a very dense character. Sir Walter Buller states that the downy plumes are sometimes six inches in length. As mentioned above, this downy stage is retained for a long time, and when the bird

## DIOMEDEA REGIA.

assumes its first full plumage, remains of the white down are often seen adhering to the ends of the feathers.

Young birds before leaving the nest are fully equal in size to the adult, and the length of time they remain in or about it, is proved by the Campbell Island specimen, which has the down of the under-surface matted together like the wool on a sheep's belly. Although on reaching full plumage, the young are very similar to the adult, and have the white head and back, they may be distinguished by the broad longitudinal black centres to the feathers of the mantle, and there are also some broad black bands on the lower rump. It must be here stated that no marks of this kind occur in the plumage of *D. exulans*.

*Adult.* General colour above pure white, with scarcely a trace of dusky vermiculations on the mantle; the scapulars with slaty-grey, or blackish cross-bars, or zigzag markings, the longer scapulars blackish towards the end. Wings slaty-black, the lesser series of coverts mottled with white, the feathers having white bases or white margins; the innermost median and greater coverts white with grey frecklings; parapteral feathers for the most part, and some of the outer ones, white, blackish at the ends, and resembling the innermost secondaries, the whole forming a large white patch; quills blackish, the secondaries with the inner web white; lower back, rump, upper tail-coverts and tail-feathers white, head and neck all round, and entire under-surface of the body pure white, including the under wing-coverts and axillaries, the bend of the wing being mottled with a few black patches; quills blackish below; secondaries mostly white on the inner web; "bill white, with a roseate or pinky tinge in life, yellowish horn-colour on the terminal hook, with a broad black line along the cutting edge of the upper mandible; legs and feet fleshy white; iris very dark brown, almost black; bare eyelids jet-black" (W. L. Buller). Total length, 44 inches; culmen, 7.5; wing, 26.5; tail, 8.2; tarsus, 4.5; middle toe and claw, 7.1.

The description and adult figure in the Plate are taken from one of the specimens procured by Dr. McCormick on Enderby Island, during Sir James Clark Ross' voyage. The artist has somewhat exaggerated the cross-barring on the scapulars, which is not so closely developed as it is there represented.

The description of the nestling and young bird are from the Campbell Island examples in the British Museum.

## 106. DIOMEDEA CHIONOPTERA, *Salvin.*

(SNOWY-WINGED ALBATROS.)

(PLATE 91.)

*Diomedea exulans* (nec Linn.), Coues and Kidder, Bull. U. S. Nat. Mus., No. 2, p. 19 (1875); Kidder, op. cit., No. 3, p. 11 (1876); Salvin, P. Z. S., 1878, p. 740; id., Voy. "Challenger," Zool., II., pt. VIII., p. 147 (1881).

*Diomedea chionoptera*, Salvin, Cat. Birds Brit. Mus., XXV., p. 443 (1896); Hall, Ibis, 1900, p. 12.

*D. regia* similis, sed scapularibus omnibus, tectricibus alarum plerisque et regione olecrana, pure albis, regionem alarem longitudinalem niveam formantibus.

*Diomedea chionoptera* resembles *D. regia*, and differs from *D. exulans* in having the entire mantle and back, the marginal and lesser wing-coverts, as well as the olecranal patch of feathers and most of the inner secondaries, snowy-white, thus forming a broad longitudinal alar area, extending the length of the wing. This feature is admirably shown in a photograph by Mr. Robert Hall, of a specimen of *D. chionoptera* sitting on its nest on Kerguelen Island (*Ibis*, 1900, p. 12).

The geographical distribution of *D. regia* and *D. chionoptera* appears to be restricted to certain districts in the southern oceans, whereas *D. exulans*, the Wandering Albatros, seems to be dispersed over the whole of the seas inhabited by *D. regia* and *D. chionoptera*; thus, while *D. regia* is an inhabitant of New Zealand and the adjacent islands, *D. chionoptera* is found only in the South Atlantic. The typical example of *D. chionoptera* was procured by the "Challenger" Expedition in Kerguelen Island, where the species was found nesting by Dr. Kidder (*l.c.*) and by Mr. Robert Hall (*l.c.*). During the Antarctic Expedition it was also observed by Sir J. Hooker, on Kerguelen, and was likewise procured on Marion Island by the "Challenger" Expedition (Salvin, *Cat. Birds Brit. Mus.*, XXV., p. 443). Probably the eggs brought by Captain Armson to Mr. E. L. Layard (*Ibis*, 1867, p. 460) from the Crozets were those of *D. chionoptera*. A specimen in the British Museum was procured during the voyage of the "Valhalla" in the South Atlantic Ocean (Lat. 34° S., Long.





## DIOMEDEA CHIONOPTERA.

4° 29' E.) by Mr. M. J. Nicoll, and presented to that institution by the Earl of Crawford.

Mr. Eagle Clarke (*Ibis*, 1905, p. 264) says that an Albatros, which he supposed to be *D. exulans*, was noticed on Gough Island towards the end of April, 1904, by the naturalists of the Scottish Antarctic Expedition. Mr. G. E. Verrill, in his account of the birds observed on Gough Island by Mr. Comer (*Tr. Conn. Acad.*, IX., p. 437), says that *D. exulans* was breeding there at the end of December, and the first eggs were obtained on the 26th of that month, and were quite plentiful by the 3rd of January. The young, he says, must be ten months old before they can fly, and not more than five per cent. leave their nests, as they are killed by the Skuas and Giant Petrels.

I think it highly probable that the Albatros of Gough Island will be found to be *D. chionoptera* rather than *D. exulans*, but at present I have not sufficient evidence to decide the point.

Mr. Robert Hall describes the habits of this majestic Albatros in Kerguelen, where the old birds have a habit of rubbing their bills together when courting, and he noticed on one occasion four of them "billing" each other; two were birds of the previous year, while the other two were adults. Two old birds were sitting on their nests near by, so that within a few paces, eggs of the year, young birds of the last year, and presumably the parents of both, were to be found (Hall, *Ibis*, 1900, pp. 13, 15). Mr. Hall also examined the nests of this Albatros on Prince of Wales' Foreland, Long Island, in Royal Sound, and Howe Island, where a typical one was 37 inches in breadth, the diameter of the bowl 18 inches, and depth 5 inches. The nests were generally placed within 50 feet of the sea-level, though on one occasion he found one half a mile inland. The largest colony was near Mount Campbell, where many nests were discovered.

Further accounts of the breeding of *D. chionoptera* are given by Dr. Kidder, who accompanied the American "Transit of Venus" Expedition. He recorded the species under the name of *D. exulans* and stated that on the low strip of beach which connected Prince of Wales' Foreland with the mainland of Kerguelen, he saw many Albatroses nesting upon hillocks, placed at a little distance from each other, and built up some two feet or more from the ground. The nests were chiefly constructed of grass, combined with fibrous peat, and were of various heights, having been used repeatedly, and added to year after year.

Sir J. Hooker informs us that he found fifty or sixty nests crowded together on grassy slopes above the precipices 700 to 800 feet above the sea; a good deal of straw and stubble was mixed with the clay to give it consistency.

I have little doubt that the eggs brought by Captain Armson from the Crozets were those of *D. chionoptera*, and they have been determined as such by Mr. E. W.

## MONOGRAPH OF THE PETRELS.

Oates (*Cat. Eggs Brit. Mus.*, I., p. 162); they measure 5.0 to 5.4 inches by 2.9 to 3.3, and were similar in form and colour to those of *Phœbetria fuliginosa*.

The late C. J. Andersson (*Ibis*, 1866, p. 324) spoke to the master of a sealing-vessel, respecting the nesting of the Albatroses, and he affirmed that the nestlings subsisted on their own fat when abandoned by their parents. The birds were often hatched out in situations where it would have been impossible for them to get to the sea before they were fully fledged. Layard, however, says that this statement was derided by the sealers whom he consulted; they laughed at the idea that the young birds remained without food, and declared that the old Albatroses fed their young all the time they were in the nest with squids: the young remained there until driven away by the old birds when they wanted the nest again. They grow very slowly, but are very fat, and not at all fishy to the taste (Layard, *Ibis*, 1867, p. 461).

*Adult Male.* General colour above, including the head and sides of face, the entire neck, mantle and scapulars, pure white; the outermost scapulars sparsely vermiculated and the hindermost with a large black patch at the tips; lower back, rump, upper tail-coverts, and tail-feathers white; parapteral feathers white, with a long oval patch of black on the distal half of the outer web; coverts along the edge of the wing pure white; remainder of the wing-coverts mottled with black and white, the feathers being mostly slaty-black, with white margins, the inner webs for the most part white, with a little zigzag vermiculation; the inner median and greater coverts pure white, like the adjacent inner secondaries; bastard-wing black, with white on the inner webs; quills black, with yellow shafts; secondaries white, with black on the outer webs, the innermost secondaries pure white; entire under-surface, including the under tail-coverts, axillaries, and under wing-coverts, also pure white; the edge of the wing slightly mottled with black; quills below mostly pure white, the primaries black, except towards the base, the secondaries white, black towards the tips. Total length, 45.5 inches; culmen, 6.6; wing, 25.0; tail, 10.0; tarsus, 4.85; middle toe and claw, 6.8.

Slight variation in plumage may be seen in the series in the British Museum. I have described Salvin's type from Kerguelen Island, but the specimen obtained by the "Challenger" Expedition, on Marion Island, differs in having slight vermiculations on a few of the mantle-feathers, while some of the scapulars and parapteral plumes are strongly vermiculated; the tail is not pure white, as it has a spot of black on each of the centre feathers, and some of the others are irregularly vermiculated with black. The white area of the wing is not continuous as in the type, the marginal coverts being black, with white edges and white bases, so that the whole of the wing is mottled with black and white, excepting as regards the inner series of coverts which are white with black spots or zigzag vermiculations; the

## DIOMEDEA CHIONOPTERA.

inner, median and greater coverts pure white, forming a wing-patch which adjoins the white bases of the secondaries.

A tinge of pink or rose-colour on the face or neck is sometimes seen in adult birds, but the reason of this has not yet been explained.

I have not seen the young of this species, but Mr. Hall describes it in three stages of plumage. One, he says, was dark on the crown of the head, the back not being pure white, but resembling that of *D. exulans*; another phase was quite brown, with a little white on the face, while a third was blotched with sombre colour on its neck. On the 2nd February, 1898, Mr. Hall obtained a specimen at sea (Lat. 43° S., Long. 102° E.), which he considered to be in an intermediate stage between the uniformly brown young bird and the almost mature white-necked one. He describes it as follows:—"Dark brown, except the bill, face, cheeks and throat, which were white, with two white lines of feathers on the wings close to the body, as it floated on the water; the under-sides of the wings had two bands of bluish-white and black. It was a piebald bird, most likely of the last season, late in its moult, but not so late as the very brown one."

It will be noticed that these three stages of plumage are very similar to those of *D. exulans*, viz., a uniform brown, a white-faced brown, and the white-winged, white-backed stage. The full plumage is not acquired for some years, and even when the white-winged adult dress is attained, it appears that the back shows a few zigzag bars on some of the feathers, and another stage must be gone through before the pure white back is assumed. Dr. Reichenow, writing of *D. chionoptera*, says that the species requires further study in order to prove whether it is really distinct or only *D. exulans* in its most aged plumage.

Layard describes a nestling brought from the Crozets by Captain Armson, as "covered with pure white silky down," said to be about five or six days old (Layard, *Ibis*, 1867, p. 460); this white down, it will be remembered, is one of the specific characters of *D. regia*, to which *D. chionoptera* is very closely allied. The same author says that the bill was the most remarkable feature, "the tips of the mandibles being armed for about three-quarters of an inch with obtuse tumid sheaths, as hard, white, and shining as china."

The specimen described is the type from Kerguelen Island, and the figure is taken from the same bird.

## 107. DIOMEDEA ALBATRUS, *Pall.*

(STELLER'S ALBATROS.)

(PLATE 92.)

*Tchaiki*, Steller, Hist. Camtsch., p. 154 (1774).

*Albatros de la Chine*, D'Aubent., Pl. Enl., X., Pl. 963 (1786).

*Diomedea albatrus*, Pall., Spic. Zool., V., p. 28 (1769); id., Zoogr. Rosso-Asiat., II., p. 308 (1831); Swinhoe, P. Z. S., 1871, p. 422; David and Oust., Ois. Chine, p. 516 (1877); Baird, Brewer, and Ridgway, Water-Birds N. Amer., II., p. 351 (1884); Stejneger, Bull. U. S. Nat. Mus., No. 29, pp. 88, 316 (1885); Seebohm, Birds Japan. Emp., p. 261 (1890); Salvin, Cat. Birds Brit. Mus., XXV., p. 444 (1896); Barrett-Hamilton, Ibis, 1900, pp. 279, 285, 1903, p. 320.

*Diomedea chinensis*, Temm., Man. d'Orn., I., p. cx. (1820, ex D'Aubent.).

*Diomedea spadicea*, var.  $\beta$ . Lath., Ind. Orn., II., p. 790 (1790).

*Diomedea brachiura*, Temm., Pl. Col., livr. 79 (1838); id., Pl. Col. V., Pl. 554 (1838).

