

- Fig. 8. *Leachia zealandica*, anogenital ring.
 Fig. 9. " antenna of larva.
 Fig. 10. " male, dorsal view.
 Fig. 11. " head of male, dorsal view.
 Fig. 12. " head of male, posterior view.
 Fig. 13. " antenna of male.
 Fig. 14. " haltere of male.
 Fig. 15. " abdominal extremity of male.
 Fig. 16. " foot of male.
 Fig. 17. " claw and digitule of male.

PLATE VII.

- Fig. 1. *Celostoma pilosum*, adult female, dorsal view.
 Fig. 2. " test of adult female.
 Fig. 3. " antenna of adult female.
 Fig. 4. " foot of adult female.
 Fig. 5. " epidermal hairs and spinnerets.
 Fig. 6. " test of female, second stage.
 Fig. 7. " female of second stage, ventral view.
 Fig. 8. " antenna of female, second stage.
 Fig. 9. " foot of female, second stage.
 Fig. 10. " antenna of larva.
 Fig. 11. *C. assimile*, adult females on twig. At *a* the bark is cut away to show the cavities formed.
 Fig. 12. " adult female, dorsal view before gestation, unshrivelled.
 Fig. 13. " antennæ of adult female.
 Fig. 14. " abdominal extremity of adult female.
 Fig. 15. " antenna of larva.
 Fig. 16. " foot of larva.
 Fig. 17. " abdominal extremity of larva.

ART. II.—*An Exhibition of New and Interesting Forms of New Zealand Birds, with Remarks thereon.*

By Sir WALTER L. BULLER, K.C.M.G., F.R.S.

[Read before the Wellington Philosophical Society, 29th October, 1890.]

PROBABLY no section of New Zealand zoology has received such careful attention or been so thoroughly worked as the birds. Their beauty of form and colour, and the peculiar interest attaching to their life-history—their natural habits, their song, their wonderful modes of nidification,—and their general ministration to the requirements and caprices of man, all tend to make the study of our birds more attractive than that of any other branch of natural history. So much has already been written on this subject that it might reasonably be looked upon as a well-nigh exhausted field. So far, however, from this being the case, new forms and characters of bird-life, and new facts in the history of even our commonest species, are being continually brought to light; and it seems

to me that, after the manner of the Zoological Society of London, which has been so eminently successful, the best mode of bringing observations of the kind before such a society as this is to exhibit the specimens, wherever practicable, and to make brief remarks thereon by way of explanation or suggestion.

Adopting this plan, I shall this evening place before you some very interesting birds which have recently come into my possession; and I propose to continue doing this from time to time, as fresh material is forthcoming. By this means facts and observations of a valuable kind may often be elicited during the customary discussion that follows the reading of a paper at these meetings.

Miro traversi, Buller.

I exhibit, first, a pair of the so-called Chatham Island Robin, obtained at the Snares, where it is said to be comparatively numerous. Now, it is a very curious circumstance that this bird is not found on the Auckland Islands, nor on Antipodes Island, nor on Campbell Island, nor on the Bounty Islands. It occurs on the Chatham Islands, and on Pitt's Island, adjacent thereto; but it has never been met with in New Zealand. The set of the sea-current is from the Snares to the Chatham Islands, as we have lately been reminded by the loss of the barque "Assaye," which is supposed to have been driven upon the Snares, whilst a portion of her wreckage has been washed up, two months later, on the Chathams. This bird possesses very indifferent powers of flight, and its distribution between places so far apart must have been accomplished by the accidental floatage of a great mass of timber-growth or island *débris* of some sort.

Sphencæacus fulvus, Gray.

The pair now exhibited was obtained on the Snares, where, according to the observations of Mr. Reischek, this bird inhabits trees, instead of swamp-vegetation or fern-beds, as *S. punctatus* does in New Zealand. It is very like the last-named species in appearance; but on comparing them it will be seen that *S. fulvus*, apart from its browner or less spotted character, has the tail-feathers full and webbed instead of being narrow, with disunited barbs, as in *S. punctatus*.

Exactly similar specimens have been obtained in the South Island, and writing of these I have said (*Birds of N.Z.*, ii., p. 61): "Whilst, however, keeping the form distinct for the present, I am far from being satisfied that it can be separated from *S. punctatus*. I am more inclined to regard it as a somewhat larger local race, with a corresponding modification of plumage. But for the fact that the latter species is

as common in the South Island as in the North, this might be treated as the representative form."

