







THE AUTHOR.

*From a Photo by T. Wood, Melbourne.*

NESTS AND EGGS  
OF  
AUSTRALIAN BIRDS

INCLUDING THE  
GEOGRAPHICAL DISTRIBUTION OF THE SPECIES  
AND  
POPULAR OBSERVATIONS THEREON

59.82 156(94)

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BY  
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MELBOURNE

*With Map, 28 Coloured Plates and 131 Photographic Illustrations*

PART II.

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## FAMILY—PITTIDÆ: ANT THRUSHES.

## 419.—PITTA STREPITANS, Temminck.—(269)

## PITTA.

*Figure*.—Gould: Birds of Australia, fol., vol. iv., pl. 1.

*Reference*.—Cat. Birds Brit. Mus., vol. xiv., p. 428.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia, Hand-book, vol. i., p. 431 (1865); Ramsay: Ibis, p. 417 with pl. (1867); North: Austr. Mus. Cat., pl. 11, fig. 7 (1889).

*Geographical Distribution*.—Queensland and New South Wales.

*Nest*.—Covered or dome-shaped, side entrance with stage-like approach; composed of sticks, dead leaves, skeleton portions of stag-horn (*Platyecrium*) fronds and chiefly moss, small pieces of decayed wood being placed round the entrance; situated on or near the ground, usually between the spurs of fig or other tree, sometimes protected by a rock, in dense scrub. Dimensions over all, 8 to 9 inches across by  $11\frac{1}{2}$  inches in height; inside cavity,  $5\frac{1}{2}$  to 6 inches in diameter; entrance 3 to  $3\frac{1}{2}$  inches across; length of staging 6 inches.

*Eggs*.—Clutch, three to four, rarely five; roundish in shape, slightly more compressed at one end; texture of shell somewhat fine; surface glossy; colour, pearly-white, spotted and blotched, sometimes irregularly splashed with dark-brown, chestnut, and purplish-grey. Dimensions in inches of a perfect pair from the Richmond River district: (1)  $1.31 \times .99$ , (2)  $1.3 \times .97$ .

A full set of four has one example (No. 4) almost white, save a few speckles on the smaller end. There is usually one light-coloured egg in a clutch: (1)  $1.27 \times 1.01$ , (2)  $1.26 \times 1.0$ , (3)  $1.23 \times 1.01$ , (4)  $1.22 \times 1.03$ . (Plate 16.)

*Observations*.—This handsomely coloured bird of thrush-like habits is essentially a dweller of the luxuriant coastal scrubs from the northern part of New South Wales up to the Cardwell district, Queensland.

Dr. Ramsay mentions a single specimen was shot near Wollongong, south of Sydney, 1883.

Mr. F. Strange, who first obtained the eggs of the Pitta, sent them to Gould with the following note:—"I never saw any bird whose actions are more graceful than those of the *Pitta strepitans*, when seen in its native brushes, where its presence is indicated by the singular call, resembling the words 'want a watch,' by imitating which you can bring it close to the muzzle of your gun. No sooner, however, does it commence breeding, than it becomes shy and retiring, keeping out of sight in the most artful manner, moving about from place to place, and occasionally uttering its cry, until it has drawn you away from the nest."

In the Big Scrub, Richmond River district, one frequently hears the strong, whistle-like "want a watch" call of the Pitta, the "watch" being sounded a third or fourth higher than the other two notes.

I only succeeded in finding two empty nests, at least my companion, who had seen Pittas' nests, said they belonged to this bird. One was a half-open structure composed of moss and leaves, backed up against an outcrop of rocks.

The examples of Pitta's eggs in my collection were found in the Big Scrub by Mr. J. C. Gordon, December, 1891. There were three fresh eggs in the nest. He wrote:—"The nest was built in the spur of a buoyong tree, and was composed on the outside, first of coarse sticks, then moss mixed with dust and decaying logs, and lastly ferns; inside, grass, no feathers. The nest was open at the side."

I subsequently received a full clutch from Mr. H. R. Elvery, who has been singularly successful in finding Pittas' nests in the Big Scrub. In November, 1897, he took a "record" clutch of five eggs.

From Mr. Hermann Lau's MS., regarding the Pitta, I take:—"Dragoon Bird. During my stay at Bunya Mountains (South Queensland), ninety miles north-east from Yandilla, I was in the habit of imitating the short whistle of this bird to bring it within gunshot. On one occasion my desired friend would not come to me, but kept a respectable distance, so I approached it, sighted and despatched it. On picking up the body, to my great dismay, I discovered pieces of egg shell around the abdomen (the shot had been too severe). Looking round I beheld, only a yard distant, a beautiful nest between large stones mixed up with earth. Unfortunately there was no egg in it. The bird was evidently about to lay her first egg, which had been smashed. On dissecting the body I found three more eggs without shells. This brought me to the conclusion that the Pitta lays four eggs, roundish, in size like a Landrail's, in colour light-creamy with middle-sized brown-red spots.

"The nest was shaped like a mortar, and made of ferns and moss. Entrance at side. November, 1883."

Breeding months are probably November, December and January.

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#### 420.—PITTA STREPITANS (sub-species) SIMILLIMA, Gould

##### LESSER PITTA.

*Reference*.—Proc. Zool. Soc., p. 76 (1868).

*Previous Descriptions of Eggs*.—Ramsay: Proc. Zool. Soc., p. 501 (1875); North: Austr. Mus. Cat., pl. 11, fig. 8 (1889).

*Geographical Distribution*.—North Queensland; also New Guinea

*Nest*.—Similar in description and situation to that of *P. strepitans*.

*Eggs*.—Clutch, three to four; round oval in shape; texture of shell fine; surface glossy; colour, pearly-white or white with a slight



yellowish tone, spotted and irregularly splashed all over with chestnut, also spotted with roundish markings of dull grey. Dimensions in inches of a pair from the Bloomfield River district: (1)  $1.18 \times .95$ , (2)  $1.16 \times .95$ ; of a beautiful set from Cape York, richly marked with short, wavy blotches and lines of purplish-red and grey: (1)  $1.19 \times .91$ , (2)  $1.19 \times .91$ , (3)  $1.18 \times .92$ . These eggs are much more marked and decidedly smaller than those of the southern variety.

*Observations.*—Dr. Ramsay writes:—"This northern variety of *Pitta strepitans* I found common enough at the Herbert River and scrubs near Cardwell. Some of the specimens are deeper coloured and smaller even than any I have seen from Cape York; others again are not distinguishable from the New South Wales Birds: the white spot on the wing is almost obsolete in many from the ranges near Cardwell. Their notes are exactly the same in all localities. The nests and eggs are the same, and are found to vary in the same way as those described and figured by me in the 'Ibis,' 1867, p. 417.

"One thing is certain, I never knew a nest of either *P. strepitans* or *P. simillima* to contain more than three eggs alike, and often two out of the four (the usual number laid for a sitting) have been of a finely-spotted and light-coloured variety, the other two strongly and deeply marked."

Dr. Selater's testimony in the "Catalogue" is to the effect that "the northern specimens (*P. simillima*) are smaller in size, but not otherwise distinguishable from *P. strepitans*, and there are several specimens in a series of intermediate dimensions, which it is difficult to assign to either form without knowing the locality."

As a field observer and collector, Mr. K. Broadbent evidently believes in the two species of Pittas, for he states:—" *Simillima* is found in all the hill scrubs as far as Cape York. The nest is built at the roots of a large tree, and is made in the shape of a dome nine inches high with a diameter in proportion. It is composed of decaying leaves, palm-fibre, and twigs loosely put together, ingress being obtained at the front. Roughly speaking, I should say *P. simillima* extends as far south as Halifax Bay. *P. strepitans* reaches as far north as Rockingham Bay. The extent of country in which they both exist is therefore about fifty miles."

The following is a field note by Mr. W. B. Barnard when in the Bloomfield River district, 1893:—"Pitta, or Dragoon Bird. Found two nests, one with two eggs, the other with four. Nest on ground between two projecting roots, made of fan-palm fibre, dead leaves, small sticks, &c. Resembles a bandicoot's nest, the hole being in the side. First nest found 5th December, second on 20th."

## 421.—PITTA MACKLOTI, Temminck.

## BLUE-BREASTED PITTA.

*Figure*.—Gould: Birds of Australia, fol., supp., pl. 29.

*Reference*.—Cat. Birds Brit. Mus., vol. xiv., p. 436.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia, fol., supp. (1860); North: Austr. Mus. Cat., p. 173, pl. 11, fig. 9 (1880).

*Geographical Distribution*.—North Queensland; also New Guinea, New Britain, Aru Islands, Mysol, Salwatti, and Waigiu.

*Nest*.—A loose structure of interlaced grasses and fine fibres. In one instance it was placed on the head of a stump about six or seven inches from the ground. (Gould.)

*Eggs*. Clutch, three to four; roundish in form; texture of shell fine; surface glossy; colour, lightish cream or pale creamy-buff, lightly blotched and splashed all over with dull-purple and a few darker spots of olive. Dimensions in inches of a clutch: (1) 1.12 × .86, (2) 1.11 × .88, (3) 1.1 × .86. These eggs, besides being smaller than those of *simillima*, have their markings more blotched or of a cloudy nature. (Mr. T. A. Brittlebank's collection.)

*Observations*.—Referring to the richly-coloured Macklot or Blue-breasted Pitta, Gould states:—"I possess undoubted examples as well as young birds, from the neighbourhood of Somerset, in the Cape York district, where they were collected by Mr. James Cockerell, who informs me that although not common it is sufficiently abundant there to render the obtaining of examples a matter of no great difficulty. It inhabits thick vine scrubs, based with stones and overrun with rank herbage of various kinds. Its mournful whistle, which is most frequently uttered near sundown, is very deceptive, appearing to come from the opposite direction in which the bird is stationed; it is, in fact, a perfect ventriloquist. It sometimes leaves the ground, and may occasionally be seen perched on the tops of the highest trees, where it sits very close."

According to Mr. Cockerell's observations, the Macklot Pitta appeared to be a partial migrant to Cape York, where it arrives in October and November, departing again in January and February, presumably for New Guinea.

Mr. K. Broadbent's observations are:—"Pitta mackloti (Macklot's Pitta), the most handsome of the genus, is rather scarce. I noted it at Herbert Gorge in a hill scrub. It is plentiful at Cape York in summer, and I have procured specimens from the Goldie River, British New Guinea. It occurs on adjacent islands between these latter places, and is of interest as being one of the numerous links connecting the North Queensland and Papuan faunas. The call of the Macklot's Pitta is rather mournful, somewhat resembling that of a Pigeon. The bird is of retiring and solitary habits. Its main food—and indeed that of all the Pittas—consists of common snails (*Helicida*) and of worms.

To obtain the snail when it has retired into its shell, the Pitta has recourse to a stone. Holding the shell in its beak, the bird breaks it by repeatedly striking the delicate organism on the stone. I have often observed them thus breaking the shells in the Cardwell scrubs. In places little heaps of the broken molluscs may be seen lying on and around a stone that has evidently been especially suitable or convenient for their purpose. And I may here say, for the information of conchologists, that complete specimens of these land shells were very difficult to meet with about the Cardwell district during my stay there. *P. mackloti* builds its nest the same way as *simillima*, and the eggs laid are also equal in number."

I have seen several skins of the handsome Blue-breasted Pitta from Cape York, collected there by Mr. Harry Barnard, but he appears to have been unable to procure their eggs, notwithstanding he was there the whole of their breeding months, one season (1896-7).

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422.—PITTA IRIS, Gould.—(270)

RAINBOW PITTA.

*Figure*.—Gould: Birds of Australia, fol., vol. iv., pl. 3.

*Reference*.—Cat. Birds Brit. Mus., vol. xiv., p. 444.

*Geographical Distribution*.—North-west Australia and Northern Territory.

*Nest and Eggs*.—Undescribed.

*Observations*.—The rare Rainbow Pitta inhabits the North-west and Northern Territory. We know nothing of the economy of this beautiful creature save that it frequents the thick cane-beds near the coast, through which it runs rapidly, and where the boldness and richness of its plumage render it a most attractive object. The black under surface makes this bird quite a distinct species which, according to Mr. P. L. Selater, has no near allies.

## ORDER PICARIÆ.—PICARIAN BIRDS.

## Sub-order—Coraciæ.

## FAMILY—CYPSELIDÆ: SWIFTS.

## SUB-FAMILY—CYPSELINÆ.

## 423.—MICROPUS PACIFICUS, Latham.—(52)

## WHITE-RUMPED SWIFT.

*Figure*.—Gould: Birds of Australia, fol., vol. ii., pl. 11.

*Reference*.—Cat. Birds Brit. Mus., vol. xvi., p. 448.

*Geographical Distribution*.—Australia in general and Tasmania (occasional); also Japan, China, Mongolia, Burmah, Cachar, Assam, &c.

*Nest*.—Placed on the ledge of a cliff.

*Eggs*.—Clutch, two usually; oval in shape, while others are exceedingly elongated and bluntly pointed at the smaller end; texture of shell fine; surface has a slight trace of gloss; colour, pure white. Dimensions in inches of a proper clutch: (1) 1.01 × .66, (2) 1.0 × .6; of a more oval example: .95 × .7.

*Observations*.—The Australian or White-rumped Swift may sometimes be seen united in flocks with the Spine-tailed, the two species hawking together in our cloudless southern skies. The Australian Swift has been once recorded for Tasmania. It comes to Australia from Eastern Siberia, over Japan, China, Burmah, &c., returning thither about February. I have noted them in Riverina up to the first week in March. I possess a rarity in the shape of the egg of an Australian Swift, which was presented to me by the late Dr. Küttler, of Germany, and was taken by Dr. Dybowski in Eastern Siberia. I have since received a proper clutch from Mr. Alan Owston, Japan, who tells me that when on a yachting cruise to an island called Ukishima, which is about half-a-mile long, two hundred feet high, covered with evergreens and bamboo scrub, with cliffs all round, and about twenty miles south of Yokohama, he examined some caves on the south side, where he roughly estimated there must have been not less than 2,000 White-rumped Swifts

breeding. The White-rumped Swift also breeds in company with the Spine-tailed Swift on the ledges of rock under the Keron Waterfall.

Two seasons in succession Mr. Owston first noticed the return of the White-rumped Swifts on the 15th of May—springtime in the north. But one mid-winter—26th December, 1897—he saw more than a dozen of these birds when he thought they should have been away down south, perchance enjoying an Australian summer. By a somewhat strange coincidence, that was about the time of great bush fires, particularly in Tasmania and also on parts of the mainland, the smoke of which covered the face of the land and sea for thousands of miles. Could these Swifts have possibly lost their way and returned to the land of their nativity?

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SUB-FAMILY—CHÆTURINÆ.

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**424.**—CHÆTURA CAUDACUTA, Latham.—(51)

SPINE-TAILED SWIFT.

*Figure.*—Gould: Birds of Australia, fol., vol. ii., pl. 10.

*Reference.*—Cat. Birds Brit. Mus., vol. xvi., p. 472.

*Geographical Distribution.*—Australia and Tasmania; also South-eastern Mongolia, Eastern Siberia, China and Japan. Reported twice as a straggler to Great Britain.

*Nest and Eggs.*—Undescribed.

*Observations.*—All field observers have noticed the appearance of Swifts in summer, especially if the weather be hot and sultry. These extraordinary birds are well named, for we could imagine none swifter in flight. Seen against the sky, the long tapering wings give the bird a crescent-shaped form, with its body like a short staff stuck into the centre of the crescent. Thus it cuts the air at a tremendous speed. Gould states that it is possible for a Swift to be hawking for flies on the Continent of Australia at one hour, and at the next to be similarly employed across the Bass Strait in Tasmania.

The Spine-tailed Swift is more frequently seen than the White-rumped, and is one of the largest of its family in the world. The bird derives its vernacular name from the row of spines that fringe the end of the feathers of the short tail. The general plumage is brown and velvety black, with green and purplish reflection, relieved by part of the flanks and under tail coverts being white. Total length,  $7\frac{1}{2}$  inches, including the tail  $2\frac{1}{2}$  inches, while the wing is  $8\frac{1}{4}$  inches, exceeding the total of the bird by an inch, which is sufficient to account for the

marvellous speed of the owner. The Spine-tailed Swift lives solely on winged insects. A correspondent, writing from the Lower Tarwin, graphically depicts some of its habits:—"Day by day those birds are my constant companions, now swooping low along the heather, hawking in wide circles high in air, or cutting and glancing through the thick smoke of bush fires. I see them at early dawn, while the heather is yet wet with dew, solitary birds skimming low along the fields. Once in a while a faint silvery twitter proves that the birds are not devoid of voice. Night closes; no sound, save the low breathing moan of the distant sea. Suddenly, 'swish, whiz,' past goes a Swift, cutting through the darkness with the speed of a bullet, showing the wanderer they are with him still." Can it be possible that these restless birds fly ever by day and night till they return to the land of their nativity in the north? They have never been observed to perch in Australia, as far as my knowledge goes.\*

Mr. Alan Owston, Yokohama, informs me that the Spine-tailed Swift breeds under the Kegon Waterfall, near Nikko, Japan. The rock under the fall consists of alternate hard and soft layers, making a series of shelves, and the Swifts breed in the recesses between the shelves. The outer edges of these shelves or ledges are so rotten that they will not bear the weight of a man, therefore the place is practically inaccessible.

#### 425.—COLLOCALIA FRANCICA, Gmelin.

*C. terra regina*, Ramsay.

#### GREY-RUMPED SWIFTLET.

*Figure*.—Gould—Sharpe: Birds of New Guinea, vol. iv., pl. 38.

*Reference*.—Cat. Birds Brit. Mus., vol. xvi., p. 503.

*Geographical Distribution*.—Northern Queensland; also Fiji, Samoa, Friendly and Solomon Islands, Ternate, Mauritius, and Bourbon.

\* I possess two notes of the other (White-rumped) Swift perching. One by my son, when a student at the Horticultural School, Burnley. In a note read before the Field Naturalists' Club, he stated: "One day in March (1895) this bird came and alighted on a path not ten feet from where I was working. It seemed unable to balance itself on its feet, and after a second or two took its departure. This particular bird may have been over-fatigued and consequently dropped behind. Other Swifts were passing at the time."

The other note is by Dr. W. Macgillivray, who writes: "When down at Portland, 14th February (1899), my brother and I saw a great number of Swifts (*Micropus pacificus*). There must have been thousands flying over the town low down. They were passing for about two hours, and seemed to come along the coast from the west, and to fly in a north-easterly direction. A large number was passing over Heywood, which is about sixteen miles inland, when we reached there by train about half-an-hour later; and the same evening a friend of mine—Mr. Jas. Edgar, of Pine Hills, near Harrow—tells me a large flock took up their quarters for the night in a large gum tree near his house, and kept up a constant twittering till it was quite dark."

*Nest*.—Small, shallow, saucer-shaped; composed of some glutinous substance with a few feathers for a lining. Dimensions over all, 2 to 3 inches by  $\frac{1}{2}$  inch deep inside.

*Eggs*.—Clutch, two (!); stout oval in form; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches:  $.68 \times .5$ .

*Observations*.—When at Cardwell, Northern Queensland, August, 1885, my companions and I were greatly interested in the dusky little forms of this species of Swiftlet that hovered around our camp in dull weather, their presence usually predicting rain.

Specimens of an Edible-nest Swiftlet were procured on Dunk Island, Rockingham Bay, by Macgillivray, during the voyage of the "Rattlesnake," many years ago, but they were not recognised as an Australian species until Dr. Ramsay discovered them on the mainland and described them as *C. terre regine*. Dr. Sharpe says, "after careful comparisons I have decided on keeping this new Swiftlet distinct from *C. spodiopygia*, of Peale, to which it bears undoubted affinity. However, "doctors differ," and Mr. Ernest Hartert, in classifying this family in the Catalogue of Birds, British Museum, vol. xvi., unites both birds under *C. francica*.

Dr. Ramsay states:—"This species inhabits the north-east coast range near Cardwell, Rockingham Bay, where it is tolerably plentiful, but very difficult to procure, from its small size and swift flight. Small flocks may be seen flying to and fro over the cleared parts of the lower parts of the coast ranges, and frequently the same troop returns to the same open ground day after day; towards evening others may be found sweeping over the tops of the scrub and about the precipitous sides of the rocky ridges, where they doubtless breed. I found several young and immature-plumaged birds, and none amongst those I obtained had the tail fully grown. I have never seen this species in any other part of Australia than near Rockingham Bay. It was observed in the neighbourhood of Cardwell during October, and when I left in April, 1874, was still numerous there."

According to Mr. K. Broadbent's observations, the Grey-rumped Swiftlet is common at the base of Bellenden-Ker and up to 1,800 feet. He has seen it catching flies till nearly dark, and then fly towards the mountain. He also says it breeds in the rocky gorges of the coastal range, from Herbert River to above Cairns.

It would be well worth any field naturalist's time to explore the region named and find out for a certainty the nesting caves or quarters of this interesting little Swift.

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#### 426.—COLLOCALIA ESCULENTA, Linnæus.

##### EDIBLE-NEST SWIFTLET.

*Reference*.—Cat. Birds Brit. Mus., vol. xvi., p. 509.

*Geographical Distribution*.—Northern Queensland; also New Guinea and adjacent islands, Solomon Islands, Celebes, and Moluccas.

*Observations.*—It is interesting to be able to include in the Australian avifauna this Swiftlet, one of the builders of the long-famed edible birds' nests of Chinese commerce.

Speaking generally of the genus *Collocalia*, Mr. Hartert remarks that the various species are remarkable for their interesting nests, which are composed of moss or similar material agglutinated with saliva, those wholly composed of the latter being the "edible nests." These Swiftlets lay pure white eggs—it is believed the number is two, as a rule—in nests situated in dark caves, where hundreds or rather thousands are known to breed.

We have read of the famous birds' nest caves at Gomanton, North Borneo, where, if not the actual Edible-nest Swiftlet, a closely-allied species assembles in thousands, and when in the evening a most wonderful sight may be witnessed—columns upon columns of bats wheeling out, and then a continuous stream of Swiftlets pouring in to roost—Hawks and Kites taking up positions over the caves, and every now and then swooping down into the living mass, generally securing victims at each dash, the White-headed Sea Eagle showing a preference for bats, leaving the Kites to take the Swiftlets. In the morning a similar scene may be observed, only *vice versa*, the Bats incoming and the Swiftlets outgoing.

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## FAMILY—CAPRIMULGIDÆ: GOAT SUCKERS.

### SUB-FAMILY—CAPRIMULGINÆ.

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#### 427.—CAPRIMULGUS MACRURUS, Horsfield.—(50)

### LARGE-TAILED NIGHTJAR.

*Figure.*—Gould: Birds of Australia, fol., vol. ii., pl. 9.

*Reference.*—Cat. Birds Brit. Mus., vol. xvi., p. 537.

*Previous Descriptions of Eggs.*—Proc. Zool. Soc., p. 581 (1875);  
Hume: Nests and Eggs Indian Birds (Oates' ed.), vol. iii.,  
p. 45 (1890).

*Geographical Distribution.*—North-west Australia, Northern Territory, Queensland and New South Wales; also Papuan Islands, Malay Archipelago, Borneo, Cochin China, Siam, Malay Peninsula, and Tenasserim.

*Nest.*—Simply the bare ground in scrub or forest.

*Eggs.*—Clutch, two usually; elliptical in form; texture fine; surface glossy; light, pinkish cream colour, faintly or obscurely blotched and spotted with purplish-brown and dull-purple or slate, the markings being more numerous about the upper quarter. Dimensions in inches of a clutch: (1) 1.24 × .87, (2) 1.16 × .85. (Plate 16.)



*Observations.*—This species of Nightjar particularly possesses an intertropical habitat, which extends to many extra-Australian localities. Perhaps Dr. Ramsay would kindly enlighten us as to what proofs he has for showing the range of the Large-tailed Nightjar so far south as Victoria, South Australia and Western Australia.

It is true that Gilbert took the species, but it was most probably on his trip to Port Essington, where Gould states the birds were "moderately plentiful." Gilbert also saw a young bird apparently only a few days old, which he found lying under a shrubby tree without any nest or even a blade of grass near it. The little creature was so similar in colour to that of the ground upon which it was lying that it was with difficulty detected, and Gilbert was only induced to search for it from the peculiar manner in which the old bird rose, the reluctance it evinced to leave the spot, and its hovering over the place it had risen from.

Dr. Ramsay was indebted to Inspector Robert Johnstone for a pair of eggs of the Large-tailed Nightjar, which were found on the ground on the side of a ridge near the Herbert River, Queensland. A little to the north of the same locality, ten years subsequently (1885), I had some experience of this interesting nocturnal species, but did not succeed in procuring its eggs. I was on a collecting tour, pleasantly encamped with Messrs. Alfred and Frank Coles and Arthur Gulliver, on Meuanger or Saltwater Creek, near Cardwell. We also shot one flushed from the ground on Hinchinbrook Island, 17th September.

I received a splendid pair of eggs (the number usually laid, and not four as stated by others) from Mr. D. Le Souëf's collection. On his return to the coast, after his ascent of Mount Peter Botte, North Queensland, Mr. Le Souëf mentions his party flushed a Large-tailed Nightjar from the ground close to the track, where, without a nest of any kind, the bird was sitting upon two eggs.

The eggs of the Large-tailed Nightjar are sometimes found as early as August, the breeding season continuing to December or January.

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#### 428.—EUROSTOPUS ALBIGULARIS, Vigors and Horsfield.—(48)

##### WHITE-THROATED NIGHTJAR.

*Figure.*—Gould: Birds of Australia, fol., vol. ii., pl. 7.

*Reference.*—Cat. Birds Brit. Mus., vol. xvi., p. 607.

*Previous Descriptions of Eggs.*—Ramsay: Proc. Zool. Soc., p. 581 (1875); Campbell: Nests and Eggs Austr. Birds, add. pl. 3, fig. 48 (1883); Ramsay: Proc. Linn. Soc., N.S. Wales, 2nd ser., vol. i., p. 1142 (1886); North: Austr. Mus. Cat., pl. 11, fig. 3 (1889).

*Geographical Distribution.*—Queensland, New South Wales, Victoria, and South Australia; also New Guinea.

*Nest.*—Simply the bare ground in forest country.

*Eggs*.—Clutch, one; elliptically inclined in shape; texture fine; surface slightly glossy; rich cream or stone-colour, very sparingly but boldly marked with roundish blotches and spots of dark-purple or purplish-brown. Dimensions: (1) 1.59 × 1.11, (2) 1.57 × 1.11.

*Observations*.—This night flier is beautifully spotted, but somewhat larger than the succeeding species. Its range is not so extensive, being restricted chiefly to the eastern part of the Continent, where it loves to dwell, as a rule, in heavily timbered tracts. The first egg of the White-throated Nightjar that came into my possession was a fine specimen taken in the scrubby country adjacent to Lake King, Victoria. It was taken late in the season (January), and was the one figured in my manual, "Nests and Eggs." The second one was found among the foot-hills of the Dandenong Ranges, also in the same State. Date, 20th October, 1886.

Another in Mr. C. French, junr.'s collection was taken in the last-named locality as late as 20th January (1895).

429.—EUROSTOPUS GUTTATUS, Vigors and Horsfield.—(49)  
*E. argus*, Hartert.

SPOTTED NIGHTJAR.

*Figure*.—Gould: Birds of Australia, fol., vol. ii., pl. 8.

*Reference*.—Cat. Birds Brit. Mus., vol. xvi., p. 608.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia, Handbook, vol. i., p. 98 (1865); Ramsay: Proc. Zool. Soc., p. 581 (1875); Campbell: Nests and Eggs Australian Birds, pl. 1, fig. 49 (1883); North: Austr. Mus. Cat., pl. 11, fig. 2 (1889); Le Souef: Victorian Naturalist, vol. xvi., p. 61 (1899).

*Geographical Distribution*.—Whole of Australia; also Aru Islands and New Ireland.

*Nest*.—Anywhere upon the bare ground or in stony places in open forest country.

*Eggs*.—Clutch, one; elliptical or round oval in form; texture fine; surface glossy; light-yellowish or light-greenish stone colour, very sparingly but usually distinctly marked with round blotches and spots of dark purplish-brown; in some specimens, however, the markings are duller in colour. Dimensions in inches of examples: (1) 1.39 × 1.0, (2) 1.29 × 1.0. (Plate 16.)

*Observations*.—Wherever there has been a collector in Australia this beautiful nocturnal bird has been procured and identified.

Although Gould received undoubted eggs of this Spotted Nightjar, he found none personally, but records finding a newly-hatched young one on the precise spot from which he flushed the old bird. He describes

the young as a helpless little creature, which much resembled a small mass of down, and was reddish-brown in colour, not very dissimilar to the surface of the ground where it had been hatched.

The late Mr. S. White, Reedbeds, near Adelaide, in a communication to Gould, states: "I have several times found the female sitting on the ground on rock with only a single egg under her; the one sent to you was placed on a bare piece of stony ground, and the bird was sitting so close that she allowed me to approach within a few feet of her without moving."

I have nothing to add, except that my specimens of eggs came from Coomoooolaroo, where eggs have been found as early as August (1896), but the usual breeding months are from September to November.

In the British Museum Catalogue students will miss for the splendid Spotted Nightjar the old familiar specific name *guttatus*, which has apparently been sunk in favour of the new name *argus*, because Mr. Ernest Hartert has discovered that Vigors and Horsfield's type specimen was only the young of *albigularis*. Surely there should be a "Statute of Limitation" in ornithological matters as in other things, and the old name, *guttatus*, which has stood well nigh a century, might have remained. Undoubtedly it proves clever research on the part of Mr. Hartert to have discovered the error, but he could have pointed it out and still have adopted the old name (as Dr. Sharpe did when he determined the two species of Australian Crows). As long as Australian ornithology lasts I am afraid *guttatus* will have to stand for this species.

There is an egg of the Spotted Nightjar from the McDonnell Ranges, Central Australia, in the collection of Mr. G. A. Kearland, taken season 1894. That keen and enthusiastic field naturalist's notes concerning this Nightjar, taken during the Calvert Expedition (1896) in the North-west, will be read with interest. Mr. Kearland writes:—"During the early part of our journey the peculiar note of this bird gave rise to a considerable amount of speculation as to its origin, but at Mount Campbell I not only got the required information from the natives, but also satisfied myself by shooting the bird whilst uttering it. This note consists of a 'caw, caw, caw, gobble, gobble, gobble.' In the whole of the desert these birds are seen soon after sunset skimming over the tops of the spinifex in search of insects, but camp-fires possess a strong attraction for them in the form of winged insects attracted by the light. Whilst on watch on the night of August 17th, I counted ten birds flying round the burning spinifex at one time. Although seen far into the desert at night, they prefer rocky country in which to pass the day. On the hillside, near Mount Campbell, I disturbed fourteen birds from about half-an-acre of ground, and subsequently flushed several lots of five or six, but never saw one perch. They appear to spend all their time on the wing or ground."

## FAMILY—PODARGIDÆ.

## SUB-FAMILY—PODARGINÆ.

430.—PODARGUS PAPUENSIS, Quoy and Gaimard.—(45 and 46)  
*P. plumiferus*, Gould.

## PLUMED FROGMOUTH.

*Figure*.—Gould: Birds of Australia, fol., vol. II., pl. 6, and supp., pl. 3.

*Reference*.—Cat. Birds Brit. Mus., xvi., p. 630.

*Previous Descriptions of Eggs*.—Le Souëf: Ibis, p. 312 (1896), also Victorian Naturalist (1896).

*Geographical Distribution*.—Queensland and New South Wales; also New Guinea.

*Nest*.—Flat, slightly concave; constructed of fine sticks or twigs, brownish coloured at the base, greyish on the top. Usually situated on horizontal limb of a tree in open forest. Diameter, 8 inches by 2½ inches in thickest part.

*Eggs*.—Clutch, one usually; elliptical in shape; texture comparatively fine; surface slightly glossy and very faintly pitted; colour, pure white. Dimensions in inches of single examples: (1) 1.93 × 1.31, (2) 1.86 × 1.4.

*Observations*.—Mr. E. Hartert states:—"Dr. E. P. Ramsay considers *P. plumiferus* to be a distinct species; but I cannot distinguish it from *P. papuensis*, and if I am correct the range of the latter must be extended to the Richmond River district of New South Wales."

For the eggs of this species—the largest of Australian Frogmouths—I am indebted to Mr. D. Le Souëf, who procured them from the Bloomfield River district of Northern Queensland, and who first described a nest and egg taken by Mr. R. Hislop 20th October, 1894.

This bird is most difficult to detect on account of its colour being so much in harmony with that of its surroundings. When on the nest or on a branch it holds its head in a line with its body, and has the exact appearance of a piece of dead wood; even the markings and colour of its broad bill are similar to those of the feathers. They are fond of sleeping in casuarinas.

After one of his delightful trips to Northern Queensland, Mr. Le Souëf wrote:—"A Papuan Podargus was found sitting on its nest, which contained one egg, and on dissection the bird proved to be the male. The female was roosting in a neighbouring tree, and was not disturbed by the firing of the gun. We found three nests of the

Podargus altogether, built on the horizontal branches of the eucalyptus trees in the open forest, and on each it was the male bird that was sitting. Two of the nests had eggs, and one young."

Eggs have been taken during the months of October, November and December.

**431.**—*PODARGUS STRIGOIDES*, Latham.—(40 and 41)  
*P. cuvieri*, Vigors and Horsfield.

**TAWNY FROGMOUTH.**

*Figure.*—Gould: Birds of Australia, fol., vol. ii., pls. 3 and 4.

*Reference.*—Cat. Birds Brit. Mus., vol. xvi., p. 631.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. i., pp. 85 and 88 (1865); North: Austr. Mus. Cat., pp. 26 and 27, pl. 6, figs. 3 and 4 (1889).

*Geographical Distribution.*—Queensland, New South Wales, Victoria, South Australia and Tasmania. According to Hartert, Australia in general.

*Nest.*—Usually a frail (but occasionally a thick) platform composed of dead twigs, sometimes intermingled with grass, rootlets, &c., and generally placed in the fork of a horizontal limb of any suitable tree or on the splintered butt where a branch has been broken off, in open or thick forest. Diameter, 7 to 8 inches. (See illustration.)

*Eggs.*—Clutch, two usually, rare exceptions three; elliptical in shape; texture somewhat coarse; surface slightly glossy and very minutely pitted; colour, perfectly white. Dimensions in inches of a clutch from Victoria: (1) 1.73 × 1.18, (2) 1.65 × 1.16; of a pair taken in Tasmania, which has here and there small limy excrescences on the surface: (1) 1.8 × 1.24, (2) 1.71 × 1.24; and of a triplet of much smaller-sized examples taken in Queensland: (1) 1.59 × 1.16, (2) 1.58 × 1.21, (3) 1.53 × 1.17.

*Observations.*—The eight species of *Podargi* enumerated by Gould have been reduced, in the light of more recent knowledge and investigation, to four or five species and sub-species. However, the great naturalist evidently had some misgivings about the multiplicity of his species, because he said no one group of Australian birds had given him so much difficulty in discriminating the species as the *Podargi*, and especially asked Australians, and others of course, to ascertain if the difference in colour which occurs in these birds be distinctive of their sex, and, if so, to which the respective tints of red and grey pertain.

According to the careful comparisons by Mr. Ernest Hartert in the Catalogue of Birds in the British Museum (vol. xvi.) it will be noticed that under the heading of the Tawny-shouldered Podargus, or Frogmouth (*P. strigoides*), is included *P. cuvieri*, *P. gouldi*, and the ever doubtful *P. megalcephalus*.

In regard to the Tawny-shankered Frogmouth Gould says — "On the mode of construction I can speak with confidence having seen many nests breeding in my travels in the woods. It makes a slightly constricted flat nest of sticks, twigs, and twigs together and placed at the end of a horizontal branch of sufficient size to ensure the safety. The sticks most frequently chosen are New Zealand Waxes are the *Discosyris*, but I have occasionally seen the nest of an apple tree composed of a swing and *Discosyris*. In every instance one of the birds was sitting on the eggs and the other perched on a neighboring branch with invariably asleep. That the male participates in the duty of incubation I ascertained by having seen a bird on the nest which on inspection proved to be a male.

In the nest the above males were my own observations. Breeding season commences in August, lasting to December or January. It is said that an interval of four or five days takes place between the laying of the two eggs. Very young birds are often objects crowded as they were down. There is usually a great disparity in the size of the two young in the same nest as if there had been a long interval between the depositing of the eggs, and the parent had commenced to sit from the laying of the first. The call of the Frogmouth is a rapid pulsating, hooping sound repeated from fifteen to twenty-five times or continued from about seven to ten seconds with short intervals between each string of notes. I have ascribed to these alternating each other from different parts of the forest.

These birds from their protective coloring are difficult to detect. Many collectors have noticed what appeared to be a short stick placed across some frail flat nest. On a closer examination the stick proved to be a Frogmouth sitting upon a pair of sniv-white eggs. The main part of the bird upon the nest is upon a limb is only affected during the day. At night it remains as it were its figure and is as white as any diurnal bird.

I have a record from Queensland of two instances of nests of Frogmouths containing three eggs. The first was reported to me by the late Mr. George Bernard November, 1884.

432.—P. BARNES, PHILADELPHIA: G. & C. — 25 and 26.  
*P. barneanus* Gould.

### FRECKLED FROGMOUTH

*F. maculata* (Gould) — *Discosyris maculata* Gould, 1825.

*F. maculata* (Gould) — *Discosyris maculata* Gould, 1825.

*F. maculata* (Gould) — *Discosyris maculata* Gould, 1825.

Geographical Distribution.—New Queensland, Northern Territory, Northern West and South (Queensland) Australia.



FAWNY - PROBABLY SHE'S NESTING.

*From a Photo by the Author*





*Nest*.—Flat, slightly concave; constructed of greyish, dead, branching twigs, apparently broken off the trees by the birds. One nest from Western Australia has a few portions of grass-tree (*Xanthorrhoea*) needles intermixed; usually situated on the horizontal forked branch of a tree—eucalypt, melaleuca, &c. Dimensions, 9 or 10 inches in diameter by 2 inches in thickest part.

*Eggs*.—Clutch, two; long oval in shape; texture fine; surface slightly glossy; colour, pure white. Dimensions in inches of an odd example from Western Australia:  $1.74 \times 1.17$ ; of a proper clutch from Central Australia: (1)  $1.69 \times 1.25$ , (2)  $1.56 \times 1.22$ ; of a set from Northern Queensland: (1)  $1.72 \times 1.12$ , (2)  $1.65 \times 1.08$

*Observations*.—If this species embraces Gould's doubtful *P. brachypterus*\*—the western variety—its geographical range is wide, extending from Western Australia round to North Queensland (where it is the common species met with), and including Central South Australia.

Like the other members of its genus, this Frogmouth exhibits considerable variation in size and colour, but, as Gould points out, it may be readily distinguished from every other Australian species of Podargi by its smaller size and by the beautiful, delicate, moth-like, painted plumage.

A nest of this Frogmouth was taken for me at Quindalup, 21st October, 1889, during my visit to Western Australia. It was situated about ten or twelve feet from the ground in a paper-bark tree (*Melaleuca*), and contained two eggs, one unfortunately being broken. In Western Australia the nest is sometimes placed in the fork of a grass-tree (*Xanthorrhoea*) as well as in eucalypts.

With regard to the bird in its more northern habitat, Mr. Le Souëf records:—"The nest of this bird was found on November 25th, 1896, and contained two eggs, much incubated; on the same day another nest was discovered which contained two young ones covered with white down, and about a week old. In both instances the male was sitting on the nest, the female being in a neighbouring tree; and in the various nests of this bird that I have found, in every instance so far, when I have secured the sitting bird, either on eggs or young, it has on dissection proved to be the male.

"They are sleepy-looking birds, and do not as a rule leave the nest until almost within one's reach, and then only to fly leisurely to another tree not far off, where they can be easily secured. Occasionally I have noticed the female resting close to the male as he sits on the nest, but as a rule they are on a neighbouring tree, and the report of a gun close by does not seem to disturb them much. The present nest was built on the horizontal branch of a eucalyptus, about fifteen feet from the ground, being almost flat and composed of twigs without any lining."

\* I am not yet prepared to admit that *P. brachypterus* and *P. phalenoides* are really identical.

433.—*PODARGUS OCELLATUS* (sub-species) *MARMORATUS*. Gould.—(47)

## MARBLED FROGMOUTH.

*Figure*.—Gould. Birds of Australia, fol., suppl., pl. 4

*Reference*.—Cat. Birds Brit. Mus., vol. xvii., p. 623.

*Geographical Distribution*.—Queensland.

*Nest and Egg*.—See Appendix

*Observations*.—This Frogmouth has now been assigned only a sub-specific place. The original *P. ocellatus* appears to be confined to New Guinea. Gould, after carefully comparing examples from both localities, held that they were specifically distinct.

The Marbled Frogmouth with wedge-shaped lengthened tail is an elegant species, and may be likened to the Papuan Frogmouth in miniature. It is the smallest of its genus.

Gould took his descriptions of both these birds from specimens shot by Macgillivray on the Cape York Peninsula during 1842 or 1849. Much difference appears to exist in the colouration of the sexes. One of the larger species I examined in the collection of Mr. D. Le Souëf was a very distinct rusty-red colour.

## SUB-FAMILY—ÆGOTHELINEÆ.

434.—*ÆGOTHELES NOVE HOLLANDIÆ*. Latham.—38 and 39

*Æ. leucogaster* Gould

## LITTLE NIGHTJAR.

*Figure*.—Gould. Birds of Australia, fol., vol. i., pls. 1 and 2

*Reference*.—Cat. Birds Brit. Mus., vol. xvii., p. 621

*Ironstone Description of Egg*.—Gould. Birds of Australia (1845), also Handbook, vol. i., p. 80 (1863); Thienem Fortpfl. ges. Vog. (1854); North Austr. Mus. Cat., p. 26, pl. 14, fig. 11 (1859); Le Souëf. Ibis, p. 113 (1866), also Victorian Naturalist (1867).

*Geographical Distribution*.—Australia and Tasmania.

*Nest*.—A hole or hollow spout, situated from three feet to twenty feet from the ground, of a tree living or dead, the usual lining being eucalypt leaves.

*Eggs*.—Clutch three to four, occasionally five; roundish slightly compressed at one end; texture strong but fine; surface glossy; colour white. Dimensions in inches of a proper clutch (1) 1.08 × .84.

(2)  $1.08 \times .87$ , (3)  $1.06 \times .85$ . These eggs when rubbed together produce a porcelain or china sound.

*Observations.*—Since the White-bellied Owllet Nightjar—*N. leucogaster* of Gould, and the *N. nova hollandia* of Dr. Latham, are deemed identical, this Owl-like and very interesting little creature enjoys a great range, practically the whole of Australia and Tasmania. It is between 8 and 9 inches in length. The plumage, in general terms, is freckled with black, white, and grey, but the head is all dark, while the underparts are much lighter. The bird's call at night is a fairly loud double note, sounding like "chirk-chirk."

Gould, while traversing our forests, procured its eggs. He ascertained at least two broods are reared by each pair of birds during the season. He had known young to be taken in Tasmania in October, and in New South Wales he himself procured eggs in January, which may be taken with September prefixed as the two extremes of the breeding season.

On the upper Werribee I had an opportunity of examining several nesting places of this little nocturnal bird. One was entirely lined with dead leaves of the blackwood (*Acacia*). Another was in a hole about six feet from the ground, in a living tree, from which the bird was flushed by striking the tree with a tomahawk. The slightest tap suffices to cause these timid little creatures to slip out of their nesting or roosting place. In this instance the eggs were about a foot from the entrance and were deposited on the trampled-down nest of the White-throated Tree Creeper (*Climacteris leucophaea*), which was composed of shreds of stringy bark and moss, lined with rabbits' fur, etc., and contained one whole egg, besides fractured ones—*prima facie* evidence that the Nightjar had "jumped the claim" of the Tree Creeper. Date, October 11th, 1890.

In a forest in Western Australia, I was in the act of killing a snake, when, out of a hole in a tree close by, a bird flopped against me. At first I really thought another snake was upon me, but soon saw it was a little Owllet Nightjar that the unwonted disturbance had flushed from its hollow hiding place in a karri about four feet from the ground.

A note from Mr. James McDougall, Yorke Peninsula, South Australia, states, "The Owllet Nightjar is a somewhat scarce bird, nesting and living in holes of trees, from which it slips out on the slightest alarm, thus betraying its eggs, which are two, white, and somewhat round."

Mr. D. Le Souëf states that Mr. R. Hislop found the nest of the White-bellied Owllet Nightjar in Northern Queensland on November 23rd, 1895, and that the three pure white eggs were laid on the decayed wood at the bottom of a hollow branch of a eucalyptus tree. They are very similar in appearance to southern examples, but are slightly more oval, and measure (1)  $1.18 \times .89$ , (2)  $1.15 \times .9$ , (3)  $1.14 \times .9$  inches.

Mr. Keartland writes:—"Throughout the course of our journey (Calvert North-west Expedition), I frequently saw these birds fly about our camp at night. As the caravan passed through the forests, the unusual noise disturbed the Nightjars from their retreats in the hollow

branches of the dead trees. Whilst in pursuit of ducks with Mr. C. F. Wells on the 8th August, he called my attention to one of these birds perched within a few feet of my head. It was nearly black, but whilst changing my cartridge it disappeared across the creek, and could not again be found. Subsequently others were seen. They frequently came under the verandah at the telegraph station at night in pursuit of insects, flying in and out like Welcome Swallows."

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FAMILY—CORACIIDÆ. ROLLERS.

SUB-FAMILY—CORACINÆ.

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435.—EURYSTOMUS AUSTRALIS. Swainson.—(59)

ROLLER OR DOLLAR BIRD

*Figure*.—Gould: Birds of Australia, fol., vol. ii., pl. 17.

*Reference*.—Cat. Birds Brit. Mus., vol. xvii., p. 36.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848); also Handbook, vol. i., p. 126 (1865); Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 46 (1882); North: Austr. Mus. Cat., pl. 14, fig. 1 (1880); Le Souef: Victorian Naturalist, vol. xvi., p. 70 (1890).

*Geographical Distribution*.—Australia (except South and West); also New Zealand (accidental), Lord Howe Island, New Guinea, and throughout the Moluccas and Celebes.

*Nest*.—A hole in a hollow limb or tree, the eggs being deposited upon the decayed wood-dust within.

*Eggs*.—Clutch, four; roundish in shape; texture of shell fine; surface exceedingly glossy; colour, beautiful pearly-white. Dimensions in inches of a pair: (1) 1.45 × 1.15, (2) 1.39 × 1.14; of a proper clutch: (1) 1.4 × 1.12, (2) 1.38 × 1.15, (3) 1.34 × 1.15, (4) 1.3 × 1.14.

*Observations*.—The Rollers (a name suggested by their rolling antics when flying), or Dollar Birds as they are more commonly called (on account of the round, white mark on each wing, which shows out against the general bluish plumage), are observed to arrive in the Cardwell district from northward in August, and reach Southern Queensland and New South Wales in September. Occasionally they wander as far south as Victoria. They have been noted at Warrandyte, on the Yarra; and in the season (November) of 1893 I saw a wing of a Dollar Bird that was shot in the Lerderberg Ranges above Bacchus Marsh, November 27th, 1893. Further occurrences have been reported on the Mitta Mitta, 1891 (J. Hammerton); Murray, 31st October, 1894 (J. A. Trask); at Cowwarr (A. W. Milligan); the Dandenongs (R. C. Chanderler); Ascot Vale (A. Coles); and Somerville

(G. E. Shepherd). As soon as the birds have reached their southern limit they commence breeding operations, which are carried on to about December (some observers say two broods are reared), and by February both old and young commence to retire northward.

As Gould remarks, the Roller is bold at all times, but especially in the breeding season, when it attacks with the utmost fury any intruder that may venture to approach the hole in the tree where its eggs are deposited. It will frequently fight with the Great Kingfisher or Laughing Jackass, and successfully "jump" its nesting hole. Dr. Ramsay has actually seen the young of the Great Kingfisher thrown out of the nest by the Roller. Touching the fury of the Rollers, my German friend, Mr. Lau, tells a good story in circumstantial fashion. He says: "It was in the month of September I detected the breeding place of one about sixty feet from the ground in the knob hole of a very stout and tall eucalypt near the McIntyre Brook, at Whetstone. Seeing the bird flying in and out, I waited for a week before sending up an aborigine to make sure that eggs were deposited. With great reluctance, and under promise to give him a linen coat and trousers, half a bottle of rum in addition to a glass before starting, I persuaded my climber to the task, also promising to be in readiness with my gun to shoot the birds in case they should attack him while taking the eggs. Now on the way up there was a portion of a thick barrel, and to overcome this I provided him with four 6 in. nails to insert in the tree, for placing his big toe on. Just being in this act, both birds descended, sat soon amongst his black hair, pecking away, at the same time uttering their low-toned noise. Although my black-fellow was crying out 'shoot 'em, shoot 'em!' I waited until they left him. Both birds were shot. I found a complete egg in the female; my man taking three more out of the hole, completed the clutch (four)."

Mr. Lau once reared a pair of young Rollers. After a lapse of two months, or about the time of their migration, the impulse became so strong in the birds that in endeavouring to escape they destroyed themselves, knocking their heads against the top of the cage. They were fed on raw meat.

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#### FAMILY—MEROPIDÆ: BEE EATERS.

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#### 436.—MEROPS ORNATUS, Latham.—(58)

#### BEE EATER.

*Figure*.—Gould: Birds of Australia, fol., vol. ii., pl. 16.

*Reference*.—Cat. Birds Brit. Mus., vol. xvii., p. 74.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. i., p. 118 (1865); North: Proc. Linn. Soc., N.S. Wales, vol. ii., 2nd ser., p. 441 (1887); North: Austr. Mus. Cat., p. 34 (1889); Le Souëf: Victorian Naturalist, vol. xvi., p. 70 (1899).

*Geographical Distribution*.—Whole of Australia; also New Guinea and adjacent islands, Moluccas, Celebes, Flores and Lombok.

*Nest*.—A chamber or excavation at the termination of a small tunnel about three or four feet in length, drilled into a sand ridge or bank, but sometimes driven obliquely into flat ground.

*Eggs*.—Clutch, four to five; round or round oval in form; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches of a clutch: (1, oval)  $\cdot 95 \times \cdot 74$ , (2, oval)  $\cdot 94 \times \cdot 77$ , (3, round)  $\cdot 89 \times \cdot 75$ , (4, round)  $\cdot 86 \times \cdot 78$ .

*Observations*.—Among the Australian birds there is none so graceful and few more beautiful than the Bee Eater. It has two small, plumed, central tail feathers, and general plumage of rich golden green and sky blue. The throat is rich yellow. Beneath that marking is a band of black. The long, pointed, and slightly curved bill is black, while the lovely eyes are ruby, and the remarkably small feet are nondescript green. Length of bird, 10 inches, including tail 6 inches, and bill  $1\frac{1}{2}$  inches. Like many of our birds, it is a partial migrant, wandering between the northern and southern parts of the Continent, according to the season. Gould has recorded that some\* of the Bee Eaters arrive in New South Wales from northward in August (? September), departing again in March. I found that in their southern limit in Victoria and South-west Australia the birds arrive about the beginning of October and commence to drill their nesting holes about the end of the first week in November, laying late in that month or the beginning of December. Although not altogether gregarious, Bee Eaters frequently nest near each other in sand ridges or other favourable spots. Once in December I spent a hot afternoon on the natural embankments that rise on the east side of the salt lakes in the Benjeroop (Victoria) district. Into one of these singular banks many of the gorgeous birds had drilled their tunnels. Before I reached the egg chamber of the first hole I had to mine fully the length of my gun. Having secured the pearly set of eggs, on account of the intense heat and dust I gave up further exploration, to the probable satisfaction of the other beautiful birds. However, my friend Mr. George H. Morton at another time, 26th November, persevered near the same locality, taking five clutches, namely: 5, 5, 4, 4, and 2 eggs respectively.

With regard to the Bee Eater, Mr. Hermann Lau has left some very interesting notes in manuscript. On the Darling Downs (Q.), he observes, the birds come in September, leaving in February. He always found the entrance to the tunnel of their nest faced west and north, to avoid, apparently, the rainy weather from the opposite directions. When burrowing, the birds work with zest, the tunnel often extending to a length of four to five feet, and in a slant of about fifty degrees. The excavation at the end of the tunnel in some instances was large, about two and a half feet in circumference. "What," Mr. Lau asks, "becomes of all the sand displaced? because we rarely see more than a handful, in the form of a little ridge at the entrance." He answers his own question by supposing that the birds

\* All evidently do not migrate, because eggs have been taken in North Queensland during October

partly use their wings like shovels to scatter the sand to the winds. Mr. Lau concludes with the following incident, which occurred near Yandilla, November, 1867, and is told with characteristic German zest: "I shall relate an adventure which nearly deprived me of my life had not the all-protecting hand of Providence averted such a calamity. One day, in the month of November, being very hot, I went to a sand ridge near Tunnaville cattle station, belonging to Yandilla, twelve miles to the south of it, in search of Bee Birds' eggs. Seeing two of these birds on a bush, I soon detected their homestead. I managed to procure a stiff stick for opening the passage, working hard to a distance of three feet, thinking bottoming the hole and doing so felt something slipping in my hand; repeating my grasp suggested young birds. the second time the touch was evidently cold. It struck me an iguana was the intruder, as I had seen before such animals coming out of similar places with a young Bee Bird in its mouth. Well, working the stick to the end, I perceived something got hold of the point, and, by gradually extracting the stick, beheld to my great horror a brown snake five feet long—one of the most venomous of its kind—savagely biting the point. I dragged it to the entrance by its teeth and quickly despatched the arch-enemy, thanking my God for the release of so great a danger. Finding myself full of nervousness, I hastened home to allay such a feeling by drinking a glass of brandy and water."

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## Sub=order—Halcyones.

### FAMILY—ALCEDINIDÆ: KINGFISHERS.

#### SUB-FAMILY—ALCEDININÆ.

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**437.**—ALCYONE AZUREA, Latham.—(69 and 70)  
*A. diemenensis*, Gould.

#### BLUE KINGFISHER.

*Figure.*—Gould: Birds of Australia, fol., vol. ii., pl. 25.

*Reference.*—Cat. Birds Brit. Mus., vol. xvii., p. 168.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. i., p. 140 (1865); Ramsay: Ibis, vol. ii., new ser., p. 327 (1866); Campbell: Victorian Naturalist (1888); North: Austn. Mus. Cat., p. 40 (1889), also app. ii. (1890).

*Geographical Distribution.*—Queensland, New South Wales, Victoria, South Australia and Tasmania.

*Nest.*—An excavation at the termination of a tunnel, drilled into a bank, usually of a river or creek, or into a mound of earth attached to the base of an uprooted tree.

*Eggs.*—Clutch, five to seven; round in shape, contracted at one end; texture of shell fine; surface exceedingly glossy; colour, pearly-white. Dimensions in inches of a clutch: (1)  $.9 \times .76$ , (2)  $.9 \times .75$ , (3)  $.87 \times .74$ ; of a set which is larger, taken in Tasmania: (1)  $.94 \times .78$ , (2)  $.94 \times .75$ , (3)  $.92 \times .78$ .

*Observations.*—What observer has not lingered in some sylvan nook, by the margin of a tranquil stream, and with admiration watched this beautiful species pass quickly up or down over the surface of the water, displaying in a flash of splendour its fine ultramarine coat, and uttering at intervals its single squeak-like note?—or has not seen the bird silently perched on a twig or dead branch of a snag, where, with spasmodic motions of the head, it fully exposes its rich buff or reddish-orange breast, while now and again, like an arrow, it darts into the water to capture finny spoil?

In bygone days I often found the nesting place of the Blue Kingfisher in the shelving banks of the Yarra, behind Toorak, near Melbourne. The entrance was about  $1\frac{1}{2}$  inches in diameter. At the termination of the tunnel, which ascended slightly for twelve or fifteen inches, was a chamber between six and seven inches in diameter, for the reception of the eggs. The floor of this chamber, which was below the level of the tunnel leading to it, was usually filled with an accumulation of small fish bones and remains of water-beetles, amongst which the pearly-white eggs rested. Once I found a nest near Lake King, Gippsland, but away from water, in a small bank that had been caused by the uprooting of a fallen tree. The nest contained eggs, and was discovered by the bird flying out at my feet.

The breeding season commences in September (August according to Gould), lasting till January, during which period probably two broods are reared. Gould states that immediately on leaving their nest the young follow their parents from one part of the river to another, and are fed while resting on some stone or branch near the water's edge. They soon, however, become able to obtain their own food, and may be observed at a very early age diving into the water for a considerable depth to capture small fish or water insects. In Southern Queensland this beautiful Kingfisher commences, usually, to excavate its nest in October. It sometimes succeeds in rearing a large family. As many as six fat fledgelings have been seen huddled together in their earthy cell.

With regard to the Tasmanian variety, Dr. Sharpe states: "*A. diemenensis* cannot be separated from *A. azurea*, and the characters on which I depended in my 'Monograph' are merely those of an immature bird."

Mr. A. E. Brent has found the Tasmanian birds breeding somewhat plentifully on the Duck River during the months of October and November.

It will be observed that the eggs of the Tasmanian Blue Kingfisher are larger than those of the mainland variety.



## 438.—ALCYONE AZUREA (sub-species) PULCHRA, Gould.—(71)

## PURPLE KINGFISHER.

*Reference.*—Cat. Birds Brit. Mus., vol. xvii., p. 169.

*Previous Description of Eggs.*—North: Proc. Linn. Soc., N.S. Wales, 2nd ser., vol. iii., p. 269 (1888).

*Geographical Distribution.*—North-west Australia, Northern Territory and North Queensland.

*Nest.*—Usually a hole in the bank of a stream.

*Eggs.*—Clutch, five, probably six occasionally; similar to those of the southern representative, *A. azurea*, being rounded in form, pearly white, and the texture of the shell fine and very glossy. Dimensions in inches: (1)  $\cdot 87 \times \cdot 73$ , (2)  $85 \times \cdot 74$  (North).

*Observations.*—From the resplendent beauty of the purplish-blue of its coat the Purple Kingfisher is probably the most captivating of the Australian Alcyones, and is closely allied to, if not actually a sub-species of the lovely Blue Kingfisher—*A. azurea*.

Mr. North gives an interesting account of the finding of the first recorded nest of the Purple Kingfisher by Messrs. E. J. Cairn and Robert Grant, who were collecting in the neighbourhood of the Mount Bellenden-Ker, Northern Queensland, on behalf of the trustees of the Australian Museum. The following is Mr. Grant's own statement relative to the taking of the nest:—

“On the 26th December, 1887, at Riverstone, about sixteen miles inland from Cairns, in company with an aboriginal named ‘Charlie’ (native name Euryimba), I saw a Kingfisher fly into a hole in the bank of a creek. After running forward and placing my hat over the entrance, I, with my sheath-knife, enlarged the opening, and putting my hand in caught one of the parents. While engaged in securing it, my attention was drawn away from the nest for a moment, when to my surprise another bird flew out, so both the parent birds were in the hole at the same time. Afterwards, upon dissection, the bird I captured proved to be the male. The nest, if worthy of the name, was placed near the end of the tunnel, which was about sixteen inches in length and inclined upwards. It was composed of a few cast fish bones, and small pieces of decayed roots, but in all not sufficient to protect the eggs from the sandy soil at the bottom. The nest contained five eggs, three of which were unfortunately broken.”

## 439.—ALCYONE PUSILLA, Temminck.—(72)

## LITTLE KINGFISHER.

*Figure*.—Gould: Birds of Australia, fol., vol. ii., pl. 26.

*Reference*.—Cat. Birds Brit. Mus., vol. xvii., p. 171.

*Geographical Distribution*.—Northern Territory and North Queensland; also New Guinea.

*Nest*.—A hole, usually in the bank of a mountain stream.

*Eggs*.—Clutch, five probably. Undescribed.

*Observations*.—This tiny creature, which is only 5 inches in length, is interesting because it is probably the smallest of its tribe in the world. With the intense blue of its coat and silky white under-surface, it may be said to resemble a miniature MacLeay or the Forest Kingfisher.

The lovely Little Kingfisher is a native of Northern Australia, and is found as far down the Queensland coast as Cardwell, where Mr. K. Broadbent observed it somewhat common, but most frequently found in the smaller scrubby creeks. Leaving the neighbourhood of the coast, it resorts in October to the heads of the mountain streams, such as occur on Gowrie Creek, at the base of Mount Graham, for the purpose of breeding. By February and March, Mr. Broadbent found the Little Kingfisher again quite common about the estuaries of the small mangrove creeks which intersect the beach.

## 440.—SYMA FLAVIROSTRIS, Gould.—(67)

## YELLOW-BILLED KINGFISHER.

*Figure*.—Gould: Birds of Australia, fol., supp., pl. 5.

*Reference*.—Cat. Birds Brit. Mus., vol. xvii., p. 197.

*Geographical Distribution*.—Northern Territory and North Queensland.

*Nest and Eggs*.—Undescribed.\*

\* Since writing this, through the courtesy of Mr. T. A. Brittlebank, I have been enabled to describe—Victorian Naturalist, vol. xvi., p. 37 (1899)—a pair of eggs from Cape York, taken January, 1898, from a hollow, dead tree in open scrub near mangrove. The eggs are round in shape, sharply nipped off at one end; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches—(1) 1.0 × .88, (2) 1.0 × .88. Most resemble those of the White-tailed Kingfisher.

*Observations.*—The Yellow-billed Kingfisher is one of the rare birds of the rich scrubs of the northern parts of Australia. The more intelligent natives of Cape York, whom MacGillivray questioned separately, agreed in stating that its mode of nidification was similar to that of the White-tailed Kingfisher (*Tanysiptera sylvia*), and that it, like that species, laid several white eggs.

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SUB-FAMILY—DACELOINÆ.

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**441.**—DACELO GIGAS, Boddaert.—(60)

BROWN KINGFISHER (LAUGHING JACKASS).

*Figure.*—Gould: Birds of Australia, fol., vol. ii., pl. 18.

*Reference.*—Cat. Birds Brit. Mus., vol. xvii., p. 204.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848); also Handbook, vol. 1., p. 124 (1865); North: Austr. Mus. Cat., p. 36, pl. 6, fig. 1 (1880).

*Geographical Distribution.*—Queensland, New South Wales, Victoria, South and West (introduced 1896) Australia.

*Nest.*—In a hole or spouted limb of a tree; but is sometimes, especially in Queensland, in a hole drilled into the nest of ants or termites situated in a fork or upon the side of a standing tree. An instance is known of a nest made in the heart of a "calabash"—the fern, *Platycaerium aleicorne*.

*Eggs.*—Clutch, three to four; round in shape, sharply contracted at one end; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches of a clutch: (1) 1.92 × 1.45, (2) 1.83 × 1.5, (3) 1.83 × 1.42.

*Observations.*—The Great Brown Kingfisher (native name Kookaburra), or more commonly called Laughing Jackass, from its quaint appearance and its rollicking laughter-like notes, is not only a favourite amongst naturalists, but with every dweller in the bush. The adult Laughing Jackass has a dusky back and wings, some parts of the wings, especially the shoulders, also the lower portion of the back, being relieved with markings of blue. The tail is brownish, barred with black. The rest of the plumage may be termed buff, with a dark-brownish wash on the feathers of the head and ear coverts. The awkward-looking bill is brownish-black on the upper mandible, and yellowish or pale buff on the under mandible, while the eyes are dark-brown, and the feet yellowish. The total length of the bird is about 18 inches, including tail  $5\frac{1}{2}$  inches, and bill 3 inches.

Amongst the most cheerful of forest sounds at evening are this bird's notes when heard among lofty trees up some gully. Then again at early dawn, soon after the chirping notes of the Yellow Robin and sometimes before the melodious Magpie, the voices of the Jackasses herald the coming day. On two mornings I timed the Jackass's first song at 4.20, or just one hour before sunrise. Again at evening it is delightful to listen to these birds in the bush, when they are particularly noisy. But all settle down quietly as the last light of day fades out. It has been stated that the female only voices the laughter-like notes, while the male accompanies her with the growling noise. Is it a fact?

Until recent years the Great Brown Kingfisher did not appear to exist in Western Australia—I refer more particularly to the forests of the south-west, which would appear equally as well adapted to the peculiar habits of the bird as the eastern timber tracts are. However, Mr. G. A. Keartland, of the Calvert expedition in 1896, states whilst camped at Mullawa he heard the well-known notes of these birds, and observed a few of them always near the camps. They were also noted between Fremantle and Perth. Perhaps these latter were some of the birds captured in Victoria by Mr. James Cooper, and sent to Western Australia by order of the Government, or perhaps the Jackasses had followed the numerous other eastern "Jackasses" who had been attracted to the glorious west by the wonderful gold discoveries. The Brown Kingfisher being the southern form of the genus *Dacelo*, I was agreeably surprised, in 1885, to find the bird as far north as the Cardwell Scrubs, Northern Queensland. Since then, Mr. Dudley Le Souëf informs me he noted the bird on the Bloomfield River, still further north. It has been observed in the interior at Cooper's Creek.

The chief breeding months of the Brown Kingfisher are from September to the end of the year, during which period usually two broods are reared. In Southern Queensland Mr. Lau observed that the first clutch was generally laid in September, and the second in November. The nesting place is not lined in any way; the eggs are merely deposited on the dust of the decomposed wood in the hollow, or, if in termites' nests, on the bare floor at the end of the tunnel. Old nests are sometimes resorted to; but if new quarters have to be found, both male and female birds assist in excavating the hole.

On October 31st (1893), Mr. George H. Morton took three eggs from the spout of a red-gum tree, five feet from the ground, near the Murray River. On November 27th, he found a young bird in the same nest. When Mr. Morton removed the three eggs he may have left one egg remaining, but the greater probability is the fourth egg was laid afterwards. However, on the 12th December the young had left the nest. Therefore we may infer that from the time the female deposits her eggs till the young quit the nest is about six weeks.\* After the young leave the nest their parents continue to feed them for a

\* I possess a pair of live Jackasses that was taken from a nest when the birds were about a month old. At the age of six weeks one endeavoured to laugh, and both could laugh loudly and lustily before they were three months old.



YOUNG LAUGHING JACKASSES

*From a Photo by the Author.*



time. By their clamorous noise for food the whereabouts of the young is easily ascertained.

In my note-book I find the following recorded:—

9th November, 1870.—Visited a nest, containing three young, in the hole of a tree near Dandenong Creek.

11th October, 1880.—Found an egg fresh upon the ground near Berwick.

13th October, 1885.—Present when a pair of eggs was taken from termites' nest at Coomooboolaroo, Queensland.

1st November, 1890.—Clutch, three eggs, taken at Clayton, Victoria.

6th November, 1892.—Observed nest with young, Murray River.

Jackasses have been observed gathering mussels (*Unio*) at the edge of a creek, and whacking them against a log or limb endeavouring to open them; they will also dive for small cray-fish. Mr. C. H. McLennan tells me he has observed these birds perching on a limb just over the river (Wimmera), and diving into shallow water after yabbies (small crayfish), sometimes going right under.

No doubt the Jackasses only kill snakes for food, because dead ones are occasionally found in their nesting holes. Mr. A. W. Milligan, formerly of Traralgon, Victoria, also proved the fact by taking young Jackasses from a nest in the vicinity of his home and keeping them in a cage. When the old birds found out the captives, they sometimes brought, amongst other tit-bits, snakes, and large ones too, to feed their young.

In reference to Jackasses killing snakes, Mr. H. W. Wheelwright observed a pair that had a disabled carpet snake under an old gum tree. The birds sat on a dead branch above the reptile, every now and again darting down and pecking it, and by their antics and chattering appeared to considerably enjoy themselves at the expense of the snake.

Mr. Thos. R. Macdougall's (Queensland) field observations on "Jackasses v. Snakes," read:—

"On one occasion I saw a Jackass with a black snake about twelve inches or eighteen inches in length. On frightening the bird it dropped the snake, and I carefully examined it and found that it had not been long dead, and was only wounded behind the head. Its neck was broken. I also saw on one occasion a Jackass and green snake that had been killed while on the ground. The snake was coiled tightly around the bird's neck and body, so that it could not rise from the ground."

442.—*DACELO* LEACHII, Vigors and Horsfield.—(61)

## LEACH KINGFISHER.

*Figure*.—Gould: Birds of Australia, fol., vol. ii., pl. 19.

*Reference*.—Cat. Birds Brit. Mus., vol. xvii., p. 206.

*Previous Descriptions of Eggs*.—Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 45 (1882); Campbell: Southern Science Record (1883); North: Austr. Mus. Cat., pl. 6, fig. 2 (1889).

*Geographical Distribution*.—Northern Territory and Queensland.

*Nest*.—A hole in a tree, or a tunnel drilled into a nest of ants or termites, upon the side of a tree.

*Eggs*.—Clutch, three usually; round in shape, sharply contracted at one end; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches of odd examples: (1) 1.9 × 1.45 (2) 1.73 × 1.49; of a proper clutch, (1) 1.88 × 1.5, (2) 1.83 × 1.52, (3) 1.79 × 1.49.

*Observations*.—Although the Laughing Jackass was the first discovered bird of its remarkable genus, and was scientifically called *Dacelo gigas*, the Leach Kingfisher, in Queensland, it is actually larger in all respects, and, being a tropical form, is more highly coloured. The beautiful bluish markings on the wings and upon the back are more pronounced, and are seen to advantage when the bird is flying from tree to tree. While in the male the tail is deep blue, barred and tipped with white, in the female it is brown, conspicuously barred with dark blue.

With regard to the nidification of this fine bird the observations already recorded for the Great Brown Kingfisher are applicable, so similar are the habits of the two species. The breeding months are also the same. However, the conical sounding voices are not. The Great Brown has earned for itself the name of "Laughing" Jackass; but when the Leach bird "laughs" it produces a barking or yelping noise which is exceedingly striking when a person hears it for the first time.

The following interesting fact in the natural economy of Leach Kingfisher indicates a connecting link between the *Dacelo* and the true Kingfisher. The "Bush Naturalist," writing in the "Queenslander," 7th December, 1878, remarks: "I was camped on the banks of the crystal-clear waters of the Gregory River, when all at once one of these birds (Leach Kingfisher) plunged into a deep pool from a branch some thirty feet in height; it went completely under and reappeared with a small fish in its beak."



443.—DACELO LEACHII (sub-species) CERVINA, Gould.—(62)  
*D. occidentalis*, Gould.

#### FAWN-BREASTED KINGFISHER.

*Figure*.—Gould: Birds of Australia, fol., vol. ii., pl. 20.

*Reference*.—Cat. Birds Brit. Mus., vol. xvii., p. 207.

*Previous Description of Eggs*.—Le Souëf: Ibis, p. 392 (1897).

*Geographical Distribution*.—West and North-west Australia, Northern Territory, and North Queensland.

*Nest*.—A hole excavated in termites' mound on a eucalypt, sometimes in holes or hollow spouts of trees—eucalypt, melaleuca, &c.

*Eggs*.—Clutch, two to three; round oval in shape; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches of a clutch: (1) 1.62 × 1.38, (2) 1.58 × 1.4, (3) 1.52 × 1.3.

*Observations*.—The Fawn-breasted Kingfisher is a dweller in the more northern part of the Continent, from the region of the Gascoyne to Cape York Peninsula. It is much smaller in size than either of the other Jackasses, and by some authorities is deemed to be a sub-species only of *Leachii*. The disposition of the Fawn-breasted bird is reported to be more shy and wary than the familiar Jackass of more southern parts.

Gilbert's observations are that it "inhabits well-wooded forests, generally in pairs, is extremely shy, and difficult to procure; it is fond of perching on the topmost dead branch of a tree, whence it can have an uninterrupted view of everything passing around, and where it pours out its loud discordant tones. Sometimes three or four pairs may be heard at one time, when the noise is so great that no other sound can be heard. The natives assert that it breeds in the honey season, which is the months of May, June, and July." From the dates which follow I fear the blackfellows' theory about the laying months must fall to the ground.

The eggs of the Fawn-breasted Kingfisher, first described by my friend Mr. D. Le Souëf, were taken in November, 1896. He says:—"I noticed this bird on two or three occasions in the open forest country near Cooktown, and found two of their nests, each of which contained three eggs. Both nests were hollows scooped out in Termites' nests in eucalyptus trees, one about thirty feet from the ground and the other fifty. The birds themselves were shy, and it is astonishing how quickly they hear anyone approaching the tree where they are sitting on their nest, and they frequently fly off before being seen."

Mr. Harry Barnard took a pair of eggs of this variety from the hollow spout of a swamp gum (*Eucalyptus*) at Pine Creek, Northern Territory. 25th September, 1896, and another pair at Cape York. 9th November, 1896, this time in a paper-bark tree (*Melaleuca*). In both instances the eggs were about a foot from the entrance of the

hole. With regard to Gould's doubtful species *Dacelo occidentalis*, it seems to Dr. Sharpe to be inseparable from *D. cervina*, the under surface, he remarks, being perhaps rather paler and the crossbars more obsolete. In the "Zoological Collections of H.M.S. Alert" (1884), pp. 22-4, Dr. Sharpe gives some interesting critical remarks on a large series of Laughing Jackasses in the British Museum. He says:—"The barring of the tail feathers must be set aside, being merely dependent upon age; but, taking *D. cervina* as the central form or leading type of the Blue-tailed Jackasses of Australia, we find that eastward (in Queensland) it varies to the extent of becoming a larger bird, whiter underneath, and always more or less barred on the under-surface, the throat included (*D. leachii*). In the western part of its range, the bird has a tendency to become uniform underneath (*D. occidentalis*), but this may be due to the bleaching effect of the climate."

444.—HALCYON MACLEAYI, Jardine & Selby.—(66)

FOREST KINGFISHER.

*Figure*.—Gould: Birds of Australia, fol., vol. ii., pl. 24.

*Reference*.—Cat. Birds Brit. Mus., vol. xvii., p. 254.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. i., p. 134 (1865); North: Austn. Mus. Cat., p. 38 (1889).

*Geographical Distribution*.—North-west Australia, Northern Territory, Queensland and New South Wales; also New Guinea.

*Nest*.—A hole in a tree or tree-ants' (termites') nest.

*Eggs*.—Clutch, four to five; round or round oval in shape; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches of a proper clutch: (1) 1.0 × .85, (2) .99 × .84, (3) .99 × .8, (4) .98 × .82.

*Observations*.—I possess pleasant recollections of several pairs of these lovely Kingfishers that used to scream about our camp in a tropical forest near Cardwell. When they sometimes perched on a telegraph line close by we could not sufficiently admire their rich Prussian-blue coats and pure white under-surfaces. The birds are slightly smaller than the common Kingfisher. The male possesses a white collar or ring round the neck, which adornment is absent in the female. I again renewed the acquaintance of the Forest or Macleay Kingfisher in the Richmond River district, New South Wales, but of course it is not so prevalent there as within the tropics. My son Archie, when in the same district, 1897, noticed a nest of this Kingfisher drilled into a clump of stag-horn fern (*P. alveolarae*).

The set of beautiful white eggs in my cabinet was taken from an ant's nest (usually prominent objects) which was situated in the fork of a bloodwood tree (*Eucalyptus*) at Rosencath, the property of the Messrs. Gulliver, Townsville. The eggs were taken 25th October (1885).

These beautiful Kingfishers soon betray the locality of their nests, for on the approach of an intruder the birds scream loudly and fly about in an excited manner.

Usual breeding months. October to February.

#### 445.—HALCYON PYRRHOPYGIUS, Gould.—(64)

##### RED-BACKED KINGFISHER.

*Figure*.—Gould: Birds of Australia, fol., vol. ii., pl. 22.

*Reference*.—Cat. Birds Brit. Mus., vol. xvii., p. 258.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia, Handbook, vol. i., p. 131 (1865); Ramsay: Ibis, vol. ii. (new ser.), p. 327 (1866); Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 45 (1882). Le Souëf: Victorian Naturalist, vol. xvi., p. 70 (1899).

*Geographical Distribution*.—Australia in general.

*Nest*.—Usually a hole in a tree, but sometimes a tunnel drilled into the side of a bank or dam.

*Eggs*.—Clutch, four to five; round in form; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches of a clutch: (1) 1.05 × .87, (2) 1.01 × .83, (3) 1.0 × .85, (4) .98 × .85.

*Observations*.—This Kingfisher is similar in size to the more common Sacred Kingfisher, but white takes the place of buff plumage underneath, while the head is mottled or streaked with white. The otherwise dull bluish-green plumage is relieved by the lower portion of the back and rump being reddish-brown or chestnut, which at once distinguishes this bird from the other Kingfisher, hence the name "Red-backed." The Red-backed Kingfisher is found in the interior of all the States. Although the Sacred or common Kingfisher is found in the interior likewise, it is observed in greater numbers between the ranges and the country bordering the sea, while the Red-backed Kingfisher is exclusively a denizen of the interior and loves to dwell where the myall and the mulga flourish, and where, I believe, it is a stationary species. However during exceedingly dry seasons individuals occasionally reach Victoria. During Christmas, 1897, Mr. A. C. Smart shot a fine Red-backed Kingfisher in the Grampians.

Like the Sacred Kingfisher it lays in holes of trees, but also resorts to laying underground, as the following incidents prove:—In Queensland, Mr. Lau once discovered a Red-backed Kingfisher dead, at the

entrance of a hole in a bank; while in the Darling district, New South Wales, Dr. Ramsay records that his brother took five eggs from the end of a tunnel in the bank of a recently made dam. Eggs have been taken in October and November.

446.—HALCYON SANCTUS, Vigors & Horsfield.—(63)

SACRED KINGFISHER.

*Figure.*—Gould: Birds of Australia, fol., vol. ii., pl. 21.

*Reference.*—Cat. Birds Brit. Mus., vol. xvii., p. 267.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. i., p. 130 (1865); North: Proc. Linn. Soc., N.S. Wales, 2nd ser., vol. ii., p. 441 (1887), also Austn. Mus. Cat., p. 37 (1889); North: Trans. Roy. Soc., South Australia, vol. xxii., p. 134 (1888); Le Souëf: Victorian Naturalist, vol. xvi., p. 71 (1890).

*Geographical Distribution.*—Whole of Australia and Tasmania; also New Guinea and adjacent islands, New Caledonia, Solomon Islands, New Hebrides, Moluccas, Celebes, Lombok, Java, and Sumatra.

*Nest.*—A hole usually drilled into a decayed notch or elbow of a eucalypt or other tree. Occasionally the hole is drilled into the nest of the tree-ants or termites, situated in a fork or on boles of trees. Rarely is a hole tunnelled into a bank.

*Eggs.*—Clutch, four to five; round in form, contracted at one end; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches of a proper clutch: (1) 1.1 × .87, (2) 1.06 × .88, (3) 1.04 × .86, (4) 1.02 × .86.

*Observations.*—In spring and summer we are all familiar with the loud "pee-pec-pec" notes of the Sacred Halcyon or Kingfisher. The bird is well known by its long bill and contracted neck. Its coat, including head and tail, is generally of a greenish-blue. The broad collar round the neck and underneath parts are light buff, and there is a deeper shade on the flanks. A conspicuous line from the nostrils over each eye is also buff. Feet greenish; eyes dark brown. Total length of bird, 8½ inches, including bill 2 inches.

Gould observed in New South Wales the birds appeared in August, and by the middle of September were plentifully dispersed over all parts of the country, and that after the breeding season they began to disappear northward, and by the end of January very few were seen. Some of these birds would therefore seem to retire northward earlier than the usual run of migratory species. My earliest and latest notes for this Kingfisher in the south are respectively 12th September (1894), in Riverina, and 3rd March (1895) at the Dandenongs. However, in the vicinity of Melbourne on one occasion I fancied I heard a Sacred Kingfisher, on migration as early as the 7th September, at night.

Another time I heard the unmistakable notes overhead at Essendon, the night of one 23rd October. The week following I saw a bird perched on a chimney of the dwelling opposite to mine in Armadale. It was early morn, and no doubt the feathered visitor had just arrived from a northern flight. Kingfishers, like other birds, sometimes wander from the beaten track of their fly lines. Mr. Harry Barnard, while collecting near the Great Barrier Reef, Queensland, saw a Sacred Kingfisher alight on the ropes of his craft, evidently much exhausted, then fly to a small sand-bank near, where it remained amongst a number of Terns (*Sterna media*).

During the breeding season these Kingfishers are exceedingly noisy, and readily betray the whereabouts of their nest by uttering at intruders loud screeching cries of "cree-cree-cree." To show how the domains of the Sacred Kingfisher have been encroached upon, I may mention that several times I took eggs from a tree where the Hawksburn Railway Station now stands. The last nest I found was in the Big Scrub, New South Wales. It was in the dead spout of a fallen tree. While standing upon the ground I could look down and just discern five beautiful white eggs, reflecting the light from the entrance.

Mr. Hermann Lau observed in Southern Queensland that the Sacred Halcyon mostly deposited its clutch in the dark-coloured nests of the tree-ants or termites. Iguanas seek like places to repose in, but of course first devouring the eggs or young, for which the birds will fight desperately.

With regard to the New Zealand Halcyon, which is allied to our Halcyons, the late Mr. T. H. Potts has recorded the following interesting note on the contents of a nest:—"October 10th, first egg laid; second egg laid on the 12th, before 10 a.m.; third egg laid on the 14th; fourth egg on the 15th; fifth egg on the 16th; sixth and last egg on the 17th." Mr. Potts also ascertained that incubation lasts about seventeen days, and when about twenty-four days old the young leave the nest well able to fly and follow their parents to the feeding ground.

The New Zealand Halcyon generally breeds underground. I never found one bird so doing, but Mr. G. A. Keartland and Dr. D'Ombraïn tell me they have taken the Sacred Halcyons' eggs from the banks of the River Yarra, notably during the season 1894, while in 1898, Mr. H. E. Hill found two nests of this Kingfisher with eggs, underground, in the Bendigo district. He caught one of the birds in the tunnel.

The Sacred Kingfisher usually breeds during the months of October, November and December, and occasionally later, as Mr. G. E. Shepherd, Somerville, Victoria, once took a clutch of eggs as late as the 4th February (1897). In the north-west the members of the Calvert expedition found it breeding during December and January, in trees in the neighbourhood of the Fitzroy River, where the birds (likewise their eggs) appeared smaller than those of the migrants that usually go south.

## 447.—HALCYON SORDIDUS, Gould.—(65)

## MANGROVE KINGFISHER.

*Figure*.—Gould: Birds of Australia, fol., vol. ii., pl. 23.

*Reference*.—Cat. Birds Brit. Mus., vol. xvii., p. 278.

*Previous Description of Eggs*.—North: Proc. Linn. Soc., N.S. Wales, 2nd ser., vol. vii., p. 395 (1892).

*Geographical Distribution*.—Northern Territory and Queensland; also New Guinea, Louisiade Islands, and Aru Islands.

*Nest*.—A hole tunnelled into the side of termites' nest, or a tree adjacent to mangrove tracts, or a hole in a mangrove tree itself.

*Eggs*.—Clutch, three, probably four occasionally; round oval in shape; texture of shell fine; surface glossy; colour, pure white more or less dulled by nest stains. Excepting for their large size resemble those of the other Halcyons. Dimensions in inches of a pair *et* a clutch of three: (1) 1.3 × 1.0, (2) 1.26 × 1.0.

*Observations*.—Not much is known of this fine northern Kingfisher, which is the largest in size of Australian Halcyons. As its specific name implies, this species is not so gaily dressed as the other Kingfishers, its coat being more sombre or dusky. "Mangrove" Kingfisher appears an acceptable vernacular name for the bird because of its natural disposition to frequent these safe and sloppy retreats by the sea-shore and river's mouth.

Probably the first authenticated set of this rare Kingfisher's eggs was collected by Miss J. A. Fletcher, daughter of Mr. Price Fletcher, the "Bush Naturalist" of Queensland. It is always a pleasure to write up original field notes, more especially those of lady field-naturalists, who are usually few and far between.

Miss Fletcher has thoughtfully favoured me with a pair of eggs and the following memoranda:—"October 20th, 1888. Took three eggs of the Sordid Kingfisher from hole in an ant's nest built on a gum-tree close to the sea beach; the locality is about midway between Wellington Point and Cleveland, Moreton Bay, and is locally known as Ormiston. The eggs are large for the size of the bird, and have not such a clear pearly appearance as the eggs of the Macleay and Azure Kingfishers. In this case the eggs were advanced in incubation."

"October 24th, 1888, near the same locality, saw a Sordid Kingfisher fly out of hole in limb of mangrove-tree, and ascending the tree found three young ones, very little fledged. They were lying on the soft rotten wood." In a little more descriptive language Miss Fletcher continues:—"Oh! what mud I had to go through before I reached that tree! The trunk was high before the branches grew out, and my boots being very muddy and slippery, I had a slight trouble in ascending the tree. However I managed it, and was just able to squeeze

my hand into the hole where I felt three dear little baby Kingfishers ; and how lovely and warm they were ! I did not disturb them, and as I was getting down off the tree I noticed the old bird sitting on a neighbouring mangrove, and I have no doubt she was wishing I would go. But I did not hurry myself, and she, being anxious to see if her little ones were safe, did not wait long, but quickly and joyfully flew back to her treasures."

The next set of Mangrove Kingfisher's eggs we hear of was exhibited and described by Mr. A. J. North before the Linnean Society of New South Wales, 30th November, 1892. The eggs were obtained through the good agency of Mr. J. A. Boyd. The following is Mr. Boyd's own interesting account of the finding: "While on a trip to Hinchinbrook Island I was camped, in the beginning of October, 1892, on a ridge which, intersecting the forest of mangroves, ran down to a salt-water creek about two miles from the sea. On several successive days I had noticed a Kingfisher (*H. sordidus*) settle on a limb of a tree that had fallen into the stream, and stay there some little time picking and pluming herself. As she always came from and returned in the same direction, I concluded that she was building, and on the 6th inst. I traced her to a termites' nest in a blood-wood tree (*Eucalyptus corymbosa*), about thirty feet from the ground, and leaning over the water. The tree was two feet and a-half at the base, and the ant nest—not a large one—projecting only about twenty inches from the limb on which it was placed. I sent my black fellow up, and he brought down three eggs, two of which were slightly incubated, and reported there was no made nest, the eggs being simply laid on the bare substance of the ant-heap at the end of the burrow. I did not notice the male bird near the nest, but heard him calling from a mangrove island about two hundred yards away.

Mr. Boyd informed Mr. North that on the 26th December following he again visited the nest and flushed the Kingfisher from two fresh eggs. Evidently the same bird that was robbed in October had laid again, notwithstanding the termites' mound had been somewhat roughly opened by the blackfellow's tomahawk on the previous occasion.

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#### 448.—TANYSIPTERA SYLVIA, Gould.—(68)

##### WHITE-TAILED KINGFISHER

*Figure*.—Gould: Birds of Australia, fol., supp., pl. 6.

*Reference*.—Cat. Birds Brit. Mus., vol. xvii., p. 300.

*Previous Descriptions of Eggs*.—Diggles: Companion Gould's Handbook, p. (1877); Campbell: Southern Science Record (1885); North: Austn. Mus. Cat., p. 39 (1889); Le Souëf: Ibis, p. 55 (1898).

*Geographical Distribution*.—North Queensland.

*Nest*.—An excavation or tunnel in termites' (white ants') mound, which are usually from one-and-a-half feet to two-and-a-half feet high on the ground, and found in dense scrub. Termites' mounds situated upon trees are also used.

*Eggs*.—Clutch, three to four; round in form; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches of a pair: (1)  $1.1 \times .92$ . (2)  $1.06 \times .93$ ; of a clutch: (1)  $1.0 \times .89$ , (2)  $.99 \times .9$ , (3)  $.97 \times .87$ .

*Observations*.—This most elegant species, sometimes known as the Racket-tail Kingfisher, is by no means scarce in the Cape York Peninsula. Let Gould's own words describe its handsome dress:—"Crown of the head, wings, and five lateral tail feathers on each side, blue; ear-coverts, back of the neck and mantle, black; in the centre of the latter a triangular mark of white; rump and two middle tail feathers pure white; under surface cinnamon-red; bill and feet sealing-wax red." The total length of this feathered beauty is 12 inches, including about 7 inches from the tail, which, however, is variable in length. Its remarkable mode of nidification was first communicated to Gould by an informant who stated that according to the natives this Kingfisher laid its eggs in a hole dug by itself in one of the ant-hills, which form so remarkable a feature in the neighbourhood.

When collecting in the Bloomfield River district in 1893, Mr. D. Le Souëf observed that the beautiful White-tailed Kingfisher always selects the mounds of the white termites or ants to make its nest in. The mounds, as will be seen by the illustration, are of a conical shape and not more than two-and-a-half feet high, and are found in the dense palm scrubs on the coastal ranges. The birds come from northward about the latter end of October, and commence excavating their nests the second week in November. When the nests are finished the white ants carefully cement all the entrances of the mound into the nesting chamber, and when the young birds have left the persevering termites soon fill up the excavation again, consequently old tunnels or nests are seldom found. Mr. Le Souëf further informs me that the birds are by no means shy, and their call is frequently heard in the scrub during breeding season.

Mr. K. Broadbent found the bird prevalent at Gowrie Creek, further south in the Cardwell district, and once found at Dalrymple Gap a nest in which the proper inhabitants of the termitarium were actually running over the four young ones, which in turn were standing amongst the insects. He also observed a nest of this Kingfisher in a mound of termites on Bellenden-Ker Range, at an elevation of 1,800 feet.

Mr. Harry Barnard, when collecting at Cape York for Mr. D. Le Souëf and other Melbourne gentlemen, established quite a "record" for the number of nests he found of this beautiful Kingfisher. In February, 1897, between the 2nd and 16th days, he visited no less than thirty-five nests, as many as a dozen being discovered in one day, all containing three eggs, except in one instance of two. The following is an interesting field note by Mr. Barnard on the subject:—"Silver-





WHITE-TAILED KINGFISHER'S NEST IN ANT HILLOCK.

*From a Photo by D, Le Souéf.*



tailed Kingfishers were found breeding both in trees and on the ground; some of the nests I took were twenty and thirty feet from the ground. They seem to have a certain day to start breeding, as I opened ten nests one day and I did not get an egg; five days later I opened twelve nests and got three fresh eggs out of each nest." Breeding months, November to February. I have given a most interesting illustration by Mr. Le Souëf, showing the mouth of the Kingfisher's tunnel in the white ants' hillock.

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## Sub-order—Coccyges:—Cuckoos, &c.

### FAMILY—CUCULIDÆ: CUCKOOS.

#### SUB-FAMILY—CUCULINÆ.

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449.—*CUCULUS INTERMEDIUS*, Vahl—(377)  
*C. canoroides*, Müller.

#### ORIENTAL CUCKOO.

*Figure*.—Gould: Birds of Australia, fol., vol. iv., pl. 84.

*Reference*.—Cat. Birds Brit. Mus., vol. xix., p. 252.

*Previous Description of Eggs*.—Hume (Oates' ed.): Nests and Eggs Indian Birds, vol. ii., p. 381 (1890).

*Geographical Distribution*.—Queensland; also New Guinea, New Britain, Malay Archipelago, Indian Peninsula, China, Siberia, and Japan.

*Eggs*.—A very perfect elongated oval, a shade narrower at one end. The ground-colour is pure white, with a slight gloss. The markings, which are everywhere very sparse, are somewhat more numerous towards the larger end, and consist of minute specks and tiny lines not more than .05 inch in length, of dingy olive-brown and very pale inky purple or purplish-grey. Dimensions, .89 × .6 inch (Hume).

*Observations*.—The specimens of this fine Cuckoo examined by Gould were from the northern part of Australia, where they were killed during the month of January.

No doubt the bird is only a migrant to Australia from Asiatic regions. It is stated that the black bands on the breast are broader and more defined than in the Common Cuckoo (*C. canorus*) of Europe.

In India one of the foster parents of the Oriental or Asiatic Cuckoo is the Himalayan Streaked Laughing Thrush (*Trochalopteryx lineatum*).

450.—*CUCULUS PALLIDUS*, Latham.—(378)

## PALLID CUCKOO.

*Figure*.—Gould: Birds of Australia, fol., vol. iv., pl. 85.

*Reference*.—Cat. Birds Brit. Mus., vol. xix., p. 261.

*Previous Description of Eggs*.—Ramsay: Proc. Zool. Soc., p. 462 (1865); Campbell: Southern Science Record (1883); also Victorian Naturalist (1897).

*Geographical Distribution*.—Whole of Australia and Tasmania.

*Eggs*.—Inclined to oval in shape; texture of shell fine; surface glossy; colour, delicate fleshy tint, darkest on the apex, and here and there a small reddish or chestnut spot. Dimensions in inches: (1)  $1.4 \times .72$ , (2)  $.97 \times .68$ , (3)  $.93 \times .7$ . (Plate 16.)

*Observations*.—The plumage of the Pallid, sometimes called Unadorned, Cuckoo, is easily described, being in general tone brownish, with the underneath parts light in colour; the long tail is barred with white, the eyes are dark brown and appear large, encircled with a yellow eyelash. The bill is slightly curved, dark, except the base of the lower mandible, which is yellow, the gape and inside of the mouth being also yellowish; feet, olive. Total length, about 12 inches; tail, 6 inches; bill,  $\frac{3}{4}$  inch. In the proper season the Pallid Cuckoo may be either seen, or heard by its melancholy cry, in nearly every part of Australia and Tasmania. It may be considered migratory in its movements; and, according to the kind of season in certain quarters, appears in greater or less numbers. For instance, during the periods of great drought in the interior and Queensland, decidedly more of these birds visit, say, Victoria, or the seaboard country.

In the south, the first Pallid Cuckoo of the season is generally heard about the middle or end of August or the beginning of September. However these would appear, as far as my observations go, to be preceded by silent birds of the same species, which may be seen about the timber or perched on fences or on telegraphic wires about the beginning of August. Why these forerunners should be silent, or whether they are all one sex, has not been ascertained.

The first Pallid Cuckoo's egg is deposited in the selected foster-parent bird's nest about the middle or towards the end of September. October and November constitute the chief laying time, while a few birds lay during the beginning of December. When summer is ended, or about the end of March, all the Pallid Cuckoos—old and their young—retire northward.

Whether the Pallid Cuckoo lays more than one egg (it probably does) is not definitely settled, but its single and beautiful flesh-coloured egg is found in various insectivorous or semi-insectivorous birds' nests in Queensland, as well as the southern provinces, including Tasmania.

Among the foster parents, Gould mentions the various *Ptilotes* and *Melithrepti* (Honeyeaters), but we possess no data to show that he should have included the *Maluri* (Wrens) and *Acanthiza* ( Tits) for this particular Cuckoo.

The following is an enumeration of the foster-parents of the Pallid Cuckoo, as far as are known at present, namely:—

VERNACULAR NAME.	SCIENTIFIC NAME.	BY WHOM FIRST RECORDED OR REPORTED.
Yellow-eared Honeyeater ..	<i>Ptilotis lewini</i> .. ..	A. J. North.
White-plumed .. ..	<i>P. penicillata</i> .. ..	A. J. C.
Yellow-tufted .. ..	<i>P. auricomis</i> .. ..	Dr Ramsay.
Yellow-faced .. ..	<i>P. chrysops</i> .. ..	"
Fuscous .. ..	<i>P. fusca</i> .. ..	"
Yellow-throated .. ..	<i>P. flavigularis</i> .. ..	A. E. Brent, Tas.
White-eared .. ..	<i>P. leucotis</i> .. ..	C. French, jun
White-naped .. ..	<i>Melithreptus lunulatus</i>	Dr. Ramsay
Brown-headed .. ..	<i>M. brevirostris</i> .. ..	G. E. Shepherd
Black-headed .. ..	<i>M. melanocephalus</i> .. ..	A. E. Brent, Tas.
Strong-billed .. ..	<i>M. validirostris</i> .. ..	"
Wattle-Bird .. ..	<i>Acanthochaera carunculata</i>	L. Palmer
Brush Wattle Bird .. ..	<i>A. mellivora</i> .. ..	A. J. C.
Spinebill .. ..	<i>Acanthorhynchus tenuirostris</i>	A. J. C.
Friar Bird .. ..	<i>Philemon corniculatus</i> .. ..	Messrs Barnard, Q.
Miner .. ..	<i>Myzantha garrula</i> .. ..	A. J. C.
Brown Honeyeater .. ..	<i>Glycyphila ocellaris</i> .. ..	Messrs. Barnard, Q.
New Holland Honeyeater ..	<i>Meliornis novæ hollandiæ</i>	G. E. Shepherd
Hooded Robin .. ..	<i>Petræca bicolor</i> .. ..	J. T. Gillespie
Dusky .. ..	<i>P. vittata</i> .. ..	F. H. Reed
Yellow-breasted Shrike Robin	<i>Eopsaltria australis</i> .. ..	Robt. Hall
Oriole .. ..	<i>Oriolus viridis</i> .. ..	A. J. C.
Rufous-breasted Thickhead..	<i>Pachycephala rufiventris</i> ..	Messrs. Brittlebank
White-throated .. ..	<i>P. gutturalis</i> .. ..	"
Black and White Fantail ..	<i>Rhipidura tricolor</i> .. ..	"
Brown Flycatcher .. ..	<i>Micræca fascians</i> .. ..	H. Lau, Q. (Oct., 1868)
Leadon Flycatcher .. ..	<i>Myiagra rubecula</i> .. ..	G. E. Shepherd
Wood Swallow .. ..	<i>Artamus sordidus</i> .. ..	J. T. Gillespie
White-browed Wood-Swallow .. ..	<i>A. superciliosus</i> .. ..	A. Campbell, jun.
Masked Wood Swallow .. ..	<i>A. personatus</i> .. ..	G. E. Shepherd
White-rumped Wood Swallow .. ..	<i>A. leucogaster</i> .. ..	Messrs. Barnard, Q.
Grey Shrike Thrush .. ..	<i>Collyriocinclæ harmonica</i> ..	Messrs. Brittlebank
Magpie Lark .. ..	<i>Grallina picata</i> .. ..	J. Sommers
White-shouldered Caterpillar Catcher .. ..	<i>Lalage tricolor</i> .. ..	G. E. Shepherd and A. J. C.
White-fronted Chat .. ..	<i>Ephthianura albifrons</i> ..	W. White.

It will appear from the foregoing list of foster-parents of the Pallid Cuckoo that the Honeyeaters are the most favoured tribe, but in every case birds that construct an open nest are selected.

To the list must be added the introduced birds, the Greenfinch (*Ligurinus chloris*), and Blackbird (*Turdus merula*), for Mr. Charles French, jun., writes me:—"An egg of the Pallid Cuckoo was taken in the nest of the Greenfinch, at Albert Park (near Melbourne) on the 24th November, 1894. I also found an egg of the Pallid Cuckoo some time ago in the nest of the English Blackbird, in the same park." I had heard previously of the Greenfinch being a foster-parent, which is remarkable, seeing that the Finch is a seed-eater, or nearly so. However, although the egg is deposited in the Finch's nest, we have no evidence that it rears the young Cuckoo.

Among Mr. J. T. Gillespie's Cuckoo notes for 1893, a season when these birds were plentiful, are the following relating to the Pallid Cuckoo:—

"28th October, at Springvale.—Single egg of Pallid Cuckoo in nest of Wood Swallow (*Artamus sordidus*). Saw birds previously building their nest, which was afterwards apparently deserted.

"9th November, at Dandenong Creek.—Nest of Lunulated Honey-eater (*Melithreptus lunulatus*), containing two eggs and an egg of the Pallid Cuckoo.

"11th November, at Springvale.—From Hooded Robin's (*Petraca bicolor*) nest (found building the previous week) took egg of Pallid Cuckoo.

"25th November, at Springvale.—In White-plumed Honeyeater's (*Ptilotis penicillata*), one egg and an egg of Pallid Cuckoo.

"3rd December.—Took Pallid's egg from nest of Greenfinch (introduced bird). Finch afterwards laid four eggs."

At a meeting of the Royal Society of Victoria, held November, 1894, I read the following note on the occurrence of the egg of the Pallid Cuckoo in the nest of the Magpie Lark (*Grallina*):—

"My friend, Mr. John Sommers, of Cheltenham, presented me with a nest taken in the locality, on the 24th September, 1894, containing a set of five eggs of the *Grallina*, together with an egg of the Pallid Cuckoo (*C. pallidus*). This is the first instance, as far as I am aware, of an egg of this Cuckoo having been found in the nest of a *Grallina*."

In the Cuckoo's egg incubation was further advanced than in the other eggs.

Occasionally two Cuckoos' eggs are found in the same nest. Here is one of Mr. Charles French, jun.'s notes, thoughtfully sent to me:—  
 "White-throated Thickhead's (*Pachycephala gutturalis*) nest, containing one fresh egg of Thickhead and two fresh eggs of Pallid Cuckoo. Locality, Dandenong Ranges. 9th September, 1895."

Usually it seems that the Cuckoo's egg is the first deposited in the nest, and not unfrequently before the completion of the nest, as the finding of a Pallid Cuckoo's egg underneath the warm lining of a White-naped Honeyeater's nest attests. Once Mr. G. E. Shepherd found the egg of the Pallid Cuckoo sticking through the bottom of a White-plumed Honeyeater's nest, the egg being plainly visible from the ground.

The fact that the Cuckoo, after laying its egg, carries it in its mouth till deposited in the nest of a foster-bird, is now practically admitted. Here is a proof:—The late Mr. H. A. Smith, of Batesford, near Geelong, informed me that on one occasion he shot a Pallid Cuckoo, and removed from the back of its throat or gape, an egg, which was fractured by the bird's fall. Evidently the unfortunate bird had laid the egg, and was in the act of conveying it to some suitable nest.

It is probable that the Pallid Cuckoo lays its egg first upon the ground, and possibly early in the morning, because that is the time generally when these birds have been flushed from the ground. In his daylight rambles, Mr. Shepherd has frequently disturbed on the ground a Cuckoo with suspicious movements.

Mr. W. A. Milligan furnished me with the somewhat remarkable note, that in Gippsland he had observed an adult Pallid Cuckoo feeding a young bird of its own kind. Mr. Milligan noticed no other birds about at the time. Miss Ada Fletcher, Tasmania, writing to *The Australasian*, 30th May, 1896, states:—"I myself have seen a full-grown Pallid Cuckoo feeding a young one of the same species. The young one, when flushed, flew feebly, and I judged it had only recently left the foster-parents' nest." These notes suggest interesting questions. Do Cuckoos sometimes assist the foster-parents in feeding the young? or had these particular youngsters lost their foster-parents?

I am inclined to believe that many birds, by instinct, feed young Cuckoos, whether they be the rightful foster-parents or not. Only last season Master B. E. Bardwell watched a young Cuckoo, probably a Pallid or else a Fan-tailed, being fed by a Scarlet Robin (*P. leggii*) and then, immediately, by a Spine-billed Honeyeater. The little Honeyeater appeared not only to put its long bill, but head also, well into the mouth of the youthful Cuckoo. It is hardly likely that the Spinebill was trying to retrieve for itself the bait placed by the Robin in the throat of the Cuckoo.

With reference to the two last statements, namely, that young Cuckoos are sometimes fed by old Cuckoos, as well as by birds other than the proper foster-parents, we have further proof in the published remarks of Dr. Ramsay, in New South Wales.

Following the same plan as in the case of the Bronze Cuckoos, the Messrs. Ramsay succeeded in procuring two young Pallid Cuckoos from eggs which they (Ramsays) had left in the nest of the Yellow-tufted Honeyeater (*P. auricomis*), and thus first established the parentage of the strange eggs.

The Cuckoo's egg is hatched about the twelfth or fourteenth day, when the young Cuckoo—a little, fat, helpless creature—is scarcely larger than its foster brethren. However, growing rapidly, it soon fills up the greater part of the nest, and its unfortunate companions, either smothered by its weight or starved to death through its greediness, are thrown out by their parents.

Dr. Ramsay proceeds to say:—

"On the 30th October last (1864), we found two unhappy young birds, which had been hatched in company with a Cuckoo in a nest of *Ptilotis auricomis*, tossed out and lying upon the ground just under the nest. These were, of course, quite dead, and appeared to have been about three or four days old.

"During the months of October and November, it is no uncommon sight to see the smaller birds feeding the young of Cuckoos. Even the little *Acanthizæ*, which I believe are never the foster-parents, at least of the Pallid Cuckoo, join in supplying the wants which are easily made known by their continued peevish cry, stopping only when being fed, or when their appetites are appeased.

"While walking towards home through a half-cleared paddock, I was not a little surprised, upon hearing the cries of a young Cuckoo, to see a pair of adult birds of the same species, *C. pallidus*, flying after it, settling beside it, and apparently paying it great attention. Several

times they flew away, but returned to it again, and, from their actions, I feel convinced that they were feeding it, although, much to my regret, I was unable to obtain a view sufficiently close to make sure of the fact."

I may mention, in reference to the throwing-out business, some persons suppose that the Cuckoo throws out an egg or eggs of the foster-parent to make room for its own. This has not been proved with regard to the Pallid Cuckoo—indeed, it has been disproved by the fact that the Cuckoo's egg is frequently deposited first, or even before the nest is completed, and that full clutches of the foster-bird's have been taken together with the Cuckoo's egg. On the other hand, it is probable that some of the foster-birds throw out Cuckoos' eggs. When taking a White-shouldered Caterpillar Catcher's (*Lalage tricolor*) nest at Somerville, with Mr. Shepherd, we found a broken egg of the Pallid Cuckoo underneath upon the ground—circumstantial evidence, I think, that the egg had been deposited by the Cuckoo in the Caterpillar Catcher's nest, but Mr. Shepherd has seen a Caterpillar Catcher feeding a young Pallid Cuckoo.

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451.—CACOMANTIS FLABELLIFORMIS, Latham.—(379)

FAN-TAILED CUCKOO.

*Figure*.—Gould: Birds of Australia, fol., vol. iv., pl. 86.

*Reference*.—Cat. Birds Brit. Mus., vol. xix., p. 266.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. i., p. 619 (1865); Ramsay: Proc. Zool. Soc., p. 359 (1865); Campbell: Nests and Eggs Austr. Birds, pl. 2, fig. 379 (1883), also Victorian Naturalist (1897); Lucas: Victorian Naturalist (1884); North: Austr. Mus. Cat., pl. 13, fig. 7 (1889).

*Geographical Distribution*.—Whole of Australia and Tasmania.

*Eggs*.—Stout oval in shape; texture of shell fine; surface glossy; colour, dull white, very minutely freckled with chestnut and purplish-brown, and with a distinct band of the same character of markings round the upper quarter. Dimensions in inches: (1)  $\cdot 86 \times \cdot 56$ , (2)  $\cdot 85 \times \cdot 62$ . (Plate 17.) Two eggs from the scrub of the Richmond River (N.S.W.) are pearly white, more blotched, with umber and light purple: (1)  $\cdot 81 \times \cdot 6$ , (2)  $\cdot 8 \times \cdot 58$ .

*Observations*.—The Fan-tailed or Ash-coloured Cuckoo is similar in figure to the Pallid, but smaller in size. It possesses a dark grey or slate-coloured coat, with the underneath parts brownish, especially about the chest. Tail irregularly barred with white. Bill black, except the base of the lower mandible, which is orange. Eyes dark brown, surrounded by beautiful eyelashes of citron-yellow; feet light olive.



Total length, about 10 inches. The Fan-tailed Cuckoo, like the Pallid Cuckoo, enjoys a range over Australia and Tasmania, arriving at and departing from its southern limits about the same time the latter bird does. However, a few stragglers of the Fan-tailed species remain to winter in Victoria, as some of my notes attest. Individuals have also been observed in Tasmania during winter.

From about the end of September to the beginning of December includes the laying season of the Fan-tailed Cuckoo.\* The eggs are almost invariably deposited in domed or covered-in nests of certain insectivorous birds. But there are a few notable exceptions (four instances) of open nests having been selected.

Here follows a list of foster-parents of the Fan-tailed Cuckoo known up to the present, namely:—

VERNACULAR NAME.	SCIENTIFIC NAME	BY WHOM FIRST RECORDED OR REPORTED.
Rock Warbler .. ..	<i>Origma rubricata</i> .. ..	A. J. North
Brown-rumped Tit .. ..	<i>Acanthiza diemenensis</i> .. ..	Rev. H. T. Hull
Brown .. ..	<i>A. pusilla</i> .. ..	Dr. E. P. Ramsay
Striated .. ..	<i>A. lineata</i> .. ..	"
Little .. ..	<i>A. nana</i> .. ..	"
(?) Buff-rumped .. ..	<i>A. reguloides</i> .. ..	"
Scrub-Tit .. ..	<i>Acanthornis magna</i> .. ..	A. E. Brent
Long-tailed Wren .. ..	<i>Malurus gouldi</i> .. ..	A. J. C.
Blue .. ..	<i>M. cyaneus</i> .. ..	Dr. E. P. Ramsay
Variegated .. ..	<i>M. lamberti</i> .. ..	"
Brown Scrub Wren .. ..	<i>Sericornis humilis</i> .. ..	A. J. C.
White-browed Scrub Wren .. ..	<i>S. frontalis</i> .. ..	T Brittlebank
Large-billed Scrub Wren .. ..	<i>S. magnirostris</i> .. ..	A. J. C.
Little Field Wren .. ..	<i>Chthonicola sagittata</i> .. ..	Dr. E. P. Ramsay
White-eared Honeyeater .. ..	<i>Ptilotis leucotis</i> .. ..	C. French, jun.
Black-capped .. ..	<i>Melithreptus melanocephalus</i> .. ..	A. E. Brent
Wood Swallow .. ..	<i>Artamus sordidus</i> .. ..	" (Nov., '96)
Dusky Robin .. ..	<i>Petroeca vittata</i> .. ..	"

We are indebted to Dr. Ramsay for much original information in reference to our Cuckoos. He patiently watched their eggs in various nests, thus enabling him to identify the species when hatched. The result of his labours, together with coloured plates of four of the most familiar eggs, may be found embodied in the "Proceedings of the Zoological Society" (London), 1865 and 1869, from which I quote at length:—

"Among those species, the nests of which are favoured by visits from this 'parasite,' is *Acanthiza pusilla*, from a nest of which, in September, 1863, we took no less than four eggs—two laid by the rightful owner of the nest, and the other two by Cuckoos. One of these was a very fine specimen of *Chalcites basilis*,† the other an egg of the present species, *Cacomantis flabelliformis*. The entrance to this nest was greatly enlarged, being in width fully two inches, and the hood which usually conceals the entrance (which is near the top of the nest,

\* It is stated that an egg of this Cuckoo has been taken as early as the first week in August, from a Brown Tit's nest, in the vicinity of Sydney.

† Probably *plagusus* is intended.—A. J. C.

and not generally wider than one inch across) was pushed back to such an extent that the eggs were rendered quite visible.

"I have now before me ten nests of the *Acanthiza* and four of *Maluri*; the former comprising *Acanthiza lineata*, *A. nana*, *A. pusilla*, and what at present I believe to be that of *A. reguloides*; the latter, *Malurus cyaneus* and *M. lamberti*.

"Now, having compared the greatly enlarged entrances of those nests from which we have taken Cuckoos' eggs with the entrances of those which did not contain the egg of a Cuckoo, and which we took as soon as the bird had laid its full number of eggs for a sitting, I cannot but feel convinced more than ever that the eggs of these parasites are laid in the nests and not deposited in any other manner.

"The average width of the entrances of the nests of *Acanthiza lineata*, which have not been visited by a Cuckoo, is one inch, while those which have contained Cuckoos' eggs vary from two to two-and-a-half inches. In addition to the nests of *Acanthiza pusilla*, we have known this Cuckoo (*C. flabelliformis*) deposit its eggs in the nest of *A. reguloides* (?) and *Chthonicola sagittata*."

However valuable are Dr. Ramsay's other notes, I must, in the interests of research, combat his idea that the eggs of Cuckoos are laid in the nests, and not deposited in any other manner. How can the Fan-tailed Cuckoo, a bird about ten inches long, including a tail five inches, enter the small covered or dome-shaped nest of, say, a Tit (*Acanthiza*), the longest exterior diameter of which is only four-and-a-half inches? The side entrance, that hardly admits of one's finger, may be enlarged by the Cuckoo thrusting its head in.

In my published remarks, read before the Field Naturalists' Club of Victoria, 1883, on our Cuckoos, I ventured the opinion that our Cuckoos (particularizing four species), after laying their eggs somewhere, convey them in their bills to the nest of the chosen foster-parent. Since then I noticed an interesting article on "The Architectural Tastes of Birds," by M. Oustalet, of France, in which is stated:—

"The Cuckoo watches the moment when the mother quits the nest, then laying its egg, seizes it by its mandibles, passes it into the throat with the agility of a conjuror, and flies to deposit it delicately in the stranger's nest."

We also have the statement of another eminent ornithologist, Dr. Sharpe, of the British Museum, who says:—

"The fact of the Cuckoo carrying her egg in her bill, to deposit it in the nest of her victim, is now generally admitted."

If such be possible with the European Cuckoo, why not with our Australian species also? The following note received from Mr. Wm. P. Best, Branxholme, Victoria, is, I think, conclusive evidence on the subject as far as this species is concerned:—

"In the season of 1888, I shot a Fan-tailed Cuckoo. It was almost the first bird I had seen or heard in the season. On dissection it proved a specially interesting specimen, as in its ovary I found a nearly perfect egg, and in its gizzard another egg, which, though much broken, was evidently an egg of the same species, probably of the same bird. The season was a late one, and the conclusion I drew was, that the

bird had carried the egg about for a considerable time, and, being unable to find a suitable nest, had simply swallowed it."

By permission, I quote the following notes from the diary of the Rev. H. T. Hull, Tasmania:—

"6th October, 1877.—Found nest of *Acanthiza diemenensis*, with egg of *Cacomantis flabelliformis*. The three eggs of *Acanthiza* were all dented, as if the larger egg had been roughly deposited on the top of them."

"15th November.—Found nest of *Acanthiza diemenensis*, two eggs broken, with young far advanced, but dead; fresh egg of Cuckoo (*flabelliformis*)."

During my own visit to Tasmania, October, 1883, the overseer at Ridgeside brought under my notice a nest of the Tasmanian Tit (*Acanthiza*), in a gorse hedge, from which he had just abstracted the egg of the Fan-tailed Cuckoo. The building of the nest had apparently just been completed, and was used first by the Cuckoo. And, strange to relate, although the entrance of the nest was enlarged by the overseer to abstract the Cuckoo's egg, the enlargement did not offend the little Tit, because three days afterwards she laid her first egg, and my subsequent visits to the nest proved that she finished her complement.

Another note I made on the mainland during an excursion of the Field Naturalists' Club, reads thus:—"15.10.92—Wandong.—Egg of Fan-tailed Cuckoo in Tit's (*Acanthiza*) nest, with one egg of the Tit. Eggs could be seen from outside. Evidently the entrance had been somewhat enlarged, possibly by the head of the Cuckoo, when depositing the egg."

The following letter appeared in the *Victorian Naturalist*, December, 1891, above the name of C. French, jun.:—

"A friend of mine, living near Oakleigh, informs me that one day, when out collecting, he came across a nest of the White-eared Honeyeater (*P. leucotis*), ready for eggs, and on visiting the same nest the following day, it contained an egg of the Pallid Cuckoo (*C. pallidus*), which he left, thinking the Honeyeater would lay shortly; but on his return the third day, he found that the egg of the Pallid Cuckoo had been thrown out of the nest by the Fan-tailed Cuckoo (*C. flabelliformis*), and she had laid an egg in the nest. The Honeyeater deserted the nest. This is the second time my friend has noticed this same proceeding."

This is an exceedingly interesting note, for rarely does the Fan-tailed Cuckoo deposit its egg in an open nest. However, three other instances were observed by Mr. A. E. Brent, Tasmania, where the Fan-tailed Cuckoo is particularly partial to the covered nests of the Scrub Wren (*S. humilis*). They occurred respectively in the open nests of the Black-capped Honeyeater (*M. melanocephalus*), the Dusky Robin (*P. vittata*), and the Wood Swallow (*A. sordidus*).

In Tasmania, a fresh egg of the Fan-tailed Cuckoo was found deposited on a bare stump. Doubtless it had been laid there by the bird, which was probably disturbed before it could convey it away to some suitable nest.

This Cuckoo, as shown in Dr. Ramsay's statement, has been known to deposit its egg in a nest containing other species of Cuckoos' eggs. Here is a couplet from Mr. Brent's Tasmanian field notes, which he kindly furnished me with:—"I had the exceptionally good fortune to find a nest of our little Browntail (*Acanthiza*), containing two eggs of the parent bird, together with one egg each of the Fan-tailed, Bronze, and Narrow-billed Bronze Cuckoos—a nice lot, and all fresh."

"In December last (1895) we came across a nest of the little Browntail, in some short bushes, containing two eggs of the *Acanthiza* and one of the Bronze Cuckoo. Having nothing to carry them home in, we left them for three days, and upon returning for them we found the nest contained only one *Acanthiza*'s egg, one Bronze Cuckoo's, and also one Fan-tailed Cuckoo's; the other shell of the *Acanthiza*'s egg we picked up just outside of the nest."

Since compiling my list of foster-parents for the Fan-tailed Cuckoo, Mr. C. C. Brittlebank informs me he noticed a fully-fledged young one swelling out the open nest of a Rufous-breasted Thickhead, and that he saw a Yellow-rumped Tit (*Acanthiza*) and Yellow-faced Honeyeater (*P. chrysops*), both feeding a young Cuckoo.

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452.—*CUCOMANTIS VARIOLOSUS*, Horsfield.—(380)

*C. insperatus*, Gould.

*C. dumetorum*, Gould.

SQUARE-TAILED CUCKOO.

*Figure*.—Gould: Birds of Australia, fol., vol. iv., pl. 87.

*Reference*.—Cat. Birds Brit. Mus., vol. xix., p. 272.

*Previous Descriptions of Eggs*.—Hurst: Proc. Linn. Soc., N.S. Wales, vol. iii., 2nd ser., p. 421 (1888); North: Rec. Austr. Mus. vol. ii., p. 16 (1892); Campbell: Victorian Naturalist (1898).

*Geographical Distribution*.—Australia in general; also Timor and Molucca Islands.

*Eggs*.—Stout oval in shape; texture of shell fine; surface glossy; colour, dull or pearly-white, with a band of blotched and spotted markings of amber and purplish-grey round the upper quarter. Altogether the egg is suggestive of those of the *Myiagra* type of Flycatchers. Dimensions: (1)  $\cdot 75 \times \cdot 6$ , (2)  $\cdot 72 \times \cdot 57$ , (3)  $\cdot 71 \times \cdot 54$ . (Plate 17.)

*Observations*.—There has been some little confusion about the identity of the Square-tailed Cuckoo (*Cuculus variolosus*, Horsf.) It now appears that both Gould's *C. insperatus* and *C. dumetorum* are none other than the original *C. variolosus* of Dr. Horsfield, therefore the bird, in the season, ranges over Australia, thinning out in numbers as the southern seaboard is approached.

At first sight, this Cuckoo may be easily mistaken for the familiar Fan-tailed Cuckoo (*C. flabelliformis*), but differs from that bird by its decidedly smaller size and more square-shaped tail, which is also destitute of the white markings on the outer webs of the feathers.

The Square-tailed, or, as it has been more commonly called, the Brush Cuckoo, may also be recognised by its peculiar song—a few melancholy, jerky notes, ending abruptly, as if the strain were suddenly interrupted, or the songster had received some kind of a shock, in the middle of its song.

Dr. T. P. Lucas was the first collector who discovered this strange Cuckoo's egg, which he took when in company with his brother Mr. A. H. S. Lucas, from the nest of the White-shafted Fantail, near Box Hill, Victoria, New Year's Day, 1884. But Dr. Lucas, unfortunately, discounted his discovery by describing the strange egg as that of the Black-eared Cuckoo (*Miscocallius palliolatus*), see "Victorian Naturalist," February, 1884.

In the P.L.S., N.S.W., 1888 (vol. iii., 2nd series, p. 421) Dr. G. Hurst drew attention to, and described, a similar strange egg he had found on the 22nd December, 1887, in a nest of the Blue Wren (*Malurus cyaneus*), and attributed to the Brush or Square-tailed Cuckoo. At the same time he mentioned that a friend—Mr. Waterhouse—had on three occasions taken similar eggs from the nest of the White-shafted Fantail. In the "Records of the Australian Museum," Mr. A. J. North states that Dr. Hurst had again found other eggs in the nests of the White-shafted Fantail, notably in the month of December; while another Sydney collector, Mr. S. W. Moore, M.L.A., also found the same species of Cuckoo's eggs in the nest of the Yellow-faced Honeyeater (*P. chrysops*). Mr. North proceeds to remark:—"All these Cuckoo's eggs were obtained within a radius of ten miles of Sydney, and it is a matter of regret that the opportunity was not taken of placing them in nests, convenient for observation, and hatching the young out, as was done by Dr. Ramsay and his brothers, at Dobroyde, with the eggs of *C. pallidus*, *C. flabelliformis*, *L. plagosus*, and *L. basalis*, so as to conclusively determine to which species they belong; but there can be no doubt Dr. Hurst was right in ascribing the eggs obtained by him and his friends to *C. insperatus* (i.e., *variolosus*), as it is the only other species of Cuckoo, found near Sydney, the eggs of which we were, until then, unacquainted with."

However, Mr. Dudley Le Souëf, with the assistance of his friend Mr. R. Hislop, knocked the nail on the head by settling the parentage of these strange eggs beyond doubt. During his trip to the Cooktown district (Queensland), on the 17th November, 1896, he found one in the nest of the Dusky or Brown-backed Honeyeater (*Glycyphila modesta*). Mr. Hislop afterwards found another nest of the Honeyeater containing the Cuckoo's egg, which was "shepherded" till the young parasite was hatched and just able to fly. The interesting youngster was sent (dead, of course) to Mr. Le Souëf, who in turn referred it to the Australian Museum, the verdict being that it was the young of the *C. variolosus*.

When in New South Wales, recently, I had the pleasure of examining some of these new eggs in the collection of Mr. S. W. Moore, at Homebush; in fact, he kindly presented me with one, together with the pair of White-shafted Fantail's taken from the same nest. Mr. Moore found, or was present at the finding of, the following nests containing eggs of the Square-tailed Cuckoo:—At Haslem's Creek, about ten miles from Sydney, Yellow-faced Honeyeater, date, 4th December, 1891; at Eastwood, thirteen miles from Sydney, White-shafted Fantail (two nests), date 26th December, 1891; ditto 9th December, 1893; ditto 16th December, 1893.

Further interesting finds were made in Victorian forests. During October, 1897, Mr. G. E. Shepherd found the Cuckoo's egg with two eggs of the Scarlet-breasted Robin, and Mr. J. Gabriel took another, together with a pretty set of the Rose-breasted Robin's, in December last year (1897).

My son Archie has handed me the following note:—"31st December, 1896.—Observed a pair of Scarlet Robins feeding a fully-fledged Brush Cuckoo, which was perched on the naked branch of a tree, near Bayswater. Both male and female Robins were tending it. After darting to deposit food in the Cuckoo's mouth, the little Robins would, alternately, always sit on the branch, a foot or two away, for several seconds, as if seriously contemplating the importance of their charge, before flying off again."

Mr. Shepherd has observed, on the Mornington Peninsula, that the Square-tailed Cuckoo is decidedly rare and shy, and seems partial to secluded spots. In this last respect it resembles the Fan-tailed Cuckoo.

List, to date, of the known foster-parents of the Square-tailed Cuckoo:—

VERNACULAR NAME.	SCIENTIFIC NAME.	BY WHOM FIRST RECORDED OR REPORTED.
Blue Wren .. .. .	Malurus cyaneus ..	Dr. G. Hurst
Brown Flycatcher .. ..	Microeca fascians ..	Kearland—Ryan
White-shafted Fantail .. ..	Rhipidura albiscapa ..	Hurst—Waterhouse
Yellow-faced Honeyeater .. ..	Ptilotis chrysopt ..	North—Moore
Brown-backed Honeyeater .. ..	Glycyphila modesta ..	D. Le Souëf
Shrike Tit .. .. .	Falcunculus frontatus ..	G. A. Kearland
Scarlet-breasted Robin .. ..	Petroeca leggii ..	G. E. Shepherd
Rose-breasted Robin .. ..	P. rosea ..	J. Gabriel

### 453.—CACOMANTIS CASTANEIVENTRIS, Gould.

#### CHESTNUT-BREASTED CUCKOO.

*Figure.*—Gould: Birds of Australia, fol., supp., pl. 55.

*Reference.*—Cat. Birds Brit. Mus., vol. xix., p. 274.

*Geographical Distribution.*—Northern Territory (probably) and North Queensland; also New Guinea and Aru Islands.

*Eggs.*—Undescribed.\*

*Observations.*—This fine Cuckoo of northern forests is most nearly allied to the familiar Fan-tailed Cuckoo (*C. flabelliformis*), but differs in its smaller size, and in the uniform rich chestnut colouring of its under-surface, from which it derives its distinctive name, Chestnut-breasted.

Referring to the Chestnut-breasted Cuckoo, and writing to the "Ibis," p. 362 (1899), Mr. D. Le Souëf states: "This bird I saw on many occasions on the Bloomfield River, near Cooktown, and often heard it uttering its mournful note during the night. I have also noticed it flying among the bushes, evidently hunting for nests. I never saw or heard the Fan-tailed Cuckoo (*C. flabelliformis*) in the district. Mr. R. Hislop has sent me a clutch of eggs of *Sericornis magnirostris*, in which was deposited the egg of a Cuckoo, which I have little doubt was laid by *C. castaneiventris*."

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454.—*MISCOCALIUS PALLIOLATUS*, Latham.—(382)  
*M. osculans*, Gould.

### BLACK-EARED CUCKOO.

*Figure.*—Gould: Birds of Australia, fol., vol. iv., pl. 88.

*Reference.*—Cat. Birds Brit. Mus., vol. xix., p. 279.

*Previous Descriptions of Eggs.*—North: Report Horn Scientific Expedition, Aves, p. 65 (1896); Campbell: Victorian Naturalist (1898).

*Geographical Distribution.*—Australia in general; also Aru, Ké, and Batchian Islands.

*Eggs.*—Long oval in shape; texture of shell fine; surface glossy; colour, nearly a uniform shade of reddish-chocolate. Dimensions: (1)  $\cdot 87 \times \cdot 57$ , (2)  $\cdot 8 \times \cdot 69$ , (3)  $\cdot 88 \times \cdot 63$ .

*Observations.*—The Black-eared Cuckoo is a larger and more robust bird than any of the Bronze Cuckoos, and also differs from them in colouration.

Gould himself shot two in New South Wales, 1839, received one from Gilbert, who obtained it in Western Australia, and two from other collectors.

\* A supposed egg, provisionally described by Mr. D. Le Souëf, is: "Colour, white, with minute freckles of a brownish tint rather sparsely scattered over the egg, forming a light zone at the larger end. It is nearly oval in shape, and measures  $\cdot 82 \times \cdot 58$  inches."

As Gilbert observes, the Black-eared Cuckoo is very shy, and is usually met with in the interior of the provinces. It utters a feeble, lengthened, and somewhat plaintive note, at long intervals. It flies slowly and heavily, and for short distances at a time.

The only one I happened to notice in a state of nature was an early bird, seen "sneaking" about a native pine scrub, near Echuca, Victoria, 28th July, 1894.

On circumstantial evidence, there is no doubt that the egg received from Central Australia, by Mr. G. A. Keartland, and described by Mr. A. J. North, is referable to the Black-eared Cuckoo. Mr. C. E. Cowle was instrumental in securing this type-egg, which was found with a clutch of Tit's (*Acanthiza*). I believe a similar egg has since been found in the nest of the Red Throat (*Pyrhholæmus*), while Mr. James Kershaw exhibited at the Field Naturalists' Club, on the 13th June, 1898, an egg taken in the Wimmera district from the nest of the White Face (*Xerophila*).

#### 455.—CHALCOCOCCYX BASALIS, Horsfield.—(385)

##### NARROW-BILLED BRONZE CUCKOO.

*Figure*.—Gould: Birds of Australia, fol., vol. iv., pl. 89, lower figure.

*Reference*.—Cat. Birds Brit. Mus., vol. xix., p. 294.

*Previous Descriptions of Eggs*.—Ramsay: Proc. Zool. Soc., p. 359 (1869); Campbell: Southern Science Record (1883); North: Austr. Mus. Cat., p. 247, pl. 13, fig. 13 (1889); Campbell: Victorian Naturalist (1898).

*Geographical Distribution*.—Whole of Australia and Tasmania; also Aru Islands, Timor, Flores, Lombock, Java and Malacca.

*Eggs*.—Elliptical in form; texture of shell fine; surface slightly glossy; colour, pinkish-white, minutely freckled, or spotted all over with pinkish-red. Dimensions in inches: (1) .74 × .52, (2) .72 × .51, (3) .7 × .5. (Plate 17.)

*Observations*.—The Narrow-billed Bronze Cuckoo is also found throughout Australia, including Tasmania.

The arrival of this bird in southern parts is concurrent with the tide of the other Cuckoos, its laying season commencing about the end of September, and continuing into December. There is a noteworthy fact in connection with the two common Bronze Cuckoos frequenting the southern parts of Australia. The one that lays the olive or bronze-coloured egg, invariably, or with few exceptions, deposits its burden in dome-shaped or covered nests, while the Narrow-billed (the species now under notice) chooses either dome-shaped or open, cup-shaped nests as receptacles for its red-speckled egg.



As far as my data go, the following species are among the foster-birds of the Narrow-billed Bronze Cuckoo:—

VERNACULAR NAME.	SCIENTIFIC NAME.	BY WHOM FIRST RECORDED OR REPORTED.
White-shafted Fantail .. .. .	<i>Rhipidura albiscapa</i> .. .. .	G. E. Shepherd
Blue Wren .. .. .	<i>Malurus cyaneus</i> .. .. .	E. P. Ramsay
Long-tailed Wren .. .. .	<i>M. gouldi</i> .. .. .	Gould
Orange-backed .. .. .	<i>M. melanocephalus</i> .. .. .	H. Barnard
Red-backed .. .. .	<i>M. dorsalis</i> .. .. .	G. A. Kearland
Black-backed .. .. .	<i>M. melanotus</i> .. .. .	A. J. North
White-winged .. .. .	<i>M. leucopterus</i> .. .. .	A. J. C.
Yellow rumped Tit .. .. .	<i>Acanthiza chrysorrhœa</i> .. .. .	"
Buff-rumped .. .. .	<i>A. reguloides</i> .. .. .	E. P. Ramsay
Brown-rumped (Tasmanian) Tit .. .. .	<i>A. diemenensis</i> .. .. .	Gould
Striated Tit .. .. .	<i>A. lineata</i> .. .. .	A. J. North
Little .. .. .	<i>A. nana</i> .. .. .	E. P. Ramsay
Brown .. .. .	<i>A. pusilla</i> .. .. .	"
Scarlet-breasted Robin .. .. .	<i>Petroica leggii</i> .. .. .	A. J. North
Red-capped .. .. .	<i>P. goodenovii</i> .. .. .	A. J. C.
White-browed Scrub Wren .. .. .	<i>Sericornis frontalis</i> .. .. .	A. J. C. (Kent Group)
Yellow-throated .. .. .	<i>S. citreogularis</i> .. .. .	Hermann Lau
Large-billed .. .. .	<i>S. magnirostris</i> .. .. .	"
Short-billed Tree Tit .. .. .	<i>Smicrornis brevirostris</i> .. .. .	A. J. North
Grass Warbler .. .. .	<i>Cisticola ruficeps</i> .. .. .	G. A. Kearland
White-fronted Bush Chat .. .. .	<i>Ephthianura albifrons</i> .. .. .	J. T. Gillespie
Tricoloured .. .. .	<i>E. tricolor</i> .. .. .	T. Carter
Little Field Wren .. .. .	<i>Chthonicola sagittata</i> .. .. .	R. Hall
Striated Field Wren .. .. .	<i>Calamanthus fuliginosus</i> .. .. .	C. French, jun. and party
White Face .. .. .	<i>Xerophila leucopsis</i> .. .. .	R. Hall
New Holland Honeyeater .. .. .	<i>Meliornis novæ-hollandiæ</i> .. .. .	A. J. North
White-checked .. .. .	<i>M. sericea</i> .. .. .	E. P. Ramsay
White Eye .. .. .	<i>Zosterops cœrulescens</i> .. .. .	A. J. North
Red-browed Finch .. .. .	<i>Aegintha temporalis</i> .. .. .	E. Cornwall
Orange-winged Tree Runner .. .. .	<i>S. chrysoptera</i> .. .. .	G. E. Shepherd
Emu Wren .. .. .	<i>Stipiturus malachurus</i> .. .. .	Campbell-Shepherd
Southern Fly Eater .. .. .	<i>Gerygone culicivora</i> .. .. .	A. G. Campbell
Chestnut-eared Finch .. .. .	<i>T. castanotis</i> .. .. .	Hall-Cameron

The instance of the egg of this Cuckoo being found in the nest of the Tricoloured Chat, in Western Australia, is of additional interest from the fact that it was taken on the 5th March (1898),—a most unusual month.

It is rare to find two species of Cuckoo in the same foster-bird's nest. Once I found a nest of the Tit (*Acanthiza chrysorrhœa*), containing three eggs, besides an egg each of the two Bronze Cuckoos. If these two lively youngsters had been hatched, I suppose it would have been a case of "the survival of the fittest." However, Dr. Ramsay can go one better. In 1856, from a nest of the Little Tit (*Acanthiza nana*), he took no less than six eggs—three belonging to the Tit, and three to the Bronze Cuckoos—two of *C. plagosus*, and one of *C. basalis*.

As we saw in our observations on the Fan-tailed Cuckoo, Mr. A. E. Brent can score one higher still as far as Cuckoos' eggs are concerned, for, in a little Tasmanian Tit's (*Acanthiza*) nest, he took the eggs of no less than three species—namely, the Fan-tailed, Bronze, and Narrow-billed Bronze Cuckoos.

Exceptions always seem to prove the rule. Cuckoos, being insectivorous, usually deposit their eggs in the nest of a bird used to a similar diet. But here we have a partly graminivorous bird chosen as a foster-parent. Mr. Ed. Cornwall related to me how he once found a Finch's nest containing the fresh egg of the Narrow-billed Cuckoo. But the strange part of the affair was, that the nest also contained the body of the Finch, which apparently had been dead some weeks.

To Messrs. Brittlebank I am indebted for first-hand information relating to many of the foster-parents of various Cuckoos. I was present with them at one of our enjoyable outings at the Werribee Gorge, 11th October, 1890, when we found the egg of a Narrow-billed Cuckoo in the nest of the New Holland Honeyeater. During the visit of the expedition of the Field Naturalists' Club of Victoria, November, 1890, to the Kent Group, we discovered for the first time the egg of the Narrow-billed Cuckoo in the nest of the White-fronted Scrub Wren (*Scricornis frontalis*).\*

As in the case of the other Bronze Cuckoo, two eggs of the Narrow-billed are occasionally taken in one nest. Here is a curious note from Mr. G. E. Shepherd. At Somerville, 1896, he twice took a Blue Wren's nest containing a clutch of two eggs, together with a Narrow-billed Bronze Cuckoo's egg, and on examination a second Cuckoo's egg was found embedded in the grassy material of the nest.

That Cuckoos sometimes deposit their eggs in the foster-bird's nest before its construction is complete is again illustrated by the fact, that, after removing a pretty clutch of eggs from a Blue Wren's nest, I discovered between the grassy folds of the nest the well-known, red-speckled egg of the Narrow-billed Cuckoo.

Bearing on this point, I possess further evidence from Mr. Wm. P. Best, Branxholme, who wrote some time ago:—"I am of opinion that occasionally the Broad-billed Bronze Cuckoo deposits its egg in the *Acanthiza*'s nest before that bird has laid its eggs, and that, when this happens, the *Acanthiza* covers the strange egg with a thick layer of feathers. I have found several Cuckoos' eggs thus covered with a dense layer of feathers; in every instance the lining of the nest has been much in excess of what is usually found. It also seems to me that the Cuckoo's egg hatches in somewhat less time than the other eggs in the nest. I have been unable to verify this, however. What I have noticed is, that in nests where a Cuckoo's egg is found that egg is always in a more forward state of incubation than the others, and where I have found a young Cuckoo there have (or nearly) always been eggs broken (not young birds) under the nest."

It will be observed that the eggs of the two little Bronze Cuckoos (*C. plagosus* and *C. basalis*) are totally dissimilar in colouring, notwithstanding that the respective reputed parents are almost exactly alike, both in colour and size. Both wear coats of glorious golden-green. The Narrow-billed may be distinguished, as its name implies, by its slightly smaller and narrower bill, more mottled plumage on the throat and chest—not so barred as in the other variety—and by several (six) of the tail feathers being rufous or chestnut-coloured

\* *S. gularis*, Legge, *Victorian Naturalist*, 1896.

at their base. The young of both species, on leaving the nest, are hardly to be separated from each other, but at about three months old they possess the same characteristic markings as their parents. It would be of great interest if some of our oologists could explain the apparent anomaly in the colouration of the eggs, for experience teaches us, that, in nearly every genus, the true typical egg of each species is not without characteristic resemblance.

With reference to the supposed ousting by the young Cuckoo of its foster brethren, I do not think it applies in all cases, if at all; because if we consider, say, the Pallid and Fan-tail Cuckoos, and their rapid growth in size, compared with that of the smaller foster-family, the latter would be soon crushed or starved out of existence; moreover the nest could not contain them all. In any case, there appears an all-wise provision in the plans of the Creator for the maintenance of their (the Cuckoo) species, for it may be readily understood that it occupies the whole time of a pair of tiny foster-parents to satiate the rapacious maw of their large foster-chick, without being encumbered with a brood of their own offspring.

Mr. J. C. Goudie, Birchip, sent the following valuable note to the "Victorian Naturalist" respecting the ejection, by this Cuckoo, of its foster-brethren:—"On the 5th of November, 1897, a nest of the White-fronted Ephthianura (*E. albifrons*) was noticed, containing a clutch of three eggs of the rightful owner, and an egg of the Narrow-billed Bronze Cuckoo. Between the 5th and 8th, one of the Ephthianura's and the Cuckoo's egg were hatched, and the difference in size was at once noticeable, the usurper being half as large again as its nest-mate. By the 8th inst., the two remaining eggs had been thrown out, and the same day I was fortunate enough to witness a determined attempt on the part of the young Cuckoo to eject its smaller companion. First of all it assumed an upright sitting posture, then wriggled and shuffled about until it managed to get the young Ephthianura fairly on to its (the Cuckoo's) back; it then rose on tip-toe, with its back to the side of the nest, and, spreading its wings and using them as arms to keep its load in position, it endeavoured, by a series of violent upward jerks, to force the latter out of the nest. On this occasion it was not equal to the task, and, after a protracted struggle, gave it up. However, by the evening of the next day it had accomplished its purpose, and rested in undisputed possession. A more remarkable exhibition of instinct I have never seen—more remarkable from the fact that the bird was practically just out of the egg, blind, and seemingly helpless."

456.—*CHALCOCOCCYX LUCIDUS*, Gmelin.

## BROAD-BILLED BRONZE CUCKOO.

*Reference*.—Cat. Birds Brit. Mus., vol. xix., p. 295.

*Previous Descriptions of Eggs*.—Potts: Trans. New Zealand Inst., vol. ii., p. 65 (1870); Buller: Birds of New Zealand, vol. i., p. 83 (1888).

*Geographical Distribution*.—Australia (Eastern) and Tasmania, also New Zealand, Chatham Islands, and Macquarie Island (accidental).

*Eggs*.—Similar to that of *C. plagosus*. It has been described by Sir Walter Buller as "of a broad ovato-elliptical form, generally greenish-white or very pale olive colour, often clouded, or stained with brownish grey." Another is, "rather more elliptical in form, and of a uniform olivaceous brown." Dimensions in inches: (1)  $\cdot 8 \times \cdot 5$ , (2)  $\cdot 7 \times \cdot 5$ .

*Observations*.—There has also been some confusion about the identity and nomenclature of the various Bronze Cuckoos, and more particularly those that wander to the southern parts of Australia. Gould, after examination, concluded that the New Zealand bird, to which the specific name *lucidus* was applied, was identical with *basalis*. But, seeing the egg of the New Zealand bird is bronze, while the other is red-speckled, Gould's deductions do not hold.

Dr. Ramsay says:—"Most ornithologists agree in considering *C. plagosus* and *C. basalis* distinct species, and *C. lucidus*, from New Zealand, as a third;" while the British Museum Catalogue shows that *C. lucidus* is the New Zealand race of *C. plagosus*, with a range of habitat down Eastern Australia.

On the 25th November, 1898, Mr. J. R. Burton informs me, a Shining Cuckoo was observed on Macquarie Island, which is situate about 500 miles south-west of New Zealand. This is probably the most southern "record" for any Cuckoo. The bird was perched amongst the rocks, and was apparently in a fatigued condition.

A specimen of *C. lucidus*, or the Broad-billed Bronze Cuckoo, taken in Tasmania, and exhibited in the Australian Museum, Sydney, has a more bronzy-brown appearance than the other two varieties, but, like *C. basalis*, has chestnut markings on the tail feathers. However, this third southern variety of Bronze Cuckoo needs inquiring into by field workers, and may possibly lay in some Australian birds' nests.

I give a few remarks on the Broad-billed Bronze Cuckoo in its New Zealand habitat, where it is called the Shining Cuckoo. According to Sir Walter Buller, it arrives in the north part of the country during September. At Wellington, it was observed, from a record kept for ten years, to arrive between 5th and 10th October. The Cuckoos commence to depart about the middle of January, and most are gone by the end of that month. Other observers have noticed the birds in February and March.