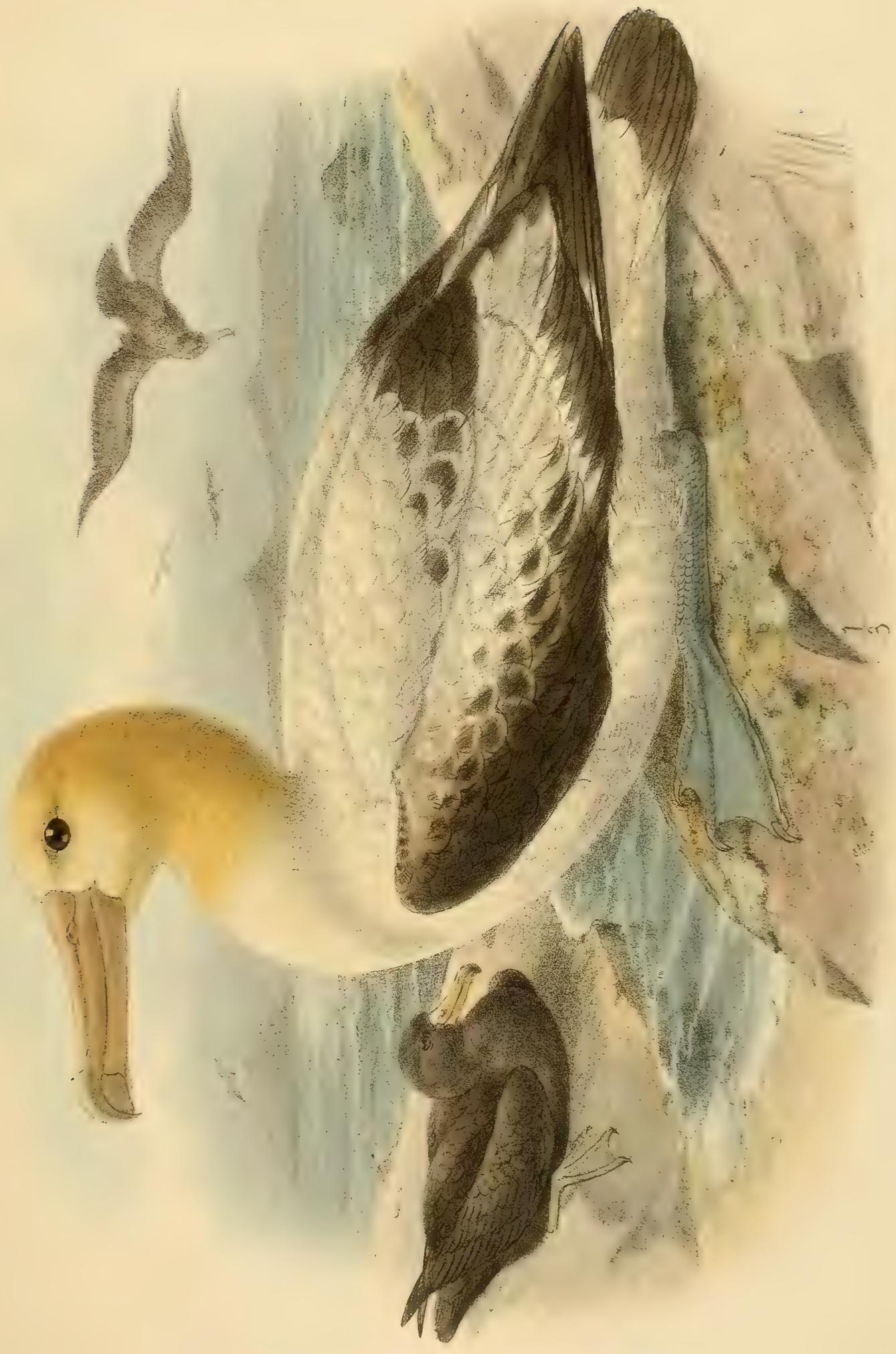
*Diomedea brachyura*, Temm., Introd., Pl. Col., p. 103 (1838); Gould, Birds Austr., VII., Pl. 39 (1848); Giglioli, Faun. Vertebr. Oceano, p. 56 (1870).

*Diomedea derogata*, Swinh., P. Z. S., 1873, p. 786; id., Ibis, 1874, p. 165, 1875, p. 140; David and Oust., Ois. Chine, p. 516 (1877).

*D. regia* similis, sed minor: plaga olecranica magna alba; sed cauda nigra, et capite aurantiaco-fulvo distinguenda.

THIS Albatros, which bears a certain resemblance to *D. exulans*, is distinguished by the tawny-buff colour of the head and neck, which is a prominent feature in the adult bird. It is, however, more closely allied to *D. regia* and *D. chionopectera*, in the great extent of white on the wing, which forms a large olecranal patch, but differs in its smaller size and entirely black tail, as well as in the golden-buff colour of the head.

The young bird is blackish-brown, and was mistaken by Seebohm for a dark phase of the species: it is however now known that the dark birds are immature, and although the series I have examined may not exhibit every intermediate stage of plumage, there are in the British Museum sufficient specimens to prove the process





## DIOMEDEA ALBATRUS.

of transition. Peale, who saw great numbers of this Albatros on the north-west coast of America, says that its plumage varied even more than that of *D. exulans*, evidently taking many years to acquire the adult dress.

Steller, who first discovered *D. albatrus*, found it abundant on the sea of Okotsk, in the Gulf of Penshin and near Bering Island, where it arrives about the end of June and returns southwards towards the latter end of July.

Major Barrett-Hamilton presented an adult female to the British Museum, which was obtained on Bering Island by Mr. Grebnitzki. Dr. Stejneger in his memoir on the "Birds of the Commander Islands" (*Bull. U. S. Nat. Mus.*, No. 29, p. 59), says that *D. albatrus* is by no means a rare visitor, and is called "Albatros" by the natives, *D. nigripes* being seldom seen there. Old birds in white plumage appear in March, when the dark young birds of the previous year are more numerous than the adults, of which very few remain, and these do not breed. Among the multitude of Auks and Fulmars one or two of these gigantic birds are always noticeable, as the Albatros is the first to take wing upon the approach of any boat.

An example from Hamilton Island, off the coast of Corea, was presented to the British Museum by Mr. A. G. Wilday (*Salvin, Cat. Birds Brit. Mus.*, XXV., p. 445, spec. *m.*), and others were procured from Iturup, the most southern of the Kurile Islands. These specimens were purchased by the Museum under the impression that they were from the Liu Kiu Islands (*Salvin, l.c.*, p. 445, spec. *h. k.*), but a MS. note by Seebohm states that they were really from Iturup.

In Japan the species was obtained by Captain Blakiston and Mr. Henson at Hakodate, and two examples were also collected by Mr. Pryer in Tokio Bay; Mr. Ringer obtained specimens at Nagasaki (*Seebohm, Birds Japan. Emp.*, p. 261); and Mr. Holst found this Albatros nesting on the Bonin Islands (*Seebohm, Ibis*, 1890, p. 105).

*D. albatrus* occurs in the Chinese seas, where it was obtained by Mr. Swinhoe at Amoy and Chefoo in April and June, while Mr. Rickett procured adult and young birds off Foochow in February and May.

This species also apparently extends along the entire western coast of North America, from the Pribilof Islands and Alaska to California, and Mr. Dall recorded it from the Aleutian Islands.

During the cruise of the "Corwin" Mr. Nelson met with a young Albatros of this species between St. Lawrence Island and Plover Bay, which appears to be the most northern latitude yet recorded. We have very little information as to its habits, but it is probable that they resemble those of other members of the genus.

Gould believed that *D. albatrus* was likely to occur among the birds of Australia, but as yet no specimen has been obtained there (*Handb. Birds Austr.*, II., p. 433).

Twelve eggs of *D. albatrus* taken by the late Mr. Holst in the Bonin Islands,

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are now in the British Museum; they are dull white, and marked on the larger end with a profusion of red spots and blotches, many of which are confluent and form a distinct cap. Isolated spots and markings of various sizes are scattered over the shell. Length, 2.75 inches; breadth, 2.05.

*Young* (Type of *D. derogata*). Dark chocolate-brown above, the feathers with obscure blackish margins on the mantle and scapulars, as well as the lower back, rump and under tail-coverts; the longer scapulars blackish towards the ends; quills blackish, the secondaries browner on the inner webs, the outer primaries with white shafts; tail blackish; the head and sides of face blacker than the back, with concealed whitish bases to the feathers; chin slightly tinged with slaty-grey, which disappears on the throat, which with the rest of the under surface is chocolate-brown, a little paler than the back and more ashy-grey; wing-coverts blackish-brown below, the greater series greyer; axillaries light ashy-brown, whitish towards the base; quills blackish below, white at the extreme base, and ashy towards the ends; "bill dull pink blotched with dusky colour at the base and dark pink towards the culmen; tip of upper mandible greenish-grey, lower one bluish-grey" (C. B. Rickett). Total length, 31.0 inches; culmen, 5.0; wing, 19.5; tail, 4.7; tarsus, 3.5; middle toe and claw, 5.0.

Dr. Stejneger says that a young bird from Copper Island had the "iris dark-brown; bill violet flesh-colour, the more bluish-white; feet violet flesh-colour, only somewhat tinged with brownish-grey." Mr. Nelson observed a young Albatros of this species in dark plumage at Cape Romanzov, Alaska, just south of Bering Strait. It had a bright yellow bill, with a conspicuous ring round the base, evidently produced by the white feathers surrounding the base of the beak. It will be noticed from the observations of the American naturalists that the colour of the bill in the young varies considerably, doubtless with age, and that the yellow bill of the adult is assumed by the young before its brown plumage is cast.

Most of the specimens in the British Museum are dark brown in colour, with black head and wings. None of these show any direct change from the brown into the white form, but one example from Iturup is much greyer beneath with white bases to the feathers, these apparently replacing the brown plumage of the quite young bird. On the back the young feathers are light-brown, with broad whitish edges, while the new plumage, which is replacing it, is uniform dark brown without pale margins. Another specimen, also from Iturup, is brown above, with an admixture of light edged feathers, as in the preceding specimen, but with the olecranal white patch of the adult indicated on the inner secondaries by broad whitish edgings to the feathers. The under-surface of the body is much paler grey than in the young birds, and the fore-neck and breast are much variegated with yellowish-white margins to the feathers; the sides of the body, flanks, lower abdomen and under tail-coverts being darker and of a more ashy-brown. The head

## DIOMEDEA ALBATRUS.

is black, with the base of the forehead white, the sides of the face brown, the eyelid and a small patch below the eye white. The bill is pale and almost identical in colour with that of the adult bird.

The third stage of the young bird has apparently more grey on the upper-surface, the feathers of which have white bases producing a mottled appearance; this is especially the case on the lower back, rump and upper tail-coverts. The white olecranal patch is very distinct, and has dusky centres to the feathers. The head is blackish-brown with a broad white forehead and eyebrow. The lores, the sides of face, and cheeks pure white, the ear-coverts being shaded with light brown; entire under-surface of body pure white, ashy-grey on the sides of the vent, the under tail-coverts white with ashy-grey ends; on the sides of the fore-neck a patch of brown feathers extending from the sides of the neck, the feathers on the sides of the breast mottled with brown tips; under wing-coverts white round the bend of the wing, the lesser series being streaked longitudinally with dark brown, the greater series of coverts and the axillaries pure white with brown tips; quills below blackish, white towards the base of the inner web, becoming greyer towards the tips.

*Adult.* General colour above white, including the lower back, rump and upper tail-coverts; the scapulars black, shaded with grey, with more or less white at the base; wings brown with an ashy shade; the marginal coverts with white centres; the inner median coverts for the most part white with dusky brown centres to a few adjoining the olecranal patch, which is pure white; the greater coverts ashy brown, the inner ones white at the base with the outer web for the most part ashy-brown, the innermost pure white, like the olecranal patch; quills blackish, brown on the inner webs, which are white towards their base; the secondaries blackish brown, white on the inner web; tail black; crown of head, hind-neck, and sides of face ochraceous buff, this colour extending across the lower throat; chin and upper throat and remainder of surface of body white, including the under wing-coverts and axillaries; "bill reddish violet, the nail whitish; feet greyish-blue, with dusky on the joints and webs" (Stejneger). Total length, 31 inches; culmen, 5.5; wing, 21.3; tail, 6.4; tarsus, 4.7; middle toe and claw, 5.8.

The adult bird described and figured is from Hakodate, collected by Captain Blakiston, and now in the British Museum. The young bird is the type of Swinhoe's *D. derogata*, and the figures in the Plate were taken from this example.

## 108. DIOMEDEA IRRORATA, *Salvin.*

(WAVED ALBATROS.)

(PLATE 93.)

*Diomedea irrorata*, Salvin, P. Z. S., 1883, p. 430 ; Tacz., Orn. Pérou, III., p. 461 (1886) ; Salvin, Cat. Birds Brit. Mus., XXV., p. 445, Pl. VIII. (1896) ; Rothschild and Hartert, Nov. Zool., VI., p. 192 (1899), IX., p. 414 (1902).

Subtus fuliginosa, albo regulariter transversim notata uropygio et supracaudalibus albis nigro transversim fasciatis.

ADMIRAL A. H. MARKHAM first discovered *D. irrorata* in Callao Bay, Peru, and the species was subsequently described by Salvin from one of his specimens. It has since been found breeding in the Galapagos Archipelago by Mr. Wolf in such numbers that an entire camp of "orchilla" collectors, numbering more than fifty men, lived for a month almost entirely on the eggs, though each female lays but a single one.

Dr. Habel, who was the first to record the occurrence of Albatroses on Hood Island, did not obtain any specimens, but he described the birds in two different phases of plumage, one having a blackish breast with a white band crossing the head from eye to eye, while the breast of the other was grey (Salvin, *Trans. Z. S.*, IX., pp. 458, 459) ; but whether this difference was due to sex, age, or species, he was unable to decide. It is possible that the bird with a white band may have been *D. nigripes*, though it has not yet been obtained from the Galapagos. Messrs. Rothschild and Hartert say that it was frequently procured to the northward of these islands in Lat. 32°-35° N., Long. 119°-137° W.

During the Webster-Harris Expedition, a large colony of *D. irrorata* was found breeding on Hood Island in the end of October, when many forsaken eggs were obtained. Young individuals in their first plumage were observed, but as unfortunately none were collected, the dress of the immature bird is still unrecorded (Rothschild and Hartert, *Nov. Zool.*, VI., p. 193). Dr. Baur, who visited the island between the 5th and 8th July, makes no mention of any Albatroses whatever. The Webster-Harris Expedition recorded, but did not identify, Albatroses near Duncan and Albemarle Islands, and Messrs. Rothschild and Hartert believe that the black bird with a white band observed by Mr. Harris was either *D. irrorata* in immature plumage, or possibly an unknown species.