***Prosthemadera novæ-zealandiæ*, Gmelin.**

One of the most remarkable features in the ornithology of New Zealand is the frequency of albinism. Of no less than thirty-three species, albinos of greater or less purity have been recorded. In the case of our common Tui (*Prosthemadera novæ-zealandiæ*) four examples are mentioned in my "Birds of New Zealand" (vol. i., p. 95). I have now to add the singular specimen which I exhibit this evening, and which, as I am informed, was obtained at Table Hill, about twelve miles from Milton, in March, 1887. The general plumage is white with a creamy tinge, the quills and tail-feathers being pure-white. The fore part of the head is dull steel-black, which colour fades away into greyish-brown on the neck and upper part of the breast, and then gradually blends with the white. The bill and feet are of the normal colour; but the claws are pale-brown. This is the best albino I have seen. The one that comes nearest to it is the specimen obtained by me at Wanganui (and now in the Colonial Museum), a full description of which will be found in "The Birds of New Zealand," 1st ed., p. 88.

***Platycercus novæ-zealandiæ*, Sparrm.**

One of the most variable of our species is the Red-fronted Parrakeet (*Platycercus novæ-zealandiæ*). No less than seven varieties of this species, from different islands, have been described and named by naturalists as distinct species. That from the Auckland Islands is distinguished by its diminutive size, being scarcely larger than my *Platycercus rowleyi*, from the South Island. Curiously enough, the form which comes from Antipodes Island (of which I exhibit two specimens, ♂ and ♀, this evening) is even larger than ordinary-sized examples of this species in New Zealand. It differs, too, from the latter in the general hue of the plumage, which has a larger admixture of yellow, and in having the frontal spot, which is deep-crimson in the New Zealand bird, much reduced in extent, and more or less varied with yellow. It is very singular, also, that this species should be found inhabiting a small area like Antipodes Island, which forms the restricted habitat of the perfectly distinct *Platycercus unicolor*.

***Gallinago aucklandica*, Gray.**

It will be seen from the four examples of this rare bird which are now exhibited (two males and two females) that the sexes are exactly alike in plumage. It will be noticed, also, that the general coloration is much darker in one pair than

in the other. The lighter-plumaged birds were obtained at the Auckland Islands, and of these the female has a bill fully 0.25in. longer than in the male. The darker-coloured birds (which, again, are precisely alike in plumage) came from the Snares, and ought perhaps to be referred to *Gallinago pusilla*.

***Tringa canutus*, Linn.**

The specimen of this cosmopolitan species now on the table was obtained in Pelorus Sound. It is prettily marked, and indicates the commencement of a change from winter to summer plumage, birds in the latter garb being extremely rare in this country.

***Larus novæ-hollandiæ*, Stephens.**

The specimen now exhibited exactly accords with Mr. Howard Saunders's description of this species, and the bill, which is appreciably larger than in *Larus scopulinus*, is of the same arterial-red colour. I exhibit, at the same time, an adult specimen of the latter for comparison.

But here is another Gull, recently received from Otago, and coming nearer to *Larus bulleri* (Hutton) than any of the others, which appears to be a distinct species. It will be seen that it has the same narrow bill as the latter. Instead of being entirely black, as in ordinary specimens, the bill is reddish-brown at the base, with black tips, which may be due to the season of the year in which it was killed. The legs, however, which are blackish-brown in *Larus bulleri* all the year round, appear, as far as one can judge from the dried specimen, to have been pale- or pinky-red. It seems to be an adult bird, notwithstanding the subterminal patches of black on the outer webs of the secondaries, and we therefore examine with interest the markings on the primaries, which are now recognised as being the safest criterion for separating these closely-allied forms. These we find to be very different from those in the other species of the group. The first primary has a long oar-shaped mark of white extending almost its entire length, and spreading out again at the base; the second primary has a smaller and more spatulate mark of white; the third primary has an irregular longitudinal bar of white occupying both sides of the shaft and extending to within 2in. of the tip; in the succeeding quills the same character is continued, but the white mark assumes a more symmetrical and rounded appearance.