Sir Walter Buller proceeds to remark:—"Its cry is a remarkable one, as the bird appears to be endowed with a peculiar kind of ventriloquism. It consists of eight or ten long silvery notes, quickly repeated. The first of these appears to come from a considerable distance; each successive one brings the voice nearer, till it issues from the spot where the performer is actually perched, perhaps only a few yards off. It generally winds up with a confused strain of joyous notes, accompanied by a stretching and quivering of the wings, expressive, it would seem, of the highest ecstasy. The cry of the young birds is easily distinguished, being very weak and plaintive. . . . As it is usual to find the Cuckoo's egg associated with those of the Grey Warbler, we may reasonably infer that the visitor simply deposits its egg for incubation, without displacing the existing ones. But the young Cuckoo is generally found to be the sole tenant of the nest; and the following circumstance, related to me by the Rev. R. Taylor, sufficiently proves that the intruder ejects the rightful occupants, and takes entire possession. He discovered the nest of a Grey Warbler in his garden shrubbery, containing several eggs, and among them a larger one, which he correctly assigned to the Shining Cuckoo. In due time the eggs were hatched; but, after the lapse of a day or two, the young Cuckoo was the sole tenant of the nest, and the dead bodies of the others were found lying on the ground below. At length the usurper left the nest, and for many days after both of the foster-parents were incessantly on the wing, from morning till night, catering for the inordinate appetite of their charge, whose constant piping cry served only to stimulate their activity."

The following interesting data respecting the early history of the Broad-billed Bronze Cuckoo were furnished to Sir Walter Buller by a correspondent, Mr. W. W. Smith, of Oamaru. On the 7th October, a Warbler's (*Gerygone*) nest was found, containing four eggs and one of the Cuckoo. 21st.—The batch still unhatched. 24th.—Two young were hatched; one egg upon the ground contained chick, cold and dead. 25th.—Three young in nest. 26th.—Cuckoo's egg hatched. 30th.—One dead chick found on the ground; young Cuckoo growing rapidly, nearly large enough to fill the nest itself. 2nd November.—One of the young Warblers dead in the nest. 6th.—Young Cuckoo lying with its head on the opening of nest, having taken full possession, its remaining companion being underneath it, having apparently died from starvation. 8th.—Young Cuckoo almost ready to leave its cradle. 15th.—Came out of the nest.

The following have been recorded as foster-parents of the Broad-billed or Shining Cuckoo, in New Zealand, namely:—Grey Warbler (*Gerygone flaviventris*—the usual victim, (*Gerygone albafrontata*); South Island Tomtit (*Myiomoira macrocephala*); Bell Bird or Korimako (*Anthornis melanura*); White Eye (*Zosterops cerulescens*); and the introduced House Sparrow.

The late Mr. T. H. Potts, regarding his observations of this Cuckoo, has mentioned sixteen instances of its eggs being found in the nests of Warblers, between the 28th October and 6th January—the limits probably of the laying season of the Cuckoo in New Zealand.

457.—*Chalcococcyx plagusus*, Latham.—(383)

## BRONZE CUCKOO.

*Figure*.—Gould: *Birds of Australia*, vol. iv., pl. 89, centre figure.

*Reference*.—Cat. *Birds Brit. Mus.*, vol. xix., p. 297.

*Previous Descriptions of Eggs*.—Gould: *Birds of Australia*, Handbook, vol. i., p. 624 (1865); Ramsay: *Proc. Zool. Soc.*, p. 490 (1865), also p. 359 (1869); North: *Austn. Mus. Cat.*, app., pl. 9, fig. 13 (1889); Campbell: *Victorian Naturalist* (1898).

*Geographical Distribution*.—Whole of Australia and Tasmania; also Southern New Guinea and the adjacent Islands, to the Solomon Archipelago.

*Eggs*.—Elliptical in form; texture of shell fine; surface glossy; colour, of a uniform bronze or olive shade. The bronze colour may be readily removed by moisture, which reveals a light bluish shell. Dimensions in inches: (1)  $\cdot 74 \times \cdot 51$ , (2)  $\cdot 72 \times \cdot 52$ , (3)  $\cdot 69 \times \cdot 51$ . (Plate 17.)

*Observations*.—So much alike are the various species of beautiful Bronze Cuckoos that great care is needed to discriminate between them. The Bronze Cuckoo has a resplendent coat of rich greenish bronze. The underneath parts are beautifully striped, in zebra fashion, with the same beautiful bronze tint. Eyes, bill and feet, brownish. Total length, about 6 inches. The familiar Bronze Cuckoo (its egg also being bronze-coloured) is migratory over the whole of Australia and Tasmania.\*

The whistling note of the Bronze Cuckoo is, in the vicinity of Melbourne, usually first heard in August. I have a record one year when I heard this bird as early as the 3rd of that month. Of course the majority of these Cuckoos arrive during September, a few laying by the end of that month, while the general laying season includes the months of October, November, and December.

In selecting a foster-parent for its offspring, the beautiful Bronze Cuckoo generally chooses the covered-in nests of the *Acanthiza* (Tits) tribe, but other species of dome-shaped or secluded nests are chosen, while I have a record of only four instances where open nests were selected. The following is the list of foster-birds known:—

VERNACULAR NAME.	SCIENTIFIC NAME.	BY WHOM FIRST RECORDED OR REPORTED.
Yellow-rumped Tit .. ..	<i>Acanthiza chrysoorrhoa</i> .. ..	Gould
Buff-rumped .. ..	<i>A. reguloides</i> .. ..	E P Ramsay
Brown .. ..	<i>A. pusilla</i> .. ..	"
Striated .. ..	<i>A. lineata</i> .. ..	"
Little .. ..	<i>A. nana</i> .. ..	"
Brown-rumped .. ..	<i>A. diemenensis</i> .. ..	Gould
Broad-tailed .. ..	<i>A. apicalis</i> .. ..	A. J. C.
Banded Wren .. ..	<i>Malurus splendens</i> .. ..	Gould
Blue .. ..	<i>M. cyaneus</i> .. ..	"
Turquoise,, .. ..	<i>M. callainus</i> .. ..	R " Hall

\* In the Gascoyne district (Western Australia), Mr. Tom Carter states he has seen olive-coloured eggs of Cuckoos, in various nests, as early as July.

VERNACULAR NAME.	SCIENTIFIC NAME.	BY WHOM FIRST RECORDED OR REPORTED.
Grass Warbler.. ..	<i>Cisticola exilis</i> ..	.. Hall-Keartland
Yellow-throated Scrub Wren	<i>Sericornis citreogularis</i>	.. A. J. C.
Large-billed .. ..	<i>S. magnirostris</i> ..	.. H. Lau
White-throated Fly Eater ..	<i>Gerygone albigularis</i> ..	.. H. Barnard
Brown .. ..	<i>G. tusca</i> .. ..	.. A. J. C.
Red-browed Finch .. ..	<i>Ægitha temporalis</i> ..	.. A. J. North
Brown Tree Creeper .. ..	<i>Climacteris scandens</i> ..	.. G. Bateman
*Short-billed Tree Tit .. ..	<i>Smicronis brevirostris</i>	.. E. P. Ramsay
*Emu Wren .. ..	<i>Stipiturus malachurus</i>	.. ..
Scarlet-breasted Robin ..	<i>Petroeca leggii</i> ..	.. A. J. C.]
White-fronted Bush Chat	<i>Ephthianura albifrons</i>	.. J. Sommers
Orange-winged Tree Runner	<i>Sittella chrysoptera</i> ..	.. G. E. Shepherd
Yellow-faced Honeyeater ..	<i>Ptilotis chrysops</i> ..	.. R. Hall
Fulvous-fronted .. ..	<i>Glycyphila fulvifrons</i>	.. J. W. Mellor
Long-billed .. ..	<i>Meliornis longirostris</i>	.. D. Le Sonëf
Chestnut-rumped Tit .. ..	<i>Acanthiza uropygialis</i>	.. R. Hall
Red-capped Robin .. ..	<i>Petroeca goodenovi</i> ..	.. ..

To the foregoing list may be added that troublesome introduction, the House Sparrow, an apparently deserted nest having been taken near Warrnambool, which contained an addled egg of the Bronze Cuckoo—date Christmas, 1893. One November, my son Archie observed a Sparrow chasing a Cuckoo from the verandah of our house, where Sparrows were nesting. The strange egg has also been seen in the nest of the Goldfinch (introduced).

The Tree Creeper (*Climacteris*), as a foster-bird, is mentioned on the evidence of the late Mr. Gilbert Bateman, a trapper, whose suspicions were aroused by seeing a Bronze Cuckoo emerging from a hole in a tree. An examination proved that the Cuckoo had deposited its egg among the rich, red-coloured clutch of the Tree Creeper. The nest was not far down, and could be seen from the entrance of the hole.

While in the "Big Scrub," New South Wales, in several instances I abstracted the eggs of this Bronze Cuckoo from the bulky nest of the Yellow-throated Scrub Wren (*Sericornis citreogularis*), together with the larger eggs of the rightful owner. Only once did I take, as Mr. Lau did in the South Queensland scrubs, the strange egg in the nest of the other Scrub Wren, the Large-billed (*S. magnirostris*), also so common in this locality.

As these nests are similarly constructed, and frequently near each other, I thought it remarkable that the Cuckoo should select one in preference to the other.

Dr. Bennett, in his "Gatherings of a Naturalist in Australia," mentions that a White-shafted Fantail (*Rhipidura albiscapa*) was shot at Ryde, near Sydney, in the act of feeding a solitary young "Bronze Cuckoo," in its nest—but which species is not stated.

In the west, the Bronze Cuckoo eggs I there found were in nests with clutches of the Western Tit (*Acanthiza apicalis*). I also noticed these birds feeding a young Cuckoo. While in a forest near Cape

\* I have included these as foster birds under this species, although Dr. Ramsay does not make it clear to which of the two Bronze Cuckoos they should belong. Vide P.Z.S., 1865 and 1869.

Lecuwin, during October, 1889, I made the following curious entry in my field book:—

“Four or five Bronze Cuckoos, in shining coats, making a great stir in a low tree, chasing each other, and all the while making melancholy, tremulous, whistling noises. Anxious to ascertain the cause of the disturbance, I approached too close to the little company, which immediately departed to another tree.”

Occasionally two Bronze Cuckoos' eggs are deposited in the same nest. I find that under date 2nd November, 1886, I took a pair of bronzy-coloured eggs from a nest of the Yellow-tailed Tit (*Acanthiza*), near Doncaster, Victoria. Mr. C. French, junr., recorded in the “Victorian Naturalist,” a similar instance that came under his observation during the season 1889.

Other species of the Cuckoos' eggs are occasionally found in the same bird's nest with that of the Bronze Cuckoo, as Mr. Brent's note, quoted under the Fan-tailed Cuckoo, and the following remarks by Dr. Ramsay prove: “From a nest of *Acanthiza nana* I remember taking, in the year 1855, no less than six eggs. Among them were three Bronze Cuckoos'—two of *Chalcites plagosus*, and one of *C. basalis*. In November last (1864), we took another nest of the same species, containing one of each variety. In this instance, one of the eggs of *C. plagosus* was embedded below the lining of the nest, and had evidently been laid just before the nest was completed, as is not infrequently the case. The other egg, which was a specimen of *C. basalis*, my brother Percy placed in a nest of *Acanthiza lineata*, which he had found on the previous day, and left for such an occasion. On returning to it about a week afterwards, we found the young Cuckoo had been hatched. After a lapse of seven days, the bronze feathers were just beginning to appear, and in about a week or ten days more the young bird was able to fly, the bronze on the wings, head and back, now showing plainly.

“Now, as the apertures of the nests of the *Acanthiza* are exceedingly small, a question naturally arises whether the Bronze Cuckoo lays its eggs in the nest, or places them there by some other means.

“To this I can only answer that the apertures of those nests which have contained Cuckoos' eggs are nearly twice as wide as the openings of those nests which we have taken before the Cuckoo's egg has been deposited in them. This is more easily noticed in the nest of *A. lineata*, of which the aperture is very small, and nearly covered over with a hood.”

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458.—*CHALCOCOCCYX MALAYANUS*, Raffles.—(384)  
*C. minutillus*, Gould.

#### LITTLE BRONZE CUCKOO.

*Figure*.—Gould: Birds of Australia, fol., supp., pl. 56.

*Reference*.—Cat. Birds Brit. Mus., vol. xix., p. 298.

*Previous Descriptions of Eggs*.—Ramsay: Proc. Zool. Soc., p. 600 (1875); North: Proc. Linn. Soc., N.S. Wales, vol. ix., 2nd ser., p. 41 (1894); Campbell: Victorian Naturalist (1898).

*Geographical Distribution*.—North-west Australia, Northern Terri-



tory and North Queensland; also New Guinea, Solomon Islands, Flores, Borneo, Philippine Islands, Java, and Malayan Peninsula.

*Eggs.*—(Reputed.) Similar to those of *C. plagosus*, but darker or more bronzy in colour. Dimensions in inches: (1)  $\cdot 76 \times \cdot 56$ , (2)  $\cdot 73 \times \cdot 52$ .

*Observations.*—Little appears to be known of the smallest species of our beautiful Bronze Cuckoos, which frequents the northern parts of Australia.

In a measure, I agree with Mr. North that the Cuckoos' eggs found in certain northern birds' nests may be those of the *C. malayanus*, but there is nothing to prove that they are not really the eggs of *C. pæcilurus*, another northern variety of the Bronze Cuckoos.

Dr. Ramsay's original description in the "Proceedings of the Zoological Society" (1875) is very meagre, merely stating that a bronze-coloured egg, believed to be that of *C. minutillus (malayanus)*, was obtained from a species of *Gerygone*'s nest.

Nearly twenty years afterwards, Mr. North writes:—"For some years past, Mr. Boyd (Herbert River, Queensland) has found a dark bronze-coloured egg of a Cuckoo in the nest of *Gerygone magnirostris*, varying considerably from the well-known egg of *C. plagosus*, and which I referred to when describing the nest and eggs of *G. magnirostris* in the 'Ibis' last year (1893). Recently, Mr. Boyd has forwarded two spirit specimens of the Cuckoos frequenting the vicinity of where these bronze-coloured eggs were deposited. One is the adult male of *C. malayanus*, the other a young male of *Cacomantis castaneiventris*. Now, judging from analogy, one would reasonably expect to find the egg of the latter species of the same type as *C. flabelliformis* and *C. insperatus (variolosus)*, and I have little hesitation in provisionally referring the Cuckoos' eggs found in the nests of the *Gerygone magnirostris* as belonging to *C. malayanus*, until Mr. Boyd has an opportunity of watching one of those Cuckoos' eggs hatched by the foster-parent, and conclusively proving to which species the young bird belongs."

Mr. Dudley Le Souéf and Mr. W. B. Barnard have found similar eggs in the nests of the Large-billed Fly Eater, or *Gerygone magnirostris*, in the Bloomfield River scrubs. The former collector also reports the Masked Fly Eater (*G. personata*) as a foster-parent of the same Cuckoo, whilst Mr. R. Hislop has observed the strange egg in the nest of the Lovely Wren (*Malurus amabilis*). In nearly every instance there were two eggs of the foster-parent in the nest with the Cuckoo's egg.

In the extreme north, at Cape York, Mr. Harry Barnard found these eggs in the nests of Masked Fly Eaters towards the end of November, 1896; but, as I have previously mentioned, the parasitical eggs are just as likely to be those of *C. pæcilurus* as *C. malayanus*. For it must be remembered that Gould's type of *C. russatus (pæcilurus)* came from Cape York.

459.—*CHALCOCOCCYX PÆCILURUS*, G. R. Gray.  
*C. russatus*, Gould.

RUFOUS-THROATED CUCKOO.

*Reference*.—Cat. Birds Brit. Mus., vol. xix., p. 299.

*Geographical Distribution*.—North-west Australia, Northern Territory, North Queensland, also New Guinea, Amboyna, Mysol and Goram.

*Nest and Eggs*.—Undescribed.

*Observations*.—"Similar to *C. malayanus*, but differing in having no white on the forehead; a partial narrow rufous edging on the secondaries, the outer tail coverts partially barred with rufous and white; the edges of the tail feathers washed with rufous above." (Shelley.)

460.—*EUDYNAMIS CYANOCEPHALA*, Latham.—(387)  
*E. flindersi*, Vigors and Horsfield.

KOEL.

*Figure*.—Gould: Birds of Australia, fol., vol. iv., pl. 91.

*Reference*.—Cat. Birds Brit. Mus., vol. xix., p. 324.

*Previous Descriptions of Eggs*.—North: Proc. Linn. Soc., N.S. Wales, vol. ii., 2nd ser., p. 554 (1887), also vol. x., 2nd ser., p. 215 (1895); Campbell: Victorian Naturalist (1898).

*Geographical Distribution*.—North-west Australia, Northern Territory, Queensland and New South Wales; also New Guinea, Goram, and Timor.

*Eggs*.—Oval or stout oval in shape; texture of shell a trifle coarse; surface glossy; colour, pinkish-buff or fleshy-tint (as seen on the egg of the Pallid Cuckoo—*C. pallidus*), sparingly and softly marked (spotted and blotched), thickest about the apex, with chestnut and purplish-brown. Most resembles the better known egg of the Friar Bird (*Philemon corniculatus*), but is coarser in texture. Dimensions in inches (type egg): 1.36 × 1.02. (Plate 17.) A narrower specimen, with the majority of the markings forming a cap on the larger end: 1.39 × .9.

*Observations*.—This fine Cuckoo, or Koel, the male specially splendid for his glossy greenish-black coat, is found chiefly in Northern and Eastern Australia. It visits as far south as New South Wales, where it arrives in September, departing again about March.

I have enjoyed hearing its loud whistling call notes, which become somewhat monotonous when kept up almost incessantly both day and night during the breeding season.

Koels' eggs are rare items in collections. As stated in the "Proceedings of the Linnean Society of New South Wales," vol. ii, 2nd series, p. 554 (1887), Mr. George Masters first obtained an egg of the Koel at Gayndah, Queensland, on the 25th November, 1870. He shot at and wounded a female, and while pursuing her she dropped an egg. A photograph of this egg, sent by Dr. George Bennett, was exhibited at the meeting of the Zoological Society of London, June, 1873.

However, the first normal egg was discovered, under highly interesting circumstances, by Mr. S. W. Jackson, at South Grafton. I quote from a copy of his printed remarks (dated 3rd January, 1895), which he thoughtfully forwarded to me:—"On Wednesday evening, 31st October, 1894, I was going out about three miles from South Grafton into the bush, in the hope of getting a few beetles, &c., but before I had gone two miles from the town, I was much attracted by a great noise made by a pair of Koels, male and female, which were in an apple tree (*Angophora*), sometimes called a mahogany. On going up to the tree I saw the female Koel sitting on a limb, near the nest of the Oriole (*O. viridis*). I at once climbed the tree, and found the nest contained three eggs of the latter bird, so I came down and sat in the shade of a gum tree, and watched the female Koel. She first called the male Koel, and both sat near the Oriole's nest. After five minutes the male Koel flew away, and the female went on to the Oriole's nest. I did not move from the spot where I was sitting, so after fifteen minutes I got up and hit the tree, to frighten the Koel off the Oriole's nest, but she would not go. I felt certain she was laying. After a time I again hit the tree, and off the female Koel flew, accompanied by the male Koel, who had in the meantime returned. I was delighted at this, and once more ascended the tree, and found the nest contained four eggs—three of the Oriole and one of the Koel (*Eudynamis cyanocephala*). A description of the latter I have already given."

Mr. Jackson forwarded his rare find to the Australian Museum, and Mr. North described it in the "Proceedings of the Linnean Society, New South Wales" (1895), concluding with the following remark:—"It will be observed that the egg of Flinders Cuckoo is the same size (about) of those of the Green-backed Oriole, although, as a rule, the eggs of Australian Cuckoos are larger than those of the birds in whose nests they are deposited. In the choice of a foster-parent for its young, Flinders Cuckoo has, however, exercised great discrimination in selecting a species that, like itself, depends entirely on fruits and berries for its subsistence during the spring and summer months."

Probably the food of the Koel is not entirely frugivorous, because Mr. Carl Lumholtz recorded that, at Gracemere (Queensland), he observed four Wood Swallows (*Artamus sordidus*) feeding a young Koel, which he shot, at the same time bringing down one of the Wood Swallows.

Mr. Ed. Cornwall, writing to me from Townsville (Queensland), 23rd November, 1896, reports:—

"I have taken what I believe to be the egg of Flinders' Cuckoo. I took it, on October 15th, from the nest of the Helmeted Friar Bird; and as the Cuckoos were very plentiful here, and were evidently mating,

also as the Friar Birds were seen chasing the Cuckoos away, I do not think there is much doubt about the identity of the egg."

Writing again later in the season, Mr. Cornwall says:—"Here is a note about the Koel which may be of interest. On two different occasions this year, my attention was drawn to the young of that species being fed by two other birds. In each case it was the Yellow-tinted Honeycater (*Ptilotis flava*) and the Helmeted Friar Bird (*Philemon buceroides*). I thought it rather remarkable that those two distinct birds should be feeding the one nestling. Mr. B. Gulliver can endorse the above statement."

The Koel likewise lays in the nest of the Common Friar Bird (*P. corniculatus*). At Chinchilla (Queensland), near Mr. Broadbent's camp, was a nest of a Friar Bird. He watched the young Cuckoo come out and the old Friar Birds feed it, for about a week, in the neighbourhood of his tent. There were no young Friar Birds with it. After the young Koel grew big enough, it was shot for collecting purposes. The male Koel used to come about the nest at night, remain till dawn, and fly away till the next night.

On the authority of Dr. W. Macgillivray, the Yellow-throated Miner (*Myzantha flavigula*) may be added to the list of foster-parents of the Koel. Also the Silvery-crowned Friar Bird (*P. argenteiceps*)—Le Souëf, and the Little Friar Bird (*P. sordidus*), and Northern Oriole (*O. affinis*)—Keartland.

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461.—SCYTHROPS NOVÆ HOLLANDIÆ, Latham.—(386)

CHANNEL BILL.

*Figure*.—Gould: Birds of Australia, fol., vol. iv., pl. 90.

*Reference*.—Cat. Birds Brit. Mus., vol. xix., p. 330.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. i., p. 630 (1865); North: Proc. Linn. Soc., N.S. Wales, vol. ii., 2nd ser., p. 410 (1887); Campbell: Proc. Roy. Soc., Victoria, vol. v., new ser., p. 125 (1893), also Victorian Naturalist (1898).

*Geographical Distribution*.—Australia in general and Tasmania (accidental); also New Guinea, New Britain, Ké Islands, Ceram, Bouru, Obi, Batchian, Ternate, Celebes and Flores.

*Eggs*.—Inclined to oval in shape; texture of shell somewhat coarse; surface slightly glossy; colour, vinaceous-buff, dully blotched with chestnut or amber and purplish-brown. Much resembles those of the Hill Crow Shrike (*Strepera arguta*) of Tasmania. Dimensions in inches: (1) 1.66 × 1.13, (2) 1.63 × 1.26. (Plate 17.)

*Observations*.—This bird appears to be a wanderer over the whole of Australia, but has not yet been recorded for the south-western

portion, and sometimes reaches Tasmania. It is also found in New Guinea, and other islands beyond.

The Channel Bill is manifestly interesting, because it is the largest of Australian Cuckoos. It is sometimes called in the interior the "Flood Bird," because of its arrival with such occurrences.

Gould has described an egg of this bird taken from the oviduct.

Mr. North has described a similar immature egg from a bird shot on the Macleay River, during the first week in November, 1884. An egg collected for me (taken from a Crow's or Raven's nest, if I recollect rightly) at Cooper's Creek, was, unfortunately, broken in transit.

A mature egg, described by me before the Royal Society of Victoria, 1892, was taken in October, 1880, near Inglewood, Queensland, where the Channel Bills were fairly numerous, by Mr. Hermann Lau, and, remarkable as it may appear, from the nest of the Sparrow Hawk (*Accipiter*), together with an egg of the bird of prey. On another occasion, Mr. Lau took a pair of Channel Bill's eggs, together with a pair of the Black-backed Magpie's (*Gymnorhina tibicen*), all fresh, from the nest of the latter, while the previous season he took a pair of young Channel Bills from the nest of a Strepera, probably *S. graculina*, and forwarded them to the Queensland Museum. It would be indeed interesting to learn if the same Channel Bill deposited the two eggs in the foster-bird's nest, or were they laid by separate birds. The probable number of eggs laid by the Channel Bill is three.

Referring to the Pied Crow Shrike (*Strepera graculina*) as a foster-parent to the Channel Bill, Mr. K. Broadbent kindly sends the following interesting field notes:—"I have seen, in January, flocks of Channel Bills in company with Streperas, just under the mountains in the big scrubs—some beautiful scrubs never yet trodden by the foot of white man.

"When camped under Mount Graham, on Gowrie Creek, Herbert River, near my tent was one of these Strepera's nests, which must have contained a young Channel Bill, because all the Streperas were apparently busy feeding one. Just at dark I noticed the two old Cuckoos visit the nest. All night long they were calling around, becoming silent at dawn."

The following Queensland note, by Mr. E. M. Cornwall, appeared in the "Victorian Naturalist," June, 1890, taken from his field book under date 20th February, 1890:—"My attention was attracted to-day by the peculiar behaviour of a pair of Crows and two other birds, which, on closer inspection, proved to be young Channel Bills (*Scythrops novæ-hollandiæ*). I had heard that the Crow was the foster-parent of this, the largest of our Australian Cuckoos, but had never before noted them in company. What struck me as remarkable was the fact that there were two young Cuckoos being reared by the one pair of Crows."

Mr. Herbert Kenny, writing to me from Cooper's Creek, says:—"Channel Bills, or Flood Birds, make their appearance just before or during rain or floods, laying principally in Crows' nests. Later on, or prior to leaving, the old Channel Bills go round and gather up their young, when some hard fighting between the Channel Bills and the Crows usually ensues."

When in North-west Australia, with the Calvert Expedition (1896-7), Mr. G. A. Keartland observed that:—"At the approach of the tropical rain in January the *Scythrops* made its appearance in the early morning, always coming from the west and going east. Their loud notes, which they utter when flying, were always noticed by the Crows at our camp, which at once assembled and attacked the intruder. Then a battle royal ensued. Two or more Crows attacked simultaneously, and the sharp snap of their bills might be heard for some distance. When the Channel Bill was chased for about a mile the Crows returned to their quarters. On Mount Campbell a pair of *Scythrops* frequently resorted to a fig-tree to feed. I shot the female on 3rd March, and found the stomach full of figs. The ovaries were well developed, and contained three yolks, varying in size, one being as large as a small cherry, the other two slightly less. Near the Margaret River, the natives took two young ones from a Crow's nest near the homestead, which the *Scythrops* had frequently visited. They are locally known as 'Storm Birds.'"

Mr. R. J. N. Burrowes informs me he has seen several Channel Bills reared about station camps, in Queensland. The big Cuckoos become very domesticated, feeding on scraps of meat, but generally foraging a good deal on their own account. One at Strathdarr, with its wing clipped, roamed about at will. It never went more than one hundred yards from the camp, and always returned to its cage at night.

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SUB-FAMILY—CENTROPODINÆ.

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**462.**—CENTROPUS PHASIANUS, Latham.—(388 to 390)

*C. macrourus*, Gould.

*C. melanurus*, Gould.

COUCAL.

*Figure.*—Gould: Birds of Australia, fol., vol. iv., pl. 92.

*Reference.*—Cat. Birds Brit. Mus., vol. xix., p. 340.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. i., p. 635 (1865); North: Austrn. Mus. Cat., p. 250 (1889), also Rec. Austrn. Mus., vol. ii., p. 17 (1892); Campbell: Victorian Naturalist (1898).

*Geographical Distribution.*—North-west Australia, Northern Territory, Queensland, and New South Wales.

*Nest.*—Large, covered, with an opening at either end; composed of dried grasses, sticks, &c.; lined inside with leaves, and usually placed in tussocks of coarse grass, but sometimes among the lower leaves of the screw palm (*Pandanus*), in a low thick bush, or in a deserted nest of a Babbler (*Pomatorhinus*).

*Eggs*.—Clutch, three to five; roundish in form; texture of shell somewhat coarse; surface glossy, but sometimes rough or limy; colour, dull or dirty white. Dimensions in inches of a clutch: (1) 1.67 × 1.18, (2) 1.5 × 1.2, (3) 1.45 × 1.21.

*Observations*.—The Coucal is the only member of the Australian Cuculide that undertakes the responsibility of rearing its own family. Its range is tropical and sub-tropical, where it loves to dwell in the moister tracts, amongst coarse rank grass and other vegetation.

In the matter of diet the Coucal is a ferocious creature. It is reported that it devours small snakes and birds, and is addicted to robbing nests in fowl-yards.

Mr. Charles Barnard, through Mr. North, has added an interesting note to the nidification of the Coucal. He says:—"On the 15th February, 1891, I found a nest with three eggs of *Centropus phasianus*. The nest was built about fifteen inches above the ground in some high, broad-bladed grass, the tops of which were drawn down and loosely interwoven into the shape of a ball of about eight inches internal diameter, with a round hole in one side for entrance, and another at the opposite side as a means of exit (as mentioned in Gould—A. J. C.). The bottom of the nest was thickly padded with bloodwood (*Eucalyptus corymbosa*) leaves, which extended through the entrance, and on to the bent down grass outside the nest, in the shape of a platform."

Again, another brother (Mr. Harry Barnard), in chatting with me about birds in general, mentioned that the Coucal's nest is not unfrequently placed on a fallen log or other support, such as a short bush or long grass—the surrounding grass being woven together, with the addition of twigs.

Mr. S. W. Jackson (South Grafton, New South Wales) has kindly forwarded me a very curious note respecting the Coucal laying in an old nest of the Babbler (*Pomatorhinus temporalis*). He states:—"I flushed the Coucal off the nest, which was built on a horizontal branch of a low tree, and not more than twelve feet from the ground. The four eggs were simply laid on the top of the Babbler's nest, and the Coucal had made a neat receptacle for them by pulling the sticks and twigs away, and leaving a foundation of soft, paper-like bark." The date on which the eggs were taken was the 16th September, 1895. Mr. Jackson informs me he has since found other sets of Coucals' eggs similarly situated.

I have hunted the pheasant-like Coucal in Queensland, where they are sometimes erroneously called Grass Owls. I have also heard them called Swamp Pheasants. The eggs, however, in my collection, were taken by Mr. W. T. Bailey, in Southern Queensland, on 19th February, 1891.

The breeding months would appear to be from September to February or March.

## ORDER—PSITTACI: PARROTS.

FAMILY—LORIIDÆ: LORIES, OR BRUSH-TONGUED  
PARROTS.

**463.**—*TRICHOGLOSSUS* NOVÆ-HOLLANDIÆ, Gmelin.—(444)  
*T. multicolor*, Gmelin.

## BLUE-BELLIED LORIKEET.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 48.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 57.

*Previous Descriptions of Eggs.*—Campbell: Southern Science Record (1883); North: Austrn. Mus. Cat., p. 266, pl. 14, fig. 8 (1889).

*Geographical Distribution.*—Australia (except, perhaps, West and North-west), and Tasmania.

*Nest.*—Within a hole of a branch or bole of a large tree.

*Eggs.*—Clutch, two usually; round in shape, but compressed or sharply nipped off at one end; texture of shell somewhat fine; surface dull, but occasionally has a slight trace of gloss and sometimes limy nodules; colour, white. Dimensions in inches of odd examples: (1) 1.12 × .89, (2) 1.06 × .88; of a proper pair: (1) 1.11 × .94, (2) 1.08 × .95.

*Observations.*—The many-coloured and beautiful so-called Blue Mountain Parrot follows the forests of flowering gums throughout Australia, except, perhaps, West. It is also found in Tasmania, where its visits, as in other places, are irregular. It is a most beautiful species, with green upper surface, rich blue head and abdomen, chest rich scarlet, with blood-red bill and eyes to match. The sexes are almost alike in colouring. Total length, 12 inches. As a flock of these splendid Lorikeets wheel simultaneously in mid-air, the flashing splendour of the deep crimson under the surface of the wings, intensified by the light of a slanting sun, is a sight to be remembered. But there are other sights. During February, 1896, thousands of these grand Lorikeets visited a vineyard about four acres in extent, near Murchison, on the Goulburn River, feasting for three days on grapes. They remained in one vineyard, although others were near. The unduly favoured vigneron was so exasperated, not only at the depredations committed, but with the terrible din of the multitudes of harsh, screeching voices, that in one day he shot no less than seventy birds.

In 1881 I was indebted to the late Mr. George Barnard for the eggs (those originally described) of the beautiful Blue-bellied Lorikeet, taken on his run, Coomooboolaroo, Queensland. He informed me that this





TAKING A BLUE-BELLIED LORIKEET'S NEST.

*From a Photo by S. W. Jackson.*



bird invariably lays two eggs. Possibly the clutches are regulated by the seasons and supply of food, because the late Mr. Gregory Bateman, a most intelligent field observer and bird catcher, told me that in good seasons near Stratford, Gippsland, he has seen four eggs in the nest of the Blue Mountain Parrot, as he called the bird.

Chief breeding months, September or October to December or January. But the Lorikeets sometimes lay during July and August in South Queensland, while a record in the "Catalogue of the Australian Museum" stated that Mr. J. A. Boyd, Herbert River, North Queensland, found a nest containing young as late as the month of May (1888).

With reference to Verreaux's Lorikeet, or Lory, *T. verreauxius*, separated by Professor Mivart,\* other sound authorities (Salvadori and Gould) consider it a hybrid between *T. nova-hollandiæ* and *Glossopsittacus concinnus*.

The picture by Mr. S. W. Jackson, "Taking a Blue-bellied Lorikeet's Nest," is not without interest for its originality. The bunch of tree-orchids growing on the right-hand portions of the tree trunk shows that the region where the picture was taken is undoubtedly sub-tropical.

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#### 464.—TRICHOGLOSSUS RUBRITORQUES, Vigors and Horsfield.—(445)

##### RED-COLLARED LORIKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 49.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 60.

*Previous Descriptions of Eggs*.—Le Souëf: Victorian Naturalist, vol. xv., p. 151 (1891), also Ibis, p. 360 (1899); North: Victorian Naturalist, vol. xvi., p. 12 (1899).

*Geographical Distribution*.—North-west Australia, Northern Territory and North Queensland.

*Nest*.—Within a hole or hollow spout of a tree (eucalypt).

*Eggs*.—Clutch, two; roundish oval in shape; texture of shell fine; surface without gloss; colour, originally white, but becomes more or less stained with the wood dust of the nest. Dimensions in inches of a proper pair: (1) 1.11 × .87, (2) 1.05 × 1.03.

*Observations*.—This lovely Red-collared Lorikeet inhabits the northern parts of Australia, and is a beautiful representative of its near ally, the Blue-bellied Lorikeet of more eastern parts, from which it differs in having the throat and abdomen deep olive, almost black, in addition to its distinguishing red collar.

Mr. E. J. Harris, collecting for Mr. G. A. Keartland, was probably the first white man to handle the eggs of the Red-collared Lorikeet. They were taken in the Derby District, May, 1898.

\* "Monograph of the Loriidæ."

During December and January following, Mr. E. Olive, collecting for Mr. Le Souëf and Drs. Ryan and Snowball, found several nests in the Port Darwin District. A pair of these eggs was first publicly exhibited and described by Mr. Le Souëf at a meeting of the Field Naturalists' Club of Victoria, 13th March, 1899.

Breeding season apparently variable.

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465.—*PSITTEUTELES CHLOROLEPIDOTUS*, Kuhl.—(446)

SCALY-BREASTED LORIKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 50.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 65.

*Previous Descriptions of Eggs*.—Campbell: Victorian Naturalist (1886); North: Proc. Linn. Soc., N.S. Wales, vol. ii., 2nd ser., p. 986 (1887), also Austr. Mus. Cat., app. ii., pl. 14, fig. 12 (1890).

*Geographical Distribution*.—Queensland, New South Wales, and interior of South Australia (probably).

*Nest*.—Within a hole usually in a tall tree.

*Eggs*.—Clutch, one to two; roundish in form; texture of shell fine; surface without gloss; colour, white, more or less stained with wood dust. Dimensions in inches of a clutch: (1) 1.0 × .82, (2) 1.0 × .82; of a single and smaller example: .94 × .78.

These eggs, being more rounded at the smaller end, are unlike those of the Blue-bellied Lorikeet (*Trichoglossus novaehollandie*).

*Observations*.—During my Queensland excursion, 1885, I shot specimens of the Scaly-breasted Lorikeets, which roam chiefly through the eastern latitudes of Australia, but I have never seen it or heard of them being found south of the Murray.

The Scaly-breasted Lorikeet takes its name from the beautiful scale-like yellow markings on the breast of its otherwise rich, grass-green plumage. The under surface of the wings is adorned with the richest of scarlet, which is most strikingly seen when the bird flies.

Gould stated that among other places, the Scaly-breasted Lorikeet used to breed in all the large eucalypts near Maitland, on the Hunter River, but, he regretted to say, he was unable to procure its eggs.

I received an egg from the late Mr. George Barnard's collection, which I exhibited and described before the Field Naturalists' Club of Victoria, 14th December, 1885. At Coomoboolaroo, this Lorikeet lays a single egg, sometimes two. Out of nine nests found there two only contained pairs, the rest having a single egg each. Mr. Barnard was the first collector to procure these rare eggs. Mr. S. W. Jackson tells me that on one occasion he found three eggs in a nest.

Usual breeding season from June to October, or later.

## 466.—PTILOSLERA VERSICOLOR, Vigors.—(447)

## RED-CROWNED OR VARIED LORIKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 51.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 66.

*Geographical Distribution*.—North-west Australia, Northern Territory, and North Queensland.

*Nest and Eggs*.—Undescribed.

*Observations*.—This delightful Lorikeet flies in flocks in the forest of Northern Australia, where Gilbert first observed it flashing on the top-most flowering branches of the eucalypts and melaleucas. It may be readily distinguished from all the other Lorikeets by the narrow stripe of yellow down the centre of the feathers of the plumage, and the rich, red crown of the head.

These Lorikeets are said to breed in the hollow limbs of trees on the margin of the Margaret River, North-west Australia.

## 467.—GLOSSOPSITTACUS CONCINNUS, Shaw.—(448)

*G. australis*, Latham.

## MUSK LORIKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 52.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 69.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 101 (1865); North: Austn. Mus. Cat., p. 268 (1889).

*Geographical Distribution*.—Queensland, New South Wales, Victoria, South Australia, and Tasmania.

*Nest*.—Within a hole or hollow in a dead or living tree.

*Eggs*.—Clutch, two to four; roundish or round oval in shape; texture of shell somewhat fine; surface without gloss; colour, white, dulled by the wood dust of the nest. Dimensions in inches of two pairs: A (1)  $\cdot 98 \times \cdot 83$ , (2)  $\cdot 98 \times \cdot 83$ ; B (1)  $\cdot 98 \times \cdot 82$ , (2)  $\cdot 97 \times \cdot 81$ .

*Observations*.—This Lorikeet, of musky odour, enjoys a range down Eastern Australia (including portions of the interior) to Tasmania. Except for its habit of following the flowering gums, it might almost be regarded as a stationary species. The bird may often be seen, or its harsh screeching notes heard, in the blue-gums about our cities, feasting upon the flowers. It is a common species, chubby and thick set in figure, and dressed in green, ornamented on the forehead and cheeks with patches of deep crimson. Length of bird, about 9 inches.

I have observed many nests of the Musk Lorikeet in Victoria, but the only one I could reach was in a dead (rung) eucalypt, near the Gunyah Creek, Bendigo district. It contained a pair of eggs in an advanced stage of incubation. Date, 4th October, 1880.

Mr. Brent informs me the complement to a clutch of the Musk Lorikeet in Tasmania is usually four eggs.

These Lorikeets have also cultivated a taste for fruit. During the summer (February and March) of 1889, the Muskies were very troublesome in the apple orchards of South Brighton. In April, after their depredations, I observed flocks of these birds heading in a north-easterly direction.

Breeding months September to December.

**468.**—GLOSSOPSITTACUS PORPHYROCEPHALUS, Dietrichsen.—(449)

PURPLE-CROWNED LORIKEET.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 53.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 70.

*Previous Description of Eggs.*—Campbell: Victorian Naturalist (1893).

*Geographical Distribution.*—New South Wales, Victoria, South and West Australia.

*Nest.*—Within a hollow spout or hole of a tree.

*Eggs.*—Clutch, four; roundish or round oval in form; texture of shell fine; surface without gloss; colour, white, more or less dulled by the wood dust of the nest. Dimensions in inches of two proper clutches: A (1)  $\cdot 84 \times \cdot 66$ , (2)  $\cdot 84 \times \cdot 66$ , (3)  $\cdot 8 \times \cdot 7$ ; B (1)  $\cdot 8 \times \cdot 66$ , (2)  $\cdot 79 \times \cdot 68$ , (3)  $\cdot 76 \times \cdot 65$ , (4)  $\cdot 77 \times \cdot 65$ .

*Observations.*—This exquisite little Lorikeet is an especial favourite of mine. Its particular range of habitat is across the southern parts of Australia, from east to west.

The Purple-crowned Lorikeet is rarely seen in the vicinity of Melbourne, but, in 1897, small flocks were observed flying over the city. Several specimens were shot for collections, notably at the Zoological Gardens, and the Horticultural Gardens, Burnley; also at Somerville, Western Port, where the birds were seen for the first time.

Once, when on the P. & O. mail boat, steaming across Spencer Gulf (South Australia), I was agreeably astonished to see one of these little Lorikeets flutter on board and lodge on the hurricane deck, where I easily secured it. On holding it up to the admiring passengers, the little bird protested by digging its hard bill into my thumb. Throwing the bird into the air, it uttered its characteristic, harsh screech, gave its body a quiver, and headed straight for the land.

At the time of a visit to the Wimmera district, Victoria (October, 1882), I found the Purple-crowned Lorikeet had commenced breeding in the taller trees, but was unable to procure the eggs myself. I also noticed young of this species in a karri (*Eucalyptus*) forest in West Australia, 6th October, 1889. It was not till 1893 that I had the pleasure of first describing the eggs before the Field Naturalists' Club of Victoria, through the agency of Mr. W. White (a brother, by the way, of the late Mr. White, whose useful labours are frequently mentioned by Gould).

The first nest found by Messrs. W. and A. J. White was in a hollow spout of a gum-tree near Mount Barker, South Australia. It contained one egg and three young newly hatched. Date, 18th September, 1886. The parent birds came close by, and naturally exhibited great anxiety during the operation of chopping the entrance large enough to obtain the eggs.

A set of three, that now adorns my collection, was taken by the same gentleman at Dingo Creek, Mount Remarkable, 27th September, 1894. The nesting hole was in a large limb of a red-gum growing on the banks of the creek.

I conclude with a note from Mr. White:—"It may interest you to know that the Porphyry-crowned Lorikeet nests during many months of the year, according as the different species of eucalypts come into flower, which produce their food. I arrived at Flinders Range (some two hundred and odd miles north of Adelaide) on the 19th September (1894). There were then young birds on the wing, so some of the old birds must have laid about the latter end of July. On October 6th, when leaving the locality, I saw other birds were just beginning to breed. These observations are borne out by Mr. Murray, the owner of Warrabra station, a good observer, who says the Lorikeets nest in batches from July to January, or as the different kinds of gum come into flower. Other persons have seen them nesting in December. I could not ascertain if they nested twice in the year. My own impression is that they do."

Again, writing later (1st January, 1896), Mr. White says:—"I send you another clutch of four eggs (very uncommon to get the quartet) taken by Mr. M. Murray, near Stone Hut, Flinders Range, 25th May, 1895. I have a clutch of three taken on the 3rd May."

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469.—GLOSSOPSITTACUS PUSILLUS, Shaw.—(450)

LITTLE LORIKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 54.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 71.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 104 (1865); North: Austn. Mus. Cat., p. 268 (1889).

*Geographical Distribution*.—Queensland, New South Wales, Victoria, South Australia, and Tasmania.

*Nest*.—Within a small hole of a branch or in the elbow of a limb of a tree.

*Eggs*.—Clutch, four; roundish or round oval in form; texture of shell fine; surface without gloss; colour, white, more or less stained by wood dust. Dimensions in inches of a pair: (1)  $\cdot75 \times \cdot62$ , (2)  $\cdot73 \times \cdot64$ .

*Observations*.—The chubby Little Lorikeet, the least of its tribe, is just a Musk Lorikeet in miniature, and enjoys a similar range of habitat. In addition to ravishing for food the flowers of the various eucalypts, it may often be seen threading, hanging sometimes head downwards, the slender branches of the mistletoe, feeding either upon the flower or fruit of that parasitical plant.

The Little Lorikeet is apparently fond of the company of the Musk Lorikeet, for I have observed mixed flocks flying. But I cannot surpass Gould's experience, pictured thus:—"During one of my morning rambles in the brushes of the Hunter, I came suddenly upon an immense *Eucalyptus*, which was at least two hundred feet high. The blossoms of this noble tree had attracted hundreds of birds, both Parrots and Honey Suckers, and from a single branch I killed four species of the former, viz., the Blue-bellied Lorikeet (*T. novæ-hollandiæ*) Scaly-breasted Lorikeet (*P. chlorolepidotus*), Musk Lorikeet (*G. concinnus*), and the Little Lorikeet (*G. pusillus*)." Truly in this instance it may be said that "Birds of a feather flock together." Gould succeeded in finding a nest of the Little Lorikeet, and on the 11th October, 1839, procured four eggs from a hole in a small branch of a lofty eucalypt growing on the flats at Yarrundi, on the Upper Hunter.

A nest I observed by a creek near Bagshot, Bendigo district, although comparatively low, was so awkwardly situated at the elbow of a thick limb that the cunning little birds were allowed to hatch out their eggs unmolested.

I possess a parallel to Gould's picture, above quoted, from Dr. W. Macgillivray, Western District, Victoria. Writing under date 15th December, 1895, he says:—"On a trip twenty miles out, which I made a month ago, I passed through a patch of blossoming gums alive with honey-eating birds, especially the Lorikeets, *T. novæ-hollandiæ*, *G. concinnus*, *G. pusillus*, and *N. discolor*."

Usual breeding season latter end of September to December or January.

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## FAMILY—CYCLOPSITTACIDÆ.

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### 470.—CYCLOPSITTACUS COXENI, Gould.

#### RED-FACED LORILET.

*Figure*.—Gould: Birds of Australia, fol., supp., pl. 65.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 94.

*Geographical Distribution*.—South Queensland and New South Wales.



*Nest and Eggs.*—Undescribed.

*Observations.*—Mr. Waller, of Brisbane, was the first collector to forward to Gould in England the two kinds of Australian Lorilets. Regarding the Red-faced species—scientifically named after Mr. C. Coxen, a brother-in-law of Gould and a member of the Legislative Assembly of Queensland, who was much interested in Australian ornithology—Mr. Waller wrote to Gould:—"The history of the bird, so far as I can learn, is, that during the month of June, 1866, it was shot by a sawyer near a mountain scrub, about thirty miles from Brisbane. The man states that he had seen a flock in the neighbourhood for some weeks, and had shot several for a pudding; being somewhat interested in ornithology, and observing a difference between them and the ordinary Green Parrakeet, he skinned three or four, two of which he brought me; the others were, unfortunately, destroyed."

While on my visit to the Richmond River scrubs, a single example of this pigmy Parrot was shot from a tall fig-tree. On account of their partiality for these trees, the bird is sometimes called the Fig Parrot.

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471.—CYCLOPSITTACUS MACCOYI, Gould.  
*C. macleayana*, Ramsay.

#### BLUE-FACED LORILET.

*Figure.*—Gould—Sharpe: Birds of New Guinea, vol. v., pl. 7.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 95.

*Geographical Distribution.*—North Queensland.

*Nest.*—Within a small hole in a tree in scrub or forest country, the eggs being usually deposited about one foot from the entrance.

*Eggs.*—Clutch, three to four; white at first, but become discoloured by the wood dust in the nest. An example in the Nehr Korn collection, from Cape York Peninsula, is round oval in shape, fine in texture, surface without gloss, and measures in inches  $\cdot 86 \times \cdot 7$ .

*Observations.*—This remarkable form of the Parrot family is peculiar to the scrubs of Northern Queensland. It is a short bird, and has a large rounded head furnished with powerful bill. There was a grand rush for priority of description of this new and interesting bird in 1875 by Dr. Ramsay and Gould in the "Proceedings of the Zoological Society," and Professor Sir F. McCoy in the "Annals and Magazine of Natural History." The veteran, Gould, won on the post, as sporting men say, naming the bird *Cyclopsitta maccoyi*. Dr. Ramsay's description of *C. macleayana* was actually first published in the "Sydney Morning Herald," November 15th, 1874, but in scientific circles newspaper reports do not count for priority, at least, that is the rule followed in the Zoological Catalogues of the British Museum.

In February, 1894, Mr. W. B. Barnard, after a northern tour, forwarded me some interesting field notes, including one referring to this Lorilet, with a skin for identification. Two nests were found in small holes in trees, at a height of about forty feet from the ground; the eggs were deposited about a foot downward from the entrance. The birds were discovered breeding in the scrub and forest country alike, from September to November.

During my own Cardwell camp-out (1885) we procured skins of the Blue-faced Lorilet.

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FAMILY—CACATUIDÆ: COCKATOOS.

SUB-FAMILY—CACATUINÆ.

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472.—MICROGLOSSUS ATERRIMUS, Gmelin.—(404)

PALM COCKATOO.

*Figure.*—Gould: Birds of Australia, fol., supp., pl. 61.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 103.

*Previous Descriptions of Eggs.*—Ramsay: Proc. Linn. Soc., N.S. Wales, vol. viii., p. 27 (1883); Keartland: Victorian Naturalist (1897); Le Souef: Ibis, p. 56 (1898).

*Geographical Distribution.*—North Queensland; also New Guinea, Aru Islands, &c.

*Nest.*—The hollow branch or bole of a tree.

*Eggs.*—Clutch, one usually; round oval in shape; texture somewhat coarse, or granulated; surface has a slight trace of gloss, also a few limy nodules; colour, white. Dimensions in inches of single examples: (1) 2.16 × 1.58, (2) 2.05 × 1.5.

*Observations.*—This giant amongst Cockatoos is found in the palm scrubs of Cape York and adjacent islands.

The following is an interesting and original note on this species from Macgillivray to Gould:—"This very fine bird, which is not uncommon in the vicinity of Cape York, was usually found in the densest scrub among the tops of the tallest trees, but was occasionally seen in the open forest land, perched on the largest of the *Eucalypti*, apparently resting on its passage from one belt of trees or patch of scrub to another. Like the *Calyptrorhynchæ*, it flies slowly, and usually but a short distance. In November, 1849, the period of our last visit to Cape York, it was always found in pairs, very shy, and difficult of approach. Its cry is merely a low short whistle of a single note, which may be represented by the letters 'hwet-lweet.' The stomach of the first one

killed contained a few small pieces of quartz and triturated fragments of palm cabbage, with which the crop of another specimen was completely filled; and the idea immediately suggests itself, that the powerful bill of this bird is a most fitting instrument for stripping off the leaves near the summits of the *Seaforthia elegans* and other palms to enable it to arrive at the central tender shoot."

A field note from Mr. Harry Barnard to Mr. Le Souëf stated that these birds nest in the forest country of Cape York. They have a singular habit of breaking off, with the aid of their powerful bill, green twigs about the thickness of a man's finger, stripping them of their leaves, and dropping the bare twigs into the nesting hole. The birds then bite the twigs into pieces about two or three inches in length. One nest in particular, which Mr. Barnard examined in a large bloodwood (*Eucalyptus*) stump, had the bottom of the hole covered to a depth of about four inches with the portions of sticks. With regard to the use of this bottom lining, Mr. Le Souëf suggests a feasible explanation, that, as the birds breed from November to March—the rainy season,—and as the nesting holes are usually in upright trunks which would catch much rain, the "dunnage" of sticks would keep the egg or young off the damp rotten *debris* at the bottom of the hole.

Unfortunately, Mr. Barnard did not secure eggs. The holes he was "shepherding" during his stay at Cape York, were for some reason or other deserted by the birds.

The egg Dr. Ramsay originally described was obtained in New Guinea, and was taken from the wood *debris* in a hole at the height of twenty-five feet from the ground. A bird was seen to fly from the nest, and when shot, proved to be the female.

Mr. G. A. Keartland received the first authenticated egg of the Palm Cockatoo, taken on the mainland at Cape York, February, 1897, which is the example he kindly permitted me to use in my description given above.

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**473.**—CALYPTORHYNCHUS BAUDINI, Vigors.—(403)

WHITE-TAILED COCKATOO.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 13.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 106.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848); also Handbook, vol. ii., p. 26 (1865); Le Souëf: Victorian Naturalist, vol. xvi., p. 102 (1899).

*Geographical Distribution.*—South-west Australia.

*Nest.*—A hole in a tall karri tree, or other eucalypt, in a retired part of a forest.

*Eggs.*—Clutch, two; colour, pure white. Average dimensions in inches: 1.75 × 1.37 (Gould).

*Observations.*—The Baudin or White-tailed Black Cockatoo of the west, is a splendid representative of the Funereal Cockatoo of eastern forests. I shall never forget a pretty scene I witnessed one morning at Deep Dene, in the Cape Leeuwin District. There was a flock of between twenty and thirty of Baudin Cockatoos extending their wings, ducking their heads, and disputing for the uppermost places on the topmost dead branches of a low gum-tree. I was so near that the prominent white ear coverts and white barred tails showed up to the utmost advantage, and the birds seemed more lively than the other members of the same genus I had seen in other parts of Australia.

The principal breeding months for this species are October, November and December.

In Mr. Le Souëf's reference above given, he states that "Mr. Bruce Leake (West Australia) found a nest of the White-tailed Cockatoo on the 28th August, 1898. It was situated in a hollow spout of a limb, thirty feet from the ground, that had broken off close to the trunk and was partly overgrown, the two eggs being laid on the decomposed wood at the bottom. The birds had used the same nesting site for several seasons. The eggs are dull white, slightly granulated, and with a few small excrescences; in shape, oval, and measure (1)  $1.79 \times 1.3$ , (2)  $1.77 \times 1.26$  inches."

Mr. Le Souëf further mentions that the nesting season is August and September, as against Gould's (*i.e.*, Gilbert's) observations that October and December are the breeding season.

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**474.**—*CALYPTORHYNCHUS FUNEREUS*, Shaw.—(401 and 402)  
*C. xanthonotus*, Gould.

### BLACK COCKATOO.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 11 and 12.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 107.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 21 (1865); North: Rec. Austr. Mus., vol. ii., p. 18 (1892).

*Geographical Distribution.*—South Queensland, New South Wales, Victoria, South Australia, Tasmania, and King Island.

*Nest.*—A hole usually in the trunk of a large eucalypt, situated in almost inaccessible forest tracts.

*Eggs.*—Clutch, two; roundish oval in shape; texture of shell coarse; surface slightly glossy, and with occasionally a few liny excrescences. Dimensions of single examples: (from mainland)  $1.93 \times 1.45$ , (from Tasmania)  $1.9 \times 1.5$ ; of a proper pair in the Hobart Museum, taken from a stringy-bark (eucalypt), on the Western Tier, 25th January, 1897: (1, a pointed oval)  $1.91 \times 1.4$ , (2, a more regular oval)  $1.89 \times 1.42$ .

*Observations.*—This large and exceedingly fine Black Cockatoo, easily distinguished by its yellow-barred tail, is a lover of the wild timber tracts and mountainous regions of Eastern Australia, more particularly the southern part, and Tasmania. During the expeditions of the Field Naturalists' Club to Bass Strait, the birds were seen in the blue-gum forests of King and Flinders Islands.

The late Mr. H. W. Wheelwright mentioned once having shot a female Funereal Cockatoo in May, with an egg in her. In the olden days (the fifties) these birds used chiefly to frequent the banksias, but often the large gums, in the neighbourhood of Mordialloc. They first came in flocks, but as winter advanced they appeared to separate.

Another "Old Time Memory" note by Mr. Isaac Batey, Sunbury, Victoria, reads thus:—"The yellow-tailed Black Cockatoo, a bush barometer for storms up country in the old times, used to trace the creeks after wattle grubs. About 1849, a pair of *red-tailed* Cockatoos visited this place, the only instance I know of these birds having done so, one of which my father succeeded in shooting after an incredible deal of trouble."

A large flock of Funereal Cockatoos were seen in the Mallee district of Victoria, in the winter of 1897. Another flock was noticed in October, 1898, while in September, 1899, I noticed a small number myself.

The eggs of the Funereal or Yellow-eared Black Cockatoo are extremely difficult to procure, for the reason that the bird seeks a tall rotten tree in the most inaccessible parts of the forest wherein to nest. In Gould's day he experienced the same difficulty in obtaining examples. On the 2nd February, 1839, he received a note from a correspondent in Tasmania, which ran as follows:—"In compliance with your request I wrote to Mr. Wettenhall upon the subject of the Black Cockatoo's nest, and he forthwith directed his shepherd to fell the tree in which the bird had established itself. It was situated in a gully, and was about  $4\frac{1}{2}$  feet in diameter. The hole was from ninety to one hundred feet from the ground, two feet in depth, and made quite smooth, the heart of the tree being decayed. There was no appearance whatever of a nest. The tree was broken to pieces by the fall, and the contents of the hole or nest destroyed; the fragments, however, were sought for with the greatest care, and all that could be found are sent you. It may perhaps be as well to state that both while the tree was being felled, and for a short time afterwards, a Hawk kept attacking the Cockatoo, which flew in circles round the tree before it fell, uttering its loudest and most mournful notes, and at times turning upon the Hawk, until at length it flew off."

Another correspondent informed Gould that this bird "lays two white eggs in some large rotten gum-tree, generally where one of the large branches has rotted off at the fork; inside this hole, which occasionally extends five or six feet down the bole of the tree, the bird scrapes and clears away some of the rotten wood until a sort of seat is formed, for it is a very rude attempt at making a nest. The laying commences about the latter end of October, or beginning of November. The bird, which at other times is very shy and wild, now becomes very

tame; and I have known an old bird to perch herself quietly close to me, while I have been examining the hole beneath, which contained her eggs. When the young are hatched, both the old birds go to the adjacent grounds for a supply of food, which generally consists of the seeds of some leguminous plant, and, having filled their crops and throats, they both return, when one of them commences feeding one young, and the other attends to and feeds the second. The young birds eat an immense quantity of seeds, and are very soon able to leave the nest; but the old ones continue to feed them for some time longer. They utter a very peculiar low, continued, plaintive, screeching cry when hungry. As the old birds disgorge the food and push it into the mouth of the young, they make a very curious noise, sounding like 'chucka, chucka,' rapidly repeated."

The following are more recent Tasmanian notes which have been kindly forwarded to me:—

Mr. A. E. Brent states that in 1884 he found a Fumereal Cockatoo's nest containing only one fresh egg. There was no chance of his returning to the locality for the completed clutch, so he decided that one egg in the hand was worth two in the bush, and took it.

Mr. Percy Grubb (Longford) writes to say that he found a nest on 8th February, 1896, containing a young Fumereal Cockatoo. The nest was the dead part of the top of a tree, at a height of about seventy feet from the ground. The depth of the hole was twenty-five inches, diameter of entrance eighteen inches. On the principle that "half a loaf is better than no bread," Mr. Grubb took half an egg shell which was in the nesting hole and placed it in his collection.

Mr. Leo Burbury, in January, 1896, took a nest containing a pair. This is supposed to be the first (?) full set ever taken in Tasmania.

Mr. A. E. Brent, on the 8th January, 1897, discovered another nest of this species, and made interesting observations on the habits of the birds. He says:—"For about three weeks, when the female is sitting, I discovered that the male would go to the nest three times a day—at morn, noon, and night—and was most regular. I would find myself standing, watch in hand, looking for him regularly every day for several days, and found that his times never varied more than seven minutes. To ascertain his reasons, I went to the nest at night, and crept, without disturbing the sitting bird, to a spot from where I could see all that went on, and waited. After some time, the old bird's cry would be heard in the distance, and at the same time the female's head would appear at the hole, and she would answer him with a small scream, and would repeat in answer to him as he drew near. As soon as he appeared in sight she would fly out and settle on a dry branch, meeting him there, and after the usual greeting he would sit and feed her for fully ten minutes, just as if she had been a young bird. After this she would sit and preen her feathers for a time, and then return to the nest, always entering the hole tail first. This performance I witnessed for several days."

At Coomoboolaroo, Queensland, Mr. Barnard's sons took a nest in June, 1884, with two eggs, which were deposited in the tree six feet below the entrance to the hole. Another, with young, was taken July

following. The season previous they took a young bird from the nest that contained the two eggs. Again, a few seasons later, Mr. Barnard writes:—"Last month (May, 1891), when the boys were out camping, they found four nests of Black Cockatoos—two of the Funereal and two of Leach's—but, unfortunately, only one egg in each (rather too early), and owing to the continued wet weather they were unable to go again for a fortnight, and then had to walk the ten miles. This time they got one nest only. It was the Funereal species, one they had robbed before in the trunk of a gum-tree. To get the nest on the previous occasion the boys had to cut a hole about six feet below the entrance. This time they found the bird had filled the aperture by biting away the inside of the trunk and letting the *debris* settle down to a solid foundation, reaching six inches above the cut opening, and whereon the two eggs were placed."

In communicating the same intelligence to another correspondent, Mr. Barnard added that the nests were all within a mile of each other, and were in hollow boughs of lofty eucalypts. Those of the Funereal Cockatoo were from thirty to forty feet from the ground, and deep down in a hollow trunk, while the nests of Leach's were from seventy to ninety feet from the ground, and the eggs could almost be reached from the entrance.

A correspondent, writing to "The Argus," 17th July, 1890, states: "When at Cambridge Downs, Northern Queensland, in 1885, I happened to be galloping through some timber after horses, and I noticed a Black Cockatoo fly out of an old stump about twenty feet high. I climbed the tree and got one egg, which proved to have a young one in it, but, nevertheless, I managed to save it. The old bird had yellow bars on the tail feathers."

The last find of a Funereal Cockatoo's nest is probably the most interesting. It is in connection with a pair of eggs in the collection of Mr. D. Le Souëf, taken in the Wimmera district of Victoria, 25th February, 1896, by Mr. John L. Minogue. The nest was fifty or sixty feet from the ground, in a straight, dry red gum, the trees usually chosen for breeding purposes in that district. The bird was seen to fly out of the nesting hole. The collector stated that, as is always the case, there is an interval of one week between the laying of each egg, consequently one young bird is hatched before the other, the last generally dying soon after leaving the shell, possibly having no chance in the race for life with its larger nest-fellow.

Mr. James Edgar, of Pine Hills, Harrow, Victoria, had a Funereal Cockatoo in captivity for two years, which could talk and whistle. The bird was difficult to rear, taking fits, which were cured by Epsom salts. Otherwise, it was apparently well, excepting that the feathers never grew properly, or rather the bird chewed them off. Probably there was something wanting in its food, which consisted of bread and milk, rice pudding, &c. It would eat nothing else.

The breeding months of the Funereal Cockatoo would appear to be May, June, and July, in Queensland, and October to January or February in the south.

With regard to the exceedingly doubtful species, *C. xanthonotus*, supposed to be peculiar to Tasmania, Dr. Ramsay is of opinion that it is nothing more than an insular variety of *C. funereus*, while Count Salvadori states "Although I have kept this species (*C. xanthonotus*) separate from the preceding one (*C. funereus*), I am not all sure that I am justified in so doing, as there is the most perfect gradation between the two forms."

*C. xanthonotus* is exactly like *C. funereus* in colouring, but is smaller in its dimensions, and as both sizes have been found in Tasmania and on the mainland, I have deemed it simpler to treat them as one.

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475.—CALYPTORHYNCHUS BANKSI, Latham.—(397)

BANKSIAN COCKATOO.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 7.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 109.

*Previous Description of Eggs*.—North: Victorian Naturalist (1896).

*Geographical Distribution*.—Queensland, New South Wales, Victoria, and South Australia.

*Nest*.—A hole in, or hollow limb of, a large tree, usually near a river.

*Eggs*.—Clutch, usually one; long oval in shape; texture of shell coarse, especially about the apex; surface without gloss, minutely pitted, and sometimes with a few limy nodules. Dimensions in inches of single examples: (1) 2.19 × 1.5, (2) 2.03 × 1.34.

*Observations*.—This splendid Banksian Black Cockatoo enjoys a range of habitat extending down Eastern Australia. Gould has mentioned the bird as being a native of Victoria, but, by some oversight, the species is omitted from the column for that State in his "Table of Distribution;" nor is the important bird credited to Victoria in Dr. E. P. Ramsay's "Tabular List."

The late Mr. H. W. Wheelwright stated he knew of two specimens of Black Cockatoos that were killed in the district of Melbourne in the early "fifties," that had "the tail feathers spotted with red." No doubt they were Banksian Birds. The late Mr. T. A. Forbes-Leith, in his treatise, "The Parrots of Victoria," states that at one time the Banksian Cockatoo "was common enough in the interior of Victoria," while I myself saw a small flock of these fine birds in the Wimmera district (1882). They were engaged nipping off the tender tops of a tree, leaving the branchlets scattered on the ground below.

Although the Banksian was one of the first Black Cockatoos known to ornithologists, its egg was one of the last to be described. The first



authenticated egg was exhibited by my friend, Mr. Joseph Gabriel, at a meeting of the Field Naturalists' Club of Victoria, held 12th August, 1895. When he first procured the rare specimen he brought it to compare with those of the other varieties of Black Cockatoos in my collection, but, probably believing I had enough matter on new eggs ready for the printer, he kindly allowed Mr. A. J. North, during a visit to Melbourne, to describe the specimen in our home journal, "The Victorian Naturalist."

Mr. W. H. Watson (Mr. Gabriel's collector) took two eggs in the western district of Queensland about the 1st of May and June, respectively (1895). Both nesting places were in large hollow limbs of eucalypts overhanging the river. In both instances the fine black birds were observed to fly from the nest. At one time Mr. Watson used to manage Cultowa station, on the Darling River, where he noticed many nests of this Cockatoo, generally in the biggest trees in the river bends, and although he examined about a dozen nests in New South Wales and Queensland, he never found more than a single egg or one young bird in any of them.

Another correspondent, possibly referring to the same species, states:—"Their nests may be found in the hollows of the tallest gum-trees on the River Darling, from Wilcannia to Bourke; but their greatest camping place is about Nelyambo, Buckanby, and Kalara. Nesting time, July, August, and September. The young are very difficult to rear, and very noisy."

Referring to the Banksian Cockatoo in the Bloomfield district, Northern Queensland, a note by Mr. D. Le Souëf, under date the end of October, 1896, states that one of these birds "had its nest near by, with a nearly fully-fledged young one in it. The parent birds left their fledgeling in the morning, and did not return to it until the evening. As the tree in which the nest was close to the house, Mr. Cochrane was enabled to keep the bird under his observation, and observed the fact stated. The birds, apparently, only lay one egg, as in the four nests that I have heard of such was the case. Mr. Hislop knew of another nest, and was waiting until the young bird was old enough to take, but the natives, forestalling him, took the young bird and ate it."

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476.—*CALYPTORHYNCHUS MACRORHYNCHUS*, Gould.—(398)

#### GREAT-BILLED COCKATOO.

*Figure*.—Gould: *Birds of Australia*, fol., vol. v., pl. 8.

*Reference*.—*Cat. Birds Brit. Mus.*, vol. xx., p. 110.

*Geographical Distribution*.—North-west Australia, Northern Territory, and North Queensland.

*Nest and Eggs*.—Undescribed.

*Observations.*—The Great-billed Black Cockatoo is a northern species. All the specimens that came under Gould's notice were collected in the Port Darwin District, probably by Gilbert.

Amongst the mountains and hills near our camp at Cardwell were some of these fine Cockatoos, at least, we took them to be the variety at present under consideration. They were exceedingly shy, and we only procured a pair. The male was an exceedingly handsome bird, fully twenty-two inches in length, with a beautiful broad band of scarlet across the tail feathers. The female differed in having a few light-coloured spots over her dusky plumage, with a mixture of yellow in the scarlet band of the tail.

When exploring in the far north, Mr. O'Donnell flushed a Black Cockatoo from its nest in a low hollow tree. The bird was, most probably, this Great-billed species.

During the Calvert Expedition, early in November (1896), young birds were taken by the natives from the spouts of the eucalypts on the Margaret River.

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**477.**—CALYPTORHYNCHUS STELLATUS, Wagler.—(399)  
*C. naso*, Gould.

#### RED-TAILED COCKATOO.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 9.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 111.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 17 (1865); North: Aves, Report Horn Scientific Expedition, p. 59 (1896).

*Geographical Distribution.*—West, North-west, and Central Australia, and probably Northern Territory.

*Nest.*—A hole, where the eggs are deposited on the soft decayed wood within, of a tall tree in forest or by stream.

*Eggs.*—Clutch, one usually, two occasionally; oval or inclined to an ellipse in form; texture of shell coarse; surface has faint trace of gloss; colour, pure white. Dimensions in inches of typical examples: (1) 2.06 × 1.44, (2) 2.05 × 1.42; but a fine series in Mr. G. A. Keartland's collection varies from 2.16 × 1.57 to 1.82 × 1.32.

*Observations.*—This fine Cockatoo is the Red-tailed species of the great western and interior territory. I had opportunities of seeing these sombre-coloured birds at home in the forests of karri and jarrah, in fact, I saw a bird emerge from a nesting hole of a locally so-called red gum. How I wished I could climb the tree and thrust my hand into the hole for an egg! But to reach the spot was beyond my ability, and there were no natives near.

The eggs Gilbert collected for Gould were taken by a native from a hole in a very high gum-tree, in the last week of October.

The Horn Scientific Expedition found the Red-tailed Cockatoo plentiful in the interior. Mr. G. A. Kearland states the first specimen shot was by Mr. Horn, at the Goyder Well, on 15th May (1894), the most southern point at which these birds were known to be found. Judging by the young ones shot, the breeding season was evidently just over, for at Trickett's Creek they were numerous and flocking. It was ascertained that they breed in the spouts of the eucalypts along the Finke, Todd, Hale, and Palmer Rivers, usually late, or probably according to the season.

Eggs taken the following season (1895) reached Mr. Kearland and other collectors, one pair being taken on the 12th March.

The specimen in my collection, a gift from Mr. C. French, junr., was received from the same quarter (1896), therefore the Red-tailed Cockatoo would appear to be a constant breeder in the interior parts.

Breeding season, October to March, or later.

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478.—*CALYPTORHYNCHUS VIRIDIS*, Vieillot.—(400)

*C. leachii*, Wagler.

GLOSSY COCKATOO.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 10.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 112.

*Previous Descriptions of Eggs*.—Campbell: Southern Science Record (1883), also Nests and Eggs Austr. Birds, pl. 2, fig. 400 (1883); North: Rec. Austr. Mus., vol. i., p. 115 (1891).

*Geographical Distribution*.—Queensland, New South Wales, Victoria, and South Australia.

*Nest*.—A hole in or hollow bough of a tree.

*Eggs*.—Clutch, one to two, usually one; roundish oval in shape; texture of shell coarse; surface has faint trace of gloss, and occasionally limy nodules; colour, white. Dimensions in inches of single examples: (1) 1.62 × 1.27, (2) 1.54 × 1.27.

*Observations*.—This species is the smallest of the Black Cockatoos. In the male bird the broad band of scarlet, which is seen on the tail when expanded, is exceedingly beautiful and striking. With regard to the nidification of the Leach Cockatoo, Gould merely states that "It lays two eggs in the holes of the trees." It was not until 1883 that I had the pleasure of first describing a specimen, which I received from the discoverer, Mr. E. H. Lane, of Wambangalang, near Dubbo, New South Wales. During March, April, and May, 1880, he found six nests, each containing but one egg or young. The nesting place was usually a few feet down from the entrance in the trunk of a eucalypt.

For further interesting notes of the nesting of the Leach, or Glossy Cockatoo, I am indebted to the late Mr. George Barnard, of Coomoooolaroo, Queensland, who at the time (June, 1891) informed me that his sons had found the previous month no less than four Black Cockatoos' nests, each with a single fresh egg. Two were the Glossy Cockatoo, the others the Funereal species. The nests of the former were from seventy to ninety feet from the ground, and the eggs could almost be reached from the entrance.

This interesting Black Cockatoo would therefore appear to be an autumn and winter breeder.

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**479.**—*CALLOCEPHALON GALEATUM*, Latham.—(405)

GANG-GANG COCKATOO.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 14.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 113.

*Previous Descriptions of Eggs.*—Kearland: Victorian Naturalist, vol. xv., p. 63 (1898); Le Souëf: Victorian Naturalist, vol. xvi., p. 102 (1899).

*Geographical Distribution.*—South Queensland, New South Wales, Victoria, Tasmania, and King Island.

*Nest.*—A hole or hollow in a tall tree in thick forest.

*Eggs.*—Clutch, four to five; round oval in shape; texture of shell somewhat coarse; surface without gloss; colour, pure white. Dimensions in inches: 1.31 × 1.08; according to Le Souëf: (1) 1.28 × .92, (2) 1.25 × .94.

*Observations.*—The Gang-Gang (a native name) Cockatoo is a singular species, ranging through eastern forests, but not in great numbers, from South Queensland to Tasmania. A specimen of this bird was secured on King Island, Bass Strait, during the expedition of the Field Naturalists' Club of Victoria, 1887. Probably the bird is nowhere more frequently met with than in the Snowy River district and other places in Gippsland. Its most westerly range is the Grampians.

Gould wrote long ago: "The paucity of information here given (in his Handbook) will, I trust, be a sufficient hint to those favourably situated for observing the habits of this species, that by transmitting an account of the number of its eggs, or other particulars respecting it, to any scientific journal, they would be promoting the cause of science, and adding to the stock of ornithological knowledge."

To this day we are very much in the dark about the Gang-Gang, especially in reference to its nidification. Of course, like most Cockatoos, it lays in holes in tall forest trees. The only egg I have seen

is a specimen which Mr. Keartland has kindly permitted me to re-describe from his collection, said to have been taken from the spout of a living eucalypt tree near Warragul, Victoria, 20th October, 1897.

The late Mr. Gregory Bateman informed me that he knew of an instance of five young Gang-Gangs having been taken from a nest in the Strathbogie Ranges.

The Gang-Gang has the reputation of being easily tamed. It is not unlike an African Parrot, with forehead, crest and cheeks scarlet.

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480.—CACATUA GALERITA, Latham. (391)

WHITE COCKATOO.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 1.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 116.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 4 (1865); North: Austr. Mus. Cat., p. 250 (1889).

*Geographical Distribution.*—Australia in general, Tasmania and King Island.

*Nest.*—A hole in a tree usually.

*Eggs.*—Clutch, two to three, occasionally four; elongated in form or tapering towards one end; texture somewhat coarse; surface glossy, and minutely pitted, with here and there a limy nodule; colour, white. Dimensions in inches of proper pairs: A (1) 2.04 × 1.28, (2) 1.94 × 1.24; B (1) 1.92 × 1.35, (2) 1.68 × 1.32.

*Observations.*—There is no more widely distributed species of Australian Cockatoos than the Great Sulphur-crested or White Cockatoo. It is really an imposing creature, about twenty inches in total length. Although the plumage is generally white, some of the underneath parts, such as the wings and tail, wear a slight yellowish tinge. The beautiful crest or top-knot, which can be erected at will, is pure yellow. The whole of the light-coloured plumage is enhanced by powerful, abruptly-curved black bill and black eyes, while the short feet are greyish in colour. The harsh, discordant screech of these birds grates terribly on one's ear; but it is a beautiful sight to see their snowy forms crowded upon a tall eucalypt, or in more northern forests to witness them clinging on to and feeding on the bunches of seeds upon the stems under the frondage of elegant palms. The White Cockatoos which I observed in the northern scrubs possessed, as a rule, more powerful bills than those in southern parts. Perhaps, as Gould remarked, the difference in the size of the mandibles may be according to the kind of localities the birds have to search for their particular food.

Gould says the White Cockatoo sometimes places its eggs in fissures of rocks wherever they present a suitable site, and that the crevices

of the white cliffs bordering the Murray River, in South Australia, are annually resorted to for this purpose by thousands of these Cockatoos, the cliffs being completely honeycombed by them. I have questioned many masters of the river steamers, as well as old trappers, and they have no knowledge of the Cockatoos resorting to the locality described, excepting Captain F. C. Hansen, who believes some of the birds still lay there, because he has seen them in the neighbourhood, and has also seen Galahs going in and out of the holes.

The long defunct Werribee tribe of aborigines called the White Cockatoo "Ny-euk."

Usual breeding months August to November, but in some parts of Queensland they lay as early as June and as late as January. White Cockatoos were found breeding in the red-gums on the course of the Wimmera River, above Lake Albaeutya, Victoria, about the middle of October, 1898. The eggs (a pair in each case) were nearly incubated.

"Up a Tree," as we Australians say, would perhaps have been a better motto for Mr. Le Souëf's picture of Mr. Harry Barnard "Taking a White Cockatoo's Nest." (See illustration.)

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#### 481.—CACATUA LEADBEATERI, Vigors.—(392)

##### PINK COCKATOO.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 2.

*Reference.*—Cat. Birds Brit Mus., vol. xx., p. 123.

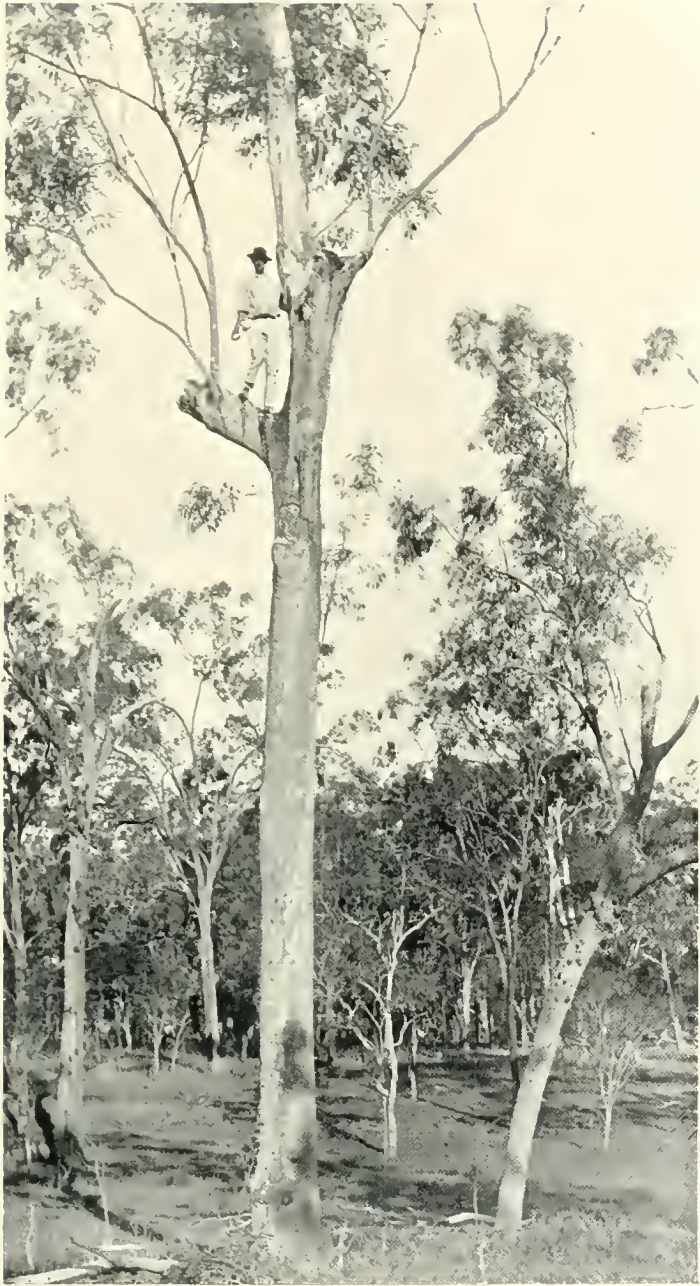
*Previous Descriptions of Eggs.*—Campbell: Southern Science Record (1883); North: Austr. Mus. Cat., p. 251, pl. 14, fig. 2 (1889).

*Geographical Distribution.*—Interior of Australia in general.

*Nest.*—Within a hole of a tree, sometimes in trees standing in water.

*Eggs.*—Clutch, two to four; roundish in shape, slightly more compressed at one end; texture of shell comparatively fine; surface slightly glossy; colour, pure white. Dimensions in inches of proper clutches: A (1) 1.48 × 1.04, (2) 1.42 × 1.11, (3) 1.41 × 1.11; B (1) 1.58 × 1.09, (2) 1.5 × 1.08, (3) 1.48 × 1.08.

*Observations.*—Besides being highly prized as an aviary bird, this Cockatoo is undoubtedly the most elegant and handsome of its kind. What person has not admired its general white plumage, so delicately and beautifully tinted with rose-colour? The roseate hue is more pronounced on the forehead and portions of the underneath parts. Each feather of the crest, when erected, shows crimson, with a spot of yellow in the centre, and is tipped with white. The bill is a light horny colour, and feet dark-brown, and, if I remember rightly, the lovely eyes are ruby-coloured.



TAKING A WHITE COCKATOO'S NEST.

*From a Photo by D. Le Souef.*





Inland, from east to west of the southern part of Australia, this most beautiful Cockatoo is found. The bird is not unfrequently called Major Mitchell's Cockatoo, or the "Weejuggler" of bushmen. I well remember the first time I saw the bird in the open. I was duck shooting, along the Lower Murray, when one alighted on a tall dead stump in the centre of a lagoon, where, with noisy voice, it displayed its "pink coloured wings and glowing crest."

How an explorer's journeyings in the dreary desert must be enlivened at times by the appearance of these glorious birds! and evidently the Pink Cockatoo is a lover of the desert, for during the Calvert Expedition in the North-west, Mr. Keartland noted that the birds were only found in the desert, where morning and evening they were observed flying to and from water, or feeding on the bushes and ground. They were usually in pairs, and were seldom missed near the native wells. The birds, however, proved very shy, and flew round several times to see that all was safe before alighting.

From Mr. A. J. North we learn that Mr. K. H. Bennett found this handsome bird breeding plentifully in the interior of New South Wales, between the Lachlan and Darling Rivers, resorting usually to lofty eucalypts for the purpose. In Victoria, the timber standing in Lake Leaghur, off the Loddon River, used to be a favourite breeding locality for the Pink Cockatoo.

More recently (middle of October, 1898) Dr. Charles Ryan, Mr. Charles French, junr., and my son found Pink Cockatoos breeding on the edge of Pine Plains, North-western district of Victoria. The nests examined had either newly-hatched young or eggs nearly incubated. One nest was only about ten feet from the ground, in the hollow top of a dead pine stump.

I heard of the eggs of this Cockatoo being taken in the neighbourhood of Cooper's Creek, in June (1889). It is probable that the usual breeding season is the same as that of the White Cockatoo.

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#### 482.—CACATUA GYMNOPIA, Sc Slater.

##### BARE-EYED COCKATOO.

*Figure*.—Gould—Sharpe: Birds of New Guinea, vol. v., pl. 46.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 127.

*Geographical Distribution*.—Interiors of Queensland, New South Wales, and South Australia.

*Nest*.—A hole or hollow in a tree.

*Eggs*.—Clutch, four; roundish in form; texture somewhat coarse; surface glossy and minutely pitted; colour, white. Dimensions in inches of a pair from the Barrier Range (New South Wales): (1) 1.5 × 1.18, (2) 1.45 × 1.12.

*Observations.*—Previously I had got somewhat astray about the distribution and the eggs of this interesting Cockatoo. I now believe the birds mentioned by me in the "Proceedings of the Royal Society" (1890) were referable to the Western Long-billed species (*Licmetis pastinator*). During my visit to Western Australia I examined one or two caged birds which had not the lengthened upper mandible, therefore, without further proof, I mistook the birds for the Bare-eyed species. However, I believe it is a fact that some of the Western Long-billed birds in their native state possess shortened or rounded upper mandibles, caused by continual use in procuring certain kinds of food.

The Bare-eyed Cockatoo takes its name from the *bluish* patch of naked skin round the eye, which place is *whitish* in the Blood-stained Cockatoo, and it is the larger bird of the two. I inadvertently transposed the colours when describing some eggs before the Field Naturalists' Club of Victoria, last year. Although I have given a somewhat general distribution for the Bare-eyed Cockatoo, the only actual place I know where it exists is the region of the Barrier Range, on the borders of New South Wales and South Australia. But according to Dr. Sharpe it was the species found by Captain Sturt, the explorer, in immense flocks at Depôt Creek, Central Australia.

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483.—CACATUA SANGUINEA, Gould.—(393)

BLOOD-STAINED COCKATOO.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 3.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 128.

*Previous Description of Eggs.*—Campbell: Victorian Naturalist (1893).

*Geographical Distribution.*—Northern Territory, Queensland, New South Wales, South, West (?), and North-west Australia.

*Nest.*—In a hole in a tree; sometimes in timber standing in a lagoon or swamp.

*Eggs.*—Clutch, three to four; oval inclined or roundish in shape; texture of shell somewhat coarse; surface glossy, in some examples rough, with limy nodules; colour, white. Dimensions in inches of a clutch from Cooper's Creek (South Australia): (1) 1.44 × 1.08, (2) 1.4 × 1.07, (3) 1.33 × .98; of a pair from the Gulf of Carpentaria district: 1.6 × 1.14, (2) 1.45 × 1.09.

*Observations.*—The Blood-stained Cockatoo is a dweller of the interior, especially the great northern plains, where in some favourite localities it may be seen in thousands in a flock. This interesting little bird is also gregarious throughout the breeding season.

The first eggs of the Blood-stained Cockatoo that reached my collection were taken in the interior, 1884, by Mr. A. A. D'Ombraïn.

Mr. Herbert Kenny, while at Cooper's Creek, wrote me: "At times the Blood-stained Cockatoos are to be seen in immense flocks. In the season you may see the blacks bringing home their dilly bags full of eggs and young ones of all sizes, from those just out of the shell to fully-fledged ones." Mr. Kenny sent me a set of eggs with the following interesting data:—"Eggs of Blood-stained Cockatoo taken from gun-tree in Innamincka water-hole, Cooper's Creek, within a few yards of spot where Burke, the explorer, perished. The nest contained four eggs, which varied in size. Taken 17th August, 1890. Saw blacks with eggs latter end of July."

Far north Blood-stained Cockatoos resort to the holes of the coolbar, or flooded box (a species of eucalypt), the principal tree in the district. After a certain age the young are left during the day, and are fed at evening, when the congregation of birds returns from the plains. The young are then fed in the usual Cockatoo manner, by the parent birds pumping half-digested food from their crops into the young ones' mouths.

Here follows Mr. Price Fletcher's most graphic description of the Blood-stained Cockatoo at home, written for "The Queenslander," (1878):—"These Lesser Corellas are useful as water finders, as stated in my previous paper on water-finding birds. I have a particular affection for them, as I once found a large hole and a fine piece of country through them. I was travelling up a creek in what was then unknown land; it is some years ago now, and the scene I am about describing has vanished before those more utilitarian occupants, sheep and cattle. The season was dry, there had been no winter rains, and I was hunting for water. I had followed up the creek until I thought I was at the last water, and had camped; the creek here split into two feeders, both had heavy timber on, and ought to have had water, yet I had followed one branch for some seven miles, and had to return without finding any; the creek got drier and drier, more stony and less likely to hold. I was dispirited, for the other branch I had also gone up three miles, and it seemed of the same character; and my horses being tired, and night closing in, I had returned to my present camp. It was at a wretched little dirty puddle, and, not having found any water for many miles down the creek, as well, I had determined to give up further search; when just at sundown a very large flock of these Corellas came flying by me and up the creek, and to my surprise went along the very branch I had travelled up so far. Knowing so well the habits of these birds, and that they rejoiced in making a 'camp' or roosting place at the top-water of a creek, I was delighted, for I knew that at this time of day they were not going on to the plains to feed, but must be going to water and to roost. Intently and anxiously I watched that flock; I am sure I kept sight of them for five miles—not, indeed, really, but in this way: the sun was just setting, and the beautiful snow-white of their plumage, as they twisted and twirled in their flight, caught these setting rays and reflected the light like a flash from a moving mirror, and I kept

catching gleams of this white cloud long after the flock was otherwise undistinguishable; and they were still flying up the creek. This decided me, and I determined on the morrow to go after them until I found them. Very early dawn found me stirring; I had done the seven miles I had previously travelled by an hour after sunrise, and yet there were no signs of the birds. Another two miles, and the creek looked less and less likely for water; the channel was degenerating in size and depth, the timber was getting thinner and less continuous, and I began to think I had trusted too much to my presumed knowledge of the habits of my Corella friend. I felt dispirited; I had left camp without any breakfast (a very foolish thing for anyone to do, if he can help it, for there is nothing like a full stomach to give pluck), for water was bad, and anxiety had taken away my appetite. I was now nine miles from the morning's camp, the horses were thirsty, and the creek looked so unlikely that I was just upon the point of turning back when my eye caught the white gleams, so well known, of the birds' wings. It was a long way off, at least three miles up the creek, but there was no mistake, there were my friends of the night before. With great glee I urged on, and the gleam resolved itself into flocks, and the flocks into innumerable individuals. What strange white trees are those ahead? Surely they cannot be the Corellas on them: yes, indeed they are, a perfect forest of Cockatoos! My heart beat high with pleasurable excitement; visions of an interior lake, and a consequent happy homestead, rose before me, and I felt pleased that my trust in my feathered friends had not deceived me. Another halt, and my astonishment was indeed great; they were really trees ahead, and, instead of leaves, they were loaded with Corellas. What extraordinary numbers! Excitement made me quicken my pace from the usual explorer's walk to a canter, and I was rewarded by the sight of a fine hole of water and discovery of a veritable Cockatoos' haunt; *the home of the Corella!*

"Oh! the noise, the frightful noise, as I rode under the trees to the water's edge! What a babel of tongues, what incessant screeching, what a whirling, flying, moving mass of noise; 50,000 Cockatoos all screaming at once! Just for one moment try and realize it, reader, and you will involuntarily put your fingers to stop your ears. What incredible numbers; the air is white with them, the trees are white with them, and the ground round the edge of the water is white with them! I had seen Cockatoo 'holes' before, but never such a scene as this; it was evident I had hit upon a favourite haunt, and one in which they were not often disturbed, even by blacks. I determined to camp, if it was only to see the birds; but in half-an-hour they had all gone. . . . .

"About evening the birds began to return, and I determined to try and estimate their numbers; the task was not so difficult as at first sight it appeared, for the birds settle on the trees and remain quiet, with the exception of odd ones flying down now and again to drink. Well, I counted about 100 as they sat close together on the branches, then from that I estimated the number that were on half the tree, and made 750, double that is 1,500 on one tree; the trees

were much about the same size, and there were fifty of them occupied, that makes a grand total of 75,000; and besides that, a large flock had flown away to roost elsewhere. No wonder then that in my previous papers I said that I should, more than once, have to bring before my readers the extreme prolificness of life in these regions.

"Still this was an extra large flock; the water having dried up for so many miles around, had caused this enormous congregation. I never before or since saw anything like the present numbers. Living is easy work for them, for the plains are covered with a great variety of seeds of herbs and grasses, and besides these they also feed on the roots of various plants, which their long beaks enable them to dig up without difficulty."

Mr. Keartland reports that the Blood-stained Cockatoo, on the Fitzroy River (North-west), usually lays during August and September, and that in November the natives secure immense numbers of the nestlings, which they regard as excellent food.

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484.—CACATUA ROSEICAPILLA, Vieillot.—(394)

ROSE-BREADED COCKATOO (GALAH).

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 4.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 132.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 10 (1865); Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 53 (1882); North: Austn. Mus. Cat., pl. 14, fig. 3 (1889), also Trans. Roy. Soc., South Australia, vol. xxii., p. 163 (1898).

*Geographical Distribution*.—Australia in general.

*Nest*.—Within a hole in a tree, usually near or standing in water.

*Eggs*.—Clutch, four to seven, but usually five; round oval in shape; texture of shell comparatively fine; surface slightly glossy, occasionally with limy nodules; colour, pure white. Dimensions in inches of a pair: (1) 1.4 × 1.04, (2) 1.39 × 1.06; of a rounder pair: (1) 1.35 × 1.09, (2) 1.34 × 1.08.

*Observations*.—This lovely Cockatoo is distributed generally throughout Australia, especially in the interior provinces, where it may be seen at times in immense flocks. What an enchanting sight to witness hundreds of these birds on the wing, wheeling low, and simultaneously showing their silvery grey backs, then a flash of roseate-tinted under-surfaces!

Gould records that during the years 1839 and 1840 the Rose-breasted Cockatoo bred in considerable numbers in the holes of large gum-trees skirting the Nundewar Range, and afforded an abundant supply of young ones for the carriers and stock-men to transport to Sydney, where they were sold for a considerable sum, to be shipped to England.

The nesting places of the Rose-breasted Cockatoo or Galah are easily found, because the bark surrounding the hole is peeled off all round for some distance. Trees near the nest are often similarly marked by the birds. The young are fed by their parents long after the former have quitted their nests.

Captain F. C. Hansen (of the river steamer "Maggie"), a great lover of birds, informs me he has seen Galahs or Rose-breasted Cockatoos going in and out of the holes in the cliffs of the Murray between Morgan and the Victorian boundary. I suppose it cannot be possible that these are the birds referred to by Gould as the White Cockatoos!

Mr. J. F. Carmichael, Narlga, New South Wales, furnished me with a curious note of a pair of tame Galahs that got together portions of old paper, nested, and reared two young ones.

On the habits of birds coming to water, Mr. H. W. Ford has kindly sent me the following interesting remarks:—"The Galah comes in from sunrise for about two hours, same in evening from about two hours of sunset till near twilight. They fly right into water, settle round by thousands and drink, and then break up into flocks and fly away to feeding grounds or roosting. I look on the Galah as one of the best guides to water in Western New South Wales that a bushman can get. The Galah is never more than ten miles from water in summer, and usually less. Always goes to water morning and evening—up to two hours after sunrise and same before sunset. A person has only to watch these birds and direction of flight to find water at times stated."

During one of his periodical trips to the interior, Mr. W. Colenso noticed a hole where a Black Duck was nesting, about seventy feet from the ground, in a red gum-tree by a river. A pair of Galahs "jumped" the nesting-hole, and when it was examined, it was found that some of the Duck's eggs were of course smashed.

Among Mr. Keartland's North-west notes, under the heading of the Rose-breasted Cockatoo, one reads as follows:—"Near Lake Way these birds were first noted on July 13th; but a few days later Mr. Jones\* discovered two of their nests, from which he dislodged the birds. Subsequently, in crossing the desert, a number of other nests was found, and on October 15th Mr. Wells took three fledged young ones from a hollow tree on a sandhill. During February and March several nests, containing either eggs or young, were found near the Fitzroy River. It will thus be seen that these birds have not only a wide range in the north-west, but that their breeding time is equally extensive. The birds were found in great flocks at all waters, and were so tame that no difficulty was experienced in shooting a number for the pot, five or six frequently falling to one shot. When well stewed they form a very palatable dish."

Mr. T. Carter tells me these Cockatoos breed in holes in mangroves on the coast between Gaseoyne and Wooramel Rivers.

\*Subsequently during that terrible journey Mr. G. L. Jones, unfortunately, was lost, and perished from thirst.

485.—*LICMETIS NASICA*, Temminck.—(395)

LONG-BILLED COCKATOO (*CORELLA*).

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 5.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 133.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 11 (1865); Campbell: Southern Science Record (1883); North: Austr. Mus. Cat., p. 252, pl. 14, fig. 4 (1889).

*Geographical Distribution*.—Northern Territory, Interior Queensland (probably), New South Wales, Victoria and South Australia.

*Nest*.—At the bottom of a hole in a large gum-tree (eucalypt).

*Eggs*.—Clutch, one to four, but usually two or three; round oval in shape; texture of shell somewhat coarse; surface glossy; colour, pure white. Dimensions in inches of a pair: (1) 1.57 × 1.15, (2) 1.57 × 1.11.

*Observations*.—The Long-billed Cockatoo may be described as a bird of quaint appearance, possessing (as its name implies) a long, whitish-coloured bill,  $1\frac{1}{2}$  inches in length, and wearing a naked patch of bluish skin round the eyes. The general plumage is white, except a perceptible wash of yellow on portions of the underneath parts, which colour is not noticeable except on close inspection. There is also a small patch of red across the face; eyes light-brown. Total length of a specimen is between 16 inches and 17 inches.

This Cockatoo is chiefly an interior species of the eastern half of Australia, but it has been recorded in districts south of Melbourne. Years ago, thousands used to breed near the Murray River, exclusively in the red gum-trees (*Eucalyptus rostrata*), sometimes three or four nests in one tree. To the late Mr. Gregory Bateman, an accurate observer, who spent much time trapping amongst these feathered crowds, I have been indebted for most interesting notes.

The disappearance or the retirement towards the interior of the Long-billed Cockatoo or Corella is no doubt due to the depasturing of stock in the old haunts, the yam roots and the particular food plants of the birds being all destroyed.

If a pair of birds be seen perching on a single tree, one may be satisfied they possess a nesting-hole in the tree or in an adjacent one.

The young are mostly fed with the soft, larvæ-like seeds of a pelargonium or wild geranium. The birds usually go out in the morning from eight o'clock till eleven to feed upon the plain; and again from about five o'clock till dusk. Sometimes the young are heard being fed in the holes after dark. The Parrot tribe feed their young like Pigeons, by pumping up partly digested food into the young ones' mouths. To the uninitiated it would seem a very awkward business for the Corella, with its lengthened upper mandible, to feed its tiny squabs.

The Long-billed Cuckoo lays generally towards the end of August, incubation lasting about a month; and when the young are about five

weeks old, or about the first week in November, the birds are ready for the market. In the young, at first the pinkish skin shines through the down, which grows yellowish in colour and into a thicker covering before the feathers sprout.

It is stated, with some feasibility, that youthful birds lay clutches containing small numbers of eggs and occupy the lower trees or holes, while the older birds deposit the full complement of eggs in the largest and tallest timber.

I once examined in Mr. Chas. Fox's shop, Eastern Market, a hybrid between a Corella and a White Cockatoo, the progeny of a mated pair which was observed flying about in New South Wales. There were two young in the nest, one exactly like the White Cockatoo, and the other—an exceedingly fine bird—most resembling its Corella parent, but with a decided short crest, orange in colour, and with facial markings also orange, instead of red, as in the Corella.

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#### 486.—*LICMETIS PASTINATOR*, Gould—(396)

##### DAMPIER COCKATOO.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 134.

*Previous Descriptions of Eggs*.—Campbell: Proc. Roy. Soc., Victoria, vol. iii., new ser., p. 4 (1890), also Victorian Naturalist (1893).

*Geographical Distribution*.—West and North-west Australia.

*Nest*.—Usually a hole of a tree, or crevice of rock; but occasionally in an ant-hillock.

*Eggs*.—Clutch, three to four; oval or round oval in shape; texture of shell comparatively fine; surface glossy; colour, pure white, more or less stained with the dust of the nest. Dimensions in inches of a pair: (1) 1.63 × 1.15, (2) 1.52 × 1.14.

*Observations*.—"All ornithologists now admit that there are two species of the genus *Licmetis*; one inhabiting the western and the other the eastern portion of Australia. Living examples of both have been for some time in the menagerie of the Zoological Society of London, where their differences are far more apparent than in the skins which from time to time have been sent to this country" (Gould).

This species is probably the oldest known Australian Cockatoo, for when the navigator, Dampier, in August, 1699, was off the western coast, he saw birds flying from the mainland over to islands which form the Archipelago now bearing his name, and recorded there was a "sort of white parrot which flew a great many together." A correspondent on the western coast informs me the Cockatoos still fly "a great many together" in August and September to breed on the islands, where they nest in the holes and crevices of rocks. However, in the season of 1891, on account of the prevailing drought, they did not visit the islands as



usual. Near Point Cloates, the Western Long-bills are said by the natives to breed in numbers in the cliffs on the sea coast, where a water-hole is situated. Mr. Tom Carter has observed birds passing over from inland towards that direction. He also states they breed in numbers in the hollow stems of mangrove-trees on the islands in Exmouth Gulf.

The first authenticated eggs of this species were three in number, taken by Mr. Carter, on the 22nd September, 1888, from the hollow spout of a gum-tree on the Minilga River.

The birds would appear to be decidedly erratic in the choice of a situation for a nest, for about the beginning of October, 1892, some twenty-five miles inland, Mr Carter found the young of Western Long-billed Cockatoo in a hole within a large white ants' hillock, although gum-trees were fairly plentiful in the locality. On the 15th October, 1893, Mr. Carter took a full clutch of four eggs from a hollow tree on his station near Point Cloates.

Mr. Carter again wrote: "I was out last week and found a Cockatoo's nest with three eggs, beyond reach. I was out again with a bullock team, a few days after, carting timber, but something had sucked the eggs and killed the Cockatoo." No doubt an iguana was the culprit.

The chief breeding months are September and October, but like those of its western ally, may be said to extend from August to November. However, it is reported that young, in down, have been seen on the upper Murchison in April.

Mr. Woodward, F.G.S., informed me he had seen aborigines taking these Cockatoos from the hollows of flooded-gums (eucalypts) on Dalgety Creek, Gascoyne district, and I believe it must be the same species that frequents the islands in Nickol Bay. It is reported that Cockatoos are numerous on Picard Island, seven miles from Cossack, breeding in the rocks.

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SUB-FAMILY—CALOPSITTACINÆ.

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**487.**—CALOPSITTACUS NOVÆ HOLLANDIÆ, Gmelin.—(440)

COCKATOO PARRAKEET.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 45.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 135.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 85 (1865); North: Austn. Mus. Cat., p. 254, pl. 14, fig. 9 (1889).

*Geographical Distribution.*—Australia in general.

*Nest.*—On the dry wood dust within a hole or hollow of a tree, usually in open forest. Occasionally more than one pair of birds breed in the same tree.

*Eggs.*—Clutch, four to seven, usually five; oval or elliptically inclined in shape; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches of a proper clutch: (1)  $1.08 \times .76$ , (2)  $1.07 \times .77$ , (3)  $1.06 \times .76$ , (4)  $1.05 \times .74$ , (5)  $1.04 \times .75$ .

*Observations.*—This singular and elegant species has been found throughout the length and breadth of Australia; but it is more addicted to the plains and interior portions, moving about according to the seasons, when they sometimes fly in great flocks. I believe the birds were numerous in Riverina during the winter of 1896. Its little top-knot gives it a sprightly appearance, while the beauty of the greyish dress, relieved with white on the wings of the male, is enhanced by the lemon-yellow about his face, particularly on the cheeks. In the female the face is not so brightly coloured, being of a dull olive. Total length, about 12 inches or 13 inches.

Gould states that the beautiful Cockatoo Parrot is strictly migratory, making simultaneous movements southwards to within 100 miles of the coast in September, arriving in the York district, Western Australia, precisely at the same time that it appears on the Liverpool plains in the east, and after rearing a numerous progeny the whole retire northward again in February and March.

During the summer of 1839, Gould found these birds breeding in all the apple-tree (*Angophora*) flats on the Upper Hunter and adjacent localities.

In Central Australia, 15th July, 1894, during the progress of the Horn Scientific Expedition, Mr. Keartland states he saw large numbers of young Cockatoo Parrots. One old pair was supplying the wants of a brood of six as they clustered on a dry branch. Mr. Richard J. Dalton, on the Paroo, New South Wales, 1896, observed that the Parrots were breeding in May, and again from September to November. Nestlings were plentiful on the Fitzroy River (North-west) during January (1897). The late Mr. T. Augustus Forbes-Leith, in his pleasant little treatise on "Parrots of Victoria," mentions that he knew of several instances of this Parrot breeding in aviaries and rearing young.

On the habits of birds coming to water, Mr. H. W. Ford, F.G.S., informs me that "the Grey and Yellow Top-knotted Parrot ('Quarrion,' native name among bushmen) flies round about water-holes for some time, then settles on a tree near the water. Another would fly round screeching all the time, and down to the edge of the water, take one gulp and off as if all the hawks in creation were after it, screeching all the time. The same antics apply to the Shell Parrakeet. Both these birds come in by flocks of dozens in the afternoon, and always the same performance at drinking time as far as I have seen, and I have seen them dozens of times."

## FAMILY—PSITTACIDÆ: PARROTS.

## SUB-FAMILY—PALÆORNITHINÆ.

## 488.—POLYTELIS BARRABANDI, Swainson.—(406)

## GREEN-LEEK PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 15.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 478.

*Previous Descriptions of Eggs*.—Campbell: Southern Science Record (1883), also Nests and Eggs Australian Birds, pl. 2, fig. 406 (1883).

*Geographical Distribution*.—South Queensland, New South Wales, Victoria and South Australia.

*Nest*.—Within a hole or hollow in a tree, usually by a stream.

*Eggs*.—Clutch, four to five; elliptical in shape; texture of shell somewhat fine; surface glossy; colour, pure white. Dimensions in inches: 1.17 × .9.

*Observations*.—This most elegant and exquisitely coloured species is a somewhat scarce Parrakeet, being limited to isolated localities inland from South Queensland down to South Australia.

The Barraband Parrakeet, or, as it is called, the "Green-leek," is well named on account of its general grass-green plumage, the beauty of which is intensified by the forehead, cheeks, and throat being of rich gamboge-yellow, and immediately beneath the throat is a conspicuous crescent of scarlet. The female is a little inferior in colouring to the male. Total length of a bird, about 16 inches. The bird is a striking adornment to an aviary. In Gould's day they were frequently brought down to Sydney by draymen, from the Argyle country, where these beautiful Parrakeets were not uncommon at the time.

I have only a solitary egg in my collection, taken in the Wimmera district by a friend of the late Mr. H. A. Smith, Batesford.

## 489.—POLYTELIS ALEXANDRÆ, Gould.—(407)

## ALEXANDRA PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., supp., pl. 62.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 479.

*Previous Description of Eggs*.—North: Rec. Austr. Mus., vol. ii., p. 19 (1892).

*Geographical Distribution*.—Interiors of Northern Territory and South, West, and North-west Australia.

*Nest*.—Within a hole in a tree, usually near a watercourse. Occasionally several pairs of birds breed in the same tree.

*Eggs*.—Clutch, four to five; vary in shape from round oval to oval; texture of shell fine; surface exceedingly glossy; colour, pure white. Dimensions in inches of a proper clutch: (1) 1.1 × .9, (2) 1.09 × .9, (3) 1.05 × .88, (4) 1.04 × .92; of odd examples, round oval: 1.1 × .92; oval: 1.14 × .85.

*Observations*.—For its elegant shape, quiet and beautiful colouring—chiefly æsthetic greens,—in addition to being difficult to obtain, this Parrot is deemed a rare bird. It is a denizen of the far interior and North-west deserts. On account of the rose-pink patch on its chin and throat it should have been called the Rose-throated Parrakeet.

This lovely species, described and dedicated by Gould to the Princess of Wales, was first discovered by the Stuart Exploration Party, 1862, when Mr. F. C. Waterhouse shot three birds at Howell's Ponds, at the edge of the Stuart Plains, Northern Territory.

Nothing was heard regarding the bird till a communication from Mr. Symonds Clark appeared in the "South Australian Register," 23rd August, 1890, which was afterwards reprinted in "The Victorian Naturalist," mentioning that Mr. T. C. Margarey had brought a pair of live Alexandra Parrakeets to Adelaide. The birds were taken the previous season from a nest at Crown Point, above Charlotte Waters.

The Alexandra Parrakeet was brought prominently under notice again in 1891, when Governor the Earl of Kintore and party crossed Australia by the transcontinental route. Out of a small flock three were shot by Dr. E. C. Stirling, near Newcastle Waters.

Subsequently a fine series of these birds was procured by Mr. G. A. Kearland, the ornithologist of the Horn Scientific Expedition, at the McDonnell Ranges, 1894. The season immediately following many young birds were collected in the interior and forwarded to various members of the party, one being exhibited at the annual show of the Victorian Poultry and Kennel Club, August, 1895, by Mr. Kearland, who also received eggs, and to whom I am indebted for an example. He informs me the majority of eggs he received were taken during or about September. Mr. A. Zeitz, Assistant Curator of the Adelaide Museum, was successful in getting the Alexandra Parrakeets to breed in captivity. The female alone rears the young.

During the examination of an excellent series of skins of Alexandra Parrakeets, obtained by the Horn Expedition, Mr. North discovered that the end of the third primary of either wing of the adult male was, curiously enough, spatula-shaped. Most ornithologists will agree that Mr. North has over estimated the importance of this peculiar difference (only specific at most) by creating the new genus, *Spathopterus*, for the lovely bird. One might as well change the generic name of the *Menura alberti* because the two large lyre-shaped feathers of the tail, so conspicuous in the males of the other species, are absent.

During the Calvert Expedition (1896), the habitat of this desert beauty was found to extend to West and North-west parts of the

Continent. Mr. Keartland states\*: "On the flying trip made by Messrs. L. A. Wells and G. L. Jones, during August, they found numbers of these birds about one hundred miles north-east of Mount Bates, and on several subsequent occasions, but when we traversed the same track about five weeks later I only saw them twice, and succeeded in shooting one pair. Again, in April a pair was seen within two miles of Johanna Springs, and several days later a flock of about twenty was noted in the same neighbourhood. They appear to be confined to the most dreary desert country, and must either travel long distances to water or require very little of it. In the stomachs of those opened, the seed of the *Triodia* predominated. When noted they were disturbed whilst feeding amongst the *Spinifex*, and usually perched on the nearest tree, irrespective of species. Mr. Wells has since reported seeing several within a few miles of the Fitzroy River."

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490.—POLYTELIS MELANURA, Vigors.—(408)

BLACK-TAILED PARRAKEET (ROCK PEBBLER)

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 16.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 479.

*Previous Description of Eggs*.—Campbell: Victorian Naturalist (1858).

*Geographical Distribution*.—New South Wales, Victoria, South and West Australia.

*Nest*.—Within a hole or hollow of a tree, usually bordering a stream in the interior, or in the crevice of a cliff, notably on the Lower Murray River.

*Eggs*.—Clutch, four to six; roundish in shape; texture of shell comparatively fine; surface glossy in some instances, with limy nodules; colour, pure white. Dimensions in inches of proper clutches: A (1) 1.26 × .9, (2) 1.24 × .98, (3) 1.2 × .98, (4) 1.19 × .96; B (1) 1.17 × .91, (2) 1.16 × .91, (3) 1.12 × .91, (4) 1.11 × .95, (5) 1.07 × .91.

*Observations*.—The habitat of the very elegant Black-tailed Parrakeet is from east to west across the southern part of Australia, frequenting flats in the vicinity of permanent water. It is not a common species, and usually is seen in the interior provinces, where it may be found sometimes breeding in company with other Parrots in hollow trees overhauling the Wimmera and Avoca Rivers, and such like places.

On the Wimmera, north of Lake Albacutya, Dr. Chas. Ryan and party found the beautiful Black-tailed Parrakeets breeding about the first week of October, 1898, when all the clutches were almost incubated. One nest contained a pair of young and four addled eggs.

\*Trans. Roy. Soc., South Australia, vol. xxii., part ii., pp. 130-1 (1898).

The late Captain F. C. Hansen (of the Murray steamer, "Maggie") informed me that he has found the Black-tailed Parrakeet nesting in the Broken Bend cliffs (mallee cliffs) of the River Murray, near Wentworth, also in the cliffs lower down, between Morgan, South Australia, and the border of Victoria. Captain Hansen also states that generally only a pair of young is hatched out of a clutch of four eggs, and that a pair of old birds rears two broods a season in the same nest.

Mr. W. White, Reedbeds (South Australia), whose roomy aviary contains many beautiful Parrots, has a handsome Black-tailed Parrakeet which has reared several clutches of young Cockatoo Parrakeets. As soon as they were hatched by their proper parents they were handed over (evidently by mutual consent) to the Polytelis.

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491.—PTISTES ERYTHROPTERUS, Gmelin.—(410)

RED-WINGED LORY.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 18.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 481.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 38 (1865); North: Austn. Mus. Cat., p. 256, pl. 14, fig. 5 (1889).

*Geographical Distribution*.—Queensland and New South Wales.

*Nest*.—Within a hollow bole or branch of a tall tree, usually a eucalypt, and not unfrequently by a stream.

*Eggs*.—Clutch, four to five, usually four; round oval in shape; texture of shell comparatively fine; surface slightly glossy; colour, pure white. Dimensions in inches of a clutch: (1) 1.32 × 1.05, (2) 1.32 × 1.04, (3) 1.28 × 1.06.

*Observations*.—This most lovely Parrot is restricted to Queensland and the northern part of New South Wales. Not without reluctance I have shot the beautiful species for museum purposes, while traversing the eucalyptus flats on the Lower Fitzroy. I soon learnt to locate the bird by its peculiar "chink chink" like notes; and when a bird is seen in its living dress of exquisite verditer green, dark back, and brilliant scarlet shoulders, bending with its own weight the green bough to which it clings, I can well understand Gould when he wrote—"It is beyond my power to describe the extreme beauty of the appearance of the Red-winged Lory when seen among the silvery branches of acacia, particularly when the flocks comprise a large number of males, the gorgeous scarlet of whose shoulders offers so striking a contrast to the surrounding objects."

I understand that Gould himself shot the Red-winged Lory on the Liverpool Plains of New South Wales, therefore it seems unaccountable that Dr. Ramsay should have omitted such an important bird from the column of his own State in his "Tabular List." Mr. North met with it

on the Namoi River, November, 1896, and states he has known its eggs to have been taken from nesting places in trees on the Bogan, Macquarie and Warrego Rivers.

Many years before I visited Coomooboolaroo, Queensland, I was indebted to the late Mr. Geo. Barnard for the eggs of this species, which is said to breed from October to January.

Mr. Robert H. Adams, writing to me from Goondiwindi, Queensland, states: "Parrots here seem very fearful of iguanas,—at least that is the opinion I have formed, because they choose trees close to houses or tents. In two cases within my knowledge, Parrots—one a Rosella and the other a Red-winged Lory—nested over tents occupied by men working for me, and a pair of Red-wings had their nest in a tree in my back yard, to which the clothes line is attached. The Red-wings here appear to nest, not in spouts, but in big hollow trees, climbing down and laying on the rubbish within. Its nest is thus peculiarly open to the attacks of iguanas."

Mr. Lau, in his MS., states: "One peculiarity I must mention regarding the Red-shouldered Parrot. A female of this species had a male of the King Lory for a husband, which, on account of his great beauty, was shot without mercy. On another occasion I happened to see a pair of Red-wing Lories perched near a hole. I shot the male, not thinking they intended breeding. The female flew away, evidently very sorrowful, but behold, she returned in a few days with a new husband, and soon a batch of eggs was laid."

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492.—PTISTES COCCINEOPTERUS, Gould.—(411)

CRIMSON-WINGED LORY.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 482.

*Previous Descriptions of Eggs.*—North: Trans. Roy. Soc., South Australia, vol. xxii., p. 131 (1898); Le Souëf: Ibis, p. 360 (1899), also Victorian Naturalist, vol. xvi., p. 71 (1899).

*Geographical Distribution.*—North-west Australia, Northern Territory and North Queensland.

*Nest.*—A hollow spout or trunk of a tree.

*Eggs.*—Clutch, four probably; round oval in form; texture of shell comparatively fine; surface glossy; colour, white originally, generally more or less stained. Dimensions in inches of a pair in the collection of Mr. Dudley Le Souëf: (1) 1.26 × 1.03, (2) 1.22 × 1.02.

*Observations.*—Gould regarded the Red-winged Parrots found in the Northern Territory, as different from those of the east coast. The former are smaller in all their measurements, except the bill, which is somewhat larger, and the adult males are more richly coloured, while the red on the wings is more of a crimson hue. However, touching the three adult males, one adult female, and one young male, procured by the Calvert

Expedition at the camp near the Fitzroy River, Mr. North, who critically examined the birds of the Expedition, pronounces these Parrots similar in colour and size to examples from Eastern Australia, except in having the tail feathers slightly more yellowish-green. Therefore I may be justified, on geographical grounds only, in keeping the birds separate.

Mr. Kearland gives a graphic field note of some eggs taken:—"On March 18th, Mr. Arch. Blyth pointed out a tree into which he had noticed one of these birds enter. As we approached the tree a bullock-whip was cracked several times, but the bird sat close until the limb was struck, when she emerged from a hollow branch about forty feet high. A native was sent up, but holes had to be cut along the horizontal limb and down the trunk until the nest was located, about six feet from the ground. The four partly-incubated eggs it contained were simply deposited on the decayed wood at the bottom of the hollow."

Breeding season, usually December to March.

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493.—*APROSMICTUS CYANOPYGIUS*, Vieillot.—(409)

KING LORY.

*Figure*.—Gould: *Birds of Australia*, fol., vol. v., pl. 17.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 486.

*Previous Description of Eggs*.—North: *Austn. Mus. Cat.*, p. 255 (1889).

*Geographical Distribution*.—Queensland, New South Wales, and Victoria.

*Nest*.—Within a hollow limb or trunk of a giant-tree (eucalypt), sometimes as far down as the base, in heavy forest country.

*Eggs*.—Clutch, four to six; roundish in shape; texture of shell coarse; surface slightly glossy, but somewhat rough, being minutely pitted and with here and there a limy nodule; colour, pure white. Dimensions in inches of a clutch: (1) 1.3 × 1.08, (2) 1.27 × 1.11, (3) 1.21 × 1.06.

*Observations*.—This splendid species, with showy scarlet head and under surface, may well be called a "King" Parrot. It ranges through the wooded tracts of Eastern Australia from near Cape York\* to Cape Otway. It is a familiar bird in Gippsland, where its shrill, high-pitched single call-note frequently resounds through the forest depths.

Although the bird is fairly plentiful, the eggs are exceedingly rare, for the reason that it usually builds in the highest of trees. I only know examples of eggs in three collections, namely, the Macleayan Museum, Sydney, the National Museum, Melbourne, and in the private collection

\*The tropical bird is smaller and richer in colouring, especially in the scarlet, which is of dazzling brightness.



of Mr. Jas. Kershaw. The last-mentioned are those described above. As I remarked at the time, the eggs I first described from the Queensland Museum were rather small. I have since learnt they were referable to another Parrot, possibly the Red-winged. I am not the only one who erred in this respect, for Gould, to put it mildly as he could, "looked with suspicion," on the account of the breeding of the King Parrot given by Mr. Caley\* in the "Linnean Transactions." Gould's specimen must have reference to that of some other bird.

Of course it is well known that the male bird of this splendid Parrot does not attain its full and glorious garb until the third year.

Young ones, on more than one occasion, have been taken from within the butts of great hollow trees in the Otway Forest.

Five eggs in Mr. Kershaw's collection were taken at Childers, South Gippsland, 5th October, 1895.

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SUB-FAMILY—PLATYCERCINÆ: PARRAKEETS.

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**494.**—PLATYCERCUS ELEGANS, Gmelin.—(415)  
*P. pennantii*, Latham.

CRIMSON (PENNANT) PARRAKEET.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 23.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 541.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 45 (1865); North: Austr. Mus. Cat., p. 257, pl. 14, fig. 6 (1889).

*Geographical Distribution.*—South Queensland, New South Wales, Victoria and South Australia.

*Nest.*—Within a hollow limb or trunk of a tall tree, usually in thick forest.

*Eggs.*—Clutch, five to eight; elliptical in shape; texture of shell comparatively fine; surface glossy; colour, pure white, but sometimes yellowish in tone from the dust of the nest. Dimensions in inches of a full clutch: (1) 1.15 × .9, (2) 1.14 × .88, (3) 1.13 × .89, (4) 1.12 × .9, (5) 1.12 × .9, (6) 1.11 × .88, (7) 1.1 × .89; of three *ex* a clutch of eight by full-plumaged parents: (1) 1.18 × .92, (2) 1.17 × .92, (3) 1.15 × .93.

*Observations.*—The Pennant Parrakeet in full plumage is one of the most glorious birds of the bush. When a flock is seen passing through

\* Caley was sent to Australia by Sir Joseph Banks to collect plants, but any birds or animals he collected he was permitted to retain. These—many of which became types—he sold to the Linnean Society.

the forest they describe as it were so many streaks of the richest crimson colouring. Their beautiful dress is not donned till the third year or thereabouts. However, some of the birds breed before that stage.

The forest tracts of South-eastern Australia, including Kangaroo Island, are the home of this bird. I have noticed the birds nesting in the foot-hills of the Pyrenees, and afterwards in the Upper Werribee district, where, in conjunction with Messrs. Brittlebank, several nests were found. One in particular was interesting, from the fact that one of the birds (apparently the female) belonging to the nest had the mottled greenish dress, and was not in full plumage. The nest was in a stringy-bark tree that grew in a deep secluded gully. The nesting hole was ten or twelve feet from the ground, in a barrel near the junction of a projecting limb. The eggs, seven, slightly incubated, were within arms' length of the entrance. Date, 8th November, 1890. Another nest was found on the 10th containing eight eggs, the parents of which were both in immature dress.

Apropos of Dr. Paul Levekühn's work, "Another Bird's Egg in the Nest," the Messrs. Brittlebank took, on the 18th October, 1890, a clutch of Pennant Parrakeet's eggs, replacing in the nesting hole a clutch of Rosella's. Unfortunately it was afterwards found that another bird nester had discovered the nest and removed the eggs before the interesting experiment was concluded.

Breeding months, usually October to December, but young have been taken as late as February.

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495.—*PLATYCERCUS ELEGANS* (sub-species) *NIGRESCENS*, Ramsay.

CAMPBELL PARRAKEET.

*Reference*.—Ramsay: Tabular List Austr. Birds, p. 34.

*Geographical Distribution*.—North Queensland.

*Nest and Eggs*.—Undescribed.

*Observations*.—On the outskirts of a dense scrub, feeding upon acacia seeds, near our Cardwell camp, Northern Queensland (1885), we shot several deep crimson-red Parrakeets, with blue cheeks and shoulders like the Crimson Parrakeet (Pennant) of Gippsland, but evidently a variety, being smaller, with feathers on the back and neck almost black. Besides, the bird possessed quite a different voice, which was the means of first attracting our attention when we were at our tents.

In passing through Sydney, I brought this new variety of Parrot under the notice of Dr. E. P. Ramsay. His verdict was "*Platycercus pennantii*." With this decision I felt hardly satisfied, and had a specimen noticed in the "*Victorian Naturalist*" (1886), subsequently presenting the skin to the National Museum, Melbourne, where it is now set up in the Queensland division.

However, when Dr. Ramsay's own collector brought from the Cairns scrubs precisely similar Parrakeets, a year or two afterwards, the Doctor did not apparently hesitate to describe them under the name *Platycercus pennantii*, variety *nigrescens*.

This Parrakeet is most probably the same variety observed by the Queensland Scientific Expedition (1889), near the summit of Bellendenker.

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496.—PLATYCERCUS ADELAIDÆ, Gould.—(416)

ADELAIDE ROSELLA.

*Figur.*—Gould: Birds of Australia, fol., vol. v., pl. 22.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 543.

*Previous Description of Eggs.*—Campbell: Victorian Naturalist (1888).

*Geographical Distribution.*—South Australia.

*Nest.*—Within a hollow limb or trunk of a tree.

*Eggs.*—Clutch, five or more; roundish or round oval in form; texture of shell comparatively fine; surface glossy; colour, pure white, sometimes stained with the wood of the nest. Dimensions in inches of a proper clutch: (1) 1.14 × .95, (2) 1.12 × .94, (3) 1.12 × .92, (4) 1.11 × .92, (5) 1.04 × .92.

*Observations.*—The Adelaide Rosella or Pheasant Parrakeet is a beautiful species in radiant colouring, between the Rosella and the Crimson Parrakeet, which appears to be restricted to South Australia, including the interior. It was named *adelaidensis*, from the circumstance that Gould, in 1838, procured some of his first specimens in the very streets of Adelaide. The South Australians have an equally good vernacular name—Pheasant Parrot.

In the matter of wholly green or partially coloured youthful birds, this species resembles *P. elegans* (*pennantii*).

In 1888, through the courtesy of Mr. Geo. Beazley, I was enabled to describe the eggs of the Adelaide Rosella from the collection of the Adelaide Museum, which eggs were collected by the late Mr. F. W. Andrews.

Afterwards I received a full set of five eggs collected by Mr. W. White, Reedbeds, taken from a hole in a large gum-tree growing on the bank of a rocky creek, Flinders Range. Date, 20th September, 1894.

Some authorities believe the Adelaide Rosella to be a hybrid. Such cannot be a fact, because Mr. White has had them breed and hatch young in his aviary.

## 497.—PLATYCERCUS FLAVEOLUS, Gould.—(418)

## YELLOW PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 25.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 544.

*Previous Description of Eggs*.—Campbell: Wombat, Oct., 1897 (read before Roy. Soc., Victoria, 9th April, 1895).

*Geographical Distribution*.—New South Wales, Victoria, and South Australia.

*Nest*.—Within a hollow branch or bole of a tree, usually a red-gum (*Eucalyptus rostrata*), growing on a flat or bordering a stream.

*Eggs*.—Clutch, four to five; round oval in shape; texture of shell fine; surface slightly glossy; colour, pure white. Dimensions in inches of a proper clutch: (1) 1.16 × .93, (2) 1.16 × .92, (3) 1.12 × .93, (4) 1.10 × .92.

*Observations*.—As far as is yet known the Yellow Parrakeet, or Swamp Lory of the trappers, has a somewhat limited range, being chiefly confined to the inland provinces of New South Wales, Victoria, and South Australia. The bird is numerous in some localities, notably Riverina, where it appears to take the place of the familiar Rosella (*P. eximius*), and has a call-note like that bird, but its alarm notes are louder and harsher.

I have noticed the Yellow Parrakeet as far south as the Pyramid Hill and Echuca districts, Victoria. At the latter place, one dewy morning in early spring, I came upon a flock of about thirty or forty feeding upon the surface of a sand rise. While placing myself under a clump of silver wattles, all abloom, to make observations upon this unusually large congregation of Parrots, a pair of vagrant dogs that had been rabbiting on their own account close by crossed the rise, and dispersed my feathered friends. On another occasion I watched a pair of these birds feeding on "Bathurst" burrs, by a dead log, a few paces from me. The male appeared to be the larger and brighter coloured bird.

In the Moulamein district of Riverina, Mr. J. Gabriel and myself found the Yellow Parrakeet numerous, especially in the timber bordering streams, and not infrequently visiting the gardens of selectors and others.

The birds were then (September, 1894) pairing, or had paired, but we were unable to discover in the numerous red-gums on the flat, or along the watercourses, the eggs, which were new to science. However, Mr. W. White, with a relative, who happened to be out collecting during the same month in the Flinders Range, South Australia, kindly forwarded me a set of four eggs, which specimens are herein described. They were taken on 20th September, 1894, from a hole under an elbow of a large red-gum (*Eucalyptus*) growing in a grassy vale in the Warrabra Forest, which is 200 odd miles north of Adelaide.

498.—*PLATYCERCUS FLAVIVENTRIS*. Temminck.—(417)

## GREEN PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 24.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 545.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 49 (1865); North: Austn. Mus. Cat., p. 258 (1889).

*Geographical Distribution*.—Tasmania and principal islands in Bass Strait.

*Nest*.—Within a hole in a tall tree (eucalypt).

*Eggs*.—Clutch, four to six or eight; elliptical in shape; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches of a pair: (1) 1.17 × .88, (2) 1.16 × .89.

*Observations*.—The large Yellow-bellied or Green Parrot is peculiar to Tasmania and the larger islands in Bass Strait. Odd examples may have been found on the mainland opposite, because, in the excursion of the Field Naturalists' Club of Victoria, the Parrots were found on Kent Group, not more than sixty miles from the nearest Victorian coast. In all examples seen in the Strait we noticed none so highly coloured as the figure shown in Gould's plate: possibly they had not reached perfection, because, like the Crimson (Pennant) Parrakeet, the full adult plumage is the progress of seasons.

When these young Parrakeets are first hatched, Gould remarks that they are covered with long white down, and present an appearance of a round ball of white cotton wool.

The eggs of the Green Parrakeet in my collection are from a set of four taken by Mr. G. H. Hinsby, from a hollow gum, at a height of only six feet from the ground, on the Hamilton Road, near Bothwell, Tasmania, November, 1876.

Breeding months, October to December or January.

499.—*PLATYCERCUS PALLIDICEPS*, Vigors.—(419)

## PALE-HEADED PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 26.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 547.

*Previous Descriptions of Eggs*.—Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 53 (1882); Campbell: Southern Science Record (1883).

*Geographical Distribution*.—Queensland and New South Wales.

*Nest*.—Within a hole in a tree.

*Eggs*.—Clutch, four to five; nearly round or round oval in shape; texture of shell somewhat fine; surface glossy; colour, pure white. Dimensions in inches of a proper clutch: (1)  $1.03 \times .88$ , (2)  $1.04 \times .89$ , (3)  $1.02 \times .87$ , (4)  $1.02 \times .84$ .

*Observations*.—The beautiful Pale-headed Parrakeet, or Moreton Bay Rosella, is not so highly coloured and variegated as its more southern representative, *P. eximius*, yet when seen in the open, with its light-blue plumage and delicate yellow head, it is a most captivating creature. It lives in confinement remarkably well. Besides Queensland, the northern part of New South Wales is included in its habitat.

The eggs of the Pale-headed Parrakeet in my collection bear the data, Coomoooolaroo (Queensland), &c., where I had the pleasure of observing the birds in a state of nature, and procuring skins.

Usual breeding season, September to December, but at Coomoooolaroo the birds have been observed laying in March and July, but generally in October.

500.—*PLATYCERCUS AMATHUSIA*, Bonaparte.—(420)  
*P. cyanogenys*, Gould.

BLUE-CHEEKED PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., supp., pl. 63.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 548.

*Geographical Distribution*.—Northern Territory and North Queensland.

*Nest and Eggs*.—Undescribed.

*Observations*.—This rare Parrakeet is closely allied to the Pale-headed Parrakeet (*P. palliceps*), but differs, as Gould has pointed out, in the greener tone of the colouring of its body and in the rich blue of the cheeks, hence the name "Blue-cheeked." It is a northern bird, and the original specimen was procured at Cape York by Macgillivray, October, 1848.

501.—*PLATYCERCUS BROWNI*, Temminck.—(421)  
*P. venustus*, Kuhl.

SMUTTY PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 31.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 549.

*Geographical Distribution*.—North-west Australia and Northern Territory.

*Nest and Eggs.*—Undescribed.

*Observations.*—This exceedingly fine Parrakeet was named after the distinguished botanist, Robert Brown, but the local name, Smutty Parrot, is at once more characteristic, on account of some of the bird's feathers being slightly fringed with black. I have handled specimens from the Port Darwin district, where it is reported to be a plentiful species.

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## 502.—PLATYCERCUS ERYTHROPEPLUS, Salvadori.

## RED-BACKED ROSELLA.

*Figure.*—Proc. Zool. Soc. (1891), pl. 12.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 550.

*Geographical Distribution.*—Unknown.

*Nest and Eggs.*—Undescribed.

*Observations.*—According to Count Salvadori, this species is intermediate between *P. elegans* and *P. eximius*. The type was formerly in Gould's collection, but is now in the British Museum. Unfortunately the original label was lost, therefore it is not known where the specimen was obtained. Most probably the bird is a hybrid between the two species mentioned by the Count, as it possesses the blue of the Crimson Parrakeet on the lower part of the cheek, and the white of the Rosella on the upper, besides other combinations observable.

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## 503.—PLATYCERCUS EXIMIUS, Shaw.—(422)

## ROSELLA.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 27.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 551.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 56 (1865); North: Austn. Mus. Cat., p. 258 (1889).

*Geographical Distribution.*—South Queensland, New South Wales, Victoria, South Australia and Tasmania.

*Nest.*—Within a hollow spouted limb or trunk of a tree, occasionally not far from the ground, in forest country.

*Eggs.*—Clutch, six to nine; vary from round oval to oval in shape; texture of shell fine; occasionally somewhat coarse; surface slightly glossy; colour pure white. Dimensions in inches of a proper clutch: (1)  $1.1 \times .82$ , (2)  $1.07 \times .79$ , (3)  $1.0 \times .82$ , (4)  $.98 \times .83$ , (5)  $.96 \times .8$ ; of a larger pair: (1)  $1.11 \times .94$ , (2)  $1.09 \times .93$ .

*Observations.*—If the familiar Rosella, or Rose-hill Parrakeet, were not so common, it would, on account of the richness and variety of the colouring of its plumage, no doubt be deemed one of the most elegant and beautiful of Australian Parrots. As a cage favourite it is merely called a "Pretty Joey," possibly because, like Joseph of old, it wears a coat of many colours. It possesses a pleasing whistling call note and pleasant chattering tones.

The Rose-hill Parrakeet derived its name from being first found at Rose Hill, near Sydney. Afterwards the word no doubt became corrupted into Rosella.

The Rosella Parrakeet is an abundant species throughout South-eastern Australia, including Tasmania, where it is a larger bird.\* I have found from sets I have taken that the forest birds of Gippsland lay larger eggs than do those in the more open country of Western Victoria. What can be the reason?

Rosellas will continue to complete their clutches, even if the first eggs laid are removed, a fact I proved at Cardinia Creek, Berwick, where I took two eggs 11th October, 1880, from a nest, and again two eggs from the same hole on the 13th. The late Mr. F. H. Reed, Tasmania, also found that Rosellas continue laying, notwithstanding the eggs be removed daily.

Of all the curious places to find a Rosella's eggs I think a Babblers' (*Pomatorhinus*) nest takes the palm. On the Lower Werribee, 6th November, 1894, Mr. Charles French, junr., flushed a Rosella from one of these large covered stick-made nests, and took six eggs of the Parrot therefrom.

Mr. A. W. Milligan made the interesting observation that young Rosellas do not all leave the nest at the same time, but leave singly, perhaps a period of three weeks elapsing between first and last departure. As they leave they join a flock of old birds, by which they are cared for and fed.

Rosellas live to a good age; I have had a female in my aviary for the last seventeen years, how old she was when I obtained her I know not. An acquaintance had a single bird for twenty-three years, the bird's bill and toe-nails had frequently to be pared.

Mr. George Smellie, Williamstown, had a pair of Rosellas in captivity, and during the season of 1895 the hen laid six eggs, but, although the eggs were in a dark secluded corner, they were not hatched. The male bird used to regularly feed his mate on her nest.

The following is an incident of which the truthfulness is vouched. On Piccaimny Creek, near Kow Swamp, Victoria, a farmer friend observed a Rosella fluttering in a tree as if overpowered in some

\* The white patches on the cheeks are also conspicuously larger than those on the mainland bird.



manner. Below was a black snake, glinting in the sunlight, looking straight at the bird. The Parrot came nearer and nearer, and finally fell paralysed or dead beside the snake. The farmer then, waiting till the snake had not eaten, but simply got "outside" of the bird killed the snake, took the bird out, and examined it.

The following is another snake and Parrot story. Mr. Robert H. Adams, Goondiwindi, Queensland, writes: "In 'The Australasian' of the 30th July, 1898, you narrated an instance of a Parrot being fascinated by a snake. I heard of an almost similar case. Mr. Kimmorley, Winton station, and a friend were standing near the house, when their attention was drawn to the cries of a Parrot circling round the top of a gum-tree. On looking more carefully they discovered the head and neck of a snake projecting from the boughs, and after a while the Parrot fluttered right down to the snake's mouth. Mr. Kimmorley got a gun and shot the snake."

One nest found at Myrmiong, Victoria, was in a hollow spout, so low that standing on the ground I could see the eggs resting down in the semi-darkness. Clutch, five. 11th November, 1890.

Breeding months in general October to December, or when the grass seeds ripen. Numerous young ones may be seen hawked about the streets of Melbourne about the end of November and during December.

To persons selecting fledgeling Rosellas from the nest, or purchasers of young "Joeys" from street hawkers, it may be useful to know that the male is yellowish on the flanks, while the same parts on the female are more greenish in colour.

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#### 504.—*PLATYCERCUS SPLENDIDUS*, Gould.—(423)

##### YELLOW-MANTLED PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 28.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 553.

*Geographical Distribution*.—South Queensland, New South Wales, and interior of South Australia (probably).

*Nest and Eggs*.—Undescribed.

*Observations*.—This really "Splendid" Parrakeet was one of the first novelties procured by Gilbert after the Expedition (Leichhardt's) left Brisbane, 1844. It resembles the common Rosella, but amongst other differences has the feathers of the back broadly marked with rich gamboge instead of greenish-yellow, hence the better vernacular name, Yellow-mantled Rosella or Parrakeet.

Unless it be a hybrid, I fear Dr. Ramsay's *P. mastersianus* will have to be placed as a variety of the splendid Yellow-mantled Parrakeet.

## 505.—PLATYCERCUS IGNITUS, Leadbeater.

## FIERY PARRAKEET.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 30.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 553.

*Geographical Distribution.*—South Queensland, New South Wales, Victoria, and South Australia (?).

*Observations.*—Although Gould at first figured the Fiery Parrakeet in its truly flaming colouring, he afterwards believed the bird to be an anomalous or a diseased variety of the common Rosella (*P. eximius*). But Count Salvadori has restored it to a species. I believe Gould's second judgment is nearer the truth, and that it is not a good species.

The original specimen, which Mr. John Leadbeater described in 1837, was stated to have been procured in the district of Brisbane.

Dr. Charles Ryan has in his collection a similar beautiful bird, which was shot in Victoria. There is in the Geelong Museum a specimen, as far as I can recollect, resembling the ordinary Rosella, but with upper tail coverts red (scarlet) instead of green, thus making a kind of connecting link between the Rosella and the so-called Fiery Parrakeet. Again, in Gould's figure of the latter bird there are white markings on the wings, which appear on those parts in immature Rosellas.

Mr. A. Coles, the well-known taxidermist, states three or four examples of Fiery Parrakeets, including both sexes, have passed through his hands, and he believes the species to be distinct.

I was once invited to inspect a very beautiful Parrot, alive, at a gentleman's residence, Toorak. Its general plumage was a rich yellow, passing into white at the primaries and the extremity of the tail, while the crown of the head, throat and abdomen down to the under tail coverts were scarlet. The cheeks were white, which proved the bird was a *lusus naturæ* of the Rosella species.

## 506.—PLATYCERCUS ICTEROTIS, Temminck.—(424)

## YELLOW-CHEEKED PARRAKEET.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 29.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 554.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 59 (1865); Le Souëf: Ibis, p. 458 (1900).

*Geographical Distribution.*—South (?) and West Australia.

*Nest.*—Within a hollow spouted limb or trunk of a tall tree in thick forest.

*Eggs.*—Clutch, six to seven; colour, white. Dimensions: .92 × .8 inches (Gould).

*Observations.*—The Yellow-checked Parrakeet of Western Australia takes its name from the yellow sides of the face, which are in lovely contrast to the head and under surface of soft scarlet and a dark mottled-green back. However, during the first year or two the youthful birds are nearly a uniform green, like the Pennant and others of the genus.

I was often charmed with the lovely figures of the Yellow-checked Parrakeet, locally called the Rosella, about my hut door at Karridale, or perched upon the garden fence. Fearless of human beings, a pair was breeding in a hollow tree near the house, but to me the eggs were so many sour grapes, for the reason that I could not climb the stiff tree. The birds are particularly partial to the fruit of the Cape gooseberry, and well they may be, for I know of no preserve more delightful.

Breeding months October to December. The Western Rosella makes a good cage bird. One bird was apparently happy during twenty-one years of confinement.

507.—*PLATYCERCUS XANTHOGENYS*, Salvadori.

RED-MANTLED PARRAKEET.

*Figure.*—Cat. Birds Brit. Mus., vol. xx., pl. 16.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 555.

*Geographical Distribution.*—Unknown.

*Nest and Eggs.*—Undescribed.

*Observations.*—The Red-mantled Parrakeet is another novelty which Count Salvadori has unearthed from Gould's original collection. However, its precise habitat is unknown. It is allied to the Yellow-checked Parrakeet of Western Australia, but wears a red mantle instead of green.

508.—*PORPHYROCEPHALUS SPURIUS*, Kuhl.—(425)

*P. pileatus*, Vigors.

RED-CAPPED PARRAKEET.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 32.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 556.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 60 (1865).

*Geographical Distribution.*—West and North-west Australia. Gould also states Northern Territory.

*Nest*.—Usually within a dead hollow branch of a large eucalypt.

*Eggs*.—Clutch, seven to nine; colour, milk-white. Dimensions  $1.12 \times .87$  inches (Gould).

*Observations*.—The so-called “King Parrot” of Western Australia, or, correctly speaking, the Red-capped Parrakeet—a name derived from its deep-maroon crown—is a gorgeous bird. I enjoyed many opportunities of observing them in the karri and jarrah forests, where they loved to feed upon the kernel of the native pear (*Xylomechum*), when the fruit opens under the summer sun.

It was with much satisfaction that I brought home and let loose in my aviary one of these handsome birds. It was thriving splendidly, till one day, to my regret, a member of my household accidentally let the bird escape.

Breeding months October to December.

509.—BARNARDIUS BARNARDI, Latham.—(412)

#### MALLEE PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 21.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 558.

*Previous Descriptions of Eggs*.—Campbell: Southern Science Record (1885); North: Austn. Mus. Cat., p. 256, pl. 14, fig. 7 (1889).

*Geographical Distribution*.—South Queensland, New South Wales, Victoria, and South Australia.

*Nest*.—Within a hollow bole or branch of a tree in open forest country; also reported to breed in the cliffs of the Lower Murray River.