## DIOMEDEA IRRORATA.

The following account of the species in the Galapagos is given by Messrs. Rothschild and Hartert (*Nov. Zool.*, VI., p. 193):—"In breeding plumage *D. irrorata* agrees with Salvin's description. The neck and forehead are white, but the crown from between the eyes and the hind-neck are strongly washed with buffy-yellow. The dark grey and white mottling is much coarser on the vent and under tail-coverts, in sharp contrast to the almost uniform dark grey lower abdomen and flanks. It is gradually lost on the fore-neck. Iris brown; bill yellow; tarsi and feet lead colour, lead-blue, or greenish lead-colour." The bill and feet, too, are represented as of a fleshy pink tint, instead of being as described above.

"Eggs vary from elliptical ovate to perfectly oval, and are mostly without spots, though some show small underlying patches of pale mauve, generally confined to the larger end, but in one specimen it is spread all over the surface. Axis, 3.8-4.3 inches; diameter, 2.6-2.75. The eggs seem to be dropped at random between the rocks and bushes, but all found on this occasion were addled."

*Adult male.* General colour above smoky-brown, with a few irregular bars or spots of white on the longer scapulars, mantle, and inner secondaries, nowhere very distinct; the upper mantle and upper scapulars regularly barred with blackish brown and whitish zigzag bars, the dark bars predominating; hind-neck and sides of neck white, varied with fine transverse lines of greyish black and white, these vermiculated bars extending down the sides of the neck and sides of chest; lower back, rump and upper tail-coverts coarsely barred with black and white zigzag markings, the upper tail-coverts having broader white bars; head and neck white with a slight shade of grey on the sides of face and over the eyes; on the hinder crown a wash of ochraceous buff, which overspreads the hind neck and sides of neck; cheeks, chin and throat white; remainder of under-surface finely vermiculated with white and dusky brown, which becomes darker on the flanks and abdomen, the under tail-coverts whiter, more coarsely barred with dusky-brown; the under wing-coverts and axillaries greyish white, rather finely vermiculated with dusky-brown; edge of the wing dark brown; quills blackish below, more ashy on the inner webs, which are slightly vermiculated near the base.

Total length, about 34.0 inches; culmen, 5.8; wing, 21.5; tail, 5.1; tarsus, 4.1; middle toe and claw, 5.5.

*Adult female.* Similar to the male.

*Young.* Described as uniform brown, but no specimen yet obtained.

The description and figure are taken from Salvin's type in the British Museum. Like most of the chromo-lithographed plates in the twenty-fifth volume of the "Catalogue of Birds," that of *Diomedea irrorata* has faded, and is no longer accurate, the bill and feet being also wrongly coloured.

## 109. DIOMEDEA NIGRIPES, *Audub.*

(BLACK-FOOTED ALBATROS.)

(PLATES 94, 95.)

*Diomedea nigripes*, Audub., Orn. Biogr., V., p. 327 (1839); id., Birds Amer., 8vo, VII., p. 198 (1844); David and Oust., Ois. Chine, p. 517 (1877); Baird, Brewer, and Ridgway, Water-Birds N. Amer., II., p. 355 (1884); Seebohm, Birds Japan. Emp., p. 263 (1890); Stejneger, Bull. U. S. Nat. Mus., No. 29, p. 91 (1885); Salvin, Cat. Birds Brit. Mus., XXV., p. 445 (1896); Bryan, Key to the Birds of the Hawaiian Group, p. 10 (1901).

*Diomedea brachyura* (nec Temm.), Gray, Gen. Birds, III., p. 650 (1844); Salvin, Voy. "Challenger," II., pt. VIII., p. 147 (1881).

*Diomedea chinensis* (nec Temm.), Rothschild, Avif. Laysan, p. 55, Pls. 31, 32 (1893).

Ad. Nigricanti-brunnea; rostro et pedibus nigris; uropygio albo, vel fuliginoso-brunneo. Juv. pedibus nigrie.

THE Black-footed Albatros is an inhabitant of the north Pacific Ocean, including the west coast of America to the Bering Sea, but it is not found south of the Equator. The exact range is somewhat difficult to determine, as in ornithological memoirs this bird has often been confused with *D. brachyura* of Temminck, a name belonging to the young of *D. albatrus*, which inhabits almost the same area, and in its immature plumage resembles the adult of *D. nigripes*. The synonymy of the two species is in inextricable confusion, but once seen there should be but little difficulty in distinguishing *D. nigripes*, which is a smaller bird, with a smaller and darker bill, and also in certain stages of plumage has a white rump: neither does its range extend so far north.

This species was described by Audubon from a specimen obtained by Mr. Townsend in the Pacific Ocean, Lat. 50° N., on December 25th, 1834. Major Barrett-Hamilton states (*Ibis*, 1903, p. 321) that he noticed this Albatros nearly every day during his voyage from Unalashka to Port Townsend in October and November,





## DIOMEDEA NIGRIPES.

1896, its most northerly point being about four hundred miles from that port. He believed that it occurs but rarely in Kamtschatkan waters, and it was not seen by Dr. Stejneger in the Commander Islands. *D. nigripes* has been observed along the western coast of North America as far south as California, and was obtained on the island of Guadalupe in June, by Messrs. Brown and Marsden (Thayer and Bangs, *Condor*, X., p. 103, 1908). Major Barrett-Hamilton found it in great numbers between San Francisco and Honolulu, and it is also recorded from the seas of the Hawaiian Islands and Laysan, where Mr. Walter K. Fisher (*Auk*, XXI., p. 9, 1904) found large numbers, breeding chiefly on the sea beaches. *D. nigripes* formerly frequented Marcus Island, but Mr. Alanson Bryan informs us that it has now been exterminated by the Japanese traders, who have destroyed their colonies and those of *D. immutabilis*, and, after boiling down the bodies, packed them off to Japan for manure. *D. nigripes* has not actually been found on the Galapagos Islands, although it was observed by the Webster-Harris Expedition to the northward of this group, and especially in Lat. 32° 35' N., Long. 119° W., and again in Lat. 32° 35' N., Long. 137° W.

A specimen in the British Museum, said to be from Hakodate in Japan, is probably that recorded by Seebohm (*Ibis*, 1884, p. 176) as shot on May 17th in the Strait of Sungaru, separating Yezo from the main island of Japan. Seebohm also records another male specimen from the Sagami Province near Yokohama (*Ibis*, 1885, p. 363) obtained on the 27th February, and Holst found great numbers breeding on the Volcano Islands in June (Seebohm, *Ibis*, 1891, p. 191). Major Barrett-Hamilton, who noticed this Albatros off Staten Island, one of the Kuriles, Lat. 45° 29' N., Long. 156° 16' E., says that *D. nigripes* was constantly seen on the voyage from San Francisco to Yokohama in June, 1896, excepting in latitudes south of 23° 29' N., where it was very scarce. When passing north from Hong Kong through the China Seas in May, 1897, he saw the first "Gooney" near the Heachu Islands, and others were observed in Lat. 28° 41' N., Long. 122° 11' E., while a white-rumped specimen was seen on the same day about 4½ hours from Wohsung, and another on the 23rd, as the Japanese coast was approached (*Ibis*, 1903, p. 320).

Swinhoe found *D. nigripes* abundant in the Formosa Channel at all seasons, and there can be no doubt that it occurs throughout Chinese waters. He endeavoured to keep four of this species and two *D. albatrus* alive in his house at Amoy, but they would not feed, and gradually grew weaker till they died. One of the birds lived for twenty-nine days, and, as it had previously been a week in confinement, Swinhoe estimated that the poor bird survived for thirty-five days at least without food.

These Albatroses sit high on the water, and, unless gorged with food, rise without difficulty, but when preparing to fly, they walk on the water for a short distance, with their wings extended, using their great webbed feet to assist them.

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In flying the feet are stretched out under the tail, and often protrude beyond it, presenting the appearance of two extra long feathers (Cf. Barrett-Hamilton, *Ibis*, 1903, pp. 320-323).

*Adult male.* General colour above dark brown, with paler brown or whitish edges to the feathers; scapulars like the back; lower back and rump brown, with blackish edges to the feathers; wings brown, the median and greater coverts whitish or ashy-grey towards the base of the inner webs; primaries blackish, with yellow shafts; secondaries dark brown, greyer towards the base of the inner web; upper tail-coverts pure white, a few basal ones with dark brown margins; tail dark brown; crown of head dull white, becoming browner on the nape and hind-neck, the crown slightly mottled with light brown bases to the feathers; chin white, like the fore-part of the cheeks; hinder-cheeks, ear-coverts and remainder of throat, pale ashy, verging into brown on the sides of neck, lower throat, and fore-neck, the feathers of these areas having obscure sandy margins; remainder of under-surface pale ashy-grey, the feathers broadly margined with pale whity-brown; feathers of abdomen whiter; under tail-coverts pure white; under wing-coverts and axillaries dark brown; quills brown below, rather more ashy on the inner web; "bill plumbeous, base and tip black; tarsi and feet black; iris umber" (Bean). Total length, 27 inches; culmen, 4.2; wing, 19.5; tail, 5.4; tarsus, 3.9; middle toe and claw, 5.0.

*Young female.* Entirely brown, with faint margins of lighter brown, the rump like the back, but with no white on the upper tail-coverts; wings rather blacker than the back; sides of face dark slaty-grey, rather lighter on the throat, and especially on the chin; the cheeks, fore-neck and chest blackish, with an ashy shade; remainder of under-surface very dark ashy-grey, dark brown on the under tail-coverts, under wing-coverts and axillaries; quills blackish, rather more ashy on the inner web. Total length, 29 inches; culmen, 1.9; wing, 19.51; tail, 5.5; tarsus, 3.5; middle toe and claw, 4.5.

Immature birds show a few white feathers with brown edges on the upper tail-coverts; the crown of the head is more or less ashy-grey, and the sides of the face, ear-coverts and cheeks, as well as the throat, are paler slaty-grey, the rest of the crown and hind-neck blackish; a line across the forehead, fore-part of cheeks and chin, white; below the eye a white streak, extending a little way above the ear-coverts; feathers below and in front of the eye black.

In the "Catalogue of Birds" (*l.c.*) Salvin expressed his opinion that the white-rumped birds were the young, while those with the dark rump were the adult. After a careful examination of the series in the British Museum I arrive at a different conclusion, and as there is all through the Albatroses a tendency to grow whiter with age, I think it is far more probable that the birds with a white face and abdomen, and with white upper tail-coverts, are the fully adult, and herein I find that I am in agreement with Mr. Ridgway (*Water-Birds N. Amer.*, II., p. 355).



DIOMEDEA NIGRIFES

J.G. Kauderns. del. et. lith.



### DIOMEDEA NIGRIPES.

In part III. of his "Avifauna of Laysan" (p. 292, 1900) the Hon. Walter Rothschild mentions a bird sent him by Professor Schauinsland, which he believed to be a hybrid between *D. immutabilis* and *D. nigripes*, and of which he gives a description.

The adult male described was obtained during the voyage of H.M.S. "Challenger," in the north Pacific in June, 1875: it is figured on Plate 94, and the young bird on Plate 95.

## 110. DIOMEDEA IMMUTABILIS, *Rothschild.*

(LAYSAN ALBATROS.)

(PLATE 96.)

*Diomedea an exulans?* Kittl., Mus. Senckenb., I., p. 120 (1834).

*Diomedea brachyura*, (nec Temm.), Peale, U. S. Expl. Exped., pp. 290, 337 (1848);  
Cass., U. S. Expl. Exped., pp. 398, 451 (1858).

*Diomedea melanophrys* (nec Boie), Bean, P. U. S. Nat. Mus., V., pp. 170, 172 (1882).

*Diomedea immutabilis*, Rothschild, Bull. B. O. C., I., p. xlviii. (1893); id., Ibis, 1893, p. 448, 1894, p. 548; id., Avif. Laysan, I., p. 57, Pls. 33-39 (1893); id., Bull. B. O. C., III., p. xlvii. (1894); Salvin, Cat. Birds Brit. Mus., XXV., p. 446 (1896); Anthony, Auk, XV., p. 38 (1898), XVI., p. 99 (1899); Scott Wilson and Evans, Aves Hawaiienses, p. 217 (1899); Rothschild, Avif. Laysan, III., p. 292 (1900); Bryan, Key to the Birds Hawaiian Group, p. 10 (1901); id., Occ. Papers Bernice Pauahi Mus., Honolulu, XI., p. 106 (1903); Fisher, Auk, XXI., p. 8, Pls. 2-8 (1904); id., Bull. U. S. Fish Comm., XXIII., pt. 3, p. 786 (1906).

*D. minor*: supra brunneus; uropygio et supracaudalibus albis: pedibus carnis: rostro flavicante; pileo albo, collo et gastræo toto albis: cauda brunnea, dorso concolori.

THIS species, when first observed by von Kittlitz on the islands of Gardner, Moller, and Lisiansky, was mistaken by him for *D. exulans*: it was probably the Albatros seen by Dr. Pickering during the United States Exploring Expedition of 1844, and recorded as very abundant in the seas north of the Sandwich Islands. In his "Avifauna of Laysan," the Hon. Walter Rothschild says that on the shoals of French Frigate Island only a few of these birds were seen, while on Laysan they were in such crowds that they almost touched each other, and on Lisiansky they were also numerous.

Mr. Bryan's story of the "Gonies" on Marcus Island is one of extinction, for though so abundant at one time, that three hundred might be killed





## DIOMEDEA IMMUTABILIS.

in a day, a trading company, formed by the Japanese Government for the purpose of collecting guano, was so unsuccessful that it developed into a scheme for making a marketable commodity of the birds by killing and boiling them down. Subsequently the flesh, bones and viscera were barrelled and shipped to Japan, where the mixture was used as a fertiliser. The long quills from the wing were sold as Eagle-feathers, and were shipped to England or America for millinery purposes, while those from the breast were sold by the pound. Thus a profitable business was developed at the cost of the entire colony of these splendid birds, which in six years were completely exterminated, for on Mr. Bryan's visit to the island, out of ten birds which formed the total number collected that year, he was only able to procure one specimen from a Japanese trader.