***Ocydromus earli*, Gray.**

I have much pleasure in exhibiting a specimen of the true *Ocydromus earli*, lately received from the Marlborough Province; also, for comparison, an example of the common North

Island Wood-hen, which I have named *Ocydromus greyi*; in compliment to Sir George Grey.

As fully explained in "The Birds of New Zealand" (vol. ii., pp. 106, 107), when I came to examine the type of *Ocydromus earli* (described as far back as 1862) in the British Museum, I found that this was not the North Island species, as every writer on the subject had treated it, but a closely-allied form, with pale-red legs, from the South Island. Of the latter bird Mr. Reischek obtained five specimens in 1884, and two of these I purchased and took to England with me. This led to my hunting up the type of *O. earli*, with the result I have stated. By this discovery the common North Island bird was left without a distinctive name. Finding, when I looked over the old type-collection of birds in the British Museum, that Sir George Grey had been one of the earliest and most liberal contributors of specimens from New Zealand, I thought I could not do better than dedicate this species to him.

Nycticorax caledonicus, Gmelin.

I have also to exhibit another New-Zealand-killed example of the Nankeen Heron, differing from those already recorded in being furnished with the beautiful occipital white plumes, rolled in the form of a pointed queue, 7in. long. This was shot at the mouth of the Catlin River, about a mile from the sea, about August or September, 1888. As already recorded (Birds of N.Z., ii., pp. 139, 140), Sir George Grey, when Governor of the colony, in 1852, introduced some of these birds from Australia, and liberated them at Wellington. But as early as 1845 the Rev. Mr. Colenso met with one in the Waikato district (*l.c.*, p. 140); and, as the bird is only met with rarely, singly, and at long intervals, it is most reasonable to suppose that these are stray visitants from Australia rather than the descendants of the imported stock. The example described in my first edition, and now in the Colonial Museum, was shot in the neighbourhood of Wellington in 1856, and may have been one of the introduced birds.

Diomedea fuliginosa, Latham.

I exhibit a younger nestling of this Albatros than the one described in "The Birds of New Zealand." The whole body is covered with thick woolly down of a slaty-grey colour, except on the forehead, face, and throat, where the down is very short and thickset, having the appearance of pile-velvet. This stumpy growth is black; but a patch of white encircles the eyes, fills the lores, and sweeps over the base of the bill, having the appearance of blinkers. Bill and feet black.

***Cestrelata mollis*, Gould.**

Among the specimens exhibited to-night is a full-plumaged example of *Cestrelata mollis*, a species only rarely met with off the New Zealand coast. This one was sent to me by Mr. T. F. Cheeseman, who obtained it on Sunday Island during his semi-official visit to the Kermadec Group in August, 1887. It was known to the settlers there as the "mutton-bird," and Mr. Cheeseman treated it as an undetermined species of *Majaqueus*. I have another example in my collection, from Otago; and if, as I believe, my birds are male and female, the sexes present no difference in plumage.

This species was originally described by Mr. Gould in the "Annals and Magazine of Natural History" (vol. xiii., p. 363); and in his account of it in "The Birds of Australia" he records a very remarkable circumstance. "It is a species," he says, "that will ever live in my memory, from its being the first large Petrel I saw after crossing the Line, and from a somewhat curious incident that then occurred. The weather being too boisterous to admit of a boat being lowered, I endeavoured to capture the bird with a hook and line; and, the ordinary sea-hooks being too large for the purpose, I was in the act of selecting one from my stock of salmon-flies, when a sudden gust of wind blew my hooks, and a piece of parchment 10in. long by 6in. wide, between which they were placed, overboard into the sea, and I was obliged to give up the attempt for that day. On the next I succeeded in capturing the bird with a hook I had still left, and the reader may judge of my surprise when, on opening the stomach, I there found the piece of parchment, softened by the action of the salt water and the animal juices to which it had been subjected, but so completely uninjured that it was dried and again restored to its original use when a further supply of flies could be procured."