*Eggs*.—Clutch, four to five; elliptical or round oval in shape; texture of shell inclined to be coarse in some examples, finer in others; surface slightly glossy; colour, white. Dimensions in inches of a set of three: (1)  $1.24 \times .97$ , (2)  $1.22 \times .94$ , (3)  $1.2 \times .99$ ; of odd examples: (1)  $1.2 \times .92$ , (2)  $1.18 \times 1.0$ , (3)  $1.12 \times .93$ , (4)  $1.1 \times .93$ .

*Observations*.—This splendid Parrot loves the inland portions chiefly of New South Wales, Victoria, and South Australia, and it is usually associated in pairs or small families in such places as the Wimmera district or Riverina. This species of “Collared” Parrakeets (Barnard) is also known as the Mallee Parrot. Besides the yellow collar, it wears nearly all the other colours of the rainbow, and is indeed a lovely Parrot.

The Mallee Parrakeet possesses a lighter or higher pitched voice than the *Platyceci*, and when the bird is on the wing its notes, though somewhat jerky, are musical, sounding like "whit-whit-whit." When Emu egging in the Riverina, June, 1895, I noticed this handsome Parrakeet usually in pairs. The male always appeared the larger and more brightly coloured bird.

Gould did not succeed in taking the eggs of the Mallee, or Barnard Parrakeet, although it was breeding in the large trees of all the different parts of the country he visited. Indeed these eggs were rare in collections for some time. The one originally described by me in 1885 was procured through the agency of my brother, then at Nhill, in the Wimmera district.

The late Mr. T. A. Forbes-Leith records:—"I have this beautiful Parrakeet well impressed on my memory, as on following one I got bushed for some time, with the thermometer about 160 degrees in the sun, and no water in the district. I brought the Parrot home, although at one time, owing to the great heat and my intense thirst, I thought I should have perished."

On the authority of the late Captain F. C. Hansen, I have mentioned the Murray cliffs as a breeding place. He did not take eggs, but when passing in the steamer "Maggie" noticed these Parrakeets nesting there, also the Rock Pebbler (*Polytelis melanura*) and the "Blue Bonnet" (*Psephotus zanthorrhous*).

Breeding months from the middle of September to the end of the year, but in extraordinary seasons (notably 1899) eggs and young have been noticed in July.

## 510.—BARNARDIUS SEMITORQUATUS. Quoy and Gaimard.—(413)

### YELLOW-COLLARED PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 19.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 559.

*Previous Descriptions of Eggs*.—\*Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 42 (1865).

*Geographical Distribution*.—West Australia.

*Nest*.—A hole or hollow in a tall tree (eucalypt) in thick forest.

*Eggs*.—Clutch, seven to nine (Gould); round oval in shape; texture of shell comparatively fine; surface slightly glossy; colour, pure white. Dimensions of a set of three: (1) 1.29 × 1.0, (2) 1.22 × 1.0, (3) 1.21 × 1.0. (Keartland collection.)

*Observations*.—This is the largest species of the handsome ring-necked Parrakeets, and is a Western Australian bird, where it is plentiful. I do not think it ventures into the tropics. It has been

\*No dimensions given.

called from time immemorial the "Twenty-eight" Parrakeet, for during its undulatory flight through the woods it often calls "twenty-eight, twenty-eight, twenty-eight." Few sights are more captivating than a family of these magnificent Parrakeets perched upon a naked bough.

Breeding season, end of September and beginning of October to December.

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511.—BARNARDIUS ZONARIUS, Shaw.—(414)

YELLOW-BANDED PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 20.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 560.

*Previous Descriptions of Eggs*.—Campbell: Victorian Naturalist (1888), also Proc. Roy. Soc., Victoria, vol. iii., p. 4 (1890).

*Geographical Distribution*.—Victoria, South, West, and North-west Australia and the Interior, including the Gulf of Carpentaria district.

*Nest*.—Within a hole or hollow branch of a tree, the eggs, as in the case of the majority of the tribe, being deposited on the dry, decayed dust at the bottom.

*Eggs*.—Clutch, five or more; roundish in shape; texture of shell fine; surface glossy, with occasionally tiny limy nodules; colour, pure white. Dimensions in inches of a proper clutch from Western Australia: (1) 1.27 × .96, (2) 1.2 × .94, (3) 1.2 × .93, (4) 1.19 × .9, (5) 1.18 × .95; of odd examples from Central Australia: (1) 1.15 × .96, (2) 1.1 × .91.

*Observations*.—Excepting the eastern and northern parts of Australia, the Yellow-banded, or locally-called Port Lincoln, Parrakeet, is found over a great part of Australia, especially the dry, desolate, inland portion from Central to West, and, like its cousin, the Yellow-collared, wears a black head, but may be distinguished by its gamboge-yellow waistcoat, hence the name "banded."

On Boxing Day, 1889, when shooting with Mr. R. H. Cowan, on the Greenough River, Champion Bay district, West Australia, we heard the peculiar chattering voices of Parrots in light metallic tones. We soon shot specimens, which resembled the Yellow-banded, yet by their lighter colour and smaller size, seemed different. However, on sending an example to the British Museum, Count Salvadori classed it with *B. zonarius*.

To the goodness of Miss N. Loque, of Ellendale, Champion Bay, I am indebted for sending me a full set of five eggs, which were taken from a hollow eucalyptus bordering her home river—the Greenough.

## 512.—BARNARDIUS OCCIDENTALIS, North.

## NORTH PARRAKEET.

*Reference.*—Records Austr. Mus., vol. ii., p. 83 (1893).

*Geographical Distribution.*—West and North-west Australia.

*Observations.*—Mr. North states: "In the disposition of its markings *B. occidentalis* resembles *B. zonarius*, but it differs from that species in having light-blue instead of dark-blue cheeks; in the greater extent of the conspicuous lemon-yellow of the lower portion of the breast and the whole of the abdomen, and which extends as far as the vent, instead of the deep gamboge-yellow of the centre of the abdomen only; in the verditer-green of the chest, back, wings, scapulars and interscapular region, instead of dark green, and in the absence of the narrow black band immediately below the collar."

This description seems to answer to those of the birds I shot near Champion Bay (referred to in the preceding species), one of which I forwarded to the British Museum, with the hint that it was possibly new, but which Count Salvadori made synonymous with *B. zonarius*. I also received similar Parrots from Mr. T. Carter, Point Cloates.

If I recollect rightly, *B. occidentalis* is the first bird that has been named by Mr. North, and if he can establish his new species, I venture to think ornithologists will agree with me in placing it on the vernacular list as the North Parrakeet. In the event of the new species being undoubtedly established, then the eggs which I have described from the Champion Bay district as *B. zonarius* are referable to *B. occidentalis*.

## 513.—PSEPHOTUS ZANTHORRHOS, Gould.—(427)

## YELLOW-VENTED PARRAKEET.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 563.

*Previous Descriptions of Eggs.*—Lucas: Victorian Naturalist (1884);  
Campbell: Southern Science Record (1885); North: Proc.  
Linn. Soc., N.S. Wales, vol. ii., 2nd ser., p. 986 (1887).

*Geographical Distribution.*—New South Wales, Victoria, South and West Australia.

*Nest.*—Within a hole or hollow, usually in a box-tree (*Eucalyptus*) growing in belts of timber on the plains; also reported to breed in the cliffs of the Lower Murray River.

*Eggs.*—Clutch, five to seven usually, ten maximum; round in shape; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches of a clutch: (1) 1.0 × .84, (2) .94 × .84, (3) .94 × .8, (4) .92 × .84, (5) .92 × .82.

*Observations.*—The Yellow-vented Parrakeet, or the “Blue Bonnet” of the bird-catchers, is chiefly found in the interior portions of New South Wales and Victoria, notably on the plains of the Murray and Riverina, where it retires to the belts of timber to breed. It is also found in South and Western Australia. It is a graceful bird, about 12 inches or 13 inches in length; general colour olive-brown, relieved with a face of ultramarine blue, and a crimson patch down the abdomen, the rest of the under surface being yellowish. When flying through the belts of timber in pairs or small flocks, their voices are harsh, and grate upon one's ears.

I first received eggs from Mr. G. H. Morton, Benjeroop, 1883, and the following season I myself found the species nesting in the belts of timber near Pyramid Hill, where, on the 8th October, seven young ones about three or four weeks old were taken from a nest.

Apparently these Parrakeets are not always easily flushed from their nests. Mr. Morton tells me he has taken eggs from under the sitting birds.

The set of seven eggs, collected by Mr. J. Hill, Kewell, Victoria, taken on the 15th September, 1887, and described by Mr. North, verifies the descriptions of the eggs of this species previously published by Dr. T. P. Lucas and myself, although we all mistook the bird for the Red-vented instead of the Yellow-vented Parrakeet.

Bird-trappers say there are two races of “Blue Bonnets” which sometimes breed in the same locality. Perhaps the other bird is referable to the succeeding variety, the Red-vented Parrakeet (*P. hæmatorrhous*).

Breeding months, end of August or beginning of September to December.

On the habits of birds coming to water, Mr. H. W. Ford no doubt refers to the Yellow-vented Parrakeet when he writes:—“There is a small Parrakeet, of a smoky-grey, with a pink spot on the breast, that only goes to water after dark and before daylight. When camped, we often heard them going over us both evening and morning. This habit is often fatal to the birds, or some of them, when wire fences are near the water. I have got the birds with head cut right off against the wires. It is a peculiar habit, always going to water in the night, and, like the antics of the Quarriors (Cockatoo Parrots) and Shell Parrakeets, is to escape their enemies, I suppose. For near water in drought time all sorts of Hawks, cats, iguanas, and other carnivora loiter, as an easy place to get food.

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514.—PSEPHOTUS HÆMATORRHOUS, Gould.—(426)

RED-VENTED PARRAKEET.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 33.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 561.

*Geographical Distribution.*—South Queensland and New South Wales.



*Nest*.—A hole or hollow in a tree.

*Eggs*.—Clutch, probably five to seven, and similar to those of the Yellow-vented Parrakeet (*P. zanthorrhous*).

*Observations*.—This truly beautiful Parrakeet, although plainly figured by Gould, with its crimson-coloured under tail coverts, has been persistently confounded with the Yellow-vented species or variety, which is the common bird, in the southern parts at all events, while the Red-vented bird appears to be restricted to the northern portion of New South Wales and Southern Queensland. No doubt the natural economy of both birds is very similar.

Gould obtained his specimens of the Red-vented Parrakeet on the Lower Namoi River, Christmas, 1839. He failed, however, to glean any information respecting its nidification, particulars of which are still wanting.

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515.—PSEPHOTUS PULCHERRIMUS, Gould.—(429)

BEAUTIFUL PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 34.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 564.

*Previous Descriptions of Eggs*.—Campbell: Southern Science Record (1885); North: Austn. Mus. Cat., p. 261 (1889).

*Geographical Distribution*.—Queensland and New South Wales.

*Nest*.—Usually a hole drilled into an ants' (*Termites*) hillock, but occasionally a hole of a tree, in open forest country. (See illustration.)

*Eggs*.—Clutch, four to five; round oval in shape; texture of shell fine; surface slightly glossy; colour, pure white. Dimensions in inches of a proper clutch: (1)  $\cdot 84 \times \cdot 7$ , (2)  $\cdot 84 \times \cdot 67$ , (3)  $\cdot 81 \times \cdot 69$ , (4)  $\cdot 79 \times \cdot 68$ ; of odd examples: (1)  $\cdot 94 \times \cdot 76$ , (2)  $\cdot 85 \times \cdot 69$ .

*Observations*.—One is apt to become a little effusive when describing the glorious colours of Parrots. Gould says, "The graceful form of this Parrakeet, combined with the extreme brilliancy of its plumage, renders it one of the most lovely of the *Psittacida* yet discovered; and in whatever light we regard it, whether as a beautiful ornament to our cabinets or a desirable addition to our aviaries, it is still an object of no ordinary interest."

It has a somewhat limited range, being confined to the interior portions of Queensland and adjacent parts in New South Wales.

The eggs and the first information of the interesting fact that the birds lay in ant-hillocks, I received from the late Mr. George Barnard, Coomoooolaroo (Queensland), where the birds breed. Unfortunately, during my visit to that part of the country, a drought

existed, and consequently the birds were not laying. However, on a trip subsequently, Mr. D. Le Souëf was more successful, and was enabled to bring away an excellent photograph of an ant-hill, also one showing the position of the eggs in the mound.

Dr. Carl Lumlholtz observed that the nests were several miles apart, and that those examined in September contained eggs partly incubated. He proceeds to state, "There is an irregular entrance, about two inches in diameter and about a foot above the ground. In the interior the Parrot makes an opening about a foot high and two or three feet in diameter. None of the building material is carried away, but all the cells and canals are trampled down, so that there remains simply a wall, one or two inches thick, around the whole nest. Here the female lays five white eggs."

Breeding months September to December.

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516.—PSEPHOTUS CHRYSOPTERYGIUS, Gould.—(428)

GOLDEN-SHOULDERED PARRAKEET.

*Figure.*—Gould: Birds of Australia, fol., supp., pl. 64.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 565.

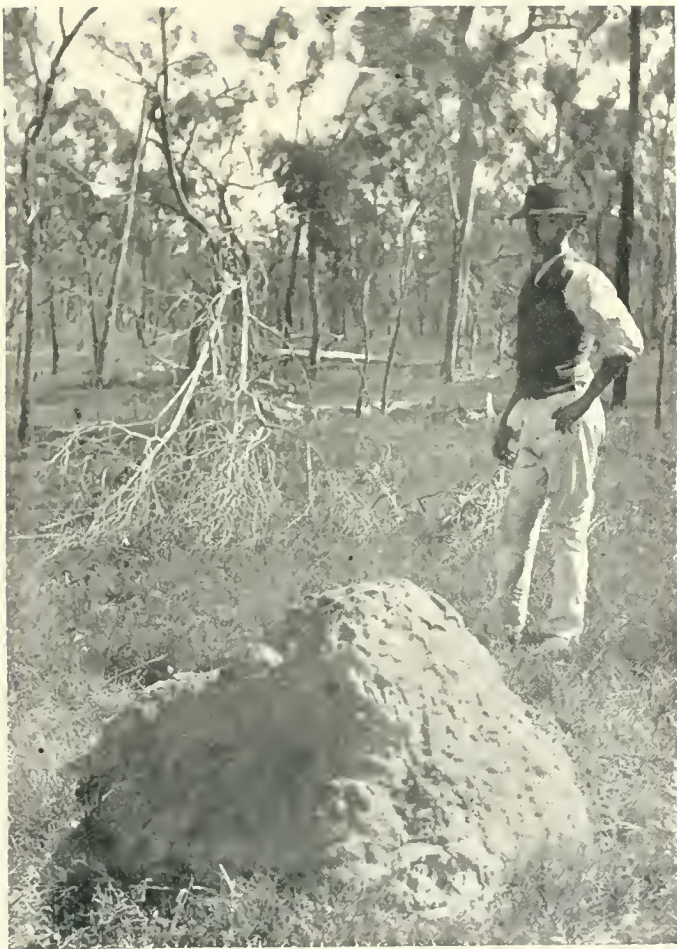
*Geographical Distribution.*—North-west Australia, Northern Territory, and North Queensland.

*Nest and Eggs.*—Undescribed.

*Observations.*—Gould wrote concerning the glorious Golden-shouldered Parrakeet:—"One of the greatest pleasures enjoyed by the late celebrated botanist, Robert Brown, during the last thirty years of his life, was now and then to show me a drawing of a Parrakeet, made by one of the brothers Bauer, from a specimen procured somewhere on the north coast of Australia, but of which no specimen was preserved at the time, and none had been sent to England until several were brought home by Mr. Elsey, a year or two prior to Mr. Brown's death. On comparing these with the drawing made at least forty years before, no doubt remained in my mind as to its having been made from an example of this species."

This most beautiful Parrakeet remained in oblivion for exactly another forty years (Mr. Elsey having obtained his skins in the Gulf of Carpentaria district during Gregory's explorations, 14th September, 1856), until Mr. Harry Barnard secured specimens at Pine Creek, Port Darwin district, for some Melbourne collectors. I had the pleasure of examining the rare specimens.

The following year (10th March, 1897) the Zoological Society of London purchased a pair of live Golden-shouldered Parrakeets in England. By a coincidence, the end of the same year another bird was bought in a dealer's shop, Sydney, for the Trustees of the Australian Museum. No doubt, in both instances, these live birds came originally from Port Darwin.



ANT HILLOCK, SHOWING NEST OF THE BEAUTIFUL  
PARRAKEET.

*From a Photo by D. Le Souëf.*



## 517.—PSEPHOTUS DISSIMILIS, Collett.

## CHESTNUT-CROWNED PARRAKEET.

*Reference.*—Proc. Zool. Soc., p. 356 (1898).

*Geographical Distribution.*—Northern Territory.

*Nest and Eggs.*—Undescribed.

*Observations.*—Dr. Dahl first obtained this Parrakeet in 1895, in the Northern Territory, where he met it here and there in small flocks, particularly between Pine Creek and Catherine River, but it did not appear common, and was only observed during the dry season. Professor R. Collett, who described the bird, states that it comes nearest to the Golden-shouldered Parrakeet (*P. chrysopterygius*), but lacks the yellow band across the forehead, has a chestnut crown, the lower parts verditer-blue (in the male), and the under tail coverts orange.

## 518.—PSEPHOTUS MULTICOLOR, Temminck.—(430)

## MANY-COLOURED PARRAKEET.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 35.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 566.

*Previous Descriptions of Eggs.*—Campbell: Victorian Naturalist (1888); North: Austn. Mus. Cat., p. 261 (1889).

*Geographical Distribution.*—New South Wales, Victoria, and South, West and North-west Australia.

*Nest.*—Within a hole or hollow trunk of a tree.

*Eggs.*—Clutch, four to six; round in form; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches: (1)  $\cdot 9 \times \cdot 76$ , (2)  $\cdot 9 \times \cdot 72$ , (3)  $\cdot 89 \times \cdot 76$ , (4)  $\cdot 88 \times \cdot 75$ , (5)  $\cdot 86 \times \cdot 76$ , (6)  $\cdot 86 \times \cdot 75$ .

*Observations.*—The Many-coloured Parrakeet, especially the male, is well named, and is found in the open forest country of the interior portions of Southern Australia, where in parts it is stated to be plentiful. It was noticed by the Horn Expedition near all water-holes in Central Australia, and by the Calvert Expedition between Cue and Lake Augusta, West Australia, while Mr. T. Carter found the species at the North-west Cape. I have noticed a few pairs in the Wimmera district of Victoria, where they breed. However, the eggs in my collection are from Yorke Peninsula, South Australia, where they were collected by Mr. W. White from a nest in a hollow mallee limb. One of the parents was captured on the nest.

Breeding months August, September and October, and probably later. As soon as the young are feathered the sexes can be distinguished—the male by his yellow shoulders, the female by her dull-red.

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519.—PSEPHOTUS HEMATONOTUS, Gould.—(431)

RED-BACKED PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 36.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 567.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 70 (1865); North: Austr. Mus. Cat., p. 262 (1889).

*Geographical Distribution*.—South Queensland, New South Wales, Victoria and South Australia.

*Nest*.—Within a hole or hollow trunk of a tree, in open forest.

*Eggs*.—Clutch, six to eight; roundish in shape; texture of shell fine; surface glossy; colour, pure white, occasionally stained or soiled with the wood dust of the nest. Dimensions in inches of selected pairs: A (1) .95 × .79, (2) .94 × .77; B (1) .99 × .73, (2) .92 × .72.

*Observations*.—The familiar Red-backed Parrakeet is probably the most common of the graceful genus *Psephotus*, and is found in the inland or interior tracts of Eastern Australia, where at some seasons, especially during winter, they congregate in flocks of from 150 to 200 birds, making a harvest for bird catchers. On account of its spending most of its time on the ground, it is often called the "grass" Parrot. It makes a good cage bird, its musical whistling notes, as Gould remarks, almost approach a song.

Mr. John Ramsay has taken the eggs of this species as early as 2nd September (1868), at Cardington, on the Bell River.

An incomplete set of four eggs I took from a small dead tree near Pyramid Hill, Victoria, 7th October, 1887. On the same date I saw another nest with three young in down, proving these birds breed early for Parrots. The eggs are common in collections.

The female of this graceful Parrakeet appears solely to perform the task of incubation. I have watched her mate feeding her in or near the nesting hole. He performs the operation somewhat after the manner of a common Pigeon feeding its young, by connecting beaks and discharging at intervals the contents of its crop with spasmodic jerks, while the female keeps up a continual hissing noise.

Breeding months, end of August or September to December.

## 520.—NEOPHEMA BOURKEI, Gould (Mitchell).—(438)

## BOURKE GRASS PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 43.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 570.

*Previous Descriptions of Eggs*.—Campbell: Southern Science Record (1883); North: Austn. Mus. Cat., p. 264 (1889).

*Geographical Distribution*.—New South Wales, Victoria, and South Australia.

*Nest*.—Within a hole or hollow in a tree.

*Eggs*.—Clutch, four, in some instances probably five; inclined to oval in shape; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches about  $\cdot 9 \times \cdot 7$ .

*Observations*.—The Bourke Parrakeet is a somewhat rare interior species, which I have never seen myself in the open. Of birds kept in captivity it has been ascertained that the male bird assists in the task of incubation, and in all probability this rule applies to the other members of this beautiful genus.

With the original description of an egg, furnished in the "Catalogue" of the Australian Museum, it is stated that the late Mr. K. H. Bennett took a set of these rare Parrakeets' eggs on the 20th August, 1884, in the interior of New South Wales.

Breeding season includes August and probably the three or four following months.

## 521.—NEOPHEMA VENUSTA, Temminck.—(432)

*Euphema chrysostoma*, Gould.

## BLUE-WINGED GRASS PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 37.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 570.

*Previous Descriptions of Eggs*.—\*Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 72 (1865); Campbell: Southern Science Record (1883); North: Austn. Mus. Cat., p. 262 (1889); Hall: Victorian Naturalist (1898).

*Geographical Distribution*.—New South Wales, Victoria, South Australia, Tasmania, King Island, and probably other islands in Bass Strait.

*Nest*.—Within a small hole in a tree or in a hollow log or stump.

\* No dimensions given.

*Eggs.*—Clutch, five to seven; roundish oval in shape; texture of shell somewhat fine; surface glossy; colour, pure white. Dimensions in inches of selected examples: (1)  $\cdot 91 \times \cdot 73$ , (2)  $\cdot 9 \times \cdot 74$ , (3)  $\cdot 89 \times \cdot 72$ , (4)  $\cdot 86 \times \cdot 7$ .

*Observations.*—We are now dealing with a delightful genus, the species of which, for grace, elegance, and delicate colouring, may be considered the most beautiful of little Parrots.

The species under notice is a dweller of the thinly-timbered localities where much grass grows, in the south-eastern corner of Australia, including Tasmania and some of the islands in Bass Strait, notably Flinders. Gould says it is merely a summer visitant to Tasmania. Mr. Robert Hall states it has been observed to arrive in parts of southern Victoria about the middle of September, departing again (presumably north) during March or April.

In the "Victorian Naturalist" (1898) there appears a most valuable contribution to the life history of the Blue-winged Grass Parrakeet, by Mr. Hall, from the careful observations of his correspondent, Mr. Graham, who states:—"This Parrakeet is very regular in timing its visit, from 14th to 21st September. Its first concern upon arrival is to find a suitable stump for nesting, the kind preferred being that about one foot in diameter and ten to twenty-two feet high, perpendicular, and two feet to three feet of the top part hollow. This season (1897) I watched the operations of two pairs, and, as their times of action were identical, a description of one will suffice.—On 28th September, bird No. 1 commenced preparing hole by throwing overboard every particle of charcoal and charred wood from bottom and sides of hole. After the coarser matter was removed, the fine, dry decayed matter was carefully scraped from every hole and crevice around the inside and allowed to fall to the bottom of hole. This work continued until 22nd October. I visited it each day and always found a bird at work, but whether male or female, as you ask, I cannot say—perhaps both, and it is a question for future research. From 22nd to 28th October one bird sat continually, and I got alarmed lest the eggs should be laid during this period, for although I visited it often five times during each day, and remained watching till after dark, during these six days I did not find the bird from the nest. However, on the 28th, the bird had flown and left one egg. A second was laid on 30th October, and from then until 19th November I had no opportunity of seeing what was taking place beneath the sitter, as it could not be persuaded to leave the nest; rough measures would not do. On this 19th day broken egg-shells pointed to full incubation of one or more eggs. On 21st and 23rd November more shells, with bird still keeping close on nest. On 24th November appeared five young birds, with a yellowish downy appearance, and old birds keeping close on nest till 27th November, after which two young birds opened their eyes on 1st December. On 4th December two young birds appeared, covered with grey, yellowish about head and tail feathers, the latter being one inch long. By 10th December two had developed green over body and wings, with a little grey still remaining about the head. The remaining three,



being less advanced, were partly coloured green and grey. By 19th December traces of grey had disappeared from all. The first young bird left nest on 20th December. A second left on the following day, 21st. No. 3 left on the 22nd. Nos. 4 and 5 left on 23rd. Towards the end of January, and occasionally as late as the middle of February, one may see the adult birds flying from place to place, followed closely by young birds, which receive their food from the parent birds' bills. A field of standing oats is much appreciated by this species; failing this, milk thistle and flat weed (*Hypochaeris*, sp.) seed come next in favour. Immigration to warmer parts begins during March, and continues to mid April, after which no more are seen until the following spring."

It was further observed in another instance that out of five eggs hatched by the 9th December (1896), two young left the nest on the 10th January, one was taken forcibly for identification for Mr. Hall on the 11th, and two left 14th January, or thirty-two to thirty-six days for the batch after being hatched.

Breeding months, end of September to December or January.

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522.—*NEOPHEMA ELEGANS*, Gould.—(433)

GRASS PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 38.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 572.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 74 (1865).

*Geographical Distribution*.—South Queensland, New South Wales, Victoria, South and West Australia.

*Nest*.—Within a hole or hollow in a tree.

*Eggs*.—Clutch, four to seven (Gilbert); round in form; texture of shell fine; surface without gloss; colour, pure white. Dimensions in inches of a proper clutch: (1)  $\cdot 81 \times \cdot 68$ , (2)  $\cdot 8 \times \cdot 72$ , (3)  $\cdot 78 \times \cdot 68$ , (4)  $\cdot 77 \times \cdot 67$ .

*Observations*.—In situations conducive to its habits, this truly elegant little species is found in the southern parts of Australia, from east to west. I have been privileged to see it at home about the margin of lignum swamps and brackish lakes of Victoria, as well as in Western Australia, which latter country Gould deemed the bird's proper home, and where Gilbert saw them in myriads at certain pools, there being no other water anywhere near at the time.

Breeding months, end of August, September and October, and probably later.

## 523.—NEOPHEMA CHRYSOGASTRA, Latham.—(434)

## ORANGE-BELLIED GRASS PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 39.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 573.

*Previous Description of Eggs*.—Campbell: Southern Science Record (1883).

*Geographical Distribution*.—New South Wales, Victoria, South Australia and Tasmania.

*Nest*.—Usually within a small hollow spout of a fallen tree or log.

*Eggs*.—Clutch, four to six; round in form; texture of shell fine; surface slightly glossy; colour, pure white. Dimensions in inches of a pair: (1)  $\cdot 84 \times \cdot 73$ , (2)  $\cdot 83 \times \cdot 75$ ; three from a set taken near Ross, Tasmania: (1)  $\cdot 86 \times \cdot 74$ , (2)  $\cdot 84 \times \cdot 7$ , (3)  $\cdot 82 \times \cdot 7$ .

*Observations*.—This beautiful species may be readily distinguished from the other Grass Parrakeets by the rich orange colouring of the under surface—hence the appropriate vernacular name Orange-bellied.

This bird belongs to the south-eastern provinces of Australia, including Tasmania, where it is found very abundant on the Actæon Islands at the entrance of D'Entrecasteaux Channel. It was in that grass and scrub-covered locality Gould observed, "I frequently flushed small flocks from among the grass, when they almost immediately alighted on the barilla bushes around me, their sparkling orange bellies forming a striking contrast with the green of the other parts of their plumage and the silvery foliage of the plant upon which they rested."

Mr. A. E. Brent informs me that this bird usually lays late in the season (December), depositing its eggs in a small broken spout of a fallen tree. Gould was induced to believe that the Orange-bellied Parrakeet laid eggs in holes on the ground.

## 524.—NEOPHEMA PETROPHILA, Gould.—(435)

## ROCK PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 40.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 574.

*Previous Descriptions of Eggs*.—\*Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 76 (1865); Campbell: Proc. Roy. Soc., Victoria, vol. iii., new ser., p. 4 (1890); North: Rec. Austr. Mus., vol. i., p. 115 (1891).

*Geographical Distribution*.—South and West Australia.

\* No dimensions given.

*Nest.*—In a crevice of a rock or under shelving stones, usually on islets adjacent to the mainland.

*Eggs.*—Clutch, four to five; some roundish, others elliptical in shape; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches of a proper clutch: (1)  $1.0 \times .75$ , (2)  $.98 \times .78$ , (3)  $.96 \times .75$ , (4)  $.95 \times .76$ . The eggs of the Rock Parrakeet appear to be the largest of the genus.

*Observations.*—This is a romantic little Parrakeet, which prefers to live on the rocky islets off the coast of South and Western Australia. Although Gould mentions he received specimens of the Rock Parrakeet from Port Lincoln, it is somewhat unaccountable that the bird is not indicated for South Australia on Dr. Ramsay's "Tabular List."

All that is recorded in Gould respecting the nidification of the Rock Parrakeet is the information supplied by Gilbert, who, speaking of Rottnest Island, stated the bird breeds in holes of cliffs there, and, according to the testimony of the natives, lays seven or eight eggs. The natives overstated the number of eggs, but for the nesting among the rocks I can vouch, because I enjoyed, during November, 1889, the most pleasant experiences respecting these little Parrakeets on the identical island mentioned by Gilbert.

It is a rare picture to witness a pair of these lovable little creatures in their golden-green plumage, perched on the face of a limestone crag, amidst such romantic and rugged surroundings. I was singularly successful in securing a series of their eggs at Rottnest Island, where the birds invariably select rocky islets off the main island for breeding purposes, notably Green and Parrakeet Islands.

By a curious coincidence the first person on the island to present me with specimens of both eggs and live birds was Mr. A. H. Courderôt, a corresponding member of the Society before which I described the eggs, viz., the Royal Society of Victoria. Other eggs I took myself. The birds make no nest, but simply deposit four or five eggs under the slabs of indurated sand or limestone, where the eggs are sometimes very difficult to reach, especially if a crevice on a steep side sloping to the water's edge be selected.

According to the "Records" of the Australian Museum, the Trustees received specimens in 1891 from the Adelaide Museum, procured by Mr. A. H. C. Zeitz, of the latter institute. Birds as well as eggs were collected in September, 1890, on Spilsby, one of the Sir Joseph Banks Group, in Spencer's Gulf.

In describing one of these eggs, Mr. North very properly was careful to acknowledge that Gilbert found the Rock Parrakeet breeding in the holes of the most precipitous cliffs on Rottnest Island, but he (Mr. North) overlooked the fact, published in the Royal Society of Victoria's "Proceedings," that I had given a detailed description of these nesting places on outlying rocks, also of the eggs, which Gilbert was unable to secure, from the same quarter.

Breeding season September to December.

## 525.—NEOPHEMA PULCHELLA, Shaw.—(436)

## RED-SHOULDERED GRASS PARRAKEET.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 41.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 575.

*Previous Descriptions of Eggs.*—Campbell: Southern Science Record (1883); North: Austr. Mus. Cat., p. 263 (1889).

*Geographical Distribution.*—South Queensland, New South Wales, Victoria, and South Australia.

*Nest.*—Within a hole in a tree or in a hollow log.

*Eggs.*—Clutch, four to five usually, eight maximum; round oval in shape; texture of shell somewhat fine; surface glossy; colour, pure white. Dimensions in inches of a pair taken in Gippsland: (1)  $\cdot 93 \times \cdot 75$ , (2)  $\cdot 92 \times \cdot 75$ ; of a clutch (according to the Australian Museum "Catalogue"): (1)  $\cdot 88 \times \cdot 72$ , (2)  $\cdot 85 \times \cdot 7$ , (3)  $\cdot 8 \times \cdot 71$ , (4)  $\cdot 8 \times \cdot 7$ .

*Observations.*—This exquisite species is found in the more thickly timbered tracts of South-eastern Australia. The late Mr. T. A. Forbes-Leith stated this lovely Grass Parrakeet wanders to Gippsland in spring, when it is generally seen in pairs, or perhaps three or four together. I think it was this species we used to flush from the rich alluvial flats at the foot-hills of the Dandenongs.

Mr. Percy Ramsay, long since—August, 1859—took at Macquarie Fields, New South Wales, a set of these rare Grass Parrakeets' eggs, which, however, remained undescribed for thirty years, till the "Catalogue" of the Australian Museum appeared in 1889.

The eggs in my collection, taken at Berwick, Victoria, are larger in the dimensions than the Macquarie Fields' set, and were identified by the wing of the bird shot by the same person who took the eggs. However, the finding of another authenticated clutch of these scarce eggs will be welcomed with interest.

Breeding season, August to December.

## 526.—NEOPHEMA SPLENDIDA, Gould.—(437)

## SCARLET-CHESTED GRASS PARRAKEET.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 42.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 576.

*Geographical Distribution.*—New South Wales, Victoria, South and West Australia.

*Nest and Eggs.*—See Appendix.

*Observations.*—Gould much regretted he was unable to give more than a brief notice of this beautiful and truly "Splendid" Grass Parrakeet. We are not much better off to-day. I suppose it is no wonder, because this bird has been characterised as very shy in disposition and nowhere numerous.

527.—*NANODES DISCOLOR*, Shaw.—(433)

SWIFT LORIKEET.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 47.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 592.

*Previous Descriptions of Eggs.*—Campbell: Southern Science Record (1833); North: Austr. Mus. Cat., p. 266 (1889).

*Geographical Distribution.*—South Queensland, New South Wales, Victoria, South Australia, and Tasmania.

*Nest.*—Within a hole, usually in a dead branch of a tree.

*Eggs.*—Clutch, two to three on the mainland, in Tasmania stated to be four to six; roundish in form; texture of shell fine; surface with or without gloss; colour, white, usually stained with the wood dust of the nest. Dimensions in inches of a clutch: (1)  $\cdot98 \times \cdot79$ , (2)  $\cdot96 \times \cdot8$ , (3)  $\cdot93 \times \cdot78$ .

*Observations.*—The plumage of the Swift Lorikeet (upper and under) is green, with deep blue on the forehead and wing edges, relieved with scarlet on the face, shoulder, and underneath the wings. Taken altogether it is an elegant species, about ten inches in length.

As Gould remarks, this fine Lorikeet is a migratory, or rather, it should be stated, a nomadic species, passing the summer and breeding season in its more southern or rather south-eastern part of the Australian Continent and Tasmania. The species has not been recorded farther north than South Queensland.

The late Mr. T. A. Forbes-Leith says a few of these Parrots may be met with throughout Victoria at *all* seasons.

During September and the four following months, Gould found the Swift Lorikeet not only abundant in the gum forests of Tasmania, but common in the gardens of Hobart, where, within a few feet of the heads of the passing inhabitants, the birds were feeding upon the honey of the fresh-blown eucalypt flowers. Some of the birds had so surfeited themselves with the saccharine matter, that on being shot and held up by the feet, the liquid discharged itself from their mouths.

How is it, then, that this bird is not classed by recent authorities with the honey-eating Parrots—Lorikeets? Perhaps it is because the Swift Lorikeet is not entirely a honey-eating bird. Mr. C. French, jun., brought under my notice one of these birds, shot in the Botanical Gardens (3rd October, 1896), which had a crop full of the larvæ of a certain insect.

The Swift-flying Lorikeet still continues to visit Tasmania regularly, in numbers small or great. It follows the flowering eucalypts wherever they bloom, which blooming is irregular or according to seasons. We had quite an irruption of these birds (at least I took them to be this species from what I can recollect) at Malvern, Victoria, when the red-gum trees were in flower. The birds were in hundreds. We (other boys and I) shot a string of them to make a Parrot pie.

When shot, the birds, although dead, used to hang from the branch, head downwards, for a considerable time before the feet released their grip. Proceeding home, the string we had shot became besmeared with the honey that exuded freely from their mouths, and had a heavy nauseous odour.

Gould found these Lorikeets breeding about midway between Hobart and Brown's River, but unfortunately he did not obtain eggs, in consequence of the birds nesting in holes of the loftiest and most inaccessible trees.

Mr. A. E. Brent, who states he has taken eggs from many nests of the Swift Lorikeet, says he never found less than four to a clutch, and sometimes as many as six.\*

Principal laying months November and December.

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528.—MELOPSITTACUS UNDULATUS, SHAW.—(439)

BETCHERRYGAH OR WARBLING GRASS PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 44.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 594.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 82 (1865); North: Austr. Mus. Cat., p. 264 (1889).

*Geographical Distribution*.—Australia in general.

*Nest*.—Within a hole or hollow spout of a tree.

*Eggs*.—Clutch, five to eight, one instance known of nine; round oval in shape; texture of shell fine; surface without gloss; colour, pure white, occasionally stained with wood dust. Dimensions in inches of a maximum clutch: (1)  $\cdot77 \times \cdot58$ , (2)  $\cdot76 \times \cdot6$ , (3)  $\cdot75 \times \cdot61$ , (4)  $\cdot75 \times \cdot6$ , (5)  $\cdot74 \times \cdot6$ , (6)  $\cdot74 \times \cdot59$ , (7)  $\cdot72 \times \cdot58$ .

*Observations*.—One need hardly give a description of this little Parrot, which is so well known in its dress of pale greenish-yellow, each feather having a crescent-shaped, dark brownish mark near the extremity and an under surface of bright green. The face and throat are yellow, curiously ornamented on each cheek with a small patch of the richest blue. The

\* These numbers clash with the experience of collectors on the mainland, where the bird lays two or three eggs, usually only two.

sexes are undistinguishable outwardly, except that the adult male has the cere or nostrils bluish in colour, whilst the same part on the female is brownish. Total length, about  $7\frac{1}{2}$  inches.

Where are the flocks of these lovely little Parrakeets that from the far interior used periodically to visit Victoria and other parts of Southern Australia when the grass seeds were ripening? "Because their primitive feeding grounds have been destroyed by the depasturing of other flocks (stock)," is the significant reply of an old and experienced bird trapper.

The Warbling Grass Parrakeets used to appear in the south about the same time as the sprightly Cockatoo Parrakeet, namely, about the beginning of August.

On arriving at Brezi, to the north of Liverpool Plains, in the beginning of December (1839), Gould found himself surrounded by numbers of these Parrakeets, breeding in all the hollow spouts of the large eucalypts bordering on the Mokai, and in crossing the plains between that river and the Peel, in the direction of the Turi Mountains, he saw them in flocks of thousands. By the end of the month the young were well able to provide for themselves. The birds were first called "Betcherrygah" by the aborigines of the Liverpool Plains.

Rarely does the sweet little Shell Parrakeet or "Betcherrygah" fly south of Melbourne. The late Mr. H. W. Wheelwright has stated that, in the middle of the summer of 1854, the gum-trees in the neighbourhood of Mordialloe "swarmed with them." They remained about one month, when they suddenly disappeared.

As cage birds, the Warbling Grass Parrakeets are general favourites. Gould was one, if not the first, to introduce living examples to Britain, having succeeded in bringing several with him on his return in 1840.

The late Mr. Forbes-Leith states:—"When these charming little Parrakeets were first taken to England, dealers could not supply the demand at fourteen guineas per pair. . . . I have known these Parrakeets to breed in confinement; and one pair that escaped in London, about twenty years ago, reared a brood of young in the Temple Gardens."

The habits of this little Parrakeet coming to water, mentioned by Mr. Ford, and given in connection with the Cockatoo Parrakeet, are substantiated by Mr. R. J. Dalton, who says: "The Warbling Grass Parrakeets have a very peculiar way of drinking. They never land, but fly in mobs to water, take a mouthful then circle round, repeating the performance. As each bird is satisfied it drops out, and the mob finally dwindles away."

Breeding months, August to December. In the Interior they apparently sometimes breed during winter, according to the season, for during the progress of the Horn Scientific Expedition, in the winter of 1894, numbers of nests were examined that contained young birds.

On the Minilga, Western Australia, Mr. T. Carter has taken eggs as early as August, and has seen young in March. He says these little Parrakeets appear to lay after a good rain.

During the Calvert Expedition (1896) to the North-west, throughout the whole of the country traversed, these birds were noted.

They were breeding in July and August, and numbers of eggs and young birds were seen. On July 26th, Mr. G. L. Jones took young birds fully fledged from a hollow limb, in which he found four nests. Two of the latter contained fresh eggs. Other nestlings were seen on August 26th. As these birds require to drink frequently, their presence was always noted and their course watched. They travel immense distances to feed, and in the vicinity of Johanna Springs flocks of several thousands were seen going to some favourite feeding-place soon after sunrise. On three occasions Mr. Keartland saw a beautiful yellow bird flying in the flock. These abnormal birds were described as being as richly coloured as Norwich Canaries. Incubation lasts about twenty days, and the young remain in the nest about five weeks.

When in the Gulf of Carpentaria district, some years ago, Dr. W. Macgillivray recollects a remarkable occurrence of these little Parrots coming in such numbers along the scantily-timbered creeks, that all ordinary holes and spouts soon became occupied, and some birds had to take to hollow logs upon the ground, wherein they nested side by side; all stages from fresh eggs to young birds being seen in the same log.

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529.—PEZOPORUS FORMOSUS, Latham.—(441)

#### GROUND PARRAKEET.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 46.

*Reference.*—Cat. Birds Brit. Mus., vol. xx., p. 596.

*Previous Descriptions of Eggs.*—Campbell: Victorian Naturalist (1887); North: Proc. Linn. Soc., N.S. Wales, vol. ii., 2nd ser., p. 410 (1887).

*Geographical Distribution.*—South Queensland (?), New South Wales, Victoria, South and West Australia and Tasmania, including the Furneaux Group.

*Nest.*—A somewhat deep hollow in the ground, evenly lined with fine grass, &c., under a tussock of grass—usually a button-grass tussock in Tasmania. A nest in the Australian Museum is composed of rushes and wire-grass, bitten into suitable lengths, bent and roughly interwoven into a platform about  $4\frac{1}{2}$  inches in diameter and about half-an-inch thick.

*Eggs.*—Clutch, three to four; round in form; texture of shell fine; surface glossy; colour, white. Dimensions in inches of a clutch: (1)  $1.11 \times .8$ , (2)  $1.1 \times .87$ , (3)  $1.09 \times .9$ .

*Observations.*—This most interesting and purely terrestrial form of Parrot is likely soon to become extinct. Not only are its native haunts being destroyed, but such vermin as foxes and wild cats prowl through the country.



The original geographical range of the Ground Parrakeet was across Southern Australia from east to west, including Tasmania and Flinders Island, where it existed in localities suitable to its peculiar habits, i.e., sandy sterile tracts covered with coarse covert or swampy places of rank herbage. Its call is a feeble twitter. The Ground Parrakeet is mottled golden-green and black; has comparatively large feet, and a pheasant-shaped tail, and in total length is between 11 inches and 12 inches. It emits a strong scent, so that game-dogs readily point at the bird.

On Flinders Island Gould found the Swamp or Ground Parrakeet breeding on the scrubby places which cover a greater portion of that rough island; but, although he obtained young birds, he did not secure eggs, which no doubt accounts for his over-estimating the number of eggs to a clutch.

Mr. E. D. Atkinson, C.E., of Tasmania, kindly supplied the following with the eggs:—"Three eggs in nest, which was deeply hollowed out of the ground under a button-grass tussock, evenly lined with fine grass and most carefully concealed. Had not the bird flown from under my horse ('who nearly put his foot in it'), I should certainly not have found this prize." The nest was taken about the beginning of October. These Parrots used to be plentiful in the neighbourhood of Carrum Carrum Swamp, but with the reclamation of that morass, which is now occupied by smiling farms, where potatoes of great proportions grow, the place that knew the birds then "knows them no more for ever." The only record left of their having been found there is contained in a very interesting volume, published many years ago, entitled, "Bush Wanderings of a Naturalist," by the late Mr. H. W. Wheelwright. He found the eggs of the Swamp (Ground) Parrot, four in number ("white, and more oblong than those of the other species of Parrots"), on the ground amongst the heath.

Mr. North writes:—"Dr. Ramsay informs me this bird used to breed freely in the neighbourhood of Appin, in the long, tussocky grass, during the months of September, October and November, and that the young birds afford excellent sport about the end of January."

In the olden days, when out riding at the Reedbeds, near Adelaide, Mr. W. White tells me it was no uncommon occurrence, upon flushing a Ground Parrakeet, to see his black tracker jump off his horse, rifle the nest and eat the eggs.

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### 530.—*GEOPSITTACUS OCCIDENTALIS*, Gould.—(442)

#### NIGHT PARRAKEET.

*Figure*.—Gould: Birds of Australia, fol., supp., pl. 66.

*Reference*.—Cat. Birds Brit. Mus., vol. xx., p. 598.

*Geographical Distribution*.—Victoria, South (including Central), West and North-west Australia.

*Nest*.—On the ground, usually in porcupine (*Spinifer*) grass.

*Eggs*.—Clutch, four to five. Undescribed.

*Observations.*—The Night Parrakeet is peculiarly interesting from the fact that it is the only species of its family in Australia having nocturnal habits. Moreover, with the exception of the Ground Parrakeet (*Pezoporus formosus*), it is the only Parrot that attempts to construct a nest.

The Night Parrakeet ranges across Southern Australia, living chiefly in the porcupine or spinifex grass of dry and arid tracts. The bird has been observed in the Wimmera district, Victoria, where it was reported a nest containing five eggs was found in some porcupine grass.

The following interesting "Notes on the Night Parrot" were read by the late Mr. F. W. Andrews before the Royal Society of South Australia, 6th February, 1893:—"During the day this bird lies concealed in the inside of a tussock or bunch of porcupine grass (*Triodia*), the inside being pulled out and a snug retreat formed for its protection. Here, also, its rough nest is formed, and four white eggs laid. When the dark shades of evening have fairly set in, it comes out to feed, but generally flies direct to the nearest water, which is often a considerable distance from its nest; in some instances I have known them fly a distance of four or five miles. After drinking and shaking themselves up a little, they fly off to feed on the seeds of the porcupine grass, returning to water two or three times during the night.

"The name given to this bird by the aborigines is 'Myrrlumbing,' from the supposed resemblance of their whistling note to the sound of that word. They have also a very peculiar croaking note of alarm whilst at the water, which much resembles the loud croak of a frog. On one occasion one of these Parrots was caught in a hut, where it had apparently been attracted by the light of a bush lamp; it was put into a box, with a handful of dry grass. On examination the next morning the bird could not be seen; it had placed the dry grass in a heap and had drawn out the inside straw by straw until it had formed a hole, in which it had concealed itself.

"These birds are pretty generally distributed through the north and north-west of this colony; they come and go according to the nature of the season. When the early season is wet, the porcupine grass flourishes and bears large quantities of seed, on which the birds feed; but if, on the contrary, the season is a dry one, the grass does not seed, and no birds are to be seen.

"I shot some specimens at Cooper's Creek in 1875 when out as collecting naturalist for the late Mr. J. W. Lewis, in his exploration of the country about Lake Eyre. They were in that district observed to conceal themselves during the day in the thick patches of shrubby samphire on the salt flats bordering the creeks on Lake Eyre."

The Calvert Expedition (1896) obtained evidences of the Night Parrakeet in the North-west desert as far north as Separation Well.\*

\* While on the subject of the North-west, I may mention a bird called the Spinifex Parrakeet, which is stated to have been discovered by Mr. A. Calvert during a former expedition (1891). I have not seen the Parrot named on any Australian list. The following is its description, taken from "The English Illustrated Magazine," vol. x. (1892-3):—"Six and a quarter inches long; head, brilliant cobalt-blue, which blended into softer tints down the back; wings covered with bright-blue quill feathers; the breast, emerald green upon a ground-work of orange-yellow; the belly feathers also yellow, and tail feathers flaming yellow, edged with emerald-green."



NESTING PARTY - NEW SOUTH WALES.

From a Photo by S. W. Jackson.



## ORDER—COLUMBÆ: PIGEONS AND DOVES.

## Sub-order—Columbæ: Pigeons.

## FAMILY—TRERONIDÆ.

## SUB-FAMILY—PTILOPODINÆ.

## 531.—PTILOPUS SWAINSONI, Gould.—(451)

## RED-CROWNED FRUIT PIGEON.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 55.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 95.

*Previous Description of Eggs*.—Campbell: Victorian Naturalist, vol. xiv., p. 5 (1897).

*Geographical Distribution*.—Queensland and New South Wales, also New Guinea.

*Nest*.—A very slight platform, 5 or 6 inches across and about 2 inches in thickness, composed of dry twigs placed in a slender horizontal fork. The contents may be easily seen through the nest from beneath.

*Eggs*.—Clutch, one; an ellipse in form; texture of shell fine; surface glossy; colour, white. Dimensions in inches: 1.16 × .81. A smaller and narrower example measures: 1.08 × .73.

*Observations*.—The various fruit-eating Pigeons, for the beauty of their painted plumage, are amongst the most gorgeous of Australian birds. They inhabit chiefly the luxuriant scrubs of Eastern Australia.

How delightful to stroll through these scrubs at early morn! The Coachwhip Birds, with their sharp, cracking sounds, are waking up everything, and are heard with the sweet notes of Thickheads and Warblers and the gurgling whistle of the Yellow-eared (Lewin) Honeyeater, to an accompaniment of cooing Pigeons—notably the high-pitched continuous call of the Wonga-Wonga in contrast to the muffled and bass notes of the Magnificent or Purple-breasted Fruit Pigeon hard by in the leafy canopy. Aloft may be seen the Topknots' heads, where the sun's rays are also gilding the upper boughs of a tamarind-tree and the bunches of acid fruit upon which the Pigeons are feeding. The discharge of my gun silences for a second or two all immediate sounds, frightening a beautiful cock Regent Bird high over the track, while a lovely pair of the Swainson Doves, or Red-crowned Wood Pigeons, falls on the forest floor as the smoke of the murderous weapon hangs in the damp morning air.

During my visit to the "Big Scrub" of Richmond River, New South Wales, in 1891, I noticed many of these beautiful Red-crowned Fruit Pigeons, and although I sought diligently for a nest, as in the case of the rare Rifle Bird, I returned home without it. However, in 1897, I was enabled to describe the nest and eggs of this Fruit Pigeon from specimens kindly forwarded to me by Mr. W. T. Bailey. The nest was taken with a considerable amount of risk and difficulty by Mr. Isaac Foster, in a buoyong sapling, at the height of about fifty feet from the ground. Date, 31st November, 1896. A second nest, containing an egg, was found by Mr. Bailey, 5th of February following.

The call of the Red-crowned Fruit Pigeon is remarkably loud for so small a bird, being a single "coo" repeated twelve or thirteen times—*accelerando diminuendo*, as a musician would say, the first few "coos" being slow and measured, then uttered more rapidly each time till the last notes almost run into each other; at the same time the tones become softer and almost inaudible, as if the bird were some distance away.

It is said that this Fruit Pigeon is rarely found upon the ground, but one morning I flushed a pair from some inkweed. They perched quite close to me—a loving, mated pair, with almost erect carriage, and, with pardonable pride, displaying their richly-coloured breasts. The female appeared generally lighter in colour; while the colouring on her breast was not so brilliant as on her mate. Their light greenish dress blended into the greyish head with a crimson-coloured cap or crown. The chest and neck were most beautifully hackled with greenish-grey, while the greenish flanks and abdomen were enriched by a patch of orange and purple in the centre. The eyes of this little feathered gem were soft orange set in yellowish-green eyelids. Feet and short bill were also greenish.

Respecting this fine little Fruit Pigeon in more northern quarters, Mr. Kendall Broadbent states:—"Swainson's Fruit Pigeon (*Ptilopus swainsoni*) is to be found in all the Cardwell scrubs in September, while on its summer migratory journey southward. The time of its return to the Cape York district is March, and it is most abundant there during the winter months following, being quite absent in summer. The bird does not breed at Cardwell, its passage through this part being merely a stage of its journey to South Queensland, which it reaches in October. Being a true fruit eater, it is to be found in the scrubs which clothe the ranges and border the rivers all the way from Clarence River to Cape York, and is not procurable in inland scrubs, such as at Chinchilla and Barcaldine. It lives to a large degree on the figs, &c., in the scrubs, the little yellow fig seeming to be most favoured. In this district the Pigeon feeds in company with *M. assimilis*, a congener, and the Yellow Fig Bird (*Sphæcotheres*) on a wild fig which attains perfection in May. Occasionally, so both are they to retire from the ripe berries, that I have been enabled to confine my shooting operations to one comparatively small fig-tree for the day. The bird is most prolific. An idea of its abundance at this place may be obtained when I mention that I have obtained nine brace, besides numbers of other birds, before an early breakfast."

## 532.—PTILOPUS EWINGI, Gould.—(452)

## ROSE-CROWNED FRUIT PIGEON.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 50.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 96.

*Previous Descriptions of Eggs*.—Le Souëf: Proc. Roy. Soc., Victoria, vol. vii. new ser. p. 23 (1895), also *Ibis*, p. 394 (1897).

*Geographical Distribution*.—Northern Territory and North Queensland.

*Nest*.—A slightly-built platform, about  $2\frac{1}{2}$  inches in diameter, composed of small sticks.

*Eggs*.—Clutch, one; elliptically inclined, with occasionally one end peculiarly pointed; texture of shell fine, except at the smaller end, which is somewhat granular; surface slightly glossy; colour, pure white. Dimensions in inches: (1)  $1.2 \times .86$ , (2)  $1.18 \times .85$ .

*Observations*.—This lovely little Pigeon is a native of the northern coast of Australia, and differs from the Red-crowned Fruit Pigeon, as Gould points out, in being smaller in all its dimensions, and in the colour of the crown being rose-pink instead of crimson-red, &c.

Mr. D. Le Souëf observed this beautiful Pigeon in the thick scrub on the higher land near the Bloomfield River. He writes: "We were fortunate in finding two of their nests on the 24th October (1894), one on the banks of the Annan River, in a small tree about eight feet from the ground; one contained a young bird newly hatched, and the hen bird let us approach within three feet of her nest before she flew off. The other nest was placed in a somewhat similar situation, and contained one fresh egg." Mr. Le Souëf added, that when the bird was flushed it was astonishing how the contents could remain in a nest so frail and shallow.

Two seasons afterwards, when Mr. Harry Barnard was collecting for Mr. Le Souëf and others, he found the pretty Rose-crowned Fruit Pigeons breeding in the mangroves at Cape York, seldom seeing them elsewhere. One nest was taken in October, one in November, two in December, and one in January, as late as the 28th. The nests were placed usually at a height of from four to thirty feet above the water, and were generally found by observing the bird dash off as Mr. Barnard was ploughing through the black mud, up to his knees, and harassed by myriads of sandflies.

Breeding season September to February.

## 533.—PTILOPUS ALLIGATOR, Collett.

## BLACK-BANDED FRUIT PIGEON.

*Figure*.—Proc. Zool. Soc., pl. 29 (1898).

*Reference*.—Proc. Zool. Soc., p. 354 (1898).

*Geographical Distribution*.—Northern Territory.

*Nest and Eggs.*—Undescribed.

*Observations.*—The Black-banded Fruit Pigeon was discovered by Dr. Dahl near the South Alligator River, Northern Territory, where it seems to be a very local species. Two specimens (male and female) were shot on the 15th June, 1895, from a flock found feeding on a bon-jon tree (a species of *Ficus*). Their food is said to consist mainly of the fruit of this tree.

I may mention that Dr. Knut Dahl is a Norwegian naturalist, who visited North and North-west Australia during the years 1894-5, collecting natural history specimens for the Zoological Museum, Christiania. Amongst other valuable items he discovered, much to the interest of Australian ornithologists, were three species of birds new to science.

For the beautiful Pigeon under consideration Professor Collett has proposed the somewhat harsh name of *alligator* (after the region in which the bird was found, no doubt); but on the vernacular list we may call it by the distinguishing title, Black-banded Fruit Pigeon.

The following is Professor Collett's technical description:—"Head and upper neck white; lower neck and chest whitish-cinnamon; mantle slate-black; lower back greyish-black, rump and upper tail coverts clear grey, the latter inclining to whitish. Lower parts ashy-grey, separated from the chest by a broad black band on the lower breast, sharply defined against the chest. Wings slate-black, lower surface of the quills grey, the coverts more greyish-brown. Tail slate-black, with an apical greyish-white band about one and a-half inches in breadth; under surface of the tail clearer grey; under tail coverts whitish. Bill (in skin) light-coloured, the tips yellowish; feet reddish."

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534.—PTILOPUS SUPERBUS, Temminck.—(453)

PURPLE-CROWNED FRUIT PIGEON.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 57.

*Reference.*—Cat. Birds Brit. Mus., vol. xxi., p. 112.

*Previous Descriptions of Eggs.*—Ramsay: Proc. Linn. Soc., N.S. Wales, vol. viii., p. 28 (1883); Ramsay: Proc. Linn. Soc., N.S. Wales, vol. 1, 2nd ser., p. 1151 (1886); Le Souëf: Proc. Roy. Soc., Victoria, vol. vii., new ser., p. 22 (1895).

*Geographical Distribution.*—Northern Territory, Queensland, New South Wales and Tasmania (casual); also New Guinea and adjacent islands, and Moluccas.

*Nest.*—A platform, about three inches in diameter, composed of a few twigs. Usually situated in scrub or in a small tree at a height of from two feet to ten feet from the ground.



*Eggs*.—Clutch, one usually; elliptical in form; texture of shell somewhat fine, excepting the smaller end, which is slightly granular; surface glossy; colour, white, slightly toned or of a faint creamy tint. Dimensions in inches: (1)  $1.22 \times .88$ , (2)  $1.15 \times .87$ .

*Observations*.—This charming and truly superb little Pigeon enjoys a somewhat extensive range, but as far as the mainland is concerned it is chiefly found in the scrubs of North and North-eastern Australia. It is about the same size as the Red-crowned (Swainson) Fruit Pigeon, but wears a darker green dress, has a band of black below its greyish breast, and a deep, rich, purple patch on the crown of the head, which appears only on the male bird.

Dr. Ramsay described, in 1886, or rather re-described (having previously given a description of one from New Guinea) an egg of the Superb Fruit Pigeon, taken by the late Mr. T. H. Bowyer-Bower in the scrubs near Cairns, stating that "two only are laid for a sitting," and that the eggs are "white."

Mr. Kendall Broadbent, who also affirms that this Pigeon lays two eggs, states:—"The Superb Fruit Pigeon (*Ptilopus superbus*), unlike the first-mentioned (Swainson's), does not travel far south of Cardwell. It remains at Cardwell from September to March, in large numbers, and during the rest of the year is comparatively scarce. At the Cape it is tolerably abundant for a short period—a month or so about March—and then disappears altogether, for none winter at Cape York. The note is very gruff, resembling the sound 'whoot' uttered at short intervals, and may be heard at a considerable distance from the spot of its emission. The bird is arboreal, like Swainson's, whose fruit-eating habits it also follows. Being very shy, it is rarely found outside the scrubs. The nest is made in a small bush, and constructed loosely of a few sticks, which just serve to retain the eggs when laid. The usual clutch consists of two eggs, which are generally visible to an observer from the ground."

However, during his Bloomfield River trip, Mr. D. Le Souëf procured several nests of this beautiful little Pigeon, each with a single egg only. Mr. Le Souëf proceeds to say: "We found one nest with a young bird in, built in a small shrub, about two feet from the ground, and another on 27th October on a small bush, which was growing some two feet out of a crevice of a rock overhanging a precipice, and it was with some difficulty that I managed to secure the egg."

Writing again, Mr. Le Souëf states:—"When in the open forest country, several nests of the Purple-crowned Fruit Pigeon (*P. superbus*) were found. Their nests were always situated in some thick-leaved tree. They were built near the ends of the branches, nearly hidden in the foliage. In every case it was the male bird that was sitting on the nest."

Mr. H. Barnard's collecting efforts at Cape York during the season of 1896-7 were richly rewarded as regards the eggs of this lovely little Fruit Pigeon. One nest was found October 10th, two in November, three in January, and two on February 10th. The nests in every instance contained a single egg.

Breeding season September to February.

## 535.—MEGALOPREPIA MAGNIFICA, Temminck.—(454)

## PURPLE-BREASTED FRUIT PIGEON.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 58.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 167.

*Previous Descriptions of Eggs*.—Digges: Companion Gould's Handbook, p. 59 (1877); North: Rec. Austr. Mus., vol. iii., p. 16 (1897); Campbell: Victorian Naturalist, vol. xiv., p. 5 (1897); Le Souëf: Ibis, p. 393 (1897).

*Geographical Distribution*.—Queensland and New South Wales.

*Nest*.—Substantial for a Pigeon, slightly concave, almost entirely composed of wire-like tendrils of climbing plants, placed upon a foundation of a few coarse twigs. Dimensions about 6 inches across by 2½ inches in depth.

*Eggs*.—Clutch, one; elongated in form, considerably pointed towards the smaller end; texture of shell somewhat granular; surface slightly glossy and irregular. Dimensions in inches: 1.77 × 1.05.

*Observations*.—This splendid large and highly-coloured Fruit Pigeon thrives upon the fruits of the scrubs of the eastern coastal regions. I first heard this bird's peculiar notes in the Cardwell Scrub, 1885. Six years afterwards I renewed its acquaintance in the Big Scrub, Richmond River, New South Wales. Here my companion brought down a pair. How we admired their handsome rich green coats, brightened with almost a metallic sheen on the wings and shoulders, the latter being spangled with yellow! The green of the coats blends beautifully into the French-grey of the head, which is relieved with dark-orange irides, or eyes, and a dull-red bill tipped with orange. Turning one of the birds upon its back, we find the whole of its breast of a rich plum-colour; stomach and under tail coverts yellowish-orange, with large hand-like greenish feet, well formed for perching on trees. The bird was first named the Magnificent Fruit Pigeon. By the dwellers of the scrub it is simply called the Green Pigeon. The total length of the bird is about 17 inches, and when ready for the pot it weighs 1½ pounds, sometimes 1¾ pounds. At certain seasons these birds are very fat, especially in June and July, when the figs are ripest. On falling to the ground, when shot, the birds often burst asunder.

Although we could hear the hoarse, deep call of "wallock-a-woo" in the thick leafy bowers of the scrub, we rarely saw the birds, except in the tamarind trees, where they were detected by the sparkling orange colour of the underneath part of their wings, which they flapped in order to balance themselves while feasting upon the bunches of agreeable acid fruit. We only found one nest of the magnificent Purple-breasted Fruit Pigeon. It was pointed out to us by scrub-fallers, who saw the birds carrying the material for construction, but was subsequently deserted, probably on account of the scrub-falling

in the vicinity. The nest was a springy platform, constructed of vine tendrils, and was placed in a buoyong sapling.

An authenticated nest and egg were subsequently forwarded to me by Mr. W. T. Bailey, Richmond River. They were taken by Mr. Isaac Foster, on the 2nd February, 1897, in a black myrtle, at the height of about fifteen feet from the ground. Newly-hatched young have been observed in the same district about the middle of November.

Regarding this large Pigeon in Northern Queensland, Mr. Kendall Broadbent's testimony is:—"The Magnificent Fruit Pigeon, or Wompoo of the blacks, is common in all the river and mountain scrubs of the district, though it is to be observed that it is of rather smaller size than its representative in Southern Queensland, while not so small as *M. assimilis*, which is found to the north. The Wompoo breeds in January, and for its nest fixes five or six twigs. Two (?) eggs are laid at a sitting. The site of the nest is frequently a mountain gully. The bird does not take to the ground. In the fruit season hundreds of these beautiful birds collect in the scrubs of the Tully and Murray Rivers."

In Carl Lunnholtz's work, "Among Cannibals" (1890), the author states he saw several nests of the Purple-breasted Fruit Pigeon in the mountains, built near the outer end of a branch. The nest was carelessly constructed—simply a few sticks. Lunnholtz never found more than one egg in these nests. The natives, who are fond of eating the young, generally shake them down.

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536.—MEGALOPREPIA ASSIMILIS, Gould.—(455)

ALLIED FRUIT PIGEON.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 67.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 168.

*Previous Descriptions of Eggs*.—North: Proc. Linn. Soc., N.S. Wales, vol. ii., 2nd ser., p. 410 (1887); Le Souef: Proc. Roy. Soc., Victoria, vol. vii., new ser., p. 23 (1895).

*Geographical Distribution*.—North Queensland.

*Nest*.—A platform of small twigs, about four inches in diameter; usually placed at a height of from ten to fifteen feet from the ground, in a small tree, frequently overhanging a stream, in thick scrub.

*Eggs*.—Clutch, one usually; shape varies from an ellipse to long oval; texture of shell comparatively fine, except the smaller end, which is granular; surface slightly glossy, but tiny nodules appear here and there in some examples. Dimensions in inches: (1) 1.44 × .96, (2) 1.41 × 1.04.

*Observations*.—This brilliant Fruit Pigeon is a northern and smaller variety of the Purple-breasted Fruit Pigeon, and is found chiefly in

the Cape York Peninsula, where it is fairly plentiful, and seems to take the place of the other.

Mr. North states:—"A nest of this species, found at Cape York, by Mr. George Masters, on the 17th September, 1875, from which the bird was flushed and procured, was simply a few dried sticks placed crosswise on a horizontal branch of a tree, about eight feet from the ground. The nest contained two eggs (dimensions of one only given), in an advanced state of incubation."

Mr. Le Souëf, to whom I am indebted for the eggs of this species, when visiting the Bloomfield River, took three nests, on 23rd, 27th October, and 3rd November respectively. Only one egg was in each nest.

Mr. W. B. Barnard says this Fruit Pigeon builds sometimes as low as ten feet from the ground. The first nest he took was on the 30th August, and found others up to the middle of December. He never found more than one egg in a nest.

At Cape York, season 1896-7, his brother, Mr. Harry Barnard, took no less than seventeen nests, namely, end of October, four; during November, five; December, two, and January, six. No nest contained more than a single egg.

Breeding months, August to January, or later.

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SUB-FAMILY—CARPOPHAGINÆ.

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**537.**—MYRISTICIVORA SPILORRHŌA, G. R. Gray.—(457)

NUTMEG PIGEON.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 60.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 231.

*Previous Descriptions of Eggs*.—\*Gould: Birds of Australia (1845), also Handbook, vol. ii., p. 115 (1865); Ramsay: Proc. Zool. Soc., p. 115 (1876); North: Rec. Austr. Mus., vol. i., p. 116 (1891).

*Geographical Distribution*.—Northern Territory, North Queensland; also New Guinea and adjacent islands.

*Nest*.—Flat, slight, being merely a few sticks or twigs placed crosswise—some are more substantial, being built of green branchlets; usually situated on a horizontal branch of any tree, not unfrequently in mangroves overhanging water, and occasionally near the ground or on rocks. Sometimes three or four nests are situated in one tree.

*Eggs*.—Clutch, one invariably; elliptical in shape; texture of shell somewhat coarse, especially on the smaller end; surface slightly

\* No dimensions given.

glossy; colour, pure white. Dimensions in inches (1)  $1.76 \times 1.24$ , (2)  $1.7 \times 1.18$ .

*Observations.*—The Nutmeg Pigeon, with buffy-white plumage and strongly contrasted black pinions, frequents the northern part of Australia and some of the islands beyond. It is strictly arboreal in its habits.

In the Port Darwin district, Gilbert observes that: "It pairs and commences breeding immediately after its arrival in (the beginning) November. The nest is formed of a few sticks laid across one another in opposite directions, and is so slight a structure that the eggs may usually be seen through the interstices from beneath, and it is so flat that it appears wonderful how the eggs remain upon it when the branch is waving about in the wind; it is usually built on a horizontal branch of a mangrove, and it would seem that it prefers for this purpose a branch overhanging water. That it never lays more than one egg, appears to me without a doubt, for on visiting Tablehead River, on the eastern side of the harbour of Port Essington, I found no less than twenty nests, all of which contained either a single egg or a single young bird."

Mr. Kendall Broadbent's valuable testimony towards the life history of this bird is that "The White Nutmeg Pigeon (*Myristicivora spilorrhoa*), otherwise known as the Torres Strait Pigeon, arrives at Cardwell in September and departs in April. Its favourite breeding haunts are among the islands, such as Mangrove Island, some few miles down Hinchinbrook Channel, Brook Island, in Rockingham Bay, the Family Group, Dunk Island, and North and South Barnard Islands. They fly to and fro between the Barnards and the mainland in flocks of hundreds, the distance travelled by some to their feeding grounds away among the higher mountains being thirty miles. On many of the Rockingham Bay Islands they are so numerous that their cries drown all other sounds. In the early morning they leave for the feeding grounds, but continue passing to and fro all through the day in smaller or greater numbers. The scrubs of the Murray, Tully, Herbert, and other rivers, swarm with these birds in day time, but at dusk are deserted, the birds having then gone to the islands to pass the night. At dawn and before sunset a constant stream of Pigeons to the ranges in the first case, and from them in the second, may be seen on the wing. On several occasions, when camped in the pilot cutter, anchored between the Barnards, I observed hundreds of these birds fly on to the rocks and walk to the water's edge as if to drink. I am unable to say whether such was really the case, but it would perhaps repay a local ornithologist to investigate the matter. This bird I have never seen below the Herbert River, but it frequents all the scrub coast ranges north of that. Its habitat then stretches to the eastward, the bird being found on the south east coast of New Guinea as far down as Dinner Island, but it appears no further, as far as my acquaintance with Teste Island, Bramble Haven, and other islands would indicate. In these latter places the Nicobar Pigeon takes its place. I should say the proper habitat, from September to March, is the coastal portion

of Eastern Australia as far as the Herbert River; and in winter the south-east coast of New Guinea. It must be borne in mind, however, that stragglers are not infrequently found beyond these limits."

During my own visit to Northern Queensland, 1885, on the Barnard Islands, at daybreak on the morning of the 9th September, we shot a beautiful brace of Nutmeg Pigeons. Although we heard their loud "coo" in different places, the Pigeons were difficult to sight in the leafy coverts where they sought refuge. They were just beginning to arrive from northern latitudes, probably the Papuan Islands. They roosted on the islands at night, returning to the mainland to feed at sunrise. We saw numbers of last season's nests.

Messrs. Le Souëf and H. Barnard visited these islands late in the season, November, 1891, during the full flood of birds. Mr. Le Souëf gives a very interesting account of them going to and from the mainland. He says:—"We watched the Torres Strait Pigeons returning from the mainland to roost. They came across to the islands in small flocks, varying from half-a-dozen to twenty birds, there being a continuous flight for about an hour and a-half. The numbers that were roosting on the island must have been many thousands, and when the steamer's whistle was blown as it passed by, a white cloud of birds rose up, and as they settled again the dark-foliaged trees looked as if they were covered with large white flowers. It was a remarkable sight, and worth coming a long way to see: the vegetation on the island was full of Pigeons, and the cooing of so many birds was one continuous sound. The male birds frequently made a curious chuckling kind of noise, and also fought a good deal amongst themselves. . . .

"They seem to build anywhere—high up in the trees, low down on the vines, and occasionally on the rocks or in the bird-nest ferns growing on the ground. The nests vary in size, from a light structure composed of a few sticks, to large bulky ones built of twigs with the green leaves left on. The only Pigeons that seem to remain on the island during the day are the hen birds, which were either sitting or attending to their young. We found eggs, one only in each nest, in all stages of incubation, and also young birds."

During another season, further north, on the Hope Islands, Mr. Le Souëf found hundreds busy hatching or rearing young, for very few apparently lay on the mainland adjacent. A pair of eggs in the Australian Museum was taken on Hope Island, 22nd October, 1860. The 22nd October appears to be about their earliest date of laying.

Mr. Le Souëf writes:—"The principal bird on the island was the Torres Strait Pigeon, and they were nesting there in thousands, and we got quite confused when going through the mangroves by the noise the birds made flying off their nests and away through the thick leaves of the trees above, and we were glad to return to the beach out of their immediate neighbourhood; their nests were everywhere, and all sizes, some only a few sticks, but by far the majority were much more bulky, being composed of green twigs with the leaves left on; and on the Barnard and other islands, where I have found large numbers of these birds nesting, I have noticed the same thing, and rarely found a fragile nest as most other Pigeons build. We noticed

either one egg or one young one in each nest, and I have never yet seen two, although I have looked carefully. There was the continual uninterrupted cooing all day long all over the island, which would give some idea of the great number of birds required to produce it. A few of the eggs were fresh, but most were sat on, and some of the young Pigeons were commencing to fly."

Referring to birds breeding on the mainland, in the "Records" of the Australian Museum it is stated that Mr. J. A. Boyd (Herbert River) found these birds sometimes breeding in the open forests, and has obtained young Pigeons miles from the coast.

Shooting parties sometimes go out from Townsville and other coastal towns to enjoy an outing among these Pigeons. As the birds are breeding, it is to be hoped that these excursions are not too frequent, else these beautiful birds may be in danger of being too much disturbed, and so quit their familiar abodes for ever.

Breeding season November to January.

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**538.**—*LOPHOLEMUS ANTARCTICUS*, Shaw.—(458)

**TOP-KNOT PIGEON.**

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 61.

*Reference.*—Cat. Birds Brit. Mus., vol. xvi., p. 235.

*Previous Descriptions of Eggs.*—North: Austr. Mus. Cat., p. 271 (1889); Campbell: Proc. Roy. Soc., Victoria, vol. v., new ser., p. 126 (1893).

*Geographical Distribution.*—Queensland, New South Wales, Victoria and Tasmania (casual).

*Nest.*—A platform of fairly stout twigs placed in a tall tree. Dimensions, 8 to 10 inches across by about 3 inches in thickness.

*Eggs.*—Clutch, one; elliptical in form, with sometimes the ends peculiarly pointed, especially the smaller, which nips off suddenly; texture of shell somewhat granular; surface glossy; colour, pearly-white. Dimensions in inches: (1) 1.76 × 1.21, (2) 1.65 × 1.14, (3) 1.64 × 1.16.

*Observations.*—The habitat of the Top-knot Pigeon is the coastal scrub generally, from Cape York to the Gippsland Lakes, notwithstanding some authorities persistently omit Victoria from its range. Occasionally stragglers reach Tasmania.

It is a significant fact that although these grand Pigeons are plentiful in some localities, the eggs are rare in collections. So numerous were they one season (1890) in the neighbourhood of the Tweed River, that one field observer states:—"Flocks of them, numbering thousands, could be seen, during September, flying round at any time through the day from the mountains to the coast and back." However, they are said to be scarce in the Tropics.

These birds must breed somewhere in considerable numbers. Young have been observed in the Bellenger River Scrubs in June; while Mr. W. T. Bailey observed a company of old birds nesting in a high fig-tree in the Richmond River district. The nests were well out of harm's way. Mr. S. W. Jackson in the same district found two nests similarly situated at a height of 115 feet in some tall fig-trees that stood in a clearing, and was enabled to circumvent the fine birds by reaching their nests with the aid of his ingeniously made rope ladder. As the ladder only reached about half way, it had to be drawn up and shot the remaining distance—a very difficult, not to say dangerous, undertaking, which occupied nearly the whole day to accomplish. An unfortunate loss of time occurred on account of the second nest not being discovered until *terra firma* was regained after the first nest was robbed, which necessitated a second day's work. There was one egg in each nest. One of these rare and historical specimens is now in my collection. Date, 25th October, 1899.

The Top-knot Pigeon utters a somewhat guttural double call, resembling "Quook-quook."

During my excursion to the Big Scrub, Richmond River, my companion and I visited a native tamarind-tree favoured by Fruit Pigeons, where the arrival of a number of large Top-knot Pigeons caused us to temporarily forget our stiff necks, from "craning" upwards so long. We discharged our guns with more or less success, and while the smoke was yet hanging in the damp, humid atmosphere, I examined a handsome creature. The Top-knot Pigeon, side by side with the Magnificent or Purple-breasted, is about the same length, but the latter has the advantage of being slightly heavier. The Top-knot is the possessor of a splendid grey dress, darker on the upper surface, tips of wings and tail, the latter being twice barred. The head looks majestic, with eyes rich orange, encircled with pink eyelids, and with a crowning brownish-coloured top-knot curling gracefully backward over the head. Feet large and pink complete a fine figure about seventeen inches in length.

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## FAMILY—COLUMBIDÆ.

### SUB-FAMILY—COLUMBINÆ.

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539.—COLUMBA LEUCOMELA, Temminck.—(456)

#### WHITE-HEADED FRUIT PIGEON.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 59.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 320.

*Previous Descriptions of Eggs*.—\*Gould: Birds of Australia, Handbook, vol. ii., p. 113 (1865); Le Souef: Victorian Naturalist (1897).

*Geographical Distribution*.—Queensland and New South Wales.

\* No dimensions given.



*Nest*.—The usual flat and frail structure of twigs, three or four inches across.

*Eggs*.—Clutch, one to two, but mostly one; elliptical in shape, sharply nipped off at one end; texture comparatively fine; surface glossy; colour, white. Dimensions in inches: (1)  $1.4 \times .94$ , (2)  $1.39 \times .96$ . A specimen from off which the parent was shot, in the Clarence River district, is much larger:  $1.63 \times 1.21$ .

*Observations*.—This fine and large, but somewhat local Fruit-eating Pigeon, like the majority of its kind, is strictly arboreal, and is likewise a denizen of the dense scrubs from the Cardwell district in the north to the Liverpool Range in the south.

In the former district, Mr. Broadbent remarks: "The White-headed Fruit Pigeon is not of very frequent occurrence, but still may be procured at all times of the year. It is a bird which, till very recently, was common in the Enoggera (Brisbane) Scrub, and is still so in Nerang and other South Queensland districts. It is to be noted that the Cardwell bird of this species is not so fine in plumage, and is also somewhat smaller than its Brisbane congener."

Gould described the nest and eggs, but furnished no dimensions of the latter—possibly he described them by analogy.

Mr. A. Meston, in writing to the "Queenslander," says: "We found (March 1st, 1889) nests at nine thousand feet on Bellenden-Ker of the White-headed and Pheasant Pigeons, each with a single egg, in the centre of the top of tall ferns about nine feet high."

It was not till 1897 that we really learnt anything about the egg of the White-headed Fruit Pigeon. During the visit of Mr. Le Souëf to the Bloomfield River, 1894, one of the black boys, named "Bamboo," in the service of Mr. Hislop, brought, on the 23rd November, an egg, said to belong to this bird. When Mr. Le Souëf re-visited the locality, two seasons afterwards, another nest was found, from which the parent bird was flushed. The nest was built near the end of a branch of a scrub tree overhanging a watercourse. Date, 28th November.

In the Richmond River district, November, 1891, late one evening in some thick scrub, with stinging trees not a few, my companion shot from a very tall fig-tree a pair of "Baldies," as the locals called the White-headed Pigeon. One fell near me, which I eagerly clutched, but was surprised at its extreme tenderness; handfuls of feathers peeled off at each convulsive struggle of the dying bird. In size and colour this Pigeon resembles in a degree the familiar dark "Blue Rock," except the head and neck and a portion of the breast, which are white. The usual beautiful bronzy-purple tints appear on the hackled feathers of the back and neck. The light soon fades from its large, bright hazel eyes, and the lovely pink-red tint of the bill assumes a duller hue. Its pink, scaly feet are large and well adapted to cling to the branchlets while gathering figs or other fruits.

At other times it was a common thing to hear from the dense reclusive scrub their call of "booh-booh," the second "booh" being scarcely audible except when the bird was near at hand.

## SUB-FAMILY—MACROPYGIINÆ.

## 540.—MACROPYGIA PHASIANELLA, Temminck.—(475)

## PHEASANT PIGEON.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 75.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 349.

*Previous Description of Eggs*.—North: Rec. Austr. Mus., vol. i., p. 117 (1891).

*Geographical Distribution*.—Northern Territory, Queensland, and New South Wales.

*Nest*.—A primitive structure, being simply a few sticks placed cross-wise, without any cavity, and barely sufficient to retain the egg in position (North).

A nest found in the Richmond River district was large for that of a Pigeon, being six inches across, with a cavity about one inch deep, while the whole was nine inches in depth; but the foundation tapered to a point, making the structure appear like an inverted triangle, which was inserted in the topmost forked branches of a buoyong (*Tarrictia*) sapling, at a height of about thirty feet from the ground.

*Eggs*.—Clutch, one to two; elliptical in shape, sharply nipped off at one end; texture of shell fine and brittle; surface glossy; colour, white, with a faint creamy tone. Dimensions in inches of single examples (1) 1.36 × .96, (2) 1.33 × .96, (3) 1.38 × .97.

*Observations*.—This large, brownish Pigeon is a denizen of the luxuriant coastal scrubs, where it is common in parts from the Gulf of Carpentaria to New South Wales. I have shot them in the latter locality.

It is a graceful bird, fifteen or sixteen inches in length, including an elegant tail about half that dimension. The name Large-tailed or Brown Pigeon adequately describes the bird, but there may be mentioned the resplendent bronzy and purplish reflections on the feathers of the neck, the pinkish eyes with grey circle next the pupil, and the red feet. The birds are exceedingly tame. Sometimes I saw them on the road picking up seeds, at other times perched on low branches by the wayside; but towards the evening the birds were plentiful near my quarters, coming out of the scrub to feed amongst the ink-weed (*Phytolacca*). When disturbed, half-a-dozen, with showy expanded tails, may be seen alighting upon a single stump, where one may get at least a brace at a shot. At the discharge they all fly off to the scrub, but soon reappear for the tempting berries of the plentiful ink-weed. The call of the Pheasant Pigeon is a low, monotonous tone, twice repeated. They sometimes nest in such suggestive places as the centre of a bird's nest fern or in the crown of a fern-tree.



FIELD NATURALISTS' CAMP—FLINDERS ISLAND.

*From a Photo by the Author.*



Notwithstanding birds are numerous, there are only a few authenticated eggs known. Maybe the birds, like some of the rarer Fruit Pigeons, seek a nesting place in the recluse shade of the dense wilderness of foliage, where the finding of a nest is merely a matter of chance.

The first authenticated egg of the Pheasant Pigeon was found by Mr. H. R. Elvery, Richmond River, November, 1884, and is now in my son's collection. But it was not described at the time, which gave Mr. North the opportunity of first describing in the "Records" of the Australian Museum another example found by Mr. W. J. Grime, in the Tweed River scrub during the season 1890-91.

Mr. North remarks that "Young birds were obtained by Messrs. Cairn and Grant in the scrubs that clothe the sides of the Musgrave and Russell Rivers in tropical Queensland, during November, 1887. Mr. Meston, in his Report of the Scientific Expedition to Bellenden-Ker, in the near vicinity, records finding it breeding during February, 1889, on the South Peak of the Range, at an elevation of from four thousand to five thousand feet, in the tops of tree-ferns, each nest containing a single egg or young Pigeon.

"For an opportunity of examining an egg of this species I am indebted to Mr. W. J. Grime, who, in the brushes of the Tweed River, found a nest placed on a mass of lawyer vines (*Calamus australis*), about six feet from the ground, from which he flushed the bird."

The egg in my collection was taken near Rous, Richmond River, 19th November, 1896, by Mr. W. T. Bailey. The following are the data that accompanied the specimen:—"I took the egg of the Large-tailed Pigeon. The bird makes a large nest, somewhat flat on top, like those of other Pigeons, but funnel-shaped, running downwards to a point. I could not reach the nest, as it was built in the fork of three branches, at the top of a tall and slender sapling—too thin to climb. The tree had to be felled and lowered piecemeal. When the nest was within reach I introduced my hand and could feel nothing, but on looking in I saw the egg, which, by the jarring of the chopping, had worked its way downward through the sticks into the neck of the funnel, so to speak, where I got it all right."

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#### FAMILY—PERISTERIDÆ.

##### SUB-FAMILY—GEOPELINÆ.

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#### 541.—GEOPELIA HUMERALIS, Temminck.—(471)

##### BARRED-SHOULDERED DOVE.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 72.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 455.

*Previous Descriptions of Eggs*.—\*Gilbert—Gould: Birds of Australia (1848). also Handbook, vol. ii., p. 143 (1865); Campbell: Victorian Naturalist (1888); North: Austr. Mus. Cat., p. 278 (1889).

*Geographical Distribution*.—Australia, except South and Victoria; also New Guinea.

\* No dimensions given.

*Nest*.—A loose, light structure or platform, three or four inches in diameter, composed of twigs, portions of climbing plants, and sometimes grass. Usually situated in a low tree or thick bush, in scrub.

*Eggs*.—Clutch, two; roundish in shape; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches of a proper clutch: (1)  $1\cdot04 \times \cdot82$ , (2)  $1\cdot0 \times \cdot8$ ; of a larger pair taken at Coomooboolaroo: (1)  $1\cdot15 \times \cdot91$ , (2)  $1\cdot14 \times \cdot86$ .

*Observations*.—This gentle creature enjoys a goodly range throughout Northern and the greater part of Eastern Australia down to New South Wales. I am not aware that it has ever been seen in Victoria, as indicated on Gould's and on Ramsay's Tabular Lists. It prefers forested and scrubby localities.

I have pleasant memories about the Barred-shouldered Doves, that continually called loudly "coo-coo-coo-a" about our Cardwell camp. The birds were numerous on the flats, feeding upon seeds, &c. We found them delicious eating when hashed with sweet potatoes. We took a nest containing two eggs, from which we flushed the brooding bird, in a bushy tree near the beach. The nest was at a height of eight or ten feet from the ground. Date, 4th August, 1885.

Mr. A. J. North has described a set of eggs taken by the late Mr. Geo. Barnard, Coomooboolaroo, Queensland, in 1883. I had the pleasure of going through Mr. Barnard's collection two years after that date, and even then, as far as I recollect, the species was not amongst the eggs therein.

Eggs have been taken in Queensland as late in the season as 15th April—between August and March is probably the principal breeding season. However, Mr. Lan has taken eggs in July in Southern Queensland, where he found this Dove mostly in the open places between the clumps of brigalow, eighteen miles to the west of Yandilla.

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542 —*GEOPHELIA TRANQUILLA*, Gould.—(472 and 473)  
*G. placida*, Gould.

#### GROUND DOVE.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 73.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 456.

*Previous Descriptions of Eggs*.—Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 54 (1882); Campbell: Southern Science Record (1883).

*Geographical Distribution*.—Whole of Australia.

*Nest*.—A small, slight platform, about two or three inches in diameter, composed of twigs and rootlets, or just sufficient materials to ensure the safety of the contents. Usually placed on a horizontal limb of a tree, where branches or suckers shoot, often overhanging a stream.

*Eggs*.—Clutch, two; elliptical in shape; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches of a proper clutch from Queensland: (1)  $\cdot 87 \times \cdot 61$ , (2)  $\cdot 84 \times \cdot 6$ . From Riverina: (1)  $\cdot 88 \times \cdot 67$ , (2)  $\cdot 84 \times \cdot 66$ .

*Observations*.—These delightful little Doves, well named Peaceful, because so gentle and tame, were also our constant companions about our Cardwell camp, feeding close to the tent or perching on the fence behind.

It is now accepted by ornithologists that Gould's Peaceful Dove (*G. tranquilla*) and Placid Dove (*G. placida*) are identical, the latter being a northern and slightly smaller variety. Therefore the geographical range of this pretty Dove may be taken as throughout Australia. Of course the bird is more plentiful within the Tropics.

Close to the River Murray, one evening at dusk, I shot this Dove accidentally, supposing it to be another bird. As I handled the dead Dove, I could not sufficiently admire its chaste colouring, whether the grey, striated breast and barred back, or the rich buff under parts of the shoulders and general light under-surface, suffused with a delicate purplish-brown, while a conspicuous patch of naked green skin surrounded the steel blue eyes. Total length in the flesh, eight inches.

I suppose the breeding season of the Peaceful Dove may be any time of the year. Three nests I took in the Townsville district, one on the 18th, and two on the 22nd September, 1885, each containing a pair of eggs, were situated in trees overhanging river beds. I know of other nests that were taken in April.

Mr. H. Lau writes: "The Small Dove (*G. tranquilla*) is the picture of innocence amongst the whole of the feathered kingdom, and universally liked. Its home is everywhere on the Queensland Downs, but more so where sandy soil is predominant; but you rarely meet with its nest. I heard of a squatter who offered a blackfellow a 200 lb. bag of flour for a pair of young and could not get them. Such a nest I found at Yandilla, 1865, and a second at Maidenhead, on the Severn River, New South Wales, October, 1885 (or twenty years afterwards). The first was in a small cypress pine, and the second in a low fork of an apple tree (*Angophora*). Had the birds not flown from the spot I should never have found either. Nest, fine dry grass. Eggs, a pair."

As a rule the Ground Dove does not build at a great height. The following instance is an exceptional record by Mr. D. Le Souëf, during a visit to the Wimmera district, September, 1892: "I searched in vain for their (the Doves') tiny nests, but was at last rewarded by discovering one on a bough of a dead tree about forty feet from the ground."

Some persons say it is a misnomer to call this little bird the "Peaceful" Dove, because when confined in cages, the males fight till they peck each other bald.

543.—*GEOPHELIA CUNEATA*, Latham.—(474)

## LITTLE DOVE.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 74.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 462.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 147 (1865); Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 54 (1882); North: Trans. Roy. Soc., South Australia, vol. xxii., p. 158 (1898).

*Geographical Distribution*.—Australia in general.

*Nest*.—A small, frail flat structure, usually composed of dry grass, including the flowering portions, and placed in the fork of a low or bushy tree. One collected by Gilbert in Western Australia was composed of a small species of knotty everlasting-like plant, and was placed on the drooping grass-like leaves of the *Xanthorrhoea*.

*Eggs*.—Clutch, two; roundish in shape; texture of shell fine; surface glossy; colour, white. Dimensions in inches of proper clutches: A (1)  $\cdot 78 \times \cdot 6$ , (2)  $\cdot 75 \times \cdot 6$ ; B (1)  $\cdot 76 \times \cdot 61$ , (2)  $\cdot 72 \times \cdot 59$ .

*Observations*.—The Little or Turtle Dove—the least among the Australian Pigeon family,—although nowhere plentiful, has been observed throughout Australia, chiefly in the inland portions.

By reason of its gentle and tame nature, it is a general favourite with the dwellers of the interior, and is prized as a cage bird, frequently being exhibited at shows. It looks very meek, with its cayenne-red coloured eyes, surrounded by a naked ring of skin of the same colour.

Dr. Ramsay states that Mr. John S. Ramsay found the Little Dove breeding in numbers at Cardington Station, on the Bell River. The nests were placed on the flattened tops of the vine stakes in the vineyard, and the birds were so tame that they would almost allow themselves to be taken by hand.

During the Horn Scientific Expedition to the Interior, 1894, Mr. G. A. Keartland's notes of the Little Dove were: "Many nests containing young were found and appreciated by our blacks as good food. The sites selected for breeding were generally the debris in the low shrubs near water, where the birds either hollowed the surface slightly or added a few pieces of grass to keep the eggs from rolling off."

Mr. Keartland met this dear little Dove again breeding at the Fitzroy River (North-west), where nests were found, containing eggs or young, from January to the middle of March. The nest, a very frail structure, is usually placed on the horizontal branch of a bauhinia-tree, and consists of a few small twigs or grass-stems, so loosely thrown together that the eggs may be seen from beneath, and so flat on top that it is a difficult matter to bend the limb without causing the eggs to fall.

The Little Dove sometimes breeds during winter; but the chief breeding season is, no doubt, the spring and summer months.



## SUB-FAMILY—PIABINÆ.

544.—*CHALCOPHAPS CHRYSOCHLORA*, Wagler.—(459 and 460)  
*C. longirostris*, Gould.

## LITTLE GREEN PIGEON.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 62.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 511.

*Previous Descriptions of Eggs*.—Campbell: Victorian Naturalist (1888); North: Austr. Mus. Cat., p. 27, and app. (1889); Le Souëf: Proc. Roy. Soc., Victoria, vol. vii., new ser., p. 24 (1895).

*Geographical Distribution*.—Northern Territory, Queensland, New South Wales and Victoria; also Lord Howe Island, New Hebrides, New Caledonia, Ké Islands, Moluccas, Timor Group, &c.

*Nest*.—A frail, flat structure of twigs, placed in a low tree.

*Eggs*.—Clutch, two; elliptical in shape; texture of shell fine, except on the smaller end, which is slightly granular; surface glossy; colour, light creamy-white, but darker in tone than that of *Ptilopus superbus*. Dimensions in inches of proper clutches: A (1) 1.12 × .87, (2) 1.05 × .84; B (1) 1.11 × .85, (2) 1.08 × .87.

*Observations*.—This lovely little Green Pigeon enjoys an Australian habitat ranging throughout the Northern and Eastern parts.

Mr. Broadbent records he once found the bird in Victoria, feeding on the fallen seeds of a black wattle (*Acacia*) scrub, in the vicinity of the Watts River. It was again seen in the Dandenongs about 1882. A bird presented to the Adelaide Museum by Mr. A. D. Macdonald, in March, 1898, shot in the scrub on Yorke Peninsula, may have been an escaped cage bird. If not, then "South Australia (accidental)" should be added to the geographical distribution.

I first made its acquaintance in Northern Queensland (1885), where it is fairly numerous, and where we bagged several beautiful pairs. Again I met it in the "Big Scrub," New South Wales. Here it was frequently noticed flying quickly and low through the under scrub. Being of terrestrial habits, it lives on fallen seeds and fruits. Its pretty plumage is perfect, and readily described, with its rich cinnamon-coloured body and resplendent metallic green back and wings, the latter being beautifully ornamented by a small snow-white patch on each shoulder. Its call is a melancholy bellowing sound, two or three times repeated.

Gould never met with the nest of the Little Green Pigeon, nor could he obtain, either from the natives or settlers, any particulars respecting its nidification. I had no better fortune during my Queensland trip. At Coomoboolaroo I was evidently too early. However, at the end of the season following my visit, one of Mr. Geo. Barnard's reliable black

boys brought in a pair of eggs on the 6th February, 1887. Knowing how anxious I was to see the eggs, Mr. Barnard thoughtfully sent me one for examination. The rare specimen was duly described and exhibited at the Field Naturalists' Club of Victoria, 8th August, the same year.

The following year Mr. A. J. North re-described the identical egg without any reference to its having been previously described at the Field Naturalists' Club; and he a member of that club too!

The following are the interesting data of a perfect pair of Little Green Pigeon's eggs in my collection, taken by Mr. J. C. Gordon in the "Big Scrub," New South Wales, 19th January, 1891:—"Nest built on slender tree—so slender that it would not bear my weight. Tipped it over till the eggs fell out, and caught them as they tumbled."

According to the "Catalogue" of the British Museum, the northern variety (*C. longirostris*, Gould), has a longer bill, besides being a more slenderly built bird than those, say, from New South Wales.

Mr. D. Le Souëf remarked during one of his northern trips that the Long-billed Green Pigeon was generally found on the ground and near streams in the shades of thick vegetation. On the 5th November (1893), he succeeded in finding one nest containing a single egg, securing the parent bird. The nest was very slightly built, and not more than ten feet from the ground, near the end of a thin bough.

An egg of this variety in my collection, from the same locality, measures 1.22 x .86 inches, and is lighter in colour than those of the southern birds.

Breeding months, November to February or March.

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545.—PHAPS CHALCOPERA, Latham.—(462)

BRONZE-WINGED PIGEON.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 64.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 526.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 124 (1865); North: Austr. Mus. Cat., p. 273 (1889).

*Geographical Distribution*.—Whole of Australia and Tasmania.

*Nest*.—A slight structure or platform of twigs, slightly concave and about five inches in diameter. Usually placed in the fork of a horizontal limb of a low tree, sometimes on a bushy branch or even on a stump in forest, rarely on the ground.

*Eggs*.—Clutch, two; roundish or oval in shape; texture of shell fine, excepting the smaller end, which is slightly granular; surface glossy; colour, pure white. Dimensions in inches of proper clutches: (Roundish) (1) 1.23 x 1.03, (2) 1.27 x 1.0; (oval) (1) 1.3 x .94, (2) 1.24 x .92.

*Observations.*—The beautiful Bronze-wing is undoubtedly the best known of its tribe in Australia, being found throughout the Continent, also in Tasmania. But no doubt the seasons regulate its presence in various localities.

It was first called the Bronze-winged Pigeon in 1789, and is well named, on account of the resplendent feathers of lustrous bronzy-green upon the wing. As a sterling sportsman and naturalist once remarked, "What a glorious bird does an old cock Bronze-wing appear when seen perched upon the bare limb of a gum-tree, with bronze burnished wings, chestnut head, and glossy breast reflected in the rays of the evening sun!"

As a boy I used to flush them from under the native cherry (*Evocarpus*) trees, feeding upon the fallen seeds in the forest under Mount Cotterell. Here we loved to watch their arrow flight through the trees, and to hear the soft cooing note, especially in the mating season, wafted from some secluded spot in the timber.

About 1870, the Bronze-winged Pigeon used to be very plentiful about Oakleigh and the foot-hills of the Dandenongs, where I have seen good bags taken, and where we frequently found their nests (on one occasion with fledged young in July, proving that these Pigeons will breed occasionally at any period of the year).

It is interesting to watch this fine bird in drought or thirsty regions arriving at sundown at some favourite pool to drink.

On the "Habits of Birds coming to Water," Mr. H. W. Ford, F.G.S., kindly favoured me with the following communication:—"The Bronze-winged Pigeon flies within fifty yards of water and always walks in—mostly at evening, but a few come in the morning. They walk a few yards out from the water usually, and then fly away. The Crested Pigeon (a creamy-grey bird, smaller than the Bronze-wing) flies right in, mostly evening or afternoon, and drinks like a horse, for it never lifts its head, but sucks up the water. It remains about water for some time before flying away."

In Southern Queensland, Mr. Hermann Lau writes:—"Although frequently seen in the interior, the Bronze-wing Pigeon is only met with in the little plains or meadows that intersperse the coastal scrubs, where this handsome bird is mostly seen at the sheltered vegetation amongst the sand dunes, close to the roaring billows of the Pacific.\* Its nidification is not alone restricted to arborescent places, even in the nook of a high rock have I seen its nest, and on one occasion I was struck by observing the head of a Bronze-wing protruding out of the nest of a Black Magpie (*Corcorax*). A more snug position than between the mud-made walls the bird could not have chosen. It was high in a tree, and I had to send my black guide higher in order to ladle the two eggs out of the nest. Western Creek, October, 1874."

Referring to Bronze-wings sometimes breeding upon the ground, in October, 1898, Mr. Herbert Fraser, Winbar, Louth, New South

\* There is a slight doubt in my mind whether this coastal bird mentioned by Mr. Lau is not really the Brush Bronze-wing (*P. elegans*), but as Mr. Lau is a keen and careful observer, he is entitled to the benefit of the doubt. (A. J. C.)

Wales, found a nest, which consisted of a few twigs placed under a bush, containing a pair of eggs.

Like many other birds, the Bronze-wing will sometimes, when it possesses young, endeavour to allure a person from the vicinity by fluttering on the ground, just out of reach, feigning a broken limb.

The late Mr. H. W. Wheelwright stated, in his "Bush Wanderings," that while camped at Mordialloc he observed that by the end of January young Bronze-wings were strong fliers, and large flocks of Pigeons then congregated in favourite localities previous to dispersing for the season. For about a month from that time a man who knew just where to look for the birds could enjoy some "rattling sport." The most Mr. Wheelwright ever killed in one day was eleven and a-half brace. This was not an exceptional day's luck, for one season the Pigeons were so numerous in the month of February in the banksia and she-oak groves that he averaged with his own gum twenty-five brace per week for that month. Ah! but these were the palmy days of olden times. I love old time memories. Here is another. Mr. Isaac Batey (Sumbury), writing to "The Australasian" on the birds of his district, relates the following incident about Bronze-wings:—"In 1863 something like a dozen pair of those birds appeared suddenly on our property, established themselves in a nice low-bushed, scrubby ridge, and when first seen by my people they were in the act of building their nests. Of course they were highly pleased to see the birds settle down so comfortably in their new home, and took, as they thought, every precaution for their preservation in keeping a bright look-out for 'vagrom' gunners and bird-nesting boys. All the eggs hatched, the young birds progressed bravely, the old birds grew comparatively tame, and everything went on finely, until one evil day when a drove of Crows pitched in the scrub. The young folks saw this swarm of black marauders alight, and, for a short space, the idea that these rascals would murder their pets did not occur to them. When it did, they hurried off post haste to the rescue, but were too late, as they only reached the nests in time to see the Crows swallowing the last scraps of the helpless fledgelings. They had killed every one, and, if my memory serves, the old birds, my people told me, at once left the place."

Mr. H. W. Wheelwright recorded having taken a nest of the Bronze-wing Pigeon when he was camped at Mordialloc, Victoria, on 4th February, in the "fifties." Mr. G. A. Keartland, in the same month (1889), shot a bird, which in its death agonies was delivered of an egg. The general breeding months, however, are the spring and summer, when, as Gould mentions, two or more broods are reared. About the middle of April, 1898 (after a very dry season), a nest containing a pair of eggs of this Pigeon was observed near Kerang, Victoria.

546.—*PHAPS ELEGANS*, Temminck.—(463)

### BRUSH BRONZE-WINGED PIGEON.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 65.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 527.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 126 (1865); North: Austn. Mus. Cat., p. 274 (1889).

*Geographical Distribution*.—Australia in general, Tasmania and islands in Bass Strait.

*Nest*.—Similar to that of the Common Bronze-winged Pigeon—a flat structure or platform of twigs. Usually placed in a thick bush, on a fallen tree, or even on the ground, in secluded scrubby localities.

*Eggs*.—Clutch, two; elliptical in shape; texture of shell fine, excepting the smaller end, which is slightly granular; surface glossy; colour, pure white. Dimensions of a clutch: (1) 1.32 × .98, (2) 1.24 × .97.

*Observations*.—The Brush Bronze-wing Pigeon is not quite such a handsome bird as the common Bronze-wing, and has a habitat restricted more to the southern part of Australia, especially coastal regions, from east to west, including Tasmania and some of the islands in Bass Strait.

The Bronze-wing loves the open and the forest, but the Brush Bronze-wing is more shy and solitary, and, as its name indicates, prefers scrubby situations and the growth about swampy places. I have seen the birds and obtained their eggs in the *Leptospermum* tracts that gird the shores of Port Phillip Bay, and also in the west in the short thick scrubs of King George's Sound. In Western Australia it is fond of placing its nest in the fork of a grass tree (*Xanthorrhœa*).

Writing from Yorke Peninsula, South Australia, Mr. James G. McDougall states he found the Bronze-wing a rare bird there, while its Brush congener was common in the mallee scrub and melaleuca swamps, and further, that the kangaroo hunters rear and sell the young of the latter bird.

In Tasmania, Mr. A. E. Brent observes, the Brush Bronze-wing usually seeks the sides of deep dark gullies for a nesting place, and almost in every instance the shady side of the same.

Like the other Bronze-winged Pigeon, the Brush bird breeds almost any time of the season, but usually during the months from October to January.

The following are the dates of my finds:—9th October, 1883, Evandale, Tasmania; August, 1884, Mordialloc, Victoria; 9th November, 1886, Lilydale, Victoria; 28th December, 1889, Torbay, Western Australia.

547.—*HISTRIOPHAPS HISTRIONICA*, Gould.—(164)

## FLOCK PIGEON.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 66.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 529.

*Previous Descriptions of Eggs*.—\*Diggles: Companion Gould's Handbook, p. 23 (1877); \*Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 409 (1882); North: Proc. Linn. Soc., N.S. Wales, vol. iii., 2nd ser., p. 148 (1888); D'Ombraïn: Victorian Naturalist (1891).

*Geographical Distribution*.—North-west Australia, Northern Territory, Queensland, New South Wales, and South Australia (interior).

*Nest*.—The bare ground, under any convenient low covert—tussock or bush—on the plains.

*Eggs*.—Clutch, two; elliptical in form; texture of shell fine but strong; surface glossy; colour, white, with a slight creamy tone. Dimensions in inches: (1) 1.32 × .98, (2) 1.24 × .98.

*Observations*.—This most beautiful and brilliant Bronze-wing, which is strictly terrestrial, never alighting upon trees, is a dweller of the great Central and Northern divisions of Australia, where during winter it assembles in immense flocks, hence the name Flock Pigeon of the dwellers of the interior. However, an informant writes: "The immense numbers of Flock Pigeons are never seen now, and the birds seem to be rapidly becoming scarcer."†

The Flock Pigeon is short and plump, wears a brownish or cinnamon-coloured coat, and has black and white markings about the face, therefore the bird may be easily recognised.

Gould first met this interesting Pigeon, as a new bird, on the 2nd December, 1839, while camped on the Mokai River, in the interior of New South Wales. He gives the following graphic picture: "I was strolling down beside the stream at sunrise, when one of these birds rose from the water's edge, flew to the distance of forty yards, and again alighted on the ground, where it assumed much of the air and actions of a Sand Grouse (*Pterocles*). A fortnight after this I descended about one hundred and fifty miles down the Namoi, and while traversing the extensive plains, studded here and there with patches of trees, that skirt the Nundawar Range, I was suddenly startled by an immense flock of these birds rising before me, and again alighting on the ground at a short distance. Finding they would not admit of near

\* No dimensions given.

† Regarding the alarming decrease of these exceedingly interesting Pigeons from the downs and plains of North-west Queensland, where the long grass provides natural covert and abundance of food for them, Dr. W. Macgillivray states that the introduction of sheep and cattle (which not only prevent the grass from seeding, but also disturb the birds and trample on their eggs and young) is the principle cause of the great diminution in numbers which has taken place of late years, only odd little lots of the Pigeons being now seen.

approach, I secreted myself, and desired my aboriginal companion, Natty, to go round and turn the flock towards me. The whole simultaneously rose as before with a loud burring noise, so closely packed that had they not passed me at a considerable distance many must have fallen to my shot; as it was I succeeded in obtaining four, two of which were males. About a week afterwards, while returning from a kangaroo hunt on a distant part of the same plain, we approached a small group of myalls (*Acacia pendula*), and Natty suddenly called out, 'Look! massa;' in an instant the air before us seemed literally filled with a dense mass of these birds, which had suddenly risen from under the trees at his exclamation. We had scarcely time to bring our guns to the shoulder before they were seventy or eighty yards off. Our united discharge, however, brought down eight additional specimens, all of which, being merely winged, and fluttering about, attracted the attention of our kangaroo dogs, and it was with the greatest difficulty they could be prevented from tearing them to pieces. In the midst of the scramble, a Kite, with the utmost audacity, came to the attack, and would doubtless have carried off his share, had not the contents of my second barrel stopped his career."

Leichhardt's Expedition (1847) noticed large flocks of these Pigeons lying on the patches of burnt grass on the plains of Queensland.

I have never seen any of the eggs of this Pigeon "pure white," as described by Dr. Ramsay. They always have a faint creamy tone.

I cannot resist giving at length Mr. Price Fletcher's ("The Bush Naturalist") fascinating field observations, as they appeared in "The Queenslander," 25th May, 1878, regarding the Flock Pigeon. He writes: "I was camped one September day at a large water-hole about one hundred miles north-west from the Cloncurry. About half-past four they began to come in from the plains; being so used to flocks of them, I at first paid no particular attention, but, getting up and looking round, I was astonished to find that as far as the eye could see in a north-westerly direction there was one continuous stream of these birds, apparently making for this water. Settling on the edge of the hole, I gave myself up to the pleasure of observing them. These Pigeons are most peculiar drinkers. Most birds are very deliberate over this matter, and even by their lifting up their heads heavenwards seem to return thanks; not so our vigorous Pigeon friends: they are not at all reverential, but drink as though their very life depended upon doing so quickly—as if the water would dry up before they could taste it. A flock, after flying several times swiftly round and round the lagoon, suddenly swoops down at a convenient spot; plunging their beaks into the water up to the eyes, they give two or three hasty gulps, and then suddenly, as if alarmed, they rise up and fly off again, before, I am sure, one-half have had time to touch the water. After flying round in wide circles, they again repeat the performance till, I suppose, at last, they do manage all to get satisfied. I cannot help thinking that the peculiar manner the blacks have of hunting them, and which I shall presently describe, has something to do with this strange method of drinking. At this hole, on this particular afternoon, they kept up these manœuvres till sunset, and the

hundreds of thousands that had accumulated there (many flocks had flown away satisfied) was a sight that to the eyes of a naturalist was delightful. It would take the pen of an Alexander Wilson to graphically describe the scene; how, in spite of their really incredible numbers, their closeness together, and their extreme rapidity of flight, yet not one ever made a mistake and 'cannoned' against its neighbour; in and out they glide, circle within circle, and each circle counting thousands; all seem to be moved by one spirit of unity, and they swoop and turn, rise and fall, as if directed by an invisible hand. The roar from their wings, as a larger flock than usual rose, was really deafening. The ducks paddled to the centre of the water, and the herons and spoonbills sailed away to neighbouring trees, evidently annoyed at this noisy interruption of their quiet habits. The sight was one never to be forgotten; it was a red-letter day among the many such days that a 'bush naturalist' can get in Queensland. Never but this once has it been my good fortune to see such excessive numbers at one time.

"Generally speaking, a water-hole is chosen for a favourite drinking place that is free from much timber, with a good, firm, gradually sloping 'shore' to the water. This gives plenty of room for their eccentric habits. I came across such a place one day, about fifty miles from the scene just spoken of, and was surprised to find it as it were planted all round with gum-tree branches. I could not at first make it out at all: these bushes were stuck into the mud close to the water, and were about the height and distance apart that gooseberry bushes are usually grown. It did not require the footprints, quite fresh, of blacks to let me know it was their work; but I thought the children had done it in their 'play about.' Seeing a rude sort of gunyah at each end—the hole was about one hundred yards long—I rode up, and then the mystery was explained by the heaps of Pigeons' feathers lying about. I afterwards had the pleasure of watching the blacks in this place catching them. It is thus: the blacks, well supplied with light boomerangs, conceal themselves, one in each gunyah, and wait patiently till the Pigeons come. They, with their usual impetuosity, after some preliminary circling, swoop down to the water; the little bushes confuse them, momentary disorganization ensues, they try to rise again, but their unity of spirit is broken, and they are a whizzing, buzzing mob of rabble. This is the time waited for by the blacks, who, springing to their feet, with eyes dilated, muscles quivering with wild excitement and savage satisfaction, hurl boomerang after boomerang into the seething mass before the astonished Pigeons even know that their arch-enemy is upon them. The whole scene did not take two minutes of time, and yet there lay dead or wounded some four dozen birds.

"About December these large flocks break up into couples, and it is not till after the breeding season that they again re-form. My opinion is that the couples are faithful partners, even for life, for amongst the great flocks it is still often possible to detect the pair keeping close together. They make no nest, but lay two white eggs on the bare ground, well concealed under a tussock of grass. They sit



very close, and when roused up by a horseman only fly some twenty or thirty yards and down again; by this it is always possible to tell if the bird has a nest, and the knowledge of this may enable a starving man to get a feed of young Pigeons or eggs, and so perhaps save his life. They have no voice except at pairing time, when during the early night the delicate soft coo-coo of one to another, so suggestive as it is of peace and love, is one of the pleasantest sounds that the traveller sleeping out on these plains can hear: it is a happy refrain in one's thoughts of home and love."

A keen observer of birds, who has lived in the Gulf Country since 1869, in reference to the blacks catching Flock Pigeons, mentions a somewhat different method than that described by Mr. Fletcher. The black, hiding in a bough-covered hole, has a net spread out, one side of which is attached to a long spear-like stick, the net being whipped over the birds as soon as they alight. The black then jumps out, bites the neck of each Pigeon, throwing them into the hole, gets back into his hiding place with the net ready for the next flock, which are treated similarly. In this way my informant states that he has seen hundreds of birds caught.

Mr. W. H. L. Thornton, Queensland, in writing to "The Australasian," remarks that from October to March (which includes the breeding season) Flock Pigeons are silent birds. In June, 1866, when he took charge of Tower Hill Station, they were in countless numbers. Twice he bagged forty-two at a shot. Mr. Thornton innocently adds, that they left the district for over eight years, and accounted for their absence by the country being stocked with sheep, which trample on eggs and young. May not bags, forty-two at a shot, have something to do with their disappearance also! A few birds returned in the season of 1897, but only remained a month or two. After fencing wire came into the district, the blacks gave up the use of the boomerang for killing the Pigeons, and used bits of iron about fifteen inches long. The poor Pigeons learned to fly miles past water to go to a hole with low banks, because the blacks could net or kill more easily with wire and boomerang where the banks are steep.

The eggs in my collection were taken in North-west Queensland, March, 1891, by Mr. A. S. Macgillivray. His brother (Dr. W. Macgillivray) informs me that the eggs are usually laid towards the termination or soon after the wet season, when the grass is long and green, and are deposited in a depression in the bare ground under an overhanging tussock of Mitchell grass, the seeds of this grass forming the principal food of both old and young birds.

Usual breeding months December to March.

Mr. A. J. North states the interesting fact of these splendid Pigeons breeding in captivity in the aviary of the late Hon. William Macleay, of Elizabeth Bay, during 1887-88.

But as against the field observations of such explorers as Stuart, Fletcher, and others, who state the Harlequin Bronze-wing breeds in summer after the rainy season, Mr. North says that "July and August are the usual breeding season of this species." The fact that a set

in the Dobroyde collection was taken during July, 1868, hardly I venture to state, proves his case.

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548.—PETROPHASSA ALBIPENNIS, Gould.—(470)

ROCK PIGEON.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 71.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 530.

*Geographical Distribution*.—North-west Australia.

*Nest and Eggs*.—Undescribed.

*Observations*.—Gould, who described the rare Rock Pigeon, states: "This highly singular species of Pigeon is an inhabitant of the most rugged and sterile districts of the North-west coast of Australia. Specimens were sent to me by one of the officers of the 'Beagle,' but, I regret to say, were unaccompanied by any particulars respecting their history. Writing to me from the Victoria River, Mr. Eelsey states that it is common among the sandstone cliffs of the ranges. The form of the wing would lead us to imagine that in many parts of its economy this species much resembles those of the members of the genus *Geophaps*; but on these points nothing can be ascertained with certainty, until the productions of those remote parts of Australia have been carefully investigated, a period which, from the inhospitable character of the country, I fear, is far distant."

Gould's predictions have so far, up to date, proved correct, because absolutely nothing has been yet learned about the economy of the Rock Pigeon. It is one of the three members of the Australian *Columba*, the eggs of which we are unacquainted with.

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549.—PETROPHASSA RUFIPENNIS, Collett.

CHESTNUT-QUILLED ROCK PIGEON.

*Figure*.—Proc. Zool. Soc., pl. 28 (1898).

*Reference*.—Proc. Zool. Soc., p. 354 (1898).

*Geographical Distribution*.—Northern Territory.

*Nest and Eggs*.—Undescribed.

*Observations*.—This new variety of Rock Pigeon was discovered by Dr. Dahl 19th June, 1895, on the South Alligator River, Northern Territory.

As Professor Collett says, it is easily distinguished from *P. albipennis* by its greater size, by the chestnut primaries, by the pale-grey centres of the feathers of the head and by the whitish throat.

It inhabits in flocks the sandstone hills in the central position of Arnhem Land, and at times lies close amongst the stones.

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550.—*GEOPHAPS SCRIPTA*, Temminck.—(465)

PARTRIDGE PIGEON.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 67.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 531.

*Previous Descriptions of Eggs*.—\*Gould: Birds of Australia, Handbook, vol. ii., p. 132 (1865); \*Ramsay: Proc. Zool. Soc., p. 116 (1876); Campbell: Southern Science Record (1883); North: Austr. Mus. Cat., p. 275 (1889).

*Geographical Distribution*.—Queensland, New South Wales, and South (interior), and North-west (?) Australia.

*Nest*.—A little hollow, scooped in the ground, about an inch deep, and lined more or less with dead, soft grass, sometimes sheltered by herbage.

*Eggs*.—Clutch, two; stout ellipse in shape; texture of shell somewhat fine; surface glossy; colour, white, with a slight creamy tone. Dimensions in inches of a proper clutch: (1) 1.23 × .96, (2) 1.18 × .93; of another pair: (1) 1.19 × .9; (2) 1.18 × .94.

*Observations*.—This peculiar form of Pigeon or Partridge Bronze Wing is strictly terrestrial in its habits, and is a dweller chiefly of the interior parts of Eastern Australia.

It is an exceedingly plump bird, and for the delicious flavour of its flesh is deemed equal to that of the far-famed Wonga-Wonga Pigeon. In Gould's opinion it was second to none in any part of the world, and he spoke with authority.

The Squatter Pigeon, as it is generally called, may be observed on the plains or open timbered country in pairs, or, as Gould more frequently saw them, in small flocks of from four to six in number, which, when approached, instead of seeking safety by flight, run away rapidly and crouch down or "squat" (hence the vernacular name Squatter), either on the bare plain or amongst scanty herbage, where they will almost suffer themselves to be trodden upon before flying. When they do rise, it is with a sharp burring sound of the wings. They either make for another part of the plain or alight upon a horizontal limb of the nearest tree, where they steadfastly squat again until flushed or "potted."

I fear I was guilty of potting a few of these fine Pigeons at Coomoo-boolaroo, Queensland, from whence, through the goodness of the late

\*No dimensions are given with these descriptions.

Mr. George Barnard, I had previously received my first examples of eggs of this species.

Professor Alfred Newton, Cambridge, has drawn my attention to the statement made by Gould that "the young both run and fly strongly when they are only as large as a quail, as I satisfactorily ascertained by killing one which rose before me; but at which bird I had fired I had not the slightest conception until I picked it up." Gould's statement is somewhat ambiguous and unsatisfactory, to say the least of it, and it is with very great diffidence I have to qualify the statement of such an eminent authority. It would indeed be remarkable were one of the Pigeon tribe, after coming into down, to fly before fully feathered. I wrote to the Messrs. Barnard for their field observations on the subject. The following is Mr. Charles Barnard's reply: "I have noticed the passage in Gould *re* young Pigeons that you refer to. I have seen them fly when only the size of a *large* quail, but any person could see it was the weak, uncertain flight of a young bird, and when they alight they will allow themselves to be picked up without attempting to escape. I do not think they leave the nest until they are able to fly." Mr. Harry Barnard writes: "The young Squatter Pigeons remain about a fortnight in the nest, till they can fly short distances; but they are easily caught for some time after leaving the nest, as their flight is very weak." Further, Mr. Charles was good enough to forward to me in spirits a pair of these young Pigeons about a week old, taken from the nest. Judging from their unfeathered wings, it would have been impossible for them to "fly strongly" at such an early age. Here is Mr. Barnard's own memo., which accompanied the specimen: "The young Pigeons were just about a week old when I bottled them, the eggs were last seen on Monday afternoon, 30th March (1896), and I bottled the young early the following Monday."

There is another slight inaccuracy in Gould's notes. He states the eggs are laid on the bare ground "without any nest." It may be true in some instances, but the Messrs. Barnard inform me they have frequently disturbed a pair of birds scratching out their little nesting hollow, which they line with soft, dry grass.

The Partridge Pigeon breeds at almost any period of the year, but usually from September or October to well into the autumn, the majority, perhaps, laying in January.

The following are some of the recent *data* of clutches collected at Coomooboolaroo: 14th August (1897), 22nd October (1894), 20th January (1896), 12th March (1896). The late Mr. George Barnard, writing to me, 1887, stated that then (May or beginning of June) the blacks were continually bringing in young of the Squatter Pigeons.

On the Darling Downs, Mr. Hermann Lau observed that the Partridge Pigeon went early to its "nuptial arrangements." He has taken eggs in August, and adds that the eggs often fall a prey to snakes and iguanas.

551.—*GEOPILAPS SMITHI*, Jardine and Selby.—(466)

## NAKED-EYED PARTRIDGE PIGEON.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 68.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 532.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 134 (1865).

*Geographical Distribution*.—North-west Australia and Northern Territory.

*Nest*.—A slight hollow formed in a clump of grass (Gilbert).

*Eggs*.—Clutch, two; colour, greenish-white (or white with a tone). Dimensions in inches: 1.25 × .88 (Gilbert).

*Observations*.—This splendid bird is the northern species of Partridge Bronze Wing or Squatter Pigeon. For our knowledge of this peculiar Pigeon we are alone indebted to the researches of Gilbert, who found it somewhat abundant in all parts of the Port Darwin district, where, however, its appearance was irregular.

Gilbert observed that the incubating months are from August to October, but doubtless it breeds later on, perhaps at any time of the year.

The young, like those of the other species of this singular genus, are hatched clothed with down, like a young quail.

552.—*LOPHOPHAPS PLUMIFERA*, Gould.—(467)

## PLUMED PIGEON.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 69.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 533.

*Previous Description of Eggs*.—Campbell: Victorian Naturalist (1886).

*Geographical Distribution*.—Northern Territory, Interiors of Queensland and South Australia (?).

*Nest*.—A slight depression in the ground, sheltered by herbage—spinifex, &c.

*Eggs*.—Clutch, two; elliptical in shape; texture of shell fine; surface glossy; colour, light creamy-white. Dimensions in inches: 1.0 × .79.

*Observations*.—As Gould remarks, this genus of elegant little Crested Pigeons is peculiar to the heated and arid plains of the great interior, where the birds seem to delight in basking in the tremendous heat of the sun. This Plumed Pigeon is the most northern variety.

The specimen Gilbert first shot must have appeared lovely in his hands, its rich cinnamon-coloured plumage, so beautifully relieved with irides of bright orange, and the surrounding naked skin of bright crimson, not to mention the bird's pretty crest and general contour.

The eggs I originally described were taken in the Gulf of Carpentaria country by my friend Mr. T. A. Gulliver.

This species probably lays at any period of the year, but the principal breeding months, no doubt, include those from October to March. Dr. W. Macgillivray, who has found these Pigeons plentiful in the Cloncurry Ranges, took eggs usually in October. They were placed on the bare ground, under a spinifex tussock, on the seeds of which the birds feed.

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553.—LOPHOPHAPS FERRUGINEA, Gould.—(468)

RED PLUMED PIGEON.

*Figure*.—Gould: Birds of Australia, fol., supp. pl. 68.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 534.

*Previous Descriptions of Eggs*.—Campbell: Victorian Naturalist (1887); North: Trans. Roy. Soc., South Australia, vol. xxii., p. 155 (1898), also Proc. Linn. Soc., N.S. Wales, vol. xxiii., p. 382 (1898).

*Geographical Distribution*.—Interior of South, West, and North-west Australia.

*Nest*.—A slight depression in the ground, about 3 inches across by 1 inch deep, lined with a few needles of spinifex grass, and sheltered by a low bush or bunch of spinifex, usually on sandstone ridges.

*Eggs*.—Clutch, two; elliptical in shape; texture of shell fine; surface glossy; colour, light creamy-white. Dimensions of a proper clutch: (1) 1.02 × .73, (2) 1.0 × .74; of a pair from North-west Australia: (1) 1.0 × .78, (2) .99 × .76.

*Observations*.—The Interior and the West are the homes of this sprightly little species, which may be distinguished from its congeners by the absence of the white band on the chest. Its rust-coloured plumage is decidedly protective, matching the red-coloured sand and rocks of the bird's usual surroundings.

The meagre information regarding this species was received by Gould from the Messrs. Gregory Brothers, explorers, who stated that the eggs are generally laid during the months of July and August. However, my old friend and schoolfellow, Mr. Alfred Walker, manager of Innamincka Station, Cooper's Creek, presented me with the eggs of this little Pigeon, taken 20th October, 1886. The nest was situated on a stony rise about ten paces from the edge of the creek. On the opposite bank was one of the dépôts of the ill-fated explorers, Burke and Wills, at a point of about six miles

up stream from where Burke perished. Such are the data of the first eggs of this species described. So that there could be no confusion between the Rust-coloured Pigeon and the White-bellied variety, I showed Mr. Walker the plates of both as figured in Gould. He unhesitatingly identified the former species as the parent of the eggs he found. Probably he is open to correction, and the bird was really the White-bellied variety (*L. leucogaster*): but I have examined eggs of the North-west species (*L. ferruginea*), which are absolutely undistinguishable from *L. leucogaster*, therefore my original description may stand.

Mr. G. A. Kearnland, from personal observations, writes: "The North-west part of Australia appears to be the home of this species. In habits and appearance at a distance they closely resemble *L. leucogaster* of Central Australia. In some rocky country near Gorda Town we saw these Pigeons for the first time. Several single birds were disturbed as we passed the base of the hills, but soon afterwards large coveys, consisting of about one hundred birds, passed from their feeding ground to the hills. At the homestead of Liverynga Station, I am informed they are very abundant in the hills close by, and are so tame that as many as a dozen birds may be seen under the verandah seeking shelter from the hot sun, or drinking from a dish of water placed for their convenience. They are also plentiful near the Margaret and Gaseoyne Rivers. They deposit their two creamy-white eggs on the ground beneath the shade of a spinifex tussock in a slight depression in the ground, in which a few bits of grass are collected. I am indebted to Mr. J. Harris, of Fitzroy River, for the clutch in the collection." These eggs were taken in February or March (1897), and have been described by Mr. North as "swollen ellipses in shape, and of a uniform pale cream-colour, the grain of the shell being very fine, and its surface slightly glossy." Dimensions in inches: (1)  $\cdot 94 \times \cdot 77$ , (2)  $\cdot 9 \times \cdot 77$ .

I knew of another pair of eggs, taken on the Minilga, Western Australia, 12th September, while the birds themselves have been observed as far south as the Champion Bay district.

Chief breeding season probably from October to March, but the birds may lay at any period of the year.

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#### 554.—LOPHOPHAPS LEUCOGASTER, Gould.

#### WHITE-BELLIED PLUMED PIGEON.

*Figure*.—Gould: Birds of Australia, fol., supp., pl. 69.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 535.

*Previous Description of Eggs*.—Ramsay: Proc. Linn. Soc., N.S. Wales, vol. i., 2nd ser., p. 1095 (1886).

*Geographical Distribution*.—Northern Territory, interior of Queensland (probably), and South Australia.

*Nest*.—A slight hollow in the ground, with a few loose blades of grass in or around, and sheltered by a tussock.

*Eggs*.—Clutch, two; elliptical in shape; texture of shell fine; surface glossy; colour, light creamy-white. Dimensions in inches of a proper clutch: (1) 1.05 × .8, (2) 1.03 × .81; of another pair: (1) 1.04 × .8, (2) 1.03 × .8.

*Observations*.—The habitat of this extremely interesting species is the great interior. There has been confusion amongst us about the varieties of the little, plump, Plumed Pigeons. After having examined the fine series of these birds in the Australian Museum, Mr. North says he cannot but regard *L. plumifera* and *L. leucogaster* as referable to the one species. However, the point is by no means settled.

As little is known of this small Pigeon, I quote at length Mr. G. A. Keartland's field notes as they appeared in the "Report of the Horn Scientific Expedition to Central Australia," May and June, 1894: "At Crown Point, on the 18th May, Mr. Belt secured the first pair of these birds. They proved to be adults, and the female contained a well developed egg in the oviduct. Subsequently I obtained them in numbers at Lawrie's Creek, Petermann Creek, Hermannburg, and, in fact, wherever rocks and water existed, until we reached Crown Point on the return journey, on the 26th July. On several occasions they made a welcome addition to our table, where their beautiful white flesh was much appreciated. Their love of rocky country has gained for them their appellation of 'Rock Pigeons.' They are strictly ground birds, and never perch on trees, but assembled in small companies on the rocky sides of the gorges through which we passed, where they seemed to enjoy basking in the hot sun. Owing to their colour they are not easily seen on the red sand or rocks. They are easily approached, and when disturbed rise with a 'whirr' like a quail; but as soon as they are well on the wing, they gently glide away, giving a tempting shot. At Stokes' Pass, Hugh Edgar, one of our camel drivers, found a nest, if such it might be called, containing two young ones, nearly able to fly. They were entirely brown, but others, probably a week older, were found, which had developed the white and black on the throat and head, which were invisible on the nestlings, as the feathers had not formed on those parts. The birds lay their eggs on the ground, generally near a tussock of porcupine grass, and place a few loose straws around, but in such a careless manner that it scarcely deserves the name of nest. Subsequently, at Haast's Bluff, Dr. Stirling found several nests containing eggs or young ones. There were never more than two eggs, which are about one-third smaller than those of *Ocyphaps lophotes*, and are of a dull creamy-white colour, with rather rough surface and lacking the usual glossy surface of Pigeon eggs. I was informed that these birds have never been found further south than Crown Point, on the Finke River."

The statement published by Dr. E. P. Ramsay, when first describing the eggs of this rare interior bird, that it lays *four* eggs, must evidently be an error. The Horn Expedition never observed more than two eggs or two young to a nest. Moreover, there is no instance of any species of Australian Pigeons laying more than a pair of eggs for a sitting.



Speaking of the genus generally, Gould says: "If we may judge from analogy, we may also infer that the young of these little Ground Bronzings do not remain callow and helpless for any length of time, but like the young of the *Gallinacea* generally, they are able to trip over the ground soon after exclusion from the egg. I think I have proved that Gould was mistaken about the young of the *Geophaps* being able to fly strongly when only the size of a quail. Likewise his opinion is erroneous with reference to the young of the *Lophophaps* being able to run soon after they are hatched. The young remain in the nest (merely a few straws on the ground), where they are fed by their parents like ordinary Pigeons for about three weeks. This fact I learnt from Mr. Adolph Russell, a neighbour of mine, who had these sprightly little Pigeons breeding in captivity.

Mr. Keartland kindly loaned me for examination a pair of skins of fledgelings of this Plumed Pigeon, apparently a week or ten days old, taken from the nest in Central Australia. Judging by the development of the feathers, the birds were quite incapable of flying at that stage.

As pets, the White-bellied Plumed Pigeons are very pugnacious, readily attacking other birds in the aviary.

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555.—OCYPHAPS LOPHOTES, Temminck.—(469)

#### CRESTED PIGEON.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 70.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 535.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 140 (1865); Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 410 (1882); North: Austr. Mus. Cat., p. 277, pl. 14, fig. 10 (1889).

*Geographical Distribution*.—Australia in general.

*Nest*.—A slight, flat structure of twigs, usually placed in a bush—polygumum, hakea, salt, &c.—or low tree, sometimes on a stump.

*Eggs*.—Clutch, two; elliptical in shape, sharply nipped off at one end; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches of a proper clutch: (1) 1.32 × .92, (2) 1.29 × .93.

*Observations*.—This beautifully shaped and extremely elegant Pigeon is a dweller of open timbered parts inland throughout almost the whole of Australia.

When flushed it is a pleasant sight to see a small flock of Crested Pigeons on whistling wings sail into a dead tree, and there on the grey limbs cluster their chastely-coloured figures into a pretty art pyramid. Many times have I enjoyed looking at such living pictures on the Murray and Riverina plains.

The whistling sound of the wings when the bird is flying is very peculiar, while the posing of some of the birds when perching is exceedingly odd, especially when they throw their tails into the air, an effort which seemingly almost overbalances the birds.

The first recorded nest of this species was met with by Gould, who found it in a low tree on the great plains on the Lower Namoi, 23rd December, 1839. The frail stick nest contained two eggs, from which the discoverer took his original description.

So carelessly constructed are some Pigeons' nests that we hear of a squab sometimes falling through and getting hanged in the twigs by the neck till it is dead.

In the great North-west interior of Queensland, Mr. Price Fletcher observes that there this pretty Pigeon generally breeds about six feet from the ground, and so loosely is the nest put together that he has frequently seen the eggs roll off when the sitting bird was flushed.

Although spring and summer may be the chief breeding months of the lovely Crested Pigeon, I suspect, like most of our native Pigeons, it lays almost any time of the year.

Touching laying during the off season, Mr. G. H. Morton, Murray Meadows, on 31st March, season 1894, found a nest of this species containing two eggs on a stump. On the 10th April following he found another nest, also containing two eggs, built in a saltbush.

I have eggs of the Crested Pigeon from Mr. H. C. Burkitt, collected at Cooper's Creek, 23rd March, 1887.

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SUB-FAMILY—GEOTRYGONINÆ.

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556.—LEUCOSARCIA PICATA, Latham.—(461)

WONGA-WONGA PIGEON.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 63.

*Reference*.—Cat. Birds Brit. Mus., vol. xxi., p. 607.

*Previous Descriptions of Eggs*.—\*Ramsay: Proc. Zool. Soc., p. 116 (1876); Campbell: Southern Science Record (1883); North: Austr. Mus. Cat., p. 272 (1889).

*Geographical Distribution*.—Queensland, New South Wales, and Victoria.

*Nest*.—Very frail in structure, composed of sticks or twigs placed on a horizontal branch of a tree at a height of from ten to twenty feet above the ground, in scrub or forest.

*Eggs*.—Clutch, two; elliptical in shape, occasionally more pointed at one end; texture of shell comparatively fine; surface glossy; colour.

\* No dimensions given.

pure white. Dimensions in inches of a proper clutch: (1)  $1.53 \times 1.07$ . (2)  $1.45 \times 1.1$ ; of an odd example:  $1.5 \times 1.1$ .

*Observations.*—This splendid large Pigeon (specially prized by epicures for the delicacy of its fine-flavoured flesh) is a denizen of eastern forests and scrub, from Cardwell district, North Queensland, to Victoria. Not many years ago I saw Wonga-Wongas in the Dandenongs, near Melbourne. As a rule it is a stationary species.

The greyish dappled plumage, relieved with pink feet and bill and rich brown eyes, needs no further description. It is a good plump bird, its body, when shot, averaging about a pound weight. It loves to dwell in the everlasting shades of the scrub, and seems always to be on the ground feeding upon fallen fruits and berries. Along some lonely and unfrequented track they may be flushed with loud flapping noise of wings, and they usually afford a good shot by flying along the track for a short distance before diverging into the scrub. Their loud call-notes are readily distinguished from all other Pigeons', being a rapid, continuous, high-pitched "hoo-hoo-hoo-hoo," which may be heard half-a-mile off.

The eggs I originally described were from the collection of Dr. A. E. Cox, and were taken at Penrith, New South Wales. Although this fine Pigeon is fairly numerous in certain localities, its eggs seem to be rarely found.

From Mr. Lau's manuscript I glean: "In all scrubs—cedar, myrtle, pine, or brigalow—the Wonga is surely to be met, living on seeds of the undergrowth as well as caterpillars (procession). Coming to a virgin scrub, as I did, to the Highfield (Toowoomba Range), this fine bird, of handsome plumage, and excellent for the table, appeared very plentiful, so much so that during my stay of eleven months, I with others must have shot a thousand. Here I found several nests—the most scantily made of all Pigeons', and frequently crawling with disgusting vermin, caterpillars, &c. The two eggs can be seen from below through the sticks. The nest is situated from ten to twenty feet from the ground, generally in the fork of a middle-sized tree. Although I have observed two broods, I believe they have three. Have found nests in July and November."

Mr. Lau naively adds that civilization is fast diminishing the ranks of the Wonga-Wonga Pigeons. I should say so, when he admits that he and his companions alone shot over a thousand birds in eleven months!

Chief breeding months October to January.

It has also been found laying in the autumn season, while in the Omeo district of Victoria, on the 1st July, 1897, when snow was upon the ground, Mr. I. W. De Lany shot a female containing two nearly developed eggs.

These birds thrive well in an aviary, where they sometimes lay eggs, but never sit upon them.

## ORDER—GALLINÆ: GAME-BIRDS.

## Sub-order—Peristeropodes.

## FAMILY—MEGAPODIIDÆ: MEGAPODES.

## 557.—LIPOA OCELLATA, Gould.—(477)

## MALLEE FOWL.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 78.

*Reference.*—Cat. Birds Brit. Mus., vol. xxii., p. 463.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 163 (1865); Bennett: Proc. Linn. Soc., N.S. Wales, vol. viii., p. 183 (1883); Campbell: Victorian Naturalist (1884), also Geelong Naturalist (1898); North: Austn. Mus. Cat., p. 281 (1889); \*Le Souëf: Ibis, p. 12 (1899).

*Geographical Distribution.*—New South Wales, Victoria, South and West Australia.

*Nest.*—A large conical-shaped heap or mound of sand, &c., covering a bed of leaves and other vegetable *debris* about eight inches in thickness; usually situated in a water track in the dense scrub of sandy tracts, or in reddish ironstone gravel country, such as the Mallee (so named from a species of dwarf eucalyptus which grows there), &c. Dimensions, 10 to 12 feet in diameter at base, or a circumference 30 to 40 feet, and height 2 to 4 feet.

*Eggs.*—Clutch, twelve to eighteen—other authors seven to eight; long oval in shape or elliptically inclined; texture coarse but shell exceedingly thin; surface without gloss; colour, when first laid, light-pink or pinkish-buff, which on being scratched or removed shows a yellowish-buff ground; this in turn, as incubation proceeds, chips off in patches and reveals a whitish shell. Dimensions in inches of four eggs from the same mound: (1) 3.73 × 2.35, (2) 3.7 × 2.42, (3) 3.52 × 2.26, (4) 3.44 × 2.26. (Plate 18.)

*Observations.*—The mound-raising birds are the ornithological curiosities not only of Australia but of the world.

This remarkable and truly solitary *Lipoa* dwells in the drier and more arid scrubs of Southern Australia generally, being particularly partial to the Mallee (a dwarf species of eucalypt) tracts, hence the vernacular title Mallee Hen.

The *Lipoa* resembles very much in shape and size a greyish-mottled domestic Turkey, but is slightly smaller, more compact, and stouter in the legs. It has no wattles about its head, but has a small tuft of feathers falling gracefully back from the crown.

In Western Australia the *Lipoa* has its most northerly range apparently just above the tropical line, the Calvert Expedition having

\* No dimensions given.



EGG MOUND OF THE MALLEE HEN.

*From a Photo by the Author.*



found evidences of the bird between Cue and Separation Well, in the Great North-west Desert. Mr. Tom Carter obtained eggs from the natives, gathered between Wooramel and the Murchison River. The furthest point south touched by the Lipoa is, or rather was (for I fear they have been driven out of the locality or destroyed by foxes), the Brisbane Ranges between Bacchus Marsh and the You Yangs, Victoria. At all events, the birds were there during the season 1887, Mr. A. Cameron, a station employé, having seen a nest, apparently just ready for eggs. He also heard of a person who found another nest containing eggs.

What a profound pity these wonderful and most interesting birds could not be properly preserved, because they are undoubtedly fast disappearing! I believe I have the record of the last eggs taken in the immediate neighbourhood of Bendigo. That was the season of 1879. I saw eggs that were obtained from a mound in the Bagshot forest. Formerly the birds were plentiful further north in the Whipstick scrub. During the Whipstick rush (1861) birds were exposed for sale in the poulterers' shops in Bendigo.

The aborigines in the Bendigo district, which are now, like the bird, defunct, called the creature "Low-an-ee." Mr. F. R. Godfrey recollects hearing the natives of the Lower Loddon call the bird "Louan." The great shire of Lowan, in the Wimmera district, derives its title from the native name of the bird. In Western Australia the Lipoa was first called by the trivial name "Native Pheasant," but is now usually known by its native name "Ngow," or "Nau." Gould states other Western tribes called the bird "Ngow-oo," and that this name is given on account of the tuft on its head, "Ngoweer" signifying a tuft of feathers.

Decidedly the most peculiar feature in the economy of the Lipoa, or Mallee Hen, is that it does not incubate its eggs in the usual manner, but deposits them in a large mound of sand, where they are hatched by the action of the sun's rays, together with the heat engendered by the decomposing vegetation placed underneath the sand and eggs. In constructing a new nest or mound, a slight hollow, usually a water track or shallow gully, is selected, in almost impenetrable scrub. The spot is further hollowed or scooped out, and filled with dead leaves and other vegetable matter. Then all is completely enveloped with sand, which is scraped up for several yards around.

About the end of April or the beginning of May both birds (male and female) commence to clear out their old mound or construct a new one, which is then left open till June or July (the late Mr. K. H. Bennett states October),\* when leaves, &c., are gathered and placed

\* I received a communication from Mr. K. H. Bennett, in which he writes:—"The period of the nidification of the Mallee Hen appears to differ somewhat in Victoria, for I have never known them here (Mossgeil, N.S.W.) to commence constructing their nests earlier than the middle of September (more frequently in October), whilst I have taken fresh eggs on several occasions from nests as late as the middle of March. I think the difference in time may be accounted for by the fact that the winters here are as a rule dry, the rain coming usually during the months of September and October, but it mainly depends on the season. During years of drought the birds do not nest at all, instinct apparently teaching them that without rain the attempt would be a failure."

therein. After the leaves are thoroughly saturated by the winter rains, they are covered up with the sand. The fact that the mound is usually situated in a shallow course or slight gully, further insures the vegetation becoming thoroughly soaked. The female commences to lay in September, or usually October.

Two or three inches of dry loose sand are thrown over the leaves, then a tier or layer of four eggs (Gould states eight) is deposited, each placed perpendicularly on the smaller end. The four eggs are in the form of a square, four or five inches apart. An inch or two more sand covers them, and another tier of eggs is placed opposite the interstices of the sub-tier, and so on, till the complement is reached, three or four tiers amounting to between twelve and sixteen eggs. Mr. Charles McLennan, who has enjoyed exceptional experiences with Mallee Hens' mounds, tells me there are always four eggs in the bottom tier, but sometimes six in the other tiers, except the topmost tier, which finishes with one only, the number of tiers being usually three, occasionally four. The centre or portion in the heart of the mound containing the circle of eggs is about fourteen inches in diameter. One of Gould's informants, Sir George Grey, who first mentioned the singular position of the egg, states:—"When an egg is to be deposited, the top of the mound is laid open, and a hole scraped in its centre, to within two or three inches of the bottom (? top) of the layer of dead leaves. The egg is placed in the sand just at the edge of the hole, in a vertical position, with the smaller end downwards. The sand is then thrown in again, and the mound left in its original form . . . When a second egg is laid it is deposited in precisely the same plane as the first, but at the opposite side of the hole, before alluded to. When a third egg is laid it is placed in the same plane as the others, but, as it were, at the third corner of a square. When the fourth egg is laid, it is still placed in the same plane, but in the fourth corner of the square, the figure being of this form— $\begin{matrix} o & o \\ o & o \end{matrix}$ ; the next four eggs in succession are placed in the interstices, *but always in the same plane* (?), so at last there is a circle of eight eggs, with several inches of sand intervening between each."\*

In one mound opened by Sir George Grey, which, however, had been previously robbed of several eggs, he found two eggs opposite each other in the same plane, and a third egg four and a-half inches below them, a circumstance which he says "led me to imagine it was possible that there might be sometimes successive circles of eggs in different planes."