The following notes are taken from Mr. W. K. Fisher's article on the Laysan Albatros (*Auk*, XXI., pp. 8-20):—*Diomedea immutabilis* is distributed throughout the Island of Laysan, with the exception of the sea beaches, which are colonized on all sides, saving the west, by *D. nigripes*. It prefers the open to the bushy area, and the flat plain round the lagoon is a favourite habitat. At certain times of the day the greater number of the adults go out to sea for food, while the young birds, and a few of the old ones, are left at home to disport themselves in their ridiculous attitudes and endless dances. In four months the young birds become as heavy as their parents, and if approached too near they fly into a rage and snap their beaks rapidly to frighten the intruder. When undisturbed, they sit for hours on their heels, with their feet tilted in the air, apparently gazing into the distance, and showing but little intelligence. The young birds do not stray far from home, but later, as their strength increases, they fan their wings from time to time, and this was specially the case after a shower of rain. Mr. Fisher gives a minute description of the curious sort of dance in which they engage, for which I must refer the reader to his article for further particulars. He also gives an interesting calculation of the quantity of food consumed by these birds. Taking their number at 1,000,000, which he does not consider excessive, and allowing one and a half pounds of squid (*Ommastrephes oualaniensis*) for each bird per day, they would consume nearly 600 tons of these animals. The Albatroses live on Laysan for nearly ten months of the year, arriving towards the end of October, and Dr. H. Schauinsland, who witnessed their advent, says that they come in such countless numbers that the exposed places in the island become as white as though a fall of snow had taken place. Like other Petrels, *D. immutabilis* lays a single egg about the middle of November, in a shallow depression on the top of a slightly raised mound. The egg is of a dirty white, with irregular patches and spots of brownish maroon at the larger end. The young are hatched in February, but grow slowly, and it is not till July that they can follow their parents on their first flights to sea. A few weeks later they all take their departure, and are absent from the island for about two months, when they disperse over the Pacific, wandering as far as Japan, and Guadalupe off Lower California. Besides Laysan *D. immutabilis* makes its home

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on Midway, Lisiansky, Necker and Bird Islands, where *D. nigripes* is likewise found, and a specimen in the Tring Museum is from the Japanese island of Miyakeshima (*Bull. B. O. C.*, III., p. xlvii., 1894). Mr. A. W. Anthony has recorded an example obtained between San Geronimo Island and Guadalupe Island, off Lower California (*Auk*, XV., p. 38, 1898).

*Adult.* General colour above dark brown with a shade of grey, and faded edges to the feathers; scapulars like the back, but a little darker; wings darker and blacker than the back; quills blackish, the outer primaries with yellowish shafts, the secondaries with more or less white towards the base of the inner web; lower back and rump brown, with a distinct shade of grey, the upper tail-coverts white, with a more or less conspicuous brown spot at the ends, especially on the longer ones; tail-feathers blackish brown with a little white at the extreme base, and with yellowish shafts to the centre feathers; head and neck all round as well as the entire under-surface of body, pure white, including the under tail-coverts; under wing-coverts white, with a broad blackish band round the bend of the wing; outermost hypopteral plumes greyish-brown, with white tips, the innermost with the greater part of the outer web smoky-brown, the middle ones pure white; quills dusky-brown below, greyer on the inner web; "bill grey, darker at base, tip blackish brown, base of under-mandible pale yellow; tarsi and feet fleshy-pink; iris brown" (W. Palmer). Total length, about 28 inches; culmen, 4.2; wing, 19.0; tail, 5.6; tarsus, 3.1; middle toe and claw, 4.2.

The sexes are alike in colour and the first plumage (which is dark in most Albatroses) is similar to that of the adult bird, the breast and entire under parts being pure white: hence the specific name of *immutabilis*.

The nestling is covered with down of a brown colour; the bill is blackish-brown, and the iris is brown also.

The description of the adult bird and the figure in the Plate are taken from a specimen presented to the British Museum by the Hon. Walter Rothschild. There is an excellent figure of it in his great work on the "Avifauna of Laysan." Our artist has somewhat exaggerated the yellow tinge on the back of the head and neck, and also on the under surface of the body.





## 111. DIOMEDEA MELANOPHRYS, *Boie*.

(BLACK-EYEBROWED ALBATROS.)

(PLATE 97.)

*Diomedea melanophrys*, Boie in Temminck's, Pl. Col., V., Pl. 456 (1838); Gould, Birds Austr., VII., Pl. 43 (1844); Coues, Pr. Acad. Philad., 1866, pp. 181, 188; Buller, Birds New Zeal., p. 292 (1873); Sharpe, Phil. Trans., Vol. 168, p. 146 (1879); Baird, Brewer, and Ridgway, Water-Birds N. Amer., II., p. 357 (1884); Buller, Birds New Zeal., Ed. 2, II., p. 198 (1888); Salvin, Cat. Birds Brit. Mus., XXV., p. 447 (1896).

*Diomedea gilliana*, Coues, Pr. Acad. Philad., 1866, pp. 181, 188; Ridgway, Man. N. Amer. Birds, p. 52 (1887).

*Thalassarche melanophrys*, Giglioli, Faun. Vertebr. Oceano, p. 57 (1870).

Supra nigricanti-brunnea, interscapulio schistaceo: uropygio et supracaudalibus albis: pedibus flavicantibus: rostro flavo: pileo albo: fascia supraoculari nigra: cauda schistaceo-cinerea.

THE Black-eyebrowed Albatros is found all over the Southern Oceans, and, according to Layard and Andersson, frequents the Bays round the Cape of Good Hope and has also been recorded from Walfisch Bay and Pondoland. Numbers are brought by the native fishermen into the market at Cape Town, where they are sold at threepence each, and are esteemed by the lower classes as an article of food (Sharpe ed. Layard, *Birds S. Africa*, p. 772).

Mr. Eagle Clarke regards the occurrence of *D. melanophrys* on Gough Island as somewhat doubtful, though Mr. Wilton records it as abundant off the island on April 21st, 1904 (*Ibis*, 1905, p. 265). The species was not mentioned in Professor Verrill's list of birds procured and noted by Mr. Comer, and on Tristan da Cunha some doubts as to its appearance must be entertained, although Captain Hutton in 1865 gives Captain Carmichael as an authority for its breeding there (*Ibis*, 1865, p. 283).

Mr. T. J. Parkin procured examples of *D. melanophrys*, among other Petrels, in Lat. 39° 51' S., Long. 80° 49' E. (*Bull. Brit. Orn. Club*, X., p. cvi., 1900), and

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Nikolai Hanson captured his first specimens on October 13th, 1898, in Lat. 33° 37' S., Long. 9° 54' E.

On Kerguelen Island the species was obtained by the naturalists of the "Erebus" and "Terror" (*Phil. Trans.*, Vol. 168, p. 146), and by those of the "Challenger" Expedition, while Mr. Robert Hall found it breeding on the cliffs facing the east at a height of four hundred feet.

Gould described this Albatros as the commonest in the Southern Oceans; and from Lat. 35° to 50° S., whether in the Atlantic or Pacific, it was rarely absent, while off the coast of Tasmania it was particularly abundant, following the ship to the entrance of Storm Bay, whence it departed for the open sea.

Professor Giglioli records the species between Batavia and Melbourne up to the entrance of Port Jackson, and Mr. A. J. Campbell adds Queensland, New South Wales, Victoria, S. W. Australia to its habitat (*Nest and Eggs of Austr. Birds*, II., p. 926).

In the New Zealand Seas, Sir W. Buller says that *D. melanophrys* was far more common than *D. exulans*, and this is the Albatros which is supposed to nest on the Sisters, some outlying islands of the Chatham group, where a thousand young birds are said to have been taken by the Maories in a single season (Buller, *Suppl. Birds New Zeal.*, I., p. xxiv., 1905). The nests on Chatham Island were in such inaccessible places that Captain Fairchild of the "Hinemoa" was unable to reach them (Buller, *t.c.*, p. 147). On Campbell Island Captain Hutton says the birds commence to breed during the middle of September (*Ibis*, 1903, p. 82).

Dr. Wilson relates that during the voyage of the "Discovery" he first met with *D. melanophrys* on September 27th, 1901, in Lat. 28° S., and it shortly after appeared in great numbers, accompanying the ship to the vicinity of Table Bay, and again on leaving the Cape on their southward voyage it reappeared. Some birds had a pale grey head and neck, while others had a grey collar of varying width and incomplete below. The size of the birds also differed considerably, but all had the dusky yellow bill with darker tip. The grey-necked birds are doubtless immature, and could easily be distinguished from *Thalassogeron chlororhynchus* and *T. culminatus*, as the colour of the bill in the two last named birds is more defined, and more distinctly black and yellow than that of the young *D. melanophrys*. Until October 19th only immature examples were seen, but thenceforth till October 28th adult birds alone appeared; from that time, however, onwards, he saw white-headed adults with lemon-yellow bills and orange tips, white-headed birds with bright yellow bills and dusky tips, or with dull yellow bill and blackish tip, and grey-headed birds with dusky brownish bills and darker tips. The conclusion arrived at was that they were all forms of *D. melanophrys* in various stages of plumage. Throughout the first half of November one or more of these forms was seen daily, till on reaching the ice, they disappeared, only to reappear on leaving it as the ship went north. They were very numerous in the neighbourhood

## DIOMEDEA MELANOPHRYS.

of the Auckland Islands, but between New Zealand and the Straits of Magellan, not a single one was encountered till after passing Punta Arenas. Many examples have been procured or noted at various seasons off the coast of Chile, and Professor Giglioli records the species from Callao to Valparaiso in September and November, also in the Messier Channel in Patagonia, and in the Straits of Magellan early in January,

Although Captain Abbott says that *D. melanophrys* is seldom seen in East Falkland, he found it breeding in large numbers on the adjacent islands. The nests were of mud, raised nearly a foot from the ground, and placed in close proximity to each other. The eggs, he says, are two in number, though this I think questionable, and large quantities are brought to market at Port Stanley. During the breeding season it is easier to take the egg from under the bird than to make the latter move from its nest (*Ibis*, 1861, p. 165).

*D. melanophrys* occasionally finds its way into European waters, and a specimen was taken alive near Linton, in Cambridgeshire, in 1897 (*Ibis*, 1897, p. 625; 1905, p. 482). Another was obtained in 1878 by Captain David Gray, of the "Eclipse" whaling steamer, in June, Lat. 80° 11' N., Long. 4° E., which is now in the Peterhead Museum. These two examples were subsequently identified by Salvin as *D. melanophrys* (*Bull. Brit. Orn. Club*, IV., pp. xv., xx., 1894), though the specific name was at first inadvertently given (*t.c.*, p. xv.) as *D. culminata*. Captain Gray obtained a second bird, May 2nd, 1885, in Lat. 74° N., which, from the description, Howard Saunders thought should be referred to this species. In 1860 Dr. Knud Andersen recorded the occurrence of a female on the Danish Colony at Meygganaes, at the extreme west of the Faroe Islands, and for no less than thirty-four years it was observed on the same cliff, arriving in the early spring with the Gannets, and leaving with them again in the late autumn. The strange bird was well known to the islanders, who gave it the name of "Sule Konge," or the "King of the Gannets"; it was accidentally shot in May, 1894, and the skin is preserved in the Copenhagen Museum (Andersen, *Vidensk. Medd. Kjöbenh.*, 1894, p. 241).

The habits of this Albatros resemble those of other members of the genus. It may easily be caught with a hook and line, and Gould, during his voyage to Australia, captured many specimens alive, but after examining and marking them, he set them free and was thus enabled to identify the birds, and prove that they followed the ship for many days. When placed upon the deck the bird cannot fly, and may very soon be tamed. Captain Hutton, however, relates (*Ibis*, 1865, p. 283) that he did not find *D. melanophrys* so easy to catch as *D. exulans*, and adds that he never saw it vomit oil as other Petrels do. Although these birds occasionally dive, they generally prefer to let the "Night-hawk" do so instead, then when the prey is captured they give chase, croaking and running along the top of the water with outstretched wings until they compel the latter to drop its burden, and then

## MONOGRAPH OF THE PETRELS.

seize it themselves before it sinks again. The species is apparently diurnal in its habits both at sea and ashore.

Mr. Nicoll found a large fish in the crop of a specimen which he shot, so that no doubt remains as to the bird being a fish eater (*Ibis*, 1904, p. 52).

*Adult female.* General colour above blackish-brown, the long scapulars black towards their ends; the mantle and upper back lighter and shaded with slaty-grey; lower back, rump, and upper tail-coverts pure white; tail-feathers slaty-grey with yellowish-white shafts; wings blackish-brown, the quills greyish on the inner webs, gradually inclining to white towards the base of the inner web of the secondaries; head and neck all round, and entire under-surface of body, pure white; the hinder crown, and nape, as well as the sides of the crown above the ear-coverts, delicate blue-grey, which colour is more or less visible on the hind-neck, and is more distinct where it joins the mantle; toes shaded with ashy-grey; in front of the eye a black spot, extending above it and the ear-coverts, and merging into grey on the sides of the crown; under wing-coverts black, forming a broad black border on each aspect of the wing, and on closing, a broad longitudinal band of white formed by the greater coverts; primary-coverts ashy-grey, white on the inner webs; quills blackish below, greyer on the inner web, secondaries whitish towards the base of the inner web; axillaries pure white; "bill buff, with a narrow line of black round the base; legs and toes yellowish white, the interdigital membrane and the joints marked with pale blue; iris very light brown, freckled with a darker tint" (Gould). Total length, about 32 inches; culmen, 4.7; wing, 20.7; tail, 7.6; tarsus, 3.0; middle toe and claw, 4.7.

It is interesting to note that sometimes the flocks of this Albatros consist entirely of old birds while at others only immature specimens are encountered.

The colour of the bill is said by Professor Giglioli to vary from olive with a black tip to pure orange, and even uniform flesh-colour. These differences are doubtless due to age and it may be a considerable time before the birds show the yellow bill of the fully adult.