***Cestrelata affinis*, Buller.**

I exhibit a pair of these birds lately brought from the Auckland Islands. There is no appreciable difference in the plumage of the two sexes; but in the male bird the speckled markings on the forehead are more conspicuous, whilst there is a richer tinge of brown on the arm of the forewing. Another, which I obtained, in June last, from the east coast of Otago, has gone to England, where hitherto my type-specimen has been unique. The characters by which I distinguished the species are constant in all these examples. Dr. Otto Finsch, without seeing the bird, proposed to unite it to *Cestrelata mollis*; but Mr. Osbert Salvin, our great authority on Petrels, on comparing my bird with the large series of the latter species in the British Museum, unhesitatingly agreed with me that it was quite distinct. On comparing the two

examples now on the table with the bird from Sunday Island, the following external differences are at once manifest: The species is somewhat smaller than *Æ. mollis*; the upper surface is slaty-grey instead of blackish-brown; the lower part of breast and abdomen are dark-cinereous, with barred markings on the sides of the body, instead of this surface being almost entirely white; the tail-coverts are white in their whole extent, instead of being slaty-grey; there is a broad blackish band along the edge of the wing, within which the entire lining is pure-white, instead of being grey and white intermixed, as in *Æ. mollis*, and the inner vanes of the primaries are pure-white, except at the tips; the legs, instead of being distinctly "sandalled," as in the other species, are dull-yellow, with brown toes and interdigital webs.

***Puffinus gavia*, Forster.**

The specimen exhibited was obtained at Cirele Hill, about twelve miles from Milton, in the Provincial District of Otago, in July last. Although at certain seasons of the year very numerous off our coasts, extremely few specimens are to be met with in our local museums and other collections. The single example which I took to England with me was quite unique, as no specimen of this bird then existed in Mr. Salvin's splendid collection of petrels, nor even in the British Museum, the type of Forster's original description having somehow disappeared.

The attention of collectors should be directed to these smaller petrels. The seas surrounding New Zealand and extending to Australia form, so to speak, a great nursery for this family, of which no less than thirty-nine species, belonging to fifteen genera, are already on our list; and, as comparatively trivial characters often distinguish them, it is not unreasonable to look for the discovery of new species from time to time.

***Puffinus bulleri*, Salvin.**

The petrel described by Mr. Sandager under the name of *Puffinus zealandicus* (Trans. N.Z. Inst., vol. xxii., p. 291) is now deposited in the Otago Museum. It is undoubtedly the same species as that described by Mr. Salvin under the above name. It would seem to be a somewhat rare form in these seas, for, up to the present time, only three examples are known, one of which is in the cabinet collection in the British Museum. In "The Birds of New Zealand" (2nd ed.) this petrel and the preceding one are figured together on the same plate, and, with the rock background, form a very effective picture. My original specimen was a storm-tossed one on the Waikanae Beach, in October, 1884; Mr. Sand-

ager's bird flew against the lantern of a lighthouse; and the British Museum specimen was purchased by Mr. Salvin from a dealer who said it had been obtained on the New Zealand coast.

Eudypetes, sp.

The coasts of New Zealand are rich in penguins as well as petrels. Twelve well-defined species, belonging to four genera, are already on our list, and I have now to submit to you another absolutely distinct species, of which I have received two specimens from the West Coast sounds. I have not yet been able to identify it with any described form of *Eudypetes*, and I have little doubt that it will prove to be new to science.

Among the species referred to above is one so rare that only a single example of it has yet been recorded. I refer, of course, to the Black Penguin (*Eudypetes atratus*). The type was kindly forwarded to London by Professor Parker for the purpose of being figured in the second edition of "The Birds of New Zealand," and I regret to say that this unique specimen has been lost, with my own collections, in the barque "Assaye." I have, however, given Mr. Keulemans's drawing of it to Captain Fairchild, and have asked him to keep a sharp look-out for this penguin at the Snares, its only known habitat.

ART. III.—*The Habits and Life-history of the New Zealand Glowworm.*

By G. V. HUDSON, F.E.S.

[Read before the Wellington Philosophical Society, 8th October, 1890.]

Plate VIII.

My former paper on this insect (Trans. N.Z. Inst., vol. xix., p. 62) was written considerably over four years ago, and is, I regret to say, very incomplete in its details, as well as being in some places absolutely misleading. I will therefore, with the permission of the Society, completely recast my account of the natural history of the glowworm, the present paper thus entirely superseding my previous one. I trust that this course may be allowed, as the insect is one of unusual interest, and also excessively difficult to observe. It is therefore desirable that a complete account of its habits and life-history should be carefully recorded.

My first attempt to discover the nature of the New Zealand glowworm was in January, 1885, when I captured several