Mr. F. R. Godfrey states:—"I have more than once seen a second tier of eggs exactly above the lower, but this is a rare occurrence, and sets one puzzling how the young birds that are first hatched, which of course occupy the lower story, can get out of their prison without disturbing those immediately above them."

During laying time an egg is deposited every third day. A great

\* Since writing my observations on the Mallee Hen, Dr. C. S. Ryan has kindly showed me a photograph which he took of a mound partly opened, exposing the top portions of eight eggs. They form an irregular circle, and are apparently nearly all about the same plane.—(A.J.C.)



amount of toil devolves upon the hen, assisted by her mate, because they have to dismantle and rebuild a large portion of the mound at the laying of each egg. A mound containing eggs is always left conical shaped in dull or wet weather, but in warm sunny days the top is somewhat hollowed like a miniature extinct volcano, which enables the heat from the sun's rays to concentrate and penetrate the centre among the eggs, therefore when covered up by the owners before sundown, the heat so absorbed is retained for a lengthened period. Mr. C. McLennan says: "I have been taking particular notice of them (Mallee Hens), for I love to watch them at work. They have a habit of flattening out their nest about 10 o'clock a.m., in order to admit the heat of the sun, and about 3 p.m. they build the mound up again." He never saw more than a pair of birds (male and female) working at the nest.

In building and razing the mounds the birds use their strong feet for scraping, but the loose sand is swept up and impelled forward by the aid of the breast and wings.

The eggs, which are laid between 9 and 10 o'clock in the morning (not at day-break, as stated by one writer), are placed in their perpendicular position by the parent by the aid of its feet, scraping up the sand first on one side, then the other. From the position of the eggs, and as a natural consequence, the chicks are hatched in an upright attitude, their legs drawn up in front, and toes near their beak; therefore, it may seem an easy matter when the young are delivered from the shell to wriggle through the running sand, and so free themselves from this great earthen womb. It need no longer be a disputed point whether or not the young are assisted out by their parents.

Sir George Grey (in Gould) states, from information most probably received from the blacks, that "the young one scratches its way out alone; the mother does not assist it. They usually come out one at a time; occasionally a pair appear together. The mother, who is feeding in the scrub in the vicinity, hears its call and runs to it. She then takes care of the young one as a domestic hen does of its chick. When the young are all hatched, the mother is accompanied by eight or ten young ones, who remain with her until they are more than half-grown." The last part of this statement is questionable. The young can fly from their birth, and probably lead an existence independent of their parents. Mr. Bennett, from careful observations, entertained the belief that the young Mallee Hen can liberate itself from the mound, mentioning that on many occasions, when opening mounds, he has found the chick so near the surface that in a few minutes more it would have effected its escape unaided. Mr. Bennett argues if the chicks by their own exertions could come up from the lower layer to where he had unearthed them, they could certainly have passed through the few inches of loose sand near the top.

Further, the following is conclusive evidence, I think, that the *Lipoa* chick does liberate itself from the hatching mound. In answer to a direct question of mine, Mr. Charles McLennan, who has had

twenty odd years' experience, trapping, &c., in the Mallee, replies: "There is no doubt that the young ones can get out themselves, for when I was standing near a mound one day I saw a young one come up through the sand, and I have found them very near the top of the mound." Subsequently, Mr. McLennan wrote: "I have seen a good many young birds work their way out of the mound lately."

By way of experiment, Mr. Dudley Le Souëf had a piece of wire netting placed round a mound that contained eggs. Result: none of the young emerged, but died in their shells. This may seem to prove that the parents must assist the young out. They probably do so indirectly by visiting the mound occasionally and working at it, thus keeping the soil loose and friable. In the case of the mound wired-in by Mr. Le Souëf, the sand had evidently become set or hardened for want of attention, and thus prevented the escape of the young at the proper time.

With regard to the birds frequently visiting the egg mound to repair damages, &c., Mr. Bennett states:—"I may mention that on one occasion I opened a nest about 10 o'clock in the morning, which contained three eggs. I took one, as I knew from its delicate colour that it was quite fresh. I left the nest open, and having occasion to repass it about two hours afterwards, I found the bird had in my absence made it up again. Thinking it might be possible that the egg I had taken was not the morning's laying, I again opened the nest, but there were the two eggs only. This time I opened the mound to a much greater extent, drawing the sand back to a considerable distance and again leaving it open. Shortly before sundown I returned to the nest again and found all damage repaired."

As previously mentioned, the laying season usually commences about the beginning of September, and extends through the two following months, consequently, as the female approaches the complement of her eggs, in the one mound eggs are found in various stages of incubation. The duration of the period of incubation has not yet been determined. I have hazarded the opinion that it is probably about six weeks (some observers say five),\* for the following reasons:—First, my brother, Mr. W. R. G. Campbell, during his residence in the Mallee country, observed a mound containing thirteen eggs and newly-hatched chicks. Now, as the bird lays two eggs a week (or one every third or fourth day), that would give about six weeks from the time the first egg was laid until the first appearance of young. Second, as some of the later laying birds finish their clutch about the end of November, the last of the young has been observed emerging from mounds about the middle of January.

We have accepted the usual breeding time of the Mallee Hen, from September to January, under normal conditions, but, as Mr. Bennett has pointed out, the laying period is regulated by the

\* Since writing this statement, Mr. M. McLennan, at my suggestion, made the satisfactory observations that a fresh egg, marked on the 2nd October (1898), was hatched on or about the 12th November, or 41 days afterwards; and another egg, marked on 4th November, he found hatched on the 12th December, or 38 days afterwards.



EGG MOUND OF SCRUB HEN (MEGAPODE)

*From a Photo by D. Le Souef*



EGG MOUND OF MALLEE HEN, OPENED BY BIRD.

*From a Photo by D. Le Souef.*



character of the season or rains. I believe eggs have been taken in New South Wales in July.

Gilbert, in the Wongan Hills, Western Australia, took the first Mallee Hens he ever found on the 28th September (1842). Mr. T. Carter, further north, on the Murchison, has seen eggs in the hands of the natives 20th September. The season (1884) I visited the Mallee, in Victoria, laying commenced also in September. The season of 1888 another collector watched eighteen Mallee Hen mounds, and none contained an egg before the middle of October. Then again, taking the terminal end of the laying season, and still in the same district (Wimmera), Mr. A. Esdaile, about the 27th March, 1887, found young birds just emerging from the shell; and later still, Mr. E. H. Hill, writing from Bendigo, under date 19th May, 1895, says: "A pair of Mallee Hen's eggs was brought to the School of Mines from Boort, said to have been taken from the mound last Sunday. I blew them myself, and one was perfectly fresh, though the other was addled."

Touching the complement of eggs to a mound, Gilbert stated that Mr. Roe, the Surveyor-General, who examined several mounds during his expedition to the interior, 1836, found the eggs nearly ready to hatch in November, and invariably seven or eight in number, while another authority informed him of an instance of fourteen being taken from one mound. Sir George Grey, also mentioned by Gould, says eight to ten eggs are laid, and if the mound is robbed, the female will lay again in the same nest, but will only lay the full number of eggs twice in a season. My brother, already mentioned, found thirteen eggs, some just hatched, in one instance. On one occasion, in the Mallee (Victoria), Mr. Charles McLennan states he found the extraordinary number of twenty eggs in a mound at one time, but, he adds, five of them were stale. Mr. James Macdougall, writing from Yorke Peninsula, South Australia, states:—"The Mallee Hen breeds on the northern part of the foot of the Peninsula, where the mallee is tall, dense, and almost impenetrable to man. I was fortunate to meet a farmer, November, 1885, with a dozen eggs, which he had just obtained from a mound." By far the finest lot I ever saw from the one mound was eighteen in the collection of Mr. W. White, Reedbeds, South Australia. They were all the "pink of perfection," and apparently taken as they were deposited. The measurements varied from 3.68 to 3.36 x 2.38 to 2.27 inches.

Mr. Dudley Le Souëf informs me that the Mallee Hen will thrive in confinement, but does not as a rule attempt to make a mound.

There is nothing like personal experience, and as the Mallee Hen is so replete with fascinating interest, even at the risk of being tedious, I here give a brief account, the substance of which I read before the Field Naturalists' Club of Victoria, 8th December, 1884, of a day's outing enjoyed in virgin mallee scrub of the Wimmera district of Victoria, when I was in quest of the Hen's eggs.

On the 22nd October, 1884, accompanied by a friend, I set out from Nhill for the Lawloit Range, distant about ten miles. We took our departure immediately after breakfast. It was a most delightful spring morning, clear and balmy. Merrily did our pretty pair of

mouse-coloured ponies bowl us along the high road towards the South Australian border; now passing through lovely open timbered country clothed with grass up to the cattle's knees; then, where the timber had been reclaimed, there were acres upon acres of waving cornfields, which, judging by their rich green colour, betokened a bountiful harvest.

*En route*, by previous agreement, we picked up an industrious selector, who formed his first acquaintance with the Mallee country and Mallee Hens some twenty years before. He was to be our guide, and a very able one he proved.

After crossing fine pine ridges, then a "crab-hole flat," we entered the mallee on the Lawloit Range. To call it a range is a misnomer, for it is merely a series of undulating rises or ridges of a reddish gravelly ironstone formation, and almost waterless, covered with a small variety of mallee (*Eucalyptus gracilis*) and other scrubs, notably melaleuca, &c. It was a most beautiful sight from the buggy seat to gaze on the face of this perfect sea of foliage, with here and there patches of lovely mallee blossom (prematurely blown by erratic season—it generally blooms in May), appearing like curling wave crests, while in the troughs we saw the melaleuca (*M. wilsoni*) all ablaze with rich magenta flowers. Such is the home of the curious Mallee Fowl.

Having secured the ponies, we dashed into the scrub, our selector friend leading, threading the bushes like a blackfellow, parting the bushes first with one arm and then the other. I followed suit as well as I could, but I soon found that "familiarity breeds contempt," and much poetry, for me at all events, was knocked out of the scrub when, in my enthusiasm, I came in contact with prickly bushes—hakea,—and another ugly variety, which caused me to part with fragments of my clothing, and even my flesh. My other friend took matters more easily, endeavouring to shoot a small species of Honeyeater, which abounded hereabouts, for identification. It proved to be the Wattle-cheeked (*Ptilotis cratitia*, Gould).

Running down a small water track, we struck a Lipoa or Mallee Hen's mound. It was situated between a clump of mallee and among some melaleuca bushes (*M. unornata*). The sandy soil was swept up cleanly for yards around, even to the uncovering of the roots of the scrub for two or three inches. Some conception may be formed of the size of the mound when the dimensions, by actual tape measurement, were ten feet across by about two feet in height, or thirty feet in circumference, the whole mound being equivalent to a displacement of about one hundred and fifty cubic feet. The apex of the mound was slightly concave, with a few twigs and sticks thrown across it, evidently by the bird, to obscure detection. Sticks on the nest are always a sign that the bird has begun to lay.

We commenced to scrape, on all fours, like so many dogs. The sand was dark-grey, intermixed with minute fragments of dead mallee and other foliage. This mixture was exceedingly loose, and we experienced no little difficulty in preventing it running back again towards the centre. The mound unfortunately contained only one egg. The temperature of the sand about this egg, by Fahrenheit's

thermometer, indicated 93°, being 20° hotter than the surrounding atmosphere. The mound had apparently been robbed two or three days previously. Our selector friend had, three weeks earlier, abstracted four eggs from it, making the third successive season he had collected eggs from the same mound.

After "beating about the bush" a second nest was discovered. Upon digging laboriously to its centre, we found revealed "nothing but leaves." In a third mound we were more successful. It contained five eggs, fresh and beautiful. Its situation was similar to the first, being in a slight indentation or gully on the side of a rise, and its shape and dimensions were also much on an equality. In removing the sand, great caution had to be exercised for fear of fracturing the shells, which are extremely fragile. It became intensely interesting, after grubbing away apace, to see the beautiful pink rounded apices of the eggs peep out one by one above the dry and trickling sand. The safest method to remove an egg is to displace the sand immediately round and about it till it gently overbalances. After removing about a foot of sand, we came upon one egg, evidently the commencement of a second tier, for directly underneath was the first tier of four eggs. Then four inches of dry sand intervened, succeeded by a bed about eight inches deep, of damp, humid leaves. A most unfortunate accident happened to my thermometer, which was smashed through coming into contact with some scrub. This was much to be regretted, because I had no means of recording the temperature of the egg chamber as a check against that in the first egg mound.

The eggs were as usual of immense proportions ( $3\frac{3}{4} \times 2\frac{3}{8}$  inches) compared with the size of the parent. The colour of the eggs differs, from a most beautiful soft pinkish-blush to a darker colour of rich pinkish-red, and, as incubation proceeds, the eggs become stained and discoloured. When fresh, the eggs are excellent eating; to this I bear testimony, having had one fried for a breakfast. It was exceedingly palatable, being rich and delicate, and not even as strongly flavoured as a domestic Turkey's egg. Before being cooked it turned the scales at six and a-half ounces.

We got a glimpse of one bird as it ran along a survey line. They are solitary and shy creatures. Persons who have heard its note say it is most mournful, sounding something like that of the Bronze-wing Pigeon, but of course louder and more prolonged. The call may be heard nearly a mile away. To produce the noise the bird has a peculiar habit of placing its head between its legs, with the back of the head almost touching the ground.

Its food consists of insects, seeds, and berries, and tender shoots of plants. It can subsist without water, but sometimes drinks when it rains.

Another hunt after Mallee Hens occurred on the 25th October, when we again visited the Lawloit Range, but many miles to the northward of our previous operations. We procured only two additional eggs, the birds as usual keeping out of sight. Nevertheless we had an enjoyable scramble through the scrub. When evening came we erected a comfortable mia-mia on the mallee fringe. Selecting a

triangular clump of these trees, we slung our hammocks between the intervening stems and barricaded with thick boughs the two exposed sides, while on the third side we built a huge fire. After the buggy was drawn up and the horse secured, we were all safe and snug for the night.

In Western Australia I had the opportunity of examining two *Lipoa* egg mounds, one of which appeared to be deserted, notwithstanding it was the laying season. One in particular was very interesting, from the fact that it had been scooped out preparatory to receiving the eggs. This mound was not in mallee, but in a scrub of a mixed nature, near Geographé Bay. The whole mound resembled an inverted cone, or miniature crater, and measured about forty feet in circumference at the base; the rim of the crater, so to speak, being about twenty feet round. A perpendicular line from the level of the rim to the inside bottom was three feet, including one foot below the surface of the ground. Unfortunately, some time previous to my visit, the poor hen bird was accidentally caught in a wallaby trap and killed, which accounted for the unfinished state of the mound, and also proves the theory I hold (in opposition to many intelligent observers of our mallee blocks) that only one pair of birds frequents the same mound; or else, if more, why did the depositing of eggs not proceed, seeing it was full season or near the middle of November?

To conclude, I may give good Gilbert's original and interesting nesting account (omitting one or two speculative errors) of the Mallee Hen in Western Australia, as it appeared in Gould, and dated from the Wongan Hills, 28th September 1842:—"This morning I had the good fortune to penetrate into the dense thicket I had been so long anxious to visit in search of the *Lipoa*'s eggs, and had not proceeded far when the native who was with me told me to keep a good look-out, as we were among the 'Ngou-oo' hillocks; and in half-an-hour after we found one, around which the bush was so thick that we were almost running over it before seeing it. So anxious was I to see the hidden treasures within that in my haste I threw aside the blackfellow and began scraping off the upper part of the mound. This did not at all please him, and he became very indignant, and at the same time making me understand 'that as I had never seen this nest before, I had better trust to him to get out the eggs, or I should in my haste and impatience certainly break them.' I therefore let him have his own way, and he began scraping off the earth very carefully from the centre, throwing it over the side, so the mound very soon presented the appearance of a large basin. About two feet in depth of earth was in this way thrown off when the large ends of two eggs met my anxious gaze. Both these eggs were resting on their smaller apex, and the earth around them had to be very carefully removed to avoid breaking the shell, which is extremely fragile when first exposed to the atmosphere. About one hundred yards from this first mound we came upon a second, rather larger, of the same external form and appearance; it contained three eggs. Although we saw seven or eight mounds, only these two contained eggs; we were too early; a week later and we should doubtless have found more. To give you an idea



of the place these birds choose for their remarkable mode of rearing their young, I will describe it as nearly as I can:—The Wongan Hills are about 1,300 feet above the level of the sea, in a north-north-east direction from Drummond's house, in the Toodyay. Their sides are thickly clothed with a dense forest of *Eucalypti*; and at their base is a thicket, extending for several miles, of upright growing and thick bushy plants, so high in most parts that we could not see over their tops, and so dense that if we separated only for a few yards we were obliged to 'cooey' to prevent our straying from each other. This thicket is again shadowed by a very curious species of dwarf *Eucalyptus* bearing yellow blossoms, and growing from fifteen to thirty feet in height, known to the natives as spear-wood, and of which they make their spears, digging-sticks, dowaks, &c. The whole formation is a fine reddish ironstone gravel, and this the *Lipoa* scratches up from several yards around and thus forms its mound, to be afterwards converted into a hot-bed for the reproduction of its offspring. The interior of the mound is composed of the finer particles of gravel mixed with vegetable matter, the fermentation of which produces a warmth sufficient for the purpose of hatching. Mr. Drummond, who has been for years accustomed to hot-beds in England, gave it as his opinion that the heat around the eggs was about 89°. In both the nests with eggs the white ant was very numerous, making its little covered galleries around and attached to the shell. One of the eggs I have preserved shows the white ant's tracks most beautifully. The largest mound I saw, and which appeared as if in a state of preparation for eggs, measured forty-five feet in circumference, and if rounded in proportion on the top would have been fully five feet in height. I remarked in all the mounds not ready for the reception of eggs the inside or vegetable portion was always wet and cold. In both cases where I found eggs the upper part of the mound was perfectly and smoothly rounded over, so that anyone passing it without knowing the singular habit of the bird might very readily suppose it to be an ant-hill. Mounds in this state always contain eggs within, while those without eggs are not only *not* rounded over, but have the centres so scooped out that they form a hollow. The eggs are deposited in a very different manner to those of the *Megapodius*; instead of each being placed in a separate excavation in different parts of the mound, they are laid directly in the centre, all at the same depth, separated only by about three inches of earth, and so placed as to form a circle. I regret we were so early; had we been later, the probability is I should have found the circle of eggs complete. No one, considering the immense size of the egg, can for a moment suppose the bird capable of laying more than one without at least the intermission of a day and perhaps even more. Like those of the *Megapodius*, they are covered with an epidermis-like coating, and are certainly as large, being three inches and three-quarters in length by two and a-half inches in breadth: they vary in colour from a very light-brown to a light-salmon. During the whole day we did not succeed in obtaining sight of the bird, although we saw numerous tracks of its feet and many places where it had been scratching. We also saw its tracks on the sand when

crossing the dried beds of the swamps at least two miles from the breeding thicket, which proves that the bird in procuring its food does not confine itself to the brushes around its nest, but merely resorts to them for the purpose of incubating. The native informed us that the only chance of procuring the bird was by stationing ourselves in sight of the mound at a little distance and remaining quiet and immovable till it made its appearance at sundown. This I attempted, and with the native encamped within twenty yards of the mound, about an hour before sunset, taking the precaution to conceal ourselves well with bushes from the quick eye of the bird, but leaving just a sufficient opening to get a fair sight with my gun. In a half-sitting, half-crouching position I thus remained in breathless anxiety for the approach of the bird I had so long wished to see, not daring to move a muscle for fear of moving a branch or making a noise by crushing a dead leaf, till I was so cramped I could scarcely bear the pain in my limbs. The bird did not, however, make its appearance, and the native, with the fear of wading through the thicket in darkness (for there was no moon), became so impatient that he started up and began to talk so loud and make so much noise that I was compelled to give up all hopes of seeing the bird that night. However, just as we were passing the mound, we started the bird from the opposite side, but from the denseness of the thicket and the darkness closing around us, I had no chance of getting a shot at it."

I have furnished two illustrations of egg-mounds of Mallee Hens—one, in an open state, taken by Mr. D. Le Souëf, in the mallee scrub, Victoria; the other, covered, taken by myself, in some "stink"-wood scrub in Western Australia.

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558.—CATHETURUS LATHAMI, J. E. Gray.—(476)

BRUSH TURKEY.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 77.

*Reference*.—Cat. Birds Brit. Mus., vol. xxii., p. 468.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., pp. 152-3 (1865); Ramsay: Proc. Zool. Soc., p. 116 (1876); \*Le Souëf: Ibis, p. 15 (1899).

*Geographical Distribution*.—Queensland and New South Wales.

*Nest*.—A large rotund mound of earth, chiefly black vegetable mould, with an admixture of decaying matter, some of the mounds being surrounded with sticks. Usually situated in dense scrub or forest. Dimensions, about 12 feet in diameter at the base, or a circumference of about 34 to 36 feet, and height about 2½ feet.

*Eggs*.—Complement to a mound—if used by a pair of birds, twelve to fifteen; if used by several birds, i.e., three pairs, thirty-five to thirty-six; elliptical in shape, while some are more or less compressed at one end; texture of shell coarse; surface without gloss, and rough; colour,

\*No dimensions given.



EGG MOUND OF THE BRUSH TURKEY.

*From a Photo by the Author.*



pure white, more or less stained with the earth of the mound. Dimensions in inches of four eggs from the same mound: (1)  $3.85 \times 2.42$ , (2)  $3.57 \times 2.35$ , (3)  $3.55 \times 2.37$ , (4)  $3.5 \times 2.38$ . Apparently four types, selected from a full mound (35 eggs): long oval,  $3.7 \times 2.42$ ; elliptically inclined,  $3.44 \times 2.38$ ; elliptical,  $3.63 \times 2.36$ ; oval,  $3.67 \times 2.2$ . The eggs are placed small ends downward in circles or tiers; but the exact number of eggs to a circle and the distances apart of both eggs and circles are not definitely settled.

*Observations.*—Of all the truly remarkable denizens of the dense Eastern scrubs probably none is more extraordinary than the singular Wattle-talegallus, or so-called Brush Turkey—a mound-raising bird.

Gould possibly over-reached the southern limits of the range of the Talegallus when he recorded that it was at Cape Howe. But it was formerly common in the district of Illawarra. From thence the Talegallus has been found up to the Cape York Peninsula. It is also found in some localities inland from the coastal ranges.

My introduction to this peculiar bird was also peculiar. During our delightful Cardwell camp there was a bush fire in the vicinity, which caused many birds to shift quarters, including several Talegalli, which passed close to us, running in Indian file. While in locomotion their bodies assumed a curious forward dip, probably their natural carriage when travelling through scrub, which they thread readily and with rapidity.

Although it was close upon the breeding season of the Talegallus when I reached the brigalow scrubs of Coomoboolaroo, these birds had not even commenced to reconstruct their mounds, on account of a distressing drought then existing. But during another season, further down the Continent, within the shades of the "Big Scrub," Richmond River, I was fortunate enough to fall in with an egg mound, which made an excellent subject for a photographic picture (see illustration). The mound also yielded eight eggs, which were embedded at a temperature of 94 degrees, or 4 degrees higher than the prevailing atmosphere. It was the 11th November (1891). I shall never forget the joy of unearthing the hidden eggs in that sultry atmosphere. The "sweet" toil caused great beads of perspiration to roll off the faces of my mate and self, not to mention another "joy"—the coming into contact with stinging trees that grew about the immense mound. It is stated that the male birds mostly perform the work of mound building.

The eminent naturalist, Gould, was much elated because of the fact that he was the first to make known the wonderful habits of the Talegallus, and immediately upon these habits becoming known to him, he wrote from Sydney, 5th April, 1840, and published an account in the first volume of the "Tasmanian Journal" of that year, without waiting for his own great work. The following includes a recapitulation of some of the remarks as they afterwards appeared in his book:—

"The most remarkable circumstance connected with the economy of this species is the fact of its eggs not being incubated in the manner of other birds. At the commencement of the spring the Wattle-talegallus scratches together an immense heap of decaying vegetable matter

as a depository for the eggs, and trusts to the heat engendered by the process of fermentation for the development of the young. The heap employed for this purpose is collected by the birds during several weeks previous to the period of laying, it varies in size from two to many cart-loads, and in most instances is of a pyramidal form. The construction of the mound is either the work of one pair of birds or, as some suppose, the united labours of several; the same site seems to be resorted to for several years in succession, the birds adding a fresh supply of materials each succeeding season.

“The materials composing these mounds are accumulated by the bird grasping a quantity in its foot and throwing it backwards to one common centre, the surface of the ground for a considerable distance being so completely scratched over that scarcely a leaf or a blade of grass is left. The mound being completed, and time allowed for sufficient heat to be engendered, the eggs are deposited in a circle at a distance of nine or twelve inches from each other, and buried more than an arm's depth with the large end upwards; they are covered up as they are laid, and allowed to remain until hatched. I have been credibly informed, both by natives and by settlers living near their haunts, that it is not an unusual event to obtain half-a-bushel of eggs at one time from a single mound; and I have myself seen a native woman bring to the encampment in her net half as many as the spoils of a foraging excursion to the neighbouring scrub. Some of the natives state that the females are constantly in the neighbourhood of the mound about the time the young are likely to be hatched, and frequently uncover and cover them up again, apparently for the purpose of assisting those that may have appeared; while others have informed me that the eggs are merely deposited and the young allowed to force their way unassisted. One point has been clearly ascertained, namely, that the young, from the hour they are hatched, are clothed with feathers, and have their wings sufficiently developed to enable them to fly on to the branches of trees, should they need to do so to escape from danger. They are equally nimble on their legs; in fact, as a moth emerges from a chrysalis, dries its wings and flies away, so the youthful *Talegallus*, when it leaves the egg, is sufficiently perfect to act independently and procure its own food. This we know from a personal observation of the bird in a state of captivity, several old birds having constructed mounds, in which their eggs have been deposited and their young developed, in the gardens of the Zoological Society, at Regent's Park. I shall always look back with pleasure to the fact of my being the first to make known these singular habits. Although, unfortunately, I was almost too late for the breeding season, I nevertheless saw several of these hatching mounds, both in the interior of New South Wales and at Illawarra. In every instance they were placed in retired and shady glens, and on the slope of a hill, the part above the mound being scratched clean, while all below remained untouched, as if the birds had found it more easy to convey the materials down than to throw them up.”

Other interesting information respecting the *Talegallus* has been contributed by Dr. E. P. Ramsay, who, writing of the birds of Northern Queensland, states:—“However plentiful this species may have been

formerly in the Rockingham Bay district, it is now very scarce, only one having been obtained during my visit. I found that two or more females visited the same mound to lay their eggs in; and when this is the case the mound is often twice as large as an ordinary mound. It seems probable that several individuals assist in scratching the mound together, when a space, often fifty yards in diameter (on level ground), is cleared of almost every fallen leaf and twig. The mounds are often six feet high,\* and twelve to fourteen yards at the base; sometimes they are more conical. The central portion consists of decayed leaves, mixed with fine débris, and next of coarser or less rooted materials; and the outside is a mass of recently gathered leaves, sticks and twigs, not showing any signs of decay. In opening the nest these are easily removed, and must be carefully pushed backwards over the sides, beginning at the top. Having cleared these and obtained plenty of room, remove the semi-decayed strata, and below it, where the formation begins, in a mass of light, fine leaf-mound, will be found the eggs, placed with the thin end downwards, often in a circle, with three or four in the centre, about six inches apart. At one side, where the eggs have been first laid, they will probably be found more or less incubated, but in the centre, where the eggs are placed last, quite fresh; and if only one pair of birds has laid in the mound, about twelve or eighteen eggs will be the complement, and will be found arranged as described above. On the other hand, if several females resort to the same nest, the regularity will be greatly interfered with, and two or three eggs in different stages of development will be found close to one another, some quite fresh, others within a few days of being hatched. There are usually ten eggs in the first layer or circle, five or six in the second, three or four only in the centre. I found that the females return every second day to lay, but never succeeded in ascertaining which of the parent birds opens the nest. The aborigines informed me that the male bird always performs this office, and I usually found my black boys very correct in their statements of this kind . . . . . The mounds of the *Talegallus* are seldom found on a great incline when a level spot can be obtained. They frequently bring the débris from a considerable distance, and in one instance, on the Richmond River, I noticed a place where about a cart-load had been scratched through a shallow part of a creek three or four inches deep with water, and up the other side of the bank to the mound, which was over forty yards distant. The débris is always thrown behind them. The greatest number of eggs taken from one mound at one time was thirty-six. This was a very old mound, and resorted to by several individuals."

From Mr. Hermann Lau's manuscript respecting the Brush Turkey in Southern Queensland, I take: "Large as its incubating place is, I have passed by the spot several times without detecting it, because hidden under the boughs of low overhanging branches, mostly from the Moreton Bay chestnut (*Castanospermum*), or among the underwood thicket. Have seen an accumulated heap of leaves about a foot in thickness, mixed on the top with sticks, and, together with the soil underneath, making a height of four feet by about twenty feet in circumference. Found

\* Probably this height has been inadvertently over estimated.—(A. J. C.)

as many as thirty-six eggs in two or three tiers, eighteen inches one from another, nearly perpendicular,\* the temperature of the mound being ninety-six degrees. Such a nest, as I call it, is the common property of three pairs of birds, as I have shot three male birds in close proximity to a mound. The parent always keeps watch during incubation, which lasts an uncertain time, because such a heap contains young and fresh eggs, with the rest at different stages between, at the same time. One of the mothers goes with the hatched ones in the morning and returns at night; but the second day she keeps altogether away."

The fact that Mr. Lau shot three male birds in the vicinity of a mound does not quite prove the ownership thereof of three pairs of birds. However, Mr. Lau verifies his hypothesis by further mentioning he entirely plundered the eggs of a certain mound in the Highfield scrub. Returning in a week he found the mound restored and containing ten fresh eggs, which number would be about the correct total, presuming three birds laid at an interval of three days each.

The *Talegallus* commences to lay about the beginning of November. Besides the mound which I examined in the "Big Scrub," containing eight eggs, on the 11th of that month, I obtained data of another mound in the locality, which was visited on the 31st October, but contained no eggs. On the 6th November it contained half a dozen eggs. Under ordinary seasons probably the last eggs are hatched in January or February.

However, more inland, at Coomooboolaroo, the Messrs. Barnard have found the seasons variable. On the coast, November is the usual laying month; in dry seasons the *Talegallus* does not lay at all. Once there came rain in March; the following month the birds commenced to lay, laying right through the winter to Christmas. The greatest number of eggs to one mound at Coomooboolaroo was fifteen, or rather fourteen eggs, and young newly-hatched—possibly the progeny of one pair of birds only.

Probably incubation, as is supposed in the case of the Mallee Hen, lasts about six weeks.

Mr. D. Le Souëf, in his interesting account of his "Ascent of Mount Peter Botte, North Queensland," read before the Field Naturalists' Club of Victoria, 8th February, 1897, writes: "Merrgo, our dog, found several Scrub Turkeys or *Talegalli* for us, and we passed two mounds. The male bird seems to make their nesting mound entirely by himself, jealously keeping the hens away, and if they attempt to scratch holes in the mound before he considers it ready, he beats them off unmercifully. The birds we saw at the mounds were males. They are generally in the neighbourhood, and keep it in repair. They have stronger legs and feet than the hen birds. These actions I have noticed by watching the birds in captivity. Their mounds are composed principally of leaves and a few sticks, but very little soil—not more than would naturally cling to the leaves as they were being gathered together. Sixteen eggs seem to be the full clutch. Mr. Hislop informed me that in dry weather the eggs have a greater quantity of leaves over them than in wet."

\* I presume Mr. Lau means one tier above another.—(A J. C.)



Mr. H. R. Elvery, of Alstonville, Richmond River district, removed from a mound eggs of the Brush Turkey that were nearly incubated, and placed them in an ordinary incubator. When the young was ready to be hatched it did not chip the shell, after the manner of domestic poultry, but, with a shake or a struggle, the shell, which is exceedingly brittle at this stage, burst or exploded into small pieces. When the young emerged, each feather was encased in a kind of conical-shaped gelatinous cap, which fell off as soon as it was dry, and the feather expanded. When liberated in the yard, the young bird ran strongly, carrying its head downward, like a Quail threading grass.

During one season (1897), from the same mound, Mr. Elvery took thirty-five eggs in five visits between the dates of 25th September and 16th November. There appeared to be three, if not four, types of eggs in the lot.

A would-be egg robber was once in the act of demolishing a mound for plunder, but instead of coming to a white egg he touched one of the smooth coils of a black snake. Returning with a stick, he saw the other side of the mound moving and out popped snake number two, which was despatched before number one snake received similar attention.

Concerning Brush Turkeys in captivity, Mr. D. Le Souëf writes: "The young, when hatched, are a dark-brown colour, and difficult to detect in the scrub. They grow quickly, and in nine months are barely distinguishable from their parents. They are easily kept in confinement; but, being very pugnacious, the males have to be separated when the nesting season comes on. Two years ago, in the Melbourne Zoological Gardens, there were several of these birds in one enclosure. They made a mound, but had not enough vegetation in it to cause sufficient heat to hatch the fifty-six eggs that were laid in it, consequently they were all addled. Last season only a pair was left in, and I had the mound made up for them, and when one bird had finished laying, had another put in: she also laid in the mound—one bird laying twelve eggs and the other thirteen. Seventeen young were hatched and made their own way out. Sixteen of these were reared to maturity, and the one that died did so immediately on escaping from the mound—the other eight eggs were addled."

At the same Gardens where these birds have been successfully reared, Mr. Sherbourne Le Souëf has watched the Brush Turkey depositing her egg. She first scratches out a hole about 10 inches deep, near the top of the mound, and enters it to lay, her head and portions of neck only being visible above ground. All the time she is occupied at the mound the male bird persecutes her, apparently endeavouring to drive her away. As soon as the egg is laid she leaves, and the male at once scrapes a few leaves, &c., into the hole, and getting in, tramples them well down round the egg, which he first fixes in a perpendicular position. He repeats the operation of scraping in débris several times till the hole is completely filled.

559.—*CATHETURUS PURPUREICOLLIS*, Le Souëf.

### BARNARD BRUSH TURKEY.

*Reference*.—Ibis, p. 51 (1898).

*Previous Description of Eggs*.—Le Souëf: Ibis, p. 51 (1898).

*Geographical Distribution*.—Cape York (North Queensland).

*Nest*.—A similar mound to that constructed by the common Brush Turkey or Talegallus.

*Eggs*.—Clutch, —; pure white and finely granulated. One obtained at Somerset by Mr. H. Barnard, 3rd November, 1896, measures 3.61 × 2.36 inches (Le Souëf).

*Observations*.—Mr. Harry Barnard, while collecting at Cape York for Mr. Dudley Le Souëf and other Melbourne gentlemen, at once recognised the Brush Turkey at the head of that Peninsula to be different from those he had been familiar with at Coomooboolaroo, Central Queensland, since the days of his boyhood. Mr. Le Souëf, in describing the new variety, proposed for the vernacular name the Barnard Brush Turkey—a just compliment to an excellent and conscientious field naturalist.

The following are Mr. Le Souëf's observations, taken from the "Ibis": "This species is found in the Cape York Peninsula. Mr. K. Broadbent observed it during his extended visit there some years ago. Mr. Jardine, of Somerset, Cape York, and Mr. H. G. Barnard have lately noticed the variation between it and the southern form, and the latter has kindly sent me some skins. The principal difference between the two birds is in the coloration of the lower portion of the neck and wattles, which, in *Cathetus purpureicollis* (the name by which I propose to call it), is of a purplish-white, and in *Cathetus lathamii* red, with yellow wattles. Otherwise the birds are very similar; but, as Mr. H. G. Barnard says, 'anyone who has seen the bird in life will at once observe the difference.' The bright colours soon fade on the death of the bird, and the difference is not then so noticeable, although it can still be observed. During the breeding season, from October until January, the wattle of the male is 1½ inches in length, hanging from the lower portion of the neck. When the breeding season is over the wattle shrinks and disappears; it is then more difficult to tell the male from the female when seen in the scrub.

"The total length of the adult male is 29 inches, wing 16 inches, and leg 11 inches. Its head and upper portion of the neck red, lower portion of the neck, with wattles, whitish purple; eyes very light brown, almost white; bill black; feet and legs dark brown; the upper surface is blackish-brown, the tail being almost black; the feathers of the under surface are also blackish brown, tipped with light grey. The female is slightly smaller than the male; the coloration of the head and neck is not so bright, and she has no wattle, otherwise she is similar."

560.—MEGAPODIUS DUPERREYI, LESSON.—(478)  
*M. tumulus*, Gould.

SCRUB FOWL.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 79.

*Reference*.—Cat. Birds Brit. Mus., vol. xxii., p. 454.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 175 (1865); Ramsay: Proc. Zool. Soc., p. 118 (1876); \*Le Souéf: Ibis, p. 18 (1899).

*Geographical Distribution*.—Northern Territory and North Queensland; also ranging through New Guinea, Salawatte, Aru, Ké, Banda, Sumba, Flores, and Lombok to the Kangean Archipelago.

*Nest*—or egg mound, usually of immense size, rotund in shape, occasionally conical; composed of loose, black, vegetable mould or soil, mixed with sticks, leaves, &c., if close to the beach the mound is chiefly sand and shells; usually situated within a few hundred yards of the sea-shore, and protected by thickly-foliaged scrub or trees. Dimensions, about 20 feet in diameter at base, or a circumference of about 60 feet; height about 5 feet—equal to a displacement of between 400 and 500 cubic feet. (See illustration.) Maximum dimensions recorded by Gould: circumference, 150 feet (Macgillivray); height, 15 feet (Gilbert).

*Eggs*.—Clutch or complement to a mound, variously stated, but probably eight to ten; long ellipse in shape, both ends being nearly alike; texture of shell coarse; surface without gloss; colour, pinkish or yellowish buff, the outer or beautiful pinkish buff coating, where removed, shows the yellowish buff. If both colours are scratched off a whitish shell is revealed. Dimensions in inches: (1) 3.62 × 1.98, (2) 3.55 × 2.07, (3) 3.4 × 2.05, (4) 3.33 × 2.1.

*Observations*.—This wonderful mound-raising bird is even more extraordinary than the Lipoa or the Talegallus in the matter of its mode of incubation.

The Megapode or Scrub Hen, as it is sometimes termed, is restricted to the dense thickets of the northern coasts. It likewise enjoys an extra-Australian habitat extending to New Guinea and many of the Austro-Malayan Islands.

On the opposite side of the creek to our Cardwell camp, the Megapodes on going to roost in the evening used to keep the scrub alive with their loud chuckling calls, which were sometimes continued far into the night, especially if it were moonlight. In the dense labyrinth of undergrowth on Barnard Islands we came across many of the Megapodes' mounds, each resembling so many cart-loads thrown together of sandy soil, mixed with rotten vegetation. As it was then the beginning of September, some of the mounds bore evidence of preparation for the season, being scraped up into conical shapes four feet or five feet high. While lying in

\*No dimensions given.

ambush for Rifle Birds, Megapodes frequently passed close to us, running over the ground through the scrub.

The Megapode differs from the other two Australian mound-building birds in that it raises immensely larger mounds; the largest, according to the dimensions furnished by Gilbert and Macgillivray, must have contained, by the computations of a mathematical friend of mine, nearly nine thousand cubic feet of earth. Into these great mounds the Megapode appears to burrow for several feet to deposit its egg—not like the *Lipoa* and *Talegallus*, which open the mounds up for that purpose.

Owing to the great interest attached to the Megapode and its mound-raising proclivities, I make no apology for giving at length (from Gould) Gilbert's original and most entertaining account of his observations in the Port Darwin district, 1842: "On my arrival at Port Essington, my attention was attracted to numerous immense mounds of earth, which were pointed out to me by some of the residents as the tumuli of the aborigines; on the other hand I was assured by the natives that they were formed by the Megapode for the purpose of incubating its eggs. Their statement appeared so extraordinary and so much at variance with the general habits of birds, that no one believed them or took sufficient interest in the matter to examine the mounds, and thus to verify or refute their accounts. Another circumstance which induced a doubt of their veracity was the great size of the egg brought in by the natives as that of the bird. Aware that the eggs of the *Lipoa* were hatched in a similar manner, my attention was immediately arrested by these accounts, and I at once determined to ascertain all I possibly could respecting so singular a feature in the bird's economy; and having procured the assistance of a very intelligent native, who undertook to guide me to the different places resorted to by the bird, I proceeded on the 16th November to Knocker's Bay, a part of Port Essington comparatively but little known, and where, I had been informed, a number of these birds was always to be seen. I landed beside a thicket, and had not proceeded far from the shore ere I came to a mound of sand and shells, with a slight mixture of black soil, the base resting on a sandy beach, only a few feet above high-water mark. It was enveloped in the large yellow-blossomed *Hibiscus*, was of a conical form, twenty feet in circumference at the base, and about five feet high. On pointing it out to the native and asking him what it was, he replied, 'Oooregoorg à Rambal' (Megapode's house or nest). I then scrambled up the sides of it, and to my extreme delight found a young bird in a hole about two feet deep. It was lying on a few dry withered leaves, and appeared to be only a few days old. So far I was satisfied that these mounds had some connection with the bird's mode of incubation; but I was still sceptical as to the probability of these young birds ascending from so great a depth, as the natives represented, and my suspicions were confirmed by my being unable to induce the native, in this instance, to search for the eggs, his excuse being that 'he knew it would be useless, as he saw no traces of the old birds having recently been there!' I took the utmost care of the young bird, intending to rear it if possible. I therefore obtained a moderately-sized box, and placed in it a large portion of sand. As it fed rather freely on bruised Indian corn, I was in full

hopes of succeeding ; but it proved of so wild and intractable a disposition that it would not reconcile itself to such close confinement, and effected its escape on the third day. During the period it remained in captivity it was incessantly occupied in scratching up the sand into heaps ; and the rapidity with which it threw the sand from one end of the box to the other was quite surprising for so young and small a bird, its size not being larger than that of a small quail. At night it was so restless that I was constantly kept awake by the noise it made in its endeavours to escape. In scratching up the sand it only used one foot, and having grasped a handful, as it were, the sand was thrown behind it, with but little apparent exertion, and without shifting its standing position on the other leg. This habit seemed to be the result of an innate restless disposition and a desire to use its powerful feet, and to have but little connection with its feeding ; for, although Indian corn was mixed with the sand, I never detected the bird picking any of it up while thus employed.

“ I continued to receive the eggs without having the opportunity of seeing them taken from the mound until the 6th of February, when on again visiting Knocker's Bay, I had the gratification of seeing two taken from a depth of six feet, in one of the largest mounds I had then seen. In this instance the holes ran down in an oblique direction from the centre toward the outer slope of the hillock, so that, though the eggs were six feet deep from the summit, they were only two or three feet from the side. The birds are said to lay but a single egg in each hole, and after the egg is deposited, the earth is immediately thrown down, lightly, until the hole is filled up. The upper part of the mound is then smoothed and rounded over. It is easily known when a Megapode has been recently excavating, from the distinct impressions of its feet on the top and sides of the mound, and the earth being so lightly thrown over, that with a slender stick the direction of the hole is easily detected, the ease or difficulty of thrusting the stick down indicating the length of time that may have elapsed since the bird's operations. Thus far it is easy enough, but to reach the egg requires no little exertion and perseverance. The natives dig them up with their hands alone, and only make sufficient room to admit their bodies, and throw the earth out between their legs. By grubbing with their hands alone they are enabled to follow the direction of the hole with greater certainty, which will, sometimes, at the depth of several feet, turn off abruptly at right angles, its direct course being obstructed by a clump of wood or some other impediment. Their patience is often put to severe trials. In the present instance the native dug down six times in succession to a depth of at least six or seven feet without finding an egg, and at the last attempt came up in such a state of exhaustion that he refused to try again ; but my interest was now too much excited to relinquish the opportunity of verifying the native's statements, and by the offer of an additional reward I induced him to make another effort. This seventh trial proved successful, and my gratification was complete when the native, with equal pride and satisfaction, held up an egg, and after two or three more attempts produced a second ; thus proving how cautious Europeans should be of disregarding the narratives of these poor children of Nature because they happen to

sound extraordinary, or different from anything with which they were previously acquainted.

"I re-visited Knocker's Bay on the 10th of February, and having with some difficulty penetrated into a dense thicket of cane-like creeping plants, I suddenly found myself beside a mound of gigantic proportions. It was fifteen feet in height and sixty feet in circumference at the base, the upper part being about a third less, and was entirely composed of the richest description of light vegetable mould. On the top were very recent marks of bird's feet. The native and myself immediately set to work, and after an hour's extreme labour, rendered the more fatiguing from the excessive heat and the tormenting attacks of myriads of mosquitoes and sand-flies, I succeeded in obtaining an egg from the depth of about five feet. It was in a perpendicular position, with the earth surrounding and very lightly touching it on all sides, and without any other material to impart warmth, which, in fact, did not appear necessary, the mound being quite warm to the hands. The holes in this mound commenced at the outer edge of the summit and ran down obliquely towards the centre: their direction, therefore, is not uniform. Like the majority of the mounds I have seen, this was so enveloped in thickly-foliaged trees as to preclude the possibility of the sun's rays reaching any part of it.

"The mounds differ very much in their composition, form, and situation. Most of those that are placed near the water's edge were formed of sand and shells, without a vestige of any other material: but in some of them I met with a portion of soil and decaying wood. When constructed of this loose material they are very irregular in outline, and often resemble a bank thrown up by a constant heavy surf. One remarkable specimen of this description, situated on the southern side of Knocker's Bay, has the appearance of a bank, from twenty-five to thirty feet in length, with an average height of five feet. Another even more singular is situated at the head of the harbour, and is composed entirely of pebbly ironstone, resembling a confused heap of sifted gravel. Into this I dug to the depth of two or three feet without finding any change of character. It may have been conical originally, but is now without any regularity, and is very extensive, covering a space of at least one hundred and fifty feet in circumference. These remarkable specimens would, however, seem to be exceptions, as by far the greater number are entirely formed of light, black vegetable soil, are of a conical form, and are situated in the densest thickets. Occasionally the mounds are met with in barren, rocky and sandy situations, where not a particle of soil similar to that of which they are composed occurs for miles around. How the soil is produced in such situations seems unaccountable. It has been said that the parent birds bring it from a great distance; but as we have seen that they readily adapt themselves to the difference of situation, this is scarcely probable. I conceive that they collect the dead leaves and other vegetable matter that may be at hand, and which, decomposing, forms this particular kind of soil. The mounds are doubtless the work of many years, and of many birds in succession. Some of them are evidently very ancient, trees being often seen growing from their side. In one instance I found a tree growing from the middle of a

mound which was a foot in diameter. I endeavoured to glean from the natives how the young effect their escape; but on this point they do not agree, some asserting that they find their way unaided; others, on the contrary, affirmed that the old bird, knowing when the young are ready to emerge from their confinement, scratch down and release them.

"The natives say that only a single pair of birds is ever found at the mound at one time; and such, judging from my own observation, I believe to be the case. They also affirm that the eggs are deposited at night, at intervals of several days; and this I also believe to be correct, as four eggs, taken on the same day and from the same mound, contained young, in different stages of development; and the fact that they are always placed perpendicularly is established by the concurring testimony of all the different tribes of natives I have questioned on the subject."

The following account of the breeding places of the remarkable Megapode was transmitted to Gould by Mr. John Macgillivray as the result of his observations on Nogo or Megapodius Island, in Endeavour Strait, and will also be read with interest:—"The most southern locality known to me for this bird is Haggerston Island (in lat.  $12^{\circ} 3'$  south), where I observed several of its mounds, of very large size, but did not see any of the birds. During the survey of Endeavour Strait in H.M.S. 'Bramble,' I was more fortunate, having succeeded in procuring both male and female on the island marked 'Nogo' upon the chart, where I resided several days for that sole purpose. On this small island, not more than half a mile in length, rising at one extremity into a low, rounded hill, densely covered with jungle (or what in New South Wales would be called 'brush'), three mounds, one of them apparently deserted before completion, were found. The two others were examined by Mr. Jukes and myself. The most recent, judging from the smoothness of its sides and the want of vegetable matter, was situated upon the crest of the hill, and measured eight feet in height (or thirteen and a half feet from base of slope to summit), and seventy-seven feet in circumference. In this mound, after several hours' hard digging into a well-packed mass of earth, stones, decaying branches and leaves and other vegetable matter, and the living roots of trees, we found numerous fragments of eggs, besides one broken egg containing a dead and putrid chick, and another whole one, which proved to be addled. All were embedded at a depth of *six feet* from the nearest part of the surface, at which place the heat produced by the fermentation of the mass was considerable. The egg,  $3\frac{1}{4}$  inches by  $2\frac{1}{8}$  inches, was dirty brown, covered with a kind of epidermis, which easily chipped off, exposing a pure white surface beneath. Another mound, situated at the foot of the hill, close to the beach, measured no less than 150 feet in circumference; and to form this immense accumulation of materials the ground in the vicinity had been scraped quite bare by the birds, and numerous shallow excavations pointed out whence the materials had been derived. Its form was an irregular oval, the flattened summit not being central as in the first instance, but situated near the larger end, which was elevated fourteen feet from the ground, the slope measuring in various directions, 18,  $21\frac{1}{2}$ , and 24 feet. At Port Lihou, in a small bay a few miles to the westward; at Cape York, and at Port Essington I found other mounds which were comparatively

low, and appeared to have been dug into by the natives. The great size the tumuli (which are probably the work of several generations) have attained on Haggerston and Nogo Islands arises, doubtless, from those places being seldom visited by the aborigines. I found several eggs of large size in the ovarium of a female shot in August, while the condition of the oviduct showed that an egg had very recently passed; hence it is probable that, in spite of their great comparative size, one bird lays several; but whether each mound is resorted to by more than one pair, I had not the means of ascertaining."

During Dr. E. P. Ramsay's tour to Northern Queensland, 1873-4, he made valuable field observations on the Megapode, which chiefly confirmed those made by the two previous explorers already quoted at length.

Dr. Ramsay examined several mounds during March and obtained fresh eggs; while newly-hatched young were found singly in places throughout the denser parts of the scrub. One little fellow (only five and a half inches in length) in particular, met fully a mile from the nearest mound, was well able to fly, and settled on a tree twenty feet from the ground.

Notwithstanding all these accounts, there still remain many important points in the nidification of the Megapode to be settled. For instance, what number of eggs is deposited in a mound? We are aware an incredible number is laid during the season—so many, that even the poor blackfellows assert that "both fellow (male and female) lay piccaninnies (eggs)." The eggs, like those of the Lipoa and Talegallus, are excellent eating—the white man preferring them fresh, but the blackfellow, half hatched. It would also be of undoubted interest to learn how many birds frequent each mound, how many eggs each female bird lays, and if the eggs are arranged within the hatching mound in any sort of system. It is supposed by some persons that the birds work at night at their mounds, which are small in size at first, and used by a pair of birds only, but afterwards they and their progeny keep on adding to it and using it year after year.

Some light is thrown upon the subject by Mr. A. H. Kissack, in an instructive account\* of a Megapode (*M. brazieri*) inhabiting Savo, an island in the Solomon Group. This bird, however, burrows in the soft sand instead of rearing a mound. Mr. Kissack observed that occasionally two birds were engaged alternately at the same burrow, one, after digging for five or ten minutes, giving place to the other bird, which goes quietly to work while its comrade preens its feathers close by. Side burrows lead from the main one, each of which receives a single egg, and is afterwards filled up, when the main burrow is also filled. The number of eggs contained in each hole varies from eight to ten. It was reckoned that the incubation of an egg lasted from five to six weeks. One important point Mr. Kissack appears to have settled is that the young Megapode, when hatched, makes its way through the sand which envelops it, and immediately runs off and shifts for itself.

The beautiful buff-tinted eggs of the Megapode in my cabinet were

\*Proc. Roy. Soc., Queensland (1884)



collected by Mr. Dudley Le Souëf. His first pleasant experience of these indeed curious birds, like my own, was gained in the scrub on Barnard Islands when in quest of Rifle Birds. Mr. Le Souëf, being later in the season, was more successful as regards eggs. Two mounds he (accompanied by Mr. Harry Barnard) prospected contained fresh eggs, three and one respectively.

Mr. Le Souëf gives the temperature of a mound at 94°—nearly the same as I registered for the Talegallus. Another indication of a Megapode's mound he took on the mainland was 95° at a depth of one and a half to three feet, where the eggs rested.

Only one pair of birds appears to frequent a mound, which is small (about two feet high) at first, and is added to season after season till its immense proportions become quite a feature in the scrub. When the female wishes to deposit an egg, a hole is scraped straight in, sometimes obliquely, near the top, to a distance, varying according to circumstances, from six to sixty inches. The holes, which appear to take no particular order, are about twelve inches in diameter. When the egg has been duly deposited at the terminal end, the excavation is of course filled in and smoothed off with the rest of the mound.

Mr. Le Souëf further adds that Scrub Fowls, being very restless, are difficult to keep in confinement, and generally end in accidentally killing themselves.

With regard to the laying season it is probable that eggs may be found in some mounds almost at any time of the year, but of course are more plentiful at certain seasons, to wit, from August to March.

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## Sub-Order—Alectropodes.

FAMILY—PHASIANIDÆ: PHEASANTS, &c.

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561.—COTURNIX PECTORALIS, Gould.—(486)

### STUBBLE QUAIL.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 88.

*Reference*.—Cat. Birds Brit. Mus., vol. xxii., p. 244.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 101 (1865); North: Austr. Mus. Cat., p. 289, pl. 16, fig. 10 (1889).

*Geographical Distribution*.—Queensland, New South Wales, Victoria, South and West Australia, and Tasmania.

*Nest*.—Upon the ground in crop or herbage, the nesting hollow, 4½ inches across, being lined with straw or grass as the case may be. (See illustration.)

*Eggs.*—Clutch, seven to eleven or twelve, rare instances maximum fourteen; roundish oval in shape; texture somewhat coarse; surface glossy; colour, dirty-yellow, heavily blotched and smudged with dark olive-green. Dimensions in inches of a proper clutch: (1)  $1.27 \times .91$ , (2)  $1.27 \times .9$ , (3)  $1.25 \times .93$ , (4)  $1.25 \times .88$ , (5)  $1.22 \times .91$ , (6)  $1.22 \times .92$ , (7)  $1.19 \times .88$ . (Plate 17.)

*Observations.*—The Stubble Quail may be said to be the only true Quail in Australia. As its name implies, it frequents grassy or stubble-like localities on plain or in forest alike, and is found throughout Australia, except perhaps the extreme north, and Tasmania.

It is a fine bird, with its brown coat, the feathers being zig-zagged transversely with lines of black, and striped down the centre with spear-like markings of yellowish-white. The chest and flanks are brown, while the abdomen is whitish; feet also whitish, bill dark, and eyes hazel. Total length about  $6\frac{3}{4}$  inches; bill,  $\frac{1}{2}$  inch; wing,  $3\frac{7}{8}$  inches; tarsus,  $\frac{7}{8}$  inch. The male is readily distinguished from the female by the black markings on his chest and his buff-coloured throat, the throat of the female being white. Two brace of both sexes presented to me by a friend at the opening of last season weighed 15 ounces total.

During his rambles in Australia, Gould frequently found nests and eggs of this Quail, remarking that "the number of eggs in each nest varies from eleven to fourteen. The situations chosen for the nest are much diversified; sometimes it is placed among the thick grass of luxuriant flats, while at others it is artfully concealed by a tuft of herbage on the open plains."

I possess pleasant recollections of my first experiences amongst the Stubble Quail, when long ago, as boys, we used to find their eggs in the crops on the plain, or under rank tussock grass that clothed the banks of the Werribee River. So plentiful were they one season that we captured some of the birds themselves, not to mention maimed birds that had survived the shot of the fowler and escaped his dogs.

Mr. C. H. Grove, Snowy River, Gippsland, sent me the following interesting note, together with the clutch of seven Stubble Quail's eggs:—"Bird commenced to lay 30th November (1891), and laid for seven consecutive days, the smallest egg (a brownish-coloured example) being the last. The nest on the first day was a bare hole scraped in the ground, but after the eggs were all laid some slight attempt was made at lining it."

In Southern Victoria, before the Quails were disseminated or distributed, "Old Bushman" (the late H. W. Wheelwright), in his fascinating little volume, "Bush Wanderings of a Naturalist," remarks that he observed the Stubble Quail come down about the middle of September, and remain to breed, and early in February they all appeared to leave the breeding grounds, but not the district, for they then packed, and in certain localities large flocks were to be seen late in March. The call-note of the Stubble Quail is a loud, oft-repeated "to-weep," the native name of the bird. Their note as they rise is a sharp chirp. Sportsmen regard the bird as easy to kill on account of its straight flight.



STUBBLE QUAIL'S NEST.

*From a Photo by the Author.*



Some of the earlier birds breed in September, others later, according to the season, the majority laying in the summer months (i.e., December, January, and February), or when the grass seeds ripen. We have many instances of late (probably second) broods in Victoria.

I knew of an incident at Mordialloc, on the opening day of the shooting season for Quail (1st March, 1897), when a Stubble bird rose and was shot, it being afterwards ascertained she flushed from a set of six fresh eggs. The same season, in Gippsland, at mid-winter (July), a clutch of newly-hatched young was seen.

Captain Deveton, a keen sportsman, kindly furnished me with a note of having seen, at Sunbury, on 28th April, 1888, Stubble Quail too young to shoot.

My friend Mr. A. W. Milligan, in communicating to "The Australasian," and writing from Gippsland, the season 1895, states:—"It might be interesting to some of your sporting and scientific readers to know that on Good Friday morning last, 12th April, whilst Quail shooting on the Traralgon Park Estate, Traralgon, I found a Quail's nest containing seven eggs. On breaking one of them I found it to have been comparatively new-laid. On Easter Tuesday following, the dogs of my friend who accompanied me flushed a 'squeaker,' which I subsequently caught, and have now in captivity. The dogs on the same day found three much younger birds, which were unable to fly, one of which they killed. The birds were the *Coturnix pectoralis*, or Stubble Quail."

I could recount many other instances of Quails breeding late in the season, were it necessary.

There has been much controversy in Victoria about the close season for Quails, many of our sportsmen complaining that it opens too late (i.e., 1st March); but I think it would be to the sportsman's own interest to let the law remain as it is, besides, it would give the birds the benefit of the doubt.

Our Quail are not migratory, as some persons suppose, but their movements are regulated by the seasons. If they were migratory, they would disappear from Tasmania also, where, if I remember rightly, the shooting season does not open till the 1st May.

A fact that mitigates against our brooding Quails is that they are prone to nest in grain crops, which are usually garnered before the young are hatched; thus many eggs are destroyed. Then if the old birds seek other pastures they have hardly time to rear second broods before the hunter's gun is heard.

I may here give the interesting and valuable remarks of "Neno," as they appeared in "The Australasian," 5th December, 1896:—"The common belief is that Stubble Quail migrate, arriving in Victoria in spring, and leaving in autumn. Such a belief is erroneous. Quail do not migrate. They certainly shift about, and at odd times, owing to bad seasons, they move off to better feeding grounds. In spring the stubble birds are numerous on the grassy river flats and reclaimed coast marsh lands of South Gippsland, also in growing crops, and such like places. Young Quail may be seen in November, and I have noted them up to the end of February. When the shooting season opens in

March many birds are shot on the flats and stubble fields, but during April and May sportsmen find that they are getting scarce in such places, and nine out of ten shooters will tell you that the birds are migrating. Not so; they have only gone to better feeding grounds, and will not be far off. The great wastes of barren bayonet or spear grass plains are the winter home of the Stubble Quail. The birds feed on the rich sunflower-like seed of the spear-grass. There are miles of spear grass plains in South Gippsland, stretching from the mouth of Powlett River round to Foster. In winter Quail are to be found wherever the spear-grass is in seed. The rat-tail-shaped seed pods are known locally as black-heads. Shooting over these plains I kill mostly stubble birds in the open, and Brown Quail on the edges of patches of stunted tea-tree. On the dry ridges I get an occasional brace of Painted birds. The plains simply swarm with the little King Quail. The best shooting is to be had in June and July. In March a good shot should account for every bird rising within range, for, as a rule, they are mostly squeakers, but on the open spear grass plains on a chilly winter's day, with a stiff breeze blowing, the fine, full-conditioned Stubble or Brown Birds get away with strength and speed, that will test the skill of the most expert. During last winter (1896) Quail were exceptionally plentiful on the Powlett Plains, and at Cape Patterson, but the market shooters swept over the country, and cleaned them out to a bird. There were hundreds of brace shot round about the village of Inverloch alone. The marketer uses the best nitro powders, and I have seen one tramping behind eight setters, working regularly day after day, and killing out every bird, often shooting as many as thirty brace in a day. When a marketer camps on a shooting ground he appears to consider that he is sole owner of the game, and manfully disputes the right of anyone else to shoot. I need scarcely say that he is not much loved by the sporting Quail shooter. When shooting in winter on the plains I have noticed the absence of Hawks. One would naturally expect to find them where game is so plentiful, yet we rarely see anything but an occasional Eagle. I often shoot specimens of the domestic cat gone wild, foxes and native cats on the Quail grounds; and I think the fox is the greatest enemy they have."

Young in down resemble miniature chicks of a domestic fowl, being brownish in colour, indistinctly striated with black.

**5623.**—*SYNÆCUS AUSTRALIS*, Temminck.—(487, 489 and 490)

*S. sordidus*, Gould.

*S. cervinus*, Gould.

#### BROWN QUAIL.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pls. 89 and 91.

*Reference.*—Cat. Birds Brit. Mus., vol. xxii., p. 247.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. ii., pp. 193 and 196 (1865); North: Austr. Mus. Cat., pp. 289 and 291 (1889); Campbell: Proc. Roy. Soc., Victoria, vol. iii., p. 5, pl. 1, fig. 6 (1890); North: Trans. Roy. Soc., South Australia, vol. xxii., p. 163 (1898).

*Geographical Distribution.*—Whole of Australia and Tasmania, including islands in Bass Strait; also New Guinea.

*Nest.*—A slight construction of dead grass and leaves, placed in a hollow on the ground, usually in rank herbage—tussock grass, rushes, &c.—but sometimes in cornfields.

*Eggs.*—Clutch, seven to eleven usually (ten to eighteen, Gould); roundish in form, sharply compressed at one end; texture somewhat coarse and strong; surface glossy; colour, sometimes (especially in the Tropics) of a uniform dull-white, occasionally showing a perceptible bluish tone, but more frequently more or less finely freckled with olive or light-brown. The markings, when fresh, may be removed by moisture. Dimensions in inches of a clutch of typically marked eggs from New South Wales: (1)  $1.24 \times .93$ , (2)  $1.2 \times .89$ , (3)  $1.19 \times .9$ , (4)  $1.18 \times .9$ , (5)  $1.18 \times .89$ , (6)  $1.18 \times .89$ , (7)  $1.17 \times .9$ , (8)  $1.16 \times .92$ , (9)  $1.14 \times .89$  (Plate 17); of a somewhat stout set from West Australia (variety *S. sordidus*, Gould): (1)  $1.18 \times .96$ , (2)  $1.17 \times .97$ , (3)  $1.16 \times .95$ , (4)  $1.14 \times .95$ ; of a set from North Queensland (variety *S. cervinus*, Gould), dull or yellowish-white, without markings: (1)  $1.17 \times .92$ , (2)  $1.14 \times .88$ , (3)  $1.12 \times .9$ , (4)  $1.12 \times .89$ , (5)  $1.12 \times .88$ .

*Observations.*—The Brown Quail, except for its thick bill, at first glance resembles the Painted Quail—general tone of plumage brownish, the feathers of the upper surface being irregularly but beautifully marked with transverse bars of grey, black, and chestnut; each feather is also adorned with a light stripe down the centre. The under surface is greyish-buff, each feather being ornamented with zig-zag markings of black; bill, bluish horn; eyes, orange; feet, dull-yellow. Total length,  $6\frac{1}{2}$  inches; wing,  $3\frac{3}{4}$  inches; bill,  $\frac{1}{2}$  inch; tarsus,  $\frac{7}{8}$  inch. A brace will weigh about 8 ounces. This bird has a whistle-like call-note.

Brown Quails appear to assume a variety of markings which sorely puzzle the student. Even the great Gould was himself in doubt of his own varieties, because he records: "The Swamp Quails of Australia must either be regarded as constituting but one or several species—a point which must be left for future investigation, and which can only be determined by persons resident in the colony, or by a careful examination and comparison of a much larger number of examples than are at present to be found in this country."

In these later days, no doubt from the general series at his command, Mr. W. R. Ogilvie-Grant, when compiling the xxii. volume of the British Museum "Catalogue," had some grounds for amalgamating Gould's four species of Brown, or Swamp Quails, under the common name *Synæcus australis*. However, if ornithological geography counts for anything, Gould's northern variety, *S. cervinus*, may be distinguished by its more delicate and sandy-buff colouring, the eggs being invariably of a uniform dull or cream-white, without markings, while the western variety, *S. sordidus*, is altogether a more sombre-coloured bird, and has reddish legs instead of yellowish, as in the other varieties. I think the fact of *S. sordidus* possessing different coloured legs is at least some evidence in favour of keeping that bird separate.

The Brown, or Swamp Quail, as the latter name well suggests, is

addicted to moist grassy flats and swampy localities, and may be said generally to be found throughout Australia, including Tasmania and some of the intermediate islands in Bass Strait. It is regarded as a stationary species, and would appear to be partial to insular quarters. We shot one near our camp on Kent Group. While on the Furneaux Group Expedition several specimens were secured which were flushed from the coarse tussock grass on Cat and Storehouse Islands, to the east of Flinders Island. On Albatross Island, on the opposite (western) side of the Strait, Mr. D. Le Souëf, 28th November, 1894, picked up a Brown Quail which appeared to have travelled a long distance, as it was much exhausted, and unable to fly.

An expert shooter writes that the Brown Quail usually "rises like the Partridge, flies strong and quick, and is decidedly the most sporting bird of the lot" of Australian Quails.

It may not be referable to this species, but it is stated that during June and August, 1841, the officers of the "Beagle" shot no less than one hundred and forty-five Quails, besides twenty-one Pigeons and Doves, and twelve Rails of two kinds, on Booby Island, Torres Strait.

The western dusky-coloured variety of the Brown Quail sometimes wanders towards eastern localities, for it is occasionally found in South Australia and Victoria. The species is tolerably plentiful in the heathy situations and boronia swamps of South-western Australia. On Breaksea Island I enjoyed an opportunity of cultivating their close acquaintance, for from behind the granite boulders I watched small coveys dusting themselves in the sandy earth after the fashion of domestic fowls.

I learnt from the light-keepers on that island, from whom I received specimens of eggs, that the young are usually noted about Christmas-time or the beginning of the year. It is probable that the principal breeding months are November, December and January.

Another season (1890-1) Mr. A. Robinson (principal light-keeper) wrote me: "Quails on the island all the year round. First young seen about 10th November. Took the two clutches 14th December—too late to blow."

The following are Mr. G. A. Keartland's brief observations of the Brown Quail in the grassy tracts of the North-west:—"Amongst the tall kangaroo grass between Lake Way and the camel depôt numbers of these birds were seen, and several shot. One female killed the 20th August contained a perfect egg in the oviduct. Others were seen near Mount Arthur in April, and several clutches of their eggs were picked up as we crossed a level plain covered with Flinders grass. The eggs were scattered, as though they had been washed from the nests by recent tropical rains. Both birds and eggs were identical with those found in Victoria."

Anent the domestic economy of Brown Quails, Mr. G. A. Keartland read the following interesting note at the Field Naturalists' Club of Victoria, February, 1899, in reference to these birds breeding in his aviary:—"A glance at the hen whilst sitting showed how these birds manage to cover such large clutches of eggs in a state of nature. The long feathers on the sides of the breast spread out at right angles from



the body until the bird could hide an ordinary tea saucer. Although the male bird passed most of the time beside his mate, I do not think he took any part in the work of incubation, as he never stayed at the nest when the female was away. Early on 3rd February I saw broken egg-shells near the nest, and two small chocolate-coloured heads protruding from under the wings of the female; but the male was perched on the Parrot's log, about four feet high. Next morning five chicks were seen following the mother, but the male kept out of the way, preferring the company of the Parrots to that of his wife and family. Unfortunately some of the chicks got into the water dish, and one was drowned, but the other four are thriving well, and have now wing feathers over an inch long. The male bird is now in constant attendance on them, and when finely-chopped meat or green vegetables are thrown to them he picks up pieces and holds them in his bill until the young ones take them from him. They all scratch like common fowls, and are fed principally on canary seed. When I was removing the two unhatched eggs with a spoon tied on a stick, the hen bird charged at it, with her feathers all distended, like a bantam fowl would at a strange dog."

The breeding season of the common Brown Quail is chiefly summer time. Mr. North cites an instance of eggs in the Dobroyde collection which were taken as late as the 20th March (1867), no doubt a second brood.

It has been ascertained that in Quail's eggs hatched under a domestic hen the incubation lasts from fourteen to twenty-one days. Probably if hatched under the proper parent, the term would be the longer period.

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564.—*SYNÆCUS DIEMENENSIS*, Gould.—(488)

GREATER BROWN QUAIL.

*Figure*.—Gould. Birds of Australia, fol., vol. v., pl. 90.

*Reference*.—Same.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 194 (1865); Campbell: Southern Science Record (1883); North: Austn. Mus. Cat., p. 290 (1889), also Trans. Roy. Soc., South Australia, vol. xxii., p. 164 (1898).

*Geographical Distribution*.—New South Wales (?), Victoria and Tasmania.

*Nest*.—A hollow, lined with grass, &c., in the ground, in thick herbage or beside a grass tussock, usually in marshy localities.

*Eggs*.—Clutch, seven to thirteen; round oval in shape; texture of shell somewhat coarse; surface glossy; colour, dull or greenish-yellow spotted with olive-green. The eggs of the Tasmanian Brown Quail are

usually larger and more marked than those of the ordinary Brown Quail. Dimensions in inches of a proper clutch: (1)  $1.36 \times .98$ , (2)  $1.34 \times 1.04$ , (3)  $1.3 \times .96$ , (4)  $1.3 \times .95$ , (5)  $1.29 \times 1.04$ , (6)  $1.29 \times 1.04$ , (7)  $1.29 \times 1.01$ , (8)  $1.28 \times 1.01$ , (9)  $1.26 \times 1.0$ .

*Observations.*—Although the excellent "Catalogue" of Birds of the British Museum has clubbed all our Brown or Swamp Quails under the one species, I prefer (and I think collectors generally will uphold me) to keep the largest (Tasmanian) variety, at all events, separate.

The large and handsome Tasmanian Brown Quail would appear to be an insular form of the ordinary Brown Quail, and has occasionally been recorded for Victoria, where it was known to shooters as the "Silver" Quail.

Gould, who states that from twelve to eighteen eggs are laid, procured his examples in the swamps below New Norfolk. Mr. Brent found a fine clutch of thirteen eggs, 15th October, 1896, which now fill up a considerable niche in Mr. G. E. Shepherd's collection.

Breeding months, October to December and later. Fresh eggs have been found at the end of March.

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565.—EXCALFACTORIA CHINENSIS sub-species) LINEATA, Scopoli.—(491)  
*E. australis*, Gould.

#### CHESTNUT-BELLIED QUAIL.

*Figure.*—Gould: Birds of Australia, fol., vol. v., pl. 92.

*Reference.*—Cat. Birds Brit. Mus., vol. xxii., p. 253.

*Previous Descriptions of Eggs.*—Ramsay: Ibis, p. 279 (1868); Diggles: Companion Gould's Handbook, p. 119 (1877); Campbell: Southern Science Record (1883), also Nests and Eggs Austr. Birds, pl. 2, fig. 491 (1883).

*Geographical Distribution.*—Queensland, New South Wales, Victoria and South Australia; also New Guinea, Sumatra, Java, Borneo, Sulu Islands, Palawan and Philippines.

*Nest.*—A hollow in the ground, lined, more or less, with grass, &c., and sheltered by herbage.

*Eggs.*—Clutch, four to five, one instance of seven; round oval in shape; texture of shell somewhat coarse; surface glossy; colour, dull yellowish-green or light-olive, occasionally light-green, thickly freckled with dark olive-green. Dimensions in inches of a clutch: (1)  $1.06 \times .76$ , (2)  $1.05 \times .8$ , (3)  $1.02 \times .76$ , (4)  $1.0 \times .77$ . (Plate 17.)

*Observations.*—This beautiful and most interesting little species ranges throughout Eastern Australia, and extends into Austro-Malayan regions, where it was first discovered as long ago as about 1776. The female resembles the little Quail. The male wears a different garb, chiefly

brown above; sides of head, breast, and flanks are bluish-grey; throat patched with black and white, abdomen deep chestnut-red, bill black, feet light brown, eyes hazel. Length,  $4\frac{1}{2}$  inches; wing,  $2\frac{5}{8}$  inches, bill, 7-16 inch; tarsus,  $\frac{3}{4}$  inch.

According to the season many of the Chestnut-bellied or Least Swamp Quail (least indeed, for it is the smallest of game birds in the world), reach their southern limit, Victoria, during spring and summer, and breed, retiring northward again on the approach of winter.

When camped in the early days in the district of Mordialloc, Victoria, the "Old Bushman" found the little Chestnut-bellied Quail somewhat uncommon. He generally noticed them in pairs or families in the long grass on the edges of the swamps, often in the water of the swamps themselves. He occasionally flushed them in the heath-like scrub. They bred in the district, and if they did not remain all the winter, they left for a very short period only.

The birds are more plentiful in some parts of Queensland. Mr. Cockerell informed Mr. Sylvester Diggles that he had shot fifty brace in one paddock of 100 acres in a fortnight. They are reckoned scarce, because the birds, as a rule, sit very close, and will almost suffer themselves to be trodden upon before rising. Mr. Diggles mentions that the nest has a small run leading to it, and sometimes the structure is sufficiently strong to allow the eggs to be lifted in it.

In New South Wales, according to Dr. Ramsay ("Ibis," 1868) "the Least Swamp Quail is found tolerably abundant in the marshy parts about Botany Bay and South Head, in which situations it breeds freely, rearing often three broods in the year. It usually lays five eggs, in shape resembling those of *Synœcus australis* (Latham), but much smaller in size, being 1.1 inches in length by .8 inch in breadth, and, when fresh, of a pale light green colour, dotted all over with blackish umber; in some the ground colour is a dirty olive-yellow, others, again, are almost brown, with black dots. This species is known to our Sydney sportsmen under the name of the 'King Quail,' and is by most people considered a rare bird; but if its natural haunts be visited it will be found plentiful enough, although hard to 'rise.' It shows preference for the long grass in low, damp situations, particularly bordering swamps and lagoons. The nest is like that of the rest of the family,—a few pieces of grass, upon which the eggs are laid; but on the whole greatly depending on the nature of the ground. The breeding season lasts from August to January; but in confinement they will lay at almost any time of the year. The young, upon leaving the shell, are of a dusky hue, almost black."

Breeding season, from September to February, and sometimes the autumn months. Mr. Harry Barnard has observed that March and April are the usual breeding months in Central Queensland for this Quail.

The young, in down, are tiny creatures, in colour resembling the mother bird, but with yellowish throats instead of whitish or light coloured.

## ORDER—HEMIPODII: HEMIPODES.

## FAMILY—TURNICIDÆ: HEMIPODES.

566.—TURNIX MACULOSA, Temminck.—(481)  
*T. melanotus*, Gould.

## BLACK-BACKED QUAIL.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 84.

*Reference*.—Cat. Birds Brit. Mus., vol. xxii., p. 546.

*Previous Description of Egg*.—North: Rec. Austrn. Mus., vol. ii., p. 20 (1892).

*Geographical Distribution*.—Northern Territory, Queensland, New South Wales, Victoria and South Australia; also New Guinea and Celebes.

*Nest*.—Similar to that of the other members of the genus.

*Eggs*.—Clutch, four; inclined to pyriform, or roundish much compressed at one end; texture of shell fine; surface glossy; colour, whitish or pale buff, thickly freckled all over with cinnamon-brown and amber, interspersed with blotches of dark-brown or black and grey. Dimensions in inches of a clutch: (1)  $\cdot 95 \times \cdot 75$ , (2)  $\cdot 93 \times \cdot 73$ , (3)  $\cdot 92 \times \cdot 74$ , (4)  $\cdot 9 \times \cdot 75$ .

*Observations*.—The Black-backed Turnix or Quail, although nowhere plentiful, enjoys a wide range of habitat. It loves such situations as the rank, marshy places of the northern and eastern coastal scrubs, as well as islands contiguous to these parts.

For many years I had a pair of eggs, undoubtedly of a Turnix, in my collection, but referable to none of the eggs then described. On my visit to Coomoolooloo, Queensland, 1885, I noticed a pair of exactly similar eggs in Mr. Geo. Barnard's collection, also without a name. Subsequently, in the same locality, other eggs were taken and the bird shot, which proved to be *T. maculosa (melanotus)*.

A fine and full set that graces my cabinet was taken by Mr. S. W. Jackson in the Clarence River scrub, on the 16th February this year. These eggs may be characterised as the darkest coloured of those of the small Turnixes.

567.—TURNIX MELANOGASTER, Gould.—(479)

## BLACK-BREASTED QUAIL.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 81.

*Reference*.—Cat. Birds Brit. Mus., vol. xxii., p. 550.

*Previous Descriptions of Eggs*.—Campbell: Southern Science Record (1883), also Nests and Eggs Austrn. Birds, pl. 2, fig. 479 (1883); North: Austrn. Mus. Cat., p. 285 pl. 16, fig. 11 (1889).

*Geographical Distribution*.—Queensland and New South Wales.

*Nest*.—Merely a slight depression in the ground, in grassed or open scrub country.

*Eggs*.—Clutch, three to four; round oval in shape; texture of shell fine; surface glossy; colour, dirty white, finely spotted over the whole surface with light-brown or umber, and moderately marked with large, bold, roundish blotches of very dark brown or black, also with a few bluish-grey blotches. Dimensions in inches of odd examples: (1) 1.1 × .88, (2) 1.1 × .86.

*Observations*.—This interesting species of Quail or Turnix appears to have a somewhat restricted range in Queensland and part of New South Wales.

The first specimens of eggs I ever received of the Black-breasted Quail were from the collection of the late Mr. Geo. Barnard, Coomoo-boolaroo. They were found in a belt of brigalow scrub on his run. Mr. Barnard wrote: "Black-breasted Quail—12th December, 1882. Blacks brought me three fresh eggs, found far in the dense scrub. The bird always inhabits the scrub, and is very shy and rare."

Subsequently, when relating to me from his pleasant store of field incidents he mentioned one regarding the Black-breasted Quail. He was felling a bottle-tree (*Sterculia*) for fodder for cattle during a drought. When the topmost branches reached the ground they enveloped a brooding bird that had been sitting closely upon her eggs all the time, unknown to the tree fallers. Only when the foliage came so rudely about her was she flushed, which led to the discovery of the nest with three eggs.

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568.—TURNIX VARIA, Latham.—(480 and 480A)  
*T. scintillans*, Gould.

### PAINTED QUAIL.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pls. 82 and 83.

*Reference*.—Cat. Birds Brit. Mus., vol. xxii., p. 551.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848); also Handbook, vol. ii., p. 180 (1865); Campbell: Victorian Naturalist (1889); North: Austn. Mus. Cat., p. 285 (1889).

*Geographical Distribution*.—Whole of Australia and Tasmania.

*Nest*.—A slight depression in the ground, sometimes lined with a little grass or fine leaves, and sheltered by a tussock, stone, &c., usually in an exposed, dry locality.

*Eggs*.—Clutch, four; roundish in shape, more compressed at one end; texture of shell fine; surface glossy; colour, whitish, minutely but boldly freckled with light or cinnamon-brown and umber, interspersed with slightly larger markings of dark purple or black and bluish-grey.

Dimensions in inches of proper clutches (round): (1)  $1.12 \times .95$ , (2)  $1.12 \times .94$ , (3)  $1.1 \times .92$ , (4)  $1.08 \times .9$ ; (pointed): (1)  $1.26 \times .9$ , (2)  $1.23 \times .9$ , (3)  $1.19 \times .89$ , (4)  $1.19 \times .88$ ; a West Australian set: (1)  $1.1 \times .9$ , (2)  $1.09 \times .88$ , (3)  $1.09 \times .88$ . (Plate 18.)

*Observations.*—The Painted Quail has the upper surface rich rufous-brown, most of the feathers being marked or striped transversely with chestnut and black. On the wings each feather is spotted with black and white; under surface yellowish-white and bill brownish; eyes, reddish; legs and feet yellowish. Total length, 8 inches; wing, 4 inches; bill,  $\frac{7}{8}$  inch; and tarsus,  $\frac{3}{4}$  inch. The Painted Quail family or Turinxes possess no hind toes, hence were first called Hemipodes. This fact will sometimes aid persons in identifying Quails. Gould gives the average weight (Tasmanian specimens) of this Quail at five ounces, remarking that the birds on the mainland were smaller if anything.

The Painted Quail, although found in the same places as other Quails, is more local, and prefers sandy and somewhat sterile tracts. It has been recorded for most collecting localities throughout Australia, including Tasmania and King Island. At the latter place we secured specimens during the visit of the Field Naturalists' Club, November, 1887.

"Old Bushman" says although you may occasionally kill an odd one during the winter in the Mordialloc district of Victoria, the majority of them come in September and leave in March.

The Painted Quail runs much upon the ground, and when on the wing has a wavering flight; it is, therefore, somewhat difficult to shoot. It is reckoned intermediate in size between the Stubble and Brown Quails, but it is probably equal in weight (about four and a half ounces) to the latter bird. The call of the Painted Quail is a "coo" like a pigeon, but twice repeated, and is frequently heard rising from the heath during the pairing season, and sometimes through the night.

I possess distinct recollections of the first pretty set of Painted Quail's eggs I found as a boy. The locality was in the reserve near the Botanical Gardens, Melbourne. It was on Boxing Day, 1861 or 1862. I flushed the bird from her nest, but left the eggs undisturbed. I was exceedingly loath to do so, for I feared they would be trodden under foot by some picnickers who were arriving.

The last set of eggs I chanced to find was upon the bare ground (there may have been a semblance of a nest in the shape of a few grass stalks) in open scrub near the shore of Lake King, Gippsland, in October, 1881.

I have the reliable testimony of Mr. Harry Barnard that in Queensland he has noticed several clutches of the Painted Quail just hatching in April, or when the grass seeds are ripening.

In the light of our later knowledge we had better agree in assigning Speckled Turnix (*Turnix scintillans*, Gould) to the synonym of the Painted Quail. The western bird is a very beautiful species, inhabiting Houtman's Abrolhos, as well as other portions of the west mainland. It was tolerably abundant on the East and West Wallaby Islands. Gould describes the bird as being smaller; while its colouring is much lighter, more varied and sparkling than its eastern representative—the ordinary Painted Quail.

The breeding months are from September to February, when two broods are probably reared. In Tasmania it is stated that the chief months are October, November and December.

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569.—TURNIX CASTANONOTA, Gould.—(482)

CHESTNUT-BACKED QUAIL.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 85.

*Reference*.—Cat. Birds Brit. Mus., vol. xxii., p. 552.

*Geographical Distribution*.—North-west Australia, Northern Territory, and North Queensland.

*Nest and Eggs*.—Undescribed.\*

*Observations*.—Little is known of the habits of the Chestnut-backed Quail, except that it is an inhabitant of the northern part of Australia. Gould transcribes the following note of Gilbert: "This species inhabits the sides of stony hills in coveys of from fifteen to thirty in number, which, when disturbed, seldom rise together, but run along the ground; and it is only upon being very closely pursued that they will take wing, and then they merely fly to a short distance. While running on the ground, their heads are thrown up as high as their necks will permit, and their bodies being carried very erect, a waddling motion is given to their gait, which is very ludicrous. The stomachs of those dissected were very muscular, and contained seeds and a large proportion of pebbles."

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570.—TURNIX PYRRHOTHORAX, Gould.—(484)

RED-CHESTED QUAIL.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 86.

*Reference*.—Cat. Birds Brit. Mus., vol. xxii., p. 553.

*Previous Description of Eggs*.—North: Austn. Mus. Cat., p. 287 (1889).

*Geographical Distribution*.—Northern Territory, Queensland, New South Wales, Victoria, and South Australia.

*Nest*.—Similar to that of *T. velox*.

\*There is in the collection of Mr. D. Le Souéf a pair of eggs from a clutch of four, found in the Port Darwin district, 21st January, 1899, which may possibly be referable to this species. The eggs are remarkably round in form, sharply nipped off at one end; texture, firm and fine; surface, very glossy; colour, white, sparingly marked with roundish blotches and spots of sepia, umber, and dull greyish-blue. Dimensions in inches: (1) .98 × .84, (2) .95 × .84.

*Eggs*.—Clutch, four; inclined to pyriform, or roundish in shape sharply compressed at one end; texture of shell fine; surface almost without gloss; colour, yellowish-white, thickly spotted and blotched with rich brown or chestnut, purplish-brown, and slate. Dimensions in inches of odd examples: (1)  $\cdot99 \times \cdot76$ , (2)  $\cdot93 \times \cdot76$ , (3)  $\cdot91 \times \cdot72$ .

*Observations*.—Little is known of the Red-chested Quail, except that its range is across the Continent from north to south. There is a record that Dr. Ramsay found a nest at Manar, New South Wales, during 1864.

Its manner of nidification doubtless resembles that of the Little Quail.

From a note made by Mr. Hermann Lau while on the Darling Downs, it appears that this species of "Yellow Quail," as it is locally called, is not very plentiful, only appearing here and there in pairs. At Warroo station, during the mowing of some lucerne, a nest containing four eggs was discovered. The eggs were slightly incubated. Date, September, 1873.

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### 571.—TURNIX VELOX, Gould.—(483)

#### LITTLE QUAIL.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 87.

*Reference*.—Cat. Birds Brit. Mus., vol. xxii., p. 553.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 185 (1865); North: Austrn. Mus. Cat., p. 286 (1889), also Trans. Roy. Soc., South Australia, vol. xxii., p. 159 (1898).

*Geographical Distribution*.—Australia in general.

*Nest*.—A slight depression in the ground, scantily lined with grasses, usually protected by a grass tuft or sheltered in a grain crop.

*Eggs*.—Clutch, four; round oval in shape; texture of shell fine but firm; surface slightly glossy; colour, dirty or yellowish-white, thickly spotted and blotched with umber, chestnut, and purplish-brown. Other examples are finer marked and lighter coloured. Dimensions in inches of a pair: (1)  $\cdot98 \times \cdot72$ , (2)  $\cdot95 \times \cdot73$ ; of a proper clutch: (1)  $\cdot96 \times \cdot7$ , (2)  $\cdot94 \times \cdot72$ , (3)  $\cdot92 \times \cdot7$ , (4)  $\cdot89 \times \cdot72$ . (Plate 18.)

*Observations*.—The Little Quail is somewhat chubby, with a stout, dark, horn-coloured bill. Upper surface in general is chestnut-red, pencilled with black and yellowish-white. There is a buffy wash on the throat, chest, and flanks, passing into white on the abdomen. The eyes and legs are yellowish. Total length,  $5\frac{1}{2}$  inches; wing, 3 inches; bill,  $\frac{1}{2}$  inch; tarsus,  $\frac{3}{4}$  inch.



The Little Quail is found or has been recorded throughout Australia in general.

Goold records it as strictly migratory, but I think observations will tend to prove that it is merely a wanderer, moving about according to the seasons. If there is a good season in the interior, then the birds are scarce near the sea-board; on the contrary, if drought dry up the interior, then the Little Quails as well as other varieties are plentiful towards coastal regions. One exceptionally good all-round Quail season we had in Victoria was 1888, when a sportsman shot, within a radius of fifty miles of Melbourne, no less than 813 brace of various kinds.

The year 1899 was an extraordinary season for Quails in the Mallee district of Victoria. It is reported that during May, June, and July, no less than 2,800 birds were shot in one grass paddock of about 1,000 acres. They were chiefly the Little, the Painted, and the Stubble Quail.

The Little Quail appears to prefer open dry ridges, thinly clothed with grass, in the interior provinces.

The Little Quail is one of the earliest breeders of its family, the season usually commencing in September and lasting to the close of the year, i.e., as far as southern parts are concerned, but elsewhere the breeding time is probably regulated by the season, in the interior for instance, as the following field note, received from Mr. T. Carter, Western Australia, proves: "Found species of Quail, or Turnix (probably *T. velox*), laying in great numbers on the Minilya, about 10th August, 1890." Again, at Point Cloates, April and May, 1898, "the swift-flying Turnix was breeding everywhere."

Most persons are interested in Quail. Subjoined are Mr. Keartland's interesting observations of the Little species in the far North-west: "These birds are found in North-west Australia throughout the year, frequenting alike the Flinders and Mitchell grass plains, the spinifex of the desert, and the tall kangaroo grass along the creek flats, but are most numerous near the junction of the Fitzroy and Margaret Rivers. At the latter place they get the credit of eating off the young plants in the gardens of the settlers as soon as they show above ground. Whether the charge is a just one I cannot say, but I was taken into the garden by Mr. Harris to see some young melon and cucumber plants that had just come up. On approaching the cucumber bed, three of these birds flew away, and we found that nearly all the plants had been eaten off. The bird may be driven to this practice by the scarcity of green food, which they take in conjunction with seeds and insects. After rain falls they become exceedingly numerous in the green grass which immediately springs up. As these birds are only occasional visitors to the southern portions of the Continent, it is highly probable they are driven south by protracted drought. They seem to breed nearly all through the year, four eggs being the usual complement."

## 572.—TURNIX LEUCOGASTER, North.

## WHITE-BELLIED QUAIL.

*Reference*.—Ibis, 1895, p. 342.

*Previous Description of Eggs*.—North: Report Horn Scientific Expedition, p. 103 (1896).

*Geographical Distribution*.—West, North-west and Central Australia.

*Nest*.—Similar to that of *T. velox*.

*Eggs*.—Number and description similar to those of *T. velox*.

*Observations*.—The small White-bellied Quail was one of the ornithological discoveries of the Horn Expedition to Central Australia. Mr. North, who described the new bird, considers it to be allied to *T. velox* and *T. pyrrothorax*, but pointed out that the almost uniform white under-surface serves to distinguish it from either, likewise from any member of the genus yet discovered in Australia.

But it is somewhat strange that Mr. North should risk his reputation as a cautious ornithologist in describing a new bird from a single skin of such a wandering species as a Quail! He now candidly admits that *T. leucogaster* "may prove to be only a very bleached young bird" of *T. velox*, while other authorities have no doubt it is. Therefore the following field notes of Mr. Keartland, who accompanied the Expedition (Horn's), may be read with interest as referable to either variety:—"Great numbers of these birds were found throughout the grass country north of Charlotte Waters. At Illamurta, on 30th May, a clutch of hard-set eggs was found, and afterwards young birds were frequently picked up. At Petermann Creek, half-grown young ones ran about our camp. Wherever grass was plentiful, particularly near Heavitree Gap and Missionary Plain, they were also numerous. Whilst crossing the latter country, my attention was called to a dingo hunting in the grass like a setter dog. Presently he made a decided set, and then suddenly springing forward, flushed a brace of these birds, one of which he caught in his mouth and soon swallowed. He then started after the second one, and as he was approaching his bird, hunting keenly, he permitted me to get near enough to stop his Quail-hunting. He was a fine male dingo, but black in colour."

Again, with the Calvert Expedition, two years afterwards, Mr. Keartland writes: "Throughout the whole of the journey from Cue to Derby these birds were noted. Whether we traversed the dense kangaroo grass near the creeks, the scattered herbage in the timbered country, or the arid spinifex flats between the sandhills, they rose beside our track nearly every day. In some places they were so numerous that they were flushed every fifty yards. On one occasion, soon after daybreak, I counted no less than fifteen birds all in sight at one time feeding on a patch of very short spinifex. Their eggs or

young were frequently found from early in July until March. They were often found at a great distance from water; on several occasions, however, I disturbed them whilst drinking."

573.—*PEDIONOMUS TORQUATUS*, Gould.—(485)

PLAIN WANDERER.

*Figure*.—Gould: Birds of Australia, fol., vol. v., pl. 80.

*Reference*.—Cat. Birds Brit. Mus., vol. xxii., p. 554.

*Previous Descriptions of Eggs*.—Campbell: Southern Science Record (1883), also Nests and Eggs Austr. Birds, pl. 2, fig. 485 (1883); North: Austr. Mus. Cat., p. 288, pl. 16, fig. 12 (1889).

*Geographical Distribution*.—New South Wales, Victoria, and South Australia.

*Nest*.—Merely a depression in the ground, sometimes sheltered by grass tufts, usually on open plains.

*Eggs*.—Clutch, four to five; pyriform, sharply nipped off at one end, occasionally with an elongated neck, which gives quite a pear-shaped appearance; texture fine, but firm and strong; surface glossy; colour, yellowish or greenish-white, spotted and finely blotched, thickest on the apex, with olive and dull-grey. When the shells are empty and are rubbed against each other, the sound caused resembles that produced by the grating of fine pieces of china-ware. Average dimensions in inches of a large-sized set of three: 1.33 × 1.0; odd examples: (1) 1.28 × .92, (2) 1.27 × .9. (Plate 18.)

*Observations*.—The collared Plain Wanderer, although a unique species, is closely allied to the Turnixes, from which birds, however, it differs in possessing a hind-toe. As Gould remarks, the structure of this singular bird is admirably adapted for inhabiting the extensive and arid plains of the central portions of Australia.

The bird may be at once distinguished from the other Quail by the broad white ring round its neck, spotted with black, and by its small hind toe; the rest of the plumage is reddish-brown. The yellow legs are comparatively long, while its wing power is feeble. Length, 7 inches; wing, 3 $\frac{3}{8}$  inches; bill,  $\frac{3}{4}$  inch; tarsus,  $\frac{7}{8}$  inch.

Occasionally the birds visit Victoria and South Australia. In the latter place, according to Gould, they appear in June, disappearing about January. On account of their feeble flight powers they are often caught by sportsmen's dogs. Not many years ago I heard of a bird being caught in the vicinity of the St. Kilda cemetery; and more recently a friend's dog caught one near Williamstown. The same gentleman observed a nest of the Plain Wanderer containing the peculiarly pointed eggs, on the Keilor Plains.

Although only recorded in 1889 by Mr. North, the next authenticated egg was taken at Springfield, near Goulburn, New South Wales, December, 1875. It is in the Dobroyde collection.

Although only recorded recently (1889) by Mr. North, the next authenticated egg was taken at Springfield, near Goulburn, New South Wales, December, 1875. It is in the Dobroyde collection.

The eggs that now grace my cabinet were obtained through the kindness of Mr. Beazley (then in the Adelaide Museum). The specimens were taken northward, eight miles from Adelaide, on August 20th, 1887, by Mr. S. Wesdom, who flushed and shot the female parent. The nest, which contained five eggs, was situated at the side of a large tuft of grass on the rise of a hill. A previous clutch was found in the same neighbourhood earlier in the month.

The breeding season may be said to be included in the months from August to December.

## ORDER—FULICARIÆ.

## FAMILY—RALLIDÆ: RAILS.

574.—*HYPOTENIDIA BRACHYPUS*, Swainson.—(571)

## SLATE-BREASTED (LEWIN) RAIL.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 77.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiii., p. 37.

*Previous Descriptions of Eggs*.—Campbell: Victorian Naturalist (1888); North: Austr. Mus. Cat., p. 329 (1889).

*Geographical Distribution*.—South Queensland, New South Wales, Victoria, South and West Australia, and Tasmania; also New Zealand.

*Nest*.—Composed of fine grass and rushes, and situated in a swamp among thick rushes, which are usually drawn together above, so as to form a covering. There is a staging or landing leading to the nest, which is variously placed from six inches to three feet above the water.

*Eggs*.—Clutch, four to six, usually five; oval or round oval in form; texture of shell fine; surface glossy; colour, light-pink or pinkish-white, blotched and splashed with pinkish-red and purple. Dimensions in inches of a set of three: (1) 1·41 × 1·03, (2) 1·38 × 1·1, (3) 1·37 × 1·0.

*Observations*.—This interesting Rail does not enjoy such a wide range as its larger compeer, the Pectoral Rail, being confined chiefly to the southern parts of Australia and Tasmania, where it is especially abundant in low swampy situations.

Having received authenticated eggs of this pretty Rail from different quarters in 1888, I took the opportunity of re-describing them, for in none could I discern the "pale-olive" ground colour mentioned in Gould and elsewhere, a colour probably referable to the egg of one of the Crakes—a pardonable mistake, because the identity of the parent would be difficult, when both Crakes and Rails often frequent the same swampy situation.

Mr. A. E. Brent, from whom I received two particularly fine sets first acquainted me with the fact of the singular staging or ladder leading from the nest to the water, down which, he says, "the birds when disturbed from the nest travel like lightning, disappearing under water."

Another time Mr. Brent states: "Since I wrote to you, in company with Mr. Malcolm W. Harrison, sub-inspector of stock, I discovered a nest of this bird containing five eggs. Mr. Harrison, not having taken any of these eggs, was curious to see the bird, so we

retired for a few minutes to allow the bird to return; then I told him to stand guard to identify the bird as she left the nest, while I proceeded to flush her. Looking into the tussock, I could see her on the nest, and, making a spring, with both hands I captured her."

The number of eggs in completed clutches found by Mr. Brent is respectively 5, 5, 5, 5, 4, 4, and 4.

In the following note, kindly sent to me, Mr. Brent contrasts the nests of the Slate-breasted (Lewin) Rail and of the Spotted Crake: "Both Spotted Crake and Lewin Rail have the stage or track leading up to the nest, but much larger in the latter, on account of the great height of some of the positions from the ground, as compared with those of the Crake, which are low down. I have found the nest of the Rail as high as three feet from the ground, whereas I have never found the other more than one foot high. The nest of the Rail is more compact, rounder and deeper, with the fine grass and rushes overhead laced together and formed into a kind of dome-shaped basket-work covering. I should like to draw your attention to the fact that this little bit of workmanship does not occur until such time as the bird is sitting, when she seems to amuse herself by reaching up her long neck and bill, and pulling the rushes down. The nest of the Crake is not like the Rail's, being composed of dry bits of rushes and aquatic weeds carelessly made, with a slight attempt at an overhead covering. When sitting, the nest-stage and eggs are mostly plastered with a thick coating of mud, in fact, you cannot tell if the latter are eggs or stones. I find I have omitted to say the nest of the Rail is composed of fine band-grass (dry), beautifully put together, with a track of the same material, which has the appearance of being gathered up by the end and carried in as far as the nest by the bird, where the end is tucked in, and the remaining part, which is generally long, left lying where the bird entered—by this means the track is formed. In the case of the Crake, she carries nothing for her stage, but simply makes use of the rushes and grass at hand, and with her fine long toes she must tread it into position."

Breeding months September to December.

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575.—*HYPOTENIDIA PHILIPPINENSIS*, Linnæus.—(570)

PECTORAL RAIL.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 76.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiii., p. 30.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 335 (1865); Hutton: Trans. New Zealand Institute, vol. iii., p. 111 (1871); Buller: Birds of New Zealand (1873), vol. ii., p. 99 (1888); North: Austr. Mus. Cat., p. 328 (1880); North: Trans. Roy. Soc., South Australia, vol. xxii., p. 164 (1808).

*Geographical Distribution*.—Australia in general and Tasmania.

also New Zealand, Lord Howe, Norfolk, and other Pacific Islands, and throughout the Austro-Malayan Islands to the Philippines.

*Nest*.—A thick ply of dry grass principally and leaves, placed on the ground in a slight hollow, four or five inches across, in herbage or by a tussock of grass, usually in the vicinity of water.

*Eggs*.—Clutch, five to eight usually, maximum twelve; round oval in shape; texture of shell fine; surface slightly glossy; colour, warm or pinkish-white, boldly but sparingly marked with roundish blotches of rich reddish-brown, purple, and dull purplish-grey. Dimensions in inches of a clutch: (1) 1.49 × 1.11, (2) 1.47 × 1.1, (3) 1.47 × 1.1, (4) 1.45 × 1.08, (5) 1.44 × 1.09, (6) 1.4 × 1.03, (7) 1.38 × 1.06. (Plate 18.)

*Observations*.—Few birds of its kind enjoy a wider range than the Landrail, or Pectoral Rail, and not only has it the run of marshy tracts and moist humid places of Australia and Tasmania, but is found on many other islands besides.

What with the increase of foxes, domestic wild cats, and other vermin, I do not think this favourite bird is so often seen as in former years, in Victoria, at all events.

Gould regarded it as a summer visitant to the southern parts of Australia, arriving in August and departing in February. This cannot be a general rule, because I heard in 1895 of a nest containing four undoubted Landrail's eggs having been found near Heidelberg, 4th July.

I had a curious experience in connection with the last Landrail's eggs I took. The nest was concealed in a tuft of grass near the River Murray, and contained a clutch of seven eggs, from which the bird was flushed. It was the usual sultry weather at the beginning of December (1890), and I also "flushed" a snake near, which was killed, tossed into the river, and went floating down stream with its yellowish stomach uppermost. The same evening I was blowing the eggs by the verandah at Mr. G. H. Morton's house. The children were watching what to them was an interesting operation, when suddenly a tiger snake wriggled up between us. Without dropping the precious egg I had in hand, I seized a short stick at my side and despatched the reptile while it was making towards the verandah. It measured one inch short of four feet.

I possess two notes on the Pectoral Rail from different parts of Australia. One is from Yorke Peninsula, South Australia, written by Mr. James McDougall, who says: "The Pectoral Rail breeds every year on Trowbridge Islands, as I am informed by the lighthouse keepers, who see the young and old feeding at dawn and dusk. I have seen the birds but not the eggs, which number seven or eight. The birds arrive at the end of August, and leave in February."

The other is from Darling Downs, Queensland, by Mr. H. Lau, who writes: "This bird makes no nest, but, like the Emu, simply treads down a little place among the long grass near water. This spot withers

in a short time, and on it are deposited five eggs. Found everywhere in Queensland. Took eggs near Mount McIntyre watershed, 1880."

The usual breeding months are from September to December, but during the Calvert Expedition in the North-west, two nests containing hard set clutches were observed in February near the junction of the Fitzroy and Margaret Rivers.

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**576.**—*EULABEORNIS CASTANEIVENTRIS*, Gould.—(572)

**CHESTNUT-BELLIED RAIL.**

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 78.

*Reference.*—Cat. Birds Brit. Mus., vol. xxiii., p. 49.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 338 (1865).

*Geographical Distribution.*—Northern Territory and North Queensland; also the Aru Islands.

*Nest.*—Not described.

*Eggs.*—Clutch, --; rather lengthened in form, swollen about the upper quarter and somewhat pointed at either end; texture of shell strong and coarse; surface glossy; colour, warm-white, sparingly marked with roundish blotches and spots of chestnut and dull purplish-brown. Dimensions in inches: 2.0 × 1.4 (Nehrkorn collection); according to Gould: 2.12 × 1.62. In shape these eggs are more of the Gallinule type.

*Observations.*—This fine, large, and singular species of Rail frequents the low muddy shores and mangrove swamps of the northern coast.

Gould received his original specimen from Rear-Admiral Stokes, who was surveying in H.M.S. "Beagle" at that time in the Gulf of Carpentaria.

Gould some time previously had received the eggs of this species from Port Essington (probably Gilbert's collecting), but owing to its extreme shyness the bird could never be obtained. It runs with extraordinary fleetness, taking alarm the instant the vicinity of its habitat is invaded, and vanishing amongst the dense herbage and mangroves.

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**577.**—*RALLINA TRICOLOR*, Gray.

**RED-NECKED RAIL.**

*Figure.*—Gould: Birds of Australia, fol., supp., pl. 78.

*Reference.*—Cat. Birds Brit. Mus., vol. xxiii., p. 79.

*Previous Descriptions of Eggs.*—Ramsay: Proc. Zool. Soc., p. 603 (1875); North: Austr. Mus. Cat., pl. 17, fig. 5 (1886).

*Geographical Distribution.*—North Queensland; also New Guinea, Mysol, Waigiou, Aru Islands, &c.



*Nest*.—Composed of grass and a few leaves, and hidden among thick débris at the foot of a tree in dense scrub (Ramsay). Built in the base of a thick clump of lawyer (*Calamus*) canes; somewhat like a Shrike Thrush's nest, and about a foot high.

*Eggs*.—Clutch, four to seven; elliptical in shape, occasionally some examples are more compressed at one end; texture of shell fine; surface glossy; colour, dull-white, fairly blotched and spotted, particularly about the larger end, with rufous or reddish-brown and purple. Dimensions in inches of a proper clutch: (1) 1.52 × 1.06, (2) 1.45 × 1.1, (3) 1.43 × 1.07, (4) 1.38 × 1.09; of a larger-sized pair: (1) 1.53 × 1.14, (2) 1.5 × 1.15.

*Observations*.—This elegant Rail, conspicuous for its rusty-red head and neck, is found in Northern Queensland and some of the islands beyond. Mr. Cockerell, who first collected the bird from a dry scrub that fringed a small creek in the neighbourhood of Somerset, Cape York, says he found the eggs, which were *white*. It is said that the native name of this Rail is "Tangala," from a peculiar sound the bird utters at night.

Dr. Ramsay states: "I found this fine species of Rail by no means rare in the dense scrubs which fringe the rivers and creeks of the coast and range near Rockingham Bay; but although tolerably plentiful, they are always very difficult to obtain, on account of the nature of the localities they frequent and their retiring disposition. They are seldom to be seen without lying in wait for them, and not always then can one obtain a shot, except, perhaps, at such close quarters as would entirely destroy them. They move about more in the evenings and early morn, and at night may be heard calling to one another as they traverse the dense masses of rank vegetation, which abound in those districts. I never met with them out of these scrubs, although thick, swampy grass-beds close by were frequented by allied species. They seem very local in their habits, a pair frequenting the same spot for many months or perhaps the whole year round, and breeding near the same place year after year; the young soon begin to take care of themselves, and leave the parents before they are well able to fly. I found them some four or five months old in pairs. The note resembles a hoarse croak quickly repeated in a somewhat mournful tone, and a quick 'chuck, chuck' when come upon suddenly. I was not fortunate enough to find the nest and eggs myself, but shortly after I left the Herbert River, I received a fine set of these eggs from Inspector Robert Johnstone, to whom the bird is well known, and who assures me that after finding the nest with eggs he left them until he had twice seen the bird sitting thereon, and that he might be perfectly sure there could be no mistake as to their identity."

I have received the eggs of this splendid Rail taken in New Guinea as well as from the mainland by Mr. W. Sayer, who found a clutch of six near the Russell River, when on a botanical tour to Mount Bellen-den-Ker for Baron von Mueller, 1886. Other eggs were taken in the Cooktown district at the end of January (1895), also *white* eggs, as

mentioned by Mr. Cockerell, attributed to a Rail; whether this Rail or some other bird has yet to be proved. A set of three of these white eggs may be seen in the collection of Mr. D. Le Souéf. They resemble in shape and size those of the Red-necked Rail, minus the markings, but are apparently stouter in the shell and have more gloss on the surface.

From very strong circumstantial evidence Mr. Broadbent believes the white eggs are Red-necked Rail's. In a communication to me he has kindly furnished the following interesting field notes:—

"I left Cardwell about the first week in January, on a collecting trip, for the head of the Murray River, thirty miles from Cardwell and ten miles from the Bellenden Plains, just where the mountains come down to the banks of the river—a splendid place for you about October—all the country to yourself.

"Of course, I was collecting birds, insects, reptiles, and fish, and eggs when I came across them.

"My tent was near the river scrub, about two hundred yards away, in the grass. But close to my tent, about fifty yards distant, was a little creek with scrub very thick with a great quantity of ferns and undergrowth. At night I often heard the call of the Scrub Rail, and sometimes on very dark nights they would come around the tent, but too dark to shoot. In the morning I frequently heard them in the scrub calling to each other, when I endeavoured to get them. Several mornings I got up at dawn and crawled into the scrub amongst the ferns, but unfortunately I could not see the birds—too dense and dark. However, one morning, when crawling as usual in the ferns, I nearly broke two beautiful white eggs laid on the ground amongst the ferns in a little circular basin lined with a few bits of leaves and small pieces of dead sticks, just scrub rubbish. The eggs were quite warm. I shot the female just as she was beginning to sit, judging by her breast feathers. Afterwards I shot the male about the middle of January. I hunted these scrubs for six weeks afterwards and could attribute the eggs to no other bird."

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578.—CREX CREX, Linnæus.

CORN CRAKE.

*Figure*.—Gould: Birds of Great Britain, vol. iv., pl. 87.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiii., p. 82.

*Previous Descriptions of Eggs*.—Various.

*Geographical Distribution*.—New South Wales (accidental); also Asia and Europe, migrating to winter in Africa, sometimes as far south as the Cape.

*Nest*.—A mere depression in the ground, lined with a few straws, and usually situated in a corn or clover field or meadow (Butler).

*Eggs.*—Clutch, eight to twelve; oval in shape, compressed at one end; texture of shell fine; surface glossy; colour, dull or light greyish-white, spotted and marked, chiefly in a longitudinal direction, with chestnut and purplish-brown of different shades. Dimensions in inches of a set of three: (1) 1.46 × 1.02, (2) 1.44 × 1.07, (3) 1.44 × 1.0. These eggs most resemble those of the Pectoral Rail.

*Observations.*—It is somewhat strange that a single specimen of the common Landrail, or Corn Crake of Europe, should have been found near Sydney. Date, June, 1893. These birds are known to migrate southward in winter from Europe and parts of Asia to Africa. Instead of keeping to the right, the wanderer under notice may have kept too much to the left, got "bushed" in Australia, and thus made a record by being added to the avi-fauna of that country.

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579.—PORZANA FLUMINEA, Gould.—(573)

SPOTTED CRAKE.

*Figure.*—Gould: *Birds of Australia*, fol., vol. vi., pl. 79.

*Reference.*—Cat. Birds Brit. Mus., vol. xxiii., p. 101.

*Previous Descriptions of Eggs.*—Campbell: *Victorian Naturalist* (1889); Morgan: *Trans. Roy. Soc., South Australia*, vol. xxii., p. 193 (1898).

*Geographical Distribution.*—Queensland, New South Wales, Victoria, South Australia and Tasmania.

*Nest.*—Open, somewhat flat; composed of green weeds, usually wet, lined with soft grass and generally placed low by the side of a thick tussock of grass or clump of rushes growing in water of swampy localities. There is a stage or track leading to the nest.

*Eggs.*—Clutch, four to five; round oval in form; texture of shell fine; surface glossy; colour, greyish or brownish-olive, blotched and spotted, particularly about the larger end, with red, and chiefly rich purplish-brown of various shades. Dimensions of a clutch from Tasmania: (1) 1.28 × .9, (2) 1.25 × .92, (3) 1.24 × .9, (4) 1.22 × .9. (Plate 18.) A set taken in South Queensland has a lighter ground-colour—pale-olive—and is moderately marked with roundish blotches and spots of dull-brown and purplish-brown. Dimensions: (1) 1.28 × .91, (2) 1.19 × .87, (3) 1.17 × .89, (4) 1.19 × .88.

*Observations.*—The splendid little Spotted Crake frequents the thick herbage and reed-beds of swamps and marshes in eastern localities from Queensland down to South Australia, including Tasmania—one of its strongholds.

In 1889 I was indebted to Mr. E. D. Atkinson for the pleasure of examining and first describing from his collection a set of these rare and most interesting eggs, which were taken by Mr. G. K. Hinsby.

In describing the eggs of the Slate-breasted Rail (*Hypotaenidia brachyppus*), the previous year, I stated that Gould had in error probably described the eggs of one of the *Porzana* for those of the Rail, an error easily made, considering the similar habits of both birds. There is no room to doubt now that the Spotted Crake's eggs were supposed by the great author to be those of the Rail. I am pleased for the sake of other collectors, as well as myself, that this matter has been cleared up, and, moreover, has been amply substantiated through the good and enthusiastic services of Mr. A. E. Brent.

Like most other Crakes, the Spotted keeps well within the confines of the dense herbage of its swampy retreat. Hence, as Gould from experience truly says, it is seldom seen unless the greatest trouble and labour are expended to hunt it out of its hiding place. Therefore, all the more credit is due to Mr. A. E. Brent, who, about the first week in November one season, aided by a favourite Gordon setter, tracked these birds, and was very successful in finding three of their nests in the reedy lagoons, formerly the overflow of the Derwent River, Tasmania. Two nests contained each four eggs, the other five. The nests were placed among bunches of rushes, partly on the water, and constructed of aquatic weeds for a foundation, and lined with soft band grass, which was damp. As in the case of the Slate-breasted Rail, a staging or track led up from the water to the nest.

In other communications received from Mr. Brent he has furnished some valuable and curious facts concerning Spotted Crakes. He writes: "In company with Mr. Harrison and Mr. Arthur Butler, I went to the marshes, and had not been long at work when Mr. Harrison had the good fortune to flush a bird from her nest containing four eggs. Round the nest the water was just beginning to dry, leaving a thick, sticky mud, with which the eggs were completely covered, hiding colour, spots, and everything. . . . The encasement of mud on the Crake's eggs is easily explained. The season being very dry, the water soaked away, leaving a thick mud for some distance round the nest, through which the birds had to wade, and, naturally enough, carried a certain amount on their feet each time they visited the nest. A small channel was plainly visible in the mud, through the birds keeping to the one track, which led to the discovery of the nest.

"Since, I have taken two more nests of the Spotted Crake. The first contained five eggs, the last six eggs; and I took also two Lewin's Rails, each containing five eggs. In all these clutches there have been odd eggs—a pair either devoid of colouring or larger, or very much smaller in size, as the case may be. But the general rule is, in a clutch of five a pair is large, while three match each other in every way."

Mr. Brent and companions, during the season, took no less than seventeen eggs of the Spotted Crake, representing clutches of 6, 5, 4, and 2 respectively. In October (beginning), 1896, he himself took three nests of the Spotted Crake with 3, 4, and 5 eggs respectively.

A set of eggs in my collection, taken at Slab Creek, Queensland, season 1885, have a lighter ground-colour, but in other respects are similar to the Tasmanian eggs. In this instance the nest was found among water-lilies and rushes, and was composed of dead rushes in a wet state.

Dr. A. M. Morgan, South Australia, mentions a nest containing five eggs that was taken from a bush growing in the water of a swamp near Farina. Date, 18th August, 1898.

580.—PORZANA PALUSTRIS, Gould.—(574)

LITTLE CRAKE.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 80.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiii., p. 109.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 341 (1865); Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 56, pl. 3, fig. 14 (1882).

*Geographical Distribution*.—South Queensland, New South Wales, Victoria, South and West Australia and Tasmania.

*Nest*.—Slightly concave on top; composed of portions of small, round or flat (according to the species) rushes or other aquatic plants, and concealed in rushes, &c., in shallow water, or on the mud of swamps. Dimensions over all, about 4 inches by 6 inches in height; egg cavity, about  $\frac{1}{2}$  inch deep. There are usually two small (back and front) entrances to the nest, through the clump of herbage containing the nest.

*Eggs*.—Clutch, four to eight; oval in shape; texture of shell fine; surface glossy; colour, brownish-olive, fairly but faintly mottled over the whole surface with a darker shade of the same colour. Dimensions in inches of a clutch: (1)  $1.12 \times .75$ , (2)  $1.11 \times .77$ , (3)  $1.1 \times .77$ , (4)  $1.0 \times .76$ . (Plate 19.)

*Observations*.—The rank vegetation of swamps and similar localities difficult to explore is the safe home of the Little Crake, which is an inhabitant chiefly of the southern portion of Australia (including Tasmania), ranging up to Queensland on the east coast. It is said to be more common in Tasmania than on the mainland. I used to see odd birds skipping over the water of the Caulfield Swamp, near Melbourne, before municipal stupidity reclaimed, or rather destroyed, that natural retreat for water-fowl, which could have been beautified and made a permanent home and breeding reserve for many of the feathered tribe.

Gould was indebted to the Rev. T. J. Ewing, D.D., Tasmania, for the nest and eggs of the Little Water Crake, which he (Gould) accurately described.

I have received eggs from Western Port; while Mr. J. G. Gray, of Kentucky, Riverina, sent me a valuable note with an egg for identification, referring to a nest containing eight eggs that had been discovered by a farmer's son. Dry rushes formed the bed of the nest, over which green rushes were bent as if to afford concealment as well as protection from the weather. Season 1893. The season following, Mr. G. A.

Keartland showed me eggs from a clutch of six, taken on King Island.

Breeding months, October to December or January.

The nest of the Little Water Crake that forms the subject of my illustration was pointed out to me by Mr. G. E. Shepherd, near Somerville, from which he took a set of four eggs, 19th November, 1896. It was situated in a little swamp, which was about knee-deep, and surrounded by tea-tree (*Melaleuca*), in blossom. The nest itself was in the middle of a tall tussock of "sword-grass." The nest was built up about six inches from the water, the surface was four inches across the top, which was slightly (about  $\frac{1}{2}$  inch) concave. It was composed of dead portions of rushes lined with the same material, only in smaller and softer pieces. There was a little entrance leading either way through the tussock from the nest. Of course the tussock had to be somewhat opened out to take the photograph (see illustration).

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581.—PORZANA TABUENSIS, Gmelin.—(575)

SPOTLESS CRAKE.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 82.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiii., p. 111.

*Previous Descriptions of Eggs*.—Potts: Trans. New Zealand Inst., vol. vi., p. 151 (1874); Campbell: Southern Science Record (1883), and Nests and Eggs Austr. Birds, pl. 2, fig. 575 (1883), also Victorian Naturalist (1889); Buller: Birds of New Zealand, vol. ii., p. 102 (1888); North: Austr. Mus. Cat., app. (1890).

*Geographical Distribution*.—Queensland, New South Wales, Victoria, South and West Australia and Tasmania; also New Zealand, many islands in Oceania and the Philippines.

*Nest*.—Composed of soft, dry grass, and placed on the ground; usually sheltered by a thick, drooping grass tussock near water, such as a stream.

*Eggs*.—Clutch, four, probably more; elliptically inclined in form; texture of shell fine; surface glossy; colour, dirty or greyish-white, somewhat lightly mottled all over with dull rufous or chestnut. Dimensions in inches of odd examples: (1) 1.2 × .84, (2) 1.15 × .9. (Plate 19.)

*Observations*.—This beautiful little Rail, with pink eyes, although rare, is widely dispersed, being found in its peculiar habitat throughout Australia, Tasmania, New Zealand, &c.

It was observed lately in a reedy swamp near Cheltenham, Victoria, and was in years gone by a frequenter of the Carrum Carrum Swamp, a little further south.

The following is a picture by Mr. G. E. Shepherd, Somerville, of the Spotless or Tabuan Crake at home:—"About eighteen years ago I



NEST OF THE LITTLE CRAKE.

*From a Photo by the Author.*





first saw this rare and beautiful bird, and I shall never forget it. I had made my way into the middle of a lagoon about ten acres in extent, and was sitting well out of sight among tall reeds ten or twelve feet high, waiting for ducks to alight upon a small sheet of open water; time, about sunset. Suddenly a Tabuan Water Crake made its appearance from among the reeds, having not the slightest idea of my presence (for I had been sitting motionless for some time), and gave me an opportunity of observing it feeding on insects, apparently found on the surface of the water, upon which it moved with the greatest ease, finding plenty of footing upon the hair-like water grasses, &c., which float on the surface. I often thought of the bird, and longed to see another with a view to procuring it and having it identified. Twelve years elapsed, during which time I made repeated attempts to get a specimen, but without success, till one morning in October, soon after daylight, when passing another lagoon, I heard a sound, and on nearer approach felt certain it was some bird among the tall reeds and bulrushes. Fortunately a neighbouring tree, up which I scrambled, afforded me a good outlook, and after sitting very quietly for something like twenty minutes or so, the noise was repeated and I saw for the second time the Tabuan Crake, for an instant only, at an opening in the rushes. I subsequently secured a fine specimen, shooting it from the same tree-top."

Gould did not succeed in finding a nest; but, as he conjectured, the eggs differ from those of the typical *Porzana*, and also from those of the true Rails.

The late Mr. T. H. Potts described an egg of this Crake from a salt marsh near Invercargill, New Zealand, 1874.

When I described and figured my first eggs of this species, nine years afterwards—and, curiously enough, from the same locality,—I was not aware of Mr. Potts's previous description. A second example I received from Tasmania through Mr. A. E. Brent, who also kindly supplied a description of the nest, which was found during November. In the appendix to "Catalogue" of Nests and Eggs of Australian Museum (1890), a nest and single egg, found by Dr. Metcalfe on Norfolk Island, are described.

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582.—*POLIOLIMNAS CINEREUS*, Vieillot.—(576)

*Erythra quadristrigata*, Horsfield.

WHITE-BROWED CRAKE.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 81.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiii., p. 130.

*Previous Descriptions of Eggs*.—Ramsay: Proc. Zool. Soc., p. 388 (1868); Kütler: Cabanis' Journal für Ornithologie (1884-6); Campbell: Victorian Naturalist (1889); North: Austr. Mus. Cat., pl. 16, fig. 7 (1889).

*Geographical Distribution*.—Northern Territory and Queensland; also the majority of the Pacific Islands, throughout the Austro-Malayan Archipelago and Philippines to the Malayan Peninsula.

*Nest*.—Somewhat shallow, constructed of portions of rushes and covered with fine grass, and situated on the ground in swampy situations. Dimensions, about  $2\frac{3}{4}$  inches across by  $1\frac{3}{8}$  inches deep inside.

*Eggs*.—Clutch, two to four; elliptical in shape; texture of shell fine; surface slightly glossy; colour, greyish-white, finely blotched and spotted all over with rufous-brown or chestnut and dull purplish-brown. Dimensions in inches of two odd examples (long ellipse):  $1.22 \times .86$ ; (short ellipse):  $1.2 \times .9$ . Two in the collection of Mr. S. W. Jackson, taken during the season 1897-8, near the Nicholson River, North Queensland, are stout ovals, and measure (1)  $1.14 \times .87$ . (2)  $1.1 \times .88$ .

*Observations*.—The White-browed Crake has an Austro-Malayan habitat, in addition to being found in the north and north-east parts of Australia. Gilbert first observed it frequenting the mangrove quagmires of Port Darwin district, where it was apparently a somewhat confiding bird. On the approach of an intruder it will frequently run up a branch, turn round, gaze at him, and utter a very singular, loud and chattering "Cutche-cutche." Occasionally several may be heard in chorus, as if attempting to excel each other in noise.

It is by no means difficult to obtain specimens of the bird, continues Gilbert, except when the water is too deep to admit of wading round the thick clumps of stilted mangrove roots.

During a tour in the Rockingham Bay district, 1867, Mr. E. Spalding, who accompanied Dr. Ramsay, took an egg of this species from the oviduct of a bird, which was the specimen the Doctor took his description from.

My specimens were received through the goodness of the late Dr. Kütler, of Germany, who likewise thoughtfully forwarded me extra pages of "Cabanis' Journal für Ornithologie" (1884-6), containing his description of examples of nests and eggs of the White-browed Crake, taken in Borneo. Two nests were found on the ground, 11th and 14th April, 1883, with two and four eggs respectively, slightly incubated. One nest was somewhat shallow, constructed of the bottom part of rushes, and covered with fine grasses. The other was, according to the description given by the collector, built of the leaves of rice-straw.

GoULD wrote: "As the nest and eggs of this species have not yet been discovered, they form some of the *desiderata* to which I would call the attention of the rising ornithologists of Australia, and I can assure them that the study of the eggs will greatly assist them in assigning the birds to which they belong to their proper genus."

It is of great interest and importance to collectors that the eggs of the four species of Crakes inhabiting Australia are now known.

The eggs of the Little Crake and the Tabuan or Spotless Crake undoubtedly appear to be typical of the true *Porzana*, as contrasted with the Spotted Crake and the White-browed bird, which appear oologically different—or, as Dr. Kütler remarks, with reference to the last-named, they approach in their type those of the *Gallinulina*, and form a well defined oological sub-group of the family *Rallidae*.

GoULD was right in separating the White-browed under the genus

*Erythra*; it is, however, now consigned to *Poliolimnas*. With regard to the Australian Crakes it will be seen the eggs of the White-browed most approach those of the Tabuan in general appearance; while the Spotted Crane's differ materially from all by resembling miniature Rail's.

583.—*AMAURORNIS MOLUCCANA*, Wallace.

*Gallinula ruficrissa*, Gould.

RUFOUS-TAILED MOOR HEN.

*Figure*.—Gould: Birds of Australia, fol., supp., pl. 79.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiii., p. 153.

*Previous Description of Eggs*.—North: Proc. Linn. Soc., N.S. Wales, 2nd ser., vol. ii., p. 446 (1887).

*Geographical Distribution*.—Northern Territory (probably), and Queensland; also New Guinea, New Britain and Moluccas.

*Nest*.—Not described.

*Eggs*.—Clutch, five (?); oval in form; dull white, thickly spotted with small, irregular-shaped, reddish-chestnut markings, intermingled with others of a deep bluish-grey, appearing as if beneath the surface of the shell, which predominate chiefly towards the larger end. Dimensions in inches: (1) 1.67 × 1.14, (2) 1.65 × 1.16, (3) 1.64 × 1.15, (4) 1.6 × 1.17, (5) 1.57 × 1.15 (North). A specimen in the Dalgleish collection is oval in shape; texture fine; surface glossy; colour, white, moderately marked (but thickest on the apex) with small blotches and spots of rufous and dull purplish-grey. Dimensions in inches: 1.62 × 1.12. If this be a typical egg it is narrower in form and whiter in ground-colour than any of the known Australian Rails' eggs.

*Observations*.—For the knowledge of this northern Gallinule Gould was indebted to the late Mr. F. G. Waterhouse, of the Adelaide Museum, South Australia. The bird was obtained by Mr. Rainbird, the collector, who shot it on the Cape River, a tributary of the Burdekin, Queensland.

The Rufous-tailed Moor Hen is recorded in Dr. Ramsay's "Tabular List" for the Port Denison and Wide Bay districts. Seeing its range extends to many Austro-Malayan localities, no doubt the bird occurs in other parts of northern Australia.

Scarcely anything is known of the nidification of the Rufous-tailed Moor Hen, the single egg in the Dobroyde collection being apparently unaccompanied with data of any kind. The description of eggs I have used is partly Mr. North's, taken from a set found by Mr. Parkinson while at New Britain. Specimens of birds were also procured with the eggs.

## 584.—TRIBONYX MORTIERI, Du Bus.—(565)

## NATIVE HEN.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 71.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiii., p. 164.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 325 (1865); North: Austr. Mus. Cat., p. 324, pl. 19, fig. 4 (1869).

*Geographical Distribution*.—South Australia (?) and Tasmania.

*Nest*.—Constructed of grass and other herbage, and usually placed in rushes or scrub on the ground, near water, such as the bank of a river, &c.

*Eggs*.—Clutch, seven to nine; long oval in shape, or elliptically inclined; texture of shell coarse; surface slightly glossy; colour, greyish or greenish-stone, sparingly blotched with large markings of reddish-brown and purplish-brown, also minutely freckled or spotted all over with the same colours. Dimensions in inches of a proper clutch: (1) 2.19 × 1.55, (2) 2.18 × 1.52, (3) 2.17 × 1.52, (4) 2.16 × 1.52, (5) 2.14 × 1.5, (6) 2.1 × 1.56, (7) 2.08 × 1.55. (Plate 19.)

*Observations*.—The Native Hen of Tasmania is peculiar to that island. I can find no evidence of this bird having been found on the mainland. It is almost terrestrial in its habits, and is exceedingly shy.

When going to enjoy a bath in the South Esk, Tasmania, one warm afternoon in October (1883), a pair of Native Hens kept dodging about the bank, producing a loud "crake-crake" noise, at the same time making a curious bobbing action with the tail, which is otherwise carried erect like a domestic fowl's. After a good search I found an empty nest.

Mr. A. E. Brent once on the 1st August took an early clutch of eight eggs. Breeding season usually extends from that month to January.

## 585.—MICROTRIBONYX VENTRALIS, Gould.—(566)

## BLACK-TAILED NATIVE HEN.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 72.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiii., p. 165.

*Previous Descriptions of Eggs*.—Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 56 (1882); Campbell: Southern Science Record (1883); North: Austr. Mus. Cat., pl. 17, fig. 4 (1889).

*Geographical Distribution*.—Australia in general.

*Nest*.—Open, constructed of grass, and placed on the ground among bushes such as polygonums, &c., in a swampy situation.

*Eggs.*—Clutch, five usually; occasionally as many as eight; oval or round oval in shape; texture of shell coarse; surface glossy; colour, dark-green, blotched with roundish markings of chestnut and purplish-brown, also minutely spotted all over with the same colours. Dimensions in inches of a clutch: (1)  $1.8 \times 1.26$ , (2)  $1.79 \times 1.26$ , (3)  $1.76 \times 1.27$ , (4)  $1.75 \times 1.28$ , (5)  $1.72 \times 1.22$ . (Plate 19.)

*Observations.*—As Dr. Ramsay and myself have already pointed out, Gould's description of the eggs of the Black-tailed Native Hen is hardly accurate. Probably he has described those of the Moor Hen (*Gallinule*) or some other water-fowl.

The eggs of the Black-tailed Native Hen are not only handsome for their greenish colour, but the bird itself is intensely interesting. It has been found in all the States, making its appearance, in the south especially, at irregular intervals, and in such numbers sometimes as to amount to an irruption.

The first of these irruptions we have on record was during May, 1833, when great numbers of these Native Hens visited the fields and gardens of the early settlers in Western Australia. In the same State, Gilbert mentioned that, "upon one occasion it visited the Swan River in myriads, treading down and destroying whole fields of corn in a single night."

Also, as further mentioned in Gould, Captain Sturt wrote: "This bird appeared suddenly in South Australia in 1840. It came from the north, fresh flights coming up and pushing on those which preceded them. It was moreover evident that they had been unaccustomed to the sight of man, for they dropped in great numbers in the streets and gardens of Adelaide, and ran about like domestic fowls. At last they increased so much in numbers as to swarm on all the waters and creeks, doing great damage to the crops in the neighbourhood. They took entire possession of the creek near my house, and broke down and wholly destroyed about an acre and a quarter of wheat, as if cattle had bedded on it. They made their first appearance in November, and left in the beginning of March, gradually retiring northward as they had advanced."

It is also recorded in the autumn of 1854 the Mackenzie River district (? Queensland) swarmed with Native Hens. They remained some time, then disappeared, and not a single specimen was seen there for the next three years.

Gould himself met the bird in the interior of New South Wales, but not in such numbers as to attract his attention.

It is to be regretted that the local irruptions or invasions of these birds have not all been recorded since Gould's day. If so, there might have been some data to account for these occurrences. In the Port Lincoln district (South Australia), Mr. Holroyd states: "Native Hens, as we call them, come about once in five years, and then in thousands." Of course we are aware that although the bird is partially terrestrial in its habits, it needs water. Therefore, no doubt, its movements are guided by the amount of rainfall, or rather by the want of rainfall, to fill the swamps and flood the tracts which produce its food where it usually breeds.

During a season (1892) of great drought in Central Australia, when Ibises were so plentiful in the southern parts of Victoria, a few Black-tailed Native Hens appeared on the plains near Melton, about twenty miles from Melbourne.

Usual breeding season October to January or February. Dr. Ramsay states, when the back country (of New South Wales) is flooded, these birds overrun it, breeding almost any time of the year. I had two eggs from a clutch of eight taken at Cooper's Creek, 20th June (1887).

Mr. T. Carter informs me they were also laying at Point Cloates, mid-winter (July), 1899 and 1900. A beautiful set of eggs in my collection is from Mr. W. White's (Reedbeds) preserve, where these Native Hens breed freely and are exceedingly tame. The young in down are jet black, and can swim like ducklings. The old birds feed their young on bits of thistle, dock, &c.

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586.—GALLINULA TENEBROSA, Gould.—(567)

BLACK MOOR HEN.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 73.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiii., p. 168.

*Previous Descriptions of Eggs*.—Campbell: Southern Science Record (1883 and 1885), also Nests and Eggs Austn. Birds, pl. 2, fig. 567 (1883).

*Geographical Distribution*.—Australia in general; also New Guinea.

*Nest*.—Slightly concave on the top, composed of dead flags or rushes, sometimes with twigs added; lined with the paper-like bark of tea-tree (*Melaleuca*), and placed in water among rushes, &c., or at the base of tea-trees. Dimensions over all, about 12 inches; height (from the water) about 12 inches.

*Eggs*.—Clutch, eight to eleven; oval or elliptical in shape; texture of shell coarse; surface glossy; colour, varies from pale-stone to deep warm-stone, blotched and spotted with chestnut and purplish-brown. Dimensions in inches of selected pairs: A (1) 1.98 × 1.37, (2) 1.98 × 1.4; B (1) 1.95 × 1.33, (2) 1.8 × 1.34. (Plate 19.)

*Observations*.—This interesting Moor Hen is found throughout most parts of Australia, in situations conducive to its habits, namely, swampy localities, and especially the sedge margins of lakes, rivers, and arms of the sea.

My own experience among these birds was of the most pleasant kind, when my companion, Mr. F. Symonds, and I camped on the tea-tree shores of Lake King, Gippsland, Christmas, 1884, in the hope of finding a nest.

In the finest of the Lakes—King—there are several brackish creeks, or arms, extending a quarter of a-mile or so into the elevated sloping shores, clothed with timber and thick scrub and well margined with tea-tree (*Melaleuca*) and sedgy flags. These latter afford a serene and secure retreat for several pairs of Gallinules.

My friend Mr. R. A. Poole—a great lover of birds of the country—built a home here on the shore of Bancroft Bay (the aboriginal name of the locality being Metung). In one of the small creeks, about twelve yards from where Mr. Poole moored his boats, and about one hundred yards from the dwelling, two pairs of Gallinules, or Moor Hens, took up their quarters and became very tame, so that Mr. Poole had no difficulty in observing their habits. They had been there for three seasons, and at the expense of the birds he kindly forwarded me specimens of their eggs, which were described and figured in my Manual, "Nests and Eggs" (1883). A strange circumstance occurred one season—the season of my particular visit. Both pairs of birds reconstructed an old nest, each female laying eight eggs therein, although the task of incubating the combined clutch devolved upon one pair only, Mr. Poole thoughtfully secured for me a pair of each type of this interesting combination set. One pair was similar to the eggs already described by me, while the others were stouter ovals, warm stone-colour, and with markings a reddish-brown, larger, and in the form of patches here and there.

Removing the eggs in no way disconcerted the birds, in fact it was a convenience, because one bird had much difficulty in covering the whole sixteen eggs. In about three weeks the majority of the eggs was hatched, the chickens being attended by *both* pairs of birds.

In another and neighbouring creek, Mr. Symonds and I rudely disturbed the wonted solitude by shooting a brace of birds and robbing a nest containing eleven fresh eggs. The nest was situated in a clump of tea-tree a few feet from the shore. It was heaped up about a foot from the surface of the water, and was constructed of dead flags and tea-tree twigs, and lined with square patches of the paper-like bark of the same trees.

The Moor Hens have not such a happy lot as may be expected in these romantic, sedgy-margined creeks. Troublesome water-rats keep their ranks reduced by destroying many eggs and young. During our trip we shot one of these animals in the very act of destroying a nest. It proved to be the species known as the white-bellied beaver rat (*Hydromys leucogaster*), a perfect monster.

I took exception to the eggs described by Dr. Ramsay and re-described by Mr. North in the Australian Museum "Catalogue," as being incorrect. What I have already said on this point is published in the "Victorian Naturalist" (1893), and need not be here repeated. It was with the utmost deference to such accomplished authorities as Dr. Ramsay and Mr. North that I ventured to dispute their descriptions, and I did it not in the spirit of controversy or fault-finding, but purely in the interests of research.

Dr. Ramsay was good enough to show me the eggs referred to and collected in the Richmond and Clarence River districts by Mr. Mac-

gillivray, 11th January, 1864, which ( $1.58 \times 1.15$ ) are much too small for the Gallinule, resembling those of a Rail, and being exactly like those of *Rallina tricolor*. During a visit to Sydney, 1885, I presented Dr. Ramsay, then the Curator of the Australian Museum, with the birds I shot in Gippsland, together with a pair of the eggs I collected there. When the "Descriptive Catalogue of Nests and Eggs," issued by that Institution appeared, it was natural that I expected to see these specimens, the eggs at all events, referred to, more especially as there had been a dispute about the species. But nothing was mentioned, except again to re-describe the wrong eggs for this species.

Mr. C. French, junr., has obliged me with the following original note of Moor Hens' and Coots' eggs in the same nest:—"Whilst on a visit to the swamp at the rear of the boat sheds at Prince's Bridge, I came across a nest of the Gallinule, or Moor Hen, cunningly hid among the thick reeds (*Arundo phragmites*). When I approached within about ten yards of the nest the Gallinule quietly left and swam away, making a screeching noise. While in the act of taking the eggs from the nest, I was surprised to see, a few yards from me, one of the Coots, which seemed very excited and at once commenced flapping its wings and uttering its well-known harsh notes. On examining the Gallinule's eggs (five), which were almost incubated, I was surprised to see in the nest one egg of the Coot. About a month previous I found another Gallinule's nest containing one egg and an egg of the Coot. Date, 14th December, 1897."

Usual breeding months, November to January, occasionally later.

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### 587.—PORPHYRIO BELLUS, Gould.—(564)

#### BLUE BALD COOT.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 70.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiii., p. 202.

*Previous Description of Eggs*.—Campbell: Victorian Naturalist (1889).

*Geographical Distribution*.—West and North-west Australia.

*Nest*.—Similar to that of the Common Bald Coot (*P. melanonotus*), constructed of aquatic plants, and situated in a swamp.

*Eggs*.—Clutch, five (about); stout oval in shape; texture of shell somewhat coarse; surface glossy; colour, deep-stone, fairly blotched and spotted with brown and purplish-brown of different shades. Dimensions in inches of three examples: (1)  $2.3 \times 1.65$ , (2)  $2.22 \times 1.59$ , (3)  $2.2 \times 1.65$ .

*Observations*.—This exceedingly handsome swamp bird is the western representative of the common Bald Coot, being found probably



in South as well as West Australia. I observed the beautiful Blue Bald Coots in the melaleuca swamps in the neighbourhood of Geographé Bay, but did not succeed in taking eggs. However, during the Centennial Exhibition, held at Melbourne, 1888-9, Mrs. J. F. Irvine exhibited three eggs of this bird from West Australia, which were those originally described by me before the Field Naturalists' Club of Victoria.

In the North-west these birds have been found near the junction of the Fitzroy and Margaret Rivers, where they were seen wading in the shallow swamps, or perched on trees growing in the water. Their habits are identical with those of the common Bald Coot.

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588.—PORPHYRIO MELANONOTUS, Temminck.—(563)

BALD COOT.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 69.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiii., p. 205.

*Previous Descriptions of Eggs*.—Potts: Trans. New Zealand Inst., vol. ii., p. 71 (1870); Buller: Birds of New Zealand (1873), vol. ii., p. 84 (1888); Ramsay: Proc. Zool. Soc., p. 343 (1877); Campbell: Southern Science Record (1883); North: Austn. Mus. Cat., app. (1890).

*Geographical Distribution*.—Northern Territory, Queensland, New South Wales, Victoria, South Australia, and Tasmania; also New Zealand, Norfolk and Lord Howe Islands.

*Nest*.—A somewhat rough and slightly concave structure of rushes or other aquatic plants, built up a few inches above the water, in reeds, tall grass, or at the base of a clump of tea-tree (*Melaleuca*), in a swamp or lagoon. Dimensions, 10 or 12 inches across.

*Eggs*.—Clutch, four to six usually, occasionally seven or more; round oval in shape, or elliptically inclined; texture of shell somewhat coarse; surface slightly glossy; colour, ashy-brown, or stone, sometimes with a dull greenish tone, spotted and blotched, especially about the larger end, with reddish-brown, purplish-brown, and dull-grey. Dimensions in inches of a proper clutch: (1) 2.01 × 1.42, (2) 1.96 × 1.45, (3) 1.95 × 1.44, (4) 1.92 × 1.4, (5) 1.9 × 1.42; of a selected pair: (1) 2.06 × 1.48, (2) 2.02 × 1.47. (Plate 19.)

*Observations*.—This fine large water bird is well known, and has an extensive habitat, being found throughout Australia, except West. Swamps, lagoons, and river margins are places most conducive to its habits. It is especially abundant in Tasmania and the south-east and eastern parts of the mainland.

The Bald Coot has an extraordinary manner of eating its vegetable food. The green stuff is seized between the short hind claw and sole

of one foot, held up, and nipped off rapidly in small pieces by using the powerful mandibles sideways.

The first nest I ever found of the Bald Coot was on one Prince of Wales' Birthday (9th November), many years ago, in the Como swamp (now reclaimed), near Toorak. The nest was situated between the bases of tea-trees, having a depth of water around of about three feet. My last nest was found also during November (1892), in the Murray reed-beds. It was an exciting day. I was accompanied by Mr. J. Gabriel, and, not to mention incidents with tiger snakes, we both had our baskets full of Pied (Semipalmated) Geese, Ibises, and Bitterns' eggs, in addition to two sets (four and six respectively) of Bald Coots'.