Gould, however, says that the young may be distinguished by their dark brown bill, which in the adult are buff colour, or in some immature and intermediate examples of a delicate yellow (*Handb. Birds Austr.*, II., p. 440). Hutton challenges Gould's statement that the only difference between adult and young birds lies in the colour of the bill.

According to Hutton's observations the head in the young is grey, which, as the bird grows older, becomes white, first on the cheeks, and then spreading to the top of the head, leaves a collar round the neck, which breaks first in front, and gradually spreads upwards until the whole is white. The beak remains dark blue for some time after the plumage has assumed the colours of the adult. The feet and legs of the young bird are light blue. "Bill black; tarsi and toes black with an olive-brown wash; iris hazel" (M. J. Nicoll).

## DIOMEDEA MELANOPHRYS.

Buller writes:—"In the perfectly adult bird the bill is of a uniform gamboge-yellow, shaded with orange on the hook, with a very fine line of black round the base of both mandibles; feet delicate blue-grey, darker on the joints and interdigital webs; claws whitish horn-colour."

The adult bird described is a female procured by Nikolai Hanson in Lat. 44° 23' S., and the figure is taken from an example obtained in Talcahuano Bay, formerly in our collection.

## 112. DIOMEDEA BULLERI, *Rothschild.*

(BULLER'S ALBATROS.)

(PLATE 98.)

*Diomedea culminata* (nec Gould), auct., ex Nova Zealandia; Buller, Birds New Zeal., p. 295 (1873); Finsch, J. f. O., 1874, p. 206; Buller, Birds New Zeal., 2nd ed., II., p. 201 (1888).

*Diomedea bulleri*, Rothschild, Bull. B. O. C., I., p. Iviii. (1893); id., Ibis, 1893, p. 572; Buller, Tr. N. Z. Inst., XXVII., p. 121 (1895); Salvin, Cat. Birds Brit. Mus., XXV., p. 448 (1896); Buller, Suppl. Birds New Zeal., I., p. 149, Pl. V., fig. 1 (1905); Ogilvie-Grant, Ibis, 1905, p. 558.

Minor: ala 19.2: rostro nigricante, culmine flavo: mandibula ad basin flavicante.

THIS Albatros is apparently confined to the Seas of New Zealand. It is a well-marked species, and may be distinguished by the black latericorn of the bill. The culminicorn, however, is yellow, and there is a certain amount of yellow at the base of the lower mandible.

For many years the species was known as *D. culminata*, and was thus described by Buller in the first and second editions of his "Birds of New Zealand." It differs, however, in having the mantle brownish-grey, not ashy-grey, and the fore-part of the crown is white, with the hinder-part grey, like the face and throat; whereas in *D. culminata* the whole crown is delicate ashy-grey.

The Hon. Walter Rothschild points out that as regards the form of the bill, *D. bulleri* is somewhat intermediate between the genera *Diomedea* and *Thalassogeron*. In the latter genus, as recognised by Salvin, the base of the culminicorn is separated by an interval of soft skin from the latericorn, but in *Diomedea* there is no such separation between the basal area of these two portions of the bill.

Buller says the nest is similar to that of *Thalassogeron salvini*, and describes the eggs as varying slightly in size, averaging 4 inches in length by 2.5 inches in breadth. Some are of a uniform creamy-white, while others have the larger end speckled with small reddish dots, becoming confluent in places and forming a distinct zone. The bird is, apparently, a native of Snares Island, where it nests at the end of January, and Buller says it is the only Albatros found breeding there.





## DIOMEDEA BULLERI.

*Adult male.* Above sooty-grey, with greyish margins to the feathers; scapulars and wings slightly darker than the back; secondary quills somewhat greyer, with the basal half of the inner web white, the innermost secondaries entirely brown like the scapulars; lower back, rump and upper tail-coverts pure white: tail-feathers slaty-grey, blackish on the outer web, shafts white; forehead and fore-part of crown white, shading off gradually into grey, this colour occupying the hind-neck and sides of neck and overspreading the mantle; sides of face and entire throat and fore-neck French grey; the lores and ear-coverts darker, with a shade of black on the upper-part of the lores and eyelid, extending above the ear-coverts; rest of the under-surface from the fore-neck downwards pure white; axillaries and under wing-coverts pure white, with a very broad band of blackish brown round the edge of the wing. Length, wing, 19.2 inches; tarsus, 3; middle toe and claw, 4.8; culmen, 4.9.

Culminicorn orange-yellow to tip of unguis, lower mandible of same colour, latericorn with tomia and unguis dark horn colour; legs and feet red.

Hutton states that young birds have the plumage of the entire head and neck brown.

The description and figure are taken from the type in the Tring Museum.

## 113. DIOMEDEA PLATEI, *Reichenow*.

(PLATE'S ALBATROS.)

(PLATE 98A.)

*Diomedea platei*, Reichenow, Orn. M.B., VI., p. 190 (1898); Schalow, Zool. Jahrb., Suppl., IV., 1898, p. 749; Reichenow, J. f. O., 1899, p. 119, 1900, pp. 244, 245, cum fig.; id., Orn. M.B., XIV., p. 51 (1906).

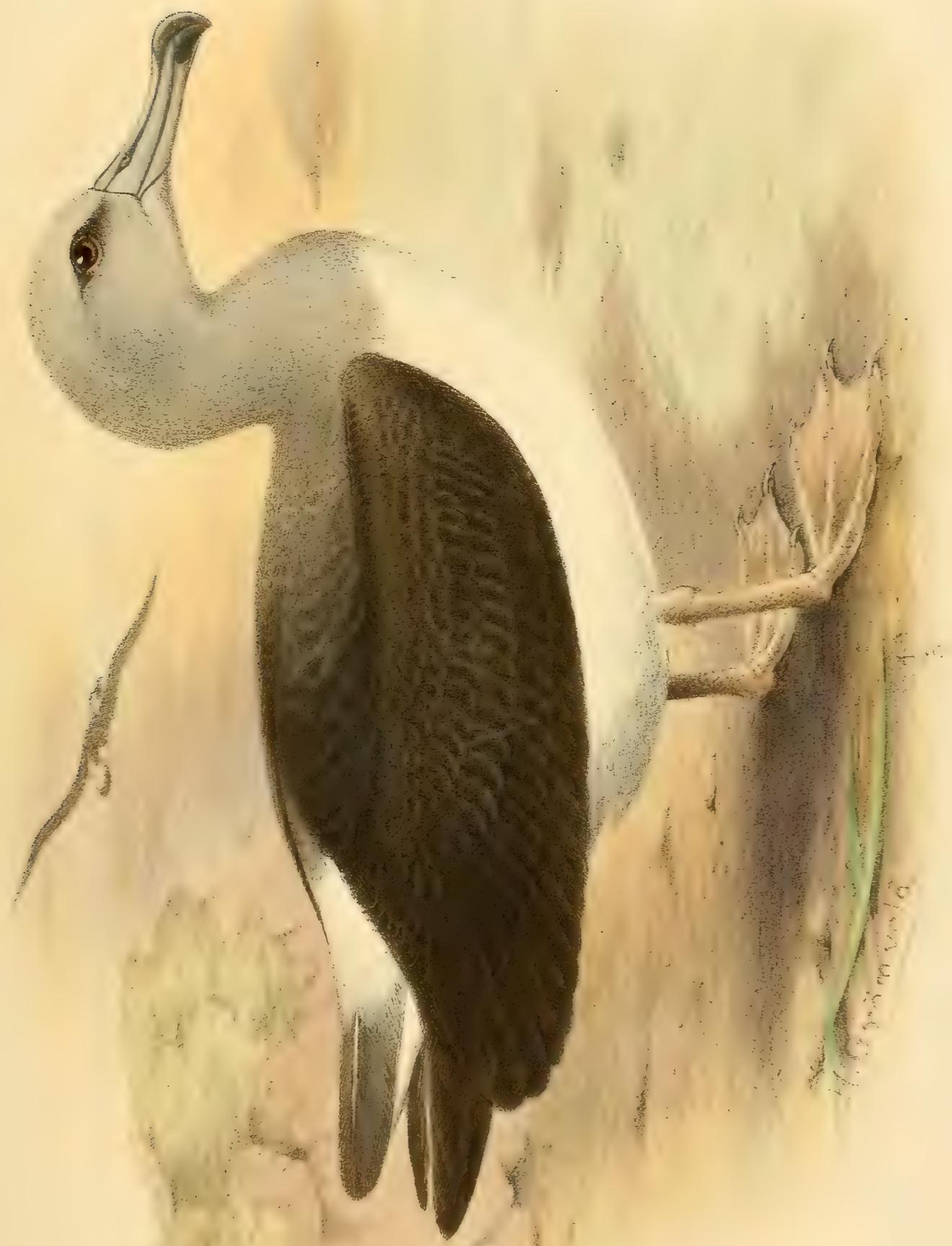
*Diomedea cauta*, imm., Ogilvie-Grant, Ibis, 1905, p. 559.

*D. bulleri* similis, pileo minime pulchre cinereo, sed dorso concolori, fumoso-griseo: rostro nigricante nec grisescenti-corneo, culmine pallidiore, corneo haud flavo distinguenda.

THIS apparently distinct species was described by Professor Reichenow from a specimen procured by Dr. Plate at Cavancha, Chile, and is at present represented by the unique example in the Berlin Museum.

Professor Reichenow, in his diagnosis, points out the difference between his new species and *Diomedea bulleri*, the type of which was lent to him for comparison by the Hon. Walter Rothschild. In 1905, Mr. Ogilvie-Grant, writing on the birds of New Zealand and the adjacent islands, expressed his opinion that *D. platei* was an immature bird of *Thalassogeron cautus*, but to this Professor Reichenow demurred. To his kindness and that of Professor Brauer, the Director of Berlin Museum, I am indebted for the opportunity of examining and figuring the type of *D. platei* in the present work. When I first saw the specimen in the Berlin Museum I was much impressed with its distinct appearance, and now having made a closer examination, I agree with Professor Reichenow that it has nothing in common with *T. cautus*, and that it is a true *Diomedea*, allied to *D. bulleri*, of which it may possibly be the young. I am, however, unable to determine this point, because neither the Rothschild Collection nor the British Museum contains any specimen in the least resembling it.

Above smoky-grey; scapulars darker; lower back slaty-grey; rump and upper tail-coverts pure white; wings slightly darker than the back, with smoky-grey margins to the coverts and the secondaries; quills blackish, greyer on the inner web;



*Booby*



## DIOMEDEA PLATEI.

outer primaries with white shafts; tail-feathers dark slaty-grey, the inner webs blacker, the shafts white; head pale ashy-grey, whiter on the forehead and becoming slightly darker on the neck and upper mantle; lores and sides of face also ashy-grey; a streak from the base of the bill extending through the eye, to a short way beyond it, black; throat and fore-neck delicate ashy-grey; remainder of under-surface pure white, including the under wing-coverts and axillaries; feathers round the bend of the wing mostly smoky-brown; quills black below, rather greyer on the inner web. Bill (in skin) horny grey, the culmen slightly paler, the unguis of both mandibles blackish horn-colour. Total length, about 31 inches; culmen, 4.6; wing, 19.0; tail, 7.2; tarsus, 2.85; middle toe and claw, 4.6.

The description and figure are both taken from the type lent by the Director of the Berlin Museum.

## 114. THALASSOGERON CAUTUS (*Gould*).

(SHY MOLLYMAUK.)

(PLATE 99.)

- Diomedea cauta*, Gould, P. Z. S., 1840, p. 177; id., Birds Austr., VII., Pl. 40 (1844); id., Handb. Birds Austr., II., p. 434 (1865); Coues, Pr. Acad. Philad., 1866, pp. 183, 188; Le Souëf, Ibis, 1895, p. 413; Ogilvie-Grant, Ibis, 1905, p. 558.
- Thalassarche cauta*, Giglioli, Faun. Vertebr. Oceano, p. 58 (1870).
- Thalassogeron cautus*, Ridgway, Man. N. Amer. Birds, p. 53 (1887); Salvin, Cat. Birds Brit. Mus., XXV., p. 449 (1896).

Capite et collo cinereis; dorso obscuriore; alis nigrescentibus; cauda grisea; uropygio et corpore toto subtus albis.

ALTHOUGH this bird resembles its ally *T. layardi* in the light horn-coloured bill with pale yellow tip, while the culmicorn is also horn-coloured like the latericorn, and not bright yellow as in many of the allied species, it can be distinguished from all other members of the genus by its larger size, the grey colour on the sides of the mandibles, and the yellow line at the base of the lower mandible.

*T. cautus* is undoubtedly an inhabitant of the Australian Seas, and according to Professor Giglioli it was seen, during the voyage of the "Magenta," on April 24th, 1867, in Lat. 39° 36' S., Long. 126° 25' E., when it followed the ship to the entrance of Port Phillip. The species was also abundant in Bass' Straits and along the coast to Port Jackson, and on leaving Sydney it continued in the track of the vessel till it reached Lat. 32° 27' S., Long. 173° 53' E., on the 2nd June.

Gould observed *T. cautus* off the coast of Tasmania, also in Recherche Bay at the south entrance to d'Entrecasteaux Channel, where it was doubtless attracted by the large quantities of fat and other remains of whales which were floating on the water; the stomachs of those examined contained fragments of large fish, barnacles and crustaceans.

He believed that the birds nested in small companies on the rocky ledges of the cliffs, and on the top of Albatros Island, one of the Hunter group, off the north-west point of Tasmania. Both sexes take part in the process of incubation, and





## THALASSOGERON CAUTUS.

when on the nest can only be removed with considerable difficulty or force. While one bird is sitting the other keeps it company by cackling and rubbing its bill against that of its mate, or at the approach of an intruder both protest loudly, spread their tails, and stretch out their heads and bow first one side then on the other.

This species is singularly dependent on the wind, and in calm weather is liable to be captured in any depression of the ground, for without a strong wind it cannot rise, and in order to fly it must reach the edge of a cliff or prominence and start with a downward movement. During a gale these birds are equally helpless, for they cannot fight against it, and are unable to alight without great difficulty at any given spot, and may be seen making many vain attempts before they succeed in achieving their object.

Like most other Petrels, this species possesses the habit of ejecting a foetid oily substance through the nostrils.

The nest is composed of chocolate coloured soil mixed with small roots and other vegetation, and is usually placed under thick matted grass or in a sheltered recess under a rock.

The egg is laid early in October and fits into a longitudinal depression, bare of feathers below the breast-bone of the parent bird, and is thus kept warm. When the bird stands up in the nest the egg is quite concealed, but if it moves about the egg is dropped. The eggs are more or less freckled with reddish-brown markings at the larger end.

The external diameter of the nest is about 14 inches, height  $5\frac{1}{2}$  inches. The bird, according to Mr. D. le Souëf, measures from tip to tip of its wings 8 feet (*Ibis*, 1895, p. 414).

*Adult.* General colour above slaty-brown, the mantle and back clear slaty-grey, with dusky brown edges to some of the feathers, which have white bases, causing a mottled appearance; lower back, rump, and upper tail-coverts pure white; scapulars dark slaty-grey, blackish towards the ends, especially the longer ones; wings dark brown marked with slaty-grey, the lesser and median, as well as the greater, coverts with concealed white shafts and white bases to the feathers, the distal ends blackish-brown, with a subterminal shade of dark slaty-grey; quills blackish, white for the greater part of the inner web of the primaries and outer secondaries, which also show a certain amount of slaty-grey; the outer primaries with yellow shafts; inner secondaries slaty-brown, white for two-thirds of the inner web, and mottled with black near the base of the outer web; tail slaty-grey, browner on the outer webs and towards the ends; crown of head and neck all round, as well as the under-surface of the body, white; under wing-coverts and axillaries as well as the quill-lining white; on the sides of the face a slight tinge of grey, a blackish streak passing through the eye to above the ear-coverts; bill light vinous-grey or bluish horn-colour,

## MONOGRAPH OF THE PETRELS.

except on the culmen, where it is more yellow, particularly at the base; the upper mandible surrounded at the base by a narrow belt of black, which also extends on each side of the culmen to the nostrils, base of the lower mandible surrounded by a belt of orange, reaching to the corner of the gape. Feet bluish white; irides brown" (Gould).

Total length, 31 inches; wing, 23; tarsus, 3.7; middle toe and claw, 5.9.

The sexes differ but little in colour; the female may, however, be distinguished by its smaller size, and the young by the bill being clouded with dark grey.





## 115. THALASSOGERON SALVINI, *Rothschild.*

(SALVIN'S ALBATROS.)

(PLATE 100.)

*Diomedea cauta* (nec Gould), Buller, Tr. N. Z. Inst., VI., p. 217 (1878); id., Birds New Zeal., ed. 2, II., p. 203 (1888); Cheeseman, Tr. N. Z. Inst., XXI., p. 125 (1889); Buller, op. cit., XXIV., p. 67 (1892); XXV., p. 76 (1893).

*Thalassogeron salvini*, Rothschild, Bull. B. O. C., I., p. lviii. (1893); id., Ibis, 1893, p. 572; Salvin, Cat. Birds Brit. Mus., XXV., p. 450 (1896).

*Diomedea salvini*, Buller, Tr. N. Z. Inst., XXVII., p. 122 (1895); id., Suppl. Birds New Zeal., I., p. 150, Pl. V., fig. 2 (1905).

*Diomedea bulleri* similis, sed rostro lateraliter cyanescenti-corneo, culmine quoque concolori, minime flavo: mandibula basali haud flavicante: gutture et collo undique clarè cinereis, pileo antico albo.

*T. salvini* was considered by Captain Hutton to be merely a variety of *T. cautus*, but after examining the specimens in the Tring Museum, Salvin unhesitatingly pronounced it to be a distinct species, placing it in close proximity to *T. cautus* and *T. layardi*, both of which it closely resembles, though differing in the colour of the bill. In the white crown and the grey head and neck *T. salvini* much resembles *Diomedea bulleri*, but the colour of the bill as figured by Buller (*Suppl. Birds New Zeal.*, I., Pl. V., figs. 1, 2) is very different, and *D. bulleri* is also a smaller bird.

Buller relates that according to Mr. Bethune, the engineer of the "Hinemoa," Salvin's Albatros is found breeding on Bounty Island only, and it was there seen by Captain Hutton in countless numbers at the beginning of August.

The nest, in the form of an inverted cone, is composed of grass, seaweed, soil and droppings of the bird, pressed closely together and forming a compact felt-like mass, which becomes solidified by exposure to the sun.

The nestling is covered with thick grey down, except on the face, where the down is short and almost white. The egg is said to be rather variable in colour and markings.

Both *T. salvini* and *T. cautus* have a bare membrane down the base of the lower mandible, and the moustachial membrane on the cheek is of a rich orange-yellow; this

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is disclosed when the bird is irritated or excited. The sides of both mandibles are olive-grey changing to dull pinkish-yellow along the rami of the lower mandible, which has its terminal expansion uniform slaty-black, and the culminicorn of a delicate lemon-yellow. The sides of the mouth, both upper and under, are fringed with a yellow membrane, which from the junction of the gape extends upwards and outwards for about an inch. Iris of a lustrous coal-black with white eyelid beneath; legs and feet a greenish-grey, with flesh-coloured webs shaded with brown towards the outer edge. Length, 36 inches; expanse of wing, 7 feet 8 inches; wing, 21; tail, 8.5; tarsus, 3.4; middle toe and claw, 5.5; culmen, 5.3.

The description and figure are taken from a specimen in the British Museum presented by the Hon. Walter Rothschild.

## 116. THALASSOGERON LAYARDI, *Salvin.*

(LAYARD'S ALBATROS.)

*Thalassogeron layardi*, Salvin, Cat. Birds Brit. Mus., XXV., p. 450 (1896);  
Ogilvie-Grant, Ibis, 1905, p. 559; W. L. Sclater, Ibis, 1906, p. 212.

*T. cauto* similis, sed minor: ala 22 poll.: tarso 3.25; digito medio cum ungue 5.05.

THE type specimen of Layard's Albatros was obtained by him in the Cape Seas, and Salvin, who says that it is allied to *T. cautus* and *T. salvini*, has separated it from the former in the 25th volume of "The Catalogue of Birds," on account of its more slender bill, shorter tarsus and smaller feet, and from the latter by reason of its smaller and slightly narrower bill, shorter tarsus and toes, and also its much whiter head and neck.

From a comparison of *T. layardi* and *T. cautus* it will be seen that in colour they are alike, and that the differences of dimension on which Salvin founded his separation are so slight that it is difficult to consider these features of sufficient value. Mr. Ogilvie-Grant (*Ibis*, 1905, p. 559) pointed out the further resemblance in the white quill lining, and there are three examples under the name of *T. layardi* in the Tring Museum which he has compared with the type, and identifies with *T. cautus*. I cannot but think it questionable whether, with more material available for comparison, the separation of the two species can be maintained.

Gould, when recording the head of an Albatros in Sir William Jardine's collection from the Cape of Good Hope, identified it with that of his *Diomedea cauta* from Tasmania, so that the idea that *T. cautus* ranges from the Australian to the Cape Seas is not altogether new.

In addition to the type specimen in the British Museum there is another from Knysna Heads, obtained by J. Marais in August, 1899.

The type measures, total length, 39 inches; culmen, 5.4; wing, 22; tail, 8.5; tarsus, 3.25; middle toe and claw, 5.05.

## 117. THALASSOGERON CULMINATUS (*Gould*).

(GREY-HEADED ALBATROS.)

(PLATE 101.)

*Diomedea chlororhynchos* (nec Gm.), Audub., Orn. Biogr. V., p. 326 (1839); Lawr. in Baird, Cassin and Lawrence, Birds N. Amer., p. 822 (1860).

*Diomedea culminata*, Gould, P.Z.S., 1843, p. 107; Ann. and Mag. Nat. Hist., XIII., p. 361 (1844); id., Birds Austr., VII., Pl. 41 (1848); id., Handb. Birds Austr., IV., p. 436 (1865); Sharpe, Phil. Trans., Vol. 168, p. 147 (1879).

*Thalassarche culminata*, Giglioli, Faun. Vertebr. Oceano, p. 59 (1870).

*Thalassogeron culminatus*, Ridgway in Baird, Brewer, and Ridgway, Water-Birds N. Amer., II., p. 358 (1884); Salvin, Cat. Birds Brit. Mus., XXV., p. 451 (1896); Sharpe, Rep. Coll. "Southern Cross," p. 162 (1902); Wilson, Nat. Antarctic Exped., II., Aves, pp. 113, 114.

Minor: culmine flavo, usque ad frontem basalem producto; mandibula quoque basaliter flava; interscapulio cineraceo, pileo toto clare cinereo; facie guttureque concoloribus.

THE Grey-headed Albatros was placed by Salvin in the genus *Thalassogeron* chiefly on account of its having an intervening space of bare skin between the base of the latericorn and that of the culminicorn, but after examining a long series I find that this membrane varies so much in extent that an almost perfect gradation in this respect is found between *Diomedea* and *Thalassogeron*. Nevertheless the osteological differences mentioned by Mr. Pycraft in the Introduction to this Monograph (p. xix) indicate that there is ample reason for the separation of the two genera.

*T. culminatus* has been compared to *Diomedea bulleri*, a characteristic *Diomedea* without any intervening patch of bare skin at the base of the mandible, but besides this difference, the colour of the mantle in *T. culminatus* is of a much clearer grey, and the entire crown, sides of the face and throat are of a delicate blue-grey, and no white frontal area is visible.

Although resembling *T. chlororhynchus* in its general features *T. culminatus* has a much stouter and deeper bill, a feature which was observed by Gould, and figured, though not quite correctly, by Mr. W. L. Selater, in the "Fauna of South Africa" (Vol. IV., p. 504, fig. 155). It differs, too, in the manner in which the culminicorn reaches the base of the mandible, impinging on the feathers of the forehead, whereas in





## THALASSOGERON CULMINATUS.

*T. chlororhynchus* the bare skin which marks the bill of a *Thalassogeron* separates the frontal feathers from the culminicorn. This alone is a character sufficient to distinguish *T. chlororhynchus* from *T. culminatus* at all ages.

The species is widely distributed in southern waters, especially in the Australasian Seas, whence it ranges throughout the Pacific to South America, extending north to the coast of Oregon; it is also found in the South Atlantic and Indian Oceans.

According to Mr. W. L. Sclater, this bird, which he calls "Gould's Yellow-nosed Mollymauk," occurs chiefly between the 30th and 50th parallels of South Latitude, and breeds on the Crozets. Mr. T. Parkin met with it in Lat. 39° 51' S., Long. 8° 49' E. (*Bull. Brit. Orn. Club*, X., p. cvi., 1900). During the voyage of the "Southern Cross" Nikolai Hanson procured several examples in October and November in Lat. 42° 23' to 45° 9' S., Long. 20° 32' E. to 77° 13' E. Dr. Davidson obtained two immature black-billed specimens, which the late Capt. Hutton stated to be from the Indian Ocean, and identified as *T. culminatus* (*Ibis*, 1903, p. 265). Numbers of these birds were observed by Gould during a voyage from Launceston to Adelaide, particularly off Cape Jarvis and Cape Northumberland, and between Sydney and the northern extremity of New Zealand. According to the late Sir Walter Buller and Capt. Hutton, *T. culminatus*, although frequenting these seas, does not breed in New Zealand.

A specimen shot on the 22nd October, 1899, about one hundred miles to the south of Campbell Island, was presented to the British Museum by Commander R. F. Ayscough, who says that only two of these birds were seen between Macquarie and Campbell Islands.

Dr. E. A. Wilson, the Naturalist of the "Discovery," relates (*Nat. Antarctic Exped.*, Aves, p. 114), that *T. culminatus* was constantly with the ship during the last ten days of October and throughout the first half of November, 1901 (between Long. 70°—140° E. and Lat. 50°—60° S.). It disappeared on approaching the ice, but when the "Discovery" again went north it was seen off the Macquarie Islands, and followed the ship thence to New Zealand. In March, 1904, the species was observed as the vessel was proceeding north (Lat. 68° S., Long. 140° E.) and continued with it until the Auckland Islands were reached. It was also seen between New Zealand and Cape Horn and in the Atlantic, although absent in the Magellan Straits; the most northerly examples were encountered in Lat. 45° S., Long. 45° W.

Professor Giglioli says that during the voyage of the "Magenta," *T. culminatus* was found in the Pacific, in the zone traversed by the ship, but was not very numerous. It was seen on the 30th of June, 1867, in Lat. 39° 49', Long. 167° 59' E., and up to the 23rd of July, in Lat. 39° 43' S., Long. 124° 54' W.

A specimen obtained by Mr. T. Bridges, near Panama, is in the British Museum; the habitat "North America" is given in the "A. O. U. Checklist," where the bird is said to be occasionally found off the coast of Oregon.

## MONOGRAPH OF THE PETRELS.

Dr. Knud Andersen, of Darlmenats, says a specimen was obtained on the ice in the North Atlantic in April 1834, at Fiskumvand, Eker, Norway, about 59° 50' N. Lat., and was sent by Professor W. Bœck to the Christiania Museum, and determined by Professor Collett. It had previously been wrongly identified with *T. chlororhynchus*.

Goold relates that the habits and food of this species are similar to those of its congeners.

*Adult female*.—General colour above slaty-brown, the feathers with scarcely perceptible margins of lighter brown, the long scapulars blackish towards the ends; mantle paler than the back, being light ashy-grey; lower back, rump, and upper tail-coverts pure white; wings darker than the back, with a slaty-gloss, especially on the secondaries, which have the inner, and often the outer webs, for the most part white; the outer primaries with yellowish-white shafts; tail-feathers dull slate-colour, the outer ones blackish on the outer webs, all having white shafts; crown of head, sides of face and throat delicate bluish-grey, paler on the forehead and hind-neck, and thence over the upper mantle; remainder of under-surface, from the lower throat downwards, pure white; axillaries and under wing-coverts pure white, with a broad black band of small coverts round the bend of the wings; quills blackish below, more ashy on the inner webs; "bill black, the culmen yellow with the tip pink; lower half of the under-mandible yellow ochre; feet and legs grey; webs fleshy pink; nails yellowish horn colour" (*E. A. Wilson*). Total length, 28 inches, culmen, 4.25; wing, 18.8; tail, 7.4; tarsus, 3.0; middle toe and claw, 4.75.