In New Zealand, the late Mr. T. H. Potts observed that "the number of eggs to a nest varies considerably, as we have found from two to seven; five may be considered the usual complement . . . . The young run about as soon as they are hatched, and on being disturbed conceal themselves with great art. They are thickly clothed with black velvety down, interspersed with fine hair-like points of silver-grey; legs, dullish red; bill has a yellowish-ivory look which contrasts pleasingly with the rest of the body."

Writing from Darling Downs (Queensland), Mr. Hermann Lau says: "Sultan's Hen (*Porphyrio melanotus*).—Long rushes are trodden down near the edge of a lagoon, in fairly deep water, and some rubbish thrown on top of them. Four eggs are deposited. Breeds October."

Although the Bald Coot usually lays five or six eggs, Mr. J. W. Mellor informs me that in October, 1894, at Lake Albert (South Australia), he found a nest containing eleven eggs. A maximum of thirteen (probably a double clutch) is said to have been seen in New Zealand.

Breeding months August or September to December.

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### 589.—FULICA AUSTRALIS, Gould.—(568)

#### COOT.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 74.

*Reference*.—Cat, Birds Brit. Mus., vol. xxiii., p. 217.

*Previous Descriptions of Eggs*.—Campbell: Southern Science Record (1883); North: Austr. Mus. Cat., p. 326 (1889).

*Geographical Distribution*.—Whole of Australia and Tasmania.

*Nest*.—Bulky (the greater part being submerged), constructed of dead rushes or other aquatic plants, and built up to a few inches above the surface of the water in a swamp or lagoon, where it is always placed. Dimensions over all, 13 to 14 inches; depth, 15 to 17 inches (i.e., 4 to 5 inches above water and balance below); egg cavity, 7 to 8 inches across by 2½ inches deep.



COOT'S NEST

*From a Photo by the Author.*



*Eggs*.—Clutch, seven to nine; oval in shape, or slightly more compressed at one end; texture of shell coarse; surface slightly glossy; colour, dull-white or light-stone, marked all over with freckles and small roundish spots of dark purplish-brown, with an admixture of faint or underlying markings. Dimensions in inches of a clutch: (1)  $2.0 \times 1.4$ , (2)  $2.0 \times 1.36$ , (3)  $1.98 \times 1.32$ , (4)  $1.95 \times 1.4$ , (5)  $1.93 \times 1.37$ ; of a narrower sized set, with a more dusky ground-colour: (1)  $1.99 \times 1.32$ , (2)  $1.98 \times 1.33$ , (3)  $1.96 \times 1.28$ , (4)  $1.94 \times 1.34$ . (Plate 20.)

*Observations*.—The Coot is a frequenter of the more inland waters throughout Australia and Tasmania, but is also found in the swamps and lagoons near the coast. In such places their black forms in scores may be seen scuttling away over the surface of the water, especially if the birds be disturbed. It is a pretty sight to see a party of Coots diving in a lagoon for food. Every now and again one will jump upwards slightly, apparently to gain impetus, before taking a "header" beneath the water, then return to the surface to devour the green stuff recovered from below.

This Coot's eggs are common in all collections, and may be readily distinguished from all their kind by the smallness of the markings.

The late Mr. Gilbert Bateman, in Riverina, once found a Coot's nest containing thirteen eggs, but whether it was a single clutch or the progeny of two birds, he did not know.

In the lagoon, before it was reclaimed for river improvements, at the rear of the boat sheds at Prince's Bridge, Mr. C. French, junr., and I spent an entertaining evening photographing a Coot's nest *in situ*. But it was a picture taken under difficulties. During the operation we were standing in water nearly up to our armpits, and experienced no little trouble in getting the buoyant legs of the tripod to stick in the murky mud beneath. However, reference to the illustration will show that we succeeded. Afterwards Mr. French removed the nest, which was composed of quite an armful of the bamboo-like reeds (*Arundo*).

The Coot is usually a late breeder, but the limits of its season are possibly August and December.

The young in down are black, having yellow hair-like tips, the down thickest about the face and neck; bill, cream-colour.

## ORDER—ALECTORIDES.

## FAMILY—GRUIDÆ: CRANES.

## 590.—ANTIGONE AUSTRALASIANA, Gould.—(543)

## CRANE OR NATIVE COMPANION.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 48.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiii., p. 265.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 291 (1865); North: Austn. Mus. Cat., p. 314 (1889).

*Geographical Distribution*.—Australia in general.

*Nest*.—Flat, consisting of a layer of coarse grass (pulled up by the roots) and reeds, mixed with lumps of hard bark, sticks, &c., and situated on a knoll of ground or "islet" in a swampy situation. Dimensions over all, about 36 inches; height, 5 or 6 inches; diameter at top, 24 inches. Sometimes there is only a semblance of a nest, when the eggs rest upon the bare ground.

*Eggs*.—Clutch, invariably two; usually elongated in shape, pointed or compressed towards one end; texture of shell exceedingly coarse; surface glossy and pitted; colour, light-drab or dirty white, blotched, chiefly about the apex, with umber and purplish-brown. In some parts of the Tropics the eggs are of a uniform dull-white colour, without markings. Dimensions in inches, large examples: (1) 3.9 × 2.45, (2) 3.7 × 2.65; small examples: (1) 3.65 × 2.4, (2) 3.5 × 2.35. (Plate 20.)

*Observations*.—In the large and familiar figure of the Native Companion, or Australian Crane, we have a conspicuous plain wanderer. Like the Wild Turkey, it is common in most parts of Australia, where it is the sole representative of its kind. It has a soldier-like appearance in its uniform of grey, with red *facings* (the bare flesh about the face and back of head is bright-red). The extraordinary quadrille parties, and grotesque motions in capering "corroborees" of these birds have been witnessed with pleasure by most dwellers of the plain.

It is to be regretted that the name of the Native Companion was ever removed from the Victorian Schedule of Protected Birds, for it is an exceedingly ornamental bird, and its figure greatly enhances the charm of any landscape; moreover, it kills vermin, such as snakes, while its flesh is good for the table. It is somewhat remarkable that the Crane does not occur in the south-western part of Australia, although I have included West Australia in the geographical range,

because I possess evidence of individuals having been seen to the west of Eucla, and once on the Ashburton. However, the birds are plentiful in the North-west, above Lagrange Bay.

Two nests I observed near the Murray River in both instances were in a swamp, and appeared to have been built by the birds digging about and heaping up the earth, grass, and other vegetable matter. "Rusticus" in contributing some interesting information to the columns of "The Australasian," in October, 1886, with regard to the nesting of the Australian Crane, stated that, in the course of an extensive experience, he found wet or swampy ground always chosen by the bird for its nesting place, usually swamplets, called crab-holes, in which case the bird will select the most elevated site obtainable. The tiny islets usually found in swamplets, just large enough to accommodate a nest, are amongst the bird's favourite building sites. Sometimes, however, the Native Companion selects deep and dense swamps; the birds will then build a huge nest of tussock grass, raised high above the surface of the water. The nest is almost flat on the top. Usually when the nest is approached the sitting bird walks slowly away, turning round now and again, and uttering a hoarse, discordant note, which is answered by her mate, who is never far distant. Sometimes the two birds will be found feeding in close proximity to the nest. This is before the hen has commenced to sit; at this time they seem to care very little for the fate of their nest if approached. Cutting a few grotesque capers and uttering their peculiar harsh cry, they take wing for a few hundred yards, then settle down and resume feeding. "Rusticus" further remarked he had observed that Native Companions stick to the same swamp year after year, and build as close to the old spot as possible, although never using the same nest twice. It is not uncommon to see two pairs of birds building in the same swamp, while on one occasion he found no less than three nests, containing eggs, in a swamp not half-a-mile in extent.

A Native Companion's nest I had the opportunity of examining myself was situated on a little grassy rise, about three or four yards across, in a swamp amid dead timber. Two dead thistles stood near the nest, which contained one egg, and is the one described above. The birds were seen perambulating at a respectful distance away.

In a swamp, near his camp at Mordialloc, Mr. H. W. Wheelwright once found a Native Companion's nest. The nest was built high, of dry rushes, and contained the usual complement—a pair of eggs. Another time he captured a half-grown bird, which was kept at his tent for a long time. That was in the early "fifties."

A pair of birds, bred at the Zoological Gardens, Melbourne, where, Mr. Dudley Le Souëf states, the birds selected a dry knoll in swampy ground, about four feet away from water. The nest was of the rudest description, being only a few sticks and leaves, and the eggs themselves were really on the bare ground, where a slight depression was made. The hen bird mostly sat, the male sitting by the nest when she was off feeding, apparently looking after it. However, it was found that towards the end of incubation the male bird took turns at sitting. He was very savage, and drove any other birds away from the vicinity.

It is known that at times Native Companions fight desperately to defend their eggs against intruders, and woe betide the being that comes in contact with their sharp bills. The breeding months are from June to November, and probably later, according to the country and the seasons, or as soon as there is sufficient rain.

After breeding season the Cranes would appear to be gregarious, assembling in flocks of scores and even hundreds, especially in the Murray River district. When in the vicinity of the Moira Lakes, March, 1893, at sunrise one morning I witnessed a glorious sight. The moist tract in the centre of a dry lake-bed, on the Victorian side, was covered with Cranes, which at a distance resembled a flock of sheep. The birds were unsettled, and were coming from the Moira Lake, on the New South Wales side, in companies of about a score, filling the air with discordant cries. Others, with heavy flight, were winging their way over the red gum-trees towards the rising sun, to feed on the plains or the cleared ground beyond.

One morning in Queensland I watched a wild dog sneaking after a Native Companion. When the quadruped came too near, the bird simply gave a few leisurely flaps of its great wings, and placed a convenient space betwixt itself and the dog. This performance was repeated several times, but whether the dingo eventually secured his prey or gave up the chase in disgust (as I am inclined to believe he did) I had not time to ascertain. Native Companions are frequently offered for sale in the Melbourne market. It was only the other week I saw six hanging in a shop. After being hung for a few days and then stuffed with good gravy-beef they are excellent eating, and quite equal to the Bustard or Wild Turkey.

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#### FAMILY—OTIDIDÆ: BUSTARDS.

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591.—EUPODOTIS AUSTRALIS, J. E. Gray.—(195)

#### BUSTARD OR WILD TURKEY.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 4.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiii., p. 328.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 209 (1865); Ramsay: Ibis, p. 417 (1867); North: Austr. Mus. Cat., p. 297 (1886).

*Geographical Distribution*.—Whole of Australia.

*Nest*.—Sometimes indicated by a few twigs or grasses, but is more frequently the bare ground in open situations or on a grassy knoll of a plain.



*Eggs.*—Clutch, one to two usually; rare occasions three; nearly elliptical in shape; texture of shell coarse; surface glossy, with usually a few limy nodules; colour, olive, obscurely mottled or smeared, chiefly in a longitudinal direction, with olive-brown. Occasionally an egg has a dull, greenish ground-colour, or is of an entirely bluish shade. Dimensions in inches of five selected examples: (1)  $3.3 \times 2.32$ , (2)  $3.27 \times 2.3$ , (3)  $3.13 \times 2.25$ , (4)  $3.12 \times 2.25$ , (5)  $3.2 \times 2.14$ . (Plate 20.)

*Observations.*—This noble bird roams throughout Australia, and may be found in most localities conducive to its habits, such as the plains. How majestic the Bustard looks as it paces slowly, with head erect! The general plumage is dappled-grey, with yellowish legs and bill. The male bird, which averages about 18 lbs. weight, is much larger than his mate; and also has the long, light-grey plumes about the neck of greater length. Therefore, as far as the pair is concerned, he has, undoubtedly, the "lordly" appearance. Their flesh, although somewhat dark in colour, is well flavoured and excellent eating; but, like all game, it most decidedly improves by keeping. "God provides the food, but the devil the cooks," as the saying goes. Many a fine Bustard has been pronounced tough and tasteless simply because it was cooked before the feathers were scarcely cold, instead of having been hung for three or four days, or a week, if possible. The Wild Turkey has learnt instinctively the value of its flesh, for it has become "mighty" shy, and can only be procured by stratagem. The best mode is shooting from horseback, or from some vehicle. Referring to my diary for 1877, I find the following note *re* stalking Wild Turkey:—"Two buggy parties out, the clergyman's son and myself occupying one. Upon reaching a great, dry salt-bush plain we separated. The other buggy soon became lost to our view in the distant dancing mirage. Turkeys tolerably numerous—some flying in pairs in their own singular fashion, with heavy flight and outstretched necks; others stalking erectly through the salt-bush, now and again 'planting.' Selected one and commenced a process of great-circle-sailing round it. 'Will the horses stand fire?' 'The near one will. I've never tried the other; he can but kick up,' was my companion's quiet reply. Circles becoming smaller—bird evidently uneasy, glancing first from one side and then the other, at the same time quickening his footsteps. Now within shooting distance. 'Pull up!' Instantly the bird rose with outstretched wings—a good target of over fifty inches in expanse of wings. From the seat in the buggy I fired. 'Good shot! That's bagged him!' A fine male bird, about 14 lbs. weight, was soon on the floor of the buggy. Had a few more shots. Fancy my shot was rather light, as I plucked a bunch of feathers out of another 'chap' which flew away, apparently unhurt. Was delighted with the behaviour of the horses. They were evidently up to the business, because when I fired over their ears they never as much as moved a muscle. On arrival home at evening we ascertained the other buggy party had bagged three birds."

There have been arguments about the weight of Wild Turkeys. Gould records the weight from 13 lbs. to 16 lbs., remarking that the male considerably exceeds the female in size. A well-known game dealer in Melbourne who used to have many birds passing through his hands quoted

18 lbs. as a fair weight ; while a sporting gentleman in Western Australia informed me that his bag of Turkeys for three months of the season 1889 was 44, the average weight being 14 lbs. or 15 lbs. In one instance only the maximum of 21 lbs. was reached.

Though these useful birds are now protected all the year round in Victoria, we hear whispers of their being served up at electorale dinners in the northern provinces. This is very wrong. What is the use of asking our legislators to extend better protection to our useful and ornamental birds when they are the first to transgress their own enactments? Why are Bustards becoming so scarce? Partly on account of their destruction, and partly on account, says an accurate observer, of the depasturing of stock, which destroys the birds' favourite feeding-grounds. Even the aborigines notice this, and discard their own language to express more forcibly to you that "*blank* jumbucks (sheep) walk, walk ; cat, cat ; never sleep ; hunt 'em everything away."

The Bustard has a habit of "planting" or feeding behind cover when danger threatens. When erect, it stands between three feet and four feet in height, and has, when walking, a slow and majestic carriage. On the wing, also, it is easily recognised by its heavy flight, with long, out-stretched neck. Its food consists of grasses and other vegetation, lizards, insects, chiefly locusts, &c.

Respecting the habits of birds coming in to drink, I am informed by Mr. H. W. Ford when in the interior of New South Wales, between the Paroo and Warrego Rivers, 1883-4-5, he noticed that the Wild Turkey (Bustard) never flies right up to the water, but always settles two hundred or three hundred yards away, and walks in. Sometimes, he thinks, they walk in miles, because he never saw one fly right in, but has noticed them walking in over half a mile on the plains. They come to water morning and evening, and sometimes through the day.

"Bush Naturalist," in writing for "The Queenslander," 22nd June, 1878, gives his observations as to how the natives catch the Wild Turkeys. Out of the shaft of one of the wing feathers of a Turkey they make a sort of elastic top to a thin rod till it bends over like a gig whip: this top is made by splitting up a feather shaft and then twisting it up again (something like the way in which a stockman twists the 'cracker' at the end of his whip). As this is being twisted, they incorporate with it a thin string made out of the hair of the gins (not traps), and finally finish off with a noose of gin's hair ; the whole apparatus is not unlike a fly-fisher's rod. Armed with this and an ordinary light spear, the black, having noted some Turkeys, starts off, ties the thin rod on to his spear, and actually manages to get so close to the Turkey as to put the noose over the bird's neck, and this, too, in broad daylight, and with no cover to hide himself in, except ordinary long grass."

Great have been the arguments whether the Bustard lays one or more eggs. The disputants on both sides—those who hold to the single egg and those who are satisfied as to the plurality—are correct, because I learn from a bush naturalist and keen observer that the Wild Turkey, as he calls it, lays one, sometimes two eggs, according to the seasons being good or indifferent. Further, it was his experience that in

bad or seasons of drought they did not lay at all. About the season of 1867 he recollects observing three eggs in one nest on the Lake Boga run (Victoria).

The following are the data I have collected bearing on the number of eggs laid by the Bustard.

Notes from Western Australia, by Mr. Tom Carter:—

“One egg appears to be the usual number.”

“2nd October, one egg.”

“1st August, 1892, found nest with two fresh eggs—Point Cloates.”

Observations in South Australia by my uncle, Mr. Thomas Pinkerton:—

“Often took one, but frequently two.”

“About 1866, on Maoup Run, about eleven miles north-west of Penola, saw three young, apparently just hatched, in one nest.”

New South Wales.—“September, 1887. A friend put bird off two eggs, near the Lachlan.” Mr. R. J. Dalton (Paroo), 24th September, 1897, found “two Turkeys’ nests, one egg in each.”

Queensland.—“Only lays one egg; sometimes, but rarely, two” (Lau).

North-west Interior.—“Never saw more than one young” (Price Fletcher).

Both Gould and Dr. Ramsay state that a pair of eggs is the usual complement.

The sexes are said to keep apart in flocks, except in the breeding season. During that period the male Bustard has a curious habit of “showing off,” as the children would say, by ascending a slight knoll or eminence on the plain, where he makes frills of his feathers and cuts all sorts of capers, majestic or otherwise.

Breeding months include June to November, but chiefly September and October. A relation of Mr. J. T. Gillespie found a fresh egg in Central Queensland in the middle of March (1898).

## ORDER—LIMICOLÆ: PLOVERS, &amp;c.

## FAMILY—ŒDICNEMIDÆ: THICK-KNEES.

## 592.—BURBINUS (ŒDICNEMUS) GRALLARIUS, Latham.—(496)

## STONE PLOVER.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 5.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 18.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 211 (1865); Harting: Proc. Zool. Soc., p. 458 (1874); Ramsay: Proc. Zool. Soc., p. 335 (1877); North: Austr. Mus. Cat., with fig., p. 297 (1889); Campbell: Proc. Austr. Assoc., vol. v., p. 423 (1893).

*Geographical Distribution*.—Whole of Australia and Tasmania (accidental).\*

*Nest*.—Eggs are deposited on the bare ground.

*Eggs*.—Clutch, usually two, in two known instances three; elegant in shape and inclined to oval; shell thin and comparatively fine in texture; surface slightly glossy; colour, pale-stone or light-buff, blotched all over, sometimes with large markings of umber and dull-slate. In some sets the markings are smaller or finer in character. In a handsome pair taken on the Werribee Plains, Victoria, the umber colouring predominates on one example, while on the other the dull-slate has prominence. There is a perceptible difference in specimens from Western Australia, which are warmer in general tone of colour, shorter in length, and decidedly rounder in shape. Dimensions in inches of proper clutches from Eastern and Western Australia:—

EASTERN EGGS.			WESTERN EGGS.		
Clutch A	(1)	.. 2'41 × 1'57	Clutch A	(1)	.. 2'13 × 1'61
	(2)	.. 2'35 × 1'6		(2)	.. 2'21 × 1'59
.. B	(1)	.. 2'31 × 1'57	.. B	(1)	.. 2'12 × 1'6
	(2)	.. 2'28 × 1'58		(2)	.. 2'11 × 1'61
.. C	(1)	.. 2'3 × 1'51	.. C	(1)	.. 2'02 × 1'51
	(2)	.. 2'28 × 1'51		(2)	.. 2'01 × 1'55

(Plate 21.)

*Observations*.—The Stone Plover, erroneously called a "Curlew," is a well-known bird, being common to the whole of Australia. It is so

\* Two birds are reported to have been obtained in Tasmania—one at Spring Bay, April, 1895, and the other at Swansea, July following. Proc. Roy. Soc. Tasmania, p. xxiii. (1894-5).

well known that we have only to mention its grey-mottled plumage, which is lighter in colour upon the underneath parts of the body, its large yellow eyes and long pale yellowish-green legs; the bird stands about two feet in height. Whether in the tropical forests of Queensland or the vast woods of Gippsland or the drier tracts of the interior provinces and of Western Australia, every dweller of the bush is familiar with the weird melancholy calls of the bird at night. Mr. Henry Seebohm, in his great work, "The Geographical Distribution of the family *Charadriide*, or the Plovers, Sandpipers, Snipes, and their Allies," has left very few *stones* unturned, but in re-naming our bird at the "Eastern" Australian Stone Curlew, and in quoting his able friend Mr. J. E. Harting for reference for the description of the egg, he overlooked the fact that Mr. Harting's specimen was taken in Western Australia.

It has been remarked that the eggs of Stone Plovers frequenting the plains north or west of the Dividing Ranges are smaller in size and have the markings more blurred or less defined than those on the coastal side. It will be observed by the dimensions given above that the eggs from Western Australia are decidedly smaller. When on my visit, I heard there were two varieties of Stone Plovers in the western territory—the larger being a dark bird, and the smaller light-coloured. But what we hear is not evidence, and the thing lacks confirmation. Yet there may be something to account for the smaller-sized eggs from the western parts, especially when we remember that Gould hinted at a second race of these birds in Australia.

During my brief sojourn in the Cardwell district, Northern Queensland, August, 1885, I was surprised to see large flocks, perhaps fifty or sixty birds, of Stone Plovers camping in the open forest glades. Probably it is a habit, especially amongst younger birds, to congregate in winter before dispersing southward or elsewhere to breed.

Breeding months include August to December, and probably January. Early in September I recollect picking up, near Lake Tragowel, Victoria, a pair of eggs, just chipped; by night the chickens were hatched, able to stand up and feed themselves. The prevailing colour of the young in down is a light grey, with a dark marking in the shape of an oval line extending from the head to near the end of the back, dark lines also extend from the wings towards the tail. The parent birds at times feign lameness or perform other scheming actions to attract intruders from the vicinity of their young. The young, if alarmed, hide themselves and lie quite motionless, with necks outstretched, rendering their discovery a matter of difficulty. A farmer friend of mine was always able to checkmate the Stone Plovers by the aid of a sagacious cattle dog. During breeding season, if he noticed a bird running away in a suspicious manner, when he crossed the trail, he would send the dog back along the line and so pick up the eggs or young.

As the Stone Plover is the initial species in the fascinating Order of the *Limicolæ*, I should like to direct attention to the fact that where a pair of eggs is the usual complement laid by any species, the egg possessing the sharper point (at the smaller end) is nearly in every case the longer egg. No doubt the difference in shape and length may be attributed to the sexual difference of the embryos, and that the more

lengthened or the sharper-pointed egg is the male. In the dimensions given above of the six clutches of Stone Plover eggs, the No. 1 eggs (which have the sharper ends) are the longer in every instance except one. It will be further seen that this rule applies to other species as they come under our notice. With reference to the longer and sharper-pointed eggs, I may mention that a relative of mine experimented with a setting of domestic fowls' eggs, selecting the longest and most pointed examples, and all, without exception, hatched out male birds.

A Stone Plover killed by a farmer had two mice in its stomach, besides several scorpions. The bird was shot at night, near a dam, and was taken in the darkness for a duck. The Stone Plover is evidently a useful bird as a vermin destroyer.

I shall conclude with my last reminiscence of Stone Plovers. I was fishing on the Murray one summer night, some distance from home, when my horse cleared off, so I elected to remain in the scrub all night. Stone Plovers were very numerous, and I amused myself by trying to put their weird calls into the tonic sol-fa system, but failed. First one bird would utter five or six preliminary wails, preceding an interval of faster cries, then a finale of a jumble of sounds, as if more than one bird were taking part.

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593.—*ORTHORHAMPHUS (ESACUS) MAGNIROSTRIS*. Vieillot.—(497)

LONG-BILLED STONE PLOVER.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 6.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 22.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 214 (1865); Hume: Nests and Eggs Indian Birds (1875), also Oates' ed., vol. iii., p. 334 (1890).

*Geographical Distribution*.—North-west Australia, Northern Territory and North Queensland; also New Guinea and Malayan Archipelago.

*Nest*.—The bare ground merely, or a small depression in the sand, a little above high-water mark.

*Eggs*.—Clutch, one, or probably two; inclined to oval in form; texture coarse; surface slightly glossy; colour, stony-grey, somewhat boldly blotched and splashed with dark-olive and dull-grey. Dimensions in inches of single examples: (1) 2.59 × 1.78, (2) 2.4 × 1.8. (Plate 21.)

*Observations*.—This Stone Plover differs from the southern bird in having a conspicuous white bar across the shoulder, also more white about the face, with a bill drawn out to apparently an inordinate length; hence the name Long-billed Stone Plover. It prefers the seashore and oozy mudbanks, to regale itself on small crabs and other low organisms,

while the southern Stone Plover loves rocky plains and open forest country. The Long-billed Stone Plover has been found as far south on the western coast as Point Cloates.

Gould was favoured with a specimen of this fine bird's egg from Commander J. M. R. Ince, who obtained it in the Port Darwin district.

The example in my collection was kindly presented to me by Mr. Dudley Le Souëf, who obtained it during one of his trips to the Cooktown district, 1894.

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## FAMILY—CURSORIIDÆ: COURSERS.

594.—*STILTIA ISABELLA*, Vieillot.—(515)  
*Glareola grillaria*, Temminck.

### PRATINCOLE.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 22.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 51.

*Previous Descriptions of Eggs*.—Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii. (1882); Campbell: Southern Science Record (1883); North: Austr. Mus. Soc., pl. 16, fig. 9 (1889); Campbell: Proc. Austr. Assoc., fol. v., p. 438 (1893).

*Geographical Distribution*.—Australia in general; also New Guinea, Aru Islands, Ké Islands, Moluccas, Celebes, Flores, Java and Borneo.

*Nest*.—Usually a bare spot where the earth or sand assimilates the colouration of the eggs.

*Eggs*.—Clutch, two to three, usually two; at first sight not unlike those of the lighter coloured type of the Black-fronted Dotrel (*Egialitis melanops*), with the exception of being proportionately larger, rounder and not so pyriform in shape; surface slightly glossy; colour, usually yellowish-buff or stone-colour, but sometimes of a deep stone shade, lightly marked almost all over with spots and splashes of umber, intermingled with patches of grey. Dimensions in inches of proper pairs: A (1) 1.29 × .94, (2) 1.23 × .95; B (1) 1.25 × .96, (2) 1.22 × .97. (Plate 21.)

*Observations*.—Authors agree that this swallow-like Plover is the most elegant of its genus. The general colour of the bird is reddish-brown or rufous, with a darker marking of rich chestnut on the abdomen; the feet and legs are black, and the long black pinions extend, when folded, 2½ inches beyond the tail. Altogether the Pratincole possesses a swallow-like appearance, especially with its long pointed wings, which give the bird a great power of flight, enabling it to take its food (insects of various kinds) on the wing if it chooses, while it is equally at home running swiftly over the ground with its slender legs after insect prey. The total length is about nine inches.

It may be deemed a rare bird, and is particularly an inhabitant of the red plains and sandhills of the interior provinces of the Continent. In the vicinity of Adelaide they appeared suddenly one year; and on the plains of Riverina they were tolerably plentiful during the season 1896.

Mr. Stafford C. Currie kindly sent for my collection a bird and a pair of eggs, collected by him at Puckawidgee, near Deniliquin, 14th November. They were an exceedingly light coloured pair. A second nest was found by him on the 21st. I also received from Mr. Herbert Brown, Kildonan, a beautiful pair of eggs, found by him the following month on the plains of Urana. Mr. Brown writes: "When the Pratincole alights on the ground after flying, it raises and lowers its body after the manner of larks, and has a habit of bobbing its head up and down like a Sandpiper or Plover. It lays its eggs on the ground, merely scraping a slight hollow. A good mother-bird uses many devices to attract attention to herself to withdraw you from the nest."

The specimens I had previously were odd examples from the Mitchell district, Central Queensland, and were found by a brother of our Tasmanian oologist, Mr. Geo. K. Hinsby. The specimens I described in 1883, which were from Mr. H. H. Peck's collection, were taken in the Darling district, New South Wales. However, Dr. Ransay first described the species the previous year from Mr. E. G. Vickery's collection, who procured them near Wilcannia, in September, 1880.

The breeding months, so far as we possess knowledge at present, appear to be from September to January. Several pairs of eggs were found by Mr. S. W. Jackson in October (1898), on the hard clay on the edge of a swamp near South Grafton, New South Wales—a most unusual locality.

In his "Notes on the Habits, &c., of Birds Breeding in the Interior of New South Wales,"\* Mr. K. H. Bennett states concerning the Pratincole that: "This somewhat singular bird is one of the few migratory species that visit this part of the colony and remain during the intense heat of summer. As a rule it arrives towards the end of September and departs about the end of February. During that interval it breeds; and the places for this purpose, and, in fact, its habitat during its stay, are the bare patches of ground, entirely destitute of vegetation, so frequent on the plains here. Some of these bare patches are of considerable extent, and the surface of the ground is broken up into countless small pieces, the size of a pea to that of a walnut, giving the appearance of having been chipped over with a hoe. This is partly due to the nature of the soil and to the intense heat and dryness of the climate, which cause the surface to crack in all directions and become quite loose. It is on these loose patches that the Pratincole deposits its eggs, two in number. It makes no nest, but simply lays its eggs on the bare surface of the loose broken ground; and so much do they assimilate in form and colour to the surrounding lumps of earth, that unless the bird is seen to move off them a person might walk on them and not observe them; and on several occasions I have taken my eyes off the spot for a few

\* P. L. S., N. S. Wales, vol. x, p. 168 (1885).



seconds and then had considerable difficulty in distinguishing the eggs again.

"As a rule, the eggs are laid in October; but this year (1884), for the first time, I obtained them in September. Usually the bird is very shy, but during the period of incubation it loses this shyness, and both parent birds will allow themselves to be approached quite closely, and seem regardless of danger in their anxiety to protect their eggs or young. In fact I have seen the female bird so loath to quit the eggs that it was only when I touched her with my hand that she would quit the nest, pecking savagely at my hand several times before she did so; the male bird, in the meantime, lying flat on the ground, with outstretched wings, a few feet off, uttering the most plaintive cries."

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595.—GLAREOLA ORIENTALIS, Leach.—(516)

ORIENTAL PRATINCOLE.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 23.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 58.

*Previous Descriptions of Eggs*.—Hume: Nests and Eggs Indian Birds, (1875), also Oates' ed., vol. iii., p. 319 (1890); Campbell: Southern Science Record (1883).

*Geographical Distribution*.—West and North-west Australia, Northern Territory, Queensland and New South Wales; also extending through the Malayan Archipelago to Burmah and India.

*Nest*.—A slight hollow on the bare ground.

*Eggs*.—Clutch, two to three; round oval in shape; texture of shell comparatively fine; surface without gloss; colour, dull yellowish-stone, heavily blotched with dark-umber, almost black, and cloudy sepia or dull greyish-black. Dimensions in inches of a pair: (1) 1.3 × 1.0, (2) 1.25 × 1.0. According to Hume, the average measurements of a considerable series are: 1.18 × .93.

*Observations*.—The Oriental Pratincole wanders or migrates from Asia to the northern parts of Australia, where it sometimes appears in countless numbers. It has been found as far south as New South Wales. This Pratincole has a more chubby appearance than the other species, and is a greyish creature, with an oval marking of spots on the throat.

In Hume's "Nests and Eggs of Indian Birds," Mr. Eugene Oates, who has invaded the nesting haunts of the Oriental Pratincole in Pegu, Lower Burmah, gives the following interesting information:—"I have found eggs of this species from the 16th April to the 1st May, on which latter date some eggs were fresh, but others much incubated. Three appears to be the maximum number of eggs, but two only are more

frequently laid. The eggs are deposited on the bare ground, burnt-up, sandy paddy-fields being much frequented. No great number of birds breed together, nor have I ever found two nests very close to each other. The finding of eggs is consequently very laborious work. When disturbed, the sitting bird flies round one's head for a short time and then goes away. But when the young are lying hid, then the birds display great anxiety, and it is on these occasions that the bird squats on the ground with wings outspread and neck stretched out. I fancy this action is meant to counterfeit lameness, and so draw the intruder off the scent. The young bird runs as soon as it is hatched. Its colour is a mixed pepper and salt, the black preponderating."

So much for the bird in its Oriental home. But it has been left to Mr. G. A. Kearland, as a reward for his enthusiasm as a field naturalist, to observe and describe wonderful flocks of these birds in their Austral quarters and by-way, extending the locality of the species to North-west Australia, where he procured several skins near the Fitzroy River. In the "List of Birds" of the Calvert Expedition (1897), Mr. Kearland writes: "During January I noticed a flight of strange birds, which afterwards proved to be this Pratincole, about a quarter of a mile from the telegraph station. I ran for my gun, but was surprised to see the birds rising from the ground like a continuous column of smoke and circling overhead until they spread out so as to almost obscure the sky. I was within one hundred yards of them when the last bird left the ground. After soaring and rising in the air they disappeared in a southerly direction. For about a month afterwards they were seen in large flocks nearly every day coming from the West, and later in the evening returning in that direction. They came in a similar manner to a flight of Swifts, scattered over a wide area and circling or dashing along in pursuit of insects. Those shot had their gullets filled with beetles and grasshoppers. Owing to their tender skin I found it difficult to obtain specimens. Although a number was shot, those which fell any distance were ruined by striking the ground, as the concussion invariably knocked off large pieces of skin. The examples secured were shot whilst skimming over a swamp, from which they were retrieved by a little black urchin about eight years old. The natives were very indignant at my shooting these birds, and a deputation from the blacks' camp explained for my edification that if I killed any more a big rain would come and never stop until it had washed everything away. The appearance of this bird is regarded by residents of North-west Australia as an indication of the approach of rain, and it is locally known as the 'Little Storm Bird.'"

The eggs of the Oriental Pratincole in my collection were collected at Akyab, Burmah, season 1885.

## FAMILY—PARRIDÆ: PARRAS.

## 596.—HYDRALECTOR GALLINACEUS, Temminck.—(569)

## COMB-CRESTED JACANA (PARRA).

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 75.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 79.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 332 (1865); Ramsay: Ibis, p. 417, pl. 8, fig. 3 (1867); North: Austr. Mus. Cat., pl. 16, fig. 8 (1889).

*Geographical Distribution*.—North-west Australia, Northern Territory, Queensland, and New South Wales; also Celebes and Borneo.

*Nest*.—Composed of a pile of green aquatic plants, half submerged in the water of a swamp, or placed upon aquatic vegetation about twenty to forty feet from the shore. Dimensions over all, 6 to 9 inches; egg cavity, which is flat,  $3\frac{1}{2}$  inches across.

*Eggs*.—Clutch, four, rarely five; pyriform or Plover-like in shape; texture of shell fine; surface exceedingly glossy; colour, yellowish-olive, curiously marked all over with interlacing lines of various widths of dark-brown or black, forming here and there irregular-shaped blotches. On account of their singular appearance, these eggs cannot possibly be mistaken for those of any other species. Dimensions in inches of a proper clutch: (1)  $1.2 \times .85$ , (2)  $1.2 \times .84$ , (3)  $1.17 \times .85$ , (4)  $1.11 \times .81$ . (Plate 21.)

*Observations*.—This remarkable species—remarkable chiefly because of its expansive feet, so beautifully adapted for traversing floating foliage on the surface of lakes and lagoons—is a tropical and sub-tropical form.

Dr. Ramsay says: "I know few more pleasing sights than a troop of this handsome Parra wandering among bright-blue and crimson blooms of the giant water-lilies which abound in almost every sheet of water of any extent in North-eastern Queensland."

Although the Parra or Jacana is more frequently observed in Northern Australia, it is common in some parts of New South Wales, notably the Clarence River district, said to be its most southern limit.\*

In his work, "Among Cannibals," Lumboltz, mentioning the Parra or Lotus Bird, says: "Its simple nest is built upon the leaves of the water-lily. The young look funny, on account of their long legs and big toes as compared with their small bodies."

\* The bird I reported in the "Victorian Naturalist," from Victoria, in the collection of the Government Entomologist (Mr. Charles French) Melbourne, was an error. I subsequently ascertained that although the specimen was purchased as a Victorian species, it really was procured on the Clarence, N.S. Wales.

Mr. S. W. Jackson, of South Grafton, Clarence River, New South Wales, has been very successful among the Parras' nests in his district, and has carefully observed the habits of the birds in their swampy haunts. To Mr. Jackson I am indebted for a most handsome set of eggs, which was accompanied with the following interesting data, and, excepting Gilbert's graphic account, as furnished in Gould, probably the best personal observation made of the bird in Australia:—"I find the Parra breeds from October to January in the swamps in this district. There is always a great difficulty in finding the nests. I have sat on the edge of a swamp for six hours watching a pair of Parras and then I did not find the nest. As soon as the Parras see a person approaching the swamp, the birds, first of all, try to sink their small damp nest a little below its general level. This is done by both male and female standing on the nest at once; after this operation is performed, both birds fly to the other end of the swamp and remain there a considerable time. I have also noticed that the Parra, when she is sitting on the nest, pretends to be feeding if anyone is near or any cattle wade out near the nest, which is not built in reeds but in thick clumps of aquatic plants along the edges of the swamps, about twenty or thirty feet from the margin. The nest measures, when in the water, nine inches across, but when taken out and the aquatic plants die, it only measures six or seven inches across. The eggs are usually four in number for a sitting; but on two occasions I found five in a nest. The eggs are placed in the wet nest with their smaller ends pointing inwards. These nests are much smaller than those of *Podiceps nova hollandiæ*, and are always much greener, with vegetation, &c."

To Mr. Jackson I am also much indebted for the splendid illustration depicting a nest of the Parra resting upon a floating orbicular leaf of the water-lily, surrounded by a crop of beautiful flowers.

Breeding season, September to February.

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## FAMILY—CHARADRIIDÆ: PLOVERS.

### SUB-FAMILY—ARENARINÆ.

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597.—ARENARIA INTERPRES, Linnaeus.—(532)

### TURNSTONE.

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 39.

*Reference.*—Cat. Birds Brit. Mus., vol. xxiv., p. 62.

*Previous Descriptions of Eggs.*—Various.

*Geographical Distribution.*—Whole of Australia and Tasmania; also almost the rest of the world, breeding towards the north.



HOME OF THE PARRA (JACANA)

From a Photo by S. W. Jackson.



*Nest.*—A mere depression in the ground, lined with a few grass-bents. Situated on a sandy or rocky soil in a bare place, or on a flat covered with heath and a few stunted bushes (Butler).

*Eggs.*—Clutch, four; pyriform in shape; texture of shell fine; surface glossy; colour, greenish-stone, boldly daubed and smudged, especially on the larger end, with umber—some of the markings have the appearance of having been wiped on obliquely with a brush; other faint grey markings also appear. Dimensions in inches: (1) 1.55 × 1.14, (2) 1.55 × 1.12.

*Observations.*—The Turnstone is a thorough "globe-trotter," distributing itself about the seashores of the world, of course including the coast-line of Australia and Tasmania. My only sight of this lively, restless nomad was on the mushroom-shaped limestone rocks known as Houtman's Abrolhos, off Western Australia, where I observed small flocks of sixes and sevens about the reefs at low water. They were scarcely in adult plumage. The male and female, when fully grown, are alike. Forehead, eyebrows, an oval spot before each eye, the centre of the throat, ear-coverts, nape of neck, lower part of back, abdomen, and under tail coverts are white, the rest of the plumage is either reddish-brown or black, the black on the chest especially being striking. It has a black bill about one inch in length, with eyes to match; the legs and feet are a rich orange. Altogether it is a smart, plump creature, about eight inches in total length. In youth the plumage is more mottled, but in all seasons and ages the Turnstone may be at once recognised by its pure white throat. The chief food of the Turnstone is shell-fish and insects and worms, which it picks up amongst the stones (hence the name Turnstone, I suppose) or seaweed. It breeds in June, on the shores of the Arctic Ocean in Europe, Asia, and America.

In 1833 Mr. Hewitson, the celebrated oologist, and his companion, Mr. Hancock, were the first naturalists to bring the eggs of the Turnstone to Britain.

Of the forty-five or forty-six species of *Charadriidae* (the general name for the family of the Plovers, the Sandpipers, and the Snipes—some call them *Limicolæ*, which, literally, means dwellers in mud) found in Australia, over a score, or half their number, retire annually to the Arctic regions to breed. Why do so many return towards the Arctic regions with such surprising regularity? Mr. Seebohm states that the *Charadriidae* are unquestionably an Arctic family. They probably originated on the shores of the polar basin, and it is not improbable that their habits of migration were acquired in the Arctic regions, untold ages ago, when the conditions of life near the pole were very different from now. The first migration was probably in search of light during the two or three months the sun failed to appear above the horizon. The habit of migration thus formed became rooted in the species, in accordance with the law of heredity (we usually call it instinct), and doubtless grew in force during the glacial epoch, when intense cold prevailed at the poles and in regions now temperate, compelling the flocks to extend their migrations until the shores of the rest of the world had been visited by them.

The migration lasts about a month, but in our spring time (the autumn of the north) it is not an uncommon thing to see a straggler or two arrive in advance. They are supposed to be barren or odd birds which have been unable to mate, or birds whose nests have been destroyed too late in the season to allow a second nest to be made. Having nothing else to do they give way to the migratory instinct, not being checked by the parental one, and drift southward before the main body. This premature migration has its uses. When migration begins, the young birds are the first to move. They have inherited an irresistible impulse to start, and are doubtless led off by the barren birds and old bachelors. When the new birds have left (they appropriate the first week), the second week generally marks the departure of the males, most of the females setting off during the third week, whilst the fourth week is left to the cripples, which come straggling in as best they may—birds which have lost a leg, or some of their toes, &c. (While at Houtman's Abrolhos I shot a Little Sandpiper (*Limonites ruficollis*) having only one leg and a stump.) In the return journey the order is slightly varied; the adult males go off first, then follow the adult females, who are followed by the young birds, and the cripples bring up the rear.

The length of the journey in some instances is marvellous. The distance from the Arctic Circle to New Zealand is approximately eight thousand miles.

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SUB-FAMILY—HÆMATOPODINÆ: OYSTER CATCHERS.

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598.—HÆMATOPUS LONGIROSTRIS, Vieillot.—(498)

PIED OYSTER CATCHER.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 7.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 112.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1818), also Handbook, vol. ii., p. 216 (1865); Potts: Trans. New Zealand Inst., vol. ii., p. 69 (1870); Buller: Birds of New Zealand (1873), also vol. ii., p. 17 (1888); North. Austr. Mus. Cat., p. 299 (1889); Campbell: Proc. Austr. Assoc., vol. v., p. 426 (1893); also Victorian Naturalist, p. 183 (1894).

*Geographical Distribution*.—Coast of whole of Australia and Tasmania; also New Zealand, New Guinea and Moluccas.

*Nest*.—Merely a slight circular depression (about six inches across by one inch deep) in the sand or in dry river beds near the sea shore.

*Eggs*.—Clutch, two, but in rare cases three; inclined to an ellipse in shape; texture of shell strong; surface glossy; colour, pale stony-grey, moderately marked with well-defined roundish blotches of umber; some



of the blotches are confluent, others have a smudged appearance; there are also a few obsolete bluish-grey markings under the surface of the shell. Dimensions in inches of proper clutches:

Clutch A	(1)	..	2'44	×	1'57	
	(2)	..	2'42	×	1'55	(sharper pointed egg).
Clutch B	(1)	..	2'42	×	1'57	(sharper pointed egg).
	(2)	..	2'32	×	1'57	
Clutch C	(1)	..	2'27	×	1'61	(sharper pointed egg).
	(2)	..	2'26	×	1'63	

A specimen from King Sound, North-west Australia, measures 2.26 × 1.57. (Plate 21.)

*Observations.*—This handsome Oyster Catcher, in its garb of black and white, may be seen in almost any portion of the Australian and Tasmanian coast, but is more abundant on the southern coast, and especially on the islands in Bass Strait. A southern tribe of aborigines in Western Australia call this Oyster Catcher “Quick-ham,” after the call notes of the bird.

During the expedition of the Field Naturalists' Club of Victoria to King Island, the latter half of November, 1887, we enjoyed ample opportunities of observing these interesting shore dwellers, which were breeding at intervals all around the island. The White-breasted or Pied Oyster Catcher was the commoner of the two species of “Red Bills.” Sometimes a pair of birds betrayed their nest by uttering the loud piping double note of alarm, which became more frequent and solicitous in tone as we approached the locality of their home. At other times we would observe a bird running away in a suspicious manner from a particular spot. Picking up its footprints in the loose sand and following the track back invariably led us to the nest, which was merely a slight circular hollow or depression on the summit of a small sand dune immediately above high-water mark. The eggs were difficult to detect on account of the similarity of the colouration of them to the sand round about. Of ten or twelve nests we took, none contained more than a pair of eggs.

During an excursion of the same club to the Furneaux Group, November, 1893, out of three nests observed of the Pied Oyster Catcher only one contained a set of three eggs. This particular nest was situated on Green Island, was near some herbage, and was lined with pieces of broken shells and other débris. From Gould and Sir Walter Buller we infer three is the usual complement, while Mr. A. J. North describes a set of three, taken by Mr. John Ramsay at Cape Upstart, Queensland. Nevertheless I think three eggs to the clutch is the exception to the rule.

Mr. Seebohm states that Oyster Catchers are not known to breed within the tropics on the mainland, but only on islands. But it appears we have an exception in the White-breasted Oyster Catcher, for I have received eggs from King Sound (North-west Australia), nearly 600 miles within the tropics; and near the North-west Cape, Mr. Tom Carter, a sound field naturalist, took on the 20th of July several clutches, and again, on the 17th of September, a single egg from the same locality.

Except one fully fledged, we did not observe on King Island the young which Gould states are capable of running soon, and in case of danger secrete themselves in a crevice of rocks or behind a stone. In down they are greyish-buff, with black spots on the back, and with a dark longitudinal stripe on each side above the wing.

The breeding months are from July to January, the early months applying to the tropical or sub-tropical coast localities.

Sir Walter Buller records the interesting fact that this Oyster Catcher does not always breed contiguous to the sea shore, as instances are known of its nesting on sandy plains a couple of miles or more inland.

### 599.—HEMATOPUS UNICOLOR, Wagler.—(499)

#### BLACK OYSTER CATCHER.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 8.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 118.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 218 (1865); Buller: Birds of New Zealand (1873), also vol. ii., p. 19 (1888); Legge: Proc. Roy. Soc., Tasmania, p. 130 (1888); North: Austr. Mus. Cat., with fig., p. 300 (1889); Campbell: Proc. Austr. Assoc. vol. v., p. 427 (1893); also Victorian Naturalist, p. 183 (1894).

*Geographical Distribution*.—Coast of whole of Australia and Tasmania; also New Zealand.

*Nest*.—Usually a rocky ledge or hollow, not far distant from high-water mark.

*Eggs*.—Clutch, two; elliptical or oval in shape; texture of shell somewhat coarse; surface glossy; colour, stony-grey, moderately marked with irregular-shaped blotches (large and small) of amber or dark-brown, a few dull-greyish splashes and marks appearing beneath the shell's surface. Dimensions in inches of proper clutches:

Clutch A	(1)	..	2.73	×	1.73	(sharper pointed egg)
	(2)	..	2.64	×	1.71	
Clutch B	(1)	..	2.7	×	1.73	(sharper pointed egg).
	(2)	..	2.56	×	1.71	
Clutch C	(1)	..	2.64	×	1.72	(sharper pointed egg).
	(2)	..	2.5	×	1.71	

The eggs are similar to those of the Pied Oyster Catcher's, but are larger in size, darker in the ground-colour, and the character of the markings as a rule are not so uniformly roundish in shape.

*Observations*.—We also found the Sooty or Black Oyster Catcher on King Island, Bass Strait, but, although not so numerous, it was equally as interesting as the White-breasted species, with which the sooty at

times co-mingled. Indeed hybrids, the progeny of the two birds, have been known. This may be the case with *H. ophthalmicus* (Castelnau and Ramsay), from the Gulf of Carpentaria, which, however, Mr. Seebohm has relegated to the synonym of the Black species. Of the several nests found during the Field Naturalists' Expedition in November, 1887, to the above-mentioned island, the eggs, which were all in a more or less advanced state of incubation, were somewhat darker in colour and a size larger than those of the other species. The Black variety seemed to select a more rocky situation for its resting place. The eggs I retained for my collection I took from a ridge of rocks almost surrounded by water at high tide. The nest contained a few broken shells, bits of stone, and small pieces of seaweed. The eggs recall a historical shipwreck, for within sight of where they were taken was the scene of the deplorable loss of the "Cataraqui," which occurred on the west coast of King Island in 1845, when no less than 399 souls perished.

Although I have stated the Sooty was the rarer of the two species of Oyster Catchers on King Island, it proved to be the commoner kind on the Furneaux Islands on the opposite (east) side of Bass Strait, when the Field Naturalists' Club visited that locality, November, 1893. On a rock near Woody Island, in Franklin Sound, three nests were found. One, which was photographed (see illustration), and measured seven inches across by one and a half inches deep, was in a hollow piece of rock, sheltered by vegetation; others were protected by salt-bush. On Samphire Reef a Black Oyster Catcher's nest was found in a Silver Gull rookery. Three other nests were taken on a small rock in Adelaide Bay, while the eighth nest was found in a slight hollow at the foot of a grass tussock, and the ninth and last nest was among pig-face weed, on the summit of a rock. All these nests contained a pair of eggs each.

Breeding months probably the same as the Pied Oyster Catcher, from July to January, but, of course, not so early on the southern seaboard. Young in down, like the parents, are of a uniform blackish-brown.

The Plover family, almost without exception, resort to tactics such as feigning lameness or a broken wing to entice intruders from their nest. Some species are more demonstrative than others; but I think the greatest mimic of all is undoubtedly the Black Oyster Catcher, for, according to Sir Walter Buller, if its young be approached it will not only feign lameness, but roll and tumble on its back as if in the throes of mortal agony in order to attract attention whilst the downy chicks make good their escape by taking to rock pools, diving under the projecting ledges, and hiding themselves in the crevices till all danger be overpast.

## SUB-FAMILY—LOBIVANELLINE.

## 600.—ERYTHROGONYS CINCTUS, Gould.—(513)

## RED-KNEED DOTTREL.

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 21.

*Reference.*—Cat. Birds Brit. Mus., vol. xxiv., p. 125.

*Previous Descriptions of Eggs.*—Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii. (1882); Campbell: Southern Science Record (1883), Nests and Eggs Austrn. Birds, fig. 513 (1883), also Proc. Austrn. Assoc., vol. v., p. 437 (1893); North: Austrn. Mus. Cat., pl. 16, fig. 5 (1889).

*Geographical Distribution.*—Australia in general.

*Nest.*—Eggs generally deposited on the moist ground near the margin of a swamp or lagoon.

*Eggs.*—Clutch, four; pyriform in shape; texture of shell exceedingly fine and thin; surface without gloss; colour, stone, marbled closely and in a decided manner almost over the whole surface with fine wavy hair-like markings and blotches of dark-sepia or black. In some examples the fine hair-like markings predominate, which, running together and interlacing, form irregular-shaped blotches in places. In shape and size the eggs exactly resemble those of the Black-fronted Dottrel (*Egialitis melanops*). Dimensions in inches of a clutch: (1) 1.28 × .88, (2) 1.22 × .86, (3) 1.22 × .86, (4) 1.21 × .85. (Plate 21.)

*Observations.*—The Red-kneed Dottrel is a rare bird, and a dweller of the Interior, where it prefers muddy flats and the borders of lagoons to the shingly river beds. Its head, back of neck, and breast are black, throat and stomach white, buffy-coloured flanks, with back and centre of wings olive. It possesses somewhat long legs, pink to the knee (readily suggesting the common name Red-kneed), with the lower portion leaden-coloured. The bill, except a dark tip, has nearly the same tint of pink as the legs. Total length of bird about seven inches. Gould could never discover its eggs, nor could his two intelligent natives aid him with any information on the subject. It was not until 1882 that Dr. Ramsay described the eggs, which were collected by Mr. K. H. Bennett in the Lachlan district. Mr. Bennett says he found the eggs, in several instances, on the damp ground at the water's edge of lagoons, and smeared over with mud, as if the birds had been shifting them from place to place, or perhaps, as Dr. Ramsay suggests, they were purposely smeared over to prevent the eggs being detected. The eggs in my own collection, which were taken the same season as

Dr. Ramsay's, but near a Murray River swamp, were smeared in the manner indicated.

The breeding months generally are from September to December.\*

601.—*LOBIVANELLUS LOBATUS*, Latham.—(500)

SPUR-WINGED PLOVER.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 9.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 139.

*Previous Descriptions of Eggs*.—Ramsay: Ibis, vol. iii., new ser., with fig. (1867); Harting: Proc. Zool. Soc., p. 458 (1874); Campbell: Southern Science Record (1883), also Proc. Austr. Assoc., vol. v., p. 429 (1893).

*Geographical Distribution*.—Queensland, New South Wales, Victoria, South Australia, Tasmania, and intermediate islands; also New Zealand (accidental).

*Nest*.—Merely a hollow on a little knoll or grassy plot, usually surrounded by water near the margin of a swamp. The nesting hollow is sometimes bare; in other instances lined with a few grass stalks, short bits of dead sticks, &c. Dimensions, four to five inches across.

*Eggs*.—Clutch, three to five, but usually four; elegant in shape, inclined to or are pyriform; texture of shell comparatively fine; surface glossy; colour, rich warmish-green, boldly blotched or splashed all over with olive of different shades. Dimensions of proper clutches in inches: A (1) 2.04 × 1.44, (2) 2.02 × 1.45, (3) 1.96 × 1.41, (4) 1.95 × 1.41; B (1) 1.93 × 1.42, (2) 1.92 × 1.38, (3) 1.91 × 1.39, (4) 1.85 × 1.38. (Plate 22.)

*Observations*.—This Plover stands proudly on long purplish-red legs, with head and back of neck black, drab-coloured wings and back, with clean white underneath parts, while the curious yellow wattle or lobes on and hanging from the face match the same coloured eyes. The bird is about fourteen inches in total length, and is armed on each shoulder with a yellow spur. Hence, it is termed (not inappropriately) the Spur-winged Plover.

While the smaller Black-breasted species affects the barest parts of plains, this exceedingly showy bird loves localities of a swampy nature, and its disposition is much the shyer of the two species, yet when called upon to defend its eggs or young the Wattled Plover is bold and courageous, attacking crows and animals long before they reach the nest by making sudden swoops upon and fairly screaming at them. On occasions, like many others of the race, this Plover mimics actions of distress for the express purpose of diverting attention from its nest or

\* See appendix for late breeding note of this and other Limicoline species.

young. Mr. Lau, on the Queensland Downs, has watched sitting birds disturbed by the approach of cattle or sheep. The bird does not quit its charge, but furiously flaps its wings and compels the animals to turn aside. Dr. Ramsay says it will even fly in the face of an animal in order to produce the desired effect.

I believe the Spur-winged Plovers are partly nocturnal, feeding chiefly at night. In the country the cries of passing birds are frequently heard in the night.

On one occasion I found on a little "island" in a swamp on the Lower Werribee Plains, a nest of the Spur-winged Plover containing three eggs (two just chipped and one addled). The nest was a slight cavity in the short vegetation, lined chiefly with short rough bits of dead sticks, and sheltered by a lichen-covered out-crop of rock. Date, Oct. 3rd, 1896.

I have captured young about a week old the first week in August, and young have been seen in April, therefore the breeding months for the Spur-winged Plover vary according to the wet seasons; but the usual months may be taken from July to January, when probably two broods are reared.

Young in down may thus be generally described: collar round the neck and underneath parts white; forehead, crown of head and rest of upper surface mottled black and brownish-grey. The species may be readily distinguished by the wattle-lobes on the face; while the spurs on the wings are soft and rudimentary.

Mr. Charles McLennan, who has spent much of his time in the wilds of the Mallee country, has furnished me with the following dingo and Plover incident:—"I heard some Plovers making a great disturbance, so I crept up till I could see what was the matter. A dingo and some Plovers were at a crab-hole. The dingo kept trotting round the water-hole apparently quite unconcerned. Every now and again the Plovers would fly just over the dog, when he would make a spring at them with the agility of a cat, and once or twice he all but grabbed a bird. I am sure he would have eventually caught one, but he happened to approach too near to where I was planted, and as there were £2 hanging to his scalp I could not resist the temptation of shooting him, and thus saved the Plovers."

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602.—LOBIVANELLUS MILES, Boddaert.—(501)  
*L. personatus*, Gould.

#### MASKED PLOVER.

*Figure*.—Gould: *Birds of Australia*, fol., vol. vi., pl. 10.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 140.

*Previous Descriptions of Eggs*.—Gould: *Birds of Australia* (1848), also *Handbook*, vol. ii., p. 221 (1865); North: *Trans. Roy. Soc., South Australia*, vol. xxii., p. 164 (1868).

*Geographical Distribution*.—North-west Australia, Northern Territory, and North Queensland; also New Guinea and Timor Laut.

*Nest*.—A hollow in the bare ground at the edge of a flat adjoining a salt marsh or a swamp.

*Eggs*.—Clutch, three to four, rarely five; pear-shaped or pyriform; texture of shell fine; surface glossy; colour, varies from yellowish-olive to greenish olive, spotted and blotched with amber or dark-brown, or olive of different shades, and dull greyish-black. Some exceptions are light yellowish-stone in colour, marked with olive and dull-slate, and resemble those in miniature of the Stone Plover (*Burhinus*). Dimensions in inches of a clutch: (1) 1.78 × 1.25, (2) 1.74 × 1.23, (3) 1.74 × 1.22.

*Observations*.—This is the northern cousin of the Wattled or Spur-winged Plover, and is found in the north portion of Australia, appreciating the mangrove swamps as well as the plains of the Interior. The Masked Plover is similar in habits, size, and appearance to the other Plover, with the exception that the wattle on the face is more elongated in shape, and the black on the back of the neck is absent.

Our knowledge at present of the nidification of this elegant Plover is not extensive. Gould mentions the breeding season as August and September, but doubtless it extends a month or two later, and in habits represents its southern ally, the better known Spur-winged Plover. However, the eggs of the Masked Plover are much smaller than we would have expected to find, for the dimensions of a set I have given from the Gulf of Carpentaria district are only about the size of the Black-breasted Plover's eggs. In that district Dr. W. Macgillivray informs me that Masked Plovers are numerous, it being no uncommon sight to see forty or fifty in a flock, and that they usually lay during January or February.

Mr. Keartland writes: "Near the Fitzroy River (North-west), many of these birds were seen, but when the rains fell they scattered to the numerous swamps which were then formed. Their habits are precisely similar to those of *L. lobatus*. Unfortunately the birds all disappeared before I had the opportunity of preserving specimens. I am indebted to Mr. Jas. Livingstone for a pair of eggs of this bird, which he obtained near the river, on the 8th March, 1897. They were taken from a slight hollow in the ground, and were of a dull olive-yellow, heavily blotched with brownish-black markings."

## SUB-FAMILY—CHARADRIINÆ.

**603.**—ZONIFER TRICOLOR, Vieillot.—(502)  
*Sarciophorus pectoralis*, Cuvier.

## BLACK-BREASTED PLOVER.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 11.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 154.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 223 (1865); Ramsay: Ibis, vol. iii., new ser., with fig. (1867); Harting: Proc. Zool. Soc., p. 458 (1874); North: Austr. Mus. Cat., pl. 17, fig. 6 (1880); Campbell: Proc. Austr. Assoc., vol. v., p. 430 (1893).

*Geographical Distribution*.—Queensland, New South Wales, Victoria, South and West Australia, and Tasmania.

*Nest*.—An indentation in the ground or slight hollow on a plain, lined with a handful of portions of dead plants, roots of grass, &c. Dimensions, 5 to 6 inches across by 1 to 1½ inches deep.

*Eggs*.—Clutch, four; pyriform in shape; texture of shell, fine and slightly lustrous; ground-colour, light olive-grey or olive-stone, marked all over with small blotches and irregular spots of brown. Dimensions in inches of proper clutches: A (1) 1.82 × 1.25, (2) 1.77 × 1.26, (3) 1.76 × 1.22, (4) 1.72 × 1.21; B (1) 1.81 × 1.26, (2) 1.8 × 1.23, (3) 1.75 × 1.26, (4) 1.75 × 1.23. (Plate 22.) The eggs of this beautiful species are readily distinguished from those of the Spur-winged Plover by their smaller size and finer (smaller) character of markings.

*Observations*.—This remarkably fine bird is a size smaller than the Spur-winged Plover, and is a frequenter more of plains than of swamps. It is conspicuous with its black breast. The spur is absent from the wing, and instead of the wattle upon the face there is an oval fleshy excrescence on each side at the base of the bill, blood-red in the male and flesh-coloured in the female. Of course, after death the colour fades out of these parts. The habitat of the Black-breasted Plover ranges from Queensland round to Western Australia and extends to Tasmania.

Two of our leading ornithologists persistently overlook Tasmania as a locality of this species as well as the Spur-winged Plover. But, in including Tasmania in the geographical range for both these birds, I find I am in very good company, for Colonel Legge, in his treatise, "On the Geographical Distribution of the Australian *Limicola*," states with regard to the Black-breasted Plover, that "it is not uncommon in the midland districts of Tasmania," while of the Spur-winged species he remarks that it "is an abundant species in many parts of Tasmania." One of my early reminiscences as a boy was of the Black-breasted Plover.





BLACK-BREASTED PLOVER'S NEST

*From a Photo by the Author.*



About 1860, near Yaloke—in those days my grandfather James Pinkerton's property, on the Werribee River—the birds were in flocks of hundreds, and I well remember the good old gentleman pointing out to me a nest under a low shelving rock on the plain, and, the timid bird, at our approach half rising with its back against the roof of the stone, exposed a beautiful clutch of thickly-spotted brownish eggs. These birds are not so tame now-a-days.

The next time I went nesting amongst these splendid little Plovers I was a grown man. I was stopping a day or two with Mr. Thomas Musgrove, farmer, on the Wharparilla Plains, near Echuca, Victoria. There had been a good season for rain, and all the little "crab"-holes were full of opalescent water. On the 5th August (1894), I was out with Mr. Musgrove and his sons. We could see pairs of Plovers dotted over the plains. Noticing one particular pair rise and fly round with complaining cries, I kept my eyes on the spot whence they rose, and walking straight on through bog and swamp I came to the clutch of four eggs, resting, points inward, in a slight hollow five inches across by one-and-a-half deep, and lined with dead portions of stems of trefoil burrs and roots of grass.

Returning towards Echuca two days afterwards, I found another set of four eggs. The nesting hollow was lined with short pieces of stubble, rabbits' dung, &c. How beautifully the dark-coloured eggs contrasted with the surrounding short green grass! This nest formed the subject of my photographic illustration.

The end of the following month (September), when Mr. J. Gabriel and I were being merrily bowled over the Riverina Plains by Mr. Rod. Macaulay, we captured a pair of young Black-breasted Plovers just able to fly. One grew fat and plump and thrived in my aviary for nearly two years, when a wretched rat got in and ended its life. It weighed six ounces.

It has been noted that the Black-breasted Plover lays an egg every day, some time before noon, till the clutch is completed, and that the period of incubation is twenty-eight days. Dry seasons do not so much interfere with the laying of this Plover as it does with the Spur-wing species, which sometimes does not lay at all if there is not the needed rainfall.

The Black-breasted Plover is an early breeder. Eggs have been taken in Riverina in April and May, in South Australia in June, and in Victoria in July and earlier. On the Darling Downs, Queensland, where Mr. Lau thinks they breed twice a year, they usually commence to lay in September. Therefore we may infer that the breeding months in general include April to December, but chiefly the last four months.

The young in down of the Black-breasted or Plain Plover, which can run almost as soon as hatched, are finely dappled with black and brown, except the back of the neck and under parts, which are light-coloured. As soon as fledged the young and the old congregate, sometimes in immense numbers.

Why are the eggs of the Plover family always placed together with the points inwards? I have heard two reasons assigned. One is that the keel of the sitting bird would fit exactly into, say, a clutch of four

pear-shaped eggs, and rest upon the points of the eggs; thus the bird would be comfortably balanced with two on either side. The other reason is that on account of the nest on the ground being a circular hollow, the smaller or tapering ends of the eggs must naturally fall or fit into the contracting centre of the circle. But it may be purely to economise space that the eggs are so arranged.

604.—*SQUATAROLA HELVETICA*, Linnaeus.—(503)

GREY PLOVER.

*Figure*.—Gould: Birds of Great Britain, vol. iv., pls. 36 and 37;  
Gould: Birds of Australia, fol., vol. vi., pl. 12.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 182.

*Previous Descriptions of Eggs*.—Seebohm and Harvie-Brown: Ibis, pl. 5 (1876); Seebohm: British Birds, pl. 25, figs. 7-9 (1887); Legge: Birds of Ceylon, p. 933 (1880).

*Geographical Distribution*.—Australia in general and Tasmania; also, New Guinea and the extreme south of the other hemisphere, migrating to breed on the Tundras of Siberia and other places in the north.

*Nest*.—A simple shallow depression in the moss or peaty soil, lined with a small handful of broken twigs and leaves of the surrounding plants. Situated on low-lying boggy tracts of tundra (Seebohm and Harvie-Brown).

*Eggs*.—Clutch, four; in shape some are rather pointed and others slightly rounded at the smaller end; colour varies, being olive-stone, greyish-stone, or yellowish-stone, blotched and clouded on the larger half, and chiefly round the end, with irregular-edged blotches of blackish-sepia, running mostly in a longitudinal direction; the markings are smaller near the minor end, and beneath the dark colouring are smears and traces of bluish-grey. Dimensions, in inches, from 2.15 to 1.96 in length by from 1.42 to 1.41 in breadth (Legge).

*Observations*.—The Grey Plover is cosmopolitan, being found more or less abundantly in every portion of the globe. It is not known to breed anywhere except in the tundras, north of the limit of forest growth in the circumpolar region. The western flocks pass through Central Europe to winter in Africa, while the eastern birds cross Siberia to "winter," amongst other countries, in Australia and Tasmania, where the birds observed have been either youthful or in winter garb, and conspicuous for the absence of the rich black belly and the beautiful dappled grey back which are the full summer plumage of the far north. The illustration in Gould shows the bird in its plain greyish Australian dress. The Grey Plover is about ten inches in length, or slightly larger than the golden variety. Seebohm reminds us that in its habits

and seasonal changes the Grey Plover scarcely differs from the Golden Plover, and the yellow colour of the young in down, as well as of the young in first plumage, proves its near relationship to the latter bird.

Although the Grey Plover was known to ornithologists as far back as 1758, it was not till the 22nd of June, 1875, that Seebohm and Harvie-Brown took the first authenticated nest in the valley of the Lower Petchora, Russia. They record:—"We had not walked very far before other Plovers rose, and we determined to commence a diligent search for a nest. . . . After more than an hour's search we found a nest on one of the dry tussocky ridges intersecting the bog, containing four eggs about the size and shape of the Golden Plover's. The nest was a hollow, evidently scratched perfectly round, somewhat deep, and containing a handful of broken slender twigs and reindeer moss. Harvie-Brown concealed himself as well as he could behind a ridge to lie in wait for the bird returning to the nest, and after half an hour's watching shot a veritable Grey Plover."

Confirming Seebohm's account of the nesting home of the Grey Plover, Mr. H. J. Pearson, who visited Russian Lapland twenty years afterwards, pleasantly writes in the "Ibis," April, 1896: "The discovery of these eggs has been so well described by Seebohm and Harvie-Brown, in their paper in the 'Ibis,' that we have little to add. We feel sure, however, that our brother ornithologists will sympathize with our glow of pleasure and even our wild war-dance on finding our first nest, containing a clutch of four beautiful eggs. And, indeed, both glow and dance were needed, for few things are more calculated to chill enthusiasm and unpleasantly lower one's temperature than watching for fifty minutes, in a piercing wind and sleet, even a Grey Plover to its nest. We took, in all, seven clutches of eggs (4, 4, 4, 4, 4, 1, and 3 respectively). The first two were fairly fresh. In the third and fourth the chicks were calling, and their beaks partly through the shell. The fifth contained young in down and not quite so advanced. The one egg in the sixth was nearly hatched, and three young birds from the other eggs were caught about the nest. In the seventh two eggs were addled, one nearly hatched, and one young in down, caught near. The positions of the nests were interesting: only two were on the lower ground near the Gobista; one was a mile both from the sea and the river; all the others—also several old nests—were on the tundra, not far from the edge of the bluffs, which form the margin of the river basin. Grey Plovers seem to prefer this position, which gives them good posts of observation and allows them to take their young easily into the marshes below to feed. We found a ready way of locating the nest of this bird was to watch a pair of Richardson's Skuas hunting over the tundra, for as soon as they approached the nest of the Plovers, both the latter rose in the air and drove the Skuas away. We never observed these birds breeding near each other, each pair appearing to take possession of about a mile of country. All the nests were slight depressions in the peat, lined with a little lichen."

It is stated that Von Middendorff was actually the first naturalist to take the eggs of the Grey Plover. He found them in Northern Siberia, but published no details concerning the circumstance.

605.—*CHARADRIUS DOMINICUS*, Müller.—(504)  
*C. fulvus*, Gmelin.

LESSER GOLDEN PLOVER.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 13.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 195.

*Previous Descriptions of Eggs*.—Seebohm: British Birds, pl. 25, fig. 5 (1887); Legge: Birds of Ceylon, p. 938 (1880); Robson: Trans. New Zealand Inst., vol. xvi., p. 308 (1883).

*Geographical Distribution*.—Australia in general and Tasmania; also New Zealand, New Guinea, and the south of the other hemisphere, migrating to the northern portions of both the Old and New Worlds to breed.

*Nest*.—A mere hollow in the ground upon a piece of turfy land, overgrown with moss and lichen, and lined with broken stalks of reindeer moss (Seebohm).

*Eggs*.—Clutch, three to four. Two clutches collected in Siberia by Seebohm are thus described by Colonel Legge: "One set is light clay-buff, and the other very pale buff with an exceedingly faint greenish tinge. The former examples are richly marked with dark sepia, in the form of straggly-edged blotches collected in a tolerably well marked ring round the large ends, with numerous large blotches extending quite round to the small ends. The pale clutch is marked with sepia-black clouds at the large ends and the same very dark blots towards the small ends, under which are a few specks of bluish-grey. In shape the eggs are pyriform, but not much compressed at the point; the obtuse ends are rather flattened. The first clutch vary in size from 1.89 to 1.91 inches in length by from 1.27 to 1.28 inches in breadth; the second from 1.89 to 1.92 inches by from 1.27 to 1.32 inches." A pair collected in Canada is exceedingly pyriform; texture comparatively fine; surface glossy; colour, stone, heavily blotched, especially round the upper quarter in one example, with umber from light to dark, almost black. Dimensions in inches: (1) 1.93 × 1.3, (2) 1.88 × 1.3.

*Observations*.—This bird, also called the Asiatic Golden Plover, breeds on the tundras (naked tracts of slightly undulating land, diversified by moor, swamp, and bog, interspersed with lakes, and abounding with reindeer moss) of Eastern Siberia, from the valley of the Yenisei to the sea. It passes through Japan, South Siberia, and Mongolia on its migration tour, and "winters," amongst other places, in Australia, straying as far as New Zealand. In order that "wintering," as applied to this and other like birds, may be clearly understood, I should remark that as they breed in the northern hemisphere during the summer there, they come to us for the purpose of "wintering" during our summer in the south. Although nowhere very plentiful, the Lesser Golden Plover visits every part of Australia and Tasmania, arriving in the southern

parts about the end of October. A correspondent, writing to "The Argus," states that a flock of these Golden Plovers was seen in company with Grey Plovers at Queenscliff one season (1893); and an observer in the Riverina district supposed that in the space of five seasons he saw perhaps about 100 birds. Gould states that its habits and general economy so closely resemble those of the Golden Plover of Europe that a description of one is characteristic of the other. Like the European bird, it frequents open plains in the neighbourhood of marshy lands or the sea beach, runs with amazing facility, and flies with equal rapidity. Its food consists of insects, slugs, small sea mollusca, and worms.

Gould's illustration represents a bird as we see it in its "winter" dress during the Australian summer, and its dress is of a buffy colour, mottled with brown, suggesting the name golden. The mottle is produced by a triangular spot of pale brown on the tip of each feather. The eyes are dark-brown, with legs and feet leaden colour; the total length of the bird is about nine inches. When in full breeding plumage in its North Asian habitat, the bird's lores, side of the face, breast, and all the under surface are conspicuously black. The eggs are pear-shaped, of a very pale buff, with a faint greenish tinge, and richly marked with sepia; length nearly two inches, by a breadth of about one and a quarter inches. The finding of the first nest and eggs of the Lesser Golden Plover, in latitude  $69\frac{1}{2}$  deg., Yenisei, Siberia, is so interesting that I give Mr. Seebohm's own words from his "Siberia in Asia":—"The tundra was hilly, with lakes, swamps, and bogs in the wide valleys and plains. As soon as I reached the flat bogs I heard the plaintive cry of a Plover, and presently caught sight of two birds. The male was very conspicuous, but all my attempts to follow the female with my glass, in order to trace her to the nest, proved ineffectual; she was too nearly the colour of the ground, and the herbage was too high. Feeling convinced that I was within thirty paces of the nest, I shot the male, and commenced a diligent search. The bird proved to be the Asiatic Lesser Golden Plover; and I determined to devote at least an hour looking for the nest. By a wonderful piece of good fortune I found it, with four eggs, in less than five minutes. It was merely a hollow in the ground upon a piece of turfy land, overgrown with moss and lichen, and was lined with broken stalks of reindeer moss."

In the latest classification (Catalogue of Birds of the British Museum), Dr. Sharpe amalgamated the Lesser Golden Plover with the American bird, the difference between the two varieties being so very slight. The American race is said to be a trifle larger, breeds in summer on the moors above the forest growth from Alaska to Greenland, and migrates to winter in South America. According to Seebohm the eggs of the American Golden Plover are absolutely indistinguishable from those of the Lesser or Asiatic Golden Plover.

**606.**—*OCHTHODROMUS (ÆGIALITIS) BICINCTUS*,  
Jardine and Selby.—(512)

**DOUBLE-BANDED DOTTREL.**

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 16.

*Reference.*—Cat. Birds Brit. Mus., vol. xxiv., p. 212.

*Previous Descriptions of Eggs.*—Potts: Trans. New Zealand Inst., vol. ii., p. 67 (1870); Buller: Birds of New Zealand (1873), also vol. ii., p. 4 (1888); Campbell: Southern Science Record (1883), also Proc. Austr. Assoc., vol. v., p. 433 (1893).

*Geographical Distribution.*—Australia in general, and Tasmania; also New Guinea, New Zealand, &c.

*Nest.*—Merely the usual little hollow on plains in the vicinity of the coast or in dry river beds.

*Eggs.*—Clutch, three; inclined to pyriform in shape; texture of shell fine and thin; surface without gloss; colour, of a greenish tinge or light greenish-stone (but sometimes greyish-stone), spotted and fancifully streaked fairly over with sepia or black. In some specimens the markings form patches about the obtuse end. Dimensions in inches: (1) 1.4 × .98, (2) 1.37 × 1.0. The eggs are very similar to those of the Hooded Dottrel (*Æ. cucullata*) in shape, size, and character of markings, with the exception of having the greenish tinged ground-colour instead of the stony shade. (Plate 22.)

*Observations.*—This very interesting species takes its name from the double markings—first chestnut and then black—across the breast, interspaced with white. The rest of the under-plumage is white, with a greyish or brownish coat. The Double-banded Dottrel is found in Australia in general, but chiefly in Tasmania and the intermediate islands, and New Zealand, its breeding country.

Eggs of the Double-banded Dottrel have not yet been recorded from Australia or Tasmania. The bird disappears from the mainland in spring and, according to the opinion of Colonel Legge, probably breeds on some of the islands in Bass Strait, as the young birds found in Tasmania during the autumn most likely come from that locality. In reference to the migration observed by Gould at Georgetown on the 15th May, Colonel Legge proceeds to remark that is about the time the birds would be arriving on a southern migration from their breeding grounds. Might the birds not have come from the breeding grounds in New Zealand on partial migration to Tasmania and Australia?

Mr. J. F. Mulder has observed the Double-banded Dottrel plentiful on the plains near Geelong during autumn, but the birds all disappear before spring. Mr. A. J. North states they are common about the Botany Swamp and flats at the mouth of Cook's River, New South Wales, during April, May, and June. The latest I have seen the Double-banded Dottrel in Victoria was the 21st August (1897), when I saw several



bunches exposed for sale in the Melbourne Market. They were supposed to have been shot on the Gippsland Lakes, and were in splendid plumage. I fancy these unfortunate birds were congregating prior to their intended flight across the Tasman Sea to New Zealand, to breed.

About the middle of August this year Mr. C. F. Belcher, of Geelong, procured a pair of Double-banded Dottrels for my collection from a flock at the Salt Pits, Stingaree Bay. When returning home, he observed another flock of about fifty birds feeding in a grassy paddock near the road. At my request, he kindly visited the Salt Pits a month later (middle of September), and found all the Double-banded Dottrels had disappeared, their places apparently being taken by fresh arrivals of migrants—Stints, &c., from the northern hemisphere.

The late Mr. T. H. Potts, F.L.S., from whom I received my specimens, when first describing the eggs of this very interesting species before the Wellington Philosophical Society in 1869, remarked that "Our Banded Dottrel is worthy of belonging to the family of the *Charadriidæ*, for it is one of the most restless and wariest of birds during the breeding season. On the approach of an intruder it flies round and round, uttering its note of warning; then, alighting on some rising ground, it steadily keeps watch. During the time it remains on the look-out it indulges in a peculiar habit of jerking its head backwards and forwards, uttering its monotonous 'twit-twit' at intervals." It is an early breeder, as would appear from Mr. Potts' notes: "August 2nd, 1856, saw a nest with two eggs, Rakaia River; September 1st, 1855, saw a nest with three eggs, Rakaia River; October 14th, 1857, young birds quite strong."

The young in down resemble little brownish puffs, being of a bright sandy-yellow, mottled with dark-brown on the upper surface, changing to yellowish-white on the under parts. They run as soon as hatched, and with great swiftness when alarmed.

Of this species Sir Walter Buller remarks: "In location of the nest itself there is very little attempt at concealment, the bird apparently trusting more for protection to the assimilation of colouring, but after the young are hatched out the old birds (and particularly the female) manifest considerable solicitude for the safety of their offspring, and feign lameness or a damaged wing for alluring intruders away, a device which very often succeeds. The young bird runs the moment it quits the shell, and is not slow to second its parent in the art of self-preservation. Its sandy colouring makes it almost indistinguishable when squatting on the ground, and it has the instinct to remain perfectly motionless the moment it hears the note of alarm, even allowing itself to be handled without betraying a sign of vitality."

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### 607.—OCHTHODROMUS VEREDUS, Gould.—(506)

#### ORIENTAL DOTTREL.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 14.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 232.

*Geographical Distribution*.—Australia in general; also the Moleucas, Java, &c., migrating to breed in Mongolia.

*Nest and Eggs.*—Undescribed.

*Observations.*—Regarding this species Henry Seebohm mentions that its white belly distinguishes it from either of its allies—the Common Dottrel (*C. morinellus*) and the Oriental (or Lesser) Golden Plover—in summer or breeding plumage; but at all ages and seasons its small, Courser-like feet are the best character.

Gilbert procured his Australian example in the Port Darwin district. A second skin was sent to Gould from Sydney, while others have since been obtained in various parts of Australia. The eggs, however, are not in any collection; but it is known that the bird breeds in Mongolia.

The following highly interesting note I received from Mr. Tom Carter, Western Australia:—"In the heat wave, as I was boating round the Point (Cloates) for two days (30th and 31st December, 1895), countless numbers of Asiatic (Oriental) Dottrels were coming from sea-wards, i.e., from west and north-west. The beach was lined with birds resting themselves. Strong north-east winds blew in the morning, and from the north in the afternoon. I never saw such a migration of these birds before. It only lasted for three or four days."

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608.—OCHTHODROMUS GEOFFROYI, Wagler.—(511)

LARGE SAND DOTTREL.

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 19 (large figure).

*Reference.*—Cat. Birds Brit. Mus., vol. xxiv., p. 217.

*Previous Descriptions of Eggs.*—Seebohm: Ibis, p. 154 (1879); Legge: Birds of Ceylon, p. 942 (1880); Harting: Proc. Zool. Soc., p. 355 (1882).

*Geographical Distribution.*—West and North-west Australia, Northern Territory and North Queensland, migrating to breed, it is supposed, in Hainan, Formosa and Japan.

*Nest.*—Undescribed.

*Eggs.*—Clutch —; oval in shape, or slightly more compressed at one end; texture of shell fine; surface glossy; colour, yellowish-stone, heavily blotched with sepia, almost black. Not unlike those of the Painted Snipe (*Rhynchewa australis*). Dimensions in inches of an example collected by Mr. R. Swinhoe in Formosa: 1.36 × .95. According to Colonel Legge the measurements vary from 1.37 to 1.27 × 1.05 × 1.0.

*Observations.*—The Large Sand Dottrel is said to be exclusively a sea coast species, and, according to Henry Seebohm, although it enjoys a very wide range in winter, its summer or breeding quarters are somewhat doubtful. It occurs throughout the summer, apparently in full breeding plumage, on the coasts of Japan, Formosa, and Hainan, and

he thinks we may fairly assume it breeds in the latter localities, and that the larger series of eggs obtained by Swinhoe ("Ibis," 1879, p. 154) are referable to this species.

It was probably this species (mentioned in Gould as *O. inornatus*) that Gilbert found abundant on most of the sandy points and bays in the Port Darwin district. Mr. Tom Carter shot a specimen at Point Cloates, Western Australia, about the 1st November, 1897, another on the 4th October, 1899.

### 609.—*OCOTHODROMUS MONGOLUS*, Pallas.

#### MONGOLIAN SAND DOTTEL.

*Figure*.—Gould: Birds of Europe, pl. 290; also Gould: Birds of Australia, fol., vol. vi., pl. 19 (right hand figure).

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 223.

*Geographical Distribution*.—Northern Territory (probably), Queensland, New South Wales, and South Australia; also New Guinea, the Moluccas, Philippines, &c., passing through China on migration to breed in Eastern Siberia and other localities.

*Nest and Eggs*.—Undescribed.

*Observations*.—Henry Seebohm observes that the Mongolian Sand Dottrel is nearest related to *O. geoffroyi*, but it is also very nearly allied to our Double-banded Dottrel (*O. bicinctus*). It breeds in Asia from Eastern Turkestan to the valley of the Amoor.

Colonel Legge mentions that Dr. Adams found the Mongolian Sand Plover breeding in Ladakh, the mountainous portion of Thibet bounding Cashmir on the east. Here he found the young at the Chimouraree Lake, but he was too late to obtain eggs. It breeds in May and June.

### 610.—*ÆGIALITIS HAVICOLA*, Linnæus.—(507)

#### RINGED DOTTEL.

*Figure*.—Gould: Birds of Great Britain, vol. iv., pl. 41.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 256.

*Previous Descriptions of Eggs*.—Various.

*Geographical Distribution*.—Arctic North America, throughout Europe generally, wintering in Africa; eastward to Lake Baikal, and extending, rarely, to North-west India; New South Wales (accidental).

*Nest*.—Sometimes none, but generally a mere depression amongst tufts of long grass, or scratched in shingle, with a few shells in the

centre. Frequently just beyond the reach of water, upon little hillocks of sand upon the sea beach; also occasionally near inland pieces of water (Butler).

*Eggs*.—Clutch, four; pyriform in shape; texture of shell fine; surface slightly glossy; colour, stony-grey, marked especially about the larger end with well defined roundish blotches and spots of dark-brown or black and grey. Dimensions in inches: (1) 1.35 × .98, (2) 1.32 × .98.

*Observations*.—Seebohm was of opinion that we claim this well-known northern Dottrell to be an Australian bird on "very unsatisfactory evidence," notwithstanding Gould stated he possessed an undoubted specimen, killed at Port Stephens, New South Wales. However, another Australian example may turn up some day.

It is within the bounds of possibility that the Indian Ringed Dottrell (*A. jerdoni*, Legge) may yet be found to touch the shores of Australia.

## 611.—*EGIALITIS RUFICAPILLA*, Temminck.—(510)

### RED-CAPPED DOTTREL.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 17.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 286.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 236 (1865); Harting: Proc. Zool. Soc., p. 459, with fig. (1874); Ramsay: Proc. Zool. Soc., p. 337 (1877); North: Austr. Mus. Cat., with fig., p. 306 (1889); Campbell: Proc. Austr. Assoc., vol. v., p. 436 (1893).

*Geographical Distribution*.—Whole of Australia and Tasmania; also New Guinea, New Zealand (accidental).

*Nest*.—Usually a slight depression in the sandy ridges of the sea beach, sometimes ornamented with pieces of dried herbage or seaweed or a few small shells in the centre. Dimensions, about 4 inches across by 1 inch deep.

*Eggs*.—Clutch, two; shape, pyriform; shell, soft in appearance and lustreless; colour, pale stony-grey or stone-colour, marked with blotches, dots, and minute splashes of dark-brown or sepia. In some clutches the markings are finer in character and distributed over the surface, while in other instances they are more blotched or are confluent about the upper quarter of the egg. Dimensions in inches of selected clutches: (Plate 22.)

Clutch A (1)	..	1.32 × .89	(sharper pointed egg)
(2)	..	1.26 × .86	
Clutch B (1)	..	1.2 × .91	(sharper pointed egg)
(2)	..	1.16 × .9	
Clutch C (1)	..	1.21 × .86	(sharper pointed egg)
(2)	..	1.19 × .88	
Clutch D (1)	..	1.2 × .87	
(2)	..	1.15 × .85	(sharper pointed egg)

*Observations.*—This, one of the smallest of our Dottrels, is readily identified by its rusty-brown or red cap, from which it receives its name. The rest of the plumage is white underneath and drab above. On the forehead is a white band, then a black marking, before the bird dons the red cap. The female is adorned with similar plumage, but in paler shades. The bill is somewhat short and dark; likewise the legs dark; The total length is only 6 inches.

Like Mr. A. J. North, I had my introduction when a boy to this Dottrel, on the sandy tracts interspersed with low scrub that stretched in those days between Sandridge (now Port Melbourne) and St. Kilda, but by the wonderful march of civilization these favourite breeding grounds of the bird have long since been supplanted by a thriving suburb, a railway station, and a military road.

Although this endearing little shore wanderer loves the foreshore of inland brackish lakes and backwaters, we observed a few members in company with the Hooded Dottrel on the boisterous and exposed situations on King Island; but nowhere have I seen the Red-capped Dottrel more plentiful than on the great sweep of sandy beach in Geographé Bay, Western Australia, where the eggs in doublets may be picked up for the seeking. I was never fortunate enough to enjoy Mr. North's experience of picking up three eggs from the one nest of this species. However, on the 25th September, 1894, in Tasmania, Mr. C. D. Groom saw a Red-capped Dottrel's containing *four* eggs, most probably the result of two birds laying in the same nest.

Although generally a coastal bird, instances are known of the eggs having been taken in the Interior. The Calvert Expedition found Red-capped Dottrels numerous near Lake Way, in the interior of the West.

The breeding months, like those of the Hooded Dottrel, are from September to January, November being the principal month.

The young in down is white underneath, and the upper parts are mottled with yellowish-brown and black.

My remarks on the Stone Curlew, with reference to the sharper-pointed egg being as a rule the longer of a pair, are again strikingly illustrated in the Red-capped Dottrel. In four clutches, selected at random and measured, it will be seen there is only one exception (clutch D) to the rule.

**612.**—*ÆGIALITIS MELANOPS*, Vieillot.—(509)  
*Æ. nigrifrons*, Cuvier.

**BLACK-FRONTED DOTTREL.**

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 20.

*Reference.*—Cat. Birds Brit Mus., vol. xxiv., p. 300.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 233 (1865); Harting: Proc. Zool. Soc., p. 459, with fig. (1874); Ramsay: Proc. Zool. Soc., p. 336 (1877); North: Austr. Mus. Cat., pl. 16, fig. 4 (1889); Campbell: Proc. Austr. Assoc., vol. v., p. 435 (1893).

*Geographical Distribution.*—Australia in general.\*

\* Tasmania is included on the authority of Mr. W. L. May, Sandford, who shot one of these Dottrels in 1896; unfortunately the bird was too much mutilated to preserve the skin.

*Nest.*—The usual slight hollow in a pebbly river bed, or on a sandy ridge near water.

*Eggs.*—Clutch, three; pyriform in shape, with thin, fine texture of shell; surface without gloss; colour, of a beautiful light-stone or yellowish-buff, very closely and curiously marked over almost the whole surface with minute specks and short angular lines of umber running into or crossing each other—intermingled are a number of dull greyish markings. Under a magnifying glass such letters as an undefined Z or K and other hieroglyphics may be discovered among the umber-coloured lines. Dimensions of a clutch in inches: (1)  $1.15 \times .81$ , (2)  $1.14 \times .85$ , (3)  $1.08 \times .83$ . Another type of specimens is lighter in general colour and more of a spotted nature, with the angular markings smudged, while the obscure greyish markings are more blotchy: (1)  $1.2 \times .82$ , (2)  $1.11 \times .8$ . (Plate 22.)

*Observations.*—This elegant little species haunts the sandy margin of inland swamps and rivers, and is found throughout Australia. The black collar and breast (from which it derives the name Black-fronted) and black facial markings are relieved by the white throat and stomach, the remainder of the dress being a brownish mottle. The legs are orange-flesh colour, likewise the bill, which is tipped with black. Brown eyes, surrounded by bright-red eyelashes, add to the sprightly appearance of the bird. The sexes are alike in colour and in size. This Dottrel is certainly the tamest of the species, for I have watched them in pairs a few yards from me chasing flies along the margin of a lagoon, or wading knee-deep after aquatic insects.

As Gould observes, this delicate little Dottrel avoids the boisterous and exposed sea beaches, preferring to dwell on the serener margins of rivers and lagoons in the more genial climate of the Interior. That great naturalist was the first to take its eggs, which he found deposited on the ground beside the Namoi River, New South Wales.

My earliest recollection of this tame little species was the finding of a clutch of eggs on the shores of the Albert Park Lagoon, near Melbourne, by a schoolfellow, about 1869.

In the MS. left for my perusal by my good friend Hermann Lau, I find, with regard to *Ægialitis nigrifrons*, he says: "It was a long time before I was enabled to find its breeding-place, because of its cunningness and the similarity of the eggs to the colour of the ground. Even when I first found the shell at Waroo (Queensland), on account of its large size, I could not accept it as belonging to this dear little bird had I not discovered near at hand three helpless young in a small gravel hollow between about half a dozen larger pebbles. Nothing soft was inside the nesting hollow, save remnants from insect food. On another occasion, while proceeding along a wide pebbly ridge, with the creek on one side and an ana-branch on the other, I found, by mere chance, three eggs, and observed the bird not far off. Birds, eggs or young, and pebbles are all much alike in colour. There are evidently two broods in the season, because I have noticed eggs and young in October and again in December."

Mr. Keartland remarks that newly-hatched Black-fronted Dottrels are probably the most handsome of all Australian birds in the down. His further observations in the "List of Birds" of the Calvert Expedition concerning this species are: "At all creeks or pools passed between Mullawa and the Fitzroy River this active little Dottrel was found, either singly or in pairs, running along the margin of the water in search of small aquatic insects. During August several young birds, just able to fly, were shot at the camel depôt, and one fresh egg was picked up beside a pool. On 7th November I found several pairs of newly-hatched young ones on the sandy bed of the Fitzroy River. Although probably not more than a day or two old, they ran very quickly for some distance before being caught. When one was captured it invariably proved that the other had escaped during the chase."

Breeding months, August, or sometimes earlier, to the end of the year.

I have previously mentioned one or two instances of birds supposed to be fascinated by snakes. Here is another. During one of his shooting outs, Mr. Tom Musgrove, junr., Wharparilla, Victoria, noticed a Black-fronted Dottrel, which was apparently mesmerised by a snake close by. The snake, when killed, had a frog in its mouth. This snake must have been a very greedy reptile. Was it going to turn its attention to the bird after it had disposed of the frog? Or had the bird been merely attracted towards the snake out of curiosity to see what was going on?

613.—ÆGIALITIS CUCULLATA, Vieillot.—(508)

*Æ. monacha*, Geoffroy.

HOODED DOTTREL.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pt. 18.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 302.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 231 (1865); Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii. (1882); North: Austr. Mus. Cat., with fig., p. 304 (1889); Campbell: Proc. Austr. Assoc., vol. v., p. 434 (1893).

*Geographical Distribution*.—South Queensland, New South Wales, Victoria, South and West Australia, Tasmania, and intermediate islands.

*Nest*.—A slight circular depression in the sand just above high-water mark, sometimes scantily lined with small broken stems and bladders of seaweed and dead polyzoa.

*Eggs*.—Clutch, two, but usually three; pyriform inclined in shape; texture of shell fine; surface without gloss; colour, of a beautiful soft stony shade, marked over with numerous spots and small irregular-

shaped markings and dashes of dark-brown or sepia. One egg of a clutch taken on Phillip Island, Victoria, is distinctly paler in the ground-colour than the remaining two. Dimensions in inches of a proper clutch: (1)  $1.4 \times 1.01$ , (2)  $1.39 \times 1.02$ , (3)  $1.36 \times 1.01$ . The eggs, excepting for their larger size, much resemble in character those of the more common Red-capped Dottrel (*A. ruficapilla*).

*Observations.*—Anywhere on the sandy shores of Australia (except the northern coast) and Tasmania may be seen the very elegant Hooded Dottrel. When the Field Naturalists visited King Island, Bass Strait, where the birds are numerous, they could not help admiring the graceful movements of the Hooded Dottrel as it tripped merrily along the beach. The male bird is very showy with his conspicuous black head (hence the name Hooded). The female differs in having her head mottled with white. The remainder of the plumage in both sexes is whitish or delicate cream-colour, enhanced by beautiful eyes encircled with rich scarlet eyelashes. They are exceedingly plump little birds, not quite so large as their inland relation, the Australian Dottrel.

I well remember the last time we celebrated as a public holiday the anniversary of the Proclamation of the New Constitution of Victoria. It was on November 23rd, 1884. I was on my way with another field naturalist to the Mutton Bird (*Puffinus*) "rookery," on Cape Wollamai, Phillip Island. While rounding a little sheltered cove on that island we flushed a Hooded Dottrel from its nest on the shining sand. The nest contained the full complement—three eggs, beautiful and fresh. The eggs are by no means readily discovered, being speckled like the sand whereon they are placed.

The breeding months are from September to January, the principal month being November.

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SUB-FAMILY—PELTOHYATINÆ.

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**614.**—PELTOHYAS (EUDROMIAS) AUSTRALIS, Gould.—(505)

DOTTREL.

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 15.

*Reference.*—Cat. Birds Brit. Mus., vol. xxiv., p. 397.

*Previous Descriptions of Eggs.*—Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii. (1882); North: Austr. Mus. Cat., with fig., app. (1899); Campbell: Proc. Austr. Assoc., vol. v., p. 431 (1893).

*Geographical Distribution.*—Interior of Australia in general.

*Nest.*—Merely a little hollow on a mound or elevated portion of a plain.



*Eggs*.—Clutch, three to five; in shape, pyriform, being considerably pointed at the smaller end; shell, thin; surface glossy; colour, rich deep stone or buff, marked with small roundish blotches of umber or dark-brown, which are distributed chiefly on the larger half of the egg. In one example of the clutch now under notice the markings are inclined to circle round the obtuse end. Dimensions in inches of a beautiful set from Western Australia are: (1)  $1.5 \times 1.06$ , (2)  $1.48 \times 1.07$ , (3)  $1.47 \times 1.05$ . A pair from Riverina, New South Wales, is not so rich in colouring, has markings more streaked than spotted, and more of an olive-brown shade; there are also underlying markings of dull-grey: (1)  $1.41 \times 1.03$ , (2)  $1.4 \times 1.0$ . (Plate 22.)

The Australian Dottrel's eggs are readily distinguished from those of the rest of the *Charadriidæ* by the richness of their colour.

*Observations*.—Little appears to be known of the movements of this exceedingly fine Dottrel. On the Lower Lachlan, Riverina, it has been observed to arrive during August, and after rearing young depart again in November, in large flocks.

The Australian Dottrel is clothed in sandy buff plumage, with a distinguishing black collar, also with a black mark across the forehead. The total length of a bird, including its yellowish legs, is between seven inches and eight inches. It has a very neat figure. It runs quickly over the ground, and feeds on worms and insects, perhaps adding to its diet occasionally shoots of tender herbs.

It is a noteworthy fact that the immortal Gould, in describing as new this interesting bird in 1840, stated that probably many years would elapse before anything was known of the habits and economy of this interior species. Gould's surmises proved correct, for it was not until 1882, or forty-two years afterwards, that its eggs were first discovered in New South Wales by Mr. E. G. Vickery, during a surveying trip near Wilcannia, and which were described by Dr. Ramsay, of the Australian Museum. The eggs in my cabinet are from the Murchison district, Western Australia (the latest recorded State included in the geographical range of this species), and were collected by Mr. C. Cadden in the season 1886.

Mr. K. H. Bennett, in communicating with Mr. North, sent the following interesting information, which I here copy: "April 26th, 1889. Found to-day a nest of *Eudromias australis*, containing three eggs; this is unusually early, for hitherto I have never known this bird to breed before September or October. The eggs were placed on a small natural mound of earth, some four or five inches in diameter, and about the same height above the surrounding ground, and completely covered with small sticks some two inches or three inches in length. I disturbed the bird from the nest on which she was sitting, and, noticing only the sticks, at first thought that in consequence of the ground all being covered with water, to the depth of two or three inches, the result of recent heavy rains, that the bird in this particular instance had departed from the usual custom and had constructed a kind of nest, and that she had not deposited her eggs; but on closer examination I found the eggs on the bare ground, and that the sticks had been placed carefully over

them as a safeguard against the keen-eyed Crow, as whenever the old bird should leave her nest without this covering, situated as they were, they would have been very conspicuous, as the little mound in which they were placed was the only dry spot for fifty yards or sixty yards around."

Mr. Bennett also found another nest of this species with two eggs on the 29th April, covered in a similar curious manner with small sticks, and another on the 3rd May, with two eggs. In the latter instance they were not covered, but were simply deposited on the loose earth on high dry ground.

The covering over of the eggs by the Dottrel is certainly very curious. Mr. C. W. Brush, Boondara Station, near Booligal, Riverina, informs me he has noticed the eggs, small ends turned downwards or inwards, and covered with pellets of hard mud, just leaving the large ends of the eggs visible.

Mr. Brush has found the Dottrels very tame, and not particular where they lay their eggs. He has observed many in the direct lines of march of travelling sheep, on the main stock routes. In September (1897), overtaking a teamster and while stopping to have a chat, one of the little Dottrels was observed sitting upon its nest, about three yards away, apparently quite unconcerned. On another occasion five young were noticed in a nest formed by the depression formed by the hoof of a horse. According to Mr. Brush's experience five is not an unusual number for a clutch, and the birds prefer the *black* soil of the plains to nest on.

The eggs I received from Boondara were collected 13th August (1897), therefore it would appear that this Dottrel lays during August, September and October in spring, or during April and May in autumn, probably according to the rain. One distressingly dry season (1898), the birds did not appear at all in the district of Boondara.

Mr. G. A. Keartland was the first to record this fine Dottrel for North-west Australia. He says: "At the first lagoon we passed on approaching the Fitzroy River, numbers of these birds were seen running near the margin of the water. When alarmed, they rose quickly, their long pointed wings enabling them to travel a great distance in a very short time. Although on several occasions three or four birds were disturbed near together, each went off by itself, either on to the open plain or some other part of the lagoon. On our return along the course of the river to Derby, they were frequently disturbed some distance from water. They were never seen in flocks."

SUB-FAMILY—HIMANTOPODINÆ : STILTS, &amp;c.

**615.**—HIMANTOPUS LEUCOCEPHALUS, Gould.—(517)**WHITE-HEADED STILT.***Figure.*—Gould : Birds of Australia, fol., vol. vi., pl. 24.*Reference.*—Cat. Birds Brit. Mus., vol. xxiv., p. 317.*Previous Descriptions of Eggs.*—Ramsay : Proc. Zool. Soc., p. 600 (1867); Potts : Trans. New Zealand Inst., vol. ii., p. 70 (1870); Buller : Birds of New Zealand (1873), also vol. ii., p. 23 (1888); Harting : Proc. Zool. Soc., p. 459 (1874); North : Austr. Mus. Cat., pl. 17, fig. 3 (1889); Campbell : Proc. Austr. Assoc., vol. v., p. 440 (1893).*Geographical Distribution.*—Whole of Australia and Tasmania ; also New Guinea and Moluccas.*Nest.*—Composed of aquatic herbage, grass, twigs, &c., built nine or ten inches above the shallow water of a swamp. Dimensions, about seven inches across the top, and one and a half inches deep in the centre. In some instances, or according to the locality, the nest is merely a depression (about five inches across by one inch deep) in the ground, on dry land, lined with a few pieces of grass.*Eggs.*—Clutch, four ; pyriform in shape ; texture of shell comparatively fine ; surface slightly glossy ; colour yellowish-olive or greenish stone, heavily blotched, spotted, and occasionally streaked with dark-umber or sepia, interspersed with dull greyish-black. Dimensions in inches of proper clutches : A (1) 1·88 × 1·25, (2) 1·83 × 1·24, (3) 1·8 × 1·26, (4) 1·78 × 1·28 ; B (1) 1·78 × 1·16, (2) 1·75 × 1·16, (3) 1·72 × 1·18, (4) 1·7 × 1·2. (Plate 23.)*Observations.*—This Stilt Plover is found in every State of Australia, and in Tasmania. But its appearance in certain localities seems to be regulated, like that of so many other birds, by the wet seasons. Its dress is easily described as white, except the wings, back, and a portion of the back of the neck, which are glossy black. The lengthened legs are pink ; the eyes are matched of the same colour. From its black and white plumage it is sometimes called the Pied Stilt, and is about the same size as the Banded Stilt.

In Dr. Ramsay's interesting remarks on this species, we read that "in 1865 large flocks arrived in company with the Straw-necked and White Ibises, and took up their abode in the lagoons and swamps in the neighbourhood of Grafton, on the Clarence River, where, on my visit to that district in September, 1866, all three species were still enjoying themselves. A few days previous to my arrival in Grafton, a black in the employ of Mr. J. Macgillivray, and a very intelligent collector, discovered a nest of this species containing four eggs, which have been

secured for our collection. The nest was a slight structure, consisting merely of a few short pieces of rushes and grass, placed in and around a depression at the foot of a clump of rushes growing near the water's edge of a lagoon."

Writing to me from the same district (Clarence River), 1898, Mr. S. W. Jackson states: "I found these birds breeding rather freely this season on Duck Swamp, near South Grafton, on September 2nd.

"The nests were floating structures where the water was deep, but in water only nine or ten inches in depth they were built up from the ground. They were composed of aquatic weeds, small twigs, grass, &c., and have the appearance in the water of those of the Black-throated Grebe, only they are much more smartly built. The eggs, which in every instance were four in number, are placed in the nests with the sharp ends pointing inwards; but in nests which were very wet the thick end was turned innermost, but for what cause I cannot tell.

"I succeeded in procuring a number of eggs, the majority of which were fresh. They show a great variation in size, shape, and general markings. The nests were built about ten or fifteen feet apart, and here and there I would drop across three or four nests only a few feet from each other. The birds make a most peculiar noise when being robbed of their eggs, and keep jumping off the ground to the height of about two feet, croaking and flapping their wings at the same time, thus giving a person the idea that they are dancing on hot bricks.

"In company with my brother, F. Jackson, and Messrs. L. Vesper and V. McEnery, I found another colony of Stilts breeding, on September 11th. The nests were about twenty-five in number, and all contained young excepting four or five, with sets of eggs heavily sat on."

To Mr. Jackson I am much indebted, not only for these notes, but two handsome clutches of eggs which accompanied them, also a photograph, which is reproduced herein.

The eggs I described in 1893 were from New Zealand (I am aware that Seebohm treats the White-headed Stilt from that quarter as a subspecies, while Gould and Sir Walter Buller regard it as identical with the Australian bird), and were taken by Mr. J. C. McLean on the 2nd November, 1890, at Repongaere, Poverty Bay, from a nest placed on a small islet or mound of earth, two feet or three feet square, rising from a sheet of shallow water. There were two other nests on adjoining islets—one containing four incubated eggs, and the other one egg (uncompleted clutch). Ten or a dozen birds were about the locality.

The young in down is of various shades of fulvous-yellow, varied on the upper part with brown, and with a series of square black dots down the back, and a broad streak of the same colour on each thigh (Buller).

Breeding season erratic. Sometimes in spring, as early as August or September; or in autumn as late as April or May.



NESTS OF WHITE-HEADED STILTS.

*From a Photo by S. W. Jackson.*



A DARTER ROOKERY.

*From a Photo by S. W. Jackson.*



616.—CLADORHYNCHUS LEUCOCEPHALUS, Vieillot.—(518)  
*U. pectoralis*, Du Bus.

BANDED STILT.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 26.

*Referenc.*—Cat. Birds Brit. Mus., vol. xxiv., p. 324.

*Previous Descriptions of Eggs*.—Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii. (1882); Campbell: Southern Science Record (1883), also Proc. Austr. Assoc., vol. v., p. 439 (1893).

*Geographical Distribution*.—New South Wales, Victoria, South, West, and North-west Australia, and Tasmania.

*Nest*.—The bare ground, but sometimes there is a semblance of a nesting-place lined with a few portions of dry reeds or other herbage.

*Eggs*.—Clutch, four; in shape inclined to pyriform; texture of shell comparatively fine; surface slightly glossy; colour, rich olive-stone, or yellowish-olive, marked with spots and heavy blotches of sepia, together with a few lighter smudges ofumber, especially on or near the obtuse end. Dimensions of odd examples in inches: (1) 1.83 × 1.24, (2) 1.75 × 1.23, (3) 1.71 × 1.23, (4) 1.7 × 1.24.

*Observations*.—The broad chestnut band on the breast at once suggests the vernacular title "Banded" for this stilt-walker. The rest of the plumage is white, excepting the wings and the centre of the abdomen, which are black. The total length of the bird is fourteen inches, including long yellowish legs, three inches, and a straight slender bill nearly the same length as the legs.

From swampy acres, full of beautiful aquatic plants, contiguous to the Murray River, I have flushed, in company with other water-fowl, the Banded Stilt, which can be detected amongst the whirr of wings and voices of the other birds by its puppy-like barking notes. As in the days of good Gilbert, I made the acquaintance of this fine Stilt on Rottnest Island, Western Australia, where it is locally known as the "Rottnest Snipe." There they wade gracefully in the shallows of the salt lake, which is evidently a favourite feeding ground, because the birds resort thither annually. About the middle of November (the 18th was the precise day the season of my visit) they arrive in companies of tens or twenties in number, apparently coming from the far Interior, because none are observed on the adjacent mainland, and gradually increasing in numbers till thousands may be seen upon the face of the lake. They remain all summer, departing again about April. During the interval between April and November no doubt, they breed in some secluded part of the Interior. But occasionally, especially during wet seasons, the Banded Stilts may be found breeding in Riverina, as in the year when my young friend, Mr. Lindsay Clark, enriched my collection with the eggs of this species, which he procured from near Booligal, on the Lachlan, New South Wales, the memorable wet season of 1879.

## 617.—RUCURVIROSTRA NOVÆ HOLLANDIÆ, Vieillot.—(519)

## RED-NECKED AVOCET.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 27.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 333.

*Previous Descriptions of Eggs*.—Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii. (1882); North: Austrn. Mus. Cat., pl. 17, fig. 1 (1889); Campbell: Proc. Austrn. Assoc., vol. v., p. 439 (1893).

*Geographical Distribution*.—Australia in general, and Tasmania; also New Zealand.

*Nest*.—The bare ground, usually near water; occasionally bits of vegetation define the nest.

*Eggs*.—Clutch, four; long oval in shape; texture of shell somewhat coarse; surface lustreless; colour, a shade of deep-stone, or stone-colour, with an olive tinge, moderately marked over the surface with blotches and large spots, mostly roundish in form, of dark-brown; also some duller markings of a slaty character appear under the shell's surface. Dimensions in inches of a clutch: (1) 2.04 × 1.34, (2) 2.03 × 1.4, (3) 1.92 × 1.28. (Plate 23.)

The Avocet's and the Banded and White-headed Stilts' eggs are much alike, but the Avocet's may be at once detected by their large size.

*Observations*.—The Avocet is extremely like the Stilts, only that it has its bill very much upturned, that organ resembling exactly a boot-maker's awl. Its plumage is black and white, contrasted with a chestnut head and neck, relieved by bright-red eyes, while the long legs are bluish-green. Along with the Stilts, the Avocet during the season is frequently exposed for sale in the Melbourne shops, and its habitat includes Australia in general and occasionally Tasmania. It frequents the shallows of lakes, mudbanks of estuaries, often wading, or readily swimming if necessary.

Mr. K. H. Bennett informed Dr. Ramsay that the breeding months embrace September and December, that is for New South Wales, and that he took the eggs, which Dr. Ramsay described, from among the herbage usually seen growing about the sheep tanks in the Interior. The Avocet sometimes breeds in large companies, as was the case when my examples of eggs were gathered at Ulonga, about thirty miles from Hay, Riverina, 1879. Mr. Bennett also found similar colonies breeding on the margin of a lake in the Interior during the season 1887.

During the autumn of 1900 small families of Avocets were found breeding in Riverina (New South Wales), and near the North-west Cape.

Avocets' eggs would appear to be rare in collections.



## SUB-FAMILY—TOTANINÆ.

## 618.—NUMENIUS CYANOPUS, Vieillot.—(535)

## CURLEW.

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 42.

*Reference.*—Cat. Birds Brit. Mus., vol. xxiv., p. 350.

*Geographical Distribution.*—Whole of Australia and Tasmania; also New Zealand and New Guinea, migrating to Eastern Siberia to breed.

*Nest and Eggs.*—Undescribed.

*Observations.*—The real Curlew is a large bird, twenty-four inches long, including a long curved bill seven inches in length. The general colour of the plumage is grey, with bluish-green legs. This bird must not be confounded with the Stone Curlew of bush-men and others.

Although the Australian Curlew was first found in Australia, it really breeds in Asia, and to escape the Asiatic winter, migrates down to Australia, and even New Zealand. Mr. Seebohm says: "The Australian Curlew breeds somewhere in Eastern Siberia, since it occurs on migration from Lake Baikal to the mouth of the Amoor, and along the coasts of Japan and China." The eggs, however, are unknown, but by analogy we can understand that, like other Curlews, the Australian lays four large eggs of a mottled olive-green appearance, upon the ground in a marshy situation. The Curlew arrives in goodly numbers about the same time as the Snipe. It wanders down the east and west coasts, and has been observed in all the States and Tasmania. Curlews feed upon crabs, molluscs, worms, &c., on the seashore and mud-flats of estuaries. Western Port, Victoria, is a favourite feeding ground. Regarding that locality Mr. G. E. Shepherd, from his own observations, writes: "I have noticed the Curlews are always with us before August is quite gone, though they are not found in great numbers till towards the end of November, when thousands are to be seen at high tide perched upon the mangrove scrub waiting for the water to recede, at which time they pounce down upon the crabs, hooking them out of holes with their long bills, which seem specially adapted for this purpose. I have made very careful observation and inquiry as to their time of departure, and I should fix it as between March and June, but several reliable boatmen state that a few winter with us, and odd birds are always to be seen about Western Port Bay."

Mr. G. E. Shepherd also mentions that it is a most interesting sight to watch, during some autumn evening, the Curlews commencing their

great northern flight or migration. He has observed the birds in hundreds, perhaps thousands, starting in long lines and flying high, describing, as it were, the figures of so many huge centipedes in the sky.

During the expedition of the Field Naturalists' Club of Victoria to the Furneaux Group, Bass Strait, November, 1893, large flocks of Curlews were observed on the Samphire Reef, south of Flinders Island, in Franklin Sound.

- 619.**—*NUMENIUS PHEOPUS* (sub-species) *VARIEGATUS*, Scopoli.—(536)  
*N. uropygialis*, Gould.

#### WHIMBREL.

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 43.

*Reference.*—Cat. Birds Brit. Mus., vol. xxiv., p. 361.

*Geographical Distribution.*—Whole of Australia and Tasmania; also New Zealand, New Guinea, and the Malayan Archipelago, migrating to Japan and Eastern Siberia.

*Nest and Eggs.*—Undescribed.

*Observations.*—This bird is a duplicate of the Curlew, only half the size, and is slightly smaller than the Whimbrel of Europe, with which some authorities believe the Australian bird is identical. The Australian Whimbrel, also like the Curlew, breeds somewhere in Eastern Siberia, passing along the coasts of Japan and China on migration to Australia and Tasmania, but it also "winters" in India and other intermediate localities. I have observed Whimbrels both on the east and west coasts of Australia. I especially remember a number running about the flat on a creek behind Townsville, Queensland. The birds were tame and appeared exceedingly hungry, judging by the way they eagerly probed the moist ground in search of food. Perhaps they had just arrived from one of their long flights. It was then early in September.

- 620.**—*MESOSCOLOPAX MINUTUS*, Gould.—(537)  
*Numenius minor*, S. Müller.

#### LITTLE WHIMBREL.

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 44.

*Reference.*—Cat. Birds Brit. Mus., vol. xxiv., p. 371.

*Geographical Distribution.*—Australia in general; also the Moluccas, migrating through China and Japan to breed in Mongolia and Eastern Siberia.

*Nest and Eggs.*—Undescribed.

*Observations.*—As its name implies, this bird is a small edition of either the Curlew or Whimbrel. It is found in the coastal localities during summer in Australia in general, but has not been observed in Tasmania. It likewise migrates from the Northern Hemisphere, following in the track of its larger congeners.

During the first week of October, 1896, Mr. T. Carter wrote that Curlews and Little Whimbrels appeared at Point Cloates, near the North-west Cape of Australia.

Gould mentions having shot a pair of Little Whimbrels out of a flock of about twenty which was flying over the racecourse at Maitland, New South Wales, 4th April, 1839. Judging by the date, the birds, after spending a summer in Australia, were probably flocking to return to the land of their nativity, in the far away north—Siberia.

On the plains of North-west Australia these birds may often be noticed. Their mode of flight against the wind closely resembles that of the domestic Pigeon. On alighting on the ground they immediately become very active in their search for food, which consists of insects, especially grasshoppers, and a few small seeds.

Throughout my general observations on the Plovers, &c., family, I have frequently alluded to the name of the late Mr. Henry Seebohm. Mr. Seebohm made a life study of his particular feathered friends, the members of the extensive order *Limicolæ* tracing as many as he could to their breeding grounds within the Arctic Circle, both in Europe and Asia, likewise following them to their wintering quarters in South Africa, and has left to posterity a monument of original research of the most instructive and fascinating kind in his work, "The Geographical Distribution of the Family *Charadriidæ*, or the Plovers, Sandpipers, Snipes, and Their Allies." However, the eggs are still unknown of many of the Australian species, such as the Curlew, the Whimbrels, the Great and Little Sandpipers, and several others. Is there no enthusiastic Australian ornithologist or oologist to follow these birds till they give up their secrets as Mr. Seebohm did the British birds?

I fear it will not happen in my day, or my son's; but I prognosticate some of our grand-children will yet follow these birds to their breeding haunts. No Australian oology will be complete without the description of the eggs of these migrants to the far off frigid zone.

Let me close with an extract from Mr. Seebohm's own graphic description of what he terms "The Paradise of the *Charadriidæ*": "Winter is finally vanquished for the year, and the fragments of his beaten army are compelled to retreat to the triumphant music of thousands of song-birds, amidst the waving of green leaves and the illumination of gay flowers of every hue. The transformation is perfect. In a fortnight the endless waves of monotonous white snow have vanished, and between the northern limit of forest growth and the shores of the Polar Basin smiles a fairy-land full of the most delightful little lakes and tarns, where Phalaropes swim about amongst Ducks, and Geese, and Swans, and upon whose margins Stints and Sandpipers trip over the moss, and the stranded potamogentons, feeding upon the larvæ of mosquitoes or on the fermenting frozen fruit of last year's autumn. It is incredible how rapidly the transformation was completed. Twelve

hours after the snow had melted, the wood-anemone was in flower, and twenty-four hours afterwards the yellow flowers of the marsh marigold opened. In a short time the country was like an English garden run wild. On the Arctic Circle wild onions, wild rhubarb, pansies, Jacob's-ladder, purple anemones, dwarf roses, and a hundred other flowers made the country quite gay; whilst on the tundras wild fruit of various kinds—crowberry, cranberry, cloudberry, Arctic strawberry—were blended with reindeer moss and other lichens, together with the most characteristic of Alpine flora.

“Although the first rush of migratory birds across the Arctic Circle was almost bewildering, every piece of open water, and every patch of bare ground swarming with them, a new species, on an average, arriving every two hours for several days, the period of migration lasted more than a month. Very little migration was observable until about the 22nd of May, although a few stragglers arrived earlier, but during the next fortnight the migration was prodigious. In addition to enormous numbers of Passerine (perching) birds, countless flocks of Geese, Swans, and Ducks arrived, together with a great many Gulls and Terns and birds of prey. During the next fortnight, from the 5th to the 19th June, fresh species of Passerine birds continued to arrive, and the main migration of the species belonging to the family *Charadriida* (Plovers, &c.), took place. The Common and Pin-tailed Snipes were the first to arrive, in company with the Australian Golden Plover on the 5th. The Wood Sandpiper and Temminck's Stint arrived on the 6th. The Golden Plover arrived on the 7th, and the Ringed Plover with the Terek Sandpiper (Australian species) on the 8th. The Ruff and the Dotrel arrived on the 9th, and the Great Snipe on the 11th, and the Common Sandpiper (Australian) on the 12th. On the 15th the Green Sandpiper, the Red-necked Phalarope, and a solitary Curlew Sandpiper (Australian) arrived. Although migration continued until the end of the month, during which many new species of Passerine arrived, I did not add a new species of Charadriine bird to my list until we reached the tundra beyond the limit of forest growth.”

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**621.**—*LIMOSA NOVÆ ZEALANDIÆ*, Gray.—(521)  
*L. uropygialis*, Gould.

**BARRED-RUMPED GODWIT.**

*Figure.*—Gould: *Birds of Australia*, fol., vol. vi., pl. 29.

*Reference.*—Cat. *Birds Brit. Mus.*, vol. xxiv., p. 377.

*Previous Description of Eggs.*—Middendorff: *Sibir, Reise, Vög.*, pl. 19, fig. 5 (1851).

*Geographical Distribution.*—Australia in general, and Tasmania; also New Zealand, other Oceanic localities, and the Malayan Archipelago, migrating through China and Japan to the regions of Eastern Siberia and Alaska.

*Nest and Eggs.*—No doubt resemble those of the Black-tailed Godwit (*Limosa limosa*).

*Observations.*—This bird is the eastern ally of the Bar-tailed Godwit of Europe, and, as Mr. Seebohm observes, it is impossible to say where the two forms meet, but he suggests most probably on the Taimyr Peninsula. The eastern colony of these Godwits passes the coasts of Japan, Manchuria and China on migration, and winter in the Malayan Archipelago and Australasia. Its presence has been noted in all the States, Tasmania, and in some of the outlying islands of the South Pacific. One October (1898), I saw scores of them exhibited for sale in the Melbourne market.

Mr. Borchgrevink, of Antarctic fame, showed me three of the birds which he shot on one of the islands of the far south—Campbell, I think it was—during the cruise of the whaler “Antarctic,” 1894. Of course we usually only see the Barred-rumped Godwit here in its winter or non-breeding dress, which may be described thus—all the upper surface is a mottled brownish-grey; rump and upper tail coverts conspicuously barred (hence the vernacular name) with brown and white, while the underneath parts of the birds are greyish-white. The lengthened bill is light-coloured at the base, blending into a brownish tip; legs dark-brown or black.

However, Gould mentions having received from Mr. Waterhouse, Adelaide, a specimen, which was said to have been obtained in the Northern Territory, in red or summer dress. The bird in its winter plumage so resembles a large Snipe that it is frequently mistaken for one of the family; and, like the Snipe, is excellent eating. Gould found the Barred-rumped Godwit in great abundance in company with Curlews, Oyster Catchers, and Sandpipers at Pitwater, in Tasmania, feeding on the extensive flats left bare by the receding tide. That great ornithologist also observed it on the sandy flats of Spencer Gulf, and on the sandbanks at the mouths of rivers in New South Wales, and therefore we may easily suppose the bird is found in like situations throughout the whole of our coasts. Its chief food is small-shelled mollusca and marine insects of various kinds.

The ancient Middendorff gives a figure of the egg, but does not describe it; nor does he describe the nest—merely mentioning that it is hard to find on the marshy meadows of the tundras.

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**622.**—*LIMOSA LIMOSA*, Linnaeus.—(520)

*L. melanuroides*, Gould.

**BLACK-TAILED GODWIT.**

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 28.

*Reference.*—Cat. Birds Brit. Mus., vol. xxiv., p. 381.

*Previous Descriptions of Eggs.*—Taczanowski: Journ. Orn., p. 104 (1873).

Legge: Birds of Ceylon, p. 835 (1880); also others.

*Geographical Distribution.*—Northern Territory, Queensland, New South Wales, Victoria and South Australia, migrating to Eastern Siberia to breed.

*Nest*.—Composed of dry grass and other herbage, concealed amongst coarse vegetation in low-lying or marshy land (Butler).

*Eggs*.—Clutch, four; pyriform in shape; texture of shell somewhat coarse; surface slightly glossy; colour, light-olive, blotched in some examples obscurely with olive of different shades. Dimensions in inches of a set: (1) 2.17 × 1.5, (2) 2.1 × 1.54, (3) 2.09 × 1.52.

*Observations*.—This is the rarer of the two species of Godwits that visit Australia, where it has been noted in the Northern Territory, Queensland, New South Wales, Victoria, and South Australia. In size or total length it is fifteen inches, or about the dimensions of the preceding species. Head and upper surface are greyish-brown, with a small streak of black down the centre of each feather; wings barred with white; underneath parts white, except the chest, which is inclined to be mottled with grey. The slender legs are greenish grey, with a long bill the same colour. Of course, in common with the other Godwit, its northern or breeding plumage would be much browner in colour. This black-tailed variety, or, as Mr. Seeböhm calls it, the Siberian Black-tailed Godwit, breeds in the Altai Mountains, the basin of Lake Baikal, and throughout the valley of the Amoor, and, on migration south, follows the coast lines for the most part.

However, in the "Catalogue" of the birds of the British Museum, the eastern and western races of the Black-tailed Godwits are merged into one under the old familiar name *Limosa limosa*.

Dr. Taczanowski, writing to Mr. Dresser respecting the Black-tailed Godwit on the Vistula, says: "Usually they begin breeding early in May, and about the middle of June young may be found fully fledged. They generally breed in societies, in tolerably damp places covered with high thin herbage, where there are tussocks or small dry places; but also in fields (in scattered pairs or small colonies) and in small marshes covered with grass and bushes. On the top of a tussock or a dry place they make a depression about three inches deep, and line it carefully and neatly with dry grass, depositing four eggs, which both male and female sit on. If a human being approach their nesting colony, they meet him when some distance from it, uttering loud cries and returning again and again in larger numbers as he comes nearer to their nests. When he is amongst the nests all the birds fly overhead, uttering a continued lamentation. If the intruder remains there any time, they become tamer, and a few return to their eggs, especially if the latter are hard-set."

### 623.—*TOTANUS STAGNATILIS*, Bechstein.—(530)

#### LITTLE GREENSHANK.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 37.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 422.

*Previous Descriptions of Eggs*.—Thienemann: Abbild. Vögeleiern, pl. 64 ( ); Legge: Birds of Ceylon, p. 847 (1880); also others.

*Geographical Distribution*.—South Queensland and New South Wales; also New Guinea, Malayan Archipelago, Africa and India,

migrating to breeding grounds in North-eastern Asia and extending to Southern Europe.

*Nest*.—No doubt similar to that of the bird's larger relative, the Greenshank (*Glottis nebularius*).

*Eggs*.—Clutch, three to four; pyriform in shape; texture of shell fine; surface glossy; colour, rich stone, somewhat heavily blotched and otherwise marked with dark-brown or chestnut and dull purplish-grey. Dimensions in inches: (1) 1.57 × 1.08, (2) 1.48 × 1.09.

*Observations*.—This species is generally termed the Marsh Sandpiper, and, as its name implies, is just the Greenshank in miniature. Its eggs also, except for their smaller size, are a fac-simile of those of the Greenshank. With reference to the Little Greenshank Mr. Seeböhm remarks that its breeding range extends from the delta of the Rhone and the valley of the Danube, through South Russia, North Persia, and Turkestan to Southern Siberia. In Australia the bird has only been recorded for Queensland and New South Wales, but doubtless it has visited the coast-line of Northern Australia.

624.—*HETERACTITIS BREVIPES*, Vieillot.—(531)  
*Gambetta pulverulentus*, Müll.

GREY-RUMPED SANDPIPER.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 38.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 449.

*Geographical Distribution*.—West and North-west Australia, Northern Territory, Queensland, and New South Wales; also New Guinea and Malayan Archipelago, migrating through China and Japan to Eastern Siberia.

*Nest and Eggs*.—Undescribed.

*Observations*.—The shores of Northern Australia must be a fine field for the waders from the further north to winter on, judging by the number of kinds Gilbert noticed or procured at Port Essington and the Port Darwin district. In the salt-water lakes and swamps at some seasons of the year he saw the Grey-rumped Sandpiper in vast flocks in company with Stints and Plovers. Mr. Tom Carter saw similar flocks of the Sandpiper near the North-west Cape, November, 1899. At one shot he bagged no less than eight birds.

The Grey-rumped Sandpiper, which is closely allied to *H. incanus*, is not uncommon on the Sydney side of the coast.

Seeböhm, who calls the bird in the vernacular the Asiatic Wandering Tattler, states that it breeds in Eastern Siberia, from Lake Baikal to Kamtschatka, and passes along the coasts of Japan, China, Formosa and the Philippines, to winter in the islands of the Malay Archipelago and Australia.

**625.—HETERACTITIS INCANUS, Gmelin.**

## AMERICAN GREY-RUMPED SANDPIPER.

*Figure.*—Baird, Cassin, and Lawrence: *Birds of North America*, pl. 88.

*Reference.*—Cat. Birds Brit. Mus., vol. xxiv., p. 453.

*Geographical Distribution.*—North Queensland, across Oceania, to the Galapagos Islands, and migrating along the Pacific coasts of North America to Alaska.

*Nest and Eggs.*—Undescribed.

*Observations.*—I believe the true *H. incanus*, or American Grey-rumped Sandpiper, occasionally touches the north-eastern shores of Australia.

Although the eggs are yet undescribed, this truly "Wandering Tattler" is supposed to breed, in its beautifully-barred plumage, in Alaska and the Aleutian Islands, then passes along the coast of California and the Galapagos Islands to winter among the Polynesian Islands.

Some years ago I received a specimen of this bird from the guano depôt of Messrs. Grice, Sumner & Co., of Melbourne, at Malden Island, in the Mid-Pacific. I forwarded it to Mr. Seeborn, who replied with the following interesting remark:—"The Sandpiper is *Totanus incanus*, which breeds in Alaska, but can only be a winter visitor to Malden. This you can prove by the date. It is in newly moulted breeding dress. If it is going to Alaska to breed the date ought to be March, April, or May. If it is going to breed in the southern hemisphere the date is probably about September." The skin was drab-coloured above breast, and flanks speckled with brown. When fresh the legs and feet should be pinkish-red. In fact, in size and structure the bird resembles the Red-shank of the British Islands.

**626.—TRINGOIDES HYPOLEUCUS, Linnæus.—(528)**

## COMMON SANDPIPER.

*Figure.*—Gould: *Birds of Australia*, fol., vol. vi., pl. 35.

*Reference.*—Cat. Birds Brit. Mus., vol. xxiv., p. 456.

*Previous Descriptions of Eggs.*—Various.

*Geographical Distribution.*—Whole of Australia and Tasmania; also New Guinea, Africa, India, &c., migrating to the north of the Old World to breed.

*Nest.*—A mere hole, lined with dry grass and moss, or without any lining; situated amongst herbage upon the banks of a stream, in a gravel bed amongst pebbles, or in irregularities upon the surface of a bare rock (Butler).



*Eggs*.—Clutch, four; pyriform in shape; texture of shell fine; surface glossy; colour, stony-grey, mediumly marked and spotted with umber or reddish-brown and obscure grey. Dimensions in inches: (1) 1.45 × 1.04, (2) 1.44 × 1.02.

*Observations*.—The Common Sandpiper is well named, being common not only to Australia and Tasmania, but to many other parts of the world, including Great Britain, where it is familiarly known as the Summer Snipe. In any of our colonial museums its figure may be studied in a homely drab or brownish dress marked with darker coloured bars, while the underneath parts are much lighter. The legs are yellowish-green. Total length, between seven and eight inches. Gilbert, who procured Gould's specimens in the Northern Territory, remarks: "Although solitary in its habits, I have seen three or four together. They were mostly observed inhabiting the beds of mangroves, over the roots of which, just above the water, they were very actively engaged in searching for their food (insects, crustacea, &c.), the tail being in constant motion. Occasionally I saw solitary individuals on the margins of the lakes inland."

Its eggs have never been taken in Australia, but in Europe it constructs a slight nest amongst herbage, in which it deposits four somewhat large eggs of a warm, stony-grey colour, marked with numerous roundish spots of umber.

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627.—TEREKIA CINEREA, Güldnest.—(527)

TEREK SANDPIPER.

*Figure*.—Gould: *Birds of Australia*, fol., vol. vi., pl. 34.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 474.

*Previous Descriptions of Eggs*.—Dresser: *Birds of Europe*, vol. viii., p. 200 (1871); Harting: *Proc. Zool. Soc.*, p. 454 (1874); Legge: *Birds of Ceylon*, p. 839 (1880); Campbell: *Southern Science Record* (1883).

*Geographical Distribution*.—South Queensland, New South Wales, and South Australia; also Africa, India, &c., migrating to Northern Siberia and North-eastern Europe to breed.

*Nest*.—Simply a slight saucer-shaped hollow in the ground, lined with chips of wood and bits of thick reed, situated in open marshy parts of an alder thicket by the sides of a creek, or on the sand amongst bent grass (Alston and Harvie-Brown).

*Eggs*.—Clutch. —; pyriform in shape; texture of shell fine; surface glossy; colour, warm or rich stone, blotched and spotted with rich or deep umber and dull purplish-grey. Most resemble those of the Common Sandpiper (*Tringoides hypoleucus*). Dimensions in inches: (1) 1.5 × 1.05, (2) 1.5 × 1.03.

*Observations.*—Gould shot a single example of this species on the River Mokai, in New South Wales, on July, 12, 1839. The second record was by a Mr. Waller, who killed one near Brisbane in May, 1869, and since then birds have been obtained in South Australia. Roughly described, the Terek Sandpiper is drab-coloured above and lighter on the underneath parts, somewhat short, brownish-orange legs, and long bill (two inches), slightly upturned, of the same colour, but passing into black towards the point. Total length of bird, eight and a half inches.

Mr. Seebohm says it appears to be the Arctic form of the Common Sandpiper; while Dr. Latham states that in the summer of the north it is numerous in the neighbourhood of the Caspian Sea, particularly about the mouth of the Terek River (hence the name), where it breeds, and that it is usually met with in flocks in the marshes, especially on the borders of the salt lakes.

More recently Russian naturalists have found the Terek Sandpiper nesting in the valleys of the Volga and Ural rivers, while Chomiakoff found eggs and young in another locality on the Oka, to the south of Moscow; therefore, although Messrs. Alston and Harvie-Brown found the species nesting in abundance at the north of the Dwina, in June, 1872, the Terek Sandpiper is evidently not strictly an Arctic breeding species.

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**628.**—*GLOTTIS NEBULARIUS*, GUMPHRS.—(529)

GREENSHANK.

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 36.

*Reference.*—Cat. Birds Brit. Mus., vol. xxiv., p. 481.

*Previous Descriptions of Eggs.*—Various.

*Geographical Distribution.*—Australia in general and Tasmania; also Africa, India, &c., migrating to breed in the north of the Old World.

*Nest.*—A shallow depression in a dry tuft of grass, lined sparingly with dry, wiry grass and fragments of heath. Situated in or on the borders of marshy ground, by the side of a lake, or in open forest, often at some distance from water (Butler).

*Eggs.*—Clutch, four; exceedingly pyriform in shape; texture, comparatively fine; surface glossy; colour, varies from stony-grey to rich stone, blotched and spotted, especially about the apex, with rich reddish-brown or umber and dull purplish-grey. Dimensions in inches of odd examples: (1) 1.96 × 1.4, (2) 1.95 × 1.3; of a pair: (1) 1.9 × 1.32, (2) 1.84 × 1.36.

*Observations.*—The Greenshank, it is interesting to note, is exactly the same species that is found in the British Isles. Our visitors probably breed about the Arctic Circle in Siberia, coming to Australia by way of Eastern Asia and down the Malayau Archipelago. In the season it

is common to Australia in general, and Tasmania,\* frequenting the sandy banks of rivers and lakes, and is particularly fond of mollusca and crustacea found on the mud flats at the estuaries of rivers at low tide, where the Greenshank is often seen in small flocks in company with Curlews, Whimbrels, &c. The bird's name, Greenshank, at once betrays its identity, for its stilt-like shanks are greenish in colour, while its plumage is beautiful, being greyish mottled on the back, with rump, tail, and most of the underneath parts pure white. The eyes and bill (which is  $2\frac{1}{2}$  inches in length) are dark. The total length of the bird is 14 inches.

According to Colonel Legge, the Greenshank breeds in May and June. On the 12th of the former month Middendorff found it already at its breeding haunts in North-eastern Siberia, and its eggs were taken by Seeböhm and Harvie-Brown on the Petchora on the 11th June.

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629.—BARTRAMIA LONGICAUDA, Bechstein.—(514)

BARTRAM SANDPIPER.

*Figure.*—Gould: Birds of Australia, fol., supp., pl. 77.

*Reference.*—Cat. Birds Brit. Mus., vol. xxiv., p. 509.

*Previous Descriptions of Eggs.*—Various.

*Geographical Distribution.*—South Queensland, New South Wales, Victoria and South Australia, migrating across Oceania to North America; also visits South America, and accidental to Europe.

*Nest.*—Upon the ground on a grassy plain or pasture.

*Eggs.*—Clutch, four to five; pyriform in shape; texture of shell comparatively fine; surface slightly glossy; colour, warm, stony-grey, blotched and spotted, especially on the larger end, with amber and grey. Not unlike in appearance those of the Common Sandpiper (*Tringoides hypoleucus*), only double the size. Dimensions in inches of a proper clutch: (1)  $1.75 \times 1.28$ , (2)  $1.72 \times 1.29$ , (3)  $1.69 \times 1.36$ , (4)  $1.65 \times 1.3$ .

*Observations.*—This is a tall, gaunt bird, about 12 inches in length, and it is of interest, because it wanders to us from the southern provinces of Canada and the northern portions of the United States. It has been procured in nearly all our States. In Victoria, Count Castelnau, so Dr. Ramsay says, obtained his specimen in the Melbourne market.

Baird, Brewer and Ridgway, in "Water-Birds of North America," mention the Bartram Sandpiper as "breeding over Canada and United States from Pennsylvania northwards, more commonly in the Interior. A nest found at Carlisle, Pennsylvania, was a mere depression in a

\* The first Greenshank from Tasmania was reported to have been shot by Mr. J. Carr, Launceston, on the mud flats of the Tamar, 1892. I believe other birds have since been noted.

ploughed field, with only a few pieces of decayed grass stems to keep the eggs from the damp soil. . . . In Pennsylvania the eggs are hatched out early in June, and there, as elsewhere, only a single brood is raised in one season. The nest is always placed in an open situation, but notwithstanding this circumstance it is not easily found without the aid of a good dog trained for the purpose."

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SUB-FAMILY—SCOLOPACINÆ: SNIPES.

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630.—CALIDRIS ARENARIA, Linnæus.

SANDERLING.

*Figure*.—Gould: Birds of Great Britain, vol. iv., pl. 66.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 526.

*Previous Descriptions of Eggs*.—Newton: Proc. Zool. Soc., pl. 4, fig. 2 (1871); Feilden—Nares: Voy. Polar Sea, vol. ii., pl. 1 (1878); Seebohm: British Birds, pl. 27, fig. 8 (1887).

*Geographical Distribution*.—West and North-west Australia, North Queensland and New South Wales; nearly cosmopolitan, and breeding in the Arctic regions.

*Nest*.—Slight, made of a little dry grass and leaves (Seebohm).

*Eggs*.—Clutch, four; colour, buffish-olive, thickly mottled and spotted with pale olive-brown and with a few indistinct underlying markings of violet-grey, the majority of the markings being on the larger ends. Dimensions in inches: from 1.44 to 1.33 in length by from .99 to .92 in breadth (Seebohm).

*Observations*.—The Sanderling is easily recognised by the absence of a hind toe. According to Henry Seebohm, this wandering bird doubtless breeds on all the coasts of the Arctic Ocean, though its eggs have only been taken on the Anderson River, in Grinnell Land, Greenland, Sabine Island and in Iceland. On the Asiatic coast he himself shot it in July, Middendorff observed it on the Taimyr Peninsula, while it is a common bird in summer in Alaska.

On its migration southward to winter in various countries, the Sanderling no doubt is a regular visitor to the north-west coast of Australia, judging by the field notes Mr. Tom Carter has furnished me with from time to time.

However, the first intimation we have of the Sanderling being an Australian bird is found in Captain (afterwards Rear-Admiral) Stokes's "Discoveries in Australia," vol. ii., p. 254. When in Halifax Bay, North Queensland, June, 1841, he wrote: "Our game bag was thinly lined with small Curlews, Oyster Catchers, and Sanderlings."

Professor Alfred Newton has recorded the following note in the "Records" of the Australian Museum, Sydney (1892):—"Having lately occasion to investigate the range of the Sanderling (*Calidris arenaria*), I came across a memorandum made in the year 1860 of my having seen in the Derby Museum at Liverpool two specimens of the larger race of this species, one in winter dress and the other in incipient spring plumage, both marked as females, and as having been obtained at Sandy Cove, in New South Wales, 20th April, 1844, by the late John Macgillivray."

At a meeting of the Royal Society of Victoria, 8th November, 1894, I read a note on the occurrence of the Sanderling on the west coast at Point Cloates, near the North-west Cape.

Mr. Tom Carter kindly forwarded a skin to me with the following memorandum: "I was out with my gun last week (middle of July, 1894), and after a shot at a party of waders I picked up eight Turnstones, two Little Sandpipers (*Limonites ruficollis!*), and two birds, as per skin herewith. I take it to be the Sanderling. You will observe there is no hind toe. The other bird was too much smashed to make a skin."

The skin I passed on to Colonel Legge, who is much interested in the distribution of our Limicoline birds. He replied: "*Calidris arenaria* in abraded plumage, with new winter feathers coming on back of wings."

Since then Mr. Carter has furnished further and somewhat regular data regarding the Sanderling. The following I extract from his letters: "On the 22nd September, 1895, I shot another Sanderling at the same place as last year, and out of a flock of Waders. I had a stroll out one afternoon and gave the birds I shot to some natives to carry back, but unfortunately they cooked and ate them all before I was aware of their intentions.

"Mr. D. McLean, a visitor, shot a Sanderling at Point Cloates, 30th December, 1895.

"12th December, 1896. I shot an undoubted Sanderling. It was badly smashed and in poor plumage, so did not make a skin.

"5th December, 1897. Shot four out of five Sanderlings at one shot; was camped out at the time and could not make good skins. (This note was accompanied by a pair of skins, which unfortunately were so far damaged by insects in transit as to be perfectly worthless. He also shot two other Sanderlings about the 1st November, which were forwarded to the Perth—Western Australia—Museum).

"25th April, 1898. Shot two Sanderlings at Point Cloates, and at same locality, 27th November, 1898. Asiatic Dotterels and Sanderlings plentiful now."

"— June, 1899. Sanderlings, also Turnstones and Little Stints, are here all through the winter, every year." This last note of Mr. Carter's is certainly very puzzling, seeing that these birds, at that time, should be away in some northern clime breeding.

Returning again to the far away breeding haunts of this wandering bird, we find, according to Seebohm's "British Birds," that "the habits of the Sanderling during the breeding season are little known. It possibly pairs before it leaves its winter quarters, for it has been observed in chase of its mate on the sands. It arrives at its breeding place as soon as the snow is sufficiently melted to allow it to find food; and shortly

after its arrival its nesting duties are commenced. Probably the first authentic eggs of the Sanderling were obtained by Macfarlane on the barren ground close to the shore of the Arctic Ocean, a little east of the Anderson River, of North-west America. He found the nest on the 29th of June, 1863. It contained four fresh eggs, and the female was captured. The nest was slight, made of a little dry grass and leaves. In 1876 Capt. Feilden (not Fielden—J.A.C.) added further to our knowledge concerning this interesting little bird. He found it breeding at the extreme northern limit of animal life, on the shores of the frozen ocean, a little to the west of Cape Union, in Grinnell Land. He observed several pairs of birds, and found one nest containing two eggs, on the 24th of June. It was placed on a gravel ridge, several hundred feet above sea level, and consisted merely of a slight depression in the centre of a recumbent plant of willow, lined with a few dead leaves and some of last year's catkins. At this nest the male was killed, so that it appears both parents assist in incubating the eggs. On the 8th of August of the same year he observed several parties of young Sanderlings, just able to fly, with down sticking to their feathers, being led about by their parents and searching diligently for insects."

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631.—LIMONITES RUFICOLLIS, Pallas.—(524)  
*Tringa albescens*, Temm.

LITTLE STINT.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 31.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 545.

*Geographical Distribution*.—Whole of Australia and Tasmania; also New Guinea and the Malayan Archipelago generally, migrating through Burma, China, and Japan to Eastern Siberia.

*Nest and Eggs*.—Undescribed.

*Observations*.—This exceedingly interesting little bird is the smallest of our Sandpipers. We learn from Mr. Seebohm that it was first described by the Russian naturalist, Pallas, in 1776, and that it breeds in Eastern Siberia, passing by way of Lake Baikal, China, and Japan, to winter in the Malayan Archipelago and Australia. The Little Stint, or Least Sandpiper, is common during the summer in every State, including Tasmania. The shores of brackish swamps, salt lakes, and estuaries are its favoured haunts, where it feeds on aquatic insects (land and marine) and small shell-fish. As we see it in Australia it has a simple dress—greyish or drab-coloured—light on the underneath parts, with a faint trace of rusty mottle about the chest. The wing coverts are tipped with white. The bill and eyes are dark-brown, while the slender legs are more of an olive-brown. The total length of this sprightly little Wader is just a trifle under six inches. Gilbert, the able

coadjutor of Gould, mentions that the Little Stint assembles in large flocks on Rottneest Island. I can bear testimony to this fact, for during my visit to Western Australia the birds still were plentiful on that favourite and undisturbed feeding ground. In going round the salt lake on Rottneest (or Rat's Nest of the discoverer Vlaming) Island, I saw flocks of hundreds of the Little Stints or Little Snipe, as the residents call them. They appeared to be partial to the narrow, moist beaches, and were rather loathe to move; when flushed, however, they simultaneously rose, every now and again sharply wheeling, displaying alternately their dark backs and a flash of white under-surfaces.

Further north I sought diligently for the eggs on Houtman's Abrolhos, where Gilbert alleged he found two, but without success. I now believe Gilbert may have mistaken the eggs of the Red-capped Sandpiper for those of the Little Stint—a mistake easily made, because I noticed in the evening the two species retired from the beaches to roost together in the centre of the islands. However, it would be remarkable if Little Stints' eggs were taken in Australia, seeing the bird is an Arctic breeding species, where it is known in its gayer breeding plumage as the Red (rusty) throated Stint.

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632.—HETEROPYGIA ACUMINATA, Horsfield.—(522)

SHARP-TAILED STINT.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 30.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 566.

*Geographical Distribution*.—Whole of Australia and Tasmania; also New Zealand, New Guinea and the Malayan Archipelago, migrating by China and Japan to breed in the regions of Eastern Siberia and Alaska.

*Nest and Eggs*.—Undescribed.

*Observations*.—The Sharp-tailed Stint, or as it is sometimes called, the Marsh Tringa, has been procured in all the States of Australia and Tasmania. These birds are partial to marshy districts and the borders of streams, and run through the grass and herbage much after the manner of true Snipes. They also frequent the sandy beaches of the sea coast either in pairs or small flocks. The food is chiefly aquatic insects and their larvæ. This pretty little species of Sandpiper is only between seven inches and eight inches in total length, and much resembles a small Snipe. Here may be given a rough description of the plumage. The feathers of the upper surface are dark-brown in the centre, fading into grey on the margin, and impart a very beautiful appearance to the coat of the bird. The crown of the head and breast wear a rufous tinge, while the abdomen is whitish; legs and bill are both about the same length ( $1\frac{1}{8}$  inches), matching each other in a shade of olive-green, while the eyes are black.

While Mr. Ed. Degen, my son and I were wading through a shallow swamp on the Werribee Plains, seeking for a Spur-winged Plover's nest (which, by the way, we found with three eggs just chipped), we flushed two or three Sharp-tailed Stints, which were tame and alighted again a short distance away amongst the water weeds. Their action on the wing was jerky and butterfly-like. Date, 3rd October, 1896.

The breeding haunts of the Sharp-tailed Stint are still shrouded in mystery, and its eggs are written down "undescribed," but Mr. Seebohm supposes it breeds in Dauria.

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**633.**—*ANCYLOCHILUS SUBARQUATUS*, Güldnest.—(523)

CURLEW STINT.

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 32.

*Reference.*—Cat. Birds Brit. Mus., vol. xxiv., p. 586.

*Geographical Distribution.*—Australia in general, and Tasmania; also New Guinea, Africa, India, &c., migrating to the Arctic regions to breed.

*Nest and Eggs.*—Undescribed.

*Observations.*—Although its precise breeding grounds are yet undiscovered, the Curlew Stint or Sandpiper is an Arctic-breeding species. In the seasonal changes of its plumage it resembles the Knot (the following species), as the bird changes the red or rufous livery of summer for the greyish coat of winter. Like the rest of the Sandpipers it resorts to the shingly beaches and the banks of estuaries and rivers in nearly every part of Australia and Tasmania. The specimens I noted on that famous feeding-ground—the Abrolhos—were either single or in twos or threes about the shores, but none appeared in full plumage—that is, in the rufous stage. The length of the bird is between 7 inches and 8 inches, including a comparatively long bill of  $1\frac{1}{2}$  inches. As Colonel Legge states, this fine Sandpiper maintains its interest for the ornithologist owing to its nest and eggs still being unknown, a fact rendered all the more curious by the very brief space of time it evidently spends in the Arctic regions.

The egg figured in my manual, "Nests and Eggs," as pertaining to the Curlew Stint, was obviously an error.

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**634.**—*TRINGA CANUTUS*, Linnæus.—(525)

KNOT.

*Figure.*—Gould: Birds of Great Britain, fol., vol. iv., pl. 65.

*Reference.*—Cat. Birds Brit. Mus., vol. xxiv., p. 593.

*Previous Description of Eggs.*—Merriam: Auk, vol. ii., p. 313 (1885).

*Geographical Distribution.*—South Queensland, New South Wales, Victoria and South Australia; also New Zealand, Africa and South America, migrating to the Arctic regions to breed.



*Nest*.—Undescribed.

*Eggs*.—Clutch, ; light pea-green, closely spotted with brown in small specks about the size of a pin head. Dimensions in inches: 1.1 × 1.0 (Merriam).

*Observations*. The Knot is an exceedingly interesting migrant, wandering from the Arctic regions to the far south, even to New Zealand. It was first noticed in Australia, near Brisbane, on 2nd September, 1861. Since then it has been observed in New South Wales, Victoria and South Australia. Our National Museum possesses examples, and I recollect once seeing a bird in a taxidermist's shop in Melbourne; also odd birds exhibited for sale in the market, with Snipe, Sharp-tailed, Little and Curlew Stints. For all that the Knot may be deemed a rare bird in these parts. When in full breeding or summer plumage in the north, the whole of the underneath parts are chestnut, which is also the prevailing colour of the upper parts. The traces of red are disappearing or have disappeared by the time the bird reaches Australia in our spring or early summer. The Knot is then in its off-season dress, a garb of grey. The uninitiated seeing the bird in its northern summer plumage and in its Australian winter phase might suppose he was looking at two distinct species. The specimens I saw in Melbourne appeared to have lost little, if any, of its chestnut colouring.

Mr. A. Coles exhibited at a meeting of the Field Naturalists' Club of Victoria, held 13th July, 1896, a fine group of Knots—a male in full plumage, a female, and an immature female—which were shot at Western Port the middle of May. I can understand the male being in full livery about that time, but what were the birds doing in Austral regions at that particular season instead of being somewhere within the Arctic Circle breeding?

Scarcely anything is known of the breeding places of the Knot. Mr. H. C. Hart, the naturalist of the expedition of the "Alert" and "Discovery," saw numerous full-grown birds with their young in the down in the neighbourhood of Discovery Bay. The finding of an egg by Lieutenant Greely, late commander of the United States Expedition to Lady Franklin Sound, was announced in the "Auk," the American ornithological journal, by Dr. Hart Merriam, who says: "Lieutenant Greely writes me the specimens of the bird and egg were obtained in the vicinity of Fort Conger, latitude 81 $\frac{3}{4}$  deg. north." Some authorities are inclined to doubt the parentage of the egg.

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635.—TRINGA CRASSIROSTRIS, Temminck and Schlegel.—(526)

GREAT SANDPIPER.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 33.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 600.

*Geographical Distribution*.—Northern Territory, Queensland, New South Wales, and West Australia; also New Guinea and the Malayan Archipelago, migrating through China and Japan to Eastern Siberia.

*Nest and Eggs.*—Undescribed.

*Observations.*—Still another northern visitor, which much resembles the Curlew Stint or Sandpiper as well as the Knot—in fact, it is sometimes called the Japanese Knot. The seasonal changes of all these birds are the same, but the Great Sandpiper is slightly the largest of the three birds, being  $10\frac{1}{2}$  inches in length. In Australia it has been recorded for West Australia, Northern Territory, Queensland, and New South Wales.

In exhibiting a skin before the Field Naturalists' Club of Victoria, 1898, collected on the Gippsland Lakes by Mr. J. B. Mason, I was somewhat too hasty in extending the locality to Victoria. Afterwards, in examining other examples, I proved it to be the Common Knot. I should also have observed that the Great Sandpiper or Japanese Knot, in its winter plumage, as it reaches us, nearly resembles the ordinary Knot; but the former has, besides a longer bill, pure white upper tail coverts, notwithstanding Gould's figure of the bird shows those parts mottled.

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**636.**—GALLINAGO AUSTRALIS, Latham.—(533)

SNIPE.

*Figure.*—Gould. Birds of Australia, fol., vol. vi., pl. 40.

*Reference.*—Cat. Birds Brit. Mus., vol. xxiv., p. 652.

*Previous Description of Eggs.*—Campbell: Victorian Naturalist vol. xiv., p. 170 (1898)

*Geographical Distribution.*—Whole of Australia and Tasmania; also New Zealand (accidental), and migrating by Formosa, &c., to breed in Japan.

*Nest.*—On the ground, amongst the grass of marshy uplands.

*Eggs.*—Clutch, four; pyriform, or pear-shaped; texture of shell comparatively fine; surface glossy; colour, warm stone-grey, boldly blotched and spotted, especially round the upper quarter, with rich umber and dull or cloudy purplish-brown; some of the heavier markings have the appearance of having been wiped on with a brush. Somewhat large compared with the size of the bird, and except for their larger size come nearest in likeness to those of the Turnstone (*Arenaria interpres*). Dimensions of a clutch in inches: (1)  $1.77 \times 1.2$ , (2)  $1.73 \times 1.22$ , (3)  $1.71 \times 1.22$ , (4)  $1.7 \times 1.21$ . (Plate 23.)

*Observations.*—The Australian Snipe was first described by Dr. Latham in 1801, and is sometimes known as Latham's Snipe. All sportsmen are familiar with the "Long-bills," but little is known of their natural economy, while their nests and eggs were only discovered, at all events only described, in 1898, or nearly a century after the birds themselves became known to ornithological science.

Seebohm, in his splendid work, "The Geographical Distribution of Plovers, Sandpipers, and Snipes," states the Australian Snipe "breeds in both islands of Japan, and passes the Philippine Islands and the coast of China on migration to winter (i.e., to escape the northern winter and really to summer) in Australia and Tasmania." Colonel Legge observes that although the Snipe passes over much latitude, its path is very narrow, as it does not touch the China coast on its flight from Japan to the north of Australia.

In Messrs. Blakiston and Pryer's "Birds of Japan" (1882), it is stated that this Snipe was obtained on Fuji, when breeding, and that it is common in Yezo, where it was first discovered to be a Japanese bird in 1861.

Mr. Blakiston, in his "Amended List of Birds of Japan," p. 37 (1884), furnishes the following interesting account of the bird: "Regarding the habits of this Snipe during the breeding season, I extract the following from my notes in the 'Chrysanthemum,' November, 1882, p. 524, referring to birds observed on the south-east coast of Yezo in May: 'The Common Snipe of Europe and the Great Australian Snipe were both tolerably numerous. They were evidently preparing to breed, so that I had many opportunities of observing the aerial evolutions which they go through at such season. Whether both are alike in this I am uncertain, but the Australian species acts very like the Snipe in North America, but flying about pretty high and making sudden rapid descents almost to the ground, which latter movement is accompanied by a loud whispering noise. At evening, and during the day in dull weather, these evolutions are commonly performed; and in dirty, rainy weather the noise is frequently heard even in the middle of the night. There is another singular habit which *G. australis* has, namely, that of perching on the stumps of trees. I think this is done only at the season when the peculiar aerial evolutions are practised, but this I am not confident about, nor am I sure it is a habit of this Snipe only. To be certain, I shot two Great Australian Snipe the same day off trees. The first was on the top of a dead oak, the upper part of which had been broken square off thirty-seven or thirty-eight feet from the ground. I am tolerably near the exact height I know, because I placed a stick in a crevice in the tree, and then going off to some distance counted the number of fathoms to the top. The other one I watched for some time going through its aerial evolutions, until after one of its rapid descents it alighted on the head of a stump about ten feet high, when I shot it.'"

The Japanese, who call the bird Yama-shinja, take little interest in the natural history of their country. That is one reason why the nests and eggs remained so long undiscovered, and why we know so little of the domestic matters of this feathered migrant, so full of interest to Australians.

When Messrs. S. H. Rowe and J. Kelly, of the Customs Department of Victoria, were deputed by the Government in 1894 to undertake a "Trade Mission" to the East, I very naturally thought of Snipe, and Mr. Rowe kindly made a private memorandum in his pocket book. When he reached Japan Mr. Rowe was introduced to Mr. Allan Owston, of Yokohama, the only person there likely to procure Snipes' eggs.

I corresponded with Mr. Owston for three years, till at length he wrote: "I am the proud possessor of the eggs of *Scolopax (Gallinago) australis*. I have had extraordinary trouble and expense to obtain them. The birds breed on the grassy moorlands at the foot of Fujiyama at an elevation of 2,000 to 3,000 feet above the sea. Fujiyama is 12,500 feet high. I watched them on the 28th April (1897), and on other dates during the breeding season. When alarmed they fly round high overhead, circling generally against the sun, and every now and again they cry 'chlip, chlip, cheo, che-cheo,' and then rush downward at the intruder, beating the air in their descent and making a terrific rushing noise. When the weather is foggy and they come close down the noise is so startling that it is some time before a nervous person can get accustomed to it. Heard in the distance it may be easily mistaken for the hard breathing of a railway engine climbing a mountain gradient. They make about two or three downward dives during each circuit."

The handsome clutch of eggs I am indebted to Mr. Owston for was accompanied by the following data:—"363. *Scolopax australis*. Nest on ground, among grass. Harasatomura, Gotemba. 17th May, 1897. Contained four eggs." I may mention that Mr. Owston endeavoured to snare with bird-line one of the parents of the first nest he found, but only succeeded in pulling a few feathers out of the bird. The following day he netted another bird and caught a young one by hand.

The Snipe has been observed in Japan from April to August. When they take their great southward flight, as soon as Australia is reached some probably land, others go south-west, but the bulk of migration continues down the eastern portion of the Continent to Tasmania, the southern limit.\*

My record (assisted by Mr. P. N. Jenkins, fish salesman, &c., Swauston Street, who generally exhibits the first bird shot) for the last twelve years of the annual arrival of the advance guards of Snipes in the vicinity of Melbourne is as follows:—

"1889, 5th or 6th September; 1890, 3rd September; 1891, end August; 1892, middle August; 1893, 30th August; 1894, 1st September; 1895, 22nd August; 1896, 4th August; 1897, 27th July; † 1898, 26th August; 1899, 18th August; 1900, 29th August."

For an early arrival the 1897 date is a "record." I thought that bird might have been nained, or had remained during winter in Australia, but I ascertained that several birds about that time or soon after were seen in the same locality, which was Heatherton, between Cheltenham and Dandenong.

By September and October the majority of the Snipes have arrived, and may be found in favoured swampy situations, feeding on worms and aquatic insects. When flushed the Snipe utters a prolonged "scrape-serape," and, not being of extraordinarily rapid flight, offers a good mark to a sportsman. A brace of birds in good condition should turn the scale at 11 ozs.

\* There is a recent occurrence of a bird in New Zealand, *vide* Trans. N Z. Inst., xxxi., p. 105.

† About this extraordinarily early date three birds were shot at Melton, Tasmania.

Towards the end of the Australian autumn the Snipes—those, at least, that have happily missed being shot or otherwise killed—turn their long bills northward again, and the exodus from Australia is probably complete by March or April (Mr. Keartland's latest record was a brace and a half of birds, shot at Clayton, Victoria, on 12th March), when the land of the eucalypts is deserted in favour of the upland marshes of the snow-clad peak of Fujiyama, and other similar places in Japan.

Snipe shooters, as well as naturalists, will read with pleasure the interesting experiences and valuable information as to the habits of this bird was furnished by Mr. H. W. Wheelwright in his little book, "Bush Wanderings." Mr. Wheelwright, who lived a Bohemian life in the gold era, formed a camp near Mordialloc, Victoria, the exact spot being opposite the present railway station, between the road and the beach, and shot for the market. In 1853 he mentions having sold his first Snipe for five shillings. The most he ever "bagged" himself in one day was thirteen and a half brace. As a specimen of a day's sport in those times, the following is an extract from his game book, under date 22nd December, 1854, when he and his mate shot, on the island in the swamps (now reclaimed), near Mordialloc:—"Thirty-three Quails, seven Ground Thrushes, one Landrail, six Bronze-wing Pigeons, twenty-two Snipe, three Nankeen Herons, five Black Ducks, three Shoveller Ducks, three Coots, two Bald Coots, two Black Cockatoos, one Crimson (Pennant) Parrakeet, and seven Warbling Grass Parrakeets." Total, five short of a hundred—not a bad day's sport, and a varied bag for two guns.

But to proceed with Mr. Wheelwright's habits of the Snipe, he says: "They appear in the districts round the coast in September, remain throughout the summer, and leave in February or the beginning of March. They come down by stages, for we generally heard of the first Snipe being killed up country a fortnight at least before they reached us. The first place that they visited in our district was the Clyde, a low flat of wet pasture land about fifteen miles below Dandenong, towards Western Port Bay. This is the best and earliest Snipe ground that I know; but the water very soon goes off, and a man, to have any good shooting, should be there when they first come. Then they take another flight, and, like the Snipe at home, following the flood, come into the Dandenong country, and thence disperse themselves over the swamps and low grounds, frequenting, of course, peculiar localities where there is good feeding ground, till they reach the coast, where all that are spared remain until they leave; and I could always make sure of one or two in the honeysuckle or tea-tree scrub along the beach when I could find them nowhere else. The habits of the Australian Snipe are very puzzling, and a man who is not used to Snipe-shooting here may beat acre after acre of what we should consider, in the fen, capital Snipe ground, without springing a bird, and perhaps passing over the very places where the Snipe lie. Fancy an old fen-man trying for Snipe among ferns and heather on a dry sandy rise, or in thick honeysuckle scrub, yet these are the very places to look for the Australian Snipe: in the summer and in the heat of the day you will find them here in large wisps, and nowhere else. In the early part of the season a man may, however, beat for them in much the same places as he would at home; and as

the season advances they lie much under the shelter of any large timber near the swamp, and in patches of tea-tree which skirt the creeks and wet ground. They never lie far in, and an old dog who knows his business will potter steadily along a yard or so in the tea-tree and tumble out the Snipe as fast as ever you can load and fire. In the very heat of summer they get much into the honeysuckle scrub, but always somewhere near their feeding grounds; and here it is snap-shooting with a vengeance, for when they rise they are only seen for an instant. The Australian Snipe in the open is not nearly so difficult to kill as the Snipe at home. They are a larger object, fly much steadier, and generally go away straight; yet, owing to the places they frequent, are often missed. They are very fond of lying in the shade by day. If by chance any large gum-trees stand in an open wet plain, they will generally get under them; and I have often planted myself under a favourite tree and stood still while others were beating the ground round me, and killed as many as all the other guns. They usually rise quietly; but I have heard them 'scape' like the English bird, especially when coming down to the feeding grounds at night. I fancy one wisp follows another as they are travelling down, for in some days you will find Snipe in some places where a week before there was not one. Of course, this is much owing to the state of the feeding grounds and the season. Before the water dries up they are dispersed over the whole face of the country; but as it goes down and many of the feeding grounds become parched, they pack more. There are then some places where you are sure to find birds; and a man must know the country well to make sure of a bag late in the season, for I never knew a bird that sticks to favourite localities more than the Australian Snipe. They shift their quarters in the early part of the season very suddenly, and if a man hears of a wisp of Snipe in any particular place, he must be off at once, or upon reaching the ground he will probably have the mortification of seeing the feeding-marks of hundreds of Snipe, and find perhaps only a few outlying birds. The Australian Snipe is a terrible bird to run, and you will rarely rise one just at the spot where you saw it pitch. They often perch in the tea-tree scrub."

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637.—ROSTRATULA (RHYNCHILEA) AUSTRALIS, Gould.—(534)

PAINTED SNIPE.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 41.

*Reference*.—Cat. Birds Brit. Mus., vol. xxiv., p. 690.

*Previous Descriptions of Eggs*.—Ramsay: Proc. Linn. Soc., N.S. Wales, 2nd ser., vol. i. (1886); North: Austr. Mus. Cat., with fig., p. 312 (1889); Campbell: Proc. Austr. Assoc., vol. v., p. 442 (1893).

*Geographical Distribution*.—Australia in general.

*Nest*.—A slight depression in the ground, lined with herbage, near the margin of water.

*Eggs*.—Clutch, four; broad oval in shape, and of striking appearance; texture of shell fine; surface slightly glossy; colour, light yellowish-buff or stone, heavily marked all over with large patches of dark olive or sepia, almost black in instances. These patches, some of which would cover the area of a three-penny piece, assume fanciful figures, and are conjoined with lesser and streaky markings. Where the ground-colour is visible greyish markings appear under the surface of the shell. Dimensions in inches of a clutch: (1)  $1.42 \times 1.03$ , (2)  $1.37 \times 1.0$ , (3)  $1.32 \times .98$ , (4)  $1.3 \times 1.0$ . (Plate 23.)

*Observations*.—Although nowhere abundant, and mostly seen in solitary pairs, the Painted Snipe is a home bird, that is confined to Australia, but is not found in Tasmania. It is handsome, and when seen on the wing may be compared to a huge butterfly or a beautiful moth, of many shades of grey and brown above and light-coloured underneath. There is a white mark round the eye, extending towards the back of the head. Bill not lengthened, as that of the true Snipe, but its legs are a trifle longer—total length,  $9\frac{1}{2}$  inches. Unlike the true Snipe, the Painted bird resorts more to the drier ground contiguous to swamps and lagoons, where it procures its natural food.

In the season of 1839, on the Upper Hunter, New South Wales, Gould, in dissecting a female, found an egg in the ovarium, nearly the full size and ready to receive its calcareous covering, which left no doubt in the great naturalist's mind that the birds were breeding in that district. My namesake (Mr. Charles E. Campbell) noticed a pair of Painted Snipe, with a young family, among the herbage bordering the Bullock Creek, Pyramid Hill, Victoria, during October or November, 1884. Mr. North, in describing a handsome set of eggs taken by Mr. K. H. Bennett, near the margin of a swamp at Ivanhoe, New South Wales, in October, states the nest was a depression in the ground, neatly lined with broad eucalypt leaves. Mr. George Masters, curator of the MacLeayan Museum, Sydney, showed me a very fine clutch in the collection of that institution, which Mr. North has since given dimensions, &c., of. Mr. Masters was the first to explode the erroneous idea that they were the eggs of the true Snipe (*Gallinago*), as we had supposed similar eggs to be.

Breeding months, September to December.

We know very little about the movements of these rare birds. It is probable that, after rearing their young in the south, they retire to more interior quarters during winter.

## ORDER—GAVIÆ: SEA-BIRDS.

## FAMILY—LARIDÆ: GULLS AND TERNS.

## SUB-FAMILY—STERNINÆ: TERNS.

## 638.—HYDROCHELIDON LEUCOPTERA, Meisner and Schinz.

## WHITE-WINGED TERN.

*Figure*.—Gould: Birds of Great Britain, vol. v., pl. 76.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 6.

*Previous Description of Eggs*.—Legge: Birds of Ceylon, p. 1002 (1880).

*Geographical Distribution*.—North-west Australia, Northern Territory and North Queensland; also New Zealand (accidental) and Africa, migrating north to temperate Asia, South and Central Europe. Said to have occurred once at Wisconsin, America.

*Nest*.—Constructed of reeds and rushes, on floating vegetations in marshes (Legge).

*Eggs*.—Clutch, three usually, four occasionally; somewhat pointed in shape; colour varies considerably, being buff, brownish-buff, pale buffy-stone, or pale stone, boldly blotched and clouded, some at the large end, others on the middle, with deep sepia or blackish-brown; there are also numerous smaller markings of the same, under which are the usual light blot of grey of different shades. Dimensions in inches of selected examples: (1) 1.37 × 1.01, (2) 1.35 × .99, (3) 1.34 × 1.0 (Legge).

*Observations*.—It appears the White-winged Tern occasionally touches the northern shores of Australia, and there is one instance of its occurrence in New Zealand, where, on December 12th, 1868, Mr. D. Munro shot a pair on the Waihopai River bed, in the district of Nelson. The stragglers were associated with a colony of White-fronted Terns (*S. frontalis*).

Concerning its general habits, Colonel Legge writes: "Like the last species (the Marsh Tern), this Marsh Tern is generally met with about inland waters, about which it flies with rapid, graceful and buoyant flight, and feeds on insects, water-beetles, small fish, larvæ, and worms. It consorts in flocks, sometimes of considerable number, and associates with the Marsh Tern, which it excels, however, in the swiftness of its flight."



## 639.—HYDROCHELIDON HYBRIDA, Pallas.—(610)

## MARSH TERN.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 31.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 10.

*Previous Descriptions of Eggs*.—Legge: Birds of Ceylon, p. 999 (1880); Campbell: Southern Science Record (1883), also Nests and Eggs Austr. Birds, pl. 2, fig. 610 (1883); North: Austr. Mus. Cat., p. 353 (1889), also app. ii. (1890); Hume—Oates: Nests and Eggs of Indian Birds, vol. iii., p. 305 (1890).

*Geographical Distribution*.—Australia in general; also various other localities in the Old World.

*Nest*.—Somewhat symmetrically built of stalks of aquatic herbage, with a submerged foundation, and fringed about with growing grass ("couch") in a lagoon or swamp. Dimensions over all, including foundation under water, 18 inches in depth; diameter of base at water-line, 16 to 18 inches; diameter of top, which is slightly concave, 8 inches.

*Eggs*.—Clutch, two to three; form varies from broad to pointed oval; texture of shell fine and thin; surface slightly glossy; colour, varies from light cold-green to olive, but is usually a warm greyish-green, spotted and blotched with dark-olive or umber and dull-grey. Some of the markings are fancifully shaped, bold and large, and, in instances, inclined to cluster round the upper quarter. Dimensions in inches of a series of full clutches: typical (1) 1.57 × 1.09, (2) 1.54 × 1.1, (3) 1.51 × 1.12; small (1) 1.5 × 1.07, (2) 1.45 × 1.05, (3) 1.39 × 1.06; round (1) 1.43 × 1.11, (2) 1.41 × 1.08, (3) 1.41 × 1.06. (Plate 23.)

*Observations*.—This widely distributed species is found in Europe, Asia, and Africa, as well as Australia, where it frequents inland waters. It is a very beautiful and interesting bird. Its silvery-grey forms may often be seen flying along the course of rivers or hawking over the face of swamps in the interior. I have seen the birds a good deal in the neighbourhood of the Murray River. Unhappily for me, I was either too early for eggs or missed their favourite breeding grounds, for after I returned home my friend, Mr. G. H. Morton, kindly sent me the following interesting descriptive sketch, and several beautiful clutches of the Tern's eggs for examination:—"I have found the nesting place of the Marsh Terns. It is the old swamp that I directed you to up the river. I regretted very much that you were not with me when I came upon it, as it was as grand a sight as the Ibis rookery we discovered. Just imagine a swamp of about 500 acres in extent, covered with a beautiful green-sward of couch-grass, spangled with the bright star-like yellow flowers of the *Limnanthemum*, and hovering over this or sitting on their nests hundreds and hundreds of Terns, while hundreds of Little Grebes were bobbing up and down among them! At almost every boat's length a Tern's nest was to be seen, with invariably three eggs

lying in it, so exposed that you would think a slight wind would blow them off the nest. Among these, in the proportion of say eight to ten of the Terns, was to be seen the darker nest of the Grebe, with eggs carefully hidden from view. The Terns' nests were very symmetrically built of green grass. They were about 8 inches in diameter on the top, with submerged foundations of about 18 inches, prettily fringed round with the growing couch grass. The clutches of eggs varied from a dark umber ground with heavy blotches to finely speckled on a light greenish ground."

Again Mr. Morton writes: "I was out on the back swamps, 26th November, 1893, and took a number of clutches of Marsh Terns' eggs—three to each nest. Nest built of long stalks of green water plants, cup-shaped, and just sufficiently large to hold the eggs, placed on a radiated base about 16 to 18 inches across. Nests within a few yards of each other, floating among flowering *Limnanthemum*. Nearly all the eggs were fresh."

Referring to the Marsh, or Whiskered Tern as it is sometimes called, breeding in our great Indian Empire, Mr. Allan O. Hume gives a pretty picture when he writes: "In the centre of the jheer (lagoon), where the water was deepest, and no rice or rush grew, but where the lake was paved with lotus or lily leaves, a small colony of these birds had established itself. On the broad leaves of the lotus they had loose, slight nests of rice and rush stems, and in these we found their eggs. Only two nests contained three eggs each, the others two, and one. All the eggs were perfectly fresh. The birds had obviously just begun to lay. There were not less than twelve nor more than twenty couples. We shot one, a female, which we preserved. Whilst the nests were being robbed the birds whirled round and round the men's heads continually, emitting their hoarse screaming cry."

It is a curious fact that in North Africa Canon Tristram found a colony of Marsh Terns breeding in the deserted nests of Grebes.

#### 640.—GELOCHELIDON ANGLICA, Montagu.—(608)

*G. macrotarsa*, Gould.

#### GULL-BILLED TERN.

*Figure*.—Gould: Birds of Australia, fol., supp., pl. 81.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 25.

*Previous Descriptions of Eggs*.—Legge: Birds of Ceylon, p. 1014 (1880); Campbell: Victorian Naturalist (1888); North: Austr. Mus. Cat., p. 355, pl. 17, fig. 2 (1889); Hume—Oates: Nests and Eggs of Indian Birds, vol. iii., p. 314 (1890).

*Geographical Distribution*.—Australia in general; also Malayan Archipelago, Asia, Europe, North Africa, and America.

*Nest*.—A few pieces of dry herbage or stems of "cane" grass, placed on a small patch of ground, surrounded by water. Ten or twelve nests may be sometimes found on a patch of about 6 or 8 feet in diameter.

*Eggs*.—Clutch, three to four; oval or broad oval in form; texture of shell somewhat coarse; surface slightly glossy; colour, usually stony-grey, but sometimes yellowish-stone, strongly blotched with rich or dark amber and dull grey. In some specimens a few of the heavier blotches are congregated about the upper quarter, otherwise the markings are fairly distributed. Some of the darker-coloured eggs resemble in shape and colour the better known ones of the Silver Gull (*Larus nova hollandiæ*). Dimensions in inches of odd examples: (1) 2.1 × 1.45, (2) 2.05 × 1.52. Average of six—2.05 × 1.47.

*Observations*.—The Long-legged or Gull-billed Tern is another species which usually frequents the rivers and fresh water lakes of the interior. It is found in localities suitable to its habits throughout the Continents of the world. However, it only appears occasionally in certain parts of Australia during great floods. Gould was of the opinion that the Australian bird (he examined two examples), although closely allied, was different from the northern species, inasmuch as he thought the former possessed a lighter and more silvery-coloured back and wings, also a stouter bill and longer and larger legs.

I was indebted to Mr. F. R. Godfrey for the eggs of this inland Tern, which I exhibited at a meeting of the Field Naturalists' Club, held January, 1888. They were taken on his station, "Pevensey," about thirteen miles from Hay, New South Wales. I formerly had examples in my collection from "Ulonga," near the same locality, taken during the great Riverina flood of 1879.

Mr. Godfrey furnishes the following interesting note: "In November there were large numbers of these birds (Long-legged Terns) seen every day, skimming in hawk-like fashion over the salt-bush plains, generally about twelve or more in company, about ten or twelve feet from the ground, watching most intently, with head turned down, for insects or small reptiles. On discovering one they darted down and carried it up into the air, then dropped it and caught it while falling. The prey they seemed to be in pursuit of—which was found in the stomach of those shot—consisted of small lizards and centipedes; one specimen having two lizards, each about three inches long, and three very large centipedes of about the same length, in its stomach. These birds make their nests—which consist of a few bits of dried grass or stems of cane-grass—on a small piece of ground, surrounded by water, and generally close to each other; as many as ten or twelve nests being found on a small patch of about six feet in diameter. The eggs are generally three or four in number."

Eggs of the Long-legged Tern were collected in the Maryborough district of Victoria the same season (1887) that Mr. Godfrey took his in Riverina.

Mr. North quotes the following from the MS. of the late Mr. K. H. Bennett:—"On two occasions (1870 and 1872) I have known the *S. anglica* to breed in the Ivanhoe district. In both instances the sites chosen were similar, viz., a sandy bank, rising two or three feet above the surrounding plain, and thickly covered with dwarf salt-bush. These breeding places were about forty miles apart, in one case close to a wide

sheet of water, and in the other two miles away from the nearest water. At both places hundreds of birds were breeding, and the eggs, two in number for a sitting, were deposited on the bare ground, and so closely together that care was required when walking so as not to step upon them."

Concerning the Gull-billed Tern breeding in extra-Australian localities, it is interesting to learn that from the Persian Gulf Colonel Butler wrote as follows to Mr. Allan Hume:—"There were two species of Terns breeding in separate colonies on different parts of the island (Warba), viz., *Sterna caspia* and the present species. In each case the nests, which were very abundant, were built about a foot apart and consisted of a small mound of sand, scraped together by the birds, from 3 to 5 inches high, with small twigs and sticks laid on the top for the eggs to rest upon. Most of the nests contained three eggs, all more or less incubated. Skins of both species (*S. caspia* and *S. anglica*) were forwarded to me with the eggs for identification; and as there were no other birds on the island at the time, except a few Common Herons (*A. cinerea*), that had also just commenced breeding, I think there can be no doubt of the identity."

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641.—HYDROPROGNE CASPIA, Pallas.—(600)

CASPIAN TERN.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 22.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 32.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 393 (1865); Potts: Trans. New Zealand Inst., vol. ii., p. 76 (1870); Legge: Birds of Ceylon, p. 1010 (1880); Buller: Birds of New Zealand, vol. ii., p. 74 (1888); North: Austr. Mus. Cat., p. 353, pl. 20, fig. 3 (1889).

*Geographical Distribution*.—Seas of Australia and Tasmania; also New Zealand, and various other localities in both the Old and New Worlds.

*Nest*.—Merely a slight hollow (about  $7\frac{1}{2}$  inches across by  $1\frac{1}{2}$  inches deep), in coarse, sandy earth, amongst pig-face weed, &c.; usually situated on the rocky summit of an islet, sometimes on a sand-spit at the mouth of a river.

*Eggs*.—Clutch, two to three; inclined to oval in shape; texture of shell coarse; surface slightly glossy; colour, stone-grey or light olive-brown, moderately blotched and spotted with roundish markings of umber and dull greyish-black. Dimensions in inches of a proper clutch: (1)  $2.48 \times 1.68$ , (2)  $2.41 \times 1.62$ , (3)  $2.36 \times 1.7$ . (Plate 23.)

*Observations*.—This truly powerful Tern is a splendid bird, and is easily recognized by its large size and beautiful silvery plumage, with crown of head black in breeding season, relieved by a heavy scarlet bill.

The Caspian Tern is almost cosmopolitan as far as oceans and seas are concerned, being more numerous, of course, in certain localities. Nowhere in Australia does it live in colonies, but rather in pairs, frequenting particular islets of rocks, bold headlands and flats at the estuaries of rivers. In some parts of the world, notably in India and the Persian Gulf, the Caspian Tern lays in colonies, small or great.

As Gould has stated, nothing could be easier than to discover its eggs, because of the clamorous, cackling, screeching notes which the bird constantly utters while flying over the place where they are deposited.

I well recollect my first introduction to a pair of these fine Terns. It occurred at the mouth of the Sea Elephant River, King Island, 8th November, 1887. I was in the company of Mr. D. Le Souëf, when a bird, with buoyant flight on extensively developed wings and with bill extended, screeched at us overhead with hoarse voice most frantically. It was soon joined by its mate. We searched in vain for its eggs, but it was not until the shingly patch on the opposite side of the river was systematically searched in sections that a set of three fine eggs, which in a remarkable degree resembled the surroundings, was discovered in a depression without a semblance of a nest.

Again, during another visit (November, 1893) of the Field Naturalists' Club to the Furneaux Group, we found isolated pairs of Caspian Terns nesting on the small islands, usually near the rocky summit, where the bird had a good look-out, the nest being a slight hollow in the coarse, sandy earth, amongst the pig-face weed, dead or living.

During my Abrolhos trip, Western Australia (1889), I observed small companies about the reefs, or singly, diving for fish in the harbours. Fledgelings were noted on the 15th December, also a fresh egg was taken on the same date. The young in down are white underneath, mottled with black and brown above.

Further north on the mainland, at Point Cloates, Mr. T. Carter has taken Caspian Tern eggs in September.

In New Zealand, the late Mr. T. H. Potts remarked that "this fine Tern is content with merely a hollow scraped in the sand, just large enough to contain its eggs, the breeding season extending from November to January." Sir Walter Buller confirms that breeding term, and adds that the young birds, however, follow their parents up till the end of March, settling down with them on the sands, quivering their wings as if impatient for attention, and making an incessant squealing or whining cry.

General breeding season, August or September to January.

642.—*STERNA DOUGALLI*, Montagu.—(605)  
*S. gracilis*, Gould.

ROSEATE TERN.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 27.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 70.

*Previous Descriptions of Eggs*.—Legge: Birds of Ceylon, p. 1035 (1880); Campbell: Southern Science Record (1883), and Nests and Eggs Austr. Brds, pl. 3, fig. 605, also Proc. Roy. Soc., Victoria, vol. iii., p. 5, pl. 1, figs. 2 and 8 (1890); Hume—Oates: Nests and Eggs Indian Birds, vol. iii., p. 301 (1890).

*Geographical Distribution*.—Seas of West and North-west Australia, Northern Territory and Queensland; also New Caledonia, Malayan Archipelago, and many other localities of both the Old and New Worlds.

*Nest*.—A slight depression (about 5 inches across by 1 inch deep) in the sand or ridge of dead coral, sometimes partially lined with fine pieces of coral, shells, &c. Nests in colonies.

*Eggs*.—Clutch, two; roundish or round oval in shape; texture of shell comparatively fine; surface, slight trace of gloss; colour, varies from greyish-stone to warm-stone, boldly blotched and spotted with dark amber or sepia and dull grey. Dimensions in inches of proper clutches: A (1) 1.56 × 1.11, (2) 1.55 × 1.11; B (1) 1.5 × 1.16, (2) 1.5 × 1.15. (Plate 23.)

*Observations*.—The lovely roseate-tinted Tern was well named the Graceful by Gould. It is well nigh cosmopolitan, flying the temperate and tropical seas in both hemispheres. This species was first discovered by Dr. Macdougall, of Glasgow, about eighty years ago, on two small rocky islands known as the Cumbræes, in the Firth of Clyde. Montagu named the bird after its discoverer.

Coming to Australian regions, Gilbert observed this elegant Tern very numerous on Houtman's Abrolhos, off the Western coast of Australia, where they were continually moving about from one part of those islands to another, and settling in large flocks during the heat of the day on the coral ridges. Gilbert was informed (so Gould states) that the Terns bred in the locality, but judged that he was unfortunately too late to procure eggs, it being then November. As a matter of fact he was too early, as the sequel will prove.

At the time of my visit to the Abrolhos (1889), the eggs of this Tern had not been described from any Australian quarter, therefore, it may be conjectured that, with Gilbert's information in my mind, I kept a good look out for Roseate Terns, and thought I was to be disappointed, for I had been on the islands for about three weeks without seeing any signs of the birds. However, on my very last day, when returning to the mainland in the cutter "Una," with Messrs. F. C. Broadhurst and Groom, I was put ashore and came on to a coral ridge in Pelsart Island,

from which rose a cloud of hundreds of beautiful birds, which hovered overhead with querulous cries. My delight can be better imagined than described when I saw they were Roseate Terns, and that the ridge was dotted with their eggs in doublets.

The following is the extract from my note book: "Graceful (Roseate) Terns in companies of scores found nesting on parallel ridges of dead coral forming the narrowest part of Pelsart Island, Houtman's Abrolhos, 23rd December, 1889. Birds uttering usual shrieking cries. Eggs two, but sometimes one, the nest being a hollow made in the rough coral, filled with finer coral, shells, &c. Coral not the usual cream-colour or white, but bluish-grey, as if from long exposure to the elements, and sustaining patches of lichen (*Lecidea*). On an adjacent ridge were a few Ternlets (*Sterna nereis*) breeding; eggs two, sometimes one. Young in down of the Roseate white underneath, rest of surface slightly mottled; feet and bill pink. Eyes dark in both species."

Pelsart Island was named after the captain of the "Batavia," which came to grief on or near the island in 1629, and became one of the most remarkable and romantic wrecks on record. The exact numbers are not known; but about forty persons perished by drowning, one hundred and twenty-five were murdered, about twenty killed in the fight, and sixty executed.

Since my visit, Mr. Beddoes tells me he has observed the Graceful Terns nesting in April and June as well as December.

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643.—*STERNA MEDIA*, Horsfield.—(603)

LESSER CRESTED TERN.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 25.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 86.

*Previous Descriptions of Eggs*.—Hume: Nests and Eggs Indian Birds (1875), also (Oates ed.) vol. iii., p. 299 (1890); Legge: Birds of Ceylon, p. 1032 (1880); Campbell: Southern Science Record (1883), also Nests and Eggs Austr. Birds, pl. 3, fig. 603 (1883); North: Rec. Austr. Mus., vol. ii., p. 20 (1892).

*Geographical Distribution*.—Seas of North-west Australia, Northern Territory, Queensland, and New South Wales; also Malayan Archipelago, Lower Bay of Bengal, Arabian Sea, Persian Gulf, islands in the Indian Ocean, East Africa to Madagascar, Red Sea, and the Mediterranean.

*Nest*.—Merely a depression on a sand bank or ridge of silted-up dead coral. In colonies, almost as close to each other as the birds can conveniently sit.

*Eggs*.—Clutch, one; oval or round oval in form; texture of shell coarse; surface without gloss; colour, whitish or pinkish-white, moderately blotched and spotted with sepia or reddish-brown and purplish

grey, some of the brownish markings being softened at the edges into a paler tint, as if smudged when moist. When held up to the light the inside lining of the shell appears yellowish-green. Dimensions in inches of selected specimens: (1)  $2.15 \times 1.55$ , (2, with spotted markings)  $2.15 \times 1.44$ , (3)  $2.06 \times 1.45$ . (4, large blotches on apex)  $2.0 \times 1.46$ . (Plate 24.)

*Observations.*—This interesting Crested Tern is a medium-sized species, and enjoys a range extending throughout the inter-tropical seas of the Eastern Hemisphere.

It was first reported from Australia by Gilbert, who procured two examples at Port Essington, where he stated (according to Gould) that the bird was numerous on all the sandy points of the harbour as well as all around the coast and on the neighbouring islands. Gilbert was informed that the Lesser Crested Tern bred on the sandy islands during the months of April and May.

It has been shot as far south on the west coast of Australia as North-west Cape.

Mr. H. Barnard found these Terns nesting as closely as the birds could sit, on a sandy rock about twenty yards across, on the Great Barrier Reef, about forty miles off the North Queensland coast.

The eggs in my collection, taken by him, bear the date 23rd November, 1891. The following are Mr. Barnard's field observations, which appeared in the "Victorian Naturalist," May, 1892:—"I stopped at the reef till the afternoon, when, as one of the boats was returning, I went with it, and in about half an hour we again sighted the sand bank. As we neared it I could see the birds flying about in thousands. We ran the boat right on to the sand and jumped out into the water, which was about two feet deep. The birds rose and circled overhead as we landed. I had three shots, bringing down a bird each time, when the rest took their departure and I was not able to obtain a fourth. The eggs were lying on the sand in hundreds—I may say thousands, for in one place I noticed a heap about eight inches deep, and in another they were laid as closely together as the birds could sit, for more than six feet square. The bank was not more than twenty yards across and about three feet above high-water mark. The Terns were the same species we saw breeding on one of the North Barnard Islands. I only stayed on the bank about half an hour, as the men were anxious to get away. We reached the island about one o'clock the same night, and I employed the next morning in skinning the birds and blowing the eggs. Owing to the want of a boat I was as much handicapped on this island as we were on the North Barnard, so I employed the time in searching for insects, of which there were very few."

When Mr. James Walker, R. N., visited Adèle Island, North-west Australia, 2nd May, 1891, he observed a spot comparatively open and bare of vegetation that was a breeding place of the *Sterna media*. He was much too late for the eggs of this bird, as the young ones, in a prettily spotted stage of plumage, were as large as their parents, though as yet unable to fly, and cleared out of his way like so many ducklings.



- 644.—*STERNA BERGII*, Lichtenstein.—(601 and 602)  
*Thalasseus cristatus*, Blyth.  
*T. poliocercus*, Gould.

## CRESTED TERN.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pls. 23 and 24

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 89.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 395 (1865); Hume: Nests and Eggs of Indian Birds (1875), also (Oates' ed.) vol. iii., p. 297 (1890); Legge: Birds of Ceylon, p. 1029 (1880), also Proc. Roy. Soc. Tasmania, p. 130 (1888); North Austr. Mus. Cat., p. 354, pl. 19, fig. 2 (1889).

*Geographical Distribution*.—Seas of Australia and Tasmania; also Polynesia and the islands of the Pacific up to Hawaii Archipelago, Malayan Archipelago, China Seas up to Japan, Indian Ocean, Arabian and Red Seas, and South Africa, both sides.

*Nest*.—A slight depression in the sand or shingle, overgrown with pig-face weed or other short herbage, the only lining being occasionally pieces of sea-weed. Nests in colonies, usually on isolated rocks or islets.

*Eggs*.—Clutch, one (northern variety), two (southern variety); oval in form, or more or less pointed at one end; texture of shell coarse; surface, faint trace of gloss; colour, varies much, but usually stony-grey, fancifully streaked with hieroglyphic-like markings of dark sepia or black, others have the markings in the form of smudges or blotches; some examples from the Tropics are of exceptional beauty, having a pinkish-white or roseate-coloured ground, blotched or streaked, as the case may be, with dark or rich reddish-brown and purplish-brown. Dimensions in inches of examples from the west coast: (1) 2.55 × 1.64, (2) 2.42 × 1.66; from the north: (1) 2.41 × 1.6, (2) 2.36 × 1.62; from the south: (1) 2.32 × 1.58, (2) 2.3 × 1.59. (Plate 24.)

*Observations*.—This large and handsome Tern, distinguished by its yellowish-bill, besides frequenting the Australian seas, is found in numerous other parts of the Eastern Hemisphere.

There has been much disputing whether there are allied species of this bird. Gould recognized two, pointing out the Torres Strait Tern, which he figured as *pelecanoides*, as differing from its near ally the Bass Strait Tern (*poliocerca*) in its much larger bill and in being a much stouter bird. However, Mr. Saunders, an eminent authority on sea-birds, has bunched both as *Sterna bergii*.

Upon this point Colonel Legge, author of the "Birds of Ceylon," argues with some force: "Terns of wide range vary much in size, and the Bass Strait Tern is the smallest form of the Crested Tern of the Indian Seas, the gradation in size, however, in specimens from both localities being so regular that the southern bird is not considered by Mr. Saunders to hold its own as a distinct species. When examining

the specimens in his collection, I found *S. poliocerca* to range as low as 12·75 in the wing as against 15·12 in the largest specimens from the Persian Gulf. Since coming to Tasmania I have procured a fully adult specimen with a wing 12·0, and I find the bird is different in its note, and habits from the Indian Tern, and that the plumage is beautifully suffused with rose-colour on the under surface, a feature not observed in specimens of true *S. bergii*. Should individuals from all parts of Australian seas show the same size, I am of opinion that *S. poliocerca* may stand as a distinct species."

Colonel Legge, on the authority of Mr. G. K. Hinsby, the well-known Tasmanian collector, states that the number of eggs laid by *S. poliocerca* is two, whereas the birds I found nesting on a rock off Rottneest Island, Western Australia, which are reckoned to be the true *S. bergii*, were each sitting on one egg only. From an oologist's standpoint these facts appear undoubted evidence in favour of two species, or at least two distinct varieties.

The following is Mr. A. E. Brent's evidence:—"About the third week in November (1880), we found these birds nesting in company with the little Silver Gulls in large numbers on the small islands in the southern part of Tasmania. In most cases the birds were sitting on one egg, but many of the nests contained two eggs. The nests were so numerous that it was almost impossible to walk amongst them without treading on the eggs."

Before leaving the Bass Strait species, I may mention that during the visit of the Field Naturalists' Expedition to Furneaux Group, we disturbed a small colony on the Samphire River Reef in Franklin Sound, commencing to nest, and they had not laid. Date, 18th November, 1893. We were also informed that these Terns bred in numbers on a rock (Bramble?) lying to the south of Goose Island.

Touching the nesting place of *S. bergii* or the proper Crested Tern, it is delightful for me to reflect that I gained my experience on probably the same isolated rock off Rottneest Island where the good Gilbert, years before, found these fine birds in such great numbers breeding. I give my own picture of the place. Date, 21st November, 1889. Direction Islet is a huge solitary sandstone rock, about thirty feet high and perhaps half a cable in length. On its summit grows, in sparse quantity, pig-face weed and other short vegetation. We obtain landing in a nook on the lee side, where, close by, we are greeted by a pair of fully-fledged young, tenanted a Fish Hawk or Osprey's aerie. We proceed to examine the rock. Some of the common Terns are evidently on good terms with the owners of the Osprey's nest, because they have deposited their eggs and are prosecuting their task of incubation near the base of the aerie, perfectly fearless of their large raptorial friends. However, the majority of the Terns prefer breeding at the other and more precipitous (weather) end of the rock. Here is a scene to gladden the heart of any naturalist. It fairly thrilled me with delight. Standing upon the apex of the rock there appears before us a congregation, consisting of scores of these large handsome sea-birds. Their silvery dresses, relieved by black caps and yellowish bills, are in agreeable contrast to the dull-coloured rocks and vegetation, with their liberal dressing of



CRESTED TERNS NESTING

*From a Photo by the Author.*



bird-time. The sea rolls calmly below. The day is superbly fine; a gentle breeze is flicking the sky with cirrus-clouds—just a light a photographer loves—so here I plant the camera and chance an exposure of the bird colony. (See illustration.) Approaching nearer, the majority of the birds rise from their egg or newly-hatched young, flying backwards, forwards, and overhead with clamorous voices. There are no nests except a slight depression in the sand or pig-face weed. A single egg only is deposited, as large as a domestic fowl's, which is of a stone-colour, marked beautifully with dark, fantastical hieroglyphics. For curiosity's sake I measure the distance betwixt the nests: an average of six gave 14 inches apart—hardly the total length of the bird, which is 19 inches. The young in down are dear little objects, being white underneath, and mottled on the back with grey, brown, and black. Overhead a pair of the larger Caspian Terns, with blood-red bills opened wide, are madly screeching, making themselves heard above their confrères, the cause of their solicitude being a pair of downy chicks, near the large rookery.

A few of the Crested Terns breed on Abrolhos Islands further north.

Gould mentions that this fine Tern attracted the notice of Macgillivray while cruising in Torres Strait, who supplied the following information:—“This handsome Tern, which supplies the place of the *S. polioerca* upon the north-east coast, is generally distributed from Lizard Island to the southward, as far northward as Bramble Quay, and it is also found in Endeavour Strait. It was breeding on Lizard Island in the beginning of May, and on Raine Island in June, when both eggs and young birds were procured; in the latter locality I found it in three small parties, upon a low ridge on one side of the island, depositing its single egg in a slight hollow scooped out of the ground, in a bare, smooth spot, surrounded with herbage. The bird was so much more shy than the Sooty Tern and Noddy that I was obliged to resort to the gun to procure specimens, as it would not allow me to approach sufficiently near to throw a short stick with effect.”

There must be some astonishing rookeries of Crested Terns within the limits of the Indian Empire, for Mr. Hume states that a boat sent to a certain island for him by Capt. Wise, on the 1st June, brought back no less than 3,000 eggs, and the men said that they had not half robbed the rocks. From another quarter some fishermen brought 7,000 fresh eggs of the Crested Tern, which they were offering for sale as food at the rate of sixty for one rupee.

The birds possibly group into such large colonies to better protect themselves against the attacks of marauding gulls and other natural enemies.

645.—*STERNA FRONTALIS*, Gray.—(604)  
*S. melanorhyncha*, Gould.

WHITE-FRONTED TERN.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 26.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 97.

*Previous Descriptions of Eggs*.—Potts: Trans. New Zealand Inst., vol. ii., p. 76 (1870); Buller: Birds of New Zealand (1873), also vol. ii., p. 69 (1888); North: Austr. Mus. Cat., app. (1890).

*Geographical Distribution*.—Seas of Australia in general and Tasmania; also New Zealand.

*Nest*.—A slight depression on the ground amongst tussock-grass, pig-face weed, or other short herbage, near the shore. Nests in colonies.

*Eggs*.—Clutch, two usually, three occasionally; oval inclined in form; texture of shell comparatively fine; surface, faint trace of gloss; colour, stony-grey, strongly blotched and spotted with rich umber and dull-grey. Dimensions in inches of a pair: (1) 1.84 × 1.3, (2) 1.78 × 1.3.

*Observations*.—The White-fronted Tern is a more local form, being confined chiefly to the coast lines of Australia, Tasmania, and New Zealand. Gould shot his examples of this bird a few miles from Maria Island, off the Tasmanian coast, but I have not given his reference for the description of eggs collected by Macgillivray on St. Paul's Island, in the South Indian Ocean, 1853. They were most probably those of *S. vittata* (Gm.), which equals *S. sancti-pauli*, Gould's type, which Macgillivray procured on that island. As stated, the true *S. frontalis* belongs strictly to the Australian region.

I recollect one winter's day seeing a fine flock of these Terns fishing for whitebait close to the head of the Town Pier, Port Melbourne. The graceful actions of the birds diving into the water and capturing tiny fish were very entertaining. Sometimes they come quite close to the pier, poise in the air for a second, then dive headlong into the water, rising with a tiny silver-sided fish held in black bill. These clever little divers never appear to miss their aim. Their bodies, with semi-closed wings, resemble an arrow's head as they enter the water. Occasionally a bird on the wing gives its whole body a nervous quiver, as if throwing off the salt sea-spray after a dive.

During the expedition of the Field Naturalists' Club to Furneaux Group, 1893, we were delighted on landing on a rock between Woody and Little Woody Islands, in the Franklin Sound, to see a small colony of Southern or White-fronted Terns, distinguished by their black bills, hovering over or near. Although it was 18th November, they had not laid, but would shortly do so, judging by the little depressions or preparations of nesting-places in terraces prettily situated amongst the short matted pig-face weed and other flowering herbage close to the shore.

The eggs of the White-fronted Tern in my collection were taken in New Zealand by that enthusiastic naturalist, Mr. J. Percy Seymour.

Mr. Seymour forwarded the following interesting data with the specimens:—"The Southern Tern breeds in great numbers on a small rock lying a little distance from Ocean Beach, near Dunedin. It is called Tomahawk Island. I visited it on the 22nd November, 1883, and found literally thousands of eggs, laid in slight depressions of the ground without nests among maritime herbage, often so closely together that it was impossible to step among them without treading on them. There were usually two eggs in one nest, and occasionally (or rather frequently) three. Many were hard set. On the same date, the following year, a few eggs (fifty or sixty) were found on the same rock, and these having been taken, the birds deserted it."

The late Mr. T. H. Potts remarked that the Southern Tern (mentioned under the synonym, *Sterna longipennis*, deposits its egg on the bare rock, without the slightest protection, at a distance varying from five to six feet and upwards from the line of high tide; the egg must often lie within reach of heavy showers of spray. Mr. Potts believed that this Tern invariably laid a single egg, but he was aware others entertained a different opinion. On a rocky point in Port Cooper he observed about two hundred birds breeding, and except in three cases only, the eggs were solitary. The young, covered with mottled-grey down, varying in shade to almost brown, are quite helpless for two or three weeks after hatching, and appear unable to attempt securing safety by swimming like young Gulls when alarmed.

Sir Walter Buller writes: "My son Percy, in December, observed a vast crowd of Southern Terns on a small rock island near the Taranaki Sugar Loaves. This is a favourite breeding ground, and the birds were so closely packed that from the deck of the steamer they presented the appearance of a fall of snow. On one occasion the crew of the 'Hinemoa' landed at the place and collected several bucketfuls of eggs.

"On the small island of Motiti I found a large community of them occupying one end of it and the Red-billed Gulls the other, the two nesting places being as far apart as possible. On the high intervening ground the Black-backed Gull had established a breeding place.

"On its nesting grounds being invaded this Tern shows fight in a very determined manner, by coming in a bee-line at the intruder's face till within a couple of feet, and then darting off at a sharp angle, with a snapping cry of remonstrance. Captain Fairchild has known them even bolder, and has had his hat knocked off by the rapid actions of their wings. By the end of February the young birds have joined the general community on the sandbanks, but they may be easily distinguished by the dark plumage of their upper surface and their more sibilant cry."

**646.**—*STERNA ANÆSTHETA*, Scopoli.—(612)  
*S. panayensis*, Gmelin.

**BROWN-WINGED (PANAYAN) TERN.**

*Figure.*—Gould: Birds of Australia, fol., vol. vii., pl. 33.

*Reference.*—Cat. Birds Brit. Mus., vol. xxv., p. 101.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 411 (1865); Legge: Birds of Ceylon, p. 1042 (1880); North: Austr. Mus. Cat., p. 356 (1889); Hume—Oates: Nests and Eggs of Indian Birds, vol. iii., p. 300 (1890).

*Geographical Distribution.*—Seas of Australia in general; also tropical and sub-tropical seas of other parts of the world.

*Nest.*—A bare spot under shelving stones, or a crevice in a rock, sometimes under a bush, &c., chiefly on isolated islets. Nests single or six or seven near each other, according to the situation.

*Eggs.*—Clutch, one; broad oval in shape; texture of shell comparatively fine; surface slightly glossy; colour, varies from warmish-white to pinkish-buff, occasionally with a perceptible greenish tinge, blotched and spotted, particularly on the apex, with dark chestnut or rich reddish-brown and dull purplish-brown. When held up to the light the inside lining appears of a beautiful sea-green. Dimensions in inches: (1) 1.8 × 1.26, (2) 1.78 × 1.33, (3) 1.77 × 1.3, (4) 1.76 × 1.3. (Plate 24.)

*Observations.*—The Panayan or Brown-winged Tern, with its pure white under-parts and dark back, is an elegant bird, and, except for its lesser size, resembles the Sooty Tern in appearance.

The Panayan Tern frequents the tropical and sub-tropical seas, being migratory in parts. It visits the north-eastern coast of Australia and as far south on the western coast as Rottneest Island, where I found it breeding.

I did not find the pretty Tern exactly on Rottneest Island, but on Phillip and Duck Rocks adjacent thereto, where I took several single eggs on the 21st November, 1889. Sometimes the birds were so far in the clefts of rocks as to be nearly in darkness. One of the sitting birds I caught was a male. Pilot Gilmore and his crew were good enough to take me out to explore these rocks. On Phillip Rock, which lies at the entrance of Thompson Bay, we observed several pairs of the Brown-winged Terns, with swallow-like forked tails and graceful buoyant flight, crossing and recrossing the face of the islet, uttering cries like the barking of a small dog. We searched under the shelving rocks and loose slabs of sandstone for their eggs, and were rewarded by discovering one or two examples far down in darkened recesses, with the male bird sitting. On Duck Rock, near the pilot look-out station, we took eight or nine single eggs of the Panayan Tern. The eggs were all fresh. This trip we were in charge of Pilot Butcher.



The following month I was further north on the fascinating Abrolhos Islands, so prolific for brooding sea-birds of many kinds. Here and there in rocky fissures, without the slightest nest, round about the shores of Rat Island and on other rocks, I found more Brown-winged Terns' eggs, which, when fresh, looked exceedingly pretty, blotched and spotted with red.

Gilbert took eggs of the Panayan or Brown-winged Tern on Abrolhos, and it is truthfully recorded that the breeding season commences in the latter part of November. In their breeding habits these Terns are not gregarious (except when a few pairs take to a single rock), as most other species of Terns are.

It may be interesting to state that Captain Wickham, R.N., when surveying Houtman's Abrolhos, 1839-40, in the "Beagle," had Gilbert on board. I believe there still remains to this day evidence of the "Beagle" camp near two wells of good water on the northern group.

Macgillivray, during the voyage of the "Rattlesnake," informed Gould that he first met the Panayan Tern on Solitary Island, near Cape York, subsequently on Bramble Quay, in Torres Strait, where it was breeding in small numbers, and where it deposits its single egg in holes of loose, friable, coral sandstone. While turning over some dead turtle shells, Macgillivray was surprised to find beneath several of them pretty Terns sitting upon their egg without any nest.

At the end of November, 1896, on Hope Islands, about eleven miles from the mouth of the Bloomfield River, Northern Queensland, Mr. D. Le Souëf writes: "At one end of the island Panayan Terns (*Sterna anastheta*) were noticed flying about in great numbers and in a high state of alarm, and on going there and hunting on the ground among the scanty vegetation, just above high-water mark, we succeeded in finding many of their single eggs, laid on the bare ground under some cover, such as the thin straggling bushes, or, more generally still, the roots and leaves of pandanus palms."

Mr. E. M. Cornwall informs me he has found these Terns breeding further south on Dunk Island, near Cardwell.

One of Mr. Hume's informants, mentioned in "Nests and Eggs of Indian Birds," states that the Panayan Tern lays two to four eggs on mud-banks. Surely these eggs must be referable to some other species of Tern.

Breeding months, October or November to January.

647.—*STERNA FULIGINOSA*, Gmelin.—(611)

## SOOTY TERN.

*Figure*.—Gould: *Birds of Australia*, fol., vol. vii., pl. 32.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 106.

*Previous Descriptions of Eggs*.—Gould: *Birds of Australia* (1848); also *Handbook*, vol. ii., p. 410 (1865); Audubon: *Birds of America*, vol. vii., p. 252 (1844); Legge: *Birds of Ceylon*, p. 1038 (1880); Crowfoot (Metcalf): *Ibis*, p. 266 (1885); North: *Austn. Mus. Cat.*, p. 357 and app., pl. 21, fig. 1 (1889); Hume—Oates: *Nests and Eggs of Indian Birds*, vol. iii., p. 303 (1890).

*Geographical Distribution*.—Seas of Australia in general and Tasmania (?); also tropical and sub-tropical seas where suitable islands and reefs exist.

*Nest*.—A bare spot on the sand, on rocks, or upon the ground under bushes. Nests in great companies upon certain suitable islands, and usually associated with those of the Noddies (*Anous stolidus*).

*Eggs*.—Clutch, one; broad oval in shape; texture of shell comparatively fine; surface slightly glossy; colour, varies from warmish-white to a pronounced pinkish tinge, blotched and spotted, especially about the apex, with chestnut or rich reddish-brown and dull purplish-brown. Occasionally on a rookery a very warm-coloured egg may be found, and sometimes one entirely devoid of markings. When held up to light the inside lining of the shell appears yellowish-white. Dimensions in inches of examples from various localities:—Abrolhos Islands, West Australia—(1) 2.05 × 1.44, (2) 1.99 × 1.45, (3) 1.85 × 1.38; Norfolk Island—(1) 2.18 × 1.52, (2) 2.1 × 1.41; Malden Island (mid-Pacific)—(1) 1.98 × 1.39, (2) 1.93 × 1.4.

*Observations*.—The Sooty Tern is one of the most familiar of its family, being found on islands suitable to its habits in tropical and sub-tropical regions. I could never understand why the bird is called Sooty, when all its under parts are white, only the upper surface, as in the Panayan or Brown-winged Tern, is dark.

Although the Sooty Tern is common elsewhere in seas surrounding Australia, it is rarely seen on the southern coast. I have seen eggs supposed to have been collected on Green Island, on the Furneaux Group, Bass Strait, but I have been unable to obtain confirmatory evidence of the statement. It is one of the common sea-birds found breeding on Norfolk Island, off the east coast.

Gould reports that Gilbert found the Sooty Tern breeding on Houtman's Abrolhos, December (1839), and Mr. Macgillivray in Torres Strait, in May and June (1844?).

In the former locality, when the guest of Mr. Broadhurst and his manager, Mr. Beddoes, I enjoyed my pleasant experience of this bird, which I invariably associated with the Noddy Tern, the latter building



FLIGHT OF SOOTY TERNS

*From a Photo by the Author.*



their nests upon the saltbushes, while the Sooty Terns were nesting on the bare ground beneath.

On the afternoon of the 9th December we strolled over Rat Island. What a wonderful revelation! Why, the whole place is actually alive with birds, some breeding on every bush, some breeding under the bushes, and some breeding beneath the bushes underground. Words fail, utterly fail, to convey even an idea of the marvellous scene. The birds are perfectly fearless of our presence. We make our way between the dark-coated Noddy Terns, which cover the saltbushes as well as the ground in all directions, uttering defiant, bark-like notes. Others just move out of the way with croaking sounds, exposing their single egg on a secure platform nest of seaweeds. Prolonged guttural screams issue from underneath the bushes from Sooty Terns, likewise sitting upon a single egg, but on the bare ground, their enraged mates flying about our heads, filling the air with squeaking notes of anger, and some being rude enough to strike our hats, while higher still overhead is a cloud of Sooties—bachelors probably—calling “wide-awake” everywhere. The term wide-awake, as applied to these birds, is a sailor’s name. In conducting practical investigations in such a fascinating field of natural history there is just one drawback to contend with, namely, the showers of live guano that fall from the clouds of birds above. Locomotion over the ground is rendered extremely insecure, owing to its honey-combed nature, caused by countless burrows of Petrels, or so-called Mutton Birds. Frequently, placing your feet upon apparently solid ground, down you sink to the knees in the dry, loose earth, which runs into your boots like water, so when you return to the station you are a pretty sight, head covered with new guano, boots filled with ancient guano.

From Mr. Beddoes I learn that on the Abrolhos, Sooty Terns first appear in the beginning of September, shortly after the Noddy Terns, when they come in vast numbers for about a fortnight. After the young are reared all depart about April.

In addition to the bird’s usual call-note, “wide-awake,” a long guttural scream appears to be the alarm note, while “squeak” notes are uttered in anger. The young in down have the underneath parts (except throat) whitish, all the rest of the surface being mottled with black, brown and white. Feet and bill are dark-coloured. At the time of my visit (December) the breeding season for the Sooties appeared at its height on the Abrolhos. But it is somewhat remarkable that on the northern coast the laying season is six months later. It is just possible that the birds which lay on Abrolhos and other southern localities, such as Norfolk Island, when they depart in April nest again in the Tropics during May and June. This would be an exceedingly interesting point to determine.

On Raine’s Islet and Bramble Key or Quay, Macgillivray found prodigious numbers of breeding Sooty Terns associated with Noddies. He wrote: “The Sooty Tern deposits its solitary egg in a slight excavation in the sand, without lining of any kind. The egg varies considerably in its markings. After the party employed in building the beacon on Raine’s Islet had been on shore about ten days, and the Terns had

had their nests robbed repeatedly, the birds collected into two or three large flocks and laid their eggs in company, shifting their quarters repeatedly on finding themselves continually molested, for new-laid eggs were much in request among people who had for some time been living on ship's fare. By sitting down and keeping quiet I have seen the poor birds dropping their eggs within two yards of where I sat, apparently glad to get rid of their burden at all hazards. During the month of June, 1844, about 1,500 dozen of eggs were procured by the party upon the island. About the 20th June nearly one-half of the young birds (hatched twenty-five or thirty days previously) were able to fly, and many were quite strong upon the wing. Great numbers of young birds unable to fly were killed for the pot: in one mess of twenty-two men the average number consumed daily in June was fifty, and supposing the convicts (twenty in number) to have consumed as many, 3,000 young birds must have been killed in one month; yet I could observe no sensible diminution of the number of young, a circumstance which will give the reader some idea of the vast numbers of birds of this species congregated on a mere vegetated sandbank like Raine's Islet."

It is stated that in some other parts of the world, notably in America, the Sooty Tern sometimes lays three eggs. Probably the statement is correct; but at all events, all those birds that lay in Australian waters have only one egg. Some collectors say there is no separating the eggs of the Sooty Tern from those of the Noddy, so similar are they in appearance. As one who has nested among both birds, I fail to see how the eggs can possibly be confounded. The Sooty Terns' are finer in texture, have a slight lustre and are boldly marked: those of the Noddy are entirely lustreless, having a soft appearance, while the markings are likewise soft and not so numerous. Moreover, upon the islands there can hardly be a mistake, for the Noddy eggs are in nests, the Sooties' are upon the bare ground.

"It is said" (according to Howard Saunders) "that at Ascension Island the Sooty Terns, or 'Wide-awakes,' come every eight months to breed." This is somewhat remarkable.

The wonderful simultaneous laying of great flocks of these Terns, mentioned by Mr. W. A. Dixon, F.C.S.\* as having occurred on Malden Island (mid-Pacific), has not been noticed, at all events recorded, by any other observer. After giving some useful information that the "Wide-awakes" lay there in October and again in April, and that the young are hatched in fifteen or sixteen days and remain nearly three months upon the ground, Mr. Dixon proceeds to state: "In the end of September the flock begins to collect, flying high in the air above the spot where they intend to lay, a constant stream of birds flying to and fro between the flock and the sea. Day by day the immense flock flies lower and lower, till about the 22nd or 23rd October they are skimming closely along the ground; up to this time there are no eggs to be found, even up to three o'clock of that day. The flock evidently diminishes in number—the birds are down, an event which was looked

\* "Natural History of "A Guano Island."—Proc. Roy. Soc., N.S. Wales, p. 165 (1877).

forward to with some anxiety, and by four o'clock there is an egg to every square foot of surface."

This wonderful regularity of laying, *if usual*, may be said to eclipse the regularity of the famous Mutton Birds (*Puffinus tenuirostris*). Moreover, the majority of these birds usually lay at night or early in the morning, not in the afternoon.

Nesting months in southern localities appear to be November, December and January. Within the Tropics, April, May, and June.

The illustration, "Flight of Sooty Terns," was taken on Rat Island, Houtman's Abrolhos.

### 648.—*STERNA NEREIS*, Gould.—(607)

#### WHITE-FACED TERNLET.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 29.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 112.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848); also Handbook, vol. ii., p. 402 (1865); Potts: Trans. New Zealand Inst., vol. ii., p. 77 (1870); Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 59 (1882); Buller: Birds of New Zealand (1873), also vol. ii. p. 76 (1888); North: Austr. Mus. Cat., p. 358 (1889), and app. ii. (1890).

*Geographical Distribution*.—Seas of Queensland, New South Wales, Victoria, South and West Australia and Tasmania; also New Zealand.

*Nest*.—Merely a slight depression in the sand or shingle. Usually on islands, singly or in small groups.

*Eggs*.—Clutch, two, occasionally three; oval in shape; texture of shell fine; surface, faint trace of gloss; colour, warm stony-grey, mediumly blotched with dark umber and grey. Some of the markings have the appearance of having been smudged. Dimensions in inches of a pair: (1) 1.5 × .92, (2) 1.42 × 1.0. (Plate 24.)

*Observations*.—The fairy-like little Tern—the smallest of its race—is found in Australian seas, chiefly south of the Tropics and New Zealand. Mr. Masters' *S. inconspicua* is now deemed to be identical with *S. nereis*, probably in seasonal change.

Gould, or rather Gilbert, mentions the immense flock of Ternlets during the breeding season on Rottneest and Garden Islands on the western coast, where, I think, they breed in small groups.

It was from Carnach or Garden Island I received a small series of eggs, from kindly disposed fishermen. On Pelsart Island, Abrolhos, I myself took a few pairs of eggs of Little Terns, which were nesting on a coral ridge in close proximity to a colony of Roseate Terns. Date, 23rd November, 1889. The colourations of both species of eggs harmonize in a remarkable degree with their surroundings. Young in down of this Tern are dull or yellowish-white; bill and feet light-yellow.

Mr. Jas. McDougall, writing from Yorke Peninsula, South Australia, says: "I send you two eggs of *Sternula nereis*, but not the true clutch. These were got in November, 1886, at a sandy point, about two miles from Edithburgh, laid in a depression in the sand or seaweed, a few yards above high-water mark. There are two broods, one in November and one at the New Year. The birds are very numerous, and hover screeching above the head of an intruder, darting at him if he approach the nest too closely. The birds, which are seen seldom, and then only singly, are already beginning to assemble."

I am inclined to think that the second broods mentioned by Mr. McDougall are merely birds that have laid late in the season.

Breeding months, November, December and January.

### 649.—*STERNA SINENSIS*, Gmelin.

*S. placens*, Gould.

#### WHITE-SHAFTED TERNLET.

*Figure*.—Gould—Sharpe: Birds of New Guinea, vol. v., pl. 72.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 113.

*Previous Descriptions of Eggs*.—Legge: Proc. Zool. Soc., p. 377 (1875), also Birds of Ceylon, p. 1021 (1880); Campbell: Southern Science Record (1883), also Nests and Eggs Austr. Birds, pl. 3 (1883); North: Austr. Mus. Cat., app. (1890); Hume—Oates: Nests and Eggs of Indian Birds, vol. iii., p. 312 (1890).

*Geographical Distribution*.—Seas of Northern Territory, Queensland and New South Wales; also New Caledonia, Malayan Archipelago, Philippine Islands, China Seas up to Japan, and Bay of Bengal.

*Nest*.—Like that of *S. nereis*, merely a slight depression in the sand.

*Eggs*.—Clutch, two to three; roundish or round oval in shape; texture of shell fine; surface, slight trace of gloss; colour, light stony-grey, marked with small blotches, spots and splashes of umber and dull grey. Dimensions in inches of a clutch: (1) 1.28 × .97, (2) 1.28 × .98, (3) 1.27 × .98.

*Observations*.—This other graceful and elegant Ternlet enjoys a more northern habitat, ranging away up to Japanese waters, where it lays. It has been found as far south as the northern coast of New South Wales, where it also breeds.

The "Records of the Australian Museum" (1890), vol. i., p. 39, state: "This bird was found breeding by Messrs. Grime and Yardley, during a visit to the Tweed River heads, on 7th October, 1889. The eggs, two in number for a sitting, were laid in a slight depression in the sand, all the eggs taken at that time being in an advanced state of incubation. . . . Skins of the parent birds were obtained



with the eggs and forwarded for identification." In the same district, at the Clarence Heads, Mr. S. W. Jackson found a small colony of White-shafted Ternlets nesting on the sands. The clutches contained two or three eggs, mostly the latter number. Date, 9th November, 1894.

It is somewhat remarkable that the habits of a bird found in southern localities differ in its northern habitat. For instance, according to Mr. Hume, the White-shafted Ternlet (if it really be that species) is reckoned a river Tern in India, laying a complement of four eggs on the sand banks, instead of laying a pair of eggs on the seashore, as in the southern tropics. Mr. Hume also remarks that the eggs of this Ternlet, more perhaps than any others, change colour with keeping, even although all light be rigidly excluded.

650.—*STERNA MELANAUCHEN*, Tomminck.—(606)

BLACK-NAPED TERN.

*Figure*.—Gould: *Birds of Australia*, fol., vol. vii., pl. 28.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 126.

*Previous Descriptions of Eggs*.—Campbell: *Southern Science Record* (1883), also *Nests and Eggs Austr. Birds*, pl. 3, fig. 606 (1883); North: *Austr. Mus. Cat.*, p. 356 (1889); Hume—Oates: *Nests and Eggs of Indian Birds*, vol. iii., p. 302 (1890).

*Geographical Distribution*.—Seas of North-west Australia, Northern Territory, Queensland, and New South Wales; also Fiji and Polynesia in general, Malayan Archipelago, Philippine Islands, China Sea and North Indian Ocean.

*Nest*.—A slight hollow in the sand, just above high-water mark, on islands, usually coral.

*Eggs*.—Clutch, two; oval in shape; texture of shell comparatively fine; surface without gloss; colour, varies, but usually a delicate stony-grey, moderately marked all over with large spots and blotches, chiefly of umber and dull grey, the dull-grey or underlying blotches being more numerous. Dimensions in inches of a proper pair: (1) 1.62 × 1.13, (2) 1.59 × 1.12; of a smaller-sized set: (1) 1.54 × 1.1, (2) 1.52 × 1.1.

*Observations*.—This smaller and elegant Tern would appear generally to frequent the islands of the tropical Indian and Western Pacific Oceans. Mr. Howard Saunders has remarked that its range appears to be dependent in a great measure upon the existence of coral islands of a certain size.

Gould says the Black-naped Tern is one of the most beautiful species of its genus, and may be distinguished from all the others by the snowy whiteness of its crown and by the deep gorget-shaped black mark on the occiput.

Mr. Macgillivray wrote: "This beautiful bird is very local in its breeding places, the only one known to me being one of the 'three sandbanks' near Sir Charles Hardy's Islands. The eggs are two in number, deposited in a slight hollow in the sand. I have seen this bird on another neighbouring sandbank, also on Solitary Island, near Cape York, and in Endeavour Strait, but was unable to procure a specimen from any of the last-mentioned localities on account of its excessive shyness. It is one of the most noisy of the Terns, and I generally saw it in small parties of half-a-dozen or thereabouts. The fully-fledged young of the year differs from the adult in having the black on the head dark-brown, mottled with white, and the whole of the upper surface and wings variegated with dark brownish-grey."

The eggs I possess of the Black-naped Tern are a beautiful and softly-coloured pair, collected 1898 by my old friend and field-naturalist Mr. Ed. M. Cornwall, at Dunk Island, Rockingham Bay, North Queensland. The birds commenced to lay about the end of October and the beginning of November, the eggs being deposited on the bare sand just above high-water mark. Mr. Cornwall intended to make further observations on the nidification of this pretty Tern had he been able to remain on that verdure-clad islet.

According to Mr. Allan Hume, who obtained his information from Captain Wimberley, the Black-naped Tern breeds on the Andaman and Nicobar Islands, where it generally lays between the middle of May and the first week in August. Rocky islets a little detached from the main island, and but for scanty scrub entirely bare, seem to be chosen for nesting places, the bird laying its eggs either upon a little collection of small lumps of coral and stone on the bare rock or in a little depression in the sand.

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651.—PROCELSTERNA CINEREA, Gould.—(616)

GREY NODDY.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 37.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 135.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia, Handbook, vol. ii., p. 421 (1865); Crowfoot (Metcalf): Ibis, p. 265 (1885); North: Austn. Mus. Cat., app., pl. 21, fig. 6 (1889).

*Geographical Distribution*.—Seas of Northern Territory, Queensland (probably), and New South Wales; also Lord Howe, Norfolk, and neighbouring islands, Kermadec Group, &c.

*Nest*.—A bare spot on a rock or floor of the ledge of a cliff. Sometimes traces of a nest are indicated by bones, bits of herbage, &c.

*Eggs*.—Clutch, one; oval in shape, or elliptically inclined; texture of shell somewhat fine and thin; surface without gloss; colour, stony-white, moderately marked with small blotches and spots of amber or reddish-brown, and, chiefly, dull purplish-grey. Dimensions of selected examples: (1) 1.72 × 1.2, (2) 1.69 × 1.18, (3) 1.65 × 1.23, (4) 1.67 × 1.15, (5) 1.67 × 1.2.

*Observations.*—This charming little species is an inhabitant of the seas bordering the northern and eastern coasts of Australia, extending its range eastward across the Pacific.

Macgillivray sent beautiful specimens of eggs of the Grey Noddy to Gould, but no locality is given. It was through the kindness of Mr. F. M. Nobbs that I received a dozen of these rare eggs, collected on islets off Norfolk Island, where they were taken from ledges of rocks in cliffs or on boulders. Date, 2nd November, 1886.

The general breeding season is from September to January.

Dr. Metcalfe's testimony is (Dr. Crowfoot, "Ibis," 1885): "These Grey Terns, called by the Norfolk Islanders the 'Little Blue Petrel,' are fairly numerous during the breeding season. They lay their eggs on Phillip and Nepean Islands and the neighbouring rocks. The eggs are usually placed on inaccessible ledges, but often on the sand, sometimes not many feet from the sea—but usually from eighty to two thousand feet. They make no attempt at a nest and lay only one egg, which is the most easily broken of all the sea-birds' eggs found on these islands."

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652.—ANOUS STOLIDUS, LINNÆUS.—(613)

NODDY.

*Figure.*—Gould: Birds of Australia, fol., vol. vii., pl. 34.

*Reference.*—Cat. Birds Brit. Mus., vol. xxv., p. 136.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848); also Handbook, vol. ii., p. 416 (1865); \*Sharpe: Trans. Roy. Soc., vol. clxviii., p. 466 (1878); Legge: Birds of Ceylon, p. 1044 (1880); Crowfoot (Metcalfe): *Ib.*, p. 264 (1885); North: Austn. Mus. Cat., p. 359 and app., pl. 21, fig. 2 (1889); Hume—Oates: Nests and Eggs of Indian Birds, vol. iii., p. 315 (1890).

*Geographical Distribution.*—Seas of Australia in general; also tropical and sub-tropical seas. According to Saunders, breeding as a rule where found.

*Nest.*—Somewhat flat, constructed of twigs, sea-weed, sponges, &c., and placed upon the ground or on low bushes (salt), tufts of grass, &c. In some localities there is scarcely any nest—merely a few bits of herbage mixed with animal *débris*, such as bones, &c. Nests in great colonies, usually in company with Sooty Terns (*S. fuliginosa*), upon certain islands. A fairly built nest measures 10 to 12 inches across by about 2 inches thick.

*Eggs.*—Clutch, one; elliptically inclined in shape; texture of shell coarse; surface without gloss; colour, soft or pinkish-white, marked moderately, and chiefly on the apex, with rufous-brown and dull purplish-brown. This egg may readily be distinguished from that of the Sooty Tern by its coarser shell, softer markings, and by the dark-green

\* No dimensions given

inside lining of the shell. Dimensions in inches from various localities—Abrolhos Islands, Western Australia: (1)  $2.17 \times 1.45$ , (2)  $2.13 \times 1.46$ , (3)  $1.85 \times 1.41$ . From Norfolk Island: (1)  $2.15 \times 1.4$ , (2)  $2.05 \times 1.4$ . From Malden Island (mid-Pacific): (1)  $2.2 \times 1.48$ , (2)  $2.1 \times 1.46$ . (Plate 24).

*Observations.*—The Noddy Tern is probably the most numerous of all our sea birds—of Terns at all events—on tropical and sub-tropical islands. The bird is rarely seen off the southern coast of Australia. The Noddy—with familiar dusky plumage, relieved by the crown of the head, mouldy white—is as harmless as a dove.

Many have been the writers describing its great numbers and its nesting places. Gilbert, in Gould's work, has left us a faithful picture of what he saw of the crowds of Noddies on Houtman's Abrolhos, Western Australia, during his explorations there in 1839. During my own visit to that most interesting group of limestone islands, exactly fifty years afterwards, I found bird-life there in much about the same state as when disturbed by Gilbert.

Some of the islands—which, by the way, are about fifty miles off Champion Bay—for prodigious numbers of birds, brought to my recollection the incident mentioned in the journey of the Israelites, when Quail fell among them. Truly it seemed to me, when upon Rat Island, the face of the earth as well as the sea was covered with birds "as it were a day's journey on this side, and as it were a day's journey on the other side," round about our camp. For there were Noddy Terns, on their sea-weed built nests, breeding as closely as they could pack upon the salt-bushes; Sooty Terns were croaking over their tasks on the floor of the ground under the bushes; while the ground underneath, being honeycombed with burrows, contained brooding Petrels, which moaned and groaned, especially at night, when it might really be imagined "the whole creation" (that is the island) "groaneth and travaileth in pain."

Mr. G. H. Beddoes (manager of the guano station) and I calculated that there were about 300 acres on Rat Island occupied by birds, and that they averaged at least one bird to every square yard, giving a total of 1,452,000 birds on one small island alone. Reference to the illustration, "Noddies Nesting," will give a very fair idea of the face of the island. Some of my observations relating to the Sooty Tern may be read in connection with the Noddies, which are usually associated together in breeding colonies.

Records kept upon Rat Island show that the Noddy Terns appeared for the breeding season, 14th August, 1888, and 16th August, 1889, respectively. They are usually first heard at night, and then appear gradually for a few days before they arrive in great crowds. The earliest eggs are deposited about the beginning of October, but laying continues for the two or three following months. About the break up of the weather in April, all the Noddies, with their young, depart. Not a solitary bird remains. A week or two prior to the final exodus, the birds leave the island daily, but return at night. This may be a method of exercising the young before the last great flight. There



NODDIES NESTING

*From a Photo by the Author.*



is a curious incident of all these birds having suddenly left Rat Island for about a fortnight during the month of October, when a cold rain set in, leaving eggs and young to perish. Upon slight showers of rain falling, the birds fly out to the shoals upon the reefs and skim over the water in a remarkable manner, as if fishing. The call-note of the Noddy is a coarse gull-like bark. Young in down vary in colour from light to dark sooty-brown, with the upper portion of the head mouldy-white. Bill and feet black.

I can vouch for the following account by Gilbert: "The Noddy and an allied species (the Lesser Noddy), are extremely numerous on the Houtman's Abrolhos, where they breed in prodigious numbers. The present species lays its eggs in November and December, on a nest constructed of sea-weed, about six inches in diameter, and varying in height from four to eight inches, but without anything like regularity of form; the top is nearly flat, there being but a very slight hollow to prevent their single egg from rolling off. The nests are so completely plastered with the excrement of the bird, that at first sight they appear to be entirely formed of that material; they are either placed on the ground in a clear open space, or on the tops of the thick scrub, over those of the *Sterna fuliginosa*, the two species incubating together with the most perfect harmony, and the bushes presenting a mottled appearance from the great number of both species perched on the top—the male (*S. fuliginosa*) sitting quite close to the nest of the Noddy, while its mate is beneath, performing the duties of incubation. On walking among the nests, I was surprised to observe the pertinacity with which the birds kept their post; in fact they would not remove from off the egg or the young, but would suffer themselves to be trodden upon or taken off with the hand; and so thickly were the nests placed, that it was no easy matter to avoid crushing either eggs or birds at every step. By the middle of January the eggs were nearly ready to hatch, and there would be an overwhelming increase of this species yearly but for the cheek which nature has provided against it in the presence of a small lizard, which is very abundant about their breeding places, and which finds an easy prey in the young of this Noddy and of *Sterna fuliginosa*. I am satisfied that not more than one out of every twenty birds hatched ever reaches maturity, or lives long enough to take wing; besides which, great numbers of the old birds are constantly killed. These lizards do not eat the whole bird, but merely extract the brain and vertebral marrow; the remainder is, however, soon cleared off by the *Dermestes lardarius*, an insect which occurs in amazing numbers, and gave me a great deal of uneasiness and constant trouble to preserve my collection from their repeated attacks. I did not observe the Noddy on any but the South Island. As it finds an abundant supply of food, consisting of small fish, small mollusca, medusæ, cuttle-fish, &c., immediately outside the outer reef, it has no occasion to go far out to sea. I never observed it feeding in the smooth, quiet water between the outer reef and the islands."

"The Large Noddy," says Macgillivray, "is abundantly distributed over Torres Strait; but I never met with it to the southward of Raine's Islet, on which, as at Bramble Quay, it was found breeding in prodigious

numbers. Unlike its constant associate, the Sooty Tern, it constructs a shallow nest of small twigs, arranged in a slovenly manner, over which are strewn about a handful of fragments of coral from the beach, shells, and occasionally portions of tortoise-shell and bones of turtle. The nest is sometimes placed upon the ground, but more usually upon tufts of grass and other herbage at about a foot from the ground."

The Common Noddies breed on Phillip and Nepean Islets, adjacent to Norfolk Island. Mr. G. K. Beddoes, who visited Ashmore Shoals, about ninety miles from Timor, reported to me that Terns, especially Noddies, were exceedingly plentiful there.

At the risk of being tedious I mention the Noddies at home in an extra-Australian locality. Here is a picture by Audubon. "The Noddies," says the great ornithologist, "form regular nests of twigs and dry grass, which they place on the bushes or low trees, but never on the ground. On visiting their island on the 11th of May, 1832, I was surprised to see that many of them were repairing and augmenting nests that had remained throughout the winter, while others were employed in constructing new ones, and some were already sitting on their eggs. In a great many instances the repaired nests formed masses nearly two feet in height, and yet all of them had only a slight hollow for the egg, broken shells of which were found among the entire ones, as if they had been purposely placed there. The birds did not discontinue their labours, although there were nine or ten of us walking among the bushes, and when we had gone a few yards into the thicket, thousands of them flew quite low over us, some at times coming so close as to enable us to catch a few of them with the hand. On one side might be seen a Noddy carrying a stick in its bill, or picking up something to add to its nest; on the other several were seen sitting on their eggs unconscious of danger, while their mates brought them food. The greater part rose on the wing as we advanced, but re-alighted as soon as we had passed. The bushes were rarely taller than ourselves, so that we could easily see the eggs in the nests. . . . The Noddy lays three eggs, which average 2 inches in length by  $1\frac{3}{8}$  inches in breadth, and are of a reddish-yellow colour, spotted and patched with dull-red and faint-purple. They afford excellent eating, and our sailors seldom failed to collect bucketfuls of them daily during our stay at the Tortugas."

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653.—MICRANOUS TENUIROSTRIS, Temminck.—(614)

*Anous melanops*, Gould.

LESSER NODDY.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 35.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 144.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848); also Handbook, vol. ii., p. 419 (1865).

*Geographical Distribution*.—Seas in general of Australia, except perhaps Victoria; also New Guinea, across the Indian Ocean to Mascarene Islands, Madagascar and the Seychelles.



*Nest*.—About 6 inches across, slightly concave, constructed of seaweed, &c., carelessly thrown together, so that portions hang downward for 10 or 12 inches. Situated in the fork or elbow of mangrove branches. In colonies.

*Eggs*.—Clutch, one; elliptical in shape; texture of shell somewhat coarse; surface without gloss; colour, soft or warm white, marked on the apex, and sparingly elsewhere, with dark or rufous-brown and dull purplish-grey. Frequently the markings are rendered nearly obsolete by reason of a coating of limy matter. Inside lining of the shell, when held up to the light, sea-green. Dimensions in inches of six selected specimens: (1) 1·84 × 1·26, (2) 1·84 × 1·2, (3) 1·8 × 1·22, (4) 1·75 × 1·19, (5) 1·73 × 1·26, (6) 1·73 × 1·2. (Plate 24.)

*Observations*.—This peaceful little Noddy, besides frequenting the seas on both the east and west of Australia, ranges across the Indian Ocean.

Pelsart Island, Houtman's Abrolhos, Western Australia, is one of their breeding places, where they resort in great numbers during the season, crowding their nests of seaweed on the mangrove trees.

Respecting this rookery, Gilbert wrote: "I have seen many vast flocks of birds, but I confess I was not at all prepared for the surprise I experienced in witnessing the amazing clouds, literally speaking, of these birds when congregating in the evening while they had their young to feed. During their alternate departure and return with food, they presented a most singular appearance. From their breeding place to the outer reef, beyond the smooth water, the distance is four miles, and over this space the numbers constantly passing were in such close array that they formed one continuous and unbroken line. After the young birds were able to accompany their parents, I observed that they all left the breeding or roosting place in the morning and did not again return until evening, the first-comers apparently awaiting the arrival of the last before finally roosting for the night. It is when thus assembled that their immense numbers strike you with astonishment. Even those who have witnessed the vast flights of the Passenger Pigeon, so vividly described by Audubon, can hardly avoid expressing surprise at seeing the multitudes of these birds, which, at sunset, move in one dense mass over and around the roosting place, when the noise of the old birds, the quack and the piping whistle of the young ones, are almost deafening. Like its near ally, it commences the task of incubation in December, and lays but a single egg: while sitting on which, or tending its young, it is very easily caught, as it will suffer itself to be taken off the nest rather than quit it. It forms an excellent article of food, and several hundreds were daily killed during our stay on the island. As this bird resorts to the upper branches alone, it is secure from the attacks of the lizard, so destructive to the Noddy, the animal not being able to climb the branches with sufficient facility to capture it; and this may doubtless be one of the causes why it is more numerous than any of the many other birds inhabiting the island."

With Gilbert's account in my mind, it was on the tip-toe of excitement that I landed on Pelsart Island on the morning of 23rd December, 1889.

Armed with my camera, collecting basket, &c., and accompanied by an employé from the guano station of Messrs. Broadhurst and McNeil, I quickly made along the island. A walk of about three miles brought us to inland lagoons, bordered with mangrove trees, among which the Lesser Noddies dwell in myriads, and as they rose a black cloud of feathered forms completely obscured the face of the sun. The Lesser Noddies, as their name implies, are similar to the Noddies, but of smaller size. In their domestic life, however, they differ much. First, unlike the Noddies, which breed on bushes, the Lesser Noddies seek trees, and while the Noddy is only a summer visitant, its smaller compeer remains through the whole year. What a wonderful scene awaited us as we entered the trees! Birds met us at every point roosting on branches, on stems, or sitting upon seaweed-made nests, each containing a solitary egg or young bird. A very objectionable odour of fresh guano pervaded the entire place; every tree-stem and limb were whitewashed with it, the young on the lower levels possessing a most unenviable position, being bespattered beyond recognition by their brethren above. Taking examples of birds, young, and eggs, and a pair of photographs (see "Lesser Noddies Nesting"), we made all haste back to the cutter and found them just ready to trip the anchor, with a fair wind.

So ended my last day on that romantic collecting field—Houtman's Abrolhos—truly a wonderland for breeding sea-birds.

Young in down: sooty-black, upper part of the head mouldy-white, bill and feet black. The first eggs may be observed at the beginning of September, but the climax of the breeding season is not reached till December.

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654.—MICRANOUS LEUCOCAPILLUS, Gould.—(615)  
*Anous melanogenys*, Gray.

WHITE-CAPPED NODDY.

*Figure*.—Gould: Birds of Australia, fol. vol. vii., pl. 36.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 145.

*Previous Descriptions of Eggs*.—Campbell: Southern Science Record (1883), and Nests and Eggs Austr. Birds, pl. 3, fig. 615 (1883), also Victorian Naturalist (1888); Crowfoot (Metcalf): Ibis, p. 263 (1885); North: Austr. Mus. Cat., app., pl. 21, fig. 5 (1889).

*Geographical Distribution*.—Seas of North-west Australia (probably), Northern Territory, Queensland and New South Wales; also most of the islands in the South Pacific, Caroline Islands, Pelew Islands, Malayan Archipelago, Bay of Bengal, Indian Ocean, both sides of Africa, Inaccessible Island, near Tristan da Cunha, Tropical Atlantic and Caribbean Sea.



LESSER NODDIES NESTING.

*From a Photo by the Author.*



*Nest*.—Constructed of fresh gathered seaweeds, and placed firmly on scrub near the sea shore, or upon branches of trees more inland. Nests in colonies. On Norfolk Island sometimes six or more may be found on one bough, invariably of a white oak (*Lagunaria patersoni*).

*Eggs*.—Clutch, one; roundish oval in shape, or elliptically inclined; texture of shell somewhat coarse: surface without gloss; colour, soft or warm-white, sparingly blotched with rufous or rusty-brown and dull purplish-grey, the markings being generally confined to the larger end. Inside lining of the shell, light yellowish-green. Dimensions in inches: (1) 1.83 × 1.28, (2) 1.78 × 1.34; an average of six: 1.8 × 1.29.

*Observations*.—There has been a little confusion about the beautiful and exceedingly tame White-capped Noddy, which enjoys an extensive range. It has been chiefly observed on the northern and eastern coasts of Australia, breeding on Norfolk and Phillip Island, and is closely allied to *M. tenuirostris* of Western Australia. Gray's *A. melanogenys* is now deemed to be identical with Gould's original *A. leucocapillus*.

I am indebted to Mr. F. M. Nobbs, of Norfolk Island, for a fine series of eggs of the White-capped Noddy, collected 7th December, 1886, which were accompanied with the following data:—"Smaller Noddy Tern. One egg. On trees, some large and half a mile inland; others dwarf and close to the sea. Nest of seaweed very firmly secured on branches. In colonies."

Breeding months include October, November and December.

The second species of Noddy that Prof. Moseley observed breeding on St. Paul's Rocks, in mid-Atlantic, during the visit of the "Challenger," August, 1873, was probably referable to this species. Prof. Moseley writes: "The Noddies' nests are made of green seaweed (*Caulerpa clavifera*), which grows on the bottom in the bay, and around the rocks, and which, getting loosened by the surf, floats, and is picked up by the birds on the surface. The weed is cemented together by the birds' dung, and the nests, having been used for ages, are now solid masses, with a circular platform at the summit, beneath which hangs down a number of tails of dried seaweed. The older nests project from the cliffs on the sheltered side of the rocks, like brackets."

A figure of one of these remarkable brackets is given on page 60 of "A Naturalist on the 'Challenger.'"

### 655.—GYGIS CANDIDA, Gmelin.—(609)

#### WHITE TERN.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 30.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 149.

*Previous Descriptions of Eggs*.—Sharpe: Trans. Roy. Soc., vol. clxviii., p. 465 (1878); Crowfoot (Metcalfe): Ibis, p. 266 (1885); Campbell: Victorian Naturalist (1888); North: Austr. Mus. Cat., app., pl. 21, fig. 4 (1890).

*Geographical Distribution*.—Seas of North-west Australia (probably), Northern Territory, Queensland, and New South Wales; also Central

Pacific in general, Malayan Archipelago, Bay of Bengal, Madagascar, St. Helena, Ascension, Martin Vas Islets, Trinidad, and Fernando Noronha.

*Nest*.—None, merely the bare horizontal limb of a tree, and, according to Saunders, a point of a coral reef.

*Eggs*.—Clutch, one; almost a true ellipse in shape; texture of shell comparatively fine; surface slightly glossy; colour, varies from stone-grey to stone-yellow, blotched and curiously streaked with umber and purplish-grey, also with some dark (nearly black) linear markings on or about the apex. One singularly beautiful specimen is almost completely eluded with purplish-grey, over which are interlacing streaks of umber, somewhat after the fashion of the eggs of Bower Birds (*Chlamydodera*). Dimensions in inches (1)  $1.84 \times 1.32$ , (2)  $1.78 \times 1.32$ , (3)  $1.75 \times 1.35$ , (4)  $1.75 \times 1.3$ , (5)  $1.74 \times 1.32$ , (6)  $1.74 \times 1.29$ . (Plate 25.)

*Observations*.—This lovely snow-white Tern, with plumage strikingly contrasted by dark bill and eyes, enjoys a somewhat scattered range of habitat. In Australia it has been observed chiefly in the seas of the northern and eastern coasts.

The late Mr. Cuning informed Gould that on his visiting Elizabeth Islands, in the Pacific, he found this, or an allied species,\* breeding on a species of pandanus, its single egg being deposited on the horizontal branches in a depression, which although slight, was sufficient to retain it in position despite the high wind and the consequent oscillations to which it was subjected. Mr. Cuning added that the old birds were flying about in thousands, like swarms of bees, and that he noticed several breeding on the same tree; some of the young birds were hatched and covered with down, and being within reach, he took a few of them in his hand, and after examining replaced them on their dangerous resting-place, from which it appeared they occasionally fell down and were destroyed, for he observed several lying dead on the ground.

Referring to this species, Mr. Saunders writes (P. Z. S., p. 669, 1876): "The nesting of the *Gygis* is peculiar, the single egg of clay-white, mottled with brown, being placed on a cavity of the branch of a tree or in a fork of two branches, and on the points of the coral reefs, anywhere, in fact, where it will lie."

Again I have to acknowledge my indebtedness to Mr. F. M. Nobbs, of Norfolk Island, for a series of ten handsome eggs of this rare and beautiful Tern, gathered on his salubrious island. Mr. Nobbs is well qualified to give a description of the breeding habits of this Tern (as well as other local sea-birds), being acquainted with it not only on Norfolk Island, but on that historic island, Pitcairn—his birthplace,—where the Tern nests on banyan trees.

The White Tern breeds on Norfolk Island in November, in trees, chiefly in valleys, at a height of about from twenty to sixty feet; the

\* Probably *G. microrhynca*, Saunders.

single egg being simply deposited on the bare bark, not even in a fork, as a rule. Unlike most other Terns, the White one does not breed in colonies, one or two may be found breeding on adjacent trees, or one alone in a valley.

As the nesting habits of the White Tern are so remarkable and interesting, I give further observations by Dr. P. Metcalf, also made on Norfolk Island, as furnished by Dr. W. M. Crowfoot in the "Ibis" (1885): "It lays its eggs on trees, and here and there one finds two or three trees occupied in the same valley. I have seen eleven trees used in one locality; but I never saw two eggs on one tree, though I have seen them on adjoining trees. The egg is laid on the bare branch, sometimes in a slight depression or against a piece of roughened bark; one I have seen is in a fork. Generally it lays its egg on an outstanding branch, and balances it in a truly wonderful manner. There is not a trace of a nest, and often not even of a depression. One egg only is laid. I have seen it placed on a branch about twenty feet from the ground, and also at a height of sixty feet or more: thirty or forty feet is, perhaps, the average height at which it lays. The bird always chooses a sheltered situation, generally in a valley, and at a variable distance from the sea, from three hundred yards to eight hundred yards in the cases I have seen. Year after year this bird lays on the same tree, on the same branch, aye, and on the same spot on the branch. There is one tree where I have seen the old bird sitting once last year, and twice this year, for I got both eggs. The first I took on the 27th December, 1883. It was incubated. The second was all but quite fresh on the 25th January, 1884. In four other trees I have found eggs on the same spots as I found eggs or young birds last year. These Terns are very tame, and in one case we lifted up the bird to take the egg. It is interesting to watch the careful way in which the old bird gets off her egg when going to fly. The young are very comical-looking little objects.

"I have found the eggs on three different kinds of trees, viz., white-oak (*Lagunaria patersoni*), the ironwood (*Notelæa longifolia*), and the bloodwood (*Baloghia lucida*). How do the eggs and young birds keep on in windy weather? In November, 1882, I was looking for a specimen to send to you, and seeing one on a tree, I shot it. I was sorry to see, when it fell, that a young one was under it. However, this year I found another bird sitting on an egg in the same spot."

## SUB-FAMILY—LARINÆ: GULLS.

- 656.—*LARUS NOVÆ HOLLANDIÆ*, Stephens.—(597 & 598)  
*L. gouldi*, Bp.  
*L. longirostris*, Masters.

## SILVER GULL.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 20.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 235.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 388 (1865); Legge: Proc. Roy. Soc., Tasmania, p. 131 (1888); Campbell: Victorian Naturalist (1889), also p. 183 (1894); North: Austn. Mus. Cat., p. 352, pl. 20, fig. 4 (1889); Le Souef: Ibis, p. 421 (1895).

*Geographical Distribution*.—Seas of Australia in general and Tasmania; also New Caledonia.

*Nest*.—Not so substantially built as that of the Pacific Gull (*Gabianus pacificus*), but is somewhat frail, constructed of sea-weed of various kinds, grass, &c, and measuring 6 or 7 inches across by about 1 inch deep. The nests are situated in colonies on some isolated rock or bold headland.

*Eggs*.—Clutch, two to three; inclined to oval in shape; texture of shell coarse; surface glossy; colour, varies from light greyish-green to olive, with markings of amber or olive-brown and dull-grey. The markings also vary considerably, some being of a spotted nature, others larger and blotched, while others again are short wavy lines. Dimensions in inches of selected pairs: A (1) 2.3 × 1.6, (2) 2.19 × 1.55; B (1) 2.18 × 1.43, (2) 2.16 × 1.43; C (1) 2.16 × 1.55, (2) 2.15 × 1.53. (Plate 25.)

*Observations*.—To breed and rear its offspring the Silver Gull congregates in great numbers, and resorts to solitary islands or bold, rocky headlands. I have had many joyful experiences on "rookeries" of this Sea Gull. My first adventure was on Cape Wollomai, Phillip Island, 1884, where, on the steep declivities of that frowning headland, our party took many eggs. The nests were situated on ledges of rock, dangerous to negotiate on account of the dizzy depths beneath, where the ocean swell rolled in, dashing against the cliff, and extremely disagreeable because of the pungent aroma arising from fresh guano, which whitewashed the place everywhere. Mutton Bird egggers and other nesters have so disturbed this once favourite locality that only a few Gulls resort there to breed now.

On the west coast of King Island, November, 1887, large-sized "rookeries" were observed on Seagull Rock, in Currie Harbour, and on a large, prominent rock near the mouth of the Etterick River. Many of the eggs were far incubated. However, we obtained a few fresh





FLIGHT OF SILVER GULLS.

*From a Photo by D. Le Sunef.*



clutches, while some feathered young were captured. November, 1893, we visited another colony of breeding Silver Gulls on the Sapphire River reef, Franklin Sound, Fumeaux Group. Twenty-one nests were placed on the ground, amongst short herbage, at various distances from each other, the nearest being about thirty-four or thirty-five inches apart. It may be worth while noting here that on the outskirts of this rookery we found a pair of Oyster Catcher's eggs.

Gould found a colony of Silver Gulls on Great Actæon Island, D'Entrecasteaux Channel, Tasmania, when he visited that place in 1838. Doubtless, a similar colony still exists there, for more recently (1887) Colonel Legge noted one on the south point. But it is strange that such a careful observer as Gould should state that this Gull lays four or five eggs. On no occasion have I observed more than three to a nest.

On Albatross Rock, off the north-west corner of Tasmania, Messrs. Dudley Le Souëf and H. P. C. Ashworth, November, 1894, observed a fair-sized company of these Gulls, breeding on a shelving rocky headland, where short tussock grass grew in patches in clefts of the rocks. The nests were placed amongst this vegetation, each containing two or three eggs or young, chiefly the former number. As the flock of old birds was hovering over the spot in a solicitous manner, Mr. Le Souëf took an excellent photograph, which he has kindly permitted me to reproduce.

The pretty Silver Gull is a rare thief. I recollect when on the Abrolhos Islands, Western Australia, witnessing their plundering the Noddy Terns of their eggs (by the way, the very occupation I was engaged in myself), especially if nearly incubated. The Gulls also rob these peaceful birds after the Noddies have returned from a fishing cruise, when the contents of their stomachs are just "dished" on the edge of the nest for their mates or young.

The breeding season for the Silver Gull includes the months from September to December.

Silver Sea Gulls always arrest attention with their comely forms and buoyant flight, and by being associated with our inter-colonial sea voyages. They will hover right over the taffrail of the travelling steamer in hopes of some morsels being thrown overboard. Presently the watcher observes a noisy bunch of graceful white forms, varied with black splashed pinions, and extended blood-red legs, left astern, disputing for a half-eaten fowl from the saloon table that an unthrifty steward has heaved over the side.

The dimensions in inches of the Silver Gull are—total length, 17½ inches; wing, 13 inches; tail, 5 inches; bill, 1¾ inches. The sexes are exactly alike.

Gulls are lovers of the sea shore rather than of open ocean. Not only does the beautiful Silver Gull love the sea shores, but it also ventures far up rivers, and sometimes reaches lakes in the interior. In winter, generally when stormy weather prevails in the bay and outside the Heads, hundreds of the silvery-plumaged Gulls make their way up the Yarra amongst the shipping, wrangling in knots here and there over refuse floating down stream. At the wharf I watch a person

Gull-fishing. A baited hook attached to a line is thrown out and allowed to drift. Soon the birds catch sight of the tempting morsel, one after another snapping at it, till at length the hook catches in a horny, red bill, and, with protesting screams and fluttering pinions, the bird is drawn ashore, bagged, and sold in the market for eighteen-pence. Thenceforth it is destined to eat snails in some gentleman's garden, instead of hawking for fish over the sea, or for worms in oozy sand-flats. Very tractable pets the birds become. Many years I kept one, which rejoiced in the name of "Gullic."

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657.—GABIANUS PACIFICUS, Latham.—(596)

PACIFIC GULL.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 19.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 297.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 386 (1865); Legge: Proc. Roy. Soc., Tasmania, p. 132 (1888); North: Austr. Mus. Cat., p. 351, pl. 20, fig. 1 (1889); Campbell: Victorian Naturalist, p. 183 (1894); Le Souëf: Ibis, p. 421 (1895).

*Geographical Distribution*.—Seas of Queensland, New South Wales, Victoria, South and West Australia, and Tasmania.

*Nest*.—Open, somewhat deep, warmly constructed of grass (roots and all) and flowering stalks of plants or a thick ply of dead pig-face weed (*Mesembrianthemum*), sheltered by rocks, tussock grass, saltbush, &c. Usually situated on islets. Dimensions over all, 10 to 11 inches; inside depth, 3 to 4 inches.

*Eggs*.—Clutch, two to three; oval in shape; texture of shell coarse; surface slightly glossy; colour, light olive-brown, moderately but boldly blotched with rich umber and dull grey. Dimensions in inches of proper clutches: A (1) 3.08 × 2.09, (2) 3.05 × 2.03, (3) 2.96 × 2.0; B (1) 2.98 × 2.03, (2) 2.97 × 2.0, (3) 2.95 × 2.01. (Plate 25.)

*Observations*.—This great Gull frequents the sea shores of Australia (except, perhaps, the northern coast) and Tasmania.

The maturely grown Pacific Gull is always attractive, whether seen circling hawk-like on high, or gracefully posed on a pinnacle of jagged rock. In adults there is no difference of plumage in the sexes, both being snowy-white, with the upper surface of the wings and back black, bills yellowish, blood-coloured at the tip, and eyes most beautiful pearly-white. Total length, about 25 inches; wing, 16½ inches; tail, 6½ inches; bill, 2½ inches.

The young are not so handsome for the first three years, remaining in a dull brownish dress of mottled appearance. This I had an opportunity of verifying. During the visit of Mr. Alexander Borthwick,



NEST OF THE PACIFIC GULL.



junr., and myself to Phillip Island, Westernport, November, 1884, we secured a pair of young Pacific Gulls. One survived, which Mr. Borthwick carefully watched through its seasonal moults till 1888, when it donned full plumage. It turned out a fierce, as well as a fine creature, and would "go" for anything except its master, leaving unmistakable evidences of its formidable beak on any such soft material as unprotected flesh. I am not quite sure whether I understood Mr. Borthwick to say that this bird swallowed *holus bolus* a clutch of ducklings, but, judging from the attacks made by these Gulls in a state of nature on Petrels and other defenceless birds, it was quite capable of such an exploit. Mr. Borthwick's bird, being reared in a Scotch family, readily took to porridge, and appeared remarkably fond of it.

During the several expeditions of the Field Naturalists' Club of Victoria to Bass Strait, we had ample opportunities of examining the breeding places of the Pacific Gull. One, on the inner islet of New Year's Islands, off King Island, was a good nursery—the nests not being placed too close to each other, but at intervals, sheltered with salt-bush. On North-east Island, Kent Group, we found several nests on ledges of rock adorned with pig-face weed (*Mesembrianthemum*), bearing large white flowers. One so situated made a perfect photographic picture (see illustration). Again, on islets in Franklin Sound, Furneaux Group, many nests of Pacific Gulls were observed, which were warmly constructed of grass (roots and all) and wild flowers, placed on the ground, and sheltered by tussock grass, saltbush, or points of jutting rock.

The birds frequently betray their nests by flying overhead, and uttering their hoarse, bark-like calls. 'Tis music to a naturalist's ear to hear, amid the howling of the wind, their calls in such wild places.

All our trips to the islands occurred during the month of November, and judging by circumstances, the laying season for the Pacific Gulls commences about the middle of October, and probably continues into December. In Western Australia the Pacific Gull commences to lay in September.

The young in down are dull or dirty white, dappled with black.

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#### FAMILY—STERCORARIIDÆ: SKUAS.

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#### 658.—MEGALESTRIS ANTARCTICA, Lesson.—(599)

##### SKUA.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 21.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 310.

*Previous Descriptions of Eggs*.—Layard and Hutton: Travers: Trans. New Zealand Inst., vol. v., p. 218 (1873); Potts: Trans. New Zealand Inst., vol. vi., p. 153 (1874); Saunders: Trans. Roy. Soc., vol. cxlviii., p. 163 (1878); Kidder and Coues: Smithsonian Miscell. Coll., vol. xliii., Art. 3 (1878); Campbell: Southern Science Record (1883); Buller: Birds of New Zealand, vol. ii., p. 65 (1888).

*Geographical Distribution*.—Seas of Queensland, New South Wales, Victoria, South and West Australia, and Tasmania; also New Zealand

and the Southern Ocean in general, ranging as far north as Madagascar and the Comoro Islands.

*Nest*.—A depression in the moss or grass, lined sparingly with the same material, and usually situated in a dry place. Dimensions over all, about 12 inches by 3 inches deep inside.

*Eggs*.—Clutch, two usually; pointed oval or pyriform in shape; texture of shell exceedingly coarse, especially at the smaller end; surface slightly glossy; colour, one egg of a pair dull olive-green, the other olive-brown, both sparingly blotched (sometimes the markings being more numerous on the apex) with dark olive-brown and dull brown or greyish-black. Resemble those of the Pacific Gull (*Gabianus pacificus*), but, as a rule, slightly smaller and not so numerously marked. Dimensions in inches of odd examples: (1) 2.9 × 2.0, (2) 2.9 × 1.94; of a proper clutch from Macquarie Island: (olive-green egg) 2.97 × 2.12, (olive-brown egg) 2.85 × 2.16. (Plate 25.)

*Observations*.—This dusky and daring sea-pirate frequents chiefly the bleak islands in the higher latitudes washed by the great Southern Ocean. Professor Hutton states it is rare north of latitude 45°. Its habitat also includes Australian seas up to temperate waters.

The Southern Skua, commonly called Sea Hen by sailors, is very closely allied to the great European Skua, which is said to be fast becoming exterminated, but from which it differs in its somewhat larger size and darker colour.

The Skua may be distinguished from other ocean fliers by the more flapping motion of its roundish wings and laboured mode of flight.

Gould observed the Skua abundant particularly in Storm Bay, at the mouth of the Derwent River, Tasmania.

Sir Walter Buller gives a little interesting New Zealand incident regarding the Skua. He was travelling by coach on the west coast, when a bird, evidently worn out with fatigue, was rising every time the coach was within a few yards of it, instead of making a circuit and getting behind the pursuing coach.

“But the Skua ashore,” writes Sir Walter Buller, “was evidently out of his latitude; and this was made more apparent by the manner in which the Sea Gulls (of both species), his hereditary victims at sea, pursued him in the air and buffeted him. As is well known, this bird usually subsists by plunder, pursuing the Gulls and compelling them to disgorge their food. Here, however, the conditions were changed, as I myself had an opportunity of observing from the box-seat. The Skua had alighted in a shallow beach-stream and was ducking its body in the water, when a fine old Hawk (*Circus gouldi*), with hoary white plumage, suddenly appeared from the sand-hills and swooped down upon the intruder. The Skua, without making any show of resistance, instantly disgorged from his crop the entire body of a Diving Petrel (*Pelecanoides urinatrix*). The Hawk, balancing himself for a moment, with outspread tail, dropped his long talons into the stream and clutched up his prey without wetting a feather of his plumage, and then disappeared with it among the sand-hills, while the terrified Skua



hurried off, only to be pursued again by the clamorous Sea Gulls. Thus we have examples of retributive justice even among birds."

Mr. H. H. Travers states he only found the Sea Hen, or Skua, in certain places on Pitt Island (one of the Chatham Group), and on a small islet about two miles from that island. It commences to lay in the beginning of December. Two eggs are laid, which are scarcely distinguishable from those of *Larus dominicanus*. Whilst attempting to take eggs the birds attacked him most savagely. Both parents take part in the task of incubation. Round the nest remains of several small sea-birds, chiefly Prions, were found. It appears the Skua is nocturnal as well as diurnal in its habits. During the day Mr. Travers saw the birds usually perched in sunny places on the highest cliffs, now and then taking short flights, but not hunting for food. But whilst on Mangare Island he heard the Skua constantly during the night, swooping on the small birds which came on shore to roost. On examining the stomachs of many Skuas, they were always found to contain Prions, usually swallowed whole.

Mr. George Comer, the collector, writing to Mr. G. E. Verrill, regarding the Southern Skua, states: "These birds are the same at all the islands in the South Atlantic. At Gough Island they commence laying the middle of September. They lay two eggs. If these are taken they will lay two more. When the Penguins lay, the Sea Hens come ashore in large numbers and get their living by robbing the nests and catching the young Penguins. They also kill young Albatrosses and all small birds they can catch. The Sea Hen as it grows old becomes light-brown." While Mr. Comer was on Gough Island he killed about three hundred of these birds for their feathers.

Mr. J. R. Burton informs me that the Skua arrives on Macquarie Island about the middle of August, and that its usual breeding months are October, November, and December. In a pair of eggs one invariably differed from the other in colouring. Ejected feathers and bones in small bundles, a few inches in length by about half-an-inch in thickness of victims devoured may be observed about the nest or roosting place.

On Kerguelen, during the American Transit of Venus Expedition, 1874-5, four nests found contained only two eggs each. First was found 17th November.

I shall continue my remarks on the Southern Skua by quoting the pleasantly-written statements of Rev. A. E. Eaton, who accompanied the British Transit of Venus Expedition.

"Every marsh near Royal Sound used to have its pair of Skuas. Many were destroyed within a radius of four miles from the ships; and before the expedition sailed from the island it was impossible to walk far without coming across dead bodies of the poor creatures. The cause of this useless slaughter was the menacing aspect of the birds, who swoop with fierce impetuosity directly towards the face of any one approaching their domain, rising just in time to clear his head, and uttering short despairing cries. They did not feign to be crippled quite so much as the Skuas of Spitzbergen, but preferred intimidation

as a means of averting danger near their nest. When they thought they had succeeded in making the enemy retreat, they celebrated their triumph by standing face to face upon the ground, with their wings extended vertically so as almost to meet above their back, whilst both loudly chanted a pœan, consisting of a dozen notes or so delivered in the tones of a Carrion Crow. In October they used to croak now and then during their flight, and this croak, which was discontinued in the breeding season, was very like the lower croak of a Raven. Indeed, it was at first difficult to reassure one's self that they were not a species of *Corone* as they circled in the air far off, and the blue-jackets used to call them 'Black Crows' for some time, but before long the designation 'Molly Hawks' came to be applied to them. This change of name took place at the commencement of Petrel digging. If Blue Petrels were turned loose in the daytime, they were almost invariably chased by Skuas, and killed on the wing before they had flown half-a-mile. Petrels of one sort or another seem to constitute the staple diet of these Skuas. They hunt for them in the evening when it is becoming dusk, flying rapidly along the hillside close to the ground, ready to pounce upon any that they may see emerging from the mouth of their burrows. Again in the early morning they are upon the wing to waylay Petrels returning late from sea. Nor are they idle during the rest of the day. I have mentioned their fondness for eggs in my paper in the 'Proceedings.'

"The nest is built amongst *Azorella*, where the ground is dry and slightly raised. It consists of a hollow scraped out of the soil, lined with dead tufts of *Festuca erecta*. The eggs are two in number and do not vary much in colour. The statements in Captain Hutton's paper on 'Birds Inhabiting the Southern Ocean' (Quart. Jour. Sc., 1866, vi., 77), that the Kerguelen Skua breeds on flats among grass two feet high, and lays three eggs, and that the young are dark-brown, spotted with white, do not accord with our observations. The young are dark-brown, without any pale spots whatever. The ordinary food-call of the nestlings is rather plaintive and tremulous; they also quack like Mallards.

"The old Skuas were much puzzled when they saw rabbits come out of the Petrel's holes. They hovered for a long time over their heads, and at length used to stand beside the mouths of the burrows waiting for the young ones to creep forth, just as if they were watching for Petrels. It is doubtful if they will succeed in ridding the island of these mischievous vermin, although the young birds reared by me fed readily upon rabbits procured by a sling.

"Twenty or thirty adult Skuas used to assemble every afternoon upon a small sheltered lake near Swain's Harbour, where they washed and basked."

To show how lively the old Skuas make things for the egg hunter, I shall quote from Dr. Kidder's experience on Kerguelen. He writes: "Seeing a Skua fly by the house one day (7th December, 1874), apparently going somewhere in a hurry, I therefore snatched up my revolver (no gun being at hand) and followed him. He was going to join the female on her nest, as I suspected, and when I approached

both attacked me as usual. I succeeded in killing the male, but emptied my revolver at the female without success, and was kept standing for certainly twenty minutes, pelting the enraged bird with stones as she swooped down at my head, with the two eggs in plain sight, but not daring to pick them up. A lucky throw finally disabled her, and I secured the eggs, which were very much paler than those gathered theretofore, and quite fresh." Eggs were first found by Dr. Kidder's party on the 17th November.

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659.—*STERCORARIUS POMATORIINUS*, Temminck.

POMARINE SKUA.

*Figure*.—Gould: Birds of Great Britain, vol. v., pl. 79.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 322.

*Previous Descriptions of Eggs*.—Various.

*Geographical Distribution*.—Northern Territory (probably), and North Queensland (Cape York); also as far south as the coasts of South Africa and South America, ranging up to the Arctic regions north of 70 deg., chiefly on the Tundras during breeding season.

*Nest*.—A mere depression in the ground in moss-covered moorland (Butler).

*Eggs*.—Clutch, two usually; colour, deep olive-drab, sparingly spotted with slate and light and dark raw umber markings and black dots, chiefly at the larger end, where they become confluent. Dimensions in inches: 2.25 × 1.7 (Brewer).

*Observations*.—This other Arctic species of Skua, after breeding chiefly on the Tundras, travels southward to winter, occasionally touching the northern shores of Australia.

The beautiful plate of two pairs of Pomarine Skuas' eggs taken on the Yenisei, and figured in "The Ibis," pl. xi. (1900), under the name of Mr. C. Boyce Hill, show that the eggs of each pair are differently coloured one from the other, like those I mentioned in the case of the Southern Skua.

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660.—*STERCORARIUS CREPIDATUS*, Banks.

RICHARDSON SKUA.

*Figure*.—Gould: Birds of Great Britain, vol. v., pl. 80.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 327.

*Previous Descriptions of Eggs*.—Various.

*Geographical Distribution*.—Seas of New South Wales, Victoria, and Tasmania; also New Zealand and other localities in the Southern

Hemisphere, and ranging up to the circumpolar and sub-Arctic regions to breed.

*Nest*.—Constructed rather carelessly of grass, moss and fragments of heather, and situated on the ground amongst heather in marshy or uncultivated moorland (Butler).

*Eggs*.—Clutch, two; inclined to be pyriform, or much pointed at one end; texture of shell somewhat coarse; surface slightly glossy; colour, dull or dark-olive, blotched and spotted, more particularly about the larger end, with umber and dull greyish-black. Dimensions of a proper pair in inches (1)  $2.34 \times 1.6$ , (2)  $2.27 \times 1.53$ .

*Observations*.—This far-northern bird, in migrating southward to winter, amongst other localities reaches Australia and New Zealand waters.

The first recorded example for New Zealand was an adult bird shot by Sir W. Buller on the beach at Horowhenua, in the district of Wellington, 30th April, 1864, and presented to the Colonial Museum.

In 1883 I placed on record this species as new for Australia. When returning from Tasmania, steaming up Port Phillip Bay, in October of that year, I observed numbers of Richardson Skuas hovering over our wake and near the vessel. Several occasions since, but always in summer, I have noticed these birds in the bay. On the 26th November, 1892, when returning home from Portarlington, ten or twelve of these dusky-coloured birds were flying around the steamer. As they passed overhead one could see the dark chests and speckled under parts, while the two long narrow plumes or central tail-feathers were very conspicuous. Some of these birds dipped into the water in the wake of the vessel after the manner of Gulls.

In the Tasman Sea, during a passage from Sydney to Hobart, I often noticed birds which I took to be this Skua, therefore they appear to be more prevalent in Australian waters than is generally believed.

Like its great and ferocious cousin—the Southern Skua—it is notorious for robbing other sea birds of their food.

Henry Seebohm thus records in "Siberia in Europe" the finding of a nest: "Our most interesting find, however, was the nest, with two eggs, of the Richardson Skua, placed on a tussock of mossy ground. It was lined with some reindeer moss and leaves of the surrounding plants. The devices of the birds to deceive us, as we came near it, attracted our attention and revealed its vicinity. They often alighted within fifteen yards of us, shamming lameness and sickness, reeled from side to side as if mortally wounded, then when we persisted in our onward course they flew boldly at us, and stopped repeatedly."

## ORDER—TUBINARES : TUBE-NOSED SWIMMERS.

FAMILY—PROCELLARIIDÆ : PETRELS.

SUB-FAMILY—OCEANITINÆ : STORM PETRELS.

**661.**—OCEANITES OCEANICUS, Kuhl.—(646)

YELLOW-WEBBED STORM PETREL.

*Figure.*—Gould: Birds of Australia, fol., vol. vii., pl. 65.

*Reference.*—Cat. Birds Brit. Mus., vol. xxv., p. 358.

*Previous Descriptions of Eggs.*—Saunders: Trans. Roy. Soc., vol. clxviii., p. 164 (1878); Hall: Ibis, p. 20 (1900).

*Geographical Distribution.*—Seas of South Queensland, New South Wales, Victoria, South and West Australia and Tasmania; also New Zealand, from the Ice Barrier in the Antarctic Ocean to the Atlantic as far north as the British Isles and the coast of Labrador, and the Indian Ocean up to the Arabian Sea.

*Nest.*—A shallow indentation beneath a stone or within a crevice, lined with twigs (*Azorella*). Dimensions over all, 5 to 7 inches by 5 inches in depth (Hall).

*Eggs.*—Clutch, one; almost an ellipse in shape; texture of shell, thin and fine; surface without gloss; colour, white, with minute purplish-brown spots, usually in the form of a zone round the upper quarter. Dimensions in inches of specimens from Kerguelen Islands: (1) 1.29 × .91, (2) 1.28 × .88, (3) 1.25 × .9. These eggs are probably the smallest of all Petrels'.

*Observations.*—This little tenant of the ocean is chiefly found in the Southern seas, down to the ice barrier; but is also found in the northern hemisphere, especially in the Atlantic.

According to Gould, the Yellow-webbed Storm Petrel is one of the most abundant of its tribe inhabiting Australian seas. He observed it in great numbers within sight of the Tasmanian shores, and shot several specimens during his passage from Hobart to Sydney, April, 1839.

Concerning this graceful little bird on land (Kerguelen's), the Rev. A. E. Eaton wrote: "At length (? end of November), when we went to Thumb Peak, their mode of nesting was discovered. Carefully watching, with Lieut. Goodridge, R.N., the birds flying to and fro about the rocks, we observed that they occasionally disappeared into the crevices amongst the piles of loose stones, and crept under loose masses of rock. Having meanwhile ascertained their call, we were able to

listen attentively to detect the exact positions of several of these hidden birds. They were easily caught when the stones were rolled aside; but they were in couples, merely preparing for laying, and therefore we did not find any eggs. On our way back to Observatory Bay, after the transit, we called at the American Station, and were informed by Dr. Kidder that he had observed this Petrel on the shore near Molloy Point.

"Having found numbers of their nesting places, I will describe my method of searching for them. Whenever there was a calm night, I used to walk with a darkened bull's-eye lantern towards some rocky hill side, such as the Petrels would be likely to frequent. It was best to shut off the light and keep it concealed, using it only in dangerous places where falls would attend with injury, and progress in the dark was hardly possible, lest the birds, seeing it, should be silenced. On arriving at the ground selected, it was probable that Storm Petrels would be heard in various directions, some on the wing, others on their nests, sounding their calls at intervals of from two to five minutes. Those on nests could be distinguished from others flying by their cries proceeding from fixed positions. Having settled which of the birds should be searched after, a cautious advance had to be made in her direction, two or three steps at a time, when she was in full cry. As soon as she ceased, an abrupt halt was imperative, and a pause of some minutes might ensue before she re-commenced her cry and permitted another slight advance to be effected. In the course of this gradual approach the position of the bird might be ascertained approximately; but it had to be determined precisely, and to learn exactly where she had to be stalked in the dark noiselessly. No gleam could be permitted to escape from the lantern. Loose stones and falls over rocks—to avoid them it was sometimes necessary to dispense with slippers, and feel one's way in stockings only, for should a Petrel be alarmed once with the noise or with the light, she would probably remain silent a considerable time. When the stone beneath which the bird was domiciled was gained at last, redoubled care had to be exercised. By stooping down and listening very attentively her position could be accurately ascertained. The lantern was suddenly turned upon her before she had time to creep out of sight, and her egg could be secured by the hand, or with a spoon tied on to a stick. Sometimes I worked without lantern, and marked the positions of the nests with piles of stones, so that they might be re-visited by day. Several eggs were obtained in February from nests I had thus marked early in the previous month. The first egg taken by us was found by a retriever, on the 22nd January, on an island in Swain's Bay."

The eggs I obtained of the Yellow-webbed Storm Petrel were collected by Mr. Robert Hall, who was most kindly permitted to accompany Mr. Hans Gundersen, consul for Norway and Sweden, Melbourne, on his oiling enterprise in the brig "Edward," to Kerguelen. Between the 3rd and 14th February, 1898, Mr. Hall found ten eggs, some fresh, others much incubated, and seven nestlings. The latter were clothed in uniform greyish down, with bill black, legs bluish, tinged with faint yellow, and webs bright yellow.

It is reported that the Antarctic Expedition under Mr. Borchgrevink, found this feathered ocean waif breeding in the cliffs of Victoria Land: if so, this is the furthest south nesting note for any Australian bird.

## 662.—GARRODIA NEREIS, Gould.—(645)

## GREY-BACKED STORM PETREL.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 64.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 361.

*Previous Descriptions of Eggs*.—Kidder and Coues: Smithsonian Miscell. Coll., vol. xiii., Art 3 (1878); Buller: Birds of New Zealand, vol. ii., p. 247 (1888).

*Geographical Distribution*.—Seas of South Queensland, New South Wales, Victoria, South and West Australia and Tasmania; also New Zealand and the Southern Ocean in general.

*Nest*.—A burrow, resembling a rat hole, about  $1\frac{1}{2}$  feet in length (Seymour); or under a tuft of grass or other herbage near the sea. Sometimes the bird digs a small burrow, oftener the egg is simply covered by overhanging grass stems, in low land (Kidder and Coues).

*Eggs*.—Clutch, one; elliptical in shape; texture of shell comparatively fine; surface minutely pitted and sometimes slightly glossy; colour, white, with a finely freckled patch of brown and faint purplish-brown on or round the apex. Dimensions in inches: (1)  $1.4 \times 1.0$ , (2)  $1.39 \times 1.07$ .

*Observations*.—The habitat of the little Grey-backed Storm Petrel, so far as is known, is limited to the Southern Ocean, and, of course, occurring in Australian and New Zealand seas.

During a calm in the passage of Gould from Hobart to Sydney, May, 1839, he obtained his first (four) examples of this little ocean wanderer. That great ornithologist enthusiastically writes: "The *Procellaria nereis* is a species readily distinguishable from its congeners by the total absence of any white mark on the rump, the want of which first drew my attention and induced me to suspect it, as it subsequently proved to be, a different species from any I had before seen; my readers will therefore easily imagine with what pleasure I descended the ship's side and sallied forth in a little 'dingy' to procure specimens. This is not the only instance in which science has been benefited through the kindness of the captains I have sailed with, in allowing me the use of a boat whenever the weather permitted such a favour to be granted me without retarding the progress of the ship. Nearly thirty species of oceanic birds were obtained in this way during my voyage to Australia; whence some idea may be formed of the numbers encountered in the open sea, and of the employment the naturalist may find during a voyage round the globe."

The eggs of this Stormy Petrel I described in 1883 were referable to the White-faced variety. However, authenticated eggs of the rarer Grey-backed bird I received from Mr. J. Percy Seymour, who collected them on Tomahawk Island, Otago Peninsula, New Zealand; they were dated 20th November, 1886. I have mislaid my data of them; but

Mr. Seymour, in communicating with Sir Walter Buller, sent the following notes to him: " I found a number of nests of this Petrel on Tomahawk Island, Otago Peninsula, on the 18th January. The birds had been previously disturbed and their eggs taken, and they were, therefore, unusually late in breeding, for I have, on another occasion, obtained fresh eggs as early as November 23rd. The nests were situated in burrows, 18 inches deep, and resembling rat-holes. Five nests contained one young bird each, and the other five one egg each, on which the female was sitting in every case. I was able to preserve only two of the eggs, as in the others the young bird inside broke the shell before I reached home."

I hardly agree with Mr. Seymour that taking eggs nearly incubated in the middle of January was late. They would be freshly laid about the 20th to 23rd November, the usual date for many Petrels.

The British Transit of Venus Expedition did not appear to find any of these eggs on Kerguelen. The first birds were found by the American party on the 28th and 29th October (1874), and were dug out by dogs from small burrows under clumps of *Azorella*. A pair, captured on a later date, was found under a tussock, not two yards above high-water mark, on the beach, under a high cliff. Eggs were first found 12th December, under clumps of grass, &c., which seemed to afford sufficient protection to the nests in a bit of swampy lowland near the sea. The male only was observed sitting.

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663. PELAGODROMA MARINA, Latham.—(649)  
*Procellaria fregata*, Linnæus.

WHITE-FACED STORM PETREL.

*Figure*.—Goull: Birds of Australia, fol., vol. vii., pl. 61.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 362.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848) also Handbook, vol. ii., p. 482 (1865); North: Austr. Mus. Cat., p. 362 (1889); Campbell: Victorian Naturalist (1894); Baring and Grant: Zoologist, p. 412 (1895).

*Geographical Distribution*.—Seas of New South Wales, Victoria, South and West Australia and Tasmania; also New Zealand and Southern Hemisphere in general, northwards to the Canary Islands and British Isles (accidental) and the coast of Massachusetts.

*Nest*.—A rat-like burrow, extending underground for about 1½ feet, on a rock or islet covered with short herbage.

*Eggs*.—Clutch, one; elliptical in shape; texture of shell comparatively fine; surface occasionally has a faint trace of gloss; colour, pure white, but about fifty per cent. have numerous fine brownish freckles about the apex. Dimensions in inches: (1) 1.45 × 1.05, (2) 1.45 × 1.0, (3) 1.41 × 1.08, (4) 1.37 × 1.02, (5) 1.35 × 1.04.



*Observations.*—This lovely and delicate Storm Petrel frequents chiefly the Southern Ocean, but has been found northwards beyond the Equator.

Gilbert discovered it breeding on the small islands (probably the St. Alouran), off Cape Leeuwin, in December (1840), where he procured numbers of its eggs. He also met it on a small island about three miles south of East Wallaby Island (Abrolhos), in January, when young were in the burrows.

During my own visit (1889) to Abrolhos, I found young on another tiny islet known as Beacon Rock, adjoining Rat Island to the south, at low tide. It was then 15th December, and the young appeared about ten or fourteen days old. They were clothed in long, bluish-grey down, with dark, naked head and bill; feet also were dark-coloured, with webs yellowish-white. After death an amber-coloured oil exuded freely from the beak.

During the expedition of the Field Naturalists' Club to the Furneaux Group, Bass Strait, we found the White-faced Storm Petrel breeding on Isabella Rock. On the 18th November, with genuine delight, we invaded the rookery of this dear little creature. It was indeed a romantic situation—an islet in a sheltered sound, grassed with tussock, brightened with crops of wild, white flowers, and surrounded with great overtopping granite rocks, lichen-covered, like sentinels guarding the place. From under the grass, in the ground, out of the rat-like burrows, which extend the length of one's forearm, we withdrew the soft and delicately-plumaged little birds, each with a single egg; and remarkable as it may appear (especially to those who believe they possess a theory on the colouration of eggs), about four in every ten of the eggs were slightly spotted at one end, the egg usually being pure white.

These Petrels are also found on other isolated islets in Bass Strait, notably Petrel Island (so called on account of these birds being found thereon), Three Hummock Island, Penguin and Stack Islands of the Hunter Group, from whence I received eggs, accompanied by a skin, from Mr. E. D. Atkinson, season 1888.

Formerly they used to breed on Mud Island, Port Phillip Bay, but the erection of forts upon the place drove the little birds away. I had eggs from Mud Island, kindly collected by Mr. G. Watson, then master of the ketch "Dagmar," November, 1882.

It was somewhat remarkable that the Honourable Cecil Baring and Mr. W. R. Ogilvie-Grant found this little ocean wanderer breeding on one of the Savage Islands in the North Atlantic. On the afternoon of the arrival of these gentlemen, they found an egg in what they at first mistook for a rabbit burrow. This, however, opened their eyes, and subsequently they found large colonies of the White-faced Storm Petrel breeding on the flat top of the island in burrows dug out of the sandy ground, and partly concealed by the close growing ice-plant or pig-face weed. The birds had just begun to sit, and it was ascertained that both sexes took part in the incubation. By the end of April the eggs appeared half hatched. Many of the birds and their eggs were found destroyed, apparently by mice.

## 664.—CYMODROMA MELANOGASTER, Gould.—(647)

## BLACK-BELLIED STORM PETREL.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 62.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 364.

*Geographical Distribution*.—Seas of Australia and Tasmania; also New Zealand and the Southern Ocean in general, northward to the Bay of Bengal and to the Tropic of Cancer in the Atlantic.

*Nest and Eggs*.—Undescribed.

*Observations*.—This dusky-coloured (save its snow-white upper tail coverts and flanks) small Petrel is a flier chiefly of the Southern Ocean, but ventures up to the Tropics.

Gould's first acquaintance with this species commenced on the 12th August, 1839, when off Cape Agulhas, on his voyage to Australia; from that date it was almost daily observed during the voyage across the South Indian Ocean until he arrived at Tasmania, 19th September. Its numbers were found to gradually increase from the neighbourhood of the islands of St. Paul and Amsterdam to the termination of the voyage. In March, 1840, during his passage home, he again met with the Black-bellied Storm Petrel in great numbers between the eastern coast of Australia and New Zealand.

On Kerguelen, and referring to *Procellaria grallaria (melanogaster)*, the Rev. A. E. Eaton states:—"Occasionally late in the evening and during the night, a piercingly shrill piping note, repeated singly, at intervals of four to six seconds, used to be heard on the hills about Observatory Bay. Generally the sound changed its direction, showing that the bird which uttered it was flying. This call might be imitated on a piccolo fife in the key of G or F. In its complete form it consists of a series of single notes, separated by pauses of four seconds or more, followed by a jerky succession of notes in the same tone.

"One night the sound was traced to a crevice in a cliff beneath an immovable rock. The place was marked by a pile of stones, and visited early the next morning. While efforts were being made to remove the rock, the bird within the recess became alarmed, and uttered a cry somewhat like that of a Kestrel Hawk in its tone, but not nearly so loud. On another night the sound was followed up to a hill. Every now and then the bird ceased piping, but it re-commenced whenever the call was imitated with the lips. Its nook was therefore easily discovered; it was in a terrace on the hill-side, under a piece of rock. The stone was pulled away, the nesting place laid open, and two birds in it disclosed, of which one escaped. The female was caught, and she proved to be an *O. melanogaster*. A third pair was caught in a slope of broken rocks near the top of the hill, a few nights later, in a similar way. Their nesting place had been used before, as there were fragments of an old egg shell in the hollow that they had prepared for laying in. After this I went for three weeks

to Swain's Bay. On returning to Observatory Bay, only one bird was heard one night. No eggs were found by anyone."

The reputed eggs of the Black-bellied Storm Petrel, collected on Clifly Island, described in the "Catalogue of Nests and Eggs" of the Australian Museum, p 361 (1889), and by myself (1883), are undoubtedly those of the Diving Petrel (*Pelecanoides*). I am able to prove this from the fact that I afterwards obtained similar eggs from the island, accompanied by one of the parents in the flesh, for identification.

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665.—*CYMODROMA GRALLARIA*, Vieillot.—(648)

WHITE-BELLIED STORM PETREL.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 63.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 366.

*Geographical Distribution*.—Seas of South Queensland, New South Wales, Victoria, South and West Australia and Tasmania; also seas of Southern Hemisphere in general, northward to the coast of Florida.

*Nest and Eggs*.—Undescribed.

*Observations*.—This dark little bird, another of "Mother Carey's Chickens," with white under-surface like its other tiny congeners, flies chiefly over the surface of the Southern seas, but is probably scarce in Australian waters.

Gould, who observed all the five (naming two) Australian species of Storm Petrels at sea, graphically describes their peculiar action. It must be a delight to witness, as he has done, any Stormy Petrel "fluttering over the glassy surface of the ocean during calms with an easy, butterfly-like motion of the wings, and buffeting and breasting with equal vigour the crests of the loftiest waves of the storm; at one moment descending into their deep troughs, and at the next rising with the utmost alertness to their highest points, apparently from an impulse communicated as much by striking the surface of the water with its webbed feet as by the actions of the wings."

Gould was unable to trace the breeding place of this Storm Petrel, nor are we any better off to-day, for its breeding haunt is still one of the secrets of the seas.

## FAMILY—PUFFINIDÆ: PETRELS, &amp;c.

## SUB-FAMILY—PUFFININÆ.

666.—PUFFINUS CHLORORHYNCHUS, Lesson.—(638)  
*P. sphenurus*, Gould.

## WEDGE-TAILED PETREL.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 58.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 372.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 467 (1865); Legge: Birds of Ceylon, p. 1055 (1880); Crowfoot (Metcalf): Ibis, p. 268 (1885); Buller: Birds of New Zealand, vol. ii., p. 235 (1888); North: Austr. Mus. Cat., app. (1889); Campbell: Proc. Roy. Soc., Victoria, vol. iii., new ser., p. 6 (1890).

*Geographical Distribution*.—Seas of Queensland, New South Wales, Victoria, South and West Australia, and Tasmania; also New Zealand and northwards to the Society Islands, Central Pacific.

*Nest*.—A rabbit-like burrow, generally extending in an oblique direction for two or three feet, rarely more than five feet. Sometimes a hole or fissure in a rock is chosen, while occasionally the egg is deposited under a bush.

*Eggs*.—Clutch, one; true oval in form, or tapering towards one end; texture of shell somewhat coarse; surface minutely pitted and slightly glossy; colour, pure white. Dimensions in inches of two examples from Norfolk Island: (1)  $2.6 \times 1.7$ , (2)  $2.5 \times 1.76$ ; selected examples from Abrolhos Islands (West coast): (1)  $2.69 \times 1.6$ , (2)  $2.47 \times 1.56$ , (3)  $2.43 \times 1.68$ , (4)  $2.4 \times 1.6$ , (5)  $2.34 \times 1.56$ .

*Observations*.—This dusky Petrel, or Puffin, resembles the familiar Mutton Bird (*P. tenuirostris*), of Bass Strait and elsewhere, but has a more wedge-shaped tail (hence its name) and lighter (yellowish-flesh) coloured feet. The colour of the Petrel by day is a dark, chocolate-brown, a little lighter on the under surface; bill and feet, yellowish flesh-colour; total length about 16 inches.

In addition to frequenting Australian seas, the Wedge-tailed Petrel also ranges over the Indian Ocean on one side and the Pacific on the other. This Petrel is known to breed on Norfolk Island (whence I received eggs from Mr. F. M. Nobbs, taken on dates 7th December, 1886, and 1st January, 1887, respectively), Lord Howe, and Seal Rocks, off the New South Wales coast; and on certain islands on the western coast of Australia.

In the west Gilbert found Wedge-tailed Petrels abundant, especially on the West Wallaby Island, Houtman's Abrolhos. It was on the same group, at the guano station on Rat Island, that I enjoyed my delightful experiences among these interesting creatures. At that time (December, 1889) I was the guest of Mr. F. C. Broadhurst and his manager, Mr. Gilbert Beddoes. Until I mentioned the fact at the Science Association, 1890, it had not hitherto been recorded that this particular Petrel is nocturnal (at all events, during the breeding season) in its habits. It is somewhat extraordinary that such a peculiar trait in the bird's character should have escaped Gilbert's notice. About half-an-hour after sundown they commence moaning and get uneasy in their burrows, and shortly afterwards birds may be seen swiftly cutting the air in many directions. The moaning and infant-like cries of the Wedge-tailed Petrel are a curious experience. After a ramble, one quiet night, I noted in my pocket book next morning that "the whole island seemed groaning and travailing in pain with the noise of Mutton Birds." About half-an-hour before sunrise they disappear underground, when all is quiet as far as they are concerned. The attitude of this Petrel upon the ground resembles a duck upon water, a squatting posture. When walking they are assisted by their wings, which gives the birds a waddling or lame gait. The eggs, like those of the Noddies and other birds, are excellent eating, not at all fishy in flavour, as may be supposed.

At midnight I steal out. It is calm, moonlight. A continual din falls upon the ear from 10,000 voices of Sooties (true to their vernacular name, they cease not day or night to call "wide-awake"); some are overhead, but the greater crowds are gathered towards the further end of the island, and by reason of the distance the noise produced may be likened to that coming from a vast swamp of innumerable frogs. Added to these sounds there issue from above, below, around, the melancholy moaning and infant-like cries of Petrels—literally it seems as if the whole island were groaning and travailing in pain. I feel completely spell-bound while listening to a grand weird symphony, notwithstanding it is being played upon the rudest chords of nature. The Curlew Sandpiper introduces its whistle, the lapping wavelets under the limestone ledges at high-water mark keep time, while great fundamental effect is given by the sullen roar of the booming breakers upon the long reef four miles distant. By the dim moonlight I can discern a group of Petrels in squatting postures. At my approach they scatter—some noiselessly on long pointed wings swiftly disappear into gloom; others with awkward gait, assisted by flapping wings, move aside. Their flight is very rapid; with terrible thump the bird sometimes comes in contact with the iron roofs of the station buildings.

The season of my visit the first of these Petrel's eggs was discovered in the burrows on the 17th November, while the majority of birds laid the following week, consequently some of the eggs I collected were much incubated, but no young were yet hatched. On the 22nd November, further south, on Rottnest Island, I obtained a couple of fresh eggs of this Petrel.

My guide for the day on the island (Rottneſt) is one of the native priſoners named "Nunkey," from the Murchiſon diſtrict, who is a branded murderer. A gentle canter of about three miles brings us to the foot of a hill, where ſtands the lighthouse, about two hundred feet above ſea-level, the tower being fifty-three feet high. We keep the track to the right, continuing along the centre of the iſland, which is pear-shaped, and are heading as it were towards the neck. The track is very undulatory, chiefly through thick acacia ſcrub decorated with wreaths of flowering clematis. The Singing Honeyeaters are heard everywhere. Another three miles and we arrive at a narrow, clifty, ſandſtone point about one hundred and twenty feet above the ſea. This is the Weſt End, or Cape Vlaming, named after the diſcoverer of Rottneſt, who at the ſame time—Chriſtmas, 1697—diſcovered Swan River. From this bold point of vantage we look down on either hand upon miniature bays with ſteep ſhores, near which a gentle ſwell is breaking over low flat reefs. Securing the horſes, Nunkey and I deſcend the weather face of the cape to the Mutton Bird burrows. He eſchews my Mutton Bird crook, and prefers digging out the burrows with his hands, like a dog. We withdraw many birds, but are unſucceſſful with the eggs, only procuring one. However, the identification of the bird is important, and it proves to be the Wedge-tailed Petrel, hitherto unrecorded for the iſland. We return to quarters by noon.

Although on the weſtern coaſt the Wedge-tailed Petrel appears to lay its eggs about the end of November and the beginning of December, Dr. Metcalfe ſtates that on Norfolk Iſland he has ſeen nearly-fledged young on the 27th October, and freſh eggs in January.

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667.—PUFFINUS ASSIMILIS, Gould.—(635)

*P. nugar*, Solander.

ALLIED PETREL.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 59.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 384.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia, Hand-book, vol. ii., p. 459 (1865); Reischek: Trans. New Zealand Inst., vol. xviii., p. 95 (1885); Crowfoot (Metcalfe): Ibis, p. 269 (1885); Buller: Birds of New Zealand, vol. ii., p. 239 (1888); North: Austr. Mus. Cat., app., pl. 21, fig. 3 (1880).

*Geographical Distribution*.—Scas of South Queensland, New South Wales, Victoria, South and Weſt Australia and Tasmania; alſo New Zealand, and northward in the Atlantic to the vicinity of Madeira.

*Nest*.—A rabbit-like burrow, from 1 to 4 feet in length; ſimilar to thoſe of the other *Puffini*; ſometimes under ſtones or rocks.

*Eggs*.—Clutch, one; broad oval in ſhape; texture of ſhell ſomewhat fine; ſurface minutely pitted, and with or without a faint trace of

gloss. Dimensions in inches of two examples from Norfolk Island: (1) 1.96 × 1.4, (2) 1.94 × 1.36; two from Rat Island, off west coast. (1) 1.93 × 1.41, (2) 1.9 × 1.4.

*Observations.*—This little Petrel is an exceedingly interesting species. Gould recorded it for the eastern shores of Australia and New Zealand. I captured a specimen on the Abrolhos Islands, Western Australia; and since then the Hon. C. Baring and Mr. Ogilvie-Grant found the species breeding as far north as the Savage Islands, between Madeira and the Canaries, in the Atlantic.

On my arrival at the Abrolhos, December, 1889, I found the Allied Petrel had finished breeding, but Mr. Gilbert Beddoes had thoughtfully saved for me specimens of the eggs which were taken during the first week of July, while his men were quarrying for guano on Rat Island. However, I was anxious to obtain one of the same kind of birds that laid there for complete identification. Fortunately, I took a single specimen which appeared to have remained behind in the interests of science, and which I knocked down with my egging crook during a midnight peregrination. The birds have been known, attracted by the light, to fall into the fires of persons camping upon the islands.

It has not been previously recorded that these particular birds are nocturnal. However, most Petrels probably are nocturnal in their habits when they are on or near land, but, singular as it may appear, when at sea they become more diurnal.

In 1887, from Mr. F. M. Nobbs, I first received the eggs of the Allied Petrel, kindly forwarded from Norfolk Island, where the bird is called the "Watchman," and where the eggs were collected as in Western Australia, during July and about the end of the month. Therefore it seems remarkable that Mr. A. Reischek should have found the same species laying on islands off the New Zealand coast in October or November. Surely this bird does not lay two broods in a year! Sir W. Buller seems to think some Petrels do, and names the Diving Petrel as a possible one; but the fact, if such be the case, has not been proved.

Mr. Reischek informs us that this little Petrel comes ashore in October to clean out its burrows or make fresh ones, which process male and female accomplish together, with their bills and feet. The entrance is from 4 inches in diameter, and from 3 to 4 feet to the chamber, sometimes in a winding direction. In most cases he found two chambers similar in size to those he has already described for other Petrels, and in which there is a hollowed floor, covered with a few leaves and grass, where the female lays, end of October or early in November, one white egg. Both parents assist in hatching and rearing the young. Their habits during the breeding season are similar to those of the rest of the *Procellariide* family. The young birds are full-grown in February, when the natives collect them for food; and they are delicious eating. He saw these birds in considerable numbers during the breeding season, on the outlying islands off the east coast, especially on the Morotiri Group.

Gould received two beautiful snow-white eggs of the Allied Petrel from Macgillivray. They were collected on Royal Island (wherever that island is situated), in July, 1854. [? Rossel Island, Louisiades, June, 1844.—E. A. P.]

## 668.—PUFFINUS CARNEIPES, Gould.—(637)

## FLESHY-FOOTED PETREL.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 57.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 385.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia, Handbook, vol. ii., p. 466 (1865); Campbell: Proc. Roy. Soc., Victoria, vol. iii., new ser., p. 6 (1890).

*Geographical Distribution*.—Seas of West Australia, and probably other parts of southern coast, including Tasmania; also New Zealand and northward over the Pacific to Japan.

*Nest*.—A burrow, usually in sandy earth, four to six, frequently eight feet in length.

*Eggs*.—Clutch, one; inclined to oval in shape or tapering towards one end; texture of shell somewhat coarse; surface minutely pitted, occasionally with limy nodules and a faint trace of gloss; colour, pure white. Dimensions in inches: (1) 2.69 × 1.76, (2) 2.68 × 1.8, (3) 2.56 × 1.74.

*Observations*.—This fine Petrel flies over Australian and New Zealand seas, wandering northward in the Pacific into Japanese waters. As Gould points out, it differs from the common Mutton Bird (*P. tenuirostris*) in the greater length and the squarer form of its tail and in the fleshy colour of its bill, also of its legs—hence the good vernacular name, Fleshy-footed Petrel.

Amongst other places, it resorts to the small islands of South-western Australia, from whence Gould procured his types of birds and eggs. He most probably got them (through Gilbert) on St. Alouran Islands, off Cape Leeuwin.

I found it nesting on Breaksea Island, New Year, 1890, when I secured eight eggs, mostly incubated. Breaksea is about nine miles from Albany, a mile or more long, rugged, with a summit 380 feet high, where stands a lighthouse and reporting station. When steaming up the Sound and approaching the island, its granite sides are seen to slope in terrible manner to the water's edge, where a heavy swell sends spray far up the rocks. It is now calm. What must be the fury of the sea against these battlements in storm? Michaelmas Island lies near on the left, like a huge, crouching lion. Behind is the mainland, where patches of white, sandy beaches gleam at the foot of rocky hills, whose grey boulders, by distance, resemble depasturing flocks amid dark vegetation. Still further is seen Cape Vancouver, with other promontories, grey misted by intervening space, where Mount Manypeak reigns supreme. Nearer to the right is Bald Head, name well suggested by precipitous, fluted sides of rock, but sheltered enough to leeward to let the sombre-coloured foliage descend almost to high-water mark, with here and there flat, rocky spaces, ornamented with moss and lichen. By



the kind permission of Mr. R. C. Loftie, the Government Resident, Albany, Mr. G. Woods and myself are permitted to land at Breaksea, while a steam launch delivers stores for the lighthouse quarters. The island supports chiefly a green, aromatic-scented scrub, rushes, tussocky grass, and a small variety of pig-face weed. We are kindly treated by the lighthouse folk. The children, with glee, soon pilot us to the Mutton Bird burrows, where a small dog is sending clouds of sand in all directions in his anxiety to withdraw the hidden birds. He altogether disappears, but soon reappears, hinder end and stumpy tail foremost, with a flapping croaking bird in his jaws. Hurrah! the Fleshy-footed Petrel—the bird I have been seeking for all round the coast. It is a larger bird, and has not the black feet and legs of the Phillip Island (Victoria) species. By the aid of the familiar Mutton Birders' crook we rake out about a dozen of the single eggs from sandy burrows, 4 feet to 6 feet long, on the weather face of the island. It is now the second day of the New Year, therefore the eggs were far incubated, nevertheless they are valuable additions to my oological collection.

The first eggs were noticed by the lighthouse keeper on 30th November, and were plentiful on 7th December. The dates apply to Mutton-bird Island, Tor Bay, while some eggs were also collected on the mainland adjacent. This is the first instance I am aware of, of any species of Petrels laying on the mainland of Australia, excepting perhaps the common Mutton Bird, which, legend says, years ago used to breed on the Back Beach of Sorrento. Petrels invariably resort to isolated rocks or islands for the purpose of breeding.

The following season the principal lighthouse keeper on that island was kind enough to forward me additional data. He observed that the Fleshy-footed Petrel appeared the first week of September, and fresh eggs were taken during the first week in December. Specimens he forwarded were dated the 10th of that month.

Sir Walter Buller states that the Fleshy-footed Petrel is comparatively common off New Zealand, and breeds in large colonies on some of the small islands near the coast. He received a pair of live birds from Captain Fairchild, who obtained them on White Island, Bay of Plenty, where, it is stated, they were breeding at the beginning of November, but it is not stated whether eggs were taken. Probably not, or else Sir Walter would have described them.

669.—PUFFINUS TENUIROSTRIS, Temminck.—(636)  
*P. brevicaudus*, Brandt.

SHORT-TAILED PETREL (MUTTON BIRD).

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 56.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 388.

*Previous Descriptions of Eggs*.—Davies: Tasmanian Journal, vol. ii., p. 13 (1846); Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 464 (1865); Elwes: Ibis, p. 397 (1859); Legge: Proc. Roy. Soc., Tasmania, p. 132 (1888); Buller: Birds of New Zealand, vol. ii., p. 231 (1888); North: Austr. Mus. Cat., p. 360, also app. (1889); Montgomery: Proc. Roy. Soc., Tasmania, p. 1 (1891), also (1896); Campbell: Victorian Naturalist (1894).

*Geographical Distribution*.—Seas of South Queensland, New South Wales, Victoria, South and West Australia and Tasmania; also New Zealand and northward over the Pacific to Japan, and eastward to Samoa.

*Nest*.—A burrow in the ground, scraped out in an oblique direction, and extending from 1 to 7 feet in length. Every season these holes are cleansed or burrowed deeper. Some particular patches of ground are so honey-combed with burrows as to resemble a vast rabbit warren. Occasionally eggs are deposited under bushes or tussocks of grass.

*Eggs*.—Clutch, one; inclined to oval in shape, occasionally more elliptical; texture of shell somewhat coarse; surface minutely pitted, slight trace of gloss on some examples; colour, pure white. Dimensions in inches of selected specimens—Phillip Island: 3.0 × 1.94 (elongate); Chappell Island: 2.82 × 1.98 (roundish); New Year's Islands: 2.8 × 1.8 (small). Average weight about 3½ ozs.

*Observations*.—The Sooty or Short-tailed Petrel, more familiarly known as the Mutton Bird, in summer has its great breeding home chiefly on the smaller islands in Bass Strait, where it is known by the native name "Yolla." This dusky-coloured bird is also found in New Zealand, where it is abundant, and breeds in the Hauraki Gulf. According to Sir Walter Buller, in New Zealand this Petrel sometimes retires inland to a distance of fifty miles to breed, and the Kaimanawa Ranges in the Taupo-Patea country are cited as a locality. Retiring inland is a notable exception to the rule, for nowhere in Australia or Tasmania does this Petrel select breeding quarters except on small islands adjacent to the coast or to large islands.

In winter the Mutton Birds roam over the warmer waters of the Pacific, where they have been recorded as far north as Japan, and as far east as Samoa. At one time it was thought that when these birds and their young mysteriously disappeared they departed southward. But if we reflect for a moment, it seems hardly likely these birds would betake themselves to the region of frozen seas and endure the long

Antarctic night of winter. It would also be contrary to the general rule that migratory birds breeding in Australia usually do so at the southern limit of their habitat.

The prodigious numbers of Mutton Birds that arrived or gathered in Bass Strait in the early days of our colonial history are almost incredible. Many readers are familiar with the extraordinary flight mentioned by the illustrious navigator, Matthew Flinders, in his work on the exploration of Bass Strait. He was in company with Bass at the time (9th December, 1798), and in the neighbourhood of Three Hummock Island. Flinders wrote: "A large flock of Gannets was observed at daylight, and they were followed by such a number of Sooty Petrels as we had never seen equalled. There was a stream of from 50 to 80 yards in depth and 300 yards or more in breadth. The birds were not scattered, but were flying as compactly as a free movement of their wings seemed to allow, and during a full hour and a half this stream of Petrels continued to pass without interruption, at a rate little inferior to the swiftness of the pigeon. On the lowest computation I think the number could not have been less than a hundred millions. Taking the stream to have been fifty yards deep by three hundred in width, and that it moved at the rate of thirty miles an hour, and allowing nine cubic yards of space to each bird, the numbers would amount to 151,500,000.\* the burrows required to lodge this quantity would be 75,750,000; and allowing a square yard to each burrow, they would cover something more than 18½ geographical square miles of ground."

Mr. R. H. Davies, an early writer about Mutton Birds, who had visited the place for five seasons, found the birds so densely congregated in a cloud over Green Island one evening during the breeding season, that he believed darkness was ushered in fully ten minutes before the usual time. Again, Mr. Davies actually sailed through flocks of these birds all the way from Flinders Island to the Tamar Heads—a distance of eighty miles.

Gould himself visited Green Island, January, 1839, when he found eggs and young so numerous as to excite his astonishment.

In more recent years the Rev. Dr. Montgomery, during one of his trips to the Furneaux Mission, by an ingenious computation reckoned that upon four small islands alone there could not have been less than 2,600,000 birds, old and young.

When I visited Green Island, November, 1893, the place was a sheep farm, and real mutton was growing where thousands of Mutton Birds used annually to flourish. However, I observed there were still a few burrows occupied by these birds.

It is somewhat remarkable that only the smaller islands are sought by the Mutton Birds for their nurseries. There is not a burrow on King Island, the larger islands of Kent Group, or Flinders Island, or Cape Barren Island of the Furneaux Group. But great nurseries are on islets lying adjacent to these places. These islets as a rule are flat, clothed with salt-bush and other shrubs, rank tussock grass, pig-face weed (*Mesembrianthemum*), &c. I had the opportunity of visiting.

\* Correct computation, 132,000,000.—A. J. C.

with the expeditions of the Field Naturalists' Club of Victoria, New Year's Islands, off the north-west corner of King Island—a place thick with birds, also with snakes, in fact it is notorious that nearly all the Mutton Birds' islands are infested with large snakes of the copper-head species (*Hoplocephalus superbus*). On the opposite side of the Strait we found the birds numerous on North-east Island, off Kent Group. We also found them on Babel Island, off the east coast of Flinders Island, and on several islands in Franklin Sound, between Flinders and Cape Barren Islands. Perhaps the greatest rookery in the whole strait is on Chappell Island, at the western entrance of Franklin Sound, where we spent a day and a night (26th November, 1893), at the very height of the eggng season. It was, indeed, a joyful and astonishing experience never to be forgotten.

Chappell Island, or "Hummoeky," as the islanders call it, is about two miles long by a breadth of about a mile, and is remarkable for its cone-shaped hill in the centre, rising to a height of 650 feet. The whole of the flat portion of the island, under tussock grass, salt-bushes, crops of nettles and gardens of yellow immortelles, &c., is completely honey-combed with the burrow-like nests of the sooty-plumaged birds. Our cutter was moored to granite boulders in a serene little cove on the east side. We walked across to Shag Boat-harbour, on the south side, which accommodated the native bird-egggers' fleet—seven or eight double-ended boats. These natives (half-castes), about forty, men, women and children from the Mission Settlement on Cape Barren Island, were ashore, some camped in sheds thatched with tussock grass, others under the lee side of huge granite rocks, with boat sails converted into tents. We obtained some novel photographs of the island—boat-harbour and fleet, group of bird-egggers, and egggers at work.

At night we renew our acquaintance with the multitudes of incoming birds. About sundown the forms of birds are just discerned dodging over the horizon. Quickly they approach in perfect crowds, not straight, but circling swiftly in all directions round the island. We look across the channel, where the bold peaks of Flinders, piercing a billowy thunder-cloud, are lighted up by the western twilight and afford an excellent background to the multitudes of dark birds cutting the air with whistling wings to and fro past us. With darkness coming on apace many of the birds venture on the island, and by eight o'clock nearly all are landed. Then is heard such a row and a hubbub—a perfect pandemonium—made by thousands upon thousands of birds in their burrows, croaking, calling, fighting each other or battling with snakes. After a surfeit of these marvellous scenes and sounds we retire to rest, my brother Tom and I, on our tussock-made couch, protected by the boat's sail, on land—snakes notwithstanding—the rest of the party afloat in the boat itself.

Having touched at some of the breeding places, the history of this exceedingly interesting bird may be briefly mentioned. From what I have gathered from old sailors and sealers, but chiefly from the islanders who were born and bred in the locality, it appears that from about the 13th to the 16th September the birds first arrive to clean out their burrows, and, it is presumed, also to mate.\* Much house cleaning,

\* Some persons believe the birds are mated before they arrive.

expelling snakes and other vermin, and marrying and giving in marriage are carried on day and night till the first week in November, when all go to sea again for a trip. During the burrow cleaning process it is a curious sight to see the clouds of sand issuing from the holes all over the land. The return of the birds, both male and female, the latter to lay, commences about the 18th November, and continues for about ten days, the great focus of arrivals occurring probably on the evening of the 25th or 26th, or after what is known to fishermen and others as the Mutton Bird gale. If the weather be boisterous, the birds usually arrive earlier in the evening.\* The female lays during the night she arrives or night following. After the egg is deposited she leaves for a week to recruit and grow fat at sea, while her lord steadfastly sits. He goes out the following week, and so on, turn and turn about, for eight weeks, till the egg is hatched† The young remain in the burrows till about the middle of April, when they are simply a ball of fat, and have a fallow appearance—hence, it is said, the name Mutton Bird—and heavier than their parents. At this stage the parents desert them. As a consequence, fatty absorption ensues, quills and feathers sprout and develop, and the youngsters, becoming impatient and hungry, clear out too, about ten days or a fortnight after their parents. By the first week of May not a feather—save a few dead carcasses—remains upon any of the islands. Nothing is seen of the Mutton Birds again till the following spring, when some balmy evening in September, their familiar dusky forms may again be seen swiftly cutting the horizon and approaching from over the sea.

It should be mentioned that before the young Mutton Birds follow their parents they devour a quantity of sand or gravel. They may do this to aid their digestion when at sea, but the popular belief is, it is taken to ballast themselves, because it is said that young birds not so ballasted, if thrown into the water, will eventually drown.

When visiting their nesting homes, the birds come and go under cover of darkness, it is thought on account of the dread of their enemies—Gulls, &c. One early morning, just four minutes after the last Petrel had departed seaward, Dr. Montgomery heard the barking wail of a Pacific Gull. Twenty minutes later, a squadron of these great creatures, accompanied by many crows, came wheeling overhead, no doubt after belated Petrels or stray eggs.

Turning to the economic value of the Mutton Bird, not only are the eggs, when fresh, sought after, but the birds themselves, more particularly the young, which are the staple food of the islanders. Persons who are fond of bacon, pork, and other fatty foods, take readily to the rich flesh of a young Mutton Bird, which is decidedly delicate and delicious in flavour, if properly cooked. Some liken the flavour to that of fresh caught herring.

The islanders commence to preserve the young birds about the 20th

\* During our trip to the Furneaux Group we ascertained the first eggs were taken on Babel Island, on the 18th, while previously we had taken eggs on the 20th on New Year's Islands.

† Bishop Montgomery states that the male returns every evening and probably feeds the female during incubation.

March, carrying on the operation till the birds finally quit. The young bird is dragged from its burrow, its head is placed between the first two fingers of the right hand of a "birder," a downward jerk, together with the weight of the bird's own body is given, and the neck is easily dislocated.

Fifty or sixty are thus strung on a spit or stick, care being taken to keep the head upwards so as not to lose any oil. This oil, which is of a reddish colour, is drained from the bird, and is used for lighting and other purposes. The feathers are then plucked, the body scalded to remove all down, and the feet are cut off. The bodies are placed on the grass to cool by the evening, when they are cleaned, head and neck removed, and finally salted and pickled in barrels, each family taking about 500 or 600 birds or more for home consumption. Twenty young birds will produce a gallon of oil, which is worth commercially about 3/6, and is very useful for the preparation of leather, &c. Pickled birds are worth 10/- per hundred; while the eggs, in season, sell at from 10d. to 1/- per dozen. The down and feathers\* of the birds—an untouched or wasted industry—should prove exceedingly valuable.

On account of the great annual drains of these economic birds, as well as the numbers of eggs taken every November, the question may be asked, are the numbers of birds diminishing? Judging by the evidence of the islanders and my own observations on Phillip Island, I should say "No." If the birds were unmolested, the present burrows on the islands would not contain them, so great are their numbers. All the burrows being occupied, thousands of eggs would be, and are at times, when the glut arrives, deposited upon the bare ground, and, by exposure, perish, or are devoured by Gulls and other enemies. However, legislation may be needed in the near future, and especially with regard to depasturing cattle upon islands containing "rookeries," for these animals, treading all over the place, cave in the burrow-nests and crush both old and young.

Dr. H. H. Montgomery, Bishop of Tasmania, whose duties periodically take him to the Furneaux Group, read an interesting and valuable paper before the Royal Society of Tasmania on Mutton Birds, from notes taken in the locality during the "birding" season, March, 1891. Part of the paper dwelt on the utility of the bird and the future need of its proper protection. Dr. Montgomery was kind enough to forward me a copy of his article, together with photographs of birds, &c., he took on a subsequent visit. I shall here quote somewhat largely from the Bishop's account. His Lordship states: "In the Furneaux Group the Mutton Birds used to breed in much greater numbers than at present, and I venture to hope that the chief effect of this paper may be the timely movement by the Government to save from almost utter destruction an industry which adds distinctly to the wealth of the State, and supplies a healthy article of food. At present the most important homes of these birds in the breeding season are Chappell Island (called, usually, 'Hummocky,' because of the hill in the centre), Little Dog and Big Dog Islands, Green Island and Little Green Island,

\* Feathers of Mutton Birds were first exhibited by Mr. W. Gunn, of Launceston, at the Great Exhibition, London, 1851.



YOUNG MUTTON BIRD (PETREL).

*From a Photo by Bishop Montgomery.*





and Babel Island. These places are nothing more than low, sandy spots, from 300 to 1,200 acres in extent, with hardly a tree (except on Big Dog Island), and covered with long, yellow grass, growing up to the waist. Most uninviting looking spots they appear to be.

“ On the 3rd of March I landed on Little Dog Island, and received my first introduction to these most interesting sea birds. At 6 p.m. not a Mutton Bird was in sight. Indeed, during the fortnight that I was cruising about in a boat I never saw a Petrel in the day time anywhere. It is their habit to fly away to sea very early in the morning to distances forty and fifty miles away, returning only when it is dusk. Whether they have long ago cleared the immediately surrounding waters of the food they require I cannot say; but it is a surprising fact that not one of the old birds is ever visible in the neighbourhood of their young throughout the day. Walking about on a rookery is a matter of no mean difficulty. The ground, always loose and powdery, is everywhere perforated with holes from two to three feet deep, about the diameter of a rabbit burrow. Among the long grass it is almost impossible to prevent crushing down the sand and endangering the lives of the young birds by suffocation, at the same time falling headlong oneself. Just at sunset I was invited to go some two hundred yards up on to the higher ground—the island is only two hundred acres in extent—in order to see the birds come in. I shall never forget that evening as long as I live. The sun was setting, leaving a broad belt of crimson on the western horizon, and soon the surrounding sea became almost invisible. Not a sound was heard except the rustling of the grass in the wind. There was no indication that there was a living thing on the island. There were no cries of sea birds. The stillness was wonderful. Presently a single dark-winged form flitted across the island and vanished again into the gloom. In another ten seconds thousands upon thousands of birds seemed to spring like magic up out of the darkness from every quarter without warning or cry of any kind. And now backwards and forwards before my dazzled sight I saw these countless dark shadows shooting with lightning rapidity athwart the last of the evening light. Still no articulate sound was heard. Nothing but the whistle as if of bullet after bullet through the air, bewildering one with the sense of numbers and of mysterious rushing life. Repeatedly a bird would dash within an inch of my head, and then wheel like lightning to one side to escape a collision. So imminent seemed the danger of arriving at home minus an ear or a nose from contact with a sharp beak that I was fain to crouch down in the long grass to escape an accident. To sit down on the ground on that particular island was possible because there were no snakes. Nothing would have induced me to have taken up the same position in the month of March had I been upon the island called ‘Hummocky.’ But of this hereafter. The minutes passed, and still this dizzy, whirling, hurly-burly of creatures continued—silent, and even awe-inspiring. Sometimes they came in squadrons of hundreds, sometimes by tens. But still they came; each bird after a turn or two sinking with unerring instinct on to its hole, finding it in the long grass and in the darkness with a certainty which was truly marvellous. It was difficult to tear oneself away from this wonderful spectacle. But

at length we returned to our tent, pitched near the water's edge, but still among the bushes, and all night long as I lay trying to sleep I heard the cooing and cackling of innumerable birds feeding their young in their subterranean homes, some of them apparently within a yard of my ear. At length I fell asleep, and before I awoke, at six o'clock in the morning, there was not a bird to be seen on the island. All the old Petrels had long ago sped away to their distant feeding places. I regretted that I had not witnessed their morning exit. In its way it is as striking as their homeward journey. For, as these birds cannot fly off the ground, especially in the long grass, each one has to walk either to the sea shore or else to the top of some rock before it can take its flight. In some cases this journey must have meant a distance of many hundred yards. Mr. Davies relates in his paper, read in 1846, that the sealers showed him the manner in which they caught the old birds for the sake of their feathers, stopping up all the tracks they made except one, which led to a pit into which they fell, and were suffocated by those that crowded after them. I am thankful to say this custom does not obtain at the present time. On every occasion when I could take the opportunity, I used to take up my position upon the rookery to watch for the wonderful, silent rush of birds after dark. It never ceased to charm as well as astonish."

Dr. Montgomery summed up with several sound suggestions, principally that the Government should resume possession of the smaller islands where the birds breed, that have been leased; that every person who "birds" should be licensed; and that the birding time should be regulated.

I shall now give briefly some of my observations and description of the "rookeries" on Phillip Island, Western Port, Victoria, where I enjoyed my first and last experiences among the dusky crowds of Mutton Birds. The localities visited by the birds are Cape Wollomai, the Narrows, and McCaffie's Reef on that island; the former, however, is the recognised breeding place, where burrows extend for miles along the coast.

My first trip was in November, 1884, in company with two field naturalist friends—Messrs. Alex. Borthwick, jurr., and Ed. Cornwall. I remember the year well, because it was the last occasion we had the 23rd—the anniversary of the "Proclamation of the Constitution of the Colony of Victoria"—as a Government holiday. On the 22nd, fisherman John Robinson took charge of us at Hastings, whence we had a merry run in the "Ocean Bird"—a boat, well named for such an outing—to Cape Wollomai. We arrived on the Cape about mid-day. A full account of this most instructive trip appeared in "The Australasian," 31st January, 1885.

Out of our boat's sails we constructed a tent in a snug sandy cove under Red Point, on the northern side of the Cape. It was a charmingly sheltered nook, and surrounded immediately in the rear with high sand hummocks, clothed with ferns and other scrub.

We commenced to work in real earnest. Having armed ourselves each with a crook, i.e., a thin tea-tree stick about seven feet long, with a portion of sheep fencing-wire doubled and attached to the end in the

figure of a pothook, for raking the eggs out of the Mutton Birds' burrows; and after a substantial meal off half a sheep, shipped with us from Hastings, we ascended the sand hills and were directly upon the Cape. A strong odour of excreta and guano reached our sense of smell. We were amongst the Mutton Birds. A burrow was discovered here and there. By introducing our long sticks we ascertained a few birds were already at home, because they attacked the end with a rat-tat-tat from their persuasive bills. With a little bit of fencing and manœuvring an egg was raked from a burrow, again from another hole, and so on, until we had a score before sundown. At this time we crossed the neck of land on to the back beach to await the arrival of the evening's contingent of birds. The locality was a complete network of burrows, highly perfumed with incense of guano. The ocean was about 200 feet below us, with a surf gently coiling in. The sun had set; we sat down in anxious expectation to be introduced to our feathered friends. Precisely at thirty-five minutes after sundown, one bird darted in from seaward like an arrow; but "one swallow does not make a summer." Presently a few more flew round, then a dozen, then hundreds, and, incredible as it may seem, then thousands. Such a scene as was witnessed that evening is extremely difficult to depict on paper. Imagine now in the gloaming, lit up by the new-horned moon, myriads of forms of dusky-coloured birds cutting the air in all directions with lightning-like rapidity, their flight being like that of wild Ducks, very swift. We stand behind bushes as the birds whizz past. Two or more may be coming in the direction of one of us, who launches out with his egging crook at the first; it is by like a Swift, and he strikes a yard or two behind it, while the next bird nearly lifts his hat. However, at times the air is so thick that it is well nigh impossible to miss a bird if you were to strike. But it is cruel sport to fell birds thus. By about half-past eight the majority of birds had alighted. The whole place was literally alive with feathers; and such a noise—flapping of wings along the ground, pattering of feet, rustling through grass and bushes, hundreds already underground croaking and squeaking, some wrangling for burrows and others getting ousted. It appeared as if it would take all night to settle down; therefore we directed our footsteps campward by the aid of what light yet remained of the setting moon. After getting comfortably settled under canvas for the night, the gentle noise from the ocean soon lulled us to sleep.

Next morning, at daylight, we had Mutton Bird eggs frying in a pan; we relished them much. Then we started with our sticks, handbags, and a couple of fish-baskets to gather in eggs. We visited the locality, a decline facing the back beach, where we observed the most birds land on the previous evening. This siding resembled a great rabbit-warren, being a complete network of holes, except where the earth's surface was covered with a species of creeping ice-plant. It was a comical picture to observe the quintette raking away at the holes with long sticks. How eagerly each member worked—one on his knees, another doubled in two, like the man with the "muck-rake;" another grasping a croaking bird by its wing flights, while another conveyed a hat brimming full of eggs to the nearest basket. The skipper of our

boat and his boy had served their apprenticeship at Mutton Bird egging. The remainder of us were novices, but proved very apt pupils, and quickly learnt by the feeling of the stick whether we had grappled the egg or the bird. Numerous holes were at too steep an angle or otherwise awkward to rake out. It is extremely gratifying, after tediously scraping away in the dark for perhaps several minutes, to see the white egg roll up to the surface in the curved end of the stick. Other times when an egg was successfully grappled and was being withdrawn, the poor bird would follow it up, and by the aid of its cheek throw it back. In shallow burrows, where the daylight pierced, we observed them go through that performance in several instances. Many birds had not yet laid, and would not till the following morning. These would often rush out if the stick were rudely thrust in, or be unwillingly dragged out by the crook. In either case we invariably secured them; if they contained an egg we accordingly delivered them; but we had to beware of their forcible beak and toe-nails, to guard our hands from being lacerated. We soon became expert at this work. The patient was caught by the flights of each wing, and twirled over upon its back on the grass; we placed our knees on the extended wings with the bird's tail from us and its head "in chancery" between our knees, holding a leg in either hand; we turned the thumbs downward, gently and carefully pressed the abdomen, then the egg was delivered. The owner scampered off, to all appearances delighted, and finally disappeared over a cliff and flew out to sea. The locomotion of the birds is a peculiar waddle, with legs extended and apart and wings flapping along the ground. When in a hurry they stumble against the slightest obstacle, which often brings them over upon their side, or to the right-about turn.

On reckoning our takings for the three days, the total exceeded 300 specimens, distributed as follows: 1 Sea Eagle, 14 Mutton Birds with 250 eggs, 4 Seagulls with 22 eggs, 4 Penguins with 2 eggs, a pair of Hooded Dottrels with 3 eggs, and a basket of fish. Thus ended a most joyful and instructive outing amongst the Mutton Birds.

The account of my last Mutton Bird egging excursion appeared in 'The Australasian,' 2nd January, 1897, and substantially is as follows: We leave Hastings in the centre-board fishing boat "Stormy Petrel," bound for the Mutton Bird rookeries on Cape Wollomai, Phillip Island. Our party numbers four, in charge of skipper J. F. Brown.

The night is beautiful and balmy. The moon, just past her full, rises red, betokening a continuance of heat. We 'shake down' comfortably on the deck of the boat, the various night voices of birds—Sea Curlews, Greenshanks, Cormorants, Swans, Ducks, Plovers, &c.,—gathered on the mud flats, sounding strangely in our ears.

About 2 a.m. we drift on a swiftly-ebbing tide past San Remo (Griffith's Point), where all is silent, and where the buildings, sheltered beneath a grove of banksia trees, are gleaming in the moonlight. In a snug, sandy bight, on the lee of Cape Wollomai, we land about 3 a.m. Cape Wollomai is about two miles and a-half due south of San Remo, and about twenty-two miles from Hastings.

Tents were pitched in the bright moonlight, and all luggage was ashore by sunrise. Our quarters were exceedingly comfortable, being

sheltered by two stunted tea-trees (*Leptospermum*), with tops like umbrellas, throwing a grateful shade. Here, shielded from the meridian sun, we reclined, clothed only in our pyjamas, drinking delightful 'billy' tea, or occasionally a lemon squash. At our back we have the protection of a sand dune covered with scrub, tussock grass, bracken, &c. There were stunted bushes in front of our tents, which faced the beach. Fresh water in sufficient quantity was handy. At intervals along the steep shore water as clear as crystal issued from tiny springs. It was quite wholesome, with a soft taste.

Other camps were near. During our stay, about twelve or thirteen boats arrived with eggng parties from different parts of Western Port. The largest party numbered eleven. Four-horse conveyances came by Newhaven along the strand when the tide was out. There were also several visitors, including ladies, on horseback.

After an early breakfast at 6 a.m. we started to explore the Mutton Bird rookeries. We found the place somewhat altered since our visit twelve years ago. For instance, there are on Red Point piled blocks of red granite quarried by Messrs. Clutton & Chambers, of Melbourne, and alongside the quarry a dwelling, cranes, &c.

A few Mutton Birds were in their burrows, and had laid. The burrows, like rabbit warrens, extended over many acres of the cape under a covering of horehound, pig-face weed adorned with small pink flowers, sword and tussock grass, &c. The chief rookeries are nearest the sea. You can always tell when you are on a good rookery by the strong odour of guano and the musty smell of the sea-birds. Except for the scrub the cape appears at a distance bald and naked. The summit is reached from the inland side by a series of undulations, till you stand 332 feet above sea-level, peering over a rugged and frowning bluff. The cape in its broadest part is about  $1\frac{1}{8}$  miles across. It seems an omission that an important headland like Wollomai is not mentioned in the 'Class Book of Geography' used in the State schools. From this coign of vantage there is seen a most magnificent panorama of land and sea.

At 10 o'clock it was excessively hot—we could see the mainland simmering in haze. The heat drove us to camp, where we rested till the cool of the evening. We found it convenient to work on the rookeries morning and evening, resting in camp when the day was warmest. There were two advantages in turning out of camp soon after daylight—it was the most pleasant time to gather eggs, and we get our choice of the rookeries.

Our party killed three snakes and saw as many more which made their escape. Nearly every eggng party reported adventures with snakes. One is startled when withdrawing the crook to see a copper-head dart out past one's hand. Large blue-tongued lizards were plentiful. Several eggs left in camp were cleanly sucked by these reptiles during our absence. We caught one in the act. We stupefied it with narcotic juice from a dirty pipe, in order to get it to pose quietly for its photograph.

We vary our programme by spending a night on the rookery.

Leaving one of our number in camp, three of us start at half-past 7 p.m. for the top of the cape, about a mile from our camp, taking our overcoats, egging crooks, and a 'billy' of tea, &c. In the sultry evening it is warm work trudging upward through the short, stiff herbage, tripping now and again in Mutton Bird holes in the twilight. Just before 8 p.m. a few birds are seen circling swiftly about, and by the time we reach our halting-place they are numerous, cutting the air in all directions, some whizzing past close to our heads. When it is quite dark nearly all the birds have landed and entered their burrow-homes, where, judging by the noise, warm congratulations are being exchanged, and, if I mistake not, warm lights are going on, too, through birds entering wrong burrows. The hubbub is kept up more or less throughout the night. Many birds appear to sleep on the ground. Some are on the wing all night, judging by the cries. The cry consists of three rapid squeal-like notes, followed by one note low-pitched, as if the breath were drawn in. The notes are repeated three or four times.

We get on the lee side of an outcrop of rock and enjoy a nap for two hours. When we awake it is shortly after midnight, and our surroundings seem utterly strange and weird. The underground squeaking and the croaking noise made by the birds are unabated. Far below we hear the wash of the sea on the reefs and foot rocks of the cape. The half-moon is well up, and its light, piercing a bank of clouds over the mainland, sheds a silvery sheen across the calm sea. To the left hand is the flash of the distant Cape Schanck light. We walk abroad. Birds scuttle to right and left from underneath the tussocks as we pass along. One or two eggs are picked up on the surface, evidently dropped in a hurry before the birds could reach their nests. The most energetic member of our party commences in the moonlight to rake eggs from the holes.

At about half-past 3 o'clock, or just as daylight is breaking, birds begin to depart to seaward. We take up positions on the edge of the cliff to witness this interesting leave-taking. Birds in ones or twos waddle up, or sneak through the grass like rats, then, spreading their wings, take a short run and launch over the cliff and disappear into the gloom. Some on reaching the cliff pause for a minute or two, then with a neat spring off the feet sail away. Others flounder along, striking a tussock or some other obstacle before they get fairly on the wing. This performance ceases about 4 o'clock, when all the outgoing birds have departed. There are only left the breeding birds in their burrows, where all is hushed.

I break my egging crook over a large snake, and so can do no egging. My companions each fill their baskets, and we return to camp to breakfast on fried Mutton Birds' eggs and bacon.

After five days we brought an enjoyable and successful trip to a close, having collected between forty and fifty dozen of eggs.

I have given an illustration of the "pig-face" weed rookery on Phillip Island, Western Port, also a picture of a small rookery on North-east Island, one of the Kent Group.



ON THE MUTTON BIRD ROOKERY—PHILLIP ISLAND

*From a Photo by the Author*





## 670.—PUFFINUS LEUCOMELAS, Temminck.

## WHITE-FRONTED PETREL.

*Reference.*—Cat. Birds Brit. Mus., vol. xxv., p. 370.

*Geographical Distribution.*—Seas of Queensland and possibly Northern Territory; also the Moluccas, North Borneo, the Philippine Islands, and northwards to the seas of Japan and Corea.

*Nest and Eggs.*—Undescribed.

*Observations.*—This Petrel first became an Australian species when Mr. Cockerell collected it off the North-east coast. It is a fair-sized bird (about nineteen inches in total length), has a general brown upper surface, and entire under surface white.

## 671.—PUFFINUS GRISEUS, Gmelin.

## SOMBRE PETREL.

*Reference.*—Cat. Birds Brit. Mus., vol. xxv., p. 386.

*Previous Descriptions of Eggs.*—Buller: Birds of New Zealand (1873), also vol. ii., p. 233 (1888).

*Geographical Distribution.*—Two skins in the British Museum are marked Australia and New Zealand respectively. Generally distributed throughout the seas of both Hemispheres, from Faroe Islands in the North Atlantic and the Kurile Islands in the North Pacific to the Strait of Magellan and the islands south of New Zealand.

*Nest.*—Usually a deep burrow underground.

*Eggs.*—Clutch, one; round oval in shape; texture of shell somewhat coarse; surface minutely pitted and slightly glossy; colour, pure white, but frequently more or less stained with dirt. Dimensions in inches: 2.65 × 2.0; according to Buller: 3.1 × 1.95.

*Observations.*—This Sombre-coloured Petrel resembles the Short-tailed Petrel, or Mutton Bird, but is appreciably larger. Skins in the British Museum are marked "Australia." According to Sir Walter Buller it is a common species in the New Zealand seas. It is comparatively plentiful on the Island of Kapiti, where it is found breeding as late as March. On the Island of Karewa and on the Rurima Rocks large numbers annually breed, sharing their burrows with the singular Tuatara lizard, and submitting, season after season, to have their nests

robbed by the Maoris, who systematically visit the breeding grounds when the young birds are sufficiently plump and fat for the calabash.

Sir Walter proceeds to state that "Mr. Kennedy informs me that when engaged on a survey of the Kaimanawa Ranges, his native workmen caught numbers of these birds in their burrows. On their first arrival at the breeding ground the young birds were very small, but in the month of April they had attained their full-size and were veritable lumps of fat.

"It sometimes breeds in the hills at the back of Wellington, and I once met with the bird on the coach road in the Nguaranga Gorge.

"There are some nesting grounds of this species on Whale Island, in the Bay of Plenty. I visited these breeding places about the middle of January, and found the nestlings still occupying their deep burrows, but they were well grown, with black quills and tail feathers sprouting vigorously through their thick downy mantle of slaty-grey.

"These birds are at all times more nocturnal than diurnal, and when hovering overhead at night utter a frequent call-note, like 'tee-tee-tee,' from which the Maori name is derived.

"There are several well-known breeding places on the south-east coast of Otago, and on Stewart Island."

Years ago I received eggs of the Sombre Petrel from the late Mr. T. H. Potts, and more recently (1896) I received an egg, together with its parent, from Macquarie Island, where Mr. Joseph Burton informs me these birds breed in burrows under tussocks of grass on the mountain sides, laying the latter part of November.

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## 672.—PUFFINUS GAVIA, Forster.

### FORSTER PETREL.

*Reference.*—Cat. Birds Brit. Mus., vol. xxv., p. 381.

*Previous Description of Eggs.*—Reischek: Trans. New Zealand Inst., vol. xviii., p. 93 (1885).

*Geographical Distribution.*—Seas of New South Wales and South Australia, and probably other parts of Australia, including Tasmania; also New Zealand.

*Nest.*—A burrow, 4 to 5 inches in diameter at the entrance and  $1\frac{1}{2}$  to 3 feet in length; the egg chamber at the terminus being  $1\frac{1}{2}$  feet broad by  $1\frac{2}{3}$  feet high, with a few leaves on the floor as a lining. (Reischek). Like most Puffins, this species nests in colonies or rookeries, their burrows, like a huge rabbit warren, covering many acres of ground.

*Eggs.*—Clutch, one; oval in shape, or more pointed at one end; texture of shell comparatively fine; surface slightly glossy; colour, pure white. Dimensions in inches:  $2.2 \times 1.55$ .

*Observations.*—Previous to the compilation of the Vernacular List of the Australasian Association for the Advancement of Science, this Petrel's name did not appear on any Australian list. Specimens of the Forster Petrel, taken off the Australian coast, are in both the Sydney and Adelaide Museums.

This Petrel is also found in New Zealand seas. According to Sir Walter Buller, its habits are sociable, and flocks may often be seen in the daytime disporting themselves in the sea, making short flights just above the surface, then flopping into the water, splashing and chasing one another in their playful gambols, and when tired of their fun, rising and rapidly disappearing from view in a compact body, generally taking a zig-zag course, showing simultaneously the dark plumage of the upper surface, then the white under parts.

Whale Island is one of the favourite breeding grounds of the Forster Petrel, the places selected being the stony scrub-covered slopes near the summit, as well as the holes and crevices among the rocks far above high-water mark. The adjacent little island of Notoki, Karewa Island, in the Bay of Plenty, and the numerous islands in the Hauraki Gulf are also nesting grounds.

The egg in my collection, received from Mr. Edward P. Sealy, was taken in the Bay of Islands, season 1896. This Petrel lays during October, and in its natural economy much resembles the ordinary Mutton Bird.

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673.—*PRIOFINUS CINEREUS*, Gmelin.—(626)  
*Fulmarus gelidus*, Gmelin.

#### BROWN PETREL.

*Figure.*—Gould; Birds of Australia, fol. vol. vii, pl 47

*Reference.*—Cat. Birds Brit. Mus., vol. xxv., p. 390.

*Previous Description of Eggs.*—\*Gould: Birds of Australia, Handbook, vol. ii., p. 447 (1865); Campbell: Victorian Naturalist (1897).

*Geographical Distribution.*—Seas of New South Wales, Victoria, South and West Australia, and Tasmania; also New Zealand and Southern Ocean in general.

*Nest.*—(On Macquarie Island).—In burrows under tussock grass, mostly high up on the mountain sides.

*Eggs.*—Clutch, one; roundish or broad oval in shape; texture of shell close but somewhat coarse; surface very slightly glossy; colour, pure white when first laid, but soon becomes soiled with brownish earthy stains. Dimensions in inches: (1) 2.8 × 2.04, (2) 2.79 × 1.98, (3) 2.73 × 1.96.

\*No dimensions given.

*Observations.*—The large Brown or Great Grey Petrel frequents the southern seas, being most numerous between the 30th and 55th degrees of south latitude. Gould, on his voyage to and from Australia, obtained many specimens of the bird. This makes it more inexplicable why his figure ("Birds of Australia," folio, vol. vii., pl. 47) was not coloured truer to life. The bird is made to appear grey instead of light-brown, and to possess a yellowish culmen instead of dark horn-colour.

Gould remarked that the powers of flight of this fine sea-bird are exceedingly great, and in flying over the ocean it often mounts higher in the air than any other member of its group, and descends again with the utmost eagerness to seize any fatty substance thrown overboard. Its actions and flight differ slightly from those of the other Petrels, and more resemble those of the Albatrosses.

The Brown Petrel is considered one of the best divers of its tribe. Sometimes it poises in the air for a moment at the height of about twenty-five feet above the water, and closing its wings takes a header into the waves. However, under water the bird uses its wings much in the same manner as when flying.

The eggs above described were collected on Macquarie Island, the latter part of November, 1896, by Mr. Joseph Burton, *per* favour of Mr. Joseph Hatch, the lessee of the island. The eggs were accompanied by a skin of the bird. Macquarie Island is an exceedingly rough and rugged place, almost devoid of vegetation, situated 860 miles south-east by south from Hobart. It is about twenty miles long by about seven miles broad, its greatest height being 1,300 feet above sea-level.

During an interesting conversation with Mr. Burton, after his return from Macquarie Island, where he remained  $3\frac{1}{2}$  years, he informed me that Brown Petrels generally appear in numbers after the middle or towards the end of August (he noted one bird as early as the 12th of that month), and depart about the end of May. Fresh eggs may be collected the end of November or beginning of December, but, strange to say, in March and April (1900) some fresh eggs were observed in the burrows.

The burrows are in great numbers on the hill sides, from sea-level up to about 400 or 500 feet, and extend on an average four or five feet in the soft soil the nesting chamber being sparingly lined with portions of tussock grass. The burrow apparently always extends a little beyond the nesting chamber, because, if a sitting bird were disturbed, it usually got out of reach by moving further in. If a burrow be in use, a few blades of tussock grass will be noticed in the entrance.

The birds generally go to sea at day-light, which, on account of the latitude, occurs there about 2 o'clock in mid-summer, returning about dusk (10 p.m.); but, just before laying season, usually two birds (presumably a mated pair) were found in the burrows during the day.

The call of the Brown Petrel, when flying, is a single whistle-like cry. In the burrows they coo like Prions, only, of course, louder.

674.—*PRIOCELLA GLACIALOIDES*, Smith.—(639)

## SILVER-GREY PETREL.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 48.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 393.

*Geographical Distribution*.—Seas of South Queensland, New South Wales, Victoria, South and West Australia, and Tasmania; also New Zealand and Southern Ocean in general, northward along the west coast of America to Washington Territory.

*Nest and Eggs*.—Undescribed.

*Observations*.—The delicately-coloured Silver-grey Petrel belongs chiefly to southern latitudes. During his passage to and from Australia, Gould observed numerous examples. One of the first he possessed was captured by a hook and line, and afforded Mrs. Gould an opportunity of making a beautiful drawing from life.

It is stated that a specimen of this Petrel was obtained on Tristan d'Acunha by Von Willemoes Suhm; if so, it possibly breeds there. The bird flies as far south as the edge of the pack ice.

It may be here stated that out of the thirty-eight members of the Great Petrel family on the Australian list, the eggs of seven, including the above, have yet to be described.

In connection with the avifauna of Kerguelen Island, Dr. Sharpe writes: "None of the recent expeditions (Transit of Venus, 1874) seemed to have obtained it, but John Munn's narrative states that this species 'was used when young by our party as food, and our supplies were obtained by digging the young birds from the burrows in the sand or tussock bank on the lee of the S.E. side of the island. The bird was known and eaten by us under the name of the White Night Hawk.'"

675.—*MAJAJQUEUS ÆQUINOCTIALIS*, Linnæus.—(625)

*Fulmarus conspicillatus*, Gould.

## SPECTACLED PETREL.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 46.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 395.

*Previous Descriptions of Eggs*.—Saunders': Trans. Roy. Soc., vol. clxviii, p. 164 (1878); Kidder and Coues: Smithsonian Miscell. Coll., vol. xiii., p. 13 (1878); Hall: Ibis, p. 22 (1900).

*Geographical Distribution*.—Seas of New South Wales and Tasmania; also Southern Ocean in general; north, to about 30 deg. south latitude.

*Nest.*—A very deep burrow, generally under a mound of herbage in a hill side. Near the entrance to the burrow there is usually a small pool of fresh water (Kidder and Cones). The nest (proper) is built of mud and pieces of plants arranged in the form of an inverted saucer, 3 or 4 inches high, slightly hollowed out at the top. A space is left between its base and the sides of the nesting chamber (Eaton).

*Eggs.*—Clutch, one; elongate in form or lengthened oval; texture of shell coarse; surface slightly glossy; colour, pure white, which soon becomes soiled by dirt in the nest. The heavy or musky odour present more or less on all Petrels' eggs is exceedingly pronounced in this instance. Dimensions in inches of examples from Kerguelen Island: (1) 3.46 × 2.14, (2) 3.24 × 2.05.

*Observations.*—This large, dark-coloured Petrel, with conspicuous white markings about its face, is a flyer over the southern seas, and has been noted off New South Wales and Tasmania. There has been a little difficulty about determining the species on account of the variation in some individuals of the facial markings, especially under the chin. The bird is sometimes called the White-chinned Petrel. On account of the rank odour emitted by the bird it is also called the "Stinker" by whalers.

The Rev. A. E. Eaton, who accompanied the British Transit or Venus Expedition to Kerguelen Island, 1874-5, states, with reference to the Spectacled or White-chinned Petrel: "In Kerguelen Island a hole similar to a deserted rabbits' earth, excavated in wet ground, with water standing (in early summer) an inch or two deep within the entrance, especially if it is in a slope near the sea, may be regarded as a burrow most likely to be that of a White-chinned Petrel. If it is occupied by the birds there will probably be some green shoots of *Acacia*, clipped off from plants near its mouth, dropped by them in the water. During the season, when the birds are pairing, before their egg is laid, they make an extraordinary cackle in the nest chamber; the sound of approaching footsteps, or a thump upon the ground some distance away from the nest, and even a shout at the mouth of the burrow, will cause them to commence in the daytime. During the night this call is uttered by the female sitting on her nest or in the entrance of the tunnel, and she can be heard at a distance of a quarter-of-a-mile when there is a calm. Much trouble may be saved in digging out the nest by sounding with a spade along the course of the burrow until the situation of the nest-chamber is ascertained. This is spherical and tolerably large. Being in most instances near the ground, care must be taken in the removal of its roof, or the bird's back may be broken by the spade while she is sitting upon her egg. As soon as the chamber is laid open it is well to catch the hen by her beak and drag her out of the hole while she is still dazzled by the light, giving her no time to use her claws. On being released she usually makes no attempt to fly, unless she is purposely chased down the hill; but after waddling away a few yards she returns to her burrow (or to where its entrance used to be before it was dug into and choked with clods) and begins at

once to dig her way into the tunnel through the obstructions with which it has been blocked up. She takes little notice of bystanders so long as they remain still, passing leisurely by them or even over their feet if they happen to be in her way. . . . Some birds had no white patch under their chin: when it was present it varied in extent in different examples. In most instances it formed a small triangular blotch, occupying the apical portion of the angle enclosed by the lower mandible, but in a few cases the white was limited to one or two feathers only. In none of the Kerguelen specimens did the patch extend to the forehead, as it does in the birds from Australia."

During the American expedition to the same locality a single specimen of the Spectacled Petrel was dug out by a dog, on the 12th October, from a very deep burrow under a clump of herbage, but no others were observed until 15th November, when they suddenly appeared in the daytime in considerable numbers. On the 16th December, Dr. Kidder dug up specimens, with eggs, and frequently thereafter. The birds nested in very deep burrows, with almost always a little pool of water at their entrance, and kept up an incessant squealing while the dog was digging for them, very like the sound of a water-whistle toy. They fought the dog more bravely than other Petrels, generally coming out of the burrow hanging to his ear, and keeping him off very successfully in the open.

During Mr. Hans Gundersen's oiling visit to Kerguelen, Mr. Robert Hall found most of the eggs of the Spectacled Petrel much incubated by the end of January (1898), while some nests contained young. Nevertheless, a few fresh eggs were secured early in February.

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676.—*MAJAJUEUS PARKINSONI*, Gray.

BLACK PETREL.

*Figure*.—Cat. Birds Brit. Mus., vol. xxv., pl. 5.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 397.

*Previous Descriptions of Eggs*.—Hutton: Trans. New Zealand Inst., vol. iii., p. 111 (1871); Buller: Birds of New Zealand (1873), also vol. ii., p. 244 (1883); Reischek: Trans. New Zealand Inst., vol. xviii., p. 87 (1885).

*Geographical Distribution*.—Seas of New South Wales, Victoria (probably), and Tasmania; also New Zealand.

*Nest*.—A burrow, sometimes in loose soil and other times under roots of trees or under stones, on islands and in mountains inland in certain parts of the North Island of New Zealand.

*Eggs*.—Clutch, one; broad oval in shape; texture of shell coarse; surface glossy; colour, pure white. Dimensions in inches: 2.83 × 1.97; according to Buller: 2.7 × 2.0.

*Observations.*—Although the Black Petrel has been recorded off the coast of New South Wales and Tasmania, it is more peculiar to New Zealand seas. It is very similar to the Spectacled Petrel, but smaller.

According to Sir Walter Buller, it resorts to Little Barrier and adjacent islands to breed in colonies. It also resorts for that purpose to the top of low mountains far removed from the sea. The Maoris soon discover their breeding places, and not only collect the young, but capture large numbers of the old birds by lighting fires on calm nights (for the birds are nocturnal), and thus decoying them to their destruction.

Mr. Cheeseman informed Sir Walter Buller that the Black Petrel also breeds on the coast ranges north of Manukau and on the Cape Colville Peninsula, also on the small islets off the eastern shore.

I cannot do better than quote Mr. A. Reischek's original and interesting observations—which were extended over many seasons—on the Black, or, as he calls it, the Brown Petrel (*Procellaria parkinsoni*). He states: "These birds are found round the coast of New Zealand; I have seen them over a hundred miles from land, cruising about in a similar manner to, and in company with, the Albatross (*Diomedea erulans*), but they never go near enough to a vessel to be caught, nor do they pick up the food thrown overboard, as the Albatross does. This Petrel is gregarious, and I have seen them in large flocks together, resting on the water. Their power of flight is marvellous. In July, 1879, outside the Kaipara, on the west coast of North New Zealand, I had an opportunity of observing these birds, having to lay-by outside the bar for several days, being unable to enter, as it was blowing one of the severest gales experienced in these seas. They cruised about, dipping the points of their wings at intervals in the water, then suddenly swooping down through the foaming waves for their prey; rising with the next wave and repeating their former action. From July to November these birds are always out at sea. In November they come ashore to their breeding places, on the top of high and steep mountains, which they choose for the purpose of easier flight, as they have difficulty in ascending from the level ground.

"They are expert climbers: I saw them, by the aid of their sharp claws, their bills and wings, climbing up trees out of the perpendicular, from whence they flew away. In November, 1882, on the eastern slope, and near the centre of the Little Barrier or Hauturu Island, situated north of Auckland, at about 2,300 feet above sea-level, on a steep precipitous ridge, I noticed my dog repeatedly setting at burrows, which, on examination, I found contained *Procellaria parkinsoni*; they were cleaning out their old burrows; and staying to observe, I noticed them digging with their bills, removing the earth by a backward motion of their feet, till the burrow was cleansed. In most cases I found them working, in others the burrows were clean and the refuse outside, some burrows in loose soil, others under the roots of trees and under stones, also in hollow trees. I have found them sometimes very far inland, always on the tops of mountains.

"In December, 1884, on the Waitakerei Ranges, 1,000 feet above sea-level, and twelve miles from the ocean, I found the female sitting



on an egg, nearly hatched. I measured several burrows of these birds: the entrance was from 8 to 12 inches in diameter, the depth from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  feet, and the height about a foot. When they have finished cleaning out the burrows, which process male and female accomplish together, they remain quietly until the last rays of the sun have disappeared, then anyone can hear them call, which is similar to the Black Swan (*Chenopsis atrata*), and, on coming out, they stop a moment, pick up a few leaves or grass and go back into the burrows; this they repeat several times, and always on entering the chamber they make a peculiar noise together. After dark both come out, rise and circle round, calling until they attract others, and when a large flock is assembled they fly away to their haunts on the ocean, returning before daylight. At this season, before they lay, they are very fat. When caught, on their return from the ocean, if they cannot protect themselves by scratching and biting, they expectorate a lot of oily matter on their assailant. The first time I caught one of these birds it treated me in this manner. As soon as they have finished building their careless nest, which is a deepening in the chamber, with a few leaves in it, the female lays one white egg, about the size of that produced by a Brahma fowl. When the female lays, the male separates from her during the day, while she is hatching, and remains in a separate burrow of his own not far away. The first egg of the *Procellaria parkinsoni* I found on the 28th November, 1882, at the Little Barrier. After this date I found and examined several, but never found more than one egg or young in a nest, and the female always sitting on the egg.

“I watched these birds by moonlight, and have seen the male come out of his burrow and fly away; returning after a time, and circling round in the air, he swooped down to the burrow of the female, striking the ground with a force that could be heard some distance. He stood outside a little, then entered, and I heard a whimpering noise. After this a bird came out and flew away, returning after a time to the same burrow and in a few minutes once again emerged and flew away; but returned before daylight, and using the same precaution on entering as before. Then one bird came out and went to the second burrow. I examined the burrow where this process was going on, and on putting my hand in it was severely bitten, which was repeated on my trying to lay hold of the bird, which drew back into the chamber. So I dug with a tomahawk till I reached where the bird was sitting, and tried to take the egg from under it, which I partially succeeded in doing, when I was again so severely bitten that I had to let it go. As soon as I did so the bird with its bill rolled it back again into the nest. I protected my hand and then took the egg, which was quite fresh. My dog went to the bird, which attacked him furiously. On examination I found this was a female. I then went to the other burrow where I saw the bird go in. This bird defended itself in the same plucky manner. There was no egg in this chamber, and on examination I found this bird was a male. About the end of December I found a female in a burrow, with one small chick covered with grey down, which she defended furiously. I have also found very young birds in January, even as late as April. As soon as the young birds are a few days old,

the parents leave them in the burrow from before sunrise until after sunset, while they go to seek food. On their return they circle round their burrow as before, stopping at the entrance to call, which the young birds immediately answer. After entering, they make a whimpering noise. The old birds leave and return several times in a night. Once or twice only have I found adult birds in the burrow during the day, when they had their young: the reason being that, not having left the burrow before daylight, they are afraid to leave till evening. If they find their burrows disturbed they will not go in.

"The natives are very careful when taking the young 'Taikos' not to disturb the burrows. They make expeditions in May to the islands where these Petrels are breeding. In former times each tribe had their grounds, which they visited every year, and defended obstinately against the intruder. The birds were taken out with a flexible stick, pointed at one end and split, which they pushed into the burrow till the bird was felt, when they twisted the stick round in the down and pulled out the bird gently, then bit the head to kill it. They then took the bird's bill to cut the skin under the crop, and pulled out the oil-bag, which was thrown away, as the oil would spoil the flesh for food. They pluck each bird as they get it, and when a large number are obtained, carry them to the camp, where they singe the down off over a fire; then they roast the bird until the fat is extracted, and, placing them in a vessel made of totara bark, they cover them with the fat to keep them air-tight. When preserved in this manner they keep a length of time. I saw the natives very often preserving them during my researches in the King Country, beginning of 1882, and have eaten and found them excellent. If the natives disturb any of the Petrels' burrows, they always restore them. These birds, which were very numerous on the Little Barrier Island during the breeding season, I found on my last visit (April and May, 1885) had become very scarce, but I found the remains of many which pig and dogs had destroyed."

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677.—(ESTRELATA MACROPTERA, Smith.—(627 and 628)  
*Pterodroma atlantica*, Gould.

#### GREAT-WINGED PETREL.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 399.

*Previous Descriptions of Eggs*.—Buller: Birds of New Zealand (1873), also vol. ii., p. 246 (1888); Reischek: Trans. New Zealand Inst., vol. xviii., p. 90 (1885); Campbell: Victorian Naturalist (1889).

*Geographical Distribution*.—Seas of New South Wales, Victoria (probably), and Tasmania; also New Zealand and Southern Ocean in general.

*Nest*.—A hole or burrow, usually at the base of a cliff. In companies, sometimes four or five pairs of birds having nests within the

same cavern, each nest being placed at the end of a separate burrow, having a varying length, with an oval chamber at the further end. These burrows are generally about three feet in extent (one, however, measured four), and the nest or egg chamber is decidedly smaller than that usually formed by the Black Petrel (*M. parkinsoni*), and has a few dry leaves on the floor (Buller).

The burrows are from  $1\frac{1}{2}$  to 4 feet apart; the entrance 6 to 10 inches in diameter; the passage (usually winding) in most cases 2 to 4 feet in length. The egg chamber is from  $1\frac{1}{2}$  to 2 feet wide, and from  $\frac{1}{2}$  to 1 foot in height (Reischek).

*Eggs.*—Clutch, one; roundish oval in shape; texture of shell somewhat coarse; surface has faint trace of gloss and is minutely pitted, especially at the smaller end; colour, pure white. Dimensions in inches of examples from Cape Maria Van Diemen (New Zealand): (1)  $2.7 \times 1.9$ , (2)  $2.6 \times 1.95$ , (3)  $2.6 \times 1.9$ .

*Observations.*—This Southern Ocean flyer is at once distinguished by its great Swift-like wings, and is therefore well named on that account.

Gould considered a bird he killed in the Tasmanian seas (where they are tolerably abundant), because of its larger size, longer wings, and greyer face, to be different from the Atlantic Petrel; but more recent investigations have proved the two birds to be identical. The bird has also been called *P. gouldi* by New Zealand authors.

According to Sir Walter Buller, Reischek found the Great-winged, or Gould Petrel, all round the Little Barrier Island. This Petrel is also said to breed sixty miles inland from Opotiki, in a range of mountains, and in large numbers on the island of Karewa, in the Bay of Plenty, on Whale Island, and other small islands off the east coast, on several small islands in Hauraki Gulf, and on the coast line north of the Manukau.

The examples of eggs in my own collection were taken July, 1886, at Cape Maria Van Diemen by the lighthouse keeper.

Mr. A. Reischek's interesting field observations of the Great-winged Petrel are: "These Petrels are common on the coast of New Zealand. I saw them in large flocks out at sea, where they remain from March till August; in the latter month they come ashore to their old breeding places, which they use annually as long as they are not molested. These birds breed in colonies; their burrows are sometimes very close to one another; on the Little Barrier Island (or Hauturu Island), I measured a piece of ground thirty-six feet in circumference in the centre of which were six burrows. Their breeding resorts are always on the cliffs along the coast—and some are very difficult to approach—dug out by these Petrels even in hard sandy formation or clay. In August male and female begin to clean out their old burrows or dig fresh ones, if the former have been disturbed, in a similar manner to the *Procellaria parkinsoni*. In the beginning of September the female lays one white egg, the size of that of a common fowl; they very seldom lay two eggs. The female hatches the egg, the male roams about the

ocean in the daytime—sometimes I found them ashore in a separate burrow from that of the female.

“After sunset thick clouds of these Petrels swarm round the cliffs, uttering the melancholy sound ‘ohi! ohi!’ from which the natives name it ‘Ohi.’ Each one circles round its burrow several times before it goes down to it; then they stop for a moment before entering. These birds go to and from their burrows several times a night. When the young is hatched, the female stops for a few days with her chick in the burrow; after that both parents leave every morning before sunrise, and fly to their haunts on the ocean. Returning after sunset they circle round their burrows, then swoop down to the entrance and call: when answered by the young bird they enter. If both birds come to the burrow together, one stops outside until the other reappears. When feeding the young they make a whimpering noise. Male and female rear the young together and defend them; but they are not so vicious as Parkinson’s Petrel. In February the young are full-grown and very fat; the natives go to collect and preserve them in the same manner as I have already described in a former paper.”

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678.—ESTRELATA LESSONI, GARNOT.—(630)  
*Procellaria leucocephala*, FORSTER.

#### WHITE-HEADED PETREL.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 49.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 401.

*Previous Descriptions of Eggs*.—Saunders: Trans. Roy. Soc., vol. clxviii., p. 164 (1878); Hall: Ibis, p. 24 (1900).

*Geographical Distribution*.—Seas of Australia (except, possibly, North), and Tasmania; also New Zealand and South Indian Ocean.

*Nest*.—Externally a rabbit-like burrow, with the entrance generally sparsely bestrewn with green shoots of vegetation. The tunnel is short and the large terminal chamber contains no special nest (Eaton), save a few gathered soft fibres and an occasional feather (Hall).

*Eggs*.—Clutch, one; inclined to oval in shape; texture of shell comparatively fine; surface glossy; colour, dull white. Dimensions in inches of examples from Kerguelen Island: (1) 2.8 × 1.89, (2) 2.75 × 2.03, (3) 2.7 × 1.96. The pair of eggs I previously described as *E. lessoni* was referable, as I afterwards ascertained, to *E. rostrata* (Peale Petrel), and was taken on the Uen Islands, New Caledonia, January, 1879. They may be described thus: shape, elliptically inclined; texture comparatively fine; surface slightly glossy; colour pure white. Dimensions in inches: (1) 2.55 × 1.7, (2) 2.45 × 1.63.

*Observations*.—Gould gives an interesting note of the capture of his first fine White-headed Petrel, which is worth quoting. He says:—

“While engaged in watching the movements of the several species of the great family of *Procellariidæ*, which at one time often and often surrounded the ships that conveyed me round the world, a bright speck would appear on the distant horizon, and, gradually approaching nearer and nearer, at length assumed the form of the White-headed Petrel, whose wing powers far exceed those of any of its congeners; at one moment it would be rising high in the air, at the next sweeping, comet-like, through the flocks flying around, never, however, approaching the ship sufficiently near for a successful shot, and it was equally wary in avoiding the boat with which I was frequently favoured for the purpose of securing examples of other species. But, to make use of a familiar adage, ‘the most knowing are taken in at last.’ One beautiful morning, on the 20th February, 1839, during my passage from Hobart Town to Sydney, when the sea was perfectly calm and of a glassy smoothness, this wanderer of the ocean came in sight and approached within three hundred yards of the vessel. Anxious to attract him still closer, so as to bring him within range, I thought of the following stratagem:—A corked bottle, attached to a long line, was thrown overboard and allowed to drift to the distance of forty or fifty yards, and kept there until the bird favoured us with another visit while flying round immense circles. At length his keen eye caught sight of the neck of the bottle (to which a bobbing motion was communicated by sudden jerks of the string), and he at once proceeded to examine more closely what it was that had arrested his attention; during this momentary pause the trigger was pulled, the boat lowered, and the bird was soon in my possession.”

The White-headed Petrel breeds somewhat early, for, during the American Transit of Venus Expedition to Kerguelen, 1874-5, young, supposed to be referable to this species, were found on the 15th September living in deep burrows in the hill sides. The Rev. Mr. Eaton furnishes no dates when he took eggs, but gives the following interesting information: “In Captain Hutton’s paper before referred to, allusion is made to an undetermined species of Petrel, to which the euphonious sobriquet *Procellaria diabolica* has been applied. It was said to be a bird inhabiting Desolation Island, which flew about at night, uttering unearthly shrieks. There are good reasons for supposing the sprite to be Lesson’s Petrel. It is difficult to describe the cry of this bird. For a long time there was no finding out which of the Petrels gave utterance during its flight to its weird sounds. Whenever its cry was heard, I went out with a lantern to endeavour to get a sight of the bird, but without success. At last, near Thumb Peak, we dug out some large birds whose outcries, when caught by the beak, plainly identified them beyond all question with *E. lessoni*.”

“The burrow of this Petrel can be recognised externally by its being about as large as an ordinary rabbit’s hole, and dry, and by its entrance being generally sparsely bestrewn with green shoots of *Acacia*. It is usually excavated in *Azorella*, the tunnel is short, the large terminal chamber contains no special nest, and when the hand is cautiously introduced to feel after the egg, it is promptly and severely bitten by the old bird. It is therefore well to take the precaution of dragging

her forth from the interior before an attempt is made to secure the egg. Her removal can be easily effected. While she is stooping forward at the entrance of the nest-chamber looking out in readiness to bite, a piece of stick is presented to her, which she seizes instantly, and whilst it is being shaken to make her hold it fast, her beak is suddenly grasped with the hand, and she is drawn up by it out of the burrow, shrieking loudly. Care must meanwhile be taken to prevent her from thrusting her claws into the hand. Nests were found from the extreme confines of the sea-shore to an altitude of about 300 feet above the mean level. They were common amongst *Azorella* at the foot of the cliffs near Thumb Peak, and on the summit of the lower terraces; also in the hills near the Swain's Harbour Transit Station. There were also some nests near the principal station on a slope by a fresh water lake on the landward side of the hill."

During Mr. Hans Gundersen's (of Melbourne) oiling enterprise to Kerguelen, between the dates of 28th December and 28th January, Mr. Robt. Hall examined nine nests, the eggs of which contained well-developed embryos. On the 29th January he unearthed two very young birds, one being attended by its parent. But a few days later he procured an egg that was tolerably fresh. It was observed that both parents took part in incubation during daytime.

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679.—*ESTRELATA MOLLIS*, Gould.—(631)

SOFT-PLUMAGED PETREL.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 50.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 406.

*Previous Descriptions of Eggs*.—Campbell: Southern Science Record (1883), also Nests and Eggs Austr. Birds, pl. 3, fig. 631 (1883).

*Geographical Distribution*.—East and possibly other coasts of Australia and Tasmania; also New Zealand and South Seas, more particularly South Atlantic and South Indian Oceans, between 20 deg and 50 deg. south latitudes.

*Nest*.—The usual rabbit-like burrow.

*Eggs*.—Clutch, one; inclined to oval in shape; texture of shell somewhat coarse; surface slightly glossy, with sometimes liny nodules on the smaller end; colour, pure white. Dimensions in inches: 2.39 × 1.67.

*Observations*.—Although a frequenter of the South seas, the beautiful Soft-plumaged Petrel also loves milder waters. It was the first large Petrel Gould saw after crossing the line on his voyage to Australia. He relates a curious incident about this particular bird, which reads: "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 ten inches long by six inches 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 a 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."

An egg of the Soft-plumaged Petrel in my collection was taken on Mount Moa, New Caledonia, and was kindly forwarded to me by Mr. E. L. Layard, then British Consul at that island.

680.—(ESTRELATA SOLANDRI, Gould.—(629)

BROWN-HEADED PETREL.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 410.

*Geographical Distribution*.—Seas of South Queensland, New South Wales, Victoria, South and West Australia, and Tasmania.

*Nest and Eggs*.—Undescribed.

*Observations*.—The Brown-headed, or Solander, Petrel has been recorded for all Australian seas except north and north-west. However, most probably it is found off the latter coast.

Gould procured his type in Bass Strait, 13th March, 1839. So long ago! yet nothing is known of its breeding quarters. When they are discovered, they may prove to be high land of some verdure-clad island of the warm Pacific, and not the usual Petrel abode—a bleak island of the south.

681.—(ESTRELATA LEUCOPTERA, Gould.—(632)

WHITE-WINGED PETREL.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 51.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 416.

*Geographical Distribution*.—Seas of South Queensland, New South Wales, Victoria, South and West Australia, and Tasmania. Some authorities give east coast only of Australia.

*Nest and Eggs.*—Undescribed.

*Observations.*—Although the White-winged Petrel is closely allied to the Cook Petrel, the best authorities agree that these two delicately formed birds are distinct. Gould says:—"On comparing the specimens of both I find that my bird (*leucoptera*), which was obtained while breeding on Cabbage Tree Island, at the mouth of Port Stephens, has a shorter and much stouter bill, a much darker head, neck, and upper surface, and a uniform coloured tail, whereas Mr. Gray's *E. cooki* has the inner webs of the outer tail feathers snow-white."

He further states that the White-winged Petrel breeds in abundance on Cabbage Tree Island. In all probability it does not breed there now.

682.—*ESTRELATA* GOOKI, G. R. Gray.—(633)

COOK PETREL.

*Reference.*—Cat. Birds Brit. Mus., vol. xxv., p. 417.

*Previous Descriptions of Eggs.*—Reischek: Trans. New Zealand Inst., vol. xviii., p. 92 (1885); Buller: Birds of New Zealand, vol. ii., p. 218 (1888).

*Geographical Distribution.*—Seas of Queensland and New South Wales; also New Zealand.

*Nest.*—A lengthened and tortuous subterranean burrow from 3 to 8 feet in length. (For details see "Observations.")

*Eggs.*—Clutch, one; broadly ovoido-elliptical; surface smooth but not glossy; colour, perfectly white. Dimensions in inches: (1) 2.1 × 1.5, (2) 1.9 × 1.5 (Buller).

*Observations.*—This delicate Petrel was first discovered off the New Zealand coast, during the voyage of the "Erebus" and "Terror," and was named by G. R. Gray after the immortal navigator, Cook.

It is interesting to learn that the eggs of this beautiful bird have been found on islands off the north coast of New Zealand.

Again I give for this Petrel Mr. A. Reischek's own observations, which appear to have been taken in a very methodical manner during his different collecting excursions: "This pretty little Petrel is not so common as the previous species (*M. parkinsoni* and *E. macroptera*), according to Sir Walter Buller; there have been only a few specimens obtained, and very little is known of their habits, but I have succeeded in observing them carefully. The first time I met with this bird was in December, 1880, on my second research at the Chickens on Morotiri Islands, on the western slope of the larger island, along with the Tuatara Lizard (*Sphenodon punctatum*), in one burrow. On the north-



eastern portion, near the centre of Little Barrier, or Hauturu Island, in October, 1882, my dog set a burrow; and on digging into it, I was surprised at finding a pair of these Petrels also on this island. They came ashore to clean out their burrows, which process is accomplished with their bill and feet, as I have already described in a previous paper. I measured several of their burrows, and found the average width at the entrance from four inches to six inches in diameter, and from four to eight and even twelve feet from the entrance to the chamber, of which I always found two in each burrow, from six inches to a foot high. In each chamber is a hollow filled with leaves, moss, or fine grass. I found these burrows even in the stiffest clay, winding about roots and stones. I often worked half-a-day and then had to give it up without success. Male and female mutually assist at cleaning out or making fresh burrows. After sunset they begin to call like 'ti, ti, ti,' repeated rapidly, which is the signal to assemble for their departure to their ocean haunts, from which they do not return till before sunrise. This process goes on nightly till their burrows are cleaned out and the nest made. I built a hut in the centre of the Little Barrier, near one of these burrows, on purpose to make a close observation of these rare birds. The 1st November, when they returned as usual, early in the morning, I noticed that they made a peculiar noise in their burrows; in about half-an-hour one came out and stopped for a moment, then flew away, and did not return till after sunset, when he flew several times round above the burrow, then went off again, not returning till the next night, when he went into the burrow and made the same gurgling noise as before; after a while a bird came out and flew away, which returned before sunrise and went into the burrow. After some time one came out and again flew away. I then examined a burrow, and found a bird sitting on an egg; on dissecting the bird I found it was a female. I never found more than one egg, and always the female sitting on it; the male I have found not far off in a burrow by himself. When the young are hatched, male and female rear them together and defend them pluckily. The young are full-grown in March."

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SUB-FAMILY—FULMARINÆ: FULMARS.

683.—*OSSIFRAGA GIGANTEA*, Gmelin.—(624)

GIANT PETREL.

*Figure*.—Gould: *Birds of Australia*, fol., vol. vii., pl. 45.

*Reference*.—Cat. *Birds Brit. Mus.*, vol. xxv., p. 422.

*Previous Descriptions of Eggs*.—Layard; Kidder and Coues: *Smithsonian Miscell. Coll.*, vol. xiii., p. (1878); Buller: *Birds of New Zealand*, vol. ii., p. 227 (1888); Verrill: *Trans. Connect. Ac.*, vol. ix., p. (1895).

*Geographical Distribution*.—Seas of New South Wales, Victoria, South and West Australia, and Tasmania; also New Zealand and Southern Ocean in general; north to about 30 deg. south latitude.

*Nest*.—A hollow scooped in the ground, containing a few stems of grass, or constructed of grass, moss, and earth, separate or in small rookeries on the open ground of hills on desolate islands of the south.

*Eggs*.—Clutch, one; inclined to an ellipse in form; texture of shell exceedingly coarse and granulated; surface rough, in some instances with limy nodules, and glossless; colour, dull or dirty white. Dimensions in inches: (1) 4.02 × 2.6, (2) 3.97 × 2.62.

*Observations*.—This great Petrel in size and colour resembles the Sooty Albatross, and also sweeps the Southern Ocean, including, of course, Australian seas up to about latitude 30 deg. south. Its flight is not so graceful and buoyant as the Albatrosses'.

It is the "Nelly" or "Stink-pot" of the whalers, and is a voracious creature, hovering over sealers when engaged cutting up seals, and devouring the carcase the moment it is left. It also readily kills other sea-birds—Prions, Gulls, &c.

Occasionally there are albinos; one followed the vessel Gould was in for three weeks, between the Cape of Good Hope and Tasmania.

A note, brief, but to the point, from Mr. G. Beddoes, Abrolhos Islands, off Western Australia, states: "Big Black Petrels are about every winter. They are clumsy birds, and so tame or tired when they reach us that we can go out in a boat and catch them. They are nearly as large as an Albatross and smell worse than twenty of them."

According to Professor F. W. Hutton, C.M.Z.S., the Giant Petrel breeds on the cliffs of Prince Edward Islands and Kerguelen's Land, where its nests can be got at occasionally. The young are first covered with a beautiful long light-greyish down; when fledged they are dark-brown, mottled with white. When a person approaches a nest the old birds keep a short distance away, while the young ones squirt a horribly smelling oil out of their mouths to a distance of six or eight feet. In addition to Kerguelen, Captain Cook found the Giant Petrels very abundant on Christmas Island, where, during the breeding season, his sailors knocked the birds down with sticks. Falkland Islands are said to be another breeding place of the Giant Petrel.

This bird is also found at Gough Island and South Georgia. In Mr. Verrill's article, Mr. George Comer writes: "The 'Nellies' are the same at all the islands. These birds are grey, though when young they are almost black. As they grow older they become lighter, and once in a great while one will be seen pure white, which is, by whalers considered a sure sign of a storm. They lay separately in open land or knolls. The nests are low and built of grass and moss. They commence laying (at Gough Island) the middle of September. They lay one egg, which is usually quite rough, but, if robbed, will lay a second or a third time. These birds leave their nests when you approach them, while the other birds do not. They will go into the Penguin rookeries and carry off the young Penguins to eat, and will also reach in and pull birds (Petrels) out of the holes in the ground."

Coming to Kerguelen, and touching the Giant Petrel, the Rev. A. E. Eaton wrote: "The breeding places of the Giant Petrel in Royal

Sound, which had long been an enigma to us, were discovered on Long Island by a shooting party from the 'Volage,' on the 23rd December. The nests (according to the statements of the officers) were of a similar make to those of the Albatross, and contained half-grown nestlings. They were constructed above the ground amongst *Azorella*, about 200 yards from the sea, not very far from each other. There were two groups of them on the south-west side of the island, each containing about thirty nests, which were situated on the upper parts of very gradual slopes. One of the nestlings was brought off to the ship. It was about as large as a Cochin fowl. Whenever anybody walked past, it ejected oil from its mouth to the distance of a yard, after the manner of Petrels; on this account it was summarily set upon and despatched. Its down was very dense and thick, and formed a regular jacket, beneath which the young feathers were well-developed. Dr. Garrod, of the Zoological Society, on dissecting it, found portions of two Prions' skulls in its crop."

Coming nearer home, the eggs of the Giant Petrel in my collection are from Macquarie Island, a bold and desolate spot about 650 miles south-west by south from New Zealand, where these birds breed in small rookeries from September to November.

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684.—DAPTION CAPENSIS, Linnæus.—(640)

CAPE PETREL.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 53.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 428.

*Geographical Distribution*.—Seas of Queens'and, New South Wales, Victoria, South and West Australia, and Tasmania; also New Zealand and Southern Ocean in general, north to Ceylon and to the coast of Peru.

*Nest*.—See "Observations."

*Eggs*.—Undescribed.

*Observations*.—This Petrel, with beautifully mottled upper surface and snow-white under parts, frequents the southern seas, and is the familiar "Cape Pigeon" of voyagers. It has been noticed off the coasts of all the Australian States, except perhaps in the north. On the western coast a few usually appear every winter. It is also found numerous at most seasons of the year in New Zealand waters. These romantic birds are evidently fond of the far south. The "Challenger" Expedition occasionally saw a flock of Cape Pigeons roosting on the top of an iceberg, while Sir James Ross noted a flock of young birds January, 1841, near Victoria Land.

Gould found the Cape Petrel extremely tame and numerous off the south coast of Tasmania. He had no doubt that the bird constantly circumnavigates the globe, from the fact that individuals which had been caught, marked, and again set at liberty had been found following vessels for hundreds of miles for the sake of the offal thrown overboard.

Like most Petrels, the Cape Petrel ejects, when irritated, an oily substance from its mouth. Its notes are a feeble "cac, cac, cac," frequently uttered, the third being pronounced the shortest. It weighs fourteen to eighteen ounces. Total length,  $16\frac{1}{2}$  inches.

Nothing is known of the breeding economy of the pretty Cape Petrel. It is reported to breed on Tristan d'Acunha—a statement improbable—and on the island of South Georgia.

Professor Moseley mentions that when the "Challenger" was anchored off Heard Island, one of the Macdonald Group, 240 miles south-east of Kerguelen, the bay was thronged with Cape Pigeons (*Daption capensis*), which were mostly feeding on the water at the mouth of a glacier stream. They were breeding in holes in the low basaltic cliffs. Date, 6th February, 1874.

Dr. Sharpe states, "that the Cape Petrel breeds on Kerguelen Island is proved by the following note in Sir J. Hooker's Journal:—'It builds in sheltered ledges of cliffs, about 50 to 100 feet above the level of the sea. I found two in a nest, but quite mature. Its note is a short, hoarse croak.'"

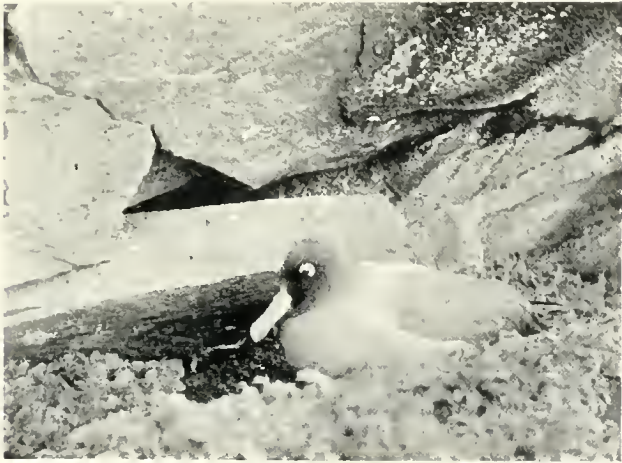
Although the eggs of the Cape Petrel have not yet been described, I am enabled, through the kindness of Mr. Robert Hall, to give a reproduction of an exceedingly interesting photograph taken by him of a pair of birds on their nest among the rocks of Kerguelen Land.

In writing to the "Ibis" (p. 28, 1900) Mr. Hall states:—"At Accessible (Betsy Cove), on February 7th, I observed four nests, each with a young one partially covered with down. The nests were in the cavities of a rough cliff, and were simply hollows, without any attempt to place weeds in them. I saw two adults sitting in a sheltered nook, without egg or young; and one of these birds was placing little stones, one by one, around it with the bill, as if to make the nesting place comfortable. These cavities or grottoes (approximately  $6 \times 3 \times 3$  feet) were about 50 feet above sea-level, and by stooping I could get inside them, except in one case. A little climb brought me to an old bird, which clucked and made its trill; and I surprised another on its nest but it did not fly, though it vigorously defended its young, and jumped backward and forward. The young may be described thus:—Length, 12.75 inches; down, generally greyish above, greyish-white below; bill, black."



CAPE PETRELS IN NEST.

*From a Photo by Robt. Hall.*



SOOTY ALBATROSS ON NEST

*From a Photo by Robt. Hall.*



## 685.—HALOBENA CERULEA, Gmelin.—(634)

## BLUE PETREL.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 52

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 431.

*Previous Descriptions of Eggs*.—Saunders: Trans. Roy. Soc., vol. clxviii., p. 165 (1878); Kidder and Coues: Smithsonian Miscell. Coll., vol. xiii., p. 17 (1878).

*Geographical Distribution*.—Seas of New South Wales, Victoria, South and West Australia, and Tasmania; also New Zealand and Southern Ocean generally, between 40 deg. and 60 deg. south latitudes.

*Nest*.—A deep, tortuous burrow in a hill side, near the sea, excavated beneath dense masses of vegetation, and often several feet in length (Kidder & Coues).

*Eggs*.—Clutch, one; roundish oval or elliptical in form; texture of shell comparatively fine; surface without gloss; colour, white, usually stained with dirt. Dimensions in inches: (1) 2.1 × 1.43, (2) 1.93 × 1.42, (3) 1.92 × 1.48, (4) 1.9 × 1.48.

*Observations*.—Gould observes that this bird may be distinguished from every other of the smaller Petrels by the conspicuous white tips of the centre tail-feathers. It is a very powerful flier, and he observed it in every part of the ocean he travelled between the 40th and 55th degrees of south latitude, both in the Atlantic and Pacific. However, the bird is rare in Australian collections.

According to the testimony of the British and American Transit of Venus Expeditions to Kerguelen, 1874-5, the Blue Petrel had probably begun to pair by the 13th September, when two birds, male and female, were usually found in each burrow during the day. Eggs were first found plentiful on the 23rd October, young began to hatch 12th November, and a nestling almost fully-fledged was killed 9th February. Newly-hatched young have bill and toes slaty-blue, with apparently pale-yellowish webs and brownish-black claws.

The Rev. A. E. Eaton wrote: "The resemblance between this Petrel and the *Prion desolatus* extends even to their 'coo.' Their calls underground are so much alike, that on hearing one it is difficult to say to which of the two species the bird cooing should be referred without digging it up for inspection, and their tone is very similar in sound to the cooing of some foreign Doves. But their calls during flight are very different from one another.

"The comparative immunity of this species from the ravages of the men was due partly to its commencing to lay eggs later than the former, and partly to its nests being less easy of access than those of that Petrel. For *H. cerulea* is in the habit of burrowing in *Azorella* growing upon the dry soft loam where no obstacles impede its progress; its eggs are,

therefore, obtainable without much trouble. It had only just begun to lay when we first landed (October). So long as its eggs continued to be fresh the liberty men dug out as many as they could, cruelly destroying the old birds, which they flung away in heaps; but when most of the eggs became uneatable through incubation they abandoned Petrel digging."

Through the courtesy of the lessee of Macquarie Island (Mr. Joseph Hatch, of Invercargill, New Zealand), Mr. J. R. Burton was permitted during his spare time to collect some birds and eggs for my work. The collection contained several eggs, new to the Australasian region, of the Blue Petrel.

Mr. Burton observed that the small burrows of the Blue Petrels were exceedingly numerous in the peaty ground under the tussock grass, anywhere on the lower levels, but chiefly on the east coast. The tunnel is usually tortuous and invariably on the incline before the egg chamber, which is about 6 inches in diameter, and lined on the floor with portions of tussock grass, is reached.

Mr. Burton's notes agree with those made on Kerguelen by the Rev. Mr. Eaton, that these Petrels commence to lay about the end of October, while fresh eggs may be gathered up to the end of November. The first young may be found in December.

All the Blue Petrels quit Macquarie about the end of May.

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686.—PRION VITTATUS, Gmelin.—(644)

BROAD-BILLED DOVE PETREL OR PRION.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 55.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 432.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia, Handbook, vol. ii., p. 475 (1865); Travers: Trans. New Zealand Inst., vol. v., p. 220 (1873).

*Geographical Distribution*.—Seas of South Queensland, New South Wales, Victoria, South and West Australia and Tasmania; also New Zealand and Southern Ocean, usually between 40 deg. and 60 deg. south latitudes.

*Nest*.—A cavity in a cliff on the sea shore, or in a hole burrowed in soft peaty soil on the summit of small islets. The burrow, which takes a slightly oblique direction, is from 1½ to 2 feet in length, and usually straight (Travers).

*Eggs*.—Clutch, one; round oval in form; texture of shell comparatively fine; surface minutely pitted, and without gloss; colour, pure white. Dimensions in inches: 1.9 × 1.43. According to Travers: 1.95 × 1.47; Gould: 2.0 × 1.5.



*Observations.*—This Dove Petrel, slightly the largest of the Prions, and easily recognized by its much dilated bill, is found most numerous between the latitudes above mentioned. Gould observed it plentiful in the South Indian Ocean. He obtained two fine eggs of this bird, which were collected by Macgillivray on St. Paul Island in that ocean.

The eggs of the Broad-billed Prion in my collection I received from the late Mr. T. H. Potts. They were taken on Pitt Island, one of the Chatham Islands, situated about 450 miles to the eastward of New Zealand.

Touching the Broad-billed Prion breeding on these islands, Mr. H. H. Travers writes: "Blue Billy of the settlers. It breeds in September, and only one egg is laid. Where the egg is laid in holes in rocks it is placed on the bare rock; but in the peaty holes a few leaves are found, but whether placed there by this bird or by smaller sea birds which use the same holes for breeding, I cannot say. Both birds take part in incubation. They are not easily disturbed when sitting, pecking at the hand whilst the egg is being taken, but remaining on the nest after its removal. When taken from the holes they fly away with a wavy, uncertain flight, as if blinded by the sudden light. One mode of getting this and other sea birds is by lighting a large fire at night at the foot of a high cliff, against which they dash themselves, or, becoming stupefied, are easily knocked down. In a cave on Pitt Island, which I reached by the aid of a rope, I found a cat, which had eaten the heads of nearly a hundred young birds without the bodies being touched. Many old birds had also been killed by this cat. How it got there I cannot imagine."

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687.—PRION BANKSI, Gould.—(643)

BANKS DOVE PETREL OR PRION.

*Reference.*—Cat. Birds Brit. Mus., vol. xxv., p. 434.

*Previous Description of Eggs.*—Campbell: Victorian Naturalist (1888).

*Geographical Distribution.*—Seas of South Queensland, New South Wales, Victoria, South and West Australia and Tasmania; also New Zealand and Southern Ocean, usually between 35 deg. and 60 deg. south latitudes; but as far north as the Equator in the Malay Archipelago.

*Nest.*—A small burrow underground, on hill sides.

*Eggs.*—Clutch, one; roundish or broad oval in shape: texture of shell comparatively fine; surface without gloss; colour, pure white. Dimensions in inches: (1) 2.01 × 1.38, (2) 2.0 × 1.4, (3) 1.98 × 1.49, (4) 1.97 × 1.45, (5) 1.97 × 1.42, (6) 1.87 × 1.32.

*Observations.*—Banks Dove Petrel may be constantly seen in the southern seas, over the same latitudes as its congeners. However, it has been noted as far north as the Equator.

It is like the other members of its genus, but most resembles *P. desolatus*, and has been seen in company with that bird; but, as Gould points out, the Banks bird may be distinguished by its larger size, and by the more bluff and darker-coloured head. Banks Petrel and the Dove Petrel are frequently found in company.

Sir Walter Buller states that in the winter of 1878 he had occasion to visit the Wellington west coast after a north-west gale had been blowing for several days, when he found a large number of Prions had been killed by the tempest and their bodies washed ashore. "It is an ill wind that blows nobody good." Sir Walter was fortunate in obtaining during one day twenty fresh birds. Of these twelve (7 ♂ and 5 ♀) were referable to *Prion turtur (desolatus)*, and eight (4 ♂ and 4 ♀) to *P. banksi*.

The eggs I have described are from Macquarie Island, where the Banks Prions commence to arrive in August. Fresh eggs may be collected at the end of November and the beginning of December. The nesting burrows are in the drier ground on the bare sides of hills, and the egg chamber is devoid of lining of any kind. The call notes uttered in the burrows resemble a dove-like "coo-coo-coo." The birds appear to be diurnal. Silently they leave in thousands at daylight, fly up and down the coast in flocks, and return at dusk.

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688.—PRION DESOLATUS, Gmelin.—(641)  
*P. turtur*, Smith.

DOVE PETREL OR PRION.

*Figure.*—Gould: Birds of Australia, fol., vol. vii., pl. 54.

*Reference.*—Cat. Birds Brit. Mus., vol. xxv., p. 434.

*Previous Descriptions of Eggs.*—Saunders: Trans. Roy. Soc., vol. clxviii., p. 165 (1878); Kidder and Coues; Smithsonian Miscell. Coll., vol. xiii., p. 16 (1878); Travers: Trans. New Zealand Inst., vol. v., p. 220 (1873); Campbell: Victorian Naturalist (1887); Buller: Birds of New Zealand, vol. ii., p. 210 (1888); North: Austr. Mus. Cat., app. (1890); Hall: Ibis, p. 30 (1900).

*Geographical Distribution.*—Seas of South Queensland, New South Wales, Victoria, South and West Australia and Tasmania; also New Zealand and the Southern Ocean in general between 35 deg. and 60 deg. south latitude, but has been found as far south as the Ice Barrier in latitude 66 deg. 30 min.

*Nest.*—A rat-like hole, usually underground, but sometimes under rank herbage, or even in a rock crevice, the floor of the egg chamber being lined with a few stalks of grass or portions of sea-weed.

*Eggs.*—Clutch, one; elliptically inclined in shape; texture of shell comparatively fine; surface slightly glossy; some specimens have lining

nodules; colour, pure white. Dimensions in inches of a series from Kerguelen Island: (1)  $1.99 \times 1.4$ , (2)  $1.98 \times 1.29$ , (3)  $1.93 \times 1.39$ , (4)  $1.92 \times 1.35$ , (5)  $1.9 \times 1.32$ , (6)  $1.87 \times 1.45$ , (7)  $1.82 \times 1.32$ , (8)  $1.78 \times 1.75$ .

*Observations.*—The charming little Dove Petrel is extremely abundant on the New Zealand coast. Sir Walter Buller states: "In boisterous weather it appears to suffer more than any other oceanic species from the fury of the tempest, and the sea beach is sometimes found literally strewn with the bodies of the dead and dying. I have frequently watched them battling, as it were, with the storm, till at length, unable longer to keep to windward, they have been mercilessly borne down upon the sands, and, being unable from sheer exhaustion to rise on the wing again, have been beaten to death by the rolling surf, or pounced upon and devoured by a hovering Seagull. On picking some up and placing them in the pocket of my overcoat they have soon revived, and in some instances have lived for several days on a diet of fresh meat minced into small pieces. From the activity they always exhibited on the approach of night, seeking the dark corners of the room, and fluttering about in a very excited manner, with a rapid twittering note, I concluded that, whether on land or at sea, this Petrel is more nocturnal than diurnal in its habits. During the day the eyes were always half closed, imparting a peculiar fretful expression to the face."

Mentioning New Zealand, Reischek found the Dove Petrel breeding in holes underground on both the Little Barrier and the Chickens Islands, where, however, it appeared scarce, and was only met with on the highest wooded ridges in the centre of the island. Mr. Reischek found a fresh egg on the 1st November, and young birds in the beginning of December.

Mr. H. H. Travers is said to have obtained this species on the Chatham Islands, where it occurs in immense numbers. It breeds in holes in the ground, laying its eggs in a nest, composed of a few dead leaves; both parents assist in incubation. Whilst on Mangare Island, Mr. Travers frequently found these Prions caught in the branches of scrubby trees, where, it is supposed, the birds were caught while attempting to escape from the Sea Hen (*Megalestris*).

According to the Rev. A. E. Eaton's observations, on Kerguelen, the burrow of this Dove-like Prion resembled a rat hole, being usually made in herbage growing upon dry, rocky slopes or stony ground. The egg is laid upon loose débris of *Azorella* or on the bare ground. The birds were pairing in October, fresh eggs being obtained the 29th November; but I think it must be a mistake that most of the nestlings had flown before the end of February, because Mr. Hall observed that throughout January (1898) only about ten per cent. of the eggs were much incubated.

## 689. —PRION ARIEL, Gould.—(642)

## FAIRY DOVE PETREL OR PRION.

*Figure.*—

*Reference.*—Cat. Birds Brit. Mus., vol. xxv., p. 439.

*Eggs.*—Described as those of *P. turtur* (*desolatus*).

*Geographical Distribution.*—Seas of New South Wales, Victoria, South Australia, and Tasmania; also New Zealand and Southern Ocean, generally between 35 deg. and 60 deg. south latitudes.

*Nest.*—A small hole under ground, in crevice of rock or upon the ground underneath rank vegetation, such as pig-face weed (*Mesembrianthemum*), &c., on isolated rocks or islets.

*Eggs.*—Clutch, one; inclined to oval in shape, occasionally elliptical; texture of shell fine; surface without gloss; colour, pure white. Dimensions of six examples from North-east Island, Bass Strait: (1) 1.78 × 1.29, (2) 1.78 × 1.19, (3) 1.72 × 1.23, (4) 1.71 × 1.27, (5) 1.68 × 1.24, (6) 1.65 × 1.25.

*Observations.*—The usual habitat of this Dove Petrel is the Southern seas, between 35 deg. and 60 deg. south latitude. Gould procured many examples (including the type) of this bird in Bass Strait on the 16th April, 1839, where many were flying around him.

It was in Bass Strait that I enjoyed my experience with these most delicately plumaged birds. On the 24th November, 1890, during the expedition of the Field Naturalists' Club of Victoria to Kent Group, we pulled away from the main island in a whale boat, the principal light-keeper, Mr. Charles Brown, being in charge, for North-east Island, which had not been visited for seven or more years. Fortunately the sea was calm, for the landing there is a difficult matter. Approaching the island, we saw it was about half a mile across and between 200 feet and 300 feet high—a huge, coarse, granite rock, with beetling walls all round. We steered for a slight indentation, which seemed our only chance by which to scramble to the summit. The rocks were prettily decorated with grey-coloured lichens and bright-green pig-face weed, which, with large, starchy, white flowers, trailed over in parts the ledges of rocks. Amongst other birds—Mutton Birds, Gulls, Oyster Catchers, &c.—we found this place a breeding home of the charming little Fairy Dove Petrel. It was breeding in numbers in the crevices of rock or under the densely-matted stems and roots of the pig-face weed. Several birds and many eggs (the latter in an advanced state of incubation) were secured.

This bird has been discovered breeding in other parts of the Strait, notably on Albatross Rock, where Messrs. D. Le Souëf and H. P. C. Ashworth found them in 1894, Craggy Island, and other spots.

We believed these birds at first to be *Prion desolatus*, which the *P. ariel* resembles much in colour and general appearance, but the



MUTTON BIRD EGGING—NORTH-EAST ISLAND

*From a Photo by the Author.*



BLACK OYSTER-CATCHER'S NEST.

*From a Photo by the Author.*



latter is much less in size, in fact it is the smallest of the four species found in Australian waters. However, in the mistake we erred in very good company. The eggs I received, taken 1885 from the Brothers—*islands in Cook Strait*—where the birds commence to lay about 20th October, are no doubt referable to the *P. ariel*, so the collector, Mr. Percy Seymour, vouches.\* The late Mr. T. H. Potts described them as *P. turtur (desolatus)*; while no less an authority than Sir Walter Buller, at a meeting of the Wellington Philosophical Society, held 29th January, 1876, exhibited from the same locality (The Brothers) five examples of the adult and young, together with a specimen of the egg, described as *P. banksi*. So much do docters differ; and no wonder, because the identification of the four species of these fairy-like oceanic wanderers is exceedingly perplexing.

The following is the "Key to the Species" of the four Prions, as furnished in the "British Museum Catalogue":—

- |     |  |                   |
|-----|--|-------------------|
| (a) | Bill very wide (0·72 to 0·8 in.), edges of the maxilla distinctly convex; lamellæ distinctly visible when the bill is shut ... ..      | <i>vittatus.</i>  |
| (b) | Bill narrower (0·5 in.), but the edges of the maxilla distinctly convex; lamellæ only visible near the rictus of the closed bill... .. | <i>banksi.</i>    |
| (c) | Bill still narrower, edges of the maxilla almost straight; lamellæ invisible ... ..  | <i>desolatus.</i> |
| (d) | Bill much smaller, more compressed, the unguis large, sides of the maxillæ straight, and the head, &c., paler blue-grey ... ..         | <i>ariel.</i>     |

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#### FAMILY—PELECANOIDIDÆ.

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#### 690.—PELECANOIDES URINATRIX, Gmelin.—(650)

##### DIVING PETREL.

*Figure*.—Gould: *Birds of Australia*, fol., vol. vii., pl. 60.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 437.

*Previous Descriptions of Eggs*.—Campbell: *Victorian Naturalist* (1887); Buller: *Birds of New Zealand*, vol. ii., p. 207 (1888); North: *Rec. Austr. Mus.*, vol. i., p. 122 (1891).

*Geographical Distribution*.—Seas of New South Wales, Victoria, South Australia, and Tasmania; also New Zealand and regions of Cape Horn and Falkland Islands.

*Nest*.—A burrow, from 6 to 8 inches or more in length, underground, or a crevice under a ledge of rock, on islets off the coast.

\* Mr. Seymour has since sent me a head for identification.

*Eggs.*—Clutch, one; roundish or round oval in shape; texture of shell somewhat fine; surface minutely pitted and without gloss; colour, pure white, at first, but frequently stained with brownish dirt. Dimensions in inches of selected examples: (1)  $1.63 \times 1.24$ , (2)  $1.6 \times 1.22$ , (3)  $1.55 \times 1.25$ , (4)  $1.54 \times 1.18$ , (5)  $1.52 \times 1.2$ , (6)  $1.44 \times 1.17$ .

*Observations.*—This chubby-shaped little Petrel frequents the seas washing the southern part of Australia and New Zealand, also those of Cape Horn and vicinity. It appears to be represented in the South Indian Ocean by *P. exsul*, which is obtained on Kerguelen, &c.

The powers of flight are not so great in this singular species as in most other Petrels, being a peculiar fluttering motion close to the surface of the water, but the bird may be literally said to fly under water, so great are its diving powers, and hence the especially appropriate name of Diving Petrel.

I had the opportunity of first describing authenticated eggs of this Diving Petrel in the beginning of August, 1886, having received a series of eggs, together with a bird for identification, from Mr. F. Dunk, at that time lighthouse keeper on Clifty Island, off Wilson's Promontory. From Mr. Dunk I learnt that the Diving Petrels usually remain in the vicinity of the islands, but at seasons disappear for two or three months. During June and July the birds come ashore to scrape out or prepare their nest-burrows. The laying time occurs about the end of July and continues for about a fortnight.

On North-east Island, one of the Kent Group, about fifty miles south of Clifty Island, where Mutton Birds and Dove Petrels (Prion) were breeding, we also found large young, nearly feathered, with down adhering, of the Diving Petrels, on 24th November (1890). They appeared to have been hatched about the end of September. The young in down are cloudy-grey; bill and eyes black; feet and legs bluish.

According to Sir W. Buller, this Petrel has been found breeding on Stephens Island, in Cook Strait, New Zealand. It also breeds on Karawa Island (off Tauranga), on the small islets off the Great Barrier, and on the "Hen and Chickens."

Further south, on Macquarie Island, Diving Petrels have been found laying during October (end) and November, about 500 feet above sea-level, on the summit of the hills.



## FAMILY—DIOMEDEIDÆ: ALBATROSSES.

## 691.—DIOMEDEA EXULANS, Linneus.—(617)

## WANDERING ALBATROSS.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 38.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 441.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848); also Handbook, vol. ii., p. 432 (1865); Kidder and Coues. Smithsonian Miscell. Coll., vol. xiii., p. (1878); Buller: Birds of New Zealand, vol. ii., p. 197 (1888); Verrill: Trans. Connect. Ac., vol. ix., p. (1895).

*Geographical Distribution*.—Seas of South Queensland (occasionally). New South Wales, Victoria, South and West Australia, and Tasmania; also New Zealand, and in general the Southern, South Pacific, and South Atlantic Oceans.

*Nest*.—Clumps of short grass and moss, trodden down, well matted together, and scooped about with earth and feathers into a conical-shaped mound, with an egg cavity at the top about the size and depth of a soup-plate. In colonies on the high land of certain desolate islands in the southern seas. Dimensions—circumference at the base, about 6 feet; height 1 to 2 feet or more. The variation in the height may be accounted for, it is supposed, by some of the older nests being used and added to year after year.

*Eggs*.—Clutch, one; lengthened in form, or long oval; texture of shell coarse or granular; surface rough and without gloss; colour, dull-white, usually with a few dull purplish-brown markings about the apex. Dimensions in inches of two examples from Campbell Island: (1) 5.15 × 2.9, (2) 4.85 × 3.1.

*Observations*.—The well-named Wandering Albatross is the largest and most powerful of great oceanic birds. It is stated to be most abundant in the seas between the 30th and 60th degrees of south latitude, which includes the seas of New South Wales, Victoria, South and West Australia, and Tasmania. However, "Wanderers" have been seen as far north as Moreton Bay (Queensland coast), while Mr. A. Alder, taxidermist, Brisbane, mentions having received a fine specimen from Southport, sent by Mr. C. H. E. Lambert. Its expanse of wings measured 9½ feet, or two feet longer than a large Wedge-tailed Eagle.

One of these majestic birds was brought prominently under notice some years ago by falling exhausted and dying upon the beach at Fremantle, West Australia, with a tin plate fastened round its neck inscribed with the mournful intelligence of the loss of the French ship "Tamaris," and that thirteen of the survivors were on Crozet Islands. The appearance of this winged messenger on the western coast has been

called a romantic story. I regarded it an act of Providence, which was unheeded alike by the nation who owned the ill-fated vessel and the nation to whose shores the bird winged its flight. The islands were within a week's steaming of the Cape of Good Hope; yet, after much apathy and an unwarranted delay of over half a year, a French transport visited the Crozet Islands but—too late. The date on the tin collar was 13th September, 1887; the bird was picked up three weeks later.

The chief homes of the Wandering Albatross are desolate islands of the south seas, which at certain seasons are swept by the bleakness and coldness of recurring Antarctic meteorological disturbances. The nearest breeding places to Australia are Chatham Islands, Auckland, Campbell and Antipodes. On the Auckland Islands the Albatrosses are said to breed on Southern Island—Adam's—which is ranged lengthwise with hills at an altitude of about 2,000 feet. At intervals for about seven miles, and about 1,500 feet above sea-level, are the rookeries of Albatrosses, mostly on the eastern aspect of the hills, on the lee side. There is a particularly large rookery at the back of Fly Harbour. The base of the hills is lined with ironwood (so-called), with thick and dark-green foliage. Higher up is found rank tussock grass, swamps at intervals, abundance of moss, in some places covering treacherous bogs. There is a lake near the summit of the hills, also a striking waterfall, that tumbles on to the beach near the South Cape.

The following account is a description by a person who paid a visit to the Albatross home on the above-mentioned island:—"One day when I was at the Auckland Islands, a group situated in latitude 51 deg. south and longitude 166 deg. east, I had an unexpected opportunity of securing to myself that great privilege of a visit to their private home circle. A large party of us landed at Port Ross, and starting under the guidance of an aged chief named Malionri, arrived in due time at a secluded and densely-wooded valley, which opened to the sandy shore of a deep bay. We had this to cross. Facing us was a lofty hill, clothed to the top with shrubs and trees of a stunted growth. By the aid of roots and branches we continued to scramble up, and at last emerged from an abyss of shrubs we had been traversing, and stood breathless upon a piece of tableland that jutted into the sea. Not a tree or a shrub was to be seen, the only vegetation being a stunted sort of tussock grass. But we were at Bird Village, and to our great delight found the inhabitants at home. We had arrived during the season of incubation. Each nest was occupied by the hen bird, and close by stood her mate—a loving guardian. Nothing could induce her to leave the nest. She would look at us imploringly if we came near, and express her objection to our visit by a harsh snapping of the beak, but she still sat on her egg. The mate at the same time made a slight show of resistance, and then, with uncouth gait and a spasmodic action of the wings, waddled away to the cliff.

"The nests were quite simple in their construction. Each of them was made by pressing down a clump of grass into the form of a shallow bowl, in depth and circumference not much larger than a soup-plate. I take it for granted that the female lays only one egg. Indeed, the little nest, which the breast of the bird covers and overlaps, could hold

no more. Well-trodden Albatross roads intersect each other in the village, and the birds' highroad led from the nest to the edge of the cliff, whence they cast themselves forth on the wing. It seemed to us also that there was an attention paid to regularity in placing the nests in a line or street, so that one main path might communicate with them all."

On Campbell Island the rookeries are at intervals on the east side of the hills which run the length of the island for about seven miles, passing along to the north of Perseverance Harbour. The highest hill is Lyall Hill, 1,355 feet, and is about the central peak.

Going beyond the Australian region we find it stated that the Giant or Wandering Albatross breeds on Tristan d'Acunha and on the top of Inaccessible Island adjacent. At Tristan there are nests actually within the crater of the terminal cone around the lake, about 7,000 feet above sea-level.

In his "Notes on Birds and Eggs from the Islands of Gough, Kerguelen, and South Georgia," regarding the Wandering Albatross, Mr. G. E. Verrill states two skins and six eggs from South Georgia, and eighty-seven eggs and one skeleton from Gough Island were received, and the Albatrosses were common in all three islands. Mr. Comer's (the collector's) own statement is: "The Albatrosses come ashore during the month of December to mate. The male bird usually remains by till the nest is built. The old nests are usually taken and built higher, the bird sitting on the nest and reaching out and picking up the moss and mud and short grass around her. The nests are from four to ten inches in height, and from twelve to sixteen inches across, the top being nearly as broad as the bottom. They do not build near other birds, but lay scattering and generally on knolls and usually on high land, where there is a good chance to run against the wind and so rise from the ground. These birds lay but one egg. When robbed they will remain on their nest for a few days and then leave. I have taken a second egg from the same nest, but my belief is that the first bird had left the nest and another taken it. The Albatross skeleton I send you is a female, and had just laid when I killed her; there were no other small eggs in her such as I have always found in other birds that lay again.

"The young Albatrosses have to be at least ten months old before they can fly, and I think it safe to say that not more than five out of a hundred live to leave their nests. They are killed by Sea Hens and Nellies."

Professor Moseley mentions in his "Challenger' Notes" that Charles Goodridge, who was one of a sealing party on the Prince Edward Islands in 1820, and spent two years on the Crozets, says that the Albatrosses there lay about Christmas, and that the period of incubation is about three months. The young, he says, were wing feathered and good to eat about May, and did not fly off till December.

At Campbell Island the young of *Diomedea exulans* have been observed just chipping their shells in February.

Referring to the remarkable length of time the young Albatross remains in or about the nest, Sir Walter Buller, in commenting upon

the fact, quotes from Professor Hutton, who states: "At a certain time of the year, between February and June, Mr. Harris cannot exactly say when, the old birds leave their young and go to sea, and do not return until the next October, when they arrive in large numbers. Each pair goes at once to its old nest; and after a little fondling of the young one, which has remained in or near its nest the whole time, they turn it out and prepare the nest for the next brood. The deserted ones are in good condition, and very lively, frequently being seen off their nests exercising their wings. When the old birds return to take possession of their nests, the young often remain outside and nibble at the head of the old one until the feathers between the beak and the eye are removed, and the skin made quite sore. The young birds do not go far from land until the following year, when they accompany the old birds to sea."

"It is amusing," writes Professor Moseley, "to watch the process of courtship. The male, standing by the female on the nest, raises his wings, spreads his tail, and elevates it, throws up his head with his bill in the air, or stretches it out forwards as far as he can, and then utters, a curious cry like the Molly Hawks, but in a much lower key, as would be expected from his larger larynx. Whilst uttering the cry the bird sways his neck up and down. The female responds with a similar note, and they bring the tips of their bills lovingly together. This sort of thing goes on for half-an-hour or so at a time. No doubt the birds consider they are singing. Occasionally another Albatross flies round and lights upon the grass, but I saw none take wing."

The greatest enemy to the Albatross is the Southern Skua (*Megalestris*), a fierce bird, always on the watch for the Albatross quitting its nest, when this feathered pirate instantly pounces down and devours the egg. So well is this poor bird aware of the propensity of its foe, that it snaps the mandibles of its bill violently whenever it observes the Skua flying overhead.

Sir Walter Buller's *D. regia* is a very fine variety of *D. exulans*, while the species frequenting Kerguelen is also regarded as another variation, known as *D. chionopectera*. I had the opportunity of examining an exceedingly large and handsome bird, in spotless plumage, from Kerguelen, brought thence by Mr. Hans Gundersen's private expedition. Six selected eggs measured in inches: (1) 5.38 × 3.0, (2) 5.31 × 2.95, (3) 5.12 × 3.12, (4) 5.0 × 3.25, (5) 4.87 × 3.2, (6) 4.75 × 3.25. Average weight  $14\frac{1}{3}$  ounces. These eggs are long ovals, slightly more compressed at one end; texture of shell exceedingly coarse and somewhat porous; surface rough and without gloss; colour, dull-white, with a patch on the apex of faint rufous-red freckles.

692.—DIOMEDEA ALBATRUS, Pallas.—(618)  
*D. brachyura*, Temminck.

SHORT-TAILED ALBATROSS.

*Figur*.—Gould: Birds of Australia, fol., vol. vii., pl. 39.

*Referenc.*.—Cat. Birds Brit. Mus., vol. xxv., p. 444.

*Previous Descriptions of Eggs.*—Smithsonian Institute; Campbell:  
 Victorian Naturalist (1898).

*Geographical Distribution.*—Seas of Northern Territory; also the North Pacific in general.

*Nest.*—None, the egg being laid on the bare ground.

*Eggs.*—Clutch, one; lengthened oval or elliptically inclined in shape; texture of shell coarse and strong; surface rough, with just a perceptible trace of gloss; colour, dirty or yellowish-white, more or less ingrained or stained with earth, and with a rusty-coloured or rufous-brown cap of freckled or blotchy markings on the larger end. In addition, some examples have, here and there over the rest of the shell, dull purplish-brown spots. Dimensions in inches: (1)  $4.67 \times 2.9$ , (2)  $4.65 \times 2.95$ ; a smaller example in Dr. Charles Ryan's collection measures  $4.26 \times 2.63$ .

*Observations.*—Of the fifteen species and varieties of Albatrosses inhabiting the globe, twelve of them fly over the ocean wastes of the southern seas, therefore most of them occur in Australian or New Zealand waters. The remaining three species are found in the North Pacific Ocean.

The Short-tailed Albatross, *Diomedea albatrus*, belongs to the northern birds, and is supposed to range as far south as the seas of the northern parts of Australia. This fine bird resembles the Wandering Albatross, from which it may be distinguished, as Gould points out, by the shortness of its tail and by the truncated form of the base of the bill.

There is a halo of romance surrounding this family of great oceanic birds, chiefly, I think, on account of the weirdness or sublime isolation of their breeding homes. These are, for instance, the island of Tristan d'Acunha, with its mist-enveloped mountain peak 8,000 feet above sea-level; Prince Edward Island, where snow in midsummer (December) covers its sharply-shaped mountains; islands of the Crozet Group, towering from the water's edge in great basaltic cliffs and hills to a height of 4,000 feet; and Kerguelen's Land, or Captain Cook's Island of Desolation (whither two of our field naturalists, Messrs. H. Gundersen and Robert Hall, went. Capped with towering conical peaks (6,000 feet high), sheltering a glacier, these islands, although very imposing, are according to navigators, severe and sterile, with a dismal climate—

rain and snow even at midsummer—and where gales are said to rage three weeks out of four. Surely this region must be one of the "Chambers of the South" whence arise Meteorologist Wragge's classical storms. Coming nearer Australian shores we have Campbell Island, a complete contrast to Kerguelen; for, although a full degree nearer Antarctica, Campbell Island is verdure clad almost to its central peak—Lyll Hill, 1,355 feet above the sea—and girt about the base with iron-wood, so-called; thick with dark-green foliage and stems gnarled and twisted by many a gale; while at our own door is the Albatross Rock of Flinders, bald and bleak, breaking the swell of the Southern Ocean near the North-east corner of Tasmania, where Messrs. D. Le Souëf, H. P. C. Ashworth, and Gabriel landed recently.

Such places are some of the breeding haunts of the Albatrosses.

The Short-tailed Albatross, however, breeds in northern latitudes. The eggs I have received through the agency of Mr. Alan Owston, Yokohama, Japan, were taken on Bonin Islands (situated in latitude  $27^{\circ} 40'$  N. and long.  $142^{\circ} 10'$  E.) where they are laid at the end of October and the beginning of November. It is most interesting to note that, although these months are the fall of the year in the Northern Hemisphere, they correspond with the laying season of the Albatrosses in the south, thus proving, I think, that the Short-tailed Albatross was once a dweller with or sprang from the southern birds, and became isolated in the north.

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**693.**—DIOMEDEA MELANOPHRYS, Temminck.—(622)

**BLACK-BROWED ALBATROSS.**

*Figure.*—Gould: Birds of Australia, fol., vol. vii., pl. 43.

*Reference.*—Cat. Birds Brit. Mus., vol. xxv., p. 447.

*Previous Descriptions of Eggs.*—Potts: Trans. New Zealand Inst., vol. vi., p. 152 (1874); Buller: Birds of New Zealand, vol. ii., p. 200 (1888); Verrill: Trans. Connect. Ac., vol. ix., p. (1895).

*Geographical Distribution.*—Seas of Queensland, New South Wales, Victoria, South and West Australia, and Tasmania; also New Zealand, the Southern Ocean in general, and straying to the North Atlantic.

*Nest.*—Small, inverted cone in shape; built of grass, moss and earth to a height of about 4 to 12 inches from the ground, leaving a trench round about from whence the material has been scooped. In colonies on plateaus or hills of certain islands in the Southern Ocean.

*Eggs.*—Clutch, one; elliptically inclined in shape; texture of shell coarse; surface rough and without gloss; colour, dull-white, with very faint or obsolete markings about the apex. Other examples have

a broad band of brownish freckles round the larger end. Dimensions in inches: (1)  $4.3 \times 2.75$ , (2)  $4.0 \times 2.7$ .

*Observations.*—The Black-browed Albatross or Molly Hawk of the sailors is regarded as the commonest of the Australian species, and frequents the Southern seas, straying occasionally to the North Atlantic. It is a somewhat remarkable fact that an individual was known to remain for more than thirty years in company with Gannets at Myggenaes Holm, Faroe Islands. An account in detail, by Mr. Kund Andersen, of the occurrence of this solitary bird so far north was published in the Proceedings of the Royal Physical Society of Edinburgh (1895).

Having crossed the Great Australian Bight one equinox (Spring, 1889), I can bear testimony to Gould's truthful picture: "In heavy, black, and lowering weather, the snowy-white plumage of this bird offers a striking contrast to the murky clouds above and behind it." During my own passage, Albatrosses of several kinds were numerous in the Bight. I noticed on my return journey in January following that the birds were absent. This raised my curiosity, and I got my good friend, Captain Anthon (so well known for many years to all inter-colonial travellers by sea), to "log" the number each month of Albatrosses he noticed in the Bight. The following is the result for one year (1893):—

Jan.	...	Absent	July	...	Numerous
Feb.	...	Absent	August	...	Numerous
Mar.	...	Few	September	...	Numerous
April	...	Increasing	October	...	Numerous
May	...	Numerous	November	...	Decreasing
June	...	Numerous	Dec.	...	Absent

It is obvious that the laying season regulates the numbers of birds abroad, for it will be seen a decrease takes place during the first laying month (November), and when the incubating season is at its height, during the three following months, the birds are absent altogether.

The Black-browed Albatrosses are reported to breed on Atckland, Campbell, Antipodes, and Bounty Islands, south of New Zealand.

We learn from Sir Walter Buller that Mr. W. Dougall visited some of these islands principally with a view of obtaining photographs of the wild and romantic out-of-the-way places, as well as of the remarkable scenes of bird-life, and was successful. As Sir Walter has done, I cannot do better than quote a portion of Mr. Dougall's own interesting story regarding the nesting habits of the Black-browed Albatross: "At Campbell Island I ascend one of the highest hills, Mount Honey (1866 feet), amidst hundreds of nests of the Albatross, surrounded by nothing save the unvarying tussock, fern, and tea-tree scrub. We come to the first Albatross, set about 800 feet above sea-level, and after reaching the crown of the hill, 1,000 feet, found them sitting in their nests and flying about close to the ground in hundreds. The Albatross apparently lays but one egg each year, but one of the party found two nests containing each two eggs. All up the sides of the hill wild parsley was growing luxuriantly, often two feet high, while everlasting daisies

clothed the ground like a carpet. The cotton-wood plant, in full bloom, was also plentiful. As the top (1866 feet) is reached, this variety of vegetation ends, and travelling becomes easier, as there is no growth to impede progress, but diminutive tussock, among which are the Albatross nests and their tenants. These nests are built up of moss and earth about four inches above the surface of the ground. The material to form the nest is so taken from the soil as to leave a trench all round it, and this keeps things dry for a very important object in view. The female never leaves her nest during incubation, a period of about *sixty days*, and is fed by her consort, who faithfully hunts for food for both. The Albatross is a stupid bird, for it will sit, whether hatching or not, till you tumble it head over heels with your foot. At the same time it will resent such liberty, and if it succeeds in getting a hold, it will take a piece out of trousers, hose, and skin. They are very strong birds. The best way to catch one is to make a feint at his head with the left hand, which distracts the bird's attention, and then quickly seize it by the bill with the right, but be sure you get the grip, as they turn quickly, and would snap your fingers off if they got the proper hold. They build on the flat plateau of the hills, and, as far as we have seen, never lower down than 700 feet from sea-level.

"At Antipodes Island, on Tuesday, January 31st, the day broke beautifully, and the bay was like a mirror, but the glass was still low. As the day advanced we were enveloped for half-an-hour in one of those dense mists characteristic of this locality, and when it passed, the hills were covered with snow. The height of this hill is marked on the chart at 600 feet, but this is an error, as the principal hill, Mount Galloway, is 1,200 feet above sea-level. From seaward the hill looks conical or dome-shaped, but on reaching the summit a beautiful clear lake, covering an area of thirteen or fourteen acres, is found—a lake which, later in the season than the time of our visit, is much frequented by the Albatross, being virtually surrounded by thousands of their nests."

Among the places beyond the Australian region where this species is stated to breed, are Falkland Islands (i.e., islands immediately south of East Falkland), Tristan d'Acunha (doubtful) and Kerguelen.

On the last mentioned locality Mr. Robert Hall made the interesting discovery of a splendid rookery near the South Head of Greenland Harbour. The cliff faced the east and was about 700 feet high. The Albatrosses were dotted upon it to the height of about 400 feet, where an incline led to it. He counted forty or fifty birds in a flock on the water, just in front of the nesting place—a small proportion compared with the five hundred to seven hundred birds that whitened the cliff above. Although Mr. Hall spent three days in visiting the islands and the mainland in search of this rookery, unfortunately it was not seen until the vessel had left and was sailing within a few hundred yards of the place.

Laying season, November and December, the young commencing to appear in January.



694.—*THALASSOGERON CAUTUS*, Gould.—(619)

## WHITE-CAPPED ALBATROSS.

*Figure*.—Gould: *Birds of Australia*, fol., vol. vii., pl. 40.

*Reference*.—Cat. *Birds Brit. Mus.*, vol. xxv., p. 449.

*Previous Description of Eggs*.—Le Souëf: *Ibis*, p. 416 (1895).

*Geographical Distribution*.—Seas of South Queensland, New South Wales, Victoria, South and West Australia and Tasmania.

*Nest*.—Composed of chocolate-coloured soil, much mixed when in a wet state with rootlets and other vegetation, which gives it the appearance of peaty substance. It is smooth, and holds together fairly well, varying in height, externally, from 3 to 7 inches. Dimensions in inches of an average nest: external, diameter at base,  $16\frac{1}{2}$ ; at top 14; height,  $5\frac{1}{2}$ ; egg cavity,  $11\frac{1}{2}$  across by  $3\frac{3}{4}$  deep (Le Souëf).

*Eggs*.—Clutch, one; elliptical in shape, others are more compressed at one end; texture of shell coarse and somewhat strong; surface rough and without gloss; colour, dust-white, with a wash or freckled band of reddish-brown or chestnut round or upon the apex. Dimensions in inches of selected examples: (1)  $4.25 \times 2.75$ —weight,  $9\frac{1}{2}$  ozs., (2)  $4.25 \times 2.5$ —weight,  $8\frac{1}{4}$  ozs., (3)  $4.13 \times 2.62$ —weight,  $8\frac{3}{4}$  ozs., (4)  $4.0 \times 2.63$ —weight, 9 ozs., (5)  $3.83 \times 2.62$ —weight,  $8\frac{1}{4}$  ozs., (6)  $3.75 \times 2.75$ —weight,  $6\frac{3}{4}$  ozs.

*Observations*.—The White-capped Albatross frequents the seas of the southern part of Australia and Tasmania.

The first record we have of this bird, although not then scientifically named, was in the days of Bass and Flinders, during their historical voyage of discovery round Tasmania. It was the 9th December, 1798—the very day when the two intrepid explorers, seeing the great western swell breaking upon the reefs, knew their long wished for discovery was attained, namely, that there was a passage through the big strait (which was afterwards named in honour of Bass, on the recommendation of his friend Flinders), and therefore Tasmania (then Van Diemen's Land) was an island.

Albatross Island—for so it was named by Flinders—is situated off the north-western part of Tasmania, and is about two miles long.

Flinders records: "We had a fine breeze at east, and our course was directed for a small rocky island which lies W.  $\frac{1}{2}$  N. six miles from the north point of the barren land. This island appeared to be almost white with birds, and so much excited our curiosity and hope of procuring a supply of food that Mr. Bass went ashore in the boat, whilst I stood off and awaiting his return.

"Mr. Bass returned at half-past two with a boat load of seals and Albatrosses. He had been obliged to fight his way up the cliffs of the island with the seals, and when arrived at the top, to make a road with

his club amongst the Albatrosses. These birds were sitting upon their nests and almost covered the surface of the ground, nor did they any otherwise derange themselves for the new visitors than to pick at their legs as they passed by."

Goold first detected this Albatross as a new species off the south coast of Tasmania, and had frequent opportunities of observing it during his stay in Recherche Bay, at the southern entrance of D'Entrecasteaux Channel, where he was windbound for nearly a fortnight. The birds seldom approached his ship near enough for a successful shot, as other Albatrosses had done, which suggested to him the name *cauta*, Cautious or Shy Albatross. However, this may be a case of misnomer, as the narratives quoted hereafter may show. White-capped Albatross is at once a more correct and distinctive name.

Goold was under the impression that it was breeding on the Mewstone and other isolated rocks in the neighbourhood, as the plumage of some of his specimens indicated that they had lately been engaged in the task of incubation; possibly so.

The lighthouse-keeper on Maatsuyker Island informed me that the precipitous cliffs of Mewstone Island, which is six miles off, are covered in summer with white objects, supposed to be Albatrosses. Mewstone Island would be a difficult place to land on.

Following the days of Bass and Flinders, some sailors and sealers occasionally visited Albatross Rock. Captain David Firmaner, for many years in the Victorian Harbour Department, gave me one of his bluntly characteristic and graphic accounts of how he once touched that isolated rock. I longed to visit the place myself, but as I had already taken three trips to islands in the tempest-tossed Strait of Bass, I relinquished the task to other field naturalists. Messrs. D. Le Souëf and H. P. C. Ashworth first essayed and well performed the risky task and brought back Albatrosses, eggs, and photographs of the "rookeries"—one picture being kindly taken by Mr. Le Souëf especially for this book. They landed on the island 26th November, 1894.

I cannot do better than quote Mr. Le Souëf's own account as it appeared in the "Ibis" (1895): "These handsome birds were nesting in several small companies on different parts of the island: the largest colony having about forty nests, and the smallest only six. They built, in some instances, on the rocky ledges of the cliff, at various heights; but the larger number were on the top of the island, near the edge of the cliff. The rocky ground at the rookery was quite bare of vegetation, and mostly covered with white guano. The male and female sit on the nest in turn, and on one occasion I saw a male bird take the place of a female, who then flew off to sea.

"There is very little difference between the appearance of the male and female—the grey colouration on the side of the neck being slightly darker, and the yellow markings on the beak brighter in the male—but I did not notice any material difference in their size. The breadth across the wings, when stretched out, was eight feet from tip to tip. Frequently, when one bird is on the nest, its mate will be seen sitting close alongside, and they cackle one to the other and rub their beaks together. Again, when two strange birds meet, they stretch out their



AN ALBATROSS ROOKERY.

*From a Photo by D. L. e. Soudy.*



necks, make a loud cackling noise, and, spreading out their tails, lean forward and put their heads several times first on one side and then on the other side of each other; and when a bird makes its way through the colony, every sitting bird that it passes makes a lunge at it with open beak, and it has to run the gauntlet while passing through.

"The nests are situated at varying distances one from the other, from a foot upwards, some on the ground and others again on the uneven side or top of a point of rock. Some of the birds had evidently come on shore to rest only, while a few of them had their heads turned back and partially under their wings, and were asleep.

"When one wished to fly, it had to walk to the edge of the cliff and go off with a downward sweep; but when the wind was blowing very strong the bird could then rise, facing it, from a point of rock. One bird was found in a depression about 60 feet across and 30 feet deep, with steep sides, and it could neither climb nor fly out, so, having caught it, I climbed up the bank with the bird under my arm and took it back to the 'rookery.' Their nests had the appearance of being used year after year, probably being only renovated each season. One unused nest was seen; it was in good preservation, although it had a little vegetation growing on it.

"This species was named the 'Shy Albatross' by Gould; but nothing of the nature of shyness was noticed either at sea or on land, for when crossing Bass Strait the birds frequently came within a few feet of the vessel and settled on the water again and again twenty feet away, in their endeavours to secure the barraconta hook which was dragging through the water. The hook was baited with a piece of wood and red flannel, and they were easily caught with a hook and line. Sir Walter Buller was informed by a collector that these birds nested on the Snares on high rocks,\* and rose off their nests on being approached and circled high in the air; but I think his informant must have mistaken the bird, as this Albatross cannot rise off its nest, unless under exceptional circumstances. Those on this island took very little notice of a visitor, and one could walk anywhere through the 'rookery' without disturbing them; it was only with considerable difficulty and force that they could be made to leave their nests. A far more suitable name would have been the 'White-capped Albatross,' as the cap is pure white, marked off by the dark shading on each side of the eye, and this feature is very striking.

"On approaching very close to the birds they would partly stand up on their nest, leaning backwards and apparently resting the tail on the edge of the nest, and then facing the intruder. When one was within two feet of them, they would utter a loud cackling noise, shaking their heads up and down and opening and shutting their beaks rapidly. A considerable noise was made by the mandibles coming together, and at the same time a strong-smelling oily secretion was thrown up. In order to secure an egg, the beak of the bird was caught hold of with one hand and the egg taken up with the other, and on stepping back the beak was let go again; the bird would sit or stand on its nest for some time afterwards.

\* Another variety (*T. salvini*).

"The orange-coloured strip of bare skin which goes from the corners of the mouth towards the back of the head was noticed only when the bird was disturbed and opened its beak wide to eject the oily substance. The use of it seems to be to enable the bird to open its mouth much wider than it otherwise could, for the purpose of letting the young bird put its head well inside the mouth of the parent when being fed.

"The birds often had difficulty in alighting on a particular spot when the wind was blowing strongly on to their breeding-ground from the sea, as they always flew against the wind when desiring to alight, and I have watched them sometimes try seven or eight times before they could successfully accomplish their object. They came up with considerable force, holding their heads well back and stretching out their expanded feet at the same time, and the fact of having their wings half closed gave them a very ungainly appearance when alighting. If there is only a light breeze they can alight easily enough, although they often stumble before gaining a proper foothold. I noticed that whenever they flew off they always shook their tails from side to side a few times, and also when they passed excreta while flying they did the same thing.

"Only one egg is laid, and that probably during the first week in October, and all the eggs hatch out within a few days of each other, showing that the birds commence laying at nearly the same time. About half the nests had newly-hatched young in them, and the eggs taken had young ones just ready to hatch; two addled eggs were obtained. The young are very fat and helpless, and if held up by their legs a small amount of oil runs out of their mouths; they are covered with white down, and their beaks are black. They generally lie down in the nest, laying their head on one side, and at first sight have the appearance of being dead.

On a warm day the parent bird was often noticed partly standing up in the nest and leaning backwards, so as to leave the chick uncovered—I presume for the sake of coolness—and also to let the little one sit up and move about in the nest.

"The birds sat very closely on their single egg. This was kept in a kind of longitudinal bag, bare of feathers, just below the breast-bone, into which the egg fitted, and was consequently very warm. Even when the bird half stood up in the nest the egg could not always be seen, but when the bird moved about the egg came down. The nests being dry, the eggs kept fairly clean, most of them were freckled more or less with reddish-brown surface-markings on the larger end. In some cases these markings were minute, numerous, and almost continuous, while in others they were much larger and darker, on a slightly reddish ground, but there were various gradations between the two types. The colour could be washed off by a little friction."

In returning from the island, Mr. Ashworth had the misfortune to lose his exposed photographic plates, and nearly his life, by the capsizing of the dingy. The following season he returned to re-take his pictures, and this time was accompanied by Mr. J. Gabriel. They started a month earlier than on the previous occasion. After waiting eleven days under the lee of an adjacent island for an opportunity of

landing on Albatross Rock, they were all but returning to Melbourne without accomplishing their task, so great and so dangerous was the swell dashing upon the unprotected sides of the rocky home of the Albatresses.

However, I give Mr. Gabriel's concluding remarks of an interesting but anxious trip, the account of which he read before the Field Naturalists' Club of Victoria, 13th January, 1896: "Early in the morning of the 29th October we started for Albatross Island, and after crossing the 'pot-boil,' north of the West Hunter, we were not long in approaching this lonely rock. Bold and rugged it is indeed, and doubly so to-day, for the wind had changed round to the north and rolled a nasty sea into the landing-place. We could see the Albatrosses sitting on their nests upon the shelving rocks, but after standing off and on for some time in the hope of a change, we had to swallow our disappointment and return. The following day an easterly gale raged all day, raising such a heavy swell that it was with little hope of success that we started again at dawn on 31st October. The 'pot-boil' was very lively, and tossed our little boat about like a cockle-shell. After a couple of miles of this we despaired of getting on the rock, but as we had the day before us we held on, and when within a few miles of the island our skipper declared we would get on after all, we cheered up considerably. Shortly after we were anchored amongst the kelp in comparatively smooth water. Dreading the backwash of the cove where the dingy was capsized last year, we scrambled on to the ledges of an outlying rock, and, following a Penguin track, were soon through the caves. In the gulchway we were surprised to see a Tasmanian Flycatcher and a Bronze Cuckoo, with his resplendent green back. Climbing over the hill, the Black-checked Falcons showed by their clatter that they had eggs, and a large Wedge-tailed Eagle soared away overhead. We were rejoiced to find the Albatross 'rookery' in full swing. It was the beau ideal of a photographic day, with little wind and light fleecy clouds, and our artist lost no time in proceeding to work. As to myself, I was soon arguing the point with the birds *re* possession of eggs, the powerful mandibles on the one hand, and my foot and a bucket on the other being the argumentative media. These beautiful birds sit gracefully on their nests, but when disturbed they flounder about in quite a ludicrous manner, strongly in contrast to their glorious appearance at sea, when they so majestically sweep through the air on expanded pinions. After its egg was taken the silly bird could not make out where it had got to, and would put its head into the nest to look for it."

It is but fair to record that in both trips to Albatross Island the party was in charge of Captain Mullens, of Circular Head. Captain Mullens also successfully landed Mr. A. E. Brent, of Tasmania, the same season, after the second trip of the Victorian Naturalists. Probably the fine White-capped Albatrosses, on their difficult to-get-at rock, will be left alone for many seasons to come. The Government of Tasmania, on the advice of the Field Naturalists' Club of Victoria, extended protection to the White-capped Albatross for five years, commencing 1898.

Mr. Brent was good enough to send me an account of a battle he witnessed between a Wedge-tailed Eagle and a fine Albatross. He says: "The Albatross was flying round just at the back of the large 'rookery' and immediately over the deep gorge after passing through number two cave, when the Eagle struck her, and fastening to her, both fell to earth about half way down the bank, rolling over each other to the bottom. I made my way towards them, but before I reached the spot the Eagle had made an entry just at the back of the Albatross's head, and she was dead. From the start the Eagle had it all his own way. I think this old warrior was used to his work, because more than half a dozen fresh carcasses were found near the spot."

The laying season for this species probably commences as early as September, or possibly August.

If it be true that in New Zealand this bird's place is taken by *T. salvini*, then the true *T. cautus* breeds nowhere save on Albatross Rock, at the western entrance to Bass Strait, and perhaps on Mewstone Island, at the south coast of Tasmania.

It is with peculiar pleasure I give as illustrations Mr. Le Souëf's pictures, "An Albatross Rookery" and "White-capped Albatrosses Nesting."

695.—*THALASSOGERON CULMINATUS*, Gould.—(620)

FLAT-BILLED ALBATROSS.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 41.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 451.

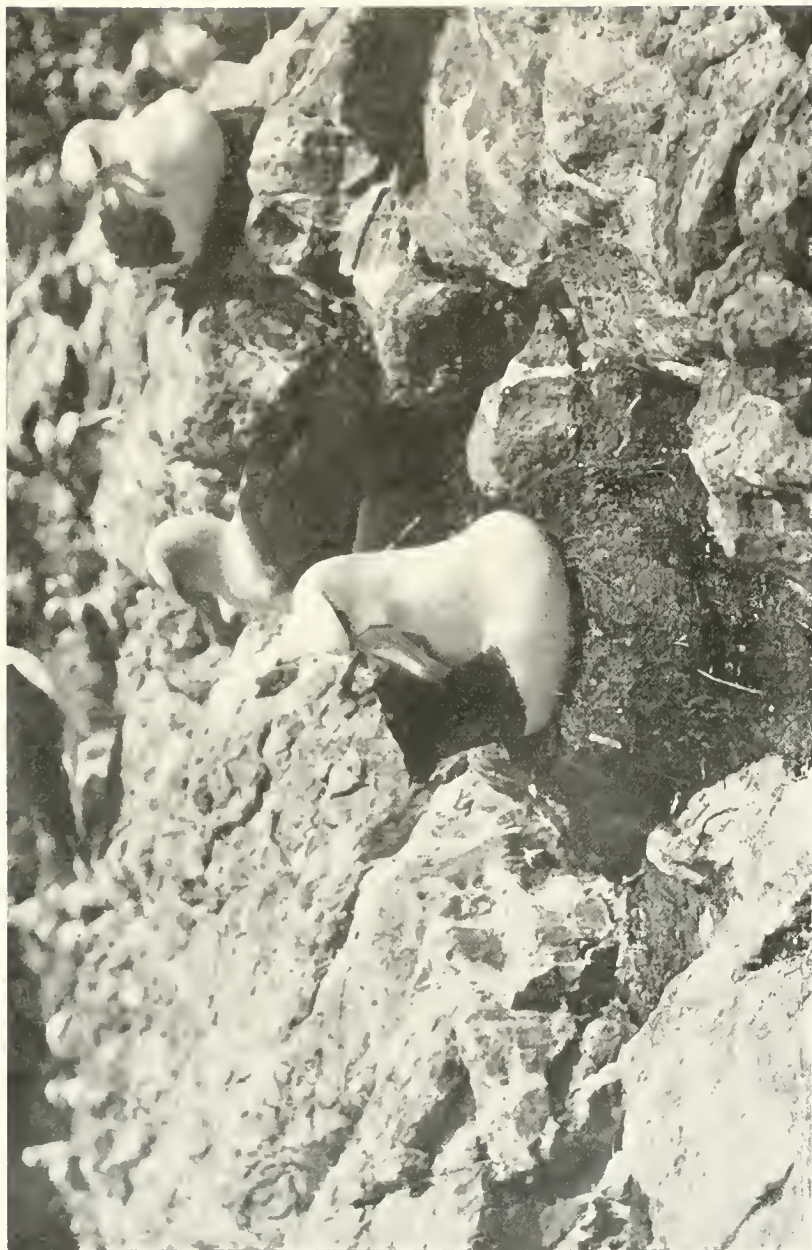
*Previous Description of Eggs*.—Emerson: Ornithologist and Oologist, p. 21 (1886).

*Geographical Distribution*.—Seas of New South Wales, Victoria, South and West Australia and Tasmania; also New Zealand and the Southern Ocean in general, ranging to the Pacific coasts of Central America.

*Nest*.—Composed outwardly of tussock grass and mud, lined inside with fine grass and feathers. Situated on the top of a rock or a loamy plain. Dimensions in inches: external diameter at top 12, at base 18; egg cavity, 10 across by 5 deep (Emerson).

*Eggs*.—Clutch, one; oval in form, smaller at one end; both ends quite blunt; colour, inclined to light creamy-white, with a ring of seemingly fine, spattered, burnt sienna specks or spots, like those made by drawing a brush of colour across a stick, as a painter does to get the effect of granite. They form a ring about two inches broad round the larger end. The centre of the ring runs together in the fine markings, making the colour almost solid, and fading away from the outer edge almost to needles' points. Dimensions in inches: 4.75 × 2.38 (Emerson). According to Kutter: (1) 4.25 × 2.75, (2) 4.11 × 2.7.





WHITE-CAPPED ALBATROSSES NESTING

*From a Photo by D. Le Souk.*



*Observations.*—Gould observed the Flat-billed or Grey-headed Albatross (*culminatus*) to be more plentiful in the Australian seas than elsewhere. Numbers came under his notice during his voyage from Launceston to Adelaide, particularly off Capes Jervis and Northumberland. It is a powerful bird, and directly intermediate in size between the White-capped Albatross (*D. cautus*) and the Yellow-nosed (*T. chlororhynchus*). The specific differences of the three kinds were so marked, that he had no difficulty, apparently, in distinguishing them, even while on the wing. But of course Gould was an expert.

Sir James Hector informed me that during a trip southward in February, 1895, he believed he saw the Flat-billed Albatrosses nesting in groups among the Black-browed variety on the great cliffs at Campbell Island.

In the pages of the "Ornithologist and Oologist," Mr. W. Otto Emerson, California, gives his description of an egg of the *T. culminatus* from an example collected 12th January, 1880, by Captain Thomas Lynch, at Diegos, Kavenen's Rocks, S. and E., fifty-two miles from Cape Horn. The egg was accompanied with the following interesting notes by Dr. J. W. Detmiller:—"The nests are very nicely and solidly built, lasting two or three seasons, even in that fearful climate. They are built very closely together, and are probably often mistaken by one and another of the birds, after the fashion of many sea birds. The nests are high, to enable the long-winged creatures to rise easily on the wing, which they cannot do on a level. The birds are very tame, allowing themselves to be handled while sitting."

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696.—*THALASSOGERON CHLORORHYNCHUS*. Gmelin.—(621)

YELLOW-NOSED ALBATROSS.

*Figure.*—Gould: Birds of Australia, fol., vol. vii., pl. 42.

*Reference.*—Cat. Birds Brit. Mus., vol. xxv., p. 451.

*Geographical Distribution.*—Seas of New South Wales, Victoria, South and West Australia and Tasmania; also New Zealand and the Southern Ocean in general.

*Nest.*—Similar to those of the other members of the genus.

*Eggs.*—Clutch, one; colour, dull-white, with single yellowish blotches, probably resulting from dirt. Dimensions in inches: 4.0 × 2.28 (Kutter).

*Observations.*—The Yellow-nosed Albatross, like most of its great-winged congeners, sweeps the seas of the Southern Ocean. This species came under Gould's observation for the first time on the 24th July, 1838, in latitude 30 deg. 38 min. S. and longitude 20 deg. 43 min. W., from which point until he reached Australia scarcely a day passed, without the ship being visited by these birds, sometimes in considerable numbers.

Recently two of these Albatrosses, either dead or dying, were picked up on the beach near the North-west Cape of Australia.

I quote two pages from Prof. Moseley's most interesting book, "A Naturalist on the 'Challenger,'" which refer to either the Flat-billed or Yellow-billed Albatross, and incidentally to other birds nesting on Nightingale Island, one of the Tristan d'Acunha Group, which was visited 17th October, 1893.

The Molly Hawk is an Albatross about the size of a goose; head, throat, and under part pure white, the wings grey, and the bill black, with a yellow streak on the top, and with a bright-yellow edge to the gape, which extends right back under the eye. The yellow shows out conspicuously on the side of the head. It is not thus shown in Gould's coloured figures. The bird is extremely handsome. They take up their abode in separate pairs anywhere about in the 'rookery,' or under the trees, where there are no Penguins, which latter situation they seem to prefer.

"They make a cylindrical nest of tufts of grass, clay, and sedge, which stands up from the ground. The nest is neat and round. There is a shallow concavity on the top for the bird to sit on, and the edge overhangs somewhat, the old bird undermining it, as the Germans said, during incubation by pecking away the turf of which it is made.

"I measured one nest, which was 14 inches in diameter and 10 inches in height. The nests when deserted and grass-grown make most convenient seats. The birds lay a single egg, about the size of a goose's or somewhat larger, but elongate, with one end larger than the other, as are all Albatross eggs.

"The egg is held in a sort of pouch while the bird is incubating. Thus the bird has to be driven right off its nest before it will drop the egg out of its pouch, and discover whether there is one there or not.

"The birds, when approached, sit quietly on their nests or stand by them, and never attempt to fly; indeed they seem, when thus bent on nesting, to have almost forgotten the use of their wings. . . . .

"The Albatrosses make their nests sometimes right in the middle of a Penguin road; but the two kinds of birds live perfectly happily together. I saw no fighting, though, small as the Penguins are, I think they could easily drive out the Molly Hawks if they wished it.

"The ground of the 'rookery' is bored in all directions by the holes of Prions and Petrels, which thus live under the Penguins. Their holes were not so numerous at Inaccessible Island as here. The holes add immensely to the danger of traversing a 'rookery,' since, as one is making a rush, the ground is apt to give way and give one a fall into the black filthy mud, and amongst a lot of furious birds, which have then full chance at one's eyes and face.

"Besides the Molly Hawks and Petrels, one or two pairs of Skuas had nests on a few mounds of earth in the 'rookery.' How these mounds came there I could not understand.

"The Skua's eggs are closely like those of the Lesser Black-backed Gull, and two in number. The birds swooped about our heads as we robbed their nests, but were not nearly so fierce as those we encountered further south. All round their nests were scattered skeletons of Prions.

"I, with three sailors carrying my botanical cases, attempted to scale the Peak; we had a desperate struggle through long grass and Penguins, and at last had to come back beaten, and make for the *Phyllica* patches, where the ground was clear. Thence I fought my way through the grass up to the lower ridge of the island; but, though there were no Penguins on this slope, I never had harder work in my life.

"I had to stop every ten yards or so for breath, the growth of the grass was so dense. My men lost me and never reached the top. On the summit I found the rest of the party which had come on shore, full of the hardships they had suffered in getting through the 'rookery,' and looking forward with no pleasure to the prospect of going back again through it."

697.—*PHICEBETRIA FULGINOSA*, Gmelin.—(623)

SOOTY ALBATROSS.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 44.

*Reference*.—Cat. Birds Brit. Mus., vol. xxv., p. 453.

*Previous Descriptions of Eggs*.—Layard; Saunders: Trans. Roy. Soc., vol. clxviii., p. 165 (1878); Kidder and Coues: Smithsonian Miscell. Coll., vol. xiii., p. 12 (1878); Buller: Birds of New Zealand, vol. ii., p. 206 (1888); Verrill: Trans. Connect. Ac., vol. ix., p. 445 (1895).

*Geographical Distribution*.—Seas of New South Wales, Victoria, South and West Australia and Tasmania; also New Zealand and the Southern Ocean in general.

*Nest*.—Similar to those of the other Albatrosses; a small, low, conical mound, constructed of the surrounding earth mixed with grass and other debris. Not in colonies, but separate, on cliffs or rocks. Dimensions: about 9 inches in height by 18 inches in diameter at base; egg cavity, about 9 inches across by  $1\frac{1}{2}$  inches deep.

*Eggs*.—Clutch, one; inclined to oval in shape, or more compressed at one end; texture of shell somewhat coarse, but fine compared with the eggs of the other species of Albatrosses; surface without gloss; colour, dull white—at first, which soon gets soiled all over by dirt in the nest—with a faint zone or wash of reddish markings round the apex. Dimensions in inches of an example from Kerguelen Island:  $3.88 \times 2.68$ ; of three from Macquarie Island: (1)  $4.12 \times 2.56$ , (2)  $4.0 \times 2.62$ , (3)  $3.87 \times 2.62$ .

*Observations*.—This dusky-coloured Albatross is one of the most familiar of its family, and is seen by almost every voyager to and from Australia.

Gould states: "The cuneated form of the tail, which is peculiar to this species, together with its slight and small legs and more delicate structure, clearly indicate that it is the most aerial species of the genus,

and accordingly we find that in its actions and mode of flight it differs very considerably from all the other species of Albatross, its aerial evolutions being far more easy, its flight much higher, and its swoops more rapid; it is, moreover, the only species that passes directly over the ship, which it frequently does in blowing weather, often poising itself over the mast-head, as if inquisitively viewing the scene below; at this moment it offers so inviting a mark for the gunner, that it often forfeits its life."

Several of the scarce eggs of the Sooty Albatrosses were collected for me by Mr. J. R. Burton on the bold west coast of Macquarie Island. They were taken about the middle of February last and were fresh. The nests were situated singly on the sheltered sides of hills on the steep faces of rock at about 800 or 900 feet above sea level, and very difficult to reach on account of the rotten rocks rendering foot hold insecure.

Latham states that it breeds on Tristan d'Acunha. Mr. George Comer, who collected one skin, a skeleton, and ten eggs, on Gough Island, and one egg on South Georgia, states: "It is the most difficult bird of all to get at. They lay separately (not in 'rookeries'), usually on cliffs or projecting rocks. The nests are built small and low, of grass and mud. They commence laying by the middle of September, and lay one egg; but when killed have a number of small eggs inside. While sitting on their nests, they keep up a continual cry, similar to that of a young goat. The beak is dark, with a yellow streak on each side. White rim on eyelids around the eye."

During the voyage of the "Challenger," which, by the way, visited Melbourne and Sydney, 1874, Professor Moseley mentions that when on Marion Island, end of December, 1873, four or five Sooty Albatrosses were observed high up, at about an elevation of 500 feet, soaring over the tops of the cliffs, where they were probably nesting. This bird, he says, is continually to be seen about cliffs and higher mountain slopes, and seems never to nest low down like the Molly Hawk and Wandering Albatross.

The Rev. A. E. Eaton, of the British Transit of Venus Expedition to Kerguelen, 1874-5, respecting the Sooty Albatross, wrote: "The Sooty Albatross is common in Royal Sound. The hills near the sea, on the mainland and islands, present occasionally places suitable for its nidification. As a rule, the nests are built in the most sheltered situations that can be found, at the foot of precipitous terraces of volcanic rock, which are so characteristic of the neighbourhood. Here and there recesses hollowed out at the base of these terraces and cliffs are thoroughly protected by the overhanging rock from wind and rain. In dry nooks of this nature *P. fuliginosa* constructs its nests of pieces of adjacent plants (especially *Festuca erecta*), disposed in the form of a low, truncated cone, hollowed out at the top. The nests appear to be used many years in succession, as the original materials of several that were examined seemed to have been reduced by age to vegetable mould. The old fabrics are re-lined with fresh, dry grass when the birds return at the commencement of the breeding season. The position of her nest is liable to be betrayed to persons walking within sight of the female when she is sitting, for every now and then, while she is observing their

movements, she will utter her cry, and thus reveal her situation. If anyone goes near her she assumes a rather formidable attitude, and ruffling up the feathers of the neck, snaps fiercely and loudly with her beak at the intruder, the noise resembling that made by a large dog in catching flies. But notwithstanding her menacing gestures, the egg can be secured (if it be desired) without displacing her from the nest. A pocket handkerchief presented to her with the left hand, or a hat placed gently on her head, will completely engross her attention while the egg is being abstracted from beneath her with the right; and she will afterwards remain in the nest complacently watching her visitors retreat."

Nearly a dozen nests were taken by the English Expedition. A bird was killed on the 23rd October that probably would have laid that night. Another female subsequently laid in the same nest. A nestling about a week old was secured about the beginning of February. On the 24th October, members of the American Expedition captured two Dusky Albatrosses on nests, but there were no eggs. The birds' loud Peacock-like scream of "pee-arr" is believed to be peculiar to the breeding season. On the 2nd November one egg and the parents were secured, the male being perceptibly the larger of the two birds. Subsequently one or two other nests were observed.

The illustration of the "Sooty Albatross on Nest," from the out-of-the-way Kerguelen Land, by Mr. Robert Hall, makes a unique and appropriate pair with the "Cape Petrels on their Nest."

## ORDER—PTALATEÆ.

## FAMILY—IBIDIDÆ: IBISES.

698.—IBIS MOLUCCA, Cuvier.—(539)  
*Threskiornis strictipennis*, Gould.

## WHITE IBIS.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 49.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 9.

*Previous Descriptions of Eggs*.—Campbell: Southern Science Record (1883), and Nests and Eggs Austr. Birds, pl. 2, fig. 539 (1883), also Victorian Naturalist (1891); North: Rec. Austr. Mus., vol. 1., p. 118 (1891).

*Geographical Distribution*.—Australia in general; also New Guinea and Molucca Islands.

*Nest*.—A shallow structure, made, in the first instance, by the birds trampling down the rushes of a swamp into a platform, to which are added flags, grasses, in some instances green (*Eucalyptus*) branchlets. Dimensions, from 12 to 18 inches across. The nests are in companies and sometimes built on polygonum bushes, after the manner of the Straw-necked Ibis.

*Eggs*.—Clutch, three to four, occasionally five; vary in shape from round oval to oval; texture of shell coarse; surface has faint trace of gloss; colour, white more or less soiled with nest stains. Inside lining of shell beautiful light green. Dimensions in inches of a proper clutch: (1) 2.6 × 1.68, (2) 2.56 × 1.74, (3) 2.5 × 1.69, (4) 2.5 × 1.67; of a stouter-sized set: (1) 2.62 × 1.82, (2) 2.62 × 1.84, (3) 2.59 × 1.8.

*Observations*.—As its specific name implies, this fine bird is found as far north as the Moluccas. It was called *Ibis molucca* by Cuvier as far back as 1829.

The White Ibis needs no description. However, it may be stated the bill is heavier and more curved, and altogether the bird is slightly larger than the Straw-necked species. The head and upper portion of the neck are naked and black, while a few black plumes adorn the end of the back; there are also some pink ornamentations of the skin on the back of the neck. What is stated with regard to the habits of the Straw-necked Ibis equally applies to the White bird; in fact, the two species are frequently observed in company. One marked difference, as Gould pointed out, may, however, be noticed, that





WHITE IBIS ROOKERY

*From a Photo by the Author.*



while the Straw-necked loves the plains as well as swamps, the other variety confines itself solely to swamps and other wet localities. The White Ibis is especially interesting, because it is closely allied to or is the Australian representative of the sacred Ibis (*I. aethiops*) of Egypt. It is interesting to look at these handsome birds (the Australian variety) and dwell upon the circumstance that by a series of evolutions extending down through ages, or by local adaptations, our Ibis is only slightly different from the very bird which from time immemorial was held in such reverence by the ancient Egyptians, and was deemed worthy of being embalmed. Egyptologists have found many mummies of the Ibis in the old Egyptian burial-places, having been preserved for over 3,000 years.

This is the only species of whose breeding habits I have had personal experience, and an exceedingly interesting experience it proved. It was the 3rd December, 1890. My friend, Mr. George H. Morton, of Murray Meadows, and I decided to proceed to the home of the Ibises immediately after tea, in the cool of the evening. Reaching the other side of the river (Murray) we haul our "flatty" or dingy over a narrow strip of land into the swamp beyond. Merrily we pole our tiny boat over the clear, mirror-like surface of the lagoon, which is so perfectly transparent that beautiful forms of aquatic weeds are readily distinguished growing below. White lilies, with small circular leaves, float upon the tranquil face of the water. This placid sheet of water appears hundreds of acres in extent, broken here and there with clumps of dark-green rushes in contrast with the seared and sunburnt rises on the further shore. We steer for slightly shoaling ground literally crowded with game and other water-fowl. Soon the scene changes. Black Swans quitting the water belabour the surface with white-pinioned wings. Black Duck, Shovellers and Teal rise with quacking notes and whirr of wings, and Stilt Plovers with puppy-like barking notes. How interesting to watch the various flocks wheeling past! Now again swiftly repassing—but at a safer distance; then they disperse in detachments. Pacific Herons, with leisurely flight, and a flock of about a score of Nankeen Herons, are likewise on the wing, and surmounting all are companies of Straw-necked Ibises gracefully ascending in spiral circles so high that the roseate hue from the western sky behind the dark fringe of gum-trees is beautifully reflected from the snow-white breasts of these birds. We pole to deeper water in the centre of the swamp, towards a large growth of bulrushes. Approaching these, another wonderful revelation confronts us. The whole place is alive and croaking with Ibises of two species—the Straw-necked and the White. The dark-coated, Straw-necked Ibises rise first, in companies of about half-hundreds, and fly away. The White species, evidently nesting, is reluctant to follow suit. But they are compelled to move, too, when we shoot the prow of our boat into the rushes amongst their nests. The nests are picturesquely grouped on irregular steps or terraces formed by the tops of the rushes being split or frayed out, then trampled or matted together into platforms to within a few inches of the water. Hastily looking at those nearest to us we see a nest with five eggs, another with four, and four with three each. Out of the

scores of nests on the rookery, only a few are occupied with young—helpless, not many days old. Their heads are black, and the pinkish skin of the rest of their bodies shows strongly through a moderate coating of white down. The water here is about four or five feet deep, the patch of rushes being about half an-acre in extent. The birds have trampled down the north and western margins for their nursery, leaving the greater portion of the bulrushes standing, which appears to afford an excellent protection as a break wind. Darkness now creeps over the water, and mosquitoes become exceedingly numerous and fierce. Porphyrio Coots screech defiantly at us from out of the reeds, but the sweet alarm notes of a flock of passing Plovers, the trumpeting of the Native Companions in the distance, together with the booming bass of Bitterns at various parts of the vast swamp, fall as charming music on our ears. Carefully now we move, and peering through the gloom steer for the higher end of the swamp, where, fortunately, we easily strike the river, and swiftly gliding with a rapid current on a broad stream for about a mile in the darkness, we reach home in safety.

Visiting the rookery two seasons afterwards, on the 5th November, we obtained only one egg fresh. Evidently the birds were about to lay, for eleven days later we took two eggs each from two nests, and three eggs each from other two nests, while in another part of the nursery we took four nests, each containing three eggs either fresh or on the point of turning. Again, on the 7th December, Mr. Morton, visiting the rookery, which was then in full swing, counted in one group of nests four containing three eggs each, two with two, and one with four, all apparently fresh.

On another occasion (14th November, 1892), in company with our good field naturalist, Mr. Joseph Gabriel, I again enjoyed an opportunity of visiting another White Ibis rookery further down the river. This nesting place was not so extensive as the one previously described, being only a cluster of five nests, this time in eum-bungie (*Typha*) beds. As usual, the nests were built near to the surface of the water, and to the matted reeds was added a plentiful supply of eucalypt branchlets. Laying operations had only commenced, for there was not more than a pair of eggs in any of the nests.

See illustrations, "A White Ibis Rookery" and "Nest of the White Ibis."

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### 699. — *CARPOLIBES FENICOLLIS*, JAMESON — (538)

#### STRAW NECKED IBIS.

*Figure*— *Gould — Birds of Australia*, fol., vol. vi., pl. 45.

*Reference*.—*Cat. Bird Brit. Mus.*, vol. xxvi., p. 11.

*Previous Descriptions of Eggs*.—LUCAS: *Victorian Naturalist* (1884); CAMPBELL: *Victorian Naturalist* (1887); *North Austr. Mus. Cat.*, p. 32 (1886).

*Geographical Distribution*.—Whole of Australia and Tasmania (accidental); also New Guinea.



NEST OF THE WHITE IBIS



*Nest*.—Usually placed in companies in a swamp, just above the water in reed beds or on polygonum bushes—portions of the reeds or bushes, as the case may be, being broken down into a platform, which is augmented with sticks, rushes, &c.

*Eggs*.—Clutch, three to four, occasionally five; roundish oval in shape; texture of shell decidedly coarse; surface slight trace of gloss and pitted; colour, dull-white at first, but becomes more or less soiled with nest stains. Inside lining of the shell greenish. Dimensions in inches of a clutch: (1) 2.68 × 1.85, (2) 2.49 × 1.82, (3) 2.46 × 1.8, (4) 2.42 × 1.76.

*Observations*.—This Ibis is probably the most common variety, having been observed in every State of Australia, while examples have been taken in New Guinea. Without going into a technical or detailed description of this useful bird, its general appearance may be stated as dark bronzy-green or purple on the upper surface of the body, the under surface being pure white. The head and comparatively slender bill, which is slightly curved, are black, with eyes to match. The legs are brownish, running into a pinkish colour at the thighs. The birds are adorned with a tuft of straw-like feathers, which hang from the neck (hence the common name, Straw-necked), the singular appendage being smaller in the female. The total length of a bird is about 28 inches, including the bill, 8 inches. At times the Straw-necked Ibis may be seen perambulating the plains in quest of grasshoppers, insinuating its long sickle-shaped bill into cricket holes, or wading knee-deep in lagoon or billabong in search of frogs, shelled molluscs, &c. During sustained flights the flocks arrange themselves into a string, or in the form of a V or other letter, and when flying high, as they usually do, the Straw-necked variety, on account of its white breast, can hardly be distinguished from the White Ibis. In Gould's time, after a severe drought, in 1839, he found the Straw-necked Ibis in such abundance on the Liverpool Plains, New South Wales, that to compute the number of birds in a single flock was simply impossible. When feeding upon the ground, he further remarked that the birds packed closely, and the downward action of the bills and the upward movement of the tails imparted to the whole a curiously agitated appearance.

To Mr. D. Le Souëf I am indebted for a perfect set of eggs of this Ibis. Mr. Le Souëf never does anything by halves—in addition to the specimens, he gave me the benefit of his field observations regarding the large rookery he visited this year (1900) in Riverina, New South Wales. Amongst his trophies were some very interesting snapshots of flocks of Ibis on the wing.

On account of the favourable season, he estimated that no less than 100,000 birds had congregated to breed in a swamp about four hundred acres in extent. The swamp was about three feet deep, and more or less covered with Polygonum bushes. These the birds trampled down into rough platforms to within six or nine inches of the water, and constructed thereon green twig nests about six inches across by two

inches deep. The bulk of the nests had no lining, but a few were lined with the yellow flowers from an annual growing on the plains. About thirty nests were frequently seen on one clump of bushes, while smaller clumps supported perhaps from three to a dozen nests, therefore the whole rookery appeared to be composed of detached companies of from three to thirty brooding pairs.

Many of the birds started nesting on the 8th September. As they arrived in variously sized companies, so they seemed to choose a suitable bush, and, having prepared it and built their nests, commenced laying about the same time.

This swamp had not been used as a breeding place by the Ibis since 1894 (the last good wet season); but in 1896 it was partially filled with water, when a large number of these birds appeared for the purpose of nesting. However in about a fortnight after the eggs were laid, the water dried off and caused the birds to suddenly desert their nests and leave the district altogether. "It is an ill wind that blows nobody any good." The Ravens then took possession, and within two days every egg on the rookery was devoured.

September to December constitute the chief breeding months.

In 1892 these Ibises were numerous in many of the southern parts of Victoria, notably Werribee, Oakleigh, Western Port, &c. They appeared again in 1897. Both seasons were exceedingly dry in the interior. During the former year, from Point Cloates, West Australia, Mr. Tom Carter wrote: "Immense flocks of Straw-necked Ibis appeared here last March (1892), when the drought broke up. They are now going away. They appear to feed almost entirely on grasshoppers. It was a fine sight to see great flocks of the birds coming in from all sides at sundown to sleep on the bare drift sandhills just behind my house, and again at early dawn to see them going away in mobs to feed."

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### 700.—PLEGADIS FALCINELLUS, Linnæus.—(540)

#### GLOSSY IBIS.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 47.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 29.

*Previous Descriptions of Eggs*.—Legge: Birds of Ceylon, p. 111 (1880); Campbell: Southern Science Record (1883); North: Austr. Mus. Cat., app. (1890); Hume—Oates: Nests and Eggs Indian Birds, vol. iii., p. 231 (1890).

*Geographical Distribution*.—Australia in general and Tasmania, also New Guinea, and through the Austro-Malayan Archipelago to Asia and Europe; Africa; a portion of Eastern North America.

*Nest*.—Constructed of medium-sized sticks or bunches of leaves, piled up about a foot high in the forked branches of a tree growing in or near water. The nests are in small companies or in a rookery, sometimes associated with those of Spoonbills, Cormorants, &c.



*Eggs.*—Clutch, three to four; oval in shape; texture of shell coarse; surface very slightly glossy; colour, cold or deep bluish green. Dimensions in inches of odd examples: (1) 2.12 × 1.45, (2) 2.09 × 1.44, (3) 2.0 × 1.4. (Plate 25.)

*Observations.*—This Ibis is well named "Glossy," from the bronze-green and purplish reflections of the feathers on the lower part of the back and wings, these resplendent colours being enhanced by the rest of the plumage of the bird, which is rich chestnut. Altogether it is a lovely creature, smaller and more slenderly built than its other two compeers. The total length of a specimen is about 21 inches, including 5 inches for a bill. The Glossy Ibis is somewhat of a cosmopolitan; in addition to being found in Australia, its habitat extends to Asia, Europe, and Africa, and a part of North America. Indeed, it is one of the identical species that the ancient Egyptians so highly venerated. Unlike the other two kinds, this bird nests in trees and lays dark bluish-green eggs.

To Mr. K. H. Bennett belongs the honour of first taking the eggs of the Glossy Ibis in Australia. The following is his descriptive note to Mr. A. J. North on the occasion—"On the 22nd October, 1889, whilst swimming about in a large depression on the plains, filled with water by the late heavy rains, and thickly overgrown with box-trees (a species of *Eucalyptus*), in quest of the eggs of Spoonbills (*Platalea flavipes*), I noticed a Glossy Ibis (*Ibis falcinellus*) fly off a nest, but as I had never heard of this bird breeding here, I did not take much notice of the occurrence, thinking that the Ibis had been merely perched upon the nest, although I thought at the time it appeared very different from those of the Herons and Spoonbills. After swimming about for some time and obtaining several Spoonbills' eggs, I returned to land, and in doing so passed the tree in which I had noticed the Ibis, and again saw it fly off the nest, and at once concluded it was the nest of the Ibis after all. On ascending the tree (the branch the nest was placed on being not more than eight or ten feet from the water) I found that such was the case, and it contained one freshly-laid egg, which I unfortunately broke whilst swimming to land. On the 2nd November I again visited this swamp or depression, in the hopes of obtaining more Ibises' eggs, and was so fortunate as to obtain six, three of which were from the nest from which I took one on the 22nd ultimo. A further search revealed another nest, which also contained three eggs, but which were considerably larger than those previously obtained, so much so that had I not seen the bird fly off the nest I should have been in doubt as to their identity, but on this point there was no possibility of mistake, for the eggs being in a somewhat advanced stage of incubation, the old bird evinced a great reluctance to quit the nest, and allowed me to approach almost within arm's length before she did so. The two nests were placed in three or more upright pronged forks of the branches of small box-trees, and were both composed of bunches of box leaves piled up on the forks to the height of about a foot, the top being slightly hollowed out, but without any lining. On the 26th November I again visited this swamp, and found

two more nests of the Ibises, both of which contained young lately hatched (one three, the other four), covered with black down. One of the nests from which I had taken the eggs on the 2nd inst. had in the meantime been appropriated by the little Pink-eared Duck (*Malacorynchus membranaceus*), and now contained five Duck's eggs, enveloped in the usual manner in a mass of down."

Colonel W. V. Legge, in writing from Ceylon to Mr. Allan O. Hume, remarks: "I found the Glossy Ibis nesting at the end of March, 1872, in thorny trees growing round a small tank in a wild part of the south-east of the island; there were, I should say, about half-a-dozen pairs of the birds present at the heronry, and they were nesting partly in company with the Spotted-bellied Pelican and Pelican Ibises, and partly with Spoonbills and Little Cormorants. The nests were placed on the lateral, lower branches of the trees, and were of the same size as those of the Little Cormorant.

"I regret to say that at the date, the 25th of March, that I discovered this heronry, the young of the Glossy Ibis were all hatched and well grown, so that I failed to procure eggs of the species. The young perched on branches contiguous to, or stood on, their nests, and when I attempted to catch them, scrambled out of the way with considerable agility. I, however, caught one or two, but I was less fortunate with them than with the young of other species that I brought away, for I found them dead on the following morning."

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FAMILY—PLATALEIDÆ: SPOONBILLS.

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**701.**—PLATALEA REGIA, Gould.—(541)

BLACK-BILLED SPOONBILL.

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 50.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvi., p. 47.

*Previous Description of Eggs.*—North: Proc. Linn. Soc., N.S. Wales, 2nd ser., vol. x., p. 218 (1895).

*Geographical Distribution.*—Australia in general, except West; also New Zealand (accidental), probably New Guinea and some of the Austro-Malayan Islands.

*Nest.*—Flat, open; composed of reeds trampled down, with the additions of twigs, &c., and situated in a swamp. Sometimes constructed like that of a Heron in the upper branches of a tree. Dimensions, about 24 inches across.

*Eggs.*—Clutch, three to five; long oval in shape, or compressed towards one end; texture coarse; surface, slight trace of gloss and minutely pitted; colour, dull or chalky-white, sometimes without markings, but usually moderately splashed with reddish-brown, most of the markings being round the apex. Dimensions in inches of a clutch:

(1—sparingly marked)  $2.63 \times 1.67$ , (2—with markings)  $2.58 \times 1.73$ ,  
 (3—without markings)  $2.53 \times 1.71$ , (4—without markings)  $2.53 \times 1.69$ .

*Observations.*—The Royal or Black-billed Spoonbill is at once distinguished from the other Australian species by its black face and bill, besides being the smaller bird. It is a tolerably common species in its peculiar haunts, especially in Northern Australia, and may be often seen fraternising with its cousins, the Ibises and the Yellow-legged Spoonbills.

During my visit to Northern Queensland, I witnessed an interesting sight—a flock of these birds perched on a dead tree. How oddly the black bill, face and legs contrasted with the pure white plumage of the birds! The long, flat bill, about one third the total length of the bird, looked decidedly awkward to handle, and appeared sometimes to be in the way, however useful an appendage for prospecting the murky mud of marshy places.

This Spoonbill is occasionally met with in southern parts, notably Riverina. The late Mr. Gilbert Bateman informed me he once found a nest of this species containing five eggs, during the season 1889, in the reed-beds of Moira Lake.

In describing eggs from the same locality, Mr. A. J. North attaches an interesting account (received, with specimens, through Mr. James Kershaw, of the National Museum, Melbourne) by Mr. H. G. Everard. Mr. Everard's note is as follows: "While Duck shooting, Christmas Day, 1893, on one of the swamps along the banks of the River Murray, about sixty miles above Echuca, and when nearing an Ibis rookery, the man who was poling the boat drew my attention to a bird flying with the White Ibis which we had disturbed, at the same time informing me that the bird was almost a stranger in those parts, and that he had not seen a specimen for the previous four or five years. As it would not leave the spot, but continued flying in a circle, we thought there might possibly be a nest near at hand, so we concealed our boat in a bed of reeds and watched. After a little while all the Ibises, and lastly the bird which I now recognised to be a Spoonbill, settled on an adjacent bed of reeds. We approached as noiselessly as possible, and I was successful in shooting it. Upon examining the place, we found the nest of the Spoonbill built amongst those of the White Ibis. It was an open, flat structure, composed of broken-down reeds and twigs, measuring two feet across, and was placed about three feet above the water. The eggs, three in number, were in an advanced state of incubation. All the nests of the Ibis contained young birds from about one to two weeks old."

Mr. S. W. Jackson has favoured me with the following note: "Black-billed Spoonbill. Clutch of four eggs was found in a swamp on Nicholson River, North Queensland, on 25th April, 1898. White Ibises were breeding on the same swamp. The Spoonbill was twice flushed from the nest before the eggs were taken. Nest was simply the reeds bent down into a platform a little above water-mark, and eggs laid thereon. The eggs were slightly incubated. Four more Black-billed Spoonbills were observed on the same swamp, but although they were watched carefully, no other nests were found."

## 702.—PLATIBIS FLAVIPES, Gould.—(542)

## YELLOW-LEGGED SPOONBILL.

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 49.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvi., p. 51.

*Previous Descriptions of Eggs.*—Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 54 (1882); Campbell: Southern Science Record (1883).

*Geographical Distribution.*—Australia in general.

*Nest.*—Constructed of sticks, lined inside with leaves, and usually situated in timber standing in a swamp or lagoon.

*Eggs.*—Clutch, four; oval in shape, or more compressed at one end; texture of shell coarse; surface slightly glossy and rough; colour, dull white, more or less soiled with nest stains. Dimensions in inches of a pair: (1) 2.87 × 1.93, (2) 2.78 × 1.9. These eggs resemble those of the Straw-necked Ibis, but are slightly larger; moreover, the inside lining of the shell is pale-yellow, whereas the lining of the eggs of the Ibis is greenish.

*Observations.*—This large and odd-looking bird has been found in Queensland, New South Wales, Victoria, and South Australia, and, no doubt, also further west. The plumage is pure white. The curious spoon-shaped bill, which is 7½ inches in length, is yellowish, legs and feet are the same colour, likewise the eyes. The total length of the bird is 38 inches. Like the Ibis, when severe droughts occur in the far interior, the Spoonbills quit their usual haunts, and approach the sea-board. One was procured not far from Melbourne during the dry season of 1897. Its plumage seemed soiled with the red dust of the interior.

The eggs in my collection were kindly presented to me by Mr. Crisp, a surveyor. He took them during October, 1883, from a solitary nest in a swamp near Edenhope, Victoria. However these Spoonbills usually breed in small families and in company with other species of birds. The Spoonbill's eggs in the collection of Mr. Charles French, junr., were also taken in Western part of Victoria. His collector (Mr. H. Davis) states they were taken from an open stick nest lined with leaves. The nest was placed in a red-gum (*Eucalyptus*) tree in the centre of a lagoon or lake. In the same tree was another nest containing four young. In 1889, on Berrimagad, Riverina, Mr. G. Bateman noticed Spoonbills breeding in the same swamp with Straw-necked Ibis. In the "Proceedings of the Linnean Society of New South Wales," vol. vii. (1882), the late Mr. K. H. Bennett gave a graphic account of nesting outs amongst Spoonbills, incidentally mentioning other species of brooding birds, which he enjoyed in a favourite resort for water-fowl in the Lachlan district (New South Wales), 1879. He concluded thus:—

"Having occasion about two years subsequently to revisit my father's station, 'Yandambah,' from which this swamp is distant only a few

miles, I availed myself of the opportunity to pay another visit to the breeding places of the Spoonbills, and as I felt sure in the event of the heronry being still occupied, I should this time be successful in obtaining eggs, I took a small bag in which to stow my spoil. On arrival at the place I found that, owing to the recent heavy rains, the whole swamp was converted into a lake, but, to my great satisfaction, I saw the clump of trees was still tenanted by the Spoonbills. To tie up my horse and strip off my clothes was but the work of a few minutes, and taking my bag I started. For some distance the water was shallow, reaching to my waist, but this was decidedly the worst of the trip, for the ground was covered with a dense growth of terribly thorny plant, known in the district as 'roleypoley' bushes, which it was impossible to avoid, and of which I still retain a lively recollection. As the water deepened, I took to swimming, and thus got clear of the 'roleypoleys,' and with the exception of encountering a few snags and stumps, made a rapid and uneventful voyage to within a short distance of my destination. Here again troubles commenced; the water shallowed and the dreaded 'roleypoleys' were as thick as ever. My naturalist's spirit, however, triumphed, and I made my way to the nearest tree, which contained three nests, from each of which a Spoonbill flew as I approached. Eager to secure my prize, I commenced climbing the tree; but numbers of the large 'bull-dog' ant had taken refuge in the branches, and of their presence I was soon painfully aware by numerous stings; but the Spoonbills' eggs I was determined to have in spite of the ants, and with an occasionally muttered imprecation at each additional sting, I at last had the satisfaction of beholding my first Spoonbills' eggs, which were rather long and pointed, the colour white. Each nest contained four eggs, and from where I stood I could see several other nests, none of which contained more than four eggs. The Herons I noticed were also breeding, their nests containing the same number of eggs.

"Having any quantity to choose from, I contented myself with some half-dozen of the best looking eggs of both Heron and Spoonbill, taken from various nests. Whilst taking these nests I discovered the nest of a Whistling Eagle in a tree a short distance away, and on which the female bird was sitting, doubtless with the idea of reaping a rich harvest for herself and young in the not far distant future. In this, so far as her present embryo family were concerned, she was mistaken, for I soon had her fine pair of eggs transferred to my bag, and as there was nothing else to be obtained just then, I continued my exploration by visiting other parts of the lake, which resulted in my discovering several other species of nests and eggs, amongst which were two nests of the Nankeen Heron (*Nycticorax caledonicus*), each containing four eggs, about the same size and colour as those of the *Ardea pacifica*, but of a paler tint. The nests were similar in construction and position to those of *A. pacifica*. By this time my bag was pretty well full, so I made my way shorewards, and returned home well pleased with the result of my day's labours, though smarting dreadfully from the combined effects of the 'roleypoley' thorns and the stinging of the ants, to say nothing of sun-burnt shoulders."

## ORDER—HERODIONES: HERONS.

## FAMILY—ARDEIDÆ: HERONS PROPER.

## 703.—ARDEA SUMATRANA, Raffles.—(546)

## GREAT-BILLED HERON.

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 54.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvi., p. 68.

*Previous Descriptions of Eggs.*—\*Gould: Birds of Australia, Handbook, vol. ii., p. 106 (1865); Campbell: Victorian Naturalist (1889).

*Geographical Distribution.*—Northern Territory, Queensland, and New South Wales; also throughout the Austro-Malayan Archipelago up to Further India.

*Nest.*—Formed of an outer layer of very strong sticks, with a few small twigs as a lining (Gould—Gilbert).

*Eggs.*—Clutch, four probably; elongated ellipse in shape; texture of shell coarse; surface faint trace of gloss; colour, light bluish-green. Dimensions in inches: 2.66 × 1.6.

*Observations.*—Gilbert, on the 5th February, 1843, in Port Darwin district, found a nest containing two eggs of the Great-billed Heron, built in a large and lofty melaleuca. Further, according to Gould, Gilbert states that this bird is solitary in habits, and only to be found in the most secluded creeks in the open spaces among the mangroves. Although chiefly a northern species, it has, as shown in Dr. Ramsay's Tabular List, been found down the eastern coast as far as New South Wales. The Great-billed Heron has also an Austro-Malayan habitat. An egg received through the late Dr. Kutter, in my collection, was taken in the Moluccas, 1878.

## 704.—ARDEA CINEREA, Linnaeus.—(545)

## GREY OR COMMON HERON.

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 55.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvi., p. 74.

*Previous Descriptions of Eggs.*—Hume: Nests and Eggs of Indian Birds (1875), also (Oates' ed.) vol. iii., p. 233 (1890); Legge: Birds of Ceylon, p. 1130 (1880); Campbell: Southern Science Record (1883).

*Geographical Distribution.*—New South Wales and South Australia; also New Zealand, Austro-Malayan Archipelago, Asia, Africa and Europe.

\*No dimensions given.

*Nest.*—Large, flat (the centre being slightly concave); roughly constructed of sticks, lined with dry grass, wool, &c. Situated in a tall tree, upon a cliff by the sea coast, or occasionally on the ground (Butler).

*Eggs.*—Clutch, three to six, usually four; elliptical in form; texture of shell coarse; surface slightly glossy; colour, light bluish-green, mottled over with lime deposits. Dimensions in inches of a set from Europe: (1)  $2.39 \times 1.7$ , (2)  $2.17 \times 1.61$ , (3)  $2.12 \times 1.6$ .

*Observations.*—The Common Heron evidently enjoys almost a world-wide range. Gould, during his journey into the interior of South Australia, 1839, saw a fine adult example of this bird, but although he resorted to every possible stratagem in his power to get within shot of it, he was unsuccessful. However, he afterwards received a skin of this species direct from New South Wales.

Amongst other localities the Grey Heron is known to breed in India, where it usually lays in small colonies in trees, amongst other kinds of Herons, Egrets, Ibises, &c.

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705.—MESOPHYX PLUMIFERA, Gould.—(550)

PLUMED EGRET.

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 57.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvi., p. 87.

*Geographical Distribution.*—Australia in general; also New Guinea and Moluccas.

*Nest and Eggs.*—Undescribed.

*Observations.*—We all agree with Gould when he says no one of the members of the beautiful genus of White Herons is more interesting than this species, inasmuch as it is not only adorned with the redundancy of graceful plumes springing from the back like the other species, but it has a mass of ornamental feathers of precisely the same structure hanging from the lower part of the neck and chest. Are not these adornments only donned during the breeding season?

The Plumed Egret has been observed in nearly every State, either about the mud flats of bays or estuaries or in swamps and lagoons in the interior, but no Australian breeding grounds have yet been discovered, or at least invaded by the collector. True to their tribe, they possibly breed in heronries or colonies, sometimes in company with other species of Herons, Ibises, &c.

The food of all Egrets consist of fish, frogs, aquatic insects, &c. A fine specimen of the Plumed Heron, procured at Western Port by one of our field naturalists, had no less than three dozen small fish in its stomach.

**706.**—HERODIAS TIMORIENSIS, LESSON.—(549)  
*H. alba* (nec. LINNÆUS), GOULD.

EGRET.

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 56.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvi., p. 98.

*Previous Descriptions of Eggs.*—Potts: Ibis, p. 313 (1871); Buller: Birds of New Zealand (1873), vol. ii., p. 128 (1888); Campbell: Southern Science Record (1883); North: Austr. Mus. Cat., app. (1890).

*Geographical Distribution.*—Whole of Australia and Tasmania; also New Zealand, and through the Austro-Malayan Archipelago up to North China and Japan.

*Nest.*—Firmly and coarsely built of sticks, well interlaced, and forming a strong platform. There is no lining except the smaller twigs that finish off the top. Diameter, about 17 inches. Usual position in a herony or colony in trees, overhanging a river. Sometimes, however, the nest is solitary.

*Eggs.*—Clutch, three to four; elliptically inclined in shape; texture of shell coarse; surface slightly glossy; colour, light bluish-green. Dimensions in inches of a clutch: (1) 2.2 × 1.5, (2) 2.2 × 1.55, (3) 2.2 × 1.52, (4) 2.2 × 1.52. (Plate 26.)

*Observations.*—The Large Egret is a noble species in matchless white plumage. Graceful plumes spring from the back and overlap the tail, while the bill and eyes are yellowish, and the legs look oddly black. The ornamental plumes are only worn during the breeding season. In size the bird is long and graceful, and about 30 inches in length. Gould called it the Australian Egret, and it is now accepted as not being identical with the great White Heron of Europe and elsewhere. The Australian variety ranges up to Japan. The bird, although not numerous, has been noted for all the States, including Tasmania and New Zealand, where it is met with along the rivers and lagoons of the interior, as well as in the neighbourhood of the coast. The birds fly gracefully with measured flight and slow, and it is a beautiful sight to witness a small flock of them in the dazzling sunshine arrange themselves into the form of a pyramid on the crown of some dead tree near the river. However, these are sights one sees when one's gun is left in camp. But when you have that murderous weapon the beautiful birds are extremely shy and difficult to approach within range. I remember once obtaining a beautiful skin without expending ammunition. I was in the scrub on the Fitzroy River, Queensland, when I heard a distant shot far down the river, and in the course of time was astonished to see a large snow-white bird, like a meteor from the sky, fall upon the ground near me dead. It was in full nuptial plumage, adorned with plumes, and no doubt expired when holding on its course as long as it could after receiving the gun shot, the report of which I had heard down the stream.



From the late Mr. T. H. Potts's beautiful description of the White Heron in New Zealand I quote the following:—"Little if anything was known about its breeding habits. In answer to enquiries, we found it was generally said to breed in swamps. At last, in December, 1871, from a sure source, we heard of a breeding place on the West Coast. It was called a cranery. It was distant certainly, being on the other side of the island, let us say, between two and three hundred miles from home. The writer and one of his sons, having ridden across the island, and thence southerly to the junction of the Waitangi with the Waitoroa rivers, found the breeding station to be situated about three miles inland from the sea, on a stream called the Waitangi-tuna (wailing river of eels). We reached the secluded home of the Kotuku (as the Maoris call the bird) by boat, passing through forest scenery of wondrous beauty. As the dense bush closed in, the swift flowing river on either side, an open glade was formed where each stretch of water disclosed to our delighted gaze fresh vistas of surpassing loveliness—drooping mosses, pendant fronds of pellucid ferns, waving like fairy banners; epiphytes, broad lichens, and flowering climbers lent their aid to dress each tree in endless shades of colour. The rimu and rata showed, in their well-contrasted foliage, like rival forest queens, each worthy of a prize for beauty. Our rapture with the wild graces of the forest tarried briefly, for rounding a little point, at once we lost all thought or care of what had just caused us such vast delight, in taking in the novel scene before us. On the still air, suddenly sounded, came a rushing noise of wings, now high above, and around us flew scores of small black Shags, and many a noble-looking Heron, in high alarm, crossing the stream, or following its windings, soaring over the tops of the trees, or gliding past the deep shadows of the woods. Our first surprise over, we could note the movements of the birds we had so much dismayed. In company with many scores of sombre-plumaged Shags, we could see from forty to fifty white-robed Herons, displaying each trick of attitude and movement, graceful or grotesque, as they brooded over or shuffled awkwardly from off their nests, prepared for flight, took wing, glided aloft, settled on tree tops, or prepared to alight. We found the small black Shags in close association with the Herons. The structures of the latter, in most cases clustered round with the smaller basin-shaped nests of the Shags, were built in a variety of trees that stood close to, in cases partly overhanging the stream, at heights varying from eight to forty feet above the ground. Around several trees were twisted the rough rope-like stems of the aspiring *Rubus australis*, and in one instance a Heron's nest occupied the top of a tree fern, with the bird crouched over her charge, the white plumage showing through the spreading fronds; this was voted the gem amongst the abodes of the heronry. The eggs were three quite as often as four to each nest. On close examination we found the eggs differed but little in size; in shape they did present a slight variation in contour, from oval to rather long ovoid form; colour, pale-green, that evidently faded slightly during the period of incubation. Whilst flying around and high above us, doubtless disgusted at our intrusion, a few birds now and then gave utterance to a hoarse call or cry of 'kornk, kornk,' repeated at slow intervals.

"From a pretty careful scrutiny, we judged that the most interesting heronry comprised some five-and-twenty nests; whilst those of the Shags, closely intermingled, were at least five or six times as numerous. We carried away most carefully the tree fern top and nest, together with several eggs; made no attempt to capture or kill a bird, being thus mindful to excite as little alarm as possible, and had the pleasure of seeing many of them returning to their nests. In the heronry the nests must be repaired year after year, as the same spot has been an old-established breeding station; those birds which breed earliest appear to select nurseries at the greatest height from the ground, as it was proved that the freshest eggs were in the lowest structures. The Heron commences laying about the third week in November; it incubates about four weeks; when the young appear, so strongly is the parental instinct developed in the old bird, that it assumes a courage foreign to its nature at all other seasons, as it has been known to suffer itself to be taken on the nest rather than desert its helpless offspring. It may be observed that the young birds remain on the nest for a considerable period, thereby the labour of the old birds in bringing home a sufficient food supply is much less than it would be if their young scrambled from the nest earlier and took up several scattered stations."

Some time subsequently Mr. Potts sent me a pair of the Heron's eggs, which he gathered on that now historic trip, and with no small amount of satisfaction did I place them in my cabinet.

Mr. H. R. Elvery, on the 8th November, 1899, found a small colony of White Egrets breeding in the Richmond River district of New South Wales. The nests were picturesquely situated in the topmost branches of trees which were enveloped with masses of vines, on an island in a swamp. Cormorants and Nankeen (Night) Herons were likewise nesting near.

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707.—NOTOPHOYX NOVÆ HOLLANDIÆ, Latham.—(548)

WHITE-FRONTED HERON.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 53.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 109.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 299 (1865); Ramsay: Proc. Zool. Soc., p. 341 (1877); North: Austr. Mus. Cat., p. 318 (1889).

*Geographical Distribution*.—Whole of Australia and Tasmania; also New Zealand, Loyalty Islands and New Caledonia; through New Guinea (probably) to the Moluccas and the Celebes.

*Nest*.—A platform, about 15 inches in diameter and 3½ inches in height, composed of coarse sticks, with smaller sticks or twigs built into the centre, and placed in branches of an overhanging tree, usually near water. The nest is much bespattered with lime and frequently re-used.

*Eggs.*—Clutch, four to five; elliptical in shape; texture of shell somewhat coarse; surface slightly glossy; colour, pale bluish-green, when fresh the shade is exquisite for beauty. Dimensions in inches of a proper clutch: (1) 2.03 × 1.35, (2) 2.0 × 1.35, (3) 1.96 × 1.37, (4) 1.92 × 1.38, (5) 1.89 × 1.36. (Plate 26.)

*Observations.*—No bird of its kind is probably more common than the White-fronted Heron, or so-called Blue Crane of the colonists. It is common to the whole of Australia and Tasmania, and wherever is a sheet of water, a river, or the mud flat of an estuary there will surely be found the attendant Blue Crane. The White-fronted Heron takes its vernacular name from its conspicuous white face and throat, while all the rest of the plumage is bluish-grey or slate-coloured, wearing a brownish tinge on the under parts. The bill is leaden colour, with eyes to match, and the legs are of a yellow hue. The bird is smaller than the Pacific Heron, being about 24 inches long. Its flight is heavy and irregular, and when on the wing or disturbed it utters a loud hoarse note. When in search of food it wades knee deep into the water in quest of marine insects, crabs, fish, &c., and when on land will not despise small reptiles.

These birds do not build in a heronry like some of the other species, nor are the solitary nests always placed near water. Once I found a nest with young in a box (*Eucalyptus*) tree, on the plains near Pyramid Hill, Victoria, some distance from the nearest swamp. The youngster was a comical looking creature, clothed in greyish down, and when disturbed thrust its long snake-like head and neck into the air and waved it to and fro.

When on the Loddon, in 1884, I observed a Heron sitting on her nest in a tree which also contained a Goshawk's nest.

In Tasmania, five clutches of five eggs each were taken from the same Heron's nest, and, notwithstanding, the bird succeeded in rearing a brood before the season expired; therefore the species would appear to be a persistent layer.

Usual breeding months from September to December or January.

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## 708.—NOTORHOYX PACIFICA, Latham.—(547)

### WHITE-NECKED (PACIFIC) HERON.

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 52.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvi., p. 111.

*Previous Description of Eggs.*—Bennett: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 324 (1882); Campbell: Southern Science Record (1883); North: Austr. Mus. Cat., p. 317, pl. 18, fig. 2, (1889).

*Geographical Distribution.*—Whole of Australia and Tasmania.

*Nest*.—A loosely constructed platform of sticks, situated in a tree overhanging a stream, or standing in a lagoon. The birds usually breed in small companies or in a heronry, consisting of about twenty-five or thirty nests. But occasionally the nests are solitary.

*Eggs*.—Clutch, four, sometimes five; vary in shape from roundish to elliptical; texture of shell coarse; surface has faint trace of gloss, and pitted; colour, light bluish-green, occasionally soiled with bird lime. Dimensions in inches of a set of round ovals: (1)  $2.17 \times 1.56$ , (2)  $2.08 \times 1.58$ , (3)  $2.06 \times 1.6$ ; of an elliptical pair: (1)  $2.23 \times 1.49$ , (2)  $2.22 \times 1.5$ .

*Observations*.—This handsome bird is found generally throughout Australia and Tasmania, being partial to quiet swamps, where it is sometimes observed in company with other wading birds, amongst which it is easily recognised by its dark-coloured body contrasted with white head, neck, and beautiful elongated breast feathers. The upper part of the bill is black, the under portion of it yellow, while the feet are black and the eyes dark-brown. Altogether it is a goodly-sized bird, being about 30 inches in total length, and a striking object in a landscape when posed in a picturesque lagoon. The Pacific Heron feeds on frogs, newts, and aquatic insects, and its actions in walking about lagoons in search of such prey are full of grace and elegance. When disturbed it utters a hoarse, ventral note, and mounts up to the dead limb of an adjacent tree. The last occasion I saw these fine Herons at home was in a small swamp near the Campaspe River, where I observed a pair for some time feeding in company with a pair of White-fronted Herons, and a solitary Straw-necked Ibis, which, bustling about in a hungry manner, was a contrast to the stately movements of the Herons.

For the beautiful eggs that grace my cabinet I am indebted to Mr. E. H. Lane (of Wambangalang, New South Wales), who took them from a heronry near Dubbo. Concerning them he writes: "I took the nests on upper side of Derribong Run, on the East Bogan, about ten miles above Dandaloo, in the month of September, 1880, during the last few days of the month. The nests were on rather stunted white box-trees, within the edge of a small lagoon or swamp, and I had to ride in with my nephew up to the saddle-flaps in water and hold his horse while he climbed for the eggs. Some of the trees had from three to five nests in them, and altogether we visited from twenty to thirty nests, some of which had young ones, others eggs far gone with young, and in various stages to fresh. The number of eggs to each nest was usually four, in an odd one three. In one of the trees where there were three or four Herons' nests, was also that of a Yellow-billed Spoonbill, with one freshly-laid egg, which I was obliged to take, as I was starting for Wambangalang station the following morning."

A solitary nest containing a pair of eggs just "chipped" was observed at Coomboolaroo (Queensland), about the middle of March, 1887. This fine Heron has been observed by Mr. K. H. Bennett breeding in company with the Yellow-legged Spoonbill (*Platalca*

*flavipes*), on trees in swamps in the Lachlan district (New South Wales), 1879. The nests of the Herons were composed of sticks laid crossways over some horizontal fork or flat portion of a thick bough, and were of a scanty nature, through which the eggs could be seen from underneath.

Mr. S. W. Jackson informs me he found the White-necked Heron for the first time (1898) breeding in his district (South Grafton). Even the aborigines state that they (the Herons) never built there before.

Two nests found on September 7th were in separate trees (Eucalypt), at an altitude of 100 feet, and hard to get at, but with the aid of his brother Frank, Mr. Jackson obtained a set of fresh eggs from each. Several other nests were found in another locality.

Breeding months, September to March.

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709.—NOTOPHOYX FLAVIROSTRIS, Sharpe.—(554)  
*Herodias picata*, Gould.

PIED EGRET.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 62.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 112.

*Geographical Distribution*.—North-west Australia, Northern Territory and North Queensland.

*Nest and Eggs*.—Undescribed.

*Observations*.—Gould's original examples of this beautiful Egret were procured by Gilbert and Commander Ince, in the Port Darwin district. The former states that the bird inhabits inland swamps, and is usually encountered in small families, often in company with other species, but is not so abundant in the vicinity of the harbour (Port Essington) as on the islands at the head of Van Diemen's Gulf, where it appeared numerous. Nothing is known of its nidification.

As Gould's original name, *Ardea (Herodias) picata*, appears to have been preoccupied by Raffles, the species required a new name. Dr. Sharpe has proposed *Notophoyx flavirostris*.

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710.—NOTOPHOYX ARUENSIS, Gray.

ARU EGRET.

*Figure*.—Cat. Birds Brit. Mus., vol. xxvi., pl. 1B.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 113.

*Geographical Distribution*—Northern Territory, also Aru Islands.

*Nest and Eggs*.—Undescribed.

*Observations.*—Dr. Sharpe considers this other variety of Pied Egret a good species. He states: “This is the species evidently referred to by Gould in his ‘Handbook’ as the young of *N. picata*, when he says: ‘The young birds differ in having the whole of the under surface white.’ Neither of the specimens in the Museum (British) appear to be immature, as they have full crests of white plumes, and further, we know that the young of *N. picata* is different.”

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**711.**—GARZETTA NIGRIPES, Temminck.—(551)  
*Herodias melanopus*, Wagler.

LESSER EGRET.

*Figure.*—Gould: Birds of Australia, fol., vol. vi., pl. 58.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvi., p. 122.

*Geographical Distribution.*—Australia in general; also New Guinea, Moluccas and Java.

*Nest.*—A platform of sticks (about 12 inches in diameter) in a eucalypt or other tree at the edge of a swamp or lagoon. Usually in colonies.

*Eggs.*—Clutch, three to four; short ellipse in shape; texture of shell somewhat coarse; surface slightly glossy and minutely pitted; colour, light or pale bluish-green. Dimensions of a set taken near the Nicholson River, North Queensland, 25th April, 1898: (1) 1.89 × 1.34, (2) 1.8 × 1.57, (3) 1.75 × 1.29. (Mr. S. W. Jackson's collection.)

*Observations.*—The Lesser or Spotless Egret is the smallest of the Australian White “Cranes.” According to Gould, both sexes are adorned with long, flowing plumes during breeding season; but the birds may be distinguished from the other Egrets by their dark-coloured bills.

There appears to be genuine doubt whether or not the Little Egret (*G. garzetta*) is really an Australian bird. Gould's identification was from a lithograph of a bird killed in the neighbourhood of Brisbane. The bird was probably the Lesser Egret.

- 712.—*DEMIEGRETTA SACRA*, Gmelin.—(553, 555, and 556)  
*Herodias asha* (nec Sykes), Gould.  
*D. jugularis*, Forster.  
*D. greyi*, Gray.

## REEF HERON.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pls. 59 to 61.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 137.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii. p. 308 (1865); Potts: Trans. New Zealand Inst., vol. iii., p. 97 (1871); Hume: Nests and Eggs Indian Birds (1875), also (Oates' ed.) vol. iii., p. 246 (1890); Buller: Birds of New Zealand, vol. ii., p. 133 (1888); North: Proc. Linn. Soc., N. S. Wales, 2nd ser. vol. ii., p. 445; also Austn. Mus. Cat., pl. 18, fig. 5, (1889); Le Souéf: Ibis, p. 422 (1895).

*Geographical Distribution*.—Coasts of Australia and Tasmania; also New Zealand and other islands of the Pacific up to Corea Bay; coasts of Further India and Austro-Malayan Archipelago.

*Nest*.—Somewhat shallow, and about 15 inches in diameter, constructed of coarse herbage, lined inside with finer material, and usually placed on a ledge or under shelving rock or in a tree at various heights.

*Eggs*.—Clutch, two to three, occasionally four; elliptical in shape, texture somewhat coarse; surface without gloss; colour, bluish-white; when held up to light the inside lining of the shell is a beautiful light-green. Dimensions in inches of a full clutch: (1) 1.86 × 1.34, (2) 1.85 × 1.35, (3) 1.77 × 1.35, (4) 1.77 × 1.32. (Plate 26.)

*Observations*.—The Reef Heron is found along our shore line, and on outlying reefs and islands elsewhere. It is supposed to be a tropical or sub-tropical species, but about twenty years ago I observed Reef Herons, both the slate-coloured bird and the pure white variety, as near Melbourne as Phillip Island. A few years after, Mr. E. D. Atkinson, of Tasmania, reported having found birds breeding for successive seasons on small islands off the north-west coast of that State.

The Blue Reef Heron has slaty-black plumage, relieved with stripe of white or buff down the chin. At first sight the bird resembles the familiar White-fronted Heron, but being about 23 inches in length it is shorter, sharper in appearance, and not so stately as the White-fronted Heron. The White Reef Heron, with the exception of a greenish-coloured bill and legs, is perfectly white; otherwise in shape and size it is the duplicate of the dark-coloured bird. This difference of colour has sorely puzzled naturalists. Some authorities treat them merely as varieties, others as different species. Gould, our great Australian observer, separated the birds. Mr. Atkinson and I observed the association of both varieties in Bass Strait; but it is a strong point for Gould that only the dark variety is found in New Zealand. Why do not the two coloured birds develop there as in Australia and the Austro-

Malayan region? However, it is now generally admitted by modern ornithologists that certain species of Herons have two phases of plumage—one blue, the other white—though probably there is yet a good deal more to be learnt before the right explanation of observed facts is given. Moreover, parti-coloured birds have also been observed.

Professor Moseley ("Notes by a Naturalist on the 'Challenger'") states: "A small Heron (*Demicretta sacra*) wades about on the coral reefs at Tonga, and catches small fish, and is also to be seen frequently inland all over the island. This bird changes its plumage from pure white to uniform grey, and all stages of parti-coloured plumage were to be seen during our visit. Contrary to the usual rule, the bird is white when young, and dark in the mature state. Hence the ancestors must have been white, and the race is assuming a darker plumage for protection."

Prompted by my article on Reef Herons, which appeared in "The Australasian," 24th February, 1894, Mr. F. Arthur Jackson, of Jackson Dale, Fiji, sent the following valuable testimony respecting the transition stage of plumage of these birds. He wrote: "During a residence of twenty-six years in Fiji I have had many opportunities of observing both the blue or slate-coloured Heron (*Demicretta sacra*), and the pure white variety, and until this year I was under the belief that they were distinct species. A constant puzzle was that I more frequently observed pairs consisting of a blue bird and a white bird together, than pairs of blue or pairs of white. The natives of Fiji have only one name for the blue Heron and the white Heron, viz., 'Belo.' If asked to distinguish them they call the white 'Belo Vuso,' and the blue 'Belo Loa,' meaning white 'Belo' or Heron, and black or dark 'Belo' or Heron. They believe that both varieties are white when young, and change to blue or slate-coloured after they have reached maturity. The Fijian natives have a name for the bird when in process of changing its plumage from white to blue or slate-coloured. They then call it 'belo sa rewa.' This year, for the first time during my long residence in Fiji, I have seen three different birds at the 'belo sa rewa' stage—i.e., in that stage when they change plumage from pure white to blue or slate-coloured. The first I saw let me get within twenty paces (they are very tame in the outlying districts and islands of Fiji) before rising; and, to my great surprise, I noticed a white Heron with blue stripes or bars across the body and wings. Before I saw this bird I had disbelieved the natives' story touching the 'belo sa rewa.' I afterwards got close to another marked like the first, and a fortnight ago I saw one nearly all blue or slate-coloured, with only a patch of white on the back, and part of the tail feathers were blue and part white. My reason for troubling you with this note is a statement, made by a correspondent of the great Australian observer, Gould, which you quote in your paper, 'Some Australian Birds,' in 'The Australasian' of 24th February, 1894. Gould's correspondent (quoted by you) says: 'From the circumstance of my always having found this (the white bird) and the dark-coloured species in company, I considered them as the same bird in different stages of plumage, their size and proportion being so similar, and was surprised that individuals exhibiting a change from blue to white, or



vice-versa, never occurred.' The natives of Fiji say this change (from white to blue only) does occur, and my having absolutely seen three birds in different stages of change from white to blue or slate-colour goes far to disprove the statement of Gould's correspondent, viz., 'that individuals exhibiting a change from blue to white or vice-versa never occurred.'"

Students who may wish to follow this difficult, and the same time interesting, subject of colouration further, will find some useful hints in Colonel Legge's "Birds of Ceylon" (p. 1136), and in Messrs. Baird, Brewer and Ridgway's "North American Water Birds," vol. i., pp. 43 and seq.

The Sombre Egret mentioned by Gould\* would appear to be merely another variety of the Reef Heron.

With regard to the blue variety, which Mr. E. D. Atkinson observed breeding on a small island off the north-west part of Tasmania, where he first took eggs in November, 1883, writing to me October, 1885, Mr. Atkinson states: "Whilst walking among the rocks I flushed a Reef Heron and found a nest with four young birds; looking about I got a second nest with two young ones. This is very disappointing, as the eggs I took previously were taken fairly fresh about the middle of November, and here I get young birds in two instances on the 27th October. Both nests were under shelves of slanting rock.

"The nest, as I think I mentioned, taken on the west coast was among tussocks; the one seen yesterday, with young birds, was a very neat one, made of dead stalks about as thick as a pipe stem, and carefully hidden under a shelf of rock. But I could find no nest with the four young birds which were older than the two, and should have thought they might have wandered from it, but the chipped egg shells proved they had not. The eggs must have been laid where I found the birds—on the ground under the leaning rock, and so protected from view that I should never have seen them had not the bird flown out close to my feet. There was probably a third nest, as five birds were hovering round me at this spot."

Once, on the 25th September, Mr. Tom Carter found a nest with a single egg of the White Reef Heron on Fraser Island, North-west Australia. On another occasion he observed two young birds in a nest, nearly fledged, and, like their parents, perfectly white. Mr. Carter also sends the following curious note: "On the wreck of the steamer 'Perth,' on the reef here, is a nest, made originally by a pair of Reef Herons. It being too far to carry sticks, the birds made the nest entirely of broken pieces of fencing-wire, picked up from the wrecked cargo. This year a pair of Black Cormorants has laid in the nest."

In Bass Strait Reef Herons commence to lay in September. In the tropics, probably, the season is different or may be variable. On Hope Islands, off the North Queensland coast, Mr. D. Le Souëf observed fully-fledged young in November; while in the same locality Mr. R. Hislop took several clutches of fresh eggs in April.

\* Handbook, vol. ii., p. 305.

713.—*NYCTICORAX CALEDONICUS*, Gmelin.—(557)

## NIGHT HERON.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 63.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 158.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 312 (1865); Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 55 (1885); North: Austr. Mus. Cat., p. 320, pl. 18, fig. 1 (1889).

*Geographical Distribution*.—Whole of Australia and Tasmania; also New Zealand (occasional), New Guinea (including Admiralty Islands), Celebes, and north to Pelew Islands.

*Nest*.—A loosely constructed platform of sticks, placed in a heronry, in trees standing in water; but frequently a solitary nest may be found in a tree usually overhanging a stream.

*Eggs*.—Clutch, four; elliptical in shape; texture of shell somewhat coarse; surface slightly glossy; colour, light bluish green. Dimensions in inches of typical eggs: (1)  $2.03 \times 1.4$ , (2)  $2.0 \times 1.39$ ; of a pair of rounder-sized examples: (1)  $1.94 \times 1.5$ , (2)  $1.92 \times 1.53$ . (Plate 26.)

*Observations*.—The Night Heron is found throughout Australia and Tasmania, with the extremes of its range from New Zealand in the south to the Pelew Islands in the north, and as its name implies, is strictly nocturnal in its habits, resting asleep, or half asleep, in tall trees during the day. At night, for food, it perambulates the swamps and creeks in favoured localities, where its hoarse croaking may be often heard.

When young, the plumage is buff or dark-brown, and is remarkable for its blotched or spotted appearance; but when mature, both sexes are dressed in a handsome coat of cinnamon-brown, with the under surface white, the crown of the head being black, from which grow two narrow, white, occipital plumes. Orange-coloured eyes, somewhat short dark bill, and light-yellow legs complete the bird's general description. Its total length is about 20 inches.

I never succeeded in discovering the nest of the Nankeen or Night Heron. The specimens of eggs I have described were received from the collection of the late Mr. George Barnard, and were taken from a heronry on the well-known Gracemere Estate, near Rockhampton, Queensland.

On Campbell Island, River Murray, there used to be a heronry where the Nankeen Herons have been observed breeding in numbers in company with the Pacific Herons and Egrets, during September and October, in flood time.

Overhanging a creek, about seven miles from Melbourne, it is stated that a solitary nest and eggs of this nocturnal species were taken not many seasons ago. In by-gone days the trees in the Botanical

Domain were favourite roosting places for great numbers of these birds, which were usually observed, in immature plumage.

Breeding months, September to December, and later in the Tropics. In North Queensland, eggs have been taken in April, even as late as June. These birds are also stated to breed in the mangroves in the Fitzroy River district (North-west).

**714.** BUTORIDES STAGNATILIS, Gould.—(560 and 561)  
*B. macrorhyncha*, Gould.

LITTLE MANGROVE BITTERN.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pls. 66 and 67.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 183.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 318 (1865); Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 50 (1882); North: Proc. Linn. Soc., N.S. Wales, vol. ii., 2nd ser., p. 445 (1887); North: Austr. Mus. Cat., p. 322, pl. 18, fig. 6 (1889).

*Geographical Distribution*.—West and North-west Australia, Northern Territory, Queensland, and New South Wales; New Guinea and Molucca Islands, Timor and Flores, Solomon Islands, New Caledonia, New Hebrides and Fiji, Friendly and Society Islands.

*Nest*.—Similar, but smaller in size to that of the Yellow-necked Bittern, being a platform of small sticks, placed on forked horizontal branches of a bushy tree or mangrove, over water. Diameter, 12 to 14 inches.

*Eggs*.—Clutch, two to three; elliptical in shape; texture somewhat coarse; surface slightly glossy; colour, light bluish-green. Dimensions in inches of a proper clutch: (1) 1.68 × 1.22, (2) 1.64 × 1.22, (3) 1.6 × 1.24.

*Observations*.—It will be observed that this interesting little Bittern enjoys a goodly range, its favourite haunts being small islets covered with mangroves and low swampy points of land running out into the sea.

It appears to be now accepted by the latest authorities that the Thick-billed and the Little Mangrove Bitterns are identical. On this point Dr. Sharpe (who examined and described the 120 species of *Herodiones* in the British Museum) states: "I have not been able to discover any evidence of the existence of two species in Australia, so far as my experience of the series in the British Museum enables me to judge; and I believe that Gould's *B. macrorhyncha* is the same species as his *B. stagnatilis*, being founded upon young or winter-plumaged specimens. Although in his pictures he has coloured the soft parts differently, I consider these colours to be due to seasonal changes only."

Gilbert found a colony of Little Mangrove Bitterns breeding on two small islets in Coral Bay, near the entrance of Port Essington.

He gives a pretty picture of their nests—about thirty in number—built both on the mangroves and on the branches of a yellow-blossomed hibiscus. They were very frail structures, consisting of a few small twigs, placed across each other on the horizontal branches, not more than six feet from the ground, and each containing two young birds or two eggs.

Gould states he himself observed two individuals sitting close to their flat nest on the branch of a mangrove growing on Garden Island, near the mouth of the Hunter River, but for some reason or other he did not describe the eggs. Dr. Ramsay, in describing the eggs, states that this Mangrove Bittern used to breed freely at one time in the neighbourhood of Sydney. Mr. John Ramsay, as far back as September, 1860, found several of their nests in the mangroves on the Parramatta River.

The eggs I have described are from the collection of Mr. S. W. Jackson, who has enjoyed pleasant nesting experiences with both this and the Yellow-necked Mangrove Bittern in the Clarence River district.

Breeding months in southern localities, September to, probably, January.

### 715.—ARDETTA SINENSIS, Gmelin.

#### LITTLE YELLOW BITTERN.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvi., p. 227.

*Previous Description of Eggs.*—Swinhoe; Hume-Oates: Nests and Eggs Indian Birds, vol. iii., p. 255 (1890).

*Geographical Distribution.*—Northern Territory and North Queensland; also New Guinea, through the Austro-Malayan Archipelago to Further India, India, China and Japan; Marianne, Caroline, and Pelew Islands.

*Nest.*—In thick reeds or rushes of swamps, two or three feet above the surface of the water.

*Eggs.*—Clutch, four to six; elliptical in shape; texture of shell fine; surface slightly glossy; colour, delicate greenish-white. Dimensions in inches (1) 1.32 × .98, (2) 1.28 × .97, (3) 1.25 × .96.

*Observations.*—It is interesting to have this Oriental little Bittern among the Australian avi-fauna. Mr. J. T. Cockerell procured an adult specimen in Queensland; while another example is also reported from Australia (probably the north). The Little Yellow Bittern is about 15 inches in total length, or about half the length again of the Minute Bittern.

Nests of the Little Yellow Bittern have been taken in various parts of India, Pegu, Amoy and Japan.

## 716. —ARDETTA PUSILLA, Vieillot.—(562)

## MINUTE BITTERN.

*Figur.*.—Gould: Birds of Australia, fol., vol. vi., pl. 68.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvi., p. 234.

*Previous Description of Eggs.*—North: Proc. Linn. Soc., N.S. Wales, 2nd ser., vol. x., p. 219 (1895).

*Geographical Distribution.*—Australia in general; also New Zealand.

*Nest.*—Slight and flat; composed of reeds, &c., loosely put together; placed sometimes on the ground, but usually on a little platform formed by the reeds or rushes being trodden down within a foot or so above the water's level. Dimensions, 6 to 7 inches in diameter by 1 to 2 inches thick.

*Eggs.*—Clutch, four, occasionally five; elliptical in shape; texture of shell comparatively fine; surface very slightly glossy; colour, white. Dimensions in inches of a pair: (1) 1.26 × 1.0, (2) 1.13 × .98.

*Observations.*—The Minute Bittern, although a rare species (obviously on account of its secluded retreats), has been found in many situations conducive to its habits, i.e., swampy reed beds, in Australia. In the olden days the bird was reported in the swamps near Mordialloc, Victoria.

Only one or two sets of their eggs have been taken, therefore we know little or nothing of the breeding habits of this little swamp wader. Mr. A. J. North, in describing the eggs in Mr. Kershaw's collection, remarks:—"Though a comparatively rare species, the Minute Bittern is widely distributed in suitable localities over most parts of Eastern Australia. In New South Wales it still frequents the neighbourhood of Sydney. Specimens have been recently presented to the Trustees of the Australian Museum that were procured on the marshy grounds at the mouth of Cook's River during January, 1895. A freshly-shot specimen was also received in the same month from a correspondent at Narromine, a pastoral and agricultural district situated on the banks of the Macquarie River, and about three hundred miles west of Sydney.

"It appears, however, to be more freely distributed on the swamps in the vicinity of the Murray River, for on several occasions Mr. Everard has been successful in finding its nest and eggs near Mathoura. Mr. James Kershaw, to whom I am also indebted for the loan of the eggs of this species for description, has kindly sent me the following notes relative to the taking of them: 'Mr. H. G. Everard found the nest of the Minute Bittern, containing four fresh eggs, in a swamp near Mathoura, during November, 1893. It was an open nest, composed of aquatic plants and grasses and herbage growing about the swamp, and was fastened to several reeds just above the surface of the water. The bird was seen on the nest, and one was captured alive.'"

717.—DUPETOR GOULDI, Bonaparte.—(559)  
*Butoroides flavicollis*, Latham.

YELLOW-NECKED MANGROVE BITTERN.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 65.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 249

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 315 (1865); Ramsay: Proc. Linn. Soc., N.S. Wales, vol. ii., p. 55 (1882); North: Austr. Mus. Cat., pl. 18, fig. 4 (1889).

*Geographical Distribution*.—Australia in general (except Victoria); also New Guinea.

*Nest*.—A flat structure or platform, slightly concave, composed of small sticks, with a foundation of coarser ones, and placed on a horizontal branch of a low tree—usually a mangrove, but sometimes other tree—over water. Diameter, about 14 inches by about  $3\frac{1}{2}$  inches thick.

*Eggs*.—Clutch, four to five; roundish or elliptical in shape; texture of shell somewhat fine; surface slightly glossy; colour, white, but the inside lining has a light greenish tinge. Dimensions in inches of a proper clutch: (1)  $1.78 \times 1.37$ , (2)  $1.75 \times 1.36$ , (3)  $1.71 \times 1.39$ , (4)  $1.71 \times 1.36$ .

*Observations*.—This fine Bittern, a lover of the muddy mangrove tracts, is found almost wherever these trees grow in Australia. However, it is not unfrequently found further inland. It has been taken by the Messrs. Barnard in the Dawson River district, Queensland, and Dr. E. D'Ombraïn obtained a specimen of the bird near Germantown, between Albury and Wagga Wagga, New South Wales.

Gould described a pair of eggs "of a very much paler bluish-green and more rounded form than those of any other species of the group." I have never seen them other than white in Australia.

In his manuscript, Mr. Lau furnishes a record of a nest of the Yellow-necked Bittern, which he found on the Clarence River, 1862. It was in a mangrove tree, at a height of six feet from the ground, and contained two eggs.

During the last week of December, 1897, when my son Archie was in the Big Scrub of Richmond River district, Mr. Elvery took a set of eggs from a nest of this Bittern, situated in a horizontal limb of acacia overhanging a creek. The nest was about twelve feet from the surface of the water, and was picturesquely situated, by reason of the acacia being in full bloom.

Like some of the other members of its tribe, this Bittern resorts to the same nest to lay again if previously robbed. Mr. Elvery states he knew of two nests which were used alternately by the same pair of birds; this he proved by robbing one nest, whereupon the birds resorted to the other.

Breeding season, September to January.

718.—*BOTAURUS PŒCILOPTILUS*, Wagler.—(558)

## BITTERN.

*Figure*.—Gould: *Birds of Australia*, fol., vol. vi., pl. 64.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 258.

*Previous Descriptions of Eggs*.—Potts: *Trans. New Zealand Inst.*, vol. ii., p. 69 (1870); Buller: *Birds of New Zealand* (1873); also vol. ii., p. 143 (1888); Ramsay: *Proc. Linn. Soc., N.S. Wales*, vol. vii., p. 55 (1882); Campbell: *Southern Science Record* (1883), also *Nests and Eggs Austr. Birds*, pl. 2, fig. 558 (1883); North: *Austr. Mus. Cat.*, p. 320, pl. 18, fig. 3 (1889).

*Geographical Distribution*.—Australia in general and Tasmania; also New Zealand, including Chatham Islands; New Caledonia.

*Nest*.—A platform (about 12 to 15 inches in diameter) of dead reeds, built crosswise up to 6 or 7 inches above the water, amongst the rushes or reeds of a swamp. Sometimes very fine down from the birds, adheres about the top of the nest. Occasionally a nest is situated in long grass and solely built of that material.

*Eggs*.—Clutch, four to five; oval in shape, or slightly more compressed at one end; texture of shell coarse; surface glossy and occasionally rough; colour, light or pale-olive. Dimensions in inches of a proper clutch: (1) 2.05 × 1.49, (2) 2.0 × 1.47, (3) 2.01 × 1.46 (4) 1.95 × 1.38, (5) 1.94 × 1.44. (Plate 26.)

*Observations*.—Almost every permanent reedy swamp or marsh is tenanted by a pair of Bitterns, and should the swamp be vast there will be more of these curious nocturnal birds. By night and by day also you may hear their loud booming notes issuing from tea-tree swamps in Western Australia, from like places in Eastern parts, from the marshes of Tasmania or King and Flinders Islands. The Bittern wears a beautiful mottled plumage of buff or dark purplish-brown, with yellow-irised eyes, so suitable for use by night. A greenish coloured bill and legs complete a fair sized bird about two feet in total length. Abiding constantly in swamps, the Bittern feeds on fish, frogs, snails, and insects. Not much is understood of the natural economy of the Bittern, consequently the bird has been viewed with a certain amount of superstition. I am not sure but that its bellowing notes coming from some dismal swamp have not been taken by natives, both black and white, for the cry of the bunyip. However, all aborigines are not superstitious about the bird, for on the Murray, near Echuca, they know it well, and call it the "Bar-mah," and in some parts of Western Australia it is called the "Bur-den-etch." Gould did not succeed in gathering any information about the nesting habits of this night-bird. It was not till 1870 that Mr. T. H. Potts described the eggs from New Zealand. Some years ago, before the Caulfield swamp, near Melbourne,

was reclaimed by an over-energetic Shire Council, which might have converted it into an ornamental sheet of water, I searched the beds of tall rushes for Bitterns' nests, but without success, although I frequently flushed the birds. I fancy I was always too early in the season, for I heard that another field naturalist succeeded in finding a nest one November. However, my most interesting experience amongst Bitterns' nests was at the swamps bordering the Murray River. With Mr. J. Gabriel and two local farmers I waded into a beautiful clear lagoon full of lovely aquatic plants, with here and there patches of tall, flat flags, "cum-bungie," in aboriginal language, but in botanical lore named *Typha*. An occasional spreading red gum tree lent picturesqueness to the swamp. Our first find was a nest, concealed in the flags, containing five eggs. At another spot we discovered a second nest with three eggs, the bird evidently not having completed her set, because the eggs were quite fresh. This swampy adventure took place on the 14th November, 1892. We secured not only Bitterns' eggs, but those of other rare waterfowl; also we had to contend with myriads of persevering leeches. A tiger snake incident or two at times imparted activity to wading. The following day, in a swamp, four or five miles further up the river, this time in bulrushes near a White Ibis rookery, we flushed a Bittern, which winged its way across the swamp in half bewildered fashion. We were not long in finding the nest, which contained a full set of five pale-olive eggs.

The illustration of the Bittern's nest was taken during this trip. It was no easy undertaking to get an effective picture when you consider the trouble of carrying a camera through a swamp, then fixing it in a thick bed of reeds. Remember, too, you are standing in water and feel a twinge every time a great leech fastens on your leg. Above water you fare no better, for flies get into your eyes, while mosquitoes feast on your sunburnt neck.

Usual breeding season November to January.





NEST OF THE BITTERN

*From a Photo by the Author.*



## FAMILY—CICONIIDÆ: STORKS.

## SUB-FAMILY—CICONINÆ.

719.—XENORHYNCHUS ASIATICUS, Latham.—(544)

## BLACK-NECKED STORK (JABIRU).

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 51.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 310.

*Previous Descriptions of Eggs*.—Hume: Nests and Eggs Indian Birds, vol. iii., p. 607 (1875), (Oates ed.) vol. iii., p. 265 (1890); White-Irion: Proc. Roy. Soc., Queensland, vol. iii., p. 137 (1886); North: Proc. Linn. Soc., N.S. Wales, 2nd ser., vol. ii., p. 987 (1887); Campbell: Victorian Naturalist (1888).

*Geographical Distribution*.—Whole of Australia (accidental to Victoria); also New Guinea up to Further India and India.

*Nest*.—A large and somewhat flat structure, composed of sticks, lined inside with grass or such like material, and situated in a large tree usually standing in a swamp. Dimensions, about 4 feet across by 3 feet in height.

*Eggs*.—Clutch, two to four; round or stout oval in shape; texture of shell coarse and granular, especially at the ends, which have the appearance of having been pitted with the point of a pin; surface without gloss. Dimensions in inches of a pair: (1) 2.92 × 2.13, (2) 2.91 × 2.16. The eggs are small compared with the size of the bird.

*Observations*.—Hardly anything can be more picturesque and truly characteristic of the Tropics than a scene representing the solitary figure of a Jabiru standing by a serene lagoon sheltered by paper bark (*Melaleuca*) trees, and with the pied plumage of the noble bird upon long pinkish legs reflected in the water amidst the large blue water lilies.

Although a scarce and shy bird, the Jabiru has been noted in every State, except, perhaps, South Australia. However, its occurrence in Victoria may be considered accidental. About 1894, Mr. Hugh Montgomery observed birds answering to the description of this feathered giant in a shallow swamp in front of "The Heart" homestead, near the Gippsland Lakes. The Jabiru also enjoys an extra Australian habitat, which ranges up to Southern Asia.

Probably the first authenticated Jabiru's nest discovered in Australia was observed by Mr. A. S. McGillivray in April, 1877, on the Saxby River, Queensland. Mr. Macgillivray was then travelling with cattle to the Palmer diggings, so merely had to content himself with a peep at the pair of eggs which the nest contained. He had no means of

conveniently carrying away such large oological trophies. However, the first Australian eggs of the Jabiru described were before the Royal Society of Queensland, by Messrs. W. T. White and Hy. Tryon, on 6th August, 1886, from specimens collected in the neighbourhood of Ingham, on the Herbert River, in March of the previous year.

Mr. White states: "The nest of the Jabiru bears a great resemblance to the nest of the Eagle in both size and appearance, but it is always so situated that there is nothing above it. The bird selects a lofty tree, generally one with the top broken off, close to the margin of a swamp or lagoon, and on the highest point of it builds a pile of sticks about three feet in depth and four in diameter; a thin layer of grass or rushes is placed upon the sticks, and upon this surface, which is almost perfectly flat, the eggs (two in number) are laid. I am of opinion that the Jabiru, like the Native Companion, does not lay more than two eggs, and, like most waders, breeds during the rainy season. I am unable to say what the period of incubation is, but both sexes share in the process."

When I exhibited the pair of "the first recorded eggs of Australia's only Stork," before the Field Naturalists' Club of Victoria, on the 10th October, 1887, I was at the time unaware that the eggs had been described the year previous by Messrs. White and Tryon.

The eggs I described of the Jabiru were collected by Mr. John L. Ayres during August, 1887, in the Clarence River District. The nest was situated comparatively low (about twelve feet from the surface of the water) in tea-tree, in a swamp about six miles from Grafton. Mr. Ayres made the discovery while Duck-shooting in a boat. He has also taken young in long, grey down in the locality.

There was apparently a temporary "boom" in Storks' eggs, for none were collected before, or have been since, that I am aware of.\* About the same time as I exhibited the pair mentioned, Mr. A. J. North described before the Linnean Society of New South Wales another pair in the collection of the National Museum, Melbourne, which were obtained, I believe, through the same channel as mine, and bearing similar data.

Mr. North mentions the fact that my friend, the late Mr. George Barnard, found a Jabiru's nest near Rockhampton (Queensland), but these birds did not remain long in possession of it owing to the repeated attacks of a pair of Wedge-tailed Eagles, which ultimately caused the Jabirus to quit. Mr. North was also informed by Dr. Ramsay that a pair of Jabirus was known to breed on the border of Lake Macquarie, New South Wales, in 1860.

Breeding months, August to March or April.

\* I find Mr. S. W. Jackson has a pair dated Nicholson R 25/4/98. Dimensions (1) 2.95 x 2.15, (2) 2.8 x 2.1.

## ORDER—STEGANOPODES: PELICANS.

## FAMILY—PHALACROCORACIDÆ: CORMORANTS.

## SUB-FAMILY—PHALACROCORACINÆ.

720.—PHALACROCORAX CARBO, Linnæus.—(652)  
*P. nova-hollandiæ*, Stephens.

## BLACK CORMORANT.

*Figure*.—Gould: Birds of Australia, fol. vol. vii., pl. 66.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 340.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 489 (1865); Potts: Trans. New Zealand Inst., vol. iii., p. 108 (1871); Buller: Birds of New Zealand (1873), vol. ii., p. 148 (1888); North: Austn. Mus. Cat., p. 365 (1889); Hume: Nests and Eggs Indian Birds (1875), also (Oates' ed.) vol. iii., p. 270 (1890).

*Geographical Distribution*.—Australia in general and Tasmania; also New Zealand (including Chatham Islands), the Austro-Malayan region, Asia, Africa, Europe, and by way of the Faroe Islands and Iceland to the Atlantic coast of North America.

*Nest*.—Rough, slightly concave on top, constructed of twigs and leaves or aquatic herbage, as the case may be; placed on bushes or low trees over water, in a rookery, sometimes in company with those of other species of Cormorants. In some localities, according to Gould, the nests are composed of seaweed, &c., and placed on ledges of rock. Dimensions, about 18 inches across by 3 or 4 inches high.

*Eggs*.—Clutch, three to four; elliptically inclined in shape; texture of shell coarse; surface without gloss; colour, greenish-white more or less irregularly coated with lime. Dimensions in inches of a clutch: (1) 2.4 × 1.5, (2) 2.34 × 1.49, (3) 2.32 × 1.44.

*Observations*.—This species, the largest of Australian Cormorants, is by sound authorities pronounced to be the common *P. carbo* of Europe. In fact, its range actually stretches right across the world from New Zealand to Iceland.

Gould found the large Black Cormorant, or Shag, nowhere so abundant as in Tasmania, inhabiting not only bays and inlets, but ascending the rivers, even to the lakes in the middle of the island, on several of which they breed. The plumage of the Black Cormorant in general may be described as a dark, glossy, greenish-black, ornamented on the sides of the neck with fine white feathers during the breeding, or summer season. Eyes are green. Dimensions: length, 34 inches; bill, 4 inches; wing, 13½ inches; tail, 8 inches.

Sir Walter Buller gives such a true and graphic picture of the Black Shag, that I cannot help quoting him: "It walks with awkward, waddling gait, supporting itself in part with its tail, which is moved alternately to the right and left at every step. It has a very fœtid odour; and a person approaching a flock of these birds, on the leeward side, is made sensible of this at a hundred yards or more. Its usual attitude on the beach is one of repose, with the body inclined forward, the tail resting full length on the ground, and the head drawn in upon the shoulders. When disturbed it instantly stretches up its neck, listens and watches attentively for a second or two, and then, after a few ungainly steps, shoots its white ordure along the sands, then rises into the air with laboured flapping of its wings, and flies off in the direction of the sea, into which it speedily plunges."

The Black Cormorant is usually shy, wary, and difficult to approach; its eggs are also rare in collections.

Cormorants are deemed vermin simply because they devour fish, making them scarce. But there were plenty of Cormorants before white men came to the country, and abundance of fish too. No, it is civilised man and not the poor Cormorants that are destroying our fisheries.

Miss A. M. Ellis, who, with her sisters, was reared on the lower Blackwood River, West Australia, and can *man* a boat with anyone, carefully collected examples of eggs and made observations of various Cormorants for me that bred in a rookery on the river, not far from her home. Miss Ellis described three species—the Black, the Little Black, and the Little—breeding, as she said, in "a kind of happy family," on the bent stems and forked branches of tea-trees (*Melaleuca*). The large Black constructed its nest of twigs and leaves, while the other two species made theirs entirely of the paper-like bark of the trees. It was also observed that when the birds were disturbed, the big Black birds, on leaving their nests, dived into the water, while the other two kinds flew round overhead. Date, end of August, 1889.

Breeding months, August to November.

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## 721. PHALACROCORAX SULCIROSTRIS, Brandt.—(656)

### LITTLE BLACK CORMORANT.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 67.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 376.

*Previous Descriptions of Eggs*.—Campbell: Southern Science Record (1883); North: Austr. Mus. Cat. p. 367 (1889).

*Geographical Distribution*.—Australia in general and Tasmania; also New Zealand, New Caledonia, and from New Guinea to Borneo.

*Nest*.—Roughly constructed of sticks, in some instances entirely of bark, and placed on a stem or fork of a low tree over water, in a rookery, sometimes in company with those of one or more other species of Cormorants.

*Eggs.*—Clutch, three usually; elliptically inclined in shape; texture of shell without gloss; colour, bluish or greenish-white, more or less coated with lime. Resemble those of the little Cormorant. Dimensions in inches of a clutch: (1)  $2.12 \times 1.34$ , (2)  $1.98 \times 1.31$ , (3)  $1.95 \times 1.3$ . Of a larger sized set: (1)  $2.21 \times 1.46$ , (2)  $2.2 \times 1.42$ , (3)  $2.2 \times 1.43$ .

*Observations.*—The Little Black Cormorant, like the large dark species, is found in places conducive to its habits throughout the Continent, including Tasmania, where it was first reported by Mr. A. E. Brent, who shot a bird at Houghton, in 1890, and in 1893 saw several more of the same kind.

The bird appears more partial to inland waters of rivers and lagoons than to those of the sea. I have observed them somewhat plentiful in the Murray district. It has been found breeding in company with Darters and other Cormorants in Lake Moira, New South Wales. In diving for food I have noticed the periods of time a bird remained under water varied from twenty to thirty seconds.

Mr. W. White informs me that he found the Little Black Cormorant nesting on a small island at the entrance of St. Vincent Gulf, in the autumn (May) of 1894. The nests were constructed of seaweed. Again during our March he observed the same species breeding on stick nests on malee bushes near the mouth of the Murray.

Usual breeding months, August to December.

Hundreds of Cormorants of different kinds used to roost in the low trees standing in the lagoon near Prince's Bridge, Melbourne, before it was filled for the river improvements in 1898. How regularly the birds used to arrive in the evening in small flocks, flying high in the shape of a V, then circling round their camping quarters before settling down! If the weather were boisterous, they would come in sooner, and they always followed the course of the river, the pied birds being the most distinguishable on account of their white breasts reflecting the rays of the setting sun.

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722.—*PHALACROCORAX GOULDI*, Salvadori.—(654)  
*P. leucogaster*, Gould.

#### WHITE-BREASTED CORMORANT.

*Figure.*—Gould: *Birds of Australia*, fol., vol. vii., pl. 69.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvi., p. 396.

*Previous Descriptions of Eggs.*—Gould: *Birds of Australia* (1848), also *Handbook*, vol. ii., p. 492 (1865); Campbell: *Southern Science Record* (1883); Legge: *Proc. Roy. Soc., Tasmania*, p. 133 (1888); North: *Austn. Mus. Cat.*, p. 366 (1889); Campbell: *Victorian Naturalist* (1894); Le Souéf: *Ibis*, p. 421 (1895).

*Geographical Distribution.*—Queensland, New South Wales, Victoria, South and West (!) Australia, and Tasmania; also Louisiade Archipelago.

*Nest.*—Comparatively large, composed of seaweeds of various kinds and colours, saltbush, &c., and terraced in colonies on naked rocks near the sea-shore. Dimensions of an average-sized nest—18 inches over all by 3 or 4 inches in height; egg cavity, 8 to 9 inches across by 2½ inches deep.

*Eggs.*—Clutch, two to three; long oval in shape; texture of shell coarse; surface without gloss; colour, greenish or bluish-white, unevenly coated with lime, which becomes more or less soiled with the dirt of the nest. Dimensions in inches of proper clutches: A (1) 2.5 × 1.43, (2) 2.5 × 1.4, (3) 2.47 × 1.35; B (1) 2.25 × 1.36, (2) 2.22 × 1.35; C (1) 2.18 × 1.48, (2) 2.16 × 1.49.

*Observations.*—The home of this fine Cormorant is Tasmania and Bass Strait, but it probably wanders more or less along the whole of the eastern and southern coasts of the mainland.

The White-breasted Cormorant is an exceedingly showy bird, and in its black and white garb much resembles the Pied. However, the White-breasted is a much finer built bird, with the naked skin at the base of the bill and round the eye purple, whereas the same parts in the Pied are bright-orange.

During the visit of an expedition from the Field Naturalists' Club of Victoria to the Furneaux Group, 1893, a rookery of these Cormorants on Storehouse Island, off Flinders Island, was visited. It was the day after our interesting visit to the Gannet rookery. We were turned out earlier than we expected, at 3 o'clock in the morning, from our snug little cove under Babel Island. The wind had changed and was blowing straight in, so there was nothing for it but to kedge the boat out far enough to get an offing, and make sail for Storehouse Island. We anchored within a hundred yards of the Cormorant Rookery, and were much interested watching the movements of the crowd of birds, while we enjoyed our breakfast. Having landed, we approached the rookery carefully for fear of disturbing the Cormorants before we had an opportunity of taking a successful photograph. It was evident from their uneasy movements they did not intend to remain for pictures as the Gannets did on the previous day. Mr. H. P. C. Ashworth and I took our pictures in turns, getting nearer to the birds each time. The illustration given was the last one taken before the birds rose and cleared out to sea.

An examination of the rookery showed that between 300 and 400 nests were situated or terraced close to each other upon naked granite boulders by the shore, which were well "white-washed." As the season (21st November) was somewhat advanced, the majority of the nests, which were about two or three feet apart, were mostly occupied by fledgelings in black down, a little mouldy white on the underneath parts. The newly-hatched young were quite naked; however, some of the nests contained eggs, one, two, or three, but generally a pair, and some were quite fresh. Our invasion had caused some of the older young to huddle together in bunches of about six or eight. Our leader remarked that when the old ones returned they would probably experience some difficulty in "sorting out" their own.





ROOKERY OF WHITE-BREASTED CORMORANTS

*From a Photo by the Author.*



I must not forget to mention the strong ammoniacal odour of the place, which was most overpowering, especially to those members of the expedition whose stomachs were rendered unduly sensitive by the motion of our boat at sea.

Colonel Legge mentions that about thirty or forty pairs of White-breasted Cormorants were breeding on the top of Blanche Rœck during his visit to the Actæon Islands 28th November, 1886. Large colonies are also known to breed on Cape Frederick Henry (Bruni Island). Mr. D. Le Souëf found a small community of these birds building on ledges of the cliff, their nests being in close proximity to those of the White-capped Albatross (*T. cautus*), on Albatross Island. In one instance, two of the Cormorants' nests were placed within a foot of a brooding Albatross, and both Albatross and nest were plentifully besprinkled with the excreta of the Cormorants.

**723.**—*PHALACROCORAX HYPOLEUCUS*, Brandt.—(653)  
*P. varius*, Gmelin.

PIED CORMORANT.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 68.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 397.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia, Handbook, vol. ii., p. 491 (1865); North: Austr. Mus. Cat., p. 365, (1880); Walker: Ibis, p. 258 (1892).

*Geographical Distribution*.—South Queensland, New South Wales, Victoria, South, West, and North-west Australia.

*Nest*.—Somewhat flat, composed of sticks (saltbush, &c.), and placed in colonies on the ground, sometimes in trees, inland; on an islet, or by the sea-shore.

*Eggs*.—Clutch, two to four, usually three; longish oval in shape; texture of shell coarse; surface without gloss; colour, greenish-white, more or less coated with lime. Dimensions in inches of a pair: (1) 2.42 × 1.47, (2) 2.3 × 1.48.

*Observations*.—This fine black and white Cormorant is probably the most common species of Australian Cormorants. (The true *P. varius* of Gmelin is said to be restricted to New Zealand.) Except, perhaps, during the breeding season, it is seen more frequently inland than the large Black Cormorant.

As other writers have stated, its large size and the contrast of its pied plumage, render it a most conspicuous object in a landscape, especially when seen artistically posed on a sandbank, low ledge of rock, or projecting stump. The birds are gregarious, particularly during the breeding season, when they may be seen in numbers in certain favoured localities on the coast.

Gould mentions the bird as especially abundant on Kangaroo Island, where he first saw this species. By a coincidence, that is the locality whence the examples of eggs in my collection were obtained. They were collected by Mr. Thos. W. Cornock, an employe of the Adelaide Museum, from a rookery of about 500 nests on a sand-pit. The time of the season was remarkable, being the beginning of April (1888), when incubation had just begun.

I observed roughly-made dark nests, splashed white with bird-lime, terraced in small rookeries on isolated rocks on the Abrolhos, also on islets off Rottneest Island, further south, but all appeared deserted, or were not in use.

On the 1st October, 1894, Mr. John W. Mellor found a few of these Cormorants inhabiting a small island in the "Coorong," South Australia, with Pelicans; both birds were breeding. The Cormorants had just commenced to incubate, their nests being situated here and there amongst or near the Pelicans'. When the Cormorants flew round, a Crow instantly appeared, spiked an egg with its bill, and carried it off, despite Mr. Mellor's endeavours to frighten the black marauder away. In answer to my further enquiries, Mr. Mellor was good enough to write: "Cormorants. The one in question is the Pied Cormorant. I found these birds laying within a few yards of the Pelican rookery. The nests were about eighteen inches in diameter at the base, and about twelve inches across the top. They were placed on the trampled-down saltbush, and about a dozen or eighteen yards from the water, and were built about a foot to eighteen inches high, of sticks and sprays of saltbush crossed and recrossed until the whole was quite firm and compact, and had a neat round appearance, with a cup-shaped depression at the top, about a couple of inches deep, in which were placed either two, three, or four eggs. The birds had not long taken up their breeding quarters, as some nests had only one fresh egg in them, while others were barely finished in construction. Mr. White tells me that he has never heard of them breeding in the spring before, he having found them breeding on small islands off Kangaroo Island on several occasions in the autumn, generally starting about the beginning of March, two to four eggs in a clutch. The late Mr. Samuel White, the well-known naturalist of Adelaide, who is quoted by Gould in his works on Australian ornithology, found these birds breeding on a sand-spit in the Bay of Shoals, at Kingscote, Kangaroo Island, South Australia, on the 24th May, 1875. An extract from his note-book says: 'On a sand-spit in the Bay of Shoals, at Kingscote, Kangaroo Island, South Australia, which is grown over with bushes, these birds were in thousands; the season was nearly over, there being only about forty nests with eggs, but the young birds covered an acre of ground as thick as they could stand, and the stench was sickening. Their nests, as usual, were made of a few sticks and bits of seaweed placed close together on the bushes that had been trodden down.'

Gould mentions, on the authority of Dr. Latham, that the Pied Cormorant also breeds in trees. I possess eggs that were taken from nests in trees in the Cape Otway district, Victoria.

As far north as Adèle Island, North-west Coast, Mr. James Walker,

of H.M.S. "Penguin," on 2nd May, 1891, observed a colony of Pied Cormorants breeding. The nests were rudely constructed of twigs, and built on the bushes about three feet from the ground. Each nest contained three eggs, placed in a slightly defined hollow. Numerous dead fishes, some small, some large, were strewn about, and the aroma of the place was "decidedly more pungent than agreeable." The birds themselves were somewhat shy, and did not admit of a very near approach before taking wing.

The Pied Cormorants have been found breeding in the spring from September to November, and in autumn from March to May.

## 724. PHALACROCORAX MELANOLEUCUS, Vieillot.—(655)

### LITTLE CORMORANT.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 70.

*Rejence*.—Cat. Birds Brit. Mus., vol. xxvi., p. 398.

*Previous Descriptions of Eggs*.—Campbell: Southern Science Record (1883); North: Austr. Mus. Cat., p. 366 (1889).

*Geographical Distribution*.—Australia in general and Tasmania; also New Zealand, New Caledonia, New Guinea, up to Moluccas and Pelew Islands, and west to Lombok.

*Nest*.—Constructed of sticks, &c., lined inside with leaves, in some instances built entirely of bark, and placed on the stem or branch of a low tree, or on bushes, such as polygonum, in water, in a rookery, occasionally in company with those of other species of Cormorants, Darters, Herons, &c. Dimensions of an average nest, about 12 inches across.

*Eggs*.—Chute, three to four, occasionally five; inclined to oval in shape; texture of shell coarse; surface without gloss; colour, bluish or greenish-white, irregularly coated with lime. Dimensions in inches of a proper clutch: (1) 1.98 × 1.27, (2) 1.92 × 1.23, (3) 1.87 × 1.26, (4) 1.82 × 1.23; of a more roundish set: (1) 1.81 × 1.32, (2) 1.79 × 1.32, (3) 1.75 × 1.32, (4) 1.74 × 1.32.

*Observations*.—The little black and white Cormorant, the smallest of the Australian species, is widely distributed over Australia, including Tasmania, besides some extra-Australian localities suitable to its habits.

It is not only a lover of the armlets of the sea, but of river reaches, and lonely lagoons far inland. In a quiet nook, in the most unexpected of places, one may frequently find the Little Cormorant fishing alone.

It was reported to Gould, probably by Gilbert, that in the Port Darwin district this species constructs its nest and rears its young in the tea-trees (*Melaleuca*) bordering the rivers near the coast, seven or eight pairs associating for that purpose in a single tree. At that time the birds are particularly pugnacious.

In a similar situation, but at another corner of the Continent, namely, Lower Blackwood River, near Cape Leeuwin, the Misses Ellis informed me that they observed the Little Cormorant breeding in nests solely made of the paper-like bark of the tea-tree, and in company with other brooding Cormorants, namely, the Large Black and Little Black, all their nests being placed from one to five feet above the surface of the water. The eggs kindly presented to me by Miss A. M. Ellis were dated 23rd August, 1889.

Mr. Harry Barnard found a rookery of about fifteen or twenty nests of Little Cormorants in a clump of saplings in the centre of a large swamp, three or four nests being in a tree, with here and there a nest of the stately White-necked (Pacific) Heron.

Mr. S. W. Jackson writes: "I found a colony of these birds breeding this season (1898) on a point of land running into a big swamp near South Grafton, on September 11th.

"The nests were built in swamp oak and eucalyptus trees, the altitudes varying from twelve to forty feet. In one small eucalyptus tree we found over 260 eggs, the tree possessing about 100 nests, some nests containing four eggs, others five, some two and one, but the majority contained three to four each. From one swamp oak tree we took 160 eggs, and many others from adjoining trees.

"The trees were simply alive with birds sitting upon nests, and their peculiar croaking noise sounded like thousands of frogs. Their eggs vary much in size and shape.

"My friend, Mr. T. Vesper, accompanied me, and also my brother, and we had a fair share each of egg-blowing to do. All eggs found were fresh."

GoULD was informed that the Little Cormorant lays six eggs sometimes. I have heard of Cormorants laying seven eggs, but am of opinion that such cases are combination clutches.

During a visit to Riverina, September, 1894, I saw examples of eggs of the Little Cormorant collected in a swamp near the Edwards River. I am informed that young Cormorants just fledged are excellent eating, and that it takes an expert to distinguish them from the flesh of ducks.

Usual laying months, August or September to November.

## SUB-FAMILY—PLOTINÆ: DARTERS.

725.—*PLOTUS NOVÆ HOLLANDIÆ*, Gould.—(657)

## DARTER.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 75.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 417.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia, Handbook, vol. ii., p. 497 (1865); North: Austr. Mus. Cat., p. 362 (1889); also Rec. Austr. Mus., vol. i., p. 147 (1891), and vol. ii., p. 21 (1892).

*Geographical Distribution*.—Whole of Australia; also New Guinea and New Zealand (accidental).

*Nest*.—A platform, about 15 inches across, slightly concave, of twigs, lined inside with a few leaves; situated, in companies, usually in low trees in a swamp or overhanging a stream, &c.

*Eggs*.—Clutch, three to four, rarely five; elongated oval in shape, more or less pointed at one end; texture of shell coarse; surface without gloss; colour, outer coating of lime, dull or chalky-white, which, on being removed, reveals a greenish-white shell. Dimensions in inches of a proper clutch: (1) 2.34 × 1.45, (2) 2.23 × 1.46, (3) 2.2 × 1.46.

*Observations*.—The Plotus, or, as it is commonly called, the Darter, is a shy and seclusive Cormorant-like bird, and, although nowhere plentiful, is found throughout Australia, frequenting lagoons near the sea as well as in the interior. I recollect only once seeing it in its native element. It swims low, the motions of its head and neck at a distance resembling the movement of a snake on the water, hence, I suppose, the name Snake Bird, which is occasionally applied to it.

As far as has been observed, Darters feed entirely under water, swimming with wings half expanded, but locomotion is only effected by their webbed feet. The bird pursues its prey (fish, &c.), taking it with the peculiar darting (hence the vernacular name Darter) or jerky action of the head and neck, which has been compared to a man poisoning a spear or harpoon before throwing it. This darting, though short, is so violent as to effectually "strike" the fish the bird is pursuing. The bird "flies" under water even more swiftly than it can through the air.\*

Part of the Darter's plumage is handsomely marked. I think it was in the New Zealand court of the Melbourne International Exhibition of 1888 that I saw ladies' muffs, &c., made of Darter skins. The technical description of this interesting bird is long, but its plumage may be described as glossy greenish-black, beautifully ornamented by

\* The special mechanism of the Darter's neck is technically explained by Mr. W. A. Forbes in the P.Z.S. (1882), pp. 210—212.

lanceolate-stripped markings of white on the scapularies of the wings. The male has rusty-red on the throat; the female is lighter coloured about the head and neck; feet and bill are yellowish; total length, about 31 inches.

The late Mr. Elsey wrote to Gould: "The Plotus is common here (Victoria R.), and excellent eating. During February and March it was incubating. It chooses large trees that hang over the water above and through the mangroves, and in these a number of them build a colony of large, coarse, flattish nests of dead sticks and twigs, which seem, from the quantity of dirt about them and their stained appearance, to be used year after year. Each season they place in the centre a few fresh green leaves, and on these they lay three or four white eggs, with a very earthy, opaque, but brittle shell. We have enjoyed many fine meals of these eggs, sometimes getting from forty to fifty in a single tree. Both birds sit."

Mr. Wm. Bateman, a fisherman, who visited rookeries in Lake Moira, Riverina, informed me that Darters sometimes breed in company with Cormorants. Young Darters, while the down is on, and unable to fly, vomit on the intruders lobsters and fish in various stages of digestion they may have swallowed, and then tumble into the water, diving twenty or thirty yards. If the nests are re-visited next day, the young are found in their places again. Perhaps the old birds carry, or help, them back. The young are of comical appearance, with long bills and necks, the heads being the same thickness, or, rather, thinness, as the necks, and their bodies are dressed in striking yellowish down.

The usual breeding months are October and November. It was stated that Darters used to breed in the neighbourhood of Brisbane about December and January, while, according to the late Mr. Elsey, they used to lay in still more northern parts during February and March.

On the 18th September, Mr. S. W. Jackson, accompanied by his brother and Mr. Vesper, found a colony of about twelve pairs of these birds breeding in swamp oak (*Casuarina*) trees, which were leaning over Harrington Neck, near South Grafton. A poetical picture of the locality from a photograph taken by Mr. Jackson is here reproduced (see illustration). The nests were ten in number, and all contained three eggs each, which were slightly incubated. Mr. Jackson observes:—"Both birds sit. The nests are built at a variety of altitudes, some only six feet from the ground, others thirty feet high, two or three nests being in the one tree. When the nests are being robbed, the birds soar high above, but return immediately and sit on them again after the eggs have gone. Even if the nest be removed, the poor bird will sit on the limb for hours at the place the nest was situated. I only once before found the nests of these birds, and that was on the 9th November, 1894, up the Clarence River, about five miles above South Grafton. The nests were five in number, and were built in swamp oak trees leaning over the river bank.

"One of the nests on this date contained five eggs, the others three each, so I am now perfectly sure that three is the usual number laid for a sitting."



## FAMILY—SULIDÆ: GANNETS.

726.—*SULA SERRATOR*, G. R. Gray. (661)

## GANNET.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 76.

*Reference*.—Cat, Birds Brit. Mus., vol. xxvi., p. 428.

*Previous Descriptions of Eggs*.—Potts: Trans. New Zealand Inst., vol. ii., p. 78 (1870); Hutton: Trans. New Zealand Inst., vol. iii., p. 112 (1871); Buller: Birds of New Zealand (1873), vol. ii., p. 181 (1888); Campbell: Southern Science Record (1883); also Victorian Naturalist (1894); North: Austr. Mus. Cat., p. 363 (1889).

*Geographical Distribution*.—Seas of Queensland, New South Wales, Victoria, South and West Australia and Tasmania; also New Zealand.

*Nest*.—Low, built upon the ground of the surrounding soil and débris scraped up and well-trodden, and slightly concave on the top. Dimensions: outside circumference about 5 feet, height 4 to 5 inches; concave top 7 to 8 inches across by  $1\frac{1}{2}$  inches deep. A rookery on Cat Island, off Flinders Island, eastern entrance to Bass Strait, measured about 150 yards in circumference, the nests being placed in fairly regular rows, 30 inches apart, each nest from centre to centre being separated by exactly the same distance.

*Eggs*.—Clutch, one; elongated oval in form; texture of shell coarse; surface without gloss; colour, the thick and rough limy coatings dull, or chalky-white, more or less stained with dirty-brown (the longer the egg remains in the nest, the dirtier the appearance). If the coating be removed a bluish-white shell is revealed. Dimensions in inches of selected examples: (1)  $3.4 \times 1.95$ , (2)  $3.12 \times 1.88$ , (3)  $3.12 \times 1.85$ , (4)  $3.0 \times 1.9$ , (5)  $3.06 \times 1.87$ , (6)  $3.02 \times 1.8$ .

*Observations*.—This fine Gannet is the most commonly known to Australians, being found round the southern part of the Continent from Queensland to West Australia, including Tasmania, where probably it is most abundant.

The only large rookeries I am aware of are in Bass Strait. There are small ones in New Zealand.

To see a company of Gannets fishing, is a sight to be remembered. From aloft they plunge nearly vertically into the water, sending up wreaths of sea spray several feet high as they enter.

Gould pleasantly wrote: "I found the *Sula australis* generally dispersed over the seas washing the shores of Tasmania, but most numerous on the south side of the island. The Mewstone, the South Cape, the rock at the mouth of D'Entrecasteaux's Channel, and the low Actæon Islands were tenanted by hundreds during the period of my visit in 1839; and it was also seen, but in less numbers, along the entire

coast of South Australia. Much as has been said respecting the natural stupidity of other species of the genus *sula*—Boobies, as they are called—the present appeared to be the Booby par excellence, as evidenced by the manner in which I captured the specimens in my collection. Observing about fifty fine adult birds reposing on the flat top of a low rock on one of the Actæons, I directed my boatman to row cautiously, that I might endeavour to get a shot at them; I was soon not only within range, but too near to use my large duck gun, loaded as it was with large shot; I determined therefore to shoot them on the wing as they flew from their resting place. Judge of my surprise when I found that neither the near approach of the boat nor our speaking to each other startled them in the least. Taking one of the men with me, I stepped on shore and approached the motley assembly, which was still sitting in close array on the rock, and which did at length exhibit some degree of surprise and uneasiness at the intrusion, but even then was so little disturbed that we succeeded in capturing five fine birds with the hand before the remainder had shuffled off to the ledge of the rock and taken wing. Had this occurred at a breeding place it would not have excited my astonishment, for I was aware that the *Sula bassana* would allow itself to be so taken at that period; but I did not expect that the present species would admit of being captured while merely at rest. This apparent want of caution or stupidity may in all probability be attributed to the fact that their haunts on these islands had rarely been intruded upon: boats the natives of the southern parts of Tasmania never possessed, and the visits of civilized man must have been few and far between."

In 1893 a party from the Field Naturalists' Club of Victoria, including myself, after spending an adventurous and anxious night in a double-ended cutter-rigged boat of about nine tons, landed on Cat Island, off the east coast of Flinders Island. The following is the official story of our good leader (Mr. Joseph Gabriel), as told before the club on our return: "20th November. At daybreak I was called by skipper Holt, to find the boat swinging by two cables and the wind blowing half a gale, but fortunately not from the dreaded quarter, viz., the east. I took watch so as to allow Mr. Holt to have a rest, he having been up all night. Soon after daybreak we had a consultation, as we were very dubious of landing, on account of the high sea running. To make matters still more annoying, we could see the Cormorant rookery on Storehouse Island, and the Gannet rookery on Cat Island, in full swing. This latter we had risked all and ventured so far to see. But our anxiety was soon set at rest by Mr. Holt, who, with our willing assistance, heaved up the anchors and sailed, under the staysail, to what turned out to be a more sheltered spot nearer Cat Island. We landed with some difficulty per dingy, at 10 a.m., and soon found our way to the Gannet rookery. Here all our troubles and seasick qualms were soon forgotten and amply repaid by the wonderful sight which stood revealed before us. We found between 2,400 and 2,600 birds (roughly estimated by measuring) seated in the locality on their nests. The birds were in nowise put out by our presence, and we photographed to our hearts' content. The nests were built on slightly raised mounds of clay and a good admixture



GANNETS NESTING.

*From a Photo by the Author.*



of guano, of which the place smelt strongly, and were composed of twigs, algae and polyzoa. Each nest contained one egg only, and not two, as stated by some authors. Hovering over the rookery, and coming and going from seaward, were the mates of the sitting birds. It was the prettiest of sights to see these birds alight alongside their mates, kissing and caressing them in a most loving and affectionate way. Occasionally one of the new comers would eject from its throat a fish which it had brought in from the sea. It is really wonderful the size of fish they carry—fifteen inches was the measurement of a pike which we found lying near one of the nests, and we saw the remains of others which must have measured still more. Frequently we would see a handsome Gannet rise on its feet off its egg, and flap its wings to stretch its feathered limbs; should the bird be so unfortunate as to lose its balance, it soon regained its position, hastened, however, by its neighbours, who viciously pecked at it, as much as to say, 'Keep your own ground.' The nests, as far as the inequality of the ground would allow, were arranged in symmetrical rows, and were about 30 inches apart. The diameter of the rookery was about 50 yards, and it was circular in shape. The birds had been at work some time, as we found several stages of growth of young, from the half-grown gosling down to that just hatched; but the greater number of nests was occupied by eggs, many quite fresh. The young, when covered with down, look very handsome. The old birds seemed to defend the eggs more fiercely than they did the young, and I had to approach them with considerable respect, requiring the aid of a bucket and fishing basket for them to peck at while securing their eggs. Promenading around the rookery, and sometimes through the rows, were to be seen those impudent scavengers, the Silver and Pacific Gulls, waiting their chance (a very poor one) of taking the eggs and pieces of fish lying about. It seems almost ludicrous that this should occur, the Gannet lying so close on its egg, and being so large a bird, one blow from its powerful beak would kill so small a bird as the Silver Gull. After our artists had taken photographs from different points of view (see illustrations: "A Gannet Rookery," and "Gannets Nesting"), we very reluctantly retired from this wonderful rookery. As the wind was still rising we hurried on board, and soon left the dangerous anchorage, very nearly getting on to the rocks in making our first tack, just being saved by the excellent seamanship of our skipper. After beating about in a nasty, choppy sea for three or four hours, we succeeded in getting shelter in a snug little cove under Babel Island."

To these remarks I may add that the young or newly-hatched birds were naked, or nearly so, and of a leaden or dark-slate colour. The older ones were clothed in down of snowy whiteness, oddly contrasting with the black feet and bill. When we approached, the old birds would simply give a goose-like cackle, making a sound not inappropriately resembling the words "get away, get away!" at the same time fencing us with their wings and formidable bills. The date of our visit (20th November) appeared to be about the middle of the laying season. Probably October or the month previous is the month they first commence to lay, as I had received eggs taken from the same rookery during

that month. They were kindly collected for me by Captain Anderson and Mr. J. Kelly, who were in the steamer, "Lady Loch," in search of tidings of the missing vessel, "May Jennings." It would, however, be interesting to be able to record when the young are fully feathered and leave—possibly March or April, when the Mutton Birds commence to move.

Besides Babel Island, another large Gannet rookery is stated to exist on the Black Pyramid, on the opposite side of Bass Strait; that island was seen at a distance and reported to be "white with birds" by the naturalists who visited Albatross Island.

Captain Fermaner, a well-known colonist of the olden days, told me that Gannets used to lay on a rock off Portland Bay early in September. I had specimens of eggs from that locality, 1870.

In his "History of the Birds of New Zealand," Sir Walter Buller gives an exceedingly popular chapter on the Australian Gannet. In one instance Sir Walter quotes from Captain Fairchild, who states: "The habits of the Gannet are so very strange that it may interest you if I give the results of my own experience with these birds. So far as I am aware, their only breeding places off the coast of New Zealand are on Gannet Island, lying to the east, on some small islands in the Hauraki Gulf, near Coromandel, and near to the Great Barrier, and on White Island, in the Bay of Plenty. At all these places the birds congregate in great numbers. They commence laying about the 18th September, and it takes about thirty-three days to hatch out the young. The female lays two eggs; she keeps one, the male taking charge of the other, and each one hatches its own and afterwards looks after the wants of the young one. About the 1st February the same thing is repeated. The second hatching takes place about the first week in March. I hardly think that there can possibly be any mistake in this, as I have carefully watched the habits of these birds during the last twenty years, whenever an opportunity offered."

This is certainly a most interesting statement, and with twenty years' experience at his back, one can hardly doubt Captain Fairchild. But I venture to assert that it needs yet to be proved that the female Gannet lays two eggs, the male hatching one, and that a second laying takes place in February. Were a second laying to take place, I fancy Gannets would be far more numerous than they are.

From my own observations of the Gannet rookery on Cat Island, which, however, I had only two brief opportunities of examining, I saw no eggs in unprotected nests, which certainly would have been the case had one or the other bird been absent on a fishing cruise, feeding; of course, that is presuming both male and female had an egg to tend. What about Gulls and other enemies hovering round for unguarded eggs? Moreover, birds were continually coming in from the sea to feed their brooding mates or young. The meetings were strikingly affectionate, the birds kissing and caressing (bird fashion) in a most loving manner, and appearing concerned in only one home.

With regard to the second laying mentioned by Captain Fairchild, it is quite possible to find fresh eggs of the late laying birds at the beginning of February without there being a second brood, and that the



GANNET ROOKERY—BASS STRAIT

*From a Photo by the Author*





laying season merely extends from September to February. I have had fresh eggs from Gannet rookeries taken respectively in October, November, December, and January.

I received from Mr. J. C. McLean, of Gisborne, specimens of eggs dated 21st December, 1888, from a Gannet rookery on Kidnapper Cape, near Napier, New Zealand. Mr. McLean visited that rookery five successive seasons. He estimated it consisted of over 300 nests, which never contained more than a single egg or young. These nests were on the ground, and formed of dirt, having a rim composed of a little coarse sea-weed, and distant one from another (centre to centre) about 30 inches. One measured as follows: width at base, 21 inches; depth outside, 3 inches; cavity, 9 inches across by  $1\frac{1}{2}$  inches deep. Mr. McLean was also kind enough to send me photographs of this most interesting bird colony, the first pictures, I believe, ever taken of a Gannet rookery.

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727.—SULA CYANOPS, Sundevall.—(662)

MASKED GANNET.

*Figure*.—Gould: Birds of Australia, vol. vii., pl. 77.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 430.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 506 (1865); Legge: Birds of Ceylon, p. 1181 (1880); Crowfoot (Metcalf): Ibis, p. 269 (1885); North: Austr. Mus. Cat., app. (1889); Campbell: Victorian Naturalist (1889); Walker: Ibis, p. 257 (1892).

*Geographical Distribution*.—Seas of North-west Australia, Northern Territory, Queensland, New South Wales and Victoria (?); also tropical seas of the world.

*Nest*.—Constructed of herbage, sometimes only a few pieces of dry grass, sticks, &c.—often no nest at all. Situation (on Phillip and Nepean Islets, adjacent to Norfolk Island), on the flat ground about the hill tops and sides; on some of the tropical islands the nesting place is merely a slight concavity in the coral sand.

*Eggs*.—Clutch, one to two, usually two; elliptical in shape, both ends nearly pointed alike; texture of shell coarse; surface slightly glossy; colour, limy coating, dull-white more or less stained with brown, obscures a bluish-white shell. Dimensions in inches of selected examples: (1)  $2.8 \times 1.84$ , (2)  $2.72 \times 1.77$ , (3)  $2.69 \times 1.9$ , (4)  $2.55 \times 1.71$ .

*Observations*.—The Masked Gannet is chiefly found in tropical seas, occurring in Australian regions as far south as Norfolk Island, where it breeds.

Gould did not succeed in procuring examples of this Gannet during his own researches in Australia; but it once came under his notice during his voyage from Hobart to Sydney, 1839, when, on approaching

Port Jackson, his attention was attracted by a Gannet with a darkly-coloured face, which was very conspicuous as the bird flew round the ship, but, to his regret, the bird kept at too great a distance for a successful shot.

However, subsequently, Gould was indebted to the officers of H.M.S. "Fly," under command of Captain Blackwood, for examples of the bird, which were found breeding in considerable numbers on Raine Island, Torres Strait.

Mr. F. M. Nobbs, of Norfolk Island, who presented me with the eggs of this species, taken from adjacent islets, says: "I think the Gannet is the clumsiest on the ground of all the birds which frequent this locality, but once it gets on the wing, it seems one of the proudest. I have often watched them from the whaling boats darting down after their prey. They descend at a wonderfully rapid rate, and must go to a considerable depth below the surface of the water, for they keep under for a long time. The flying fish seem to be their favourite food; but I have never seen a Gannet pursue them while they (the fish) are flying. A young bird is of odd appearance, and would make an excellent comic picture of a judge in a wig."

Both male and female assist in the task of incubation. Laying months, November to December, but the season may be said to extend from October to January. At Malden, in mid-Pacific, the Masked Gannet sometimes lays in March, on the east side of the lagoon there.

When Professor Moseley, in the "Challenger," visited Raine Island, 31st August, 1874, two species of Gannets, the Brown and the Masked, were nesting on the ground, and especially on a plot of ground quite flat and bare of vegetation, possibly the site of the dwellings of the men employed in erecting the beacon in 1844.

The Brown Gannet makes a slight nest of green twigs and grass; the Masked makes a circular hole in the earth, about  $1\frac{1}{2}$  inches deep.

A third species of Gannet (*S. piscator*) has red feet, which at once distinguish it from the others. Professor Moseley saw one or two of their nests made in the bushes, like those of the Noddies, raised six inches above the ground.

Booby Island, in Torres Strait, which is only two-thirds of a mile in circumference and thirty feet to forty feet in height, would appear to be a remarkable spot for birds. Not only do Boobies and Sooty Terns frequent it in great numbers, but many land birds also. As Professor Moseley pointed out, in his "Notes by a Naturalist," very likely the rock at certain seasons is used as a resting place for birds crossing from New Guinea to the mainland or vice versa. The island is described as having a small gully running nearly across it, which, affording shade and shelter, allows of the growth of a scrub of a shrub-like species of fig. In addition to this vegetation there is little else, except scanty grass and a few herbs. During the visit of the "Challenger," 9th September, 1874, the following birds were shot: Superb Fruit Pigeon (*P. superbus*), Black-backed Quail (*T. maculosa*), a Landrail, Megapode (*M. duperreyi*), Bee Eater (*Merops*), Yellow White Eye (*Zosterops lutea*), a Thickhead (*Pachycephala*), Sacred Kingfisher (*Halcyon*), besides three other species seen.

## 728.—SULA PISCATOR, Linnaeus.—(664)

## RED-LEGGED GANNET.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 79.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 432.

*Precious Descriptions of Eggs*.—Campbell: Victorian Naturalist (1889); Sugars: Victorian Naturalist (1895).

*Geographical Distribution*.—Seas of North-west Australia, Northern Territory and North Queensland; also the tropical and sub-tropical seas of the world, except the Pacific coast of America.

*Nest*.—Flat, scantily constructed of coarse twigs, &c., and placed upon the ground or on clumps of herbage or low trees.

*Eggs*.—Clutch, one usually; oval in shape, or slightly more compressed at one end; texture of shell coarse; surface without gloss; colour, a dull-white limy coating covers a bluish-white shell, which may be partially visible in places where the coating has been scraped or chipped off. Dimensions in inches: 2.33 × 1.56.

*Observations*.—The Red-legged Gannet is a common species along the northern shores of Australia and breeds in great numbers on Raine Islet, apparently a locality rich in Gannets of no less than three varieties.

Again Gould has to quote the excellent observations of Macgillivray, who says: "With the exception of one bird, which perched on the rigging, and was caught while at sea in the neighbourhood of the Keeling Islands, we found this species only on Raine's Islet, a vegetated sand-bank in the line of the Great Barrier Reef. When we landed there, on the 29th of May, it appeared to me that the breeding season was then over; but I was fortunate enough to find a solitary bird sitting upon its nest, which contained a single egg. The nest consisted of a few roots of a creeper, common on the island, forming a platform eighteen inches in diameter, laid upon a tuft of herbage. A few days after this, the Gannets, having been much molested, entirely deserted the island during the day, returning at night in a body of several hundreds, to roost on the ground and low bushes near the centre of the island."

Dr. Thos. H. Streets, from observations made of the Red-legged Gannet during the United States' North Pacific Surveying Expedition, 1873-75, writes: "Locality, Fanning Group, North Pacific. Several specimens were taken at sea, in the vicinity of this group of islands. When far away from land, they flew aboard the ship in the evenings, and roosted on the yard. They exhibited no sign of fear, but were calmly captured by the man who went aloft. In the majority of our specimens the tail is dark—it is white in the adult plumage. On Palmyra Island, their principal breeding place, the period of their incubation was over at the time of our visit, in December; but the young were not yet fledged. The latter were very numerous, they covered

the trees and bushes, and looked like great balls of snow-white down. The nests are rudely constructed of coarse twigs, and are built on the low trees.

"We arrived at Christmas Island one month later, in January, and there we found the Gannets still sitting on their eggs; few or no young were to be seen. This difference is probably induced by the physical conditions surrounding them. One of the islands is situated almost directly on the equator, exposed to the fiercest rays of the tropical sun; it is devoid of fresh water, and it rarely or never rains; the vegetation is scanty and stunted, and life in general has a very unequal struggle for existence. On the other island, Palmyra, a condition of things directly opposite to these exists. The Gannets of Christmas Island have a very curious habit, which, as far as our observations extended, is confined to those of that island. Under their nests, which were quite low on account of the stunted condition of the shrubbery, were mounds, one or two feet high, built of twigs, and in some instances solidly cemented together by their excrement. It probably affords them diversion, during the monotonous period of incubation, to break off all the twigs within reach of their bill and to drop them under their nests. These mounds furnish evidence of the nests being occupied for several successive years; for the lean bushes could not furnish a sufficient amount of twigs to build them up in a single breeding season."

Following up my notes on Malden Island in the "Victorian Naturalist," Mr. R. S. Sugars gives some interesting remarks on Gannets, gleaned by his cousin, Mr. John McCullough. The period of incubation in the case of the Red-legged Gannet was timed at forty-five days in one instance. Mr. Sugars was good enough to present me with an egg of this species, dated 23rd October, 1894. These birds were observed breeding from the middle of August to December.

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**729.**—*SULA SULA*, Linnæus.—(663)  
*S. fiber*, Linnæus.

**BROWN GANNET (BOOBY).**

*Figure.*—Gould: Birds of Australia, fol., vol. vii., pl. 78.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvi., p. 436.

*Previous Description of Eggs.*—Gould: Birds of Australia, Handbook, vol. ii., p. 507 (1865); Legge: Birds of Ceylon, p. 1179 (1880); North: Austr. Mus. Cat., p. 364 (1889); Campbell: Victorian Naturalist (1889); Walker: Ibis, p. 257 (1892).

*Geographical Distribution.*—Seas of North-west Australia, Northern Territory, and North Queensland; also the tropical and sub-tropical seas of the world, except the Pacific coast of America.

*Nest.*—Somewhat flat, slovenly constructed of dry herbage, and situated upon the ground, in colonies, upon certain islands in the Tropics.

*Eggs.*—Clutch, two usually, three occasionally; elliptically inclined in shape; texture of shell coarse; surface without gloss; colour,

a dull-white limy coating (more or less soiled with dirt) obscures a bluish-white shell. Size variable. Dimensions in inches (large example):  $2.62 \times 1.74$ ; small example:  $2.3 \times 1.47$ .

*Observations.*—As far as Australia is concerned, this Gannet has only been observed in the seas of the northern coast.

Gould gives an interesting extract from Macgillivray regarding this species of Booby in Torres Strait, who says: "I found it breeding only upon Bramble Quay, although I once, on Raine's Islet, found a solitary egg. The nest is slovenly made, of dried herbage, a foot in diameter, with scarcely any cavity, and contains two eggs, of which, in every instance, one was clean and the other very dirty. The eggs, which are white, vary considerably in size. The largest measured  $2\frac{3}{4}$  inches by  $1\frac{7}{8}$  inches; the smallest,  $2\frac{1}{8}$  inches by  $1\frac{7}{8}$  inches, and one of average size,  $2\frac{1}{2}$  inches by  $1\frac{3}{4}$  inches. Both sexes incubate; and the birds, while sitting on their eggs, allowed of a very near approach, and before flying off disgorged the contents of their stomachs, chiefly a species of *Clupea*. I need scarcely add that their bite is very severe. During our visit to Darnley Island, I observed several tame Boobies among the native villages, generally perched on the canoes hauled up on the beach. These birds were allowed their full liberty, and after fishing in the weirs upon the reefs until they had procured a sufficiency of food, returned to the huts."

The members of the "Chevert" Expedition also found this bird breeding in great numbers on Bramble Quay, 1875.

Laying months, November and December.

On Malden Island this Gannet is common, nesting upon the small islands in the lagoon. They have also been found breeding in the Northern Tropics in April.

Colonel Legge observes that the nestling of the Brown Gannet is covered with brownish down, darker on the back than on the chest; but when first hatched the young is quite naked.

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#### FAMILY—FREGATIDÆ: FRIGATE BIRDS.

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#### 730.—FREGATA AQUILA, Linnæus.—(658)

##### FRIGATE BIRD.

*Figure.*—Audubon: Birds of America, vol. vii., pl. 421.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvi., p. 443.

*Previous Descriptions of Eggs.*—Legge: Birds of Ceylon, p. 1205 (1880); Campbell: Southern Science Record (1883).

*Geographical Distribution.*—Seas of Northern Territory, North Queensland, New South Wales, and Victoria (accidental); also New Zealand, New Guinea, and tropical and sub-tropical seas in general.

*Nest.*—Composed of twigs and leaves, piled up about two feet from the ground, or placed on rocks or low shrubs—mangroves, &c.—in rookeries on certain tropical islands.

*Eggs*.—Clutch, one; varies in form from a round to a long oval, more compressed at one end; texture of shell somewhat coarse and thin; colour, white, slightly coated with lime, imparting to the eggs a chalky appearance. Dimensions in inches (long oval):  $2.82 \times 1.86$ ; round oval:  $2.65 \times 1.94$ .

*Observations*.—The Frigate Bird, or Man-of-War Hawk as it is sometimes called, enjoys a world-encircling habitat as far as tropical seas are concerned, therefore it is to be found off Northern Australia. However, a few stragglers get into more temperate waters. A specimen was captured at Brighton, Port Phillip, and is now in the National Museum, Melbourne. I am not sure whether the bird has been taken off the New South Wales coast, but Sir Walter Buller mentions an example was captured alive on the east coast of New Zealand in February, 1863.

The Frigate Bird is well known in books to almost every school-boy by its long, slender, hooked bill, lengthened wings giving wonderful power of flight, and by its plundering other sea birds, chiefly Boobies, of the fish they capture, requiring them to disgorge their meals in mid-air, which the clever Frigate Bird by its marvellous and graceful flight catches ere the food reaches the water.

The Frigate Bird is furnished with a capacious pouch in which it can store plunder not required for immediate wants—hence the name, sometimes, Frigate Pelican.

Audubon, the American ornithologist, who found these birds breeding in large numbers in the Gulf of Mexico and on the Florida Quays, has given the following interesting remarks concerning them:—"About the middle of May (a period which to me appeared very late for birds found in so warm a climate as that of the Florida Keys), the Frigate Pelicans assemble in flocks of from fifty to five hundred pairs or more. They are seen flying at a great height over the islands on which they have bred many previous seasons, courting for hours together; after which they return towards the mangroves, alight on them, and at once begin to repair the old nests or construct new ones. They pillage each other's nests of their materials, and make excursions for more to the nearest quays. They break the dry twigs of trees with ease, passing swiftly on wing, and snapping them off by a single grasp of their powerful bill. It is indeed a beautiful sight to see them when thus occupied, especially when several are engaged passing and re-passing with the swiftness of thought over the trees whose tops are blasted; their purpose appears as if accomplished by magic. It sometimes happens that the bird accidentally drops a stick while travelling towards its nest, when, if this should happen over the water, it plunges after it and seizes it with its bill before it has reached the waves."

Some years ago, I believe, the large species of Frigate Bird used to breed on Malden Island, laying in June and again in December. Two fine eggs belonging to this species, from Malden Island, grace my collection, and were nearly lost in a great hurricane. Captain Murdock, formerly of Messrs. Grice, Sumner & Co., was recruiting labour at Nui (one of the neighbouring islands) for the Malden Island Guano Depôt, in 1883.

When he was on shore, a hurricane of terrific violence suddenly arose. The mate, who remained on board in charge of the barque, "Don Diego," although short-handed, immediately set sail, bravely clearing the reef, and put to sea. A terrible night followed; it blew "great guns," as old shell-backs say. It was decidedly an awkward and desperate position. There was the good Captain, an unwilling prisoner among savages, and his ship perhaps, for aught he knew, on the coral pavements at the bottom of the Pacific. But judge his delight, when, after three days and three nights of painful suspense, he descried the white sails of his vessel on the horizon, beating in. Still greater was his joy when he stepped on board and shook his mate's rough hand again.

Professor Moseley, in his interesting book, "A Naturalist on the 'Challenger,'" observed that on the island of Fernando Noronha, off the Brazilian coast, the Frigate Birds placed their nests well out of harm's way on the very verge of a precipice, which was quite inaccessible. He looked down and saw the nests, five or six of which were built close together, almost touching one another, and contained each a single egg. Date, 1st and 2nd September, 1873. The Frigate Bird was again noticed amongst a crowd of other species of sea birds on Boatswain Bird Rock, off Ascension Island, towards the end of the voyage, March to April, 1876.

**731.—FREGATA ARIEL, Gould.—(659)**

**LESSER FRIGATE BIRD.**

*Figure.*—Gould: Birds of Australia, fol., vol. vii., pl. 72.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvi., p. 447.

*Previous Descriptions of Eggs.*—\*Gould