The colour of the bill and feet is variously given, and the following note of Professor Giglioli describes the bill as "black, the culmen and tip of the upper mandible and the edges of the rami of the lower mandible of a clear yellow, the tarsi and feet of a greyish flesh-colour, the interdigital membranes yellowish; iris brown." Mr. Nikolai Hanson's notes were as follows:—"Bill black, with a yellow edge above and below, the tip red; feet and webs fleshy-grey; iris light brown." Commander Ayscough has given the colours as follows:—"Bill black; feet pale bluish-white; webs white; joints of toes light blue." Dr. E. A. Wilson describes a female which he captured on December 29th, 1901, as having "the bill black; culmen yellow with pink tip; basal half of lower mandible yellow ochre; feet and legs grey; webs fleshy pink; claws yellowish horn colour." Goold states that the "bill is black, with the exception of the culmen and tip, and the lower edge of the basal three-fourths of the under-mandible, which are horn-colour."

The description is taken from a specimen in the British Museum, obtained by Dr. E. A. Wilson during the voyage of the "Discovery" in Lat. 56° 54' S., Long. 17° E.





## 118. THALASSOGERON CHLORORHYNCHUS (*Gm.*)

(YELLOW-NOSED ALBATROS.)

(PLATE 102.)

*Yellow-nosed Albatross*, Lath., Gen. Syn., III., pt. 2, p. 309, Pl. XCIV. (1785); id., Gen. Hist., X., p. 52, Pl. CLXIX. (1824).

*Diomedea chlororhynchus*, † Gm., Syst. Nat., I., p. 568 (1788); Gould, Birds Austr., VII., Pl. 42 (1844); id., Handb. Birds Austr., II., p. 437 (1865); Coues, Pr. Acad. Philad., 1866, pp. 148, 188; Buller, Birds New Zeal., p. 294 (1873); id., Suppl., I., p. 154 (1905); Ogilvie-Grant, Ibis, 1905, p. 560; Nicoll, t.c., p. 675.

*Diomedea chrysostoma*, Forster, Descr. Anim., p. 24 (1844).

*Diomedea olivaceorhyncha*, Gould, Ann. and Mag. Nat. Hist., XIII., p. 361 (1844).

*Diomedea olivaceirostris*, Bp., Consp. Av., II., p. 185 (1855); Coues, Pr. Acad. Philad., 1866, pp. 186, 188.

*Thalassarche chlororhynchus*, Giglioli, Faun. Vertebr. Oceano, p. 59 (1870); id., Viagg. Magenta, pp. 106, 725 (1871).

*Diomedea profuga*, Gray, Hand-list Birds, III., p. 109 (1871, Solanders MSS. in Mus. Brit.); Salvin in Rowley's Orn. Misc., I., p. 238 (1876).

*Thalassogeron chlororhynchus*, Ridgway, Man. N. Amer. Birds, p. 53 (1887); Salvin, Cat. Birds Brit. Mus., XXV., p. 451 (1896); Hall, Ibis, 1900, p. 18; Eagle Clarke, Ibis, 1906, p. 177, 1907, p. 344; Nicoll, Ibis, 1906, p. 396; Wilson, Nat. Antarctic Exped., II., Aves, pp. 114, 115.

*T. culminato* similis, sed culminicorne flavo: rostro reliquo nigro: capite fere albo, facie laterali pallide cinereo lavato.

THIS species is distinguished by its black bill and light yellow culminicorn. It resembles *T. culminatus* in general appearance, but the bill is more slender, and the culminicorn does not reach to the frontal feathers, as the former is separated at its base by a piece of bare skin; these characteristics are very well shown in Gould's figures of the two species in his "Birds of Australia."

† Written *D. chlororhyncha* by some authors.

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The yellow culmen of the bill doubtless suggested to Latham the name "Yellow-nosed Albatros," by which this bird has since been known to naturalists.

The original description was taken from a specimen procured on one of Captain Cook's voyages, and a pencil drawing of it was made by George Forster, who was the artist accompanying the expedition. The figure is scarcely recognisable, but in the description of the collections made during the voyage, John Reinhold Forster diagnosed this Albatros and gave it the name *Diomedea chrysostoma*. Forster's *Descriptiones Animalium* was not published till 1844, and in most cases his names have been anticipated. He gives the home of *D. chrysostoma* as "Oceano Australi extra tropicum." From this manuscript Latham evidently derived the habitat of his "Yellow-nosed Albatros," which he gives as the "Southern seas without the tropics." The specimen described came from the Cape of Good Hope, and was formerly in the British Museum, but is no longer in existence.

*T. chlororhynchus* is an inhabitant of the South Atlantic, the South Indian and the Australian Oceans. Gould relates that the species came under his observation for the first time on the 24th July, 1838, in Lat. 30° 38' S., Long. 20° 43' W., from which period till the ship reached New South Wales scarcely a day passed without its being seen. Upon some occasions it appeared in considerable numbers, many of the birds being apparently one or two years old, and these were easily distinguished from the adults, especially when flying, by their dark-coloured wings, back and tail, and by the culmen of the bill being less distinctly marked with yellow.

Dr. E. A. Wilson, the naturalist on board the "Discovery," says that the species was first encountered in the South Indian Ocean on September 22nd, 1901, in Lat. 35° S., Long. 14° W., and remained with the ship till the 30th of that month; it reappeared quite close to shore off False Bay on the coast of South Africa, as well as in the neighbourhood of the Agulhas Sandbank, but eastward of this in the southern ocean its place was taken by *T. culminatus*, which had not previously been observed. *T. chlororhynchus* appears to frequent different localities varying with the season of the year.

Mr. Robert Hall mentions *T. chlororhynchus* as frequenting the entrance of Christmas Harbour in Kerguelen Island, but he did not find it breeding. Dr. Filhol says that the species breeds on Campbell Island, but there is some doubt whether he identified the bird accurately (*Ibis*, 1903, p. 266). Mr. Nicoll, however, believed, that at the time of the "Valhalla's" visit to Tristan da Cunha, the "Yellow-nosed Albatros" was nesting on the top of the crater, but the weather was too unfavourable to allow of his reaching its haunts.

*Adult.* Upper-surface dark brown, wings and scapulars a little darker, upper-back tinged with grey; rump and whole under-surface white; head and neck white, tinged with grey, especially on the sides of the face; an indistinct dark grey mark,

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inclining to black in some individuals, in front of the eye; tail hoary-grey, shafts white, outer rectrix white next shaft, but becoming darker at its outer end; bill black, culmen yellow, blood-orange at its tip; a vertical yellow line at the base of the lower mandible, the tip also yellow; legs and toes flesh colour. Total length, about 30 inches; wing, 18.8; culmen, 4.65; tail, 6.6; tarsus, 3.15; middle toe and claw, 4.35.

The description and figure are taken from a bird obtained in the Australian Seas, formerly in our collection.

## 119. THALASSOGERON EXIMIUS, *Verrill*.

(GOUGH ISLAND ALBATROS.)

*Thalassogeron eximius*, Verrill, Tr. Connect. Acad. Sci., IX., p. 440, pl. 8, figs. 1, 2 (1895); Salvin, Cat. Birds Brit. Mus., XXV., p. 449 (1896); Eagle Clarke, Ibis, 1905, p. 265.

*T. chlororhyncho* similis, sed rostro nigro, ad apicem corneo: culmine læte flavo apicem versus aurantiaco, indè rubro.

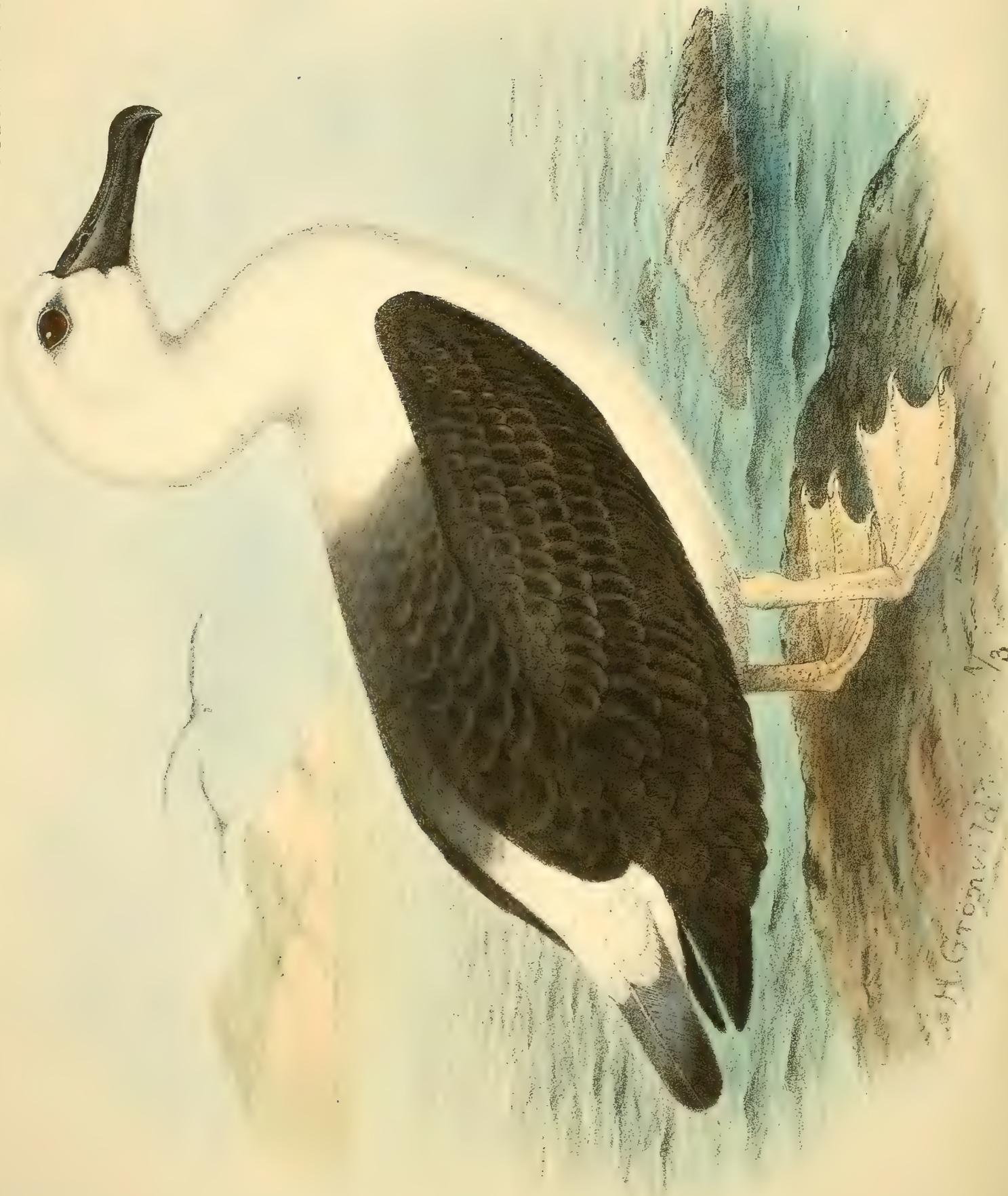
No example of *T. eximius* was ever seen by Salvin or myself, and I can therefore only repeat the account given by Mr. Comer, who procured the single specimen known, and add the description of Professor Verrill, who states "that the species is similar in plumage to *T. chlororhynchus*, but the lower mandible lacks the transverse yellow bar at the base, and is entirely black, except at the extreme outer end, where it is tipped with horn-colour. The bright-yellow culmen deepens into orange in the middle, and finally into dull red on the unguis, growing paler towards the tip. Sides and back of head pale ash-grey, forehead white. No dark spot behind the eye. Tarsus, tail and two outer toes longer than in *T. chlororhynchus*, and bill somewhat deeper at base. Wing 19·25 inches, tail 8·5, tarsus 3·05–3·07, middle toe and claw 4·32–4·35."

Mr. Comer, who obtained seventy-four eggs, states that this is the only Mollymawk on Gough Island, where it is called the "Bluehead" by the sealers.

The nests, though smaller, resemble those of *Diomedea exulans*, and the birds are somewhat solitary in habit, isolating themselves in pairs among the tussocks and brakes, where they commence to lay about September 20th.

Dr. Bruce and Mr. Wilton of the Scottish Antarctic Expedition, did not find *T. eximius* on their visit to Gough Island, but as Mr. Wilton records many instances of the occurrence of *Diomedea melanophrys*, it is possible that this Albatros may have been mistaken for *T. eximius* (Eagle Clarke, *Ibis*, 1905, p. 265).





H Grönvold, del et lith.

DIOMEDEA CARTERI.

Witherby & C<sup>o</sup> Imp.

## 120. THALASSOGERON CARTERI, *Rothschild.*

(CARTER'S ALBATROS.)

(PLATE 102 A.)

*Thalassogeron carteri*, Rothschild, Bull. B. O. C., XIV., p. 6 (1903); Hall, Key Birds Austr., p. 114 (1901); Carter, Emu, III., p. 208 (1904); Mathews, Handl. Birds Austral., p. 19 (1908).

*Diomedea carteri*, Rothschild, Bull. B. O. C., XV., p. 44 (1905).

*Thalassogeron*, sp. inc., Eagle Clarke, Ibis, 1905, p. 265.

*T. chlororhyncho* similis, sed rostro toto nigro: facie laterali et pilei lateribus, collo et interscapulio pure albis, minime cinereo lavatis, pedibusque flavicanti-albis distinguenda.

THE type of *T. carteri* was procured off the North-West of Australia, near Point Cloates, on May 12th, 1900, and for the loan of which I am indebted to the Hon. Walter Rothschild; it appears to be in fully adult plumage, but as the entire bill is black it may be found that the bird is not really adult, as the black bill is usually a sign of immaturity.

I have compared the type with the series of Albatroses both in the British and Tring Museums, but I can find no species with which to identify *T. carteri*. It is possible that like some of the true Albatroses, the members of the genus *Thalassogeron* do not assume their fully adult plumage for two or three years, and that the bill remains black for some time before it becomes parti-coloured.

The Hon. Walter Rothschild and Dr. Hartert, in their original description, point out that *T. carteri* belongs to the section of *Thalassogeron chlororhynchus*, from which, however, it differs in having the bill, including the culmen, black, the face and sides of the head white, without the grey tinge exhibited by *T. chlororhynchus*; the feet are yellowish in life and without any blackish colour on the digits and tarsi (Rothschild, *Bull. Brit. Orn. Club*, XV., p. 44).

Mr. Eagle Clarke in his paper on the "Birds of Gough Island," procured by the Scottish National Antarctic Expedition, mentions (*Ibis*, 1905, p. 265) a bird which he was unable to identify with any known species. It was captured on the island by

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Dr. Harvie Pirie, where it had alighted on a mass of tussock-grass, from which, though apparently uninjured, it was unable to rise. Mr. Rothschild, to whom he referred it for examination, recognised its resemblance to *T. carteri*, but noticed that it differed in having the toes nearly .75 inch shorter, and also the hind-neck washed with grey like the back, instead of being white (*Bull. Brit. Orn. Club*, XIV., p. 6). Mr. Eagle Clarke has now kindly lent me this specimen for examination, and I find that the short foot is occasioned by the absence of a phalanx in two of the outer toes on both feet, but in other respects it agrees very well with *T. carteri*. There are, however, some minor points worthy of notice, viz. : the extension of the dark colour of the back to the hind-neck as mentioned above, and a slight difference at the base of the culminicorn, there is also a grey tinge on the face and crown ; these characters, however, appear to me of trivial importance. I ascribe the absence of a joint in the toes to a malformation or an individual peculiarity, and I am the more inclined to do so, as the feet look out of proportion to the size of the bird, moreover I am not aware that any other member of the order Tubinares is without the full complement of toe-bones, consequently I place this bird, for the present at all events, under *T. carteri*.

*Adult male.* General colour above blackish, with broad ashy-grey margins to the feathers, becoming greyer on the mantle, wings blackish-brown, rump and upper tail-coverts pure white ; tail ashy-grey, dusky towards the ends, shafts white, the outer feathers blackish internally, light ashy-grey externally, dusky towards the end ; head and neck as well as the upper mantle white ; sides of the face and the whole of the under surface pure white, including the under wing-coverts, which have a broad band of dark brown feathers round the edge of the wing ; quills below blackish, ashy along the inner web. Culmen, 4.2 inches ; wing, 17.4 ; tail, 6.7 ; tarsus, 2.8 ; middle toe and claw, 3.3.

The description and figure are taken from the type.





## 121. PHŒBETRIA FULIGINOSA (*Gm.*).

(SOOTY ALBATROS.)

(PLATE 103.)

*Great Black Petrel*, Lath., Gen. Syn., Suppl. II., p. 333 (1801).

*Diomedea fuliginosa*, Gmel., Syst. Nat., I., p. 568 (1788); Temm., Pl. Col., 469 (1829); Gray, Gen. Birds, III., p. 650 (1844); id., Ibis, 1862, p. 247; Gould, Birds Austr., VII., Pl. 44 (1848); Hutton, Ibis, 1865, p. 284, 1867, p. 186; Buller, Birds N. Zeal., p. 296; id., Ed. 2, II., p. 205; Sharpe, Phil. Trans., clxviii., p. 148 (1879).

*Diomedea spadicea*, Less., Man. d'Orn., II., p. 391, (1828).

*Diomedea fusca*, Audub., Orn. Biogr., V., p. 116 (1839).

*Diomedea palpebrata*, Forster, Descr. Anim., p. 55 (1844).

*Phæbetria fuliginosa*, Reich., Syst. Av. Longip., p. v. (1852); Gould, Handb. Birds Austr., II., p. 441 (1865); Giglioli, Faun. Vertebr. Oceano, p. 60; Kidder, Bull. U. S. Nat. Mus., No. 3, p. 12 (1876); Salvin, Cat. Birds Brit. Mus., XXV., p. 453 (1896); Hall, Ibis, 1900, p. 18; Hutton, Ibis, 1903, p. 82; Buller, Suppl. Birds N. Zeal., I., p. 155; Eagle Clarke, Ibis, 1905, pp. 267, 560; id., 1906, p. 177; id., 1907, pp. 342, 653.

Capite et alis nigricantioribus; area oculorum alba; rostro nigro, mandibula inferiore striga flavescente.

EARLY writers recognised but a single species of the genus *Phæbetria*, and Salvin in his Catalogue of the Tubinares in the British Museum followed them in this respect, though he says that there are "individuals with a much greyer abdomen and back, mingled with the ordinary form," and he adds, "if these birds can be traced to a definite breeding place, where they alone are found, it would be well to assign them specific rank." It had been previously observed that both dark and light birds were frequently found together, but it was believed that the latter were the young in immature plumage. Neither Gould nor Buller appear to have had any doubt on this point, and the former, who both figures and describes the dark form in his fine work on the "Birds of Australia," does not allude to the subject, nor does Buller speak of a paler grey form.

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Captain Hutton in his paper on the "Birds inhabiting the Southern Ocean" (*Ibis*, 1865, p. 284) notices a pale form, but he, too, was then inclined to believe that they were young birds, though he did not feel confident about it. In 1867, he again, writing in the *Ibis*, states that while off Tristan da Cunha several examples of *P. fuliginosa* came round the ship, and more or less continued with it till Lat.  $44^{\circ} 27' S.$ , Long.  $150^{\circ} 12' E.$ , was reached. On this occasion, too, he noticed amongst them a very distinct variety, in which the neck, back and body were grey, with a broad black band round the beak, and the horizontal line on the under mandible was less conspicuous; the bird, however, was of the same size as *P. fuliginosa*, and he named it var. *cornicoides*.

Captain Hutton's statements are of considerable value, as he was not only an excellent observer, and made no less than seven voyages to the Cape of Good Hope, but he had the good fortune to obtain valuable information from Mr. Harris, engineer on board H.M.S. "Adventure," whose ship being wrecked on Kerguelen Island, necessitated a stay there for nearly a year, during which time he made careful notes on the birds of this little visited island.

In a letter to Mr. Eagle Clarke, Captain Hutton says that the pale form (*P. cornicoides*) breeds on the Auckland and Antipodes Islands, and is the common phase in the New Zealand seas, but he does not recollect having seen the sooty-coloured bird there; he adds that *P. fuliginosa* alone, so far as his information went, nests on Gough Island and Tristan da Cunha, though Mr. Eagle Clarke adds both forms were observed off Gough Island by the Scottish Expedition, but none were obtained (*Ibis*, 1905, pp. 267, 268).

Mr. Comer describes the species which breeds on Gough Island, as having the beak dark, with a yellow stripe on each side; he states that it is common, not breeding in societies, but placing its nest separately on cliffs, or projecting rocks, which are difficult of access.

If the above statements are correct we have a distinct breeding place for each form, and they must therefore be considered separate species.

Mr. W. Eagle Clarke, writing in the *Ibis* on the "Birds of the Weddell and adjacent Seas" (1907, pp. 342, 343), says, that it is a matter of surprise that two such genuinely distinct forms as *P. fuliginosa* and *P. cornicoides* should for so long have passed as the same species; he, however, points out the almost impossible task of at present determining accurately their respective distribution, since they have been so confused by observers. The collections made by the "Scotia" enabled him to say that all the birds obtained and seen in the far south belonged to Hutton's species, and it was only when the South Atlantic was approached that Gmelin's *P. fuliginosa* appeared. Specimens of both birds were obtained during the voyage, but *P. cornicoides* alone was procured in the Antarctic Ocean, where it was observed so far south as Lat.  $69^{\circ} 46'$ . No specimen of *P. fuliginosa* was either obtained or observed

## PHŒBETRIA FULIGINOSA.

by the expedition beyond 58° S., though it is known to extend rather further. Bernachi asserts that *P. cornicoides* was occasionally encountered in the pack ice, and this statement is corroborated by other travellers.

There are twenty specimens of the "Sooty Albatros" in the British Museum collection, ten of the dark form, and a similar number of the pale bird. In the dark form (*P. fuliginosa*), the streak occupying the groove in the lower mandible is of a conspicuous straw-colour, whereas in the pale phase (*P. cornicoides*) the groove is narrower and shorter, and the streak is of a dark colour. On some of the labels it is described as having been blue in life, a colour which would no doubt fade after death. This character, if constant, would be a further indication for the separation of the two forms, but, unfortunately, one of the specimens obtained by the "Southern Cross" Expedition is labelled as having a white mandibular stripe, though in the dry skin the stripe has no appearance of having been of this colour. Dr. Hartert, moreover, informs me that the Tring Museum contains four skins of the pale coloured phase, three of which have a dark stripe, similar to those in the British Museum, but in the fourth, a typical *P. cornicoides* from the Otago Coast (Buller Coll.), the stripe is as yellow as in *P. fuliginosa*. Hutton also mentioned that he had a bird of the pale form in which the streak on the under mandible was white, but this statement he afterwards withdrew in a letter to Mr. Eagle Clarke (*Ibis*, 1905, p. 267). The bills in our ten specimens average slightly larger than those of *P. cornicoides*, but as all the other measurements are practically the same, I do not attach much importance to this. Mr. Eagle Clarke has lent me coloured drawings of the two species, taken from freshly killed specimens; both have a black bill, but in *P. fuliginosa* the streak occupying the groove of the lower mandible is of a yellowish straw-colour, while in that of *P. cornicoides* it is of a delicate pale blue. The evidence on this point is conflicting, and the matter can only be satisfactorily cleared up by careful observations made on the freshly killed birds.

Gould says that the *P. fuliginosa* is one of the commonest Albatroses, and is universally distributed over all the temperate latitudes south of the equator, but as before noticed, he did not recognise a second species, and therefore it is uncertain to which form his remarks refer. He noticed it as far north as Lat. 31° 10' S., Long. 34° W., and records that it was seen constantly between the island of St. Paul and Tasmania, as well as in the Pacific near Cape Horn, and was still more abundant in the Atlantic in Lat. 41° S., Long. 34° W. According to him the cuneate tail, together with the small and slight legs and delicate structure, indicate that it is the most aerial species of the genus [*Diomedea*], and that its flight differs materially from that of other Albatroses.

The nest is of mud, raised five or six inches from the ground, slightly depressed on the top, and usually placed in cliffs difficult of access; it is also recorded as occasionally breeding in societies. The young bird when half grown is covered with a

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whitish down; when approached closely it makes a strange clattering with its beak, and if touched will eject a deluge of fœtid oily fluid from the nostrils. The egg is oval, usually white, but sometimes marked at the larger end with purplish spots and blotches.

*Adult.* Sooty-brown, inclining to black on the head and sides of the face; a ring of short white feathers, very conspicuous in life, nearly encircles the eye; wings blackish, primaries with white shafts, darker at the tips; tail also blackish, with white shafts to the feathers, very prominent; under wing-coverts paler than the upper. Bill black, with a horizontal straw-coloured groove on the under mandible, extending from the gape to the unguis.

Total length, 29.5 inches; wing, 19.2; culmen, 4.15; tail, 10.2; tarsus, 2.9; middle toe and claw, 4.6.

The description and figure are taken from a New Zealand bird formerly in our collection.

## 122. PHÆBETRIA CORNICOIDES (*Hutton*).

(HUTTON'S SOOTY ALBATROS.)

*Albatros with White Eyebrows*, Cook, *Voy.*, I., p. 38.

*Diomedea fuliginosa*, var. *cornicoides*, Hutton, *Ibis*, 1867, pp. 186, 192.

*Phæbetria cornicoides*, Eagle Clarke, *Ibis*, 1905, pp. 267, 560 ; 1906, p. 177 ; 1907, pp. 342, 653.

*P. fuliginosæ* similis, sed dorso et corpore subtus brunneo-cinereis ; mandibulæ striga cærulea distinguenda.

THIS species was first described as a variety of *P. fuliginosa* by Captain Hutton, with which it had previously been confounded. It may at once be distinguished by its grey-brown back and underside ; the groove, too, in the under mandible is smaller and narrower and in most specimens is of a pale blue.

The two races have been so confused by most of the early writers that it is very difficult, if not impossible, to decide as to which form their observations refer. This question has, however, been discussed under the preceding species. The bird referred to by Captain Cook, in Lat. 64° 12' S., Long. 38° 14' E., is undoubtedly *P. cornicoides*, as he particularly mentions the grey-brown back, the black head, and the white eyebrows. Though over a large portion of their range the two species are found together, *P. cornicoides* appears to have a more southern range than its ally, as Mr. Eagle Clarke says that it alone was encountered in the Weddell Sea by the "Scotia" Expedition, and it was only on reaching the South Atlantic that *P. fuliginosa* was seen. Hutton's "Sooty Albatros" breeds in the Auckland and Antipodes Islands ; its nest and general habits are doubtless similar to those of its ally *P. fuliginosa* described above.

*Adult.* Similar to *P. fuliginosa*, but with the mantle and upper back ashy-grey, becoming somewhat darker on the scapulars and upper tail-coverts ; wing-coverts darker than the back, with a greyish tinge ; head similar to that of *P. fuliginosa*, but offering a greater contrast to the mantle. Bill black ; suture in under mandible pale blue.

The description is taken from a specimen obtained by the "Southern Cross" Expedition in Lat. 42° 23' S., Long. 20° 32' E., October 24th, 1898.



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A  
MONOGRAPH  
OF THE  
PETRELS

(ORDER TUBINARES)

BY

F. DU CANE GODMAN

D.C.L. F.R.S. PRESIDENT OF THE BRITISH  
ORNITHOLOGISTS' UNION ETC. ETC.

WITH HAND-COLOURED PLATES  
BY J. G. KEULEMANS

IN FIVE PARTS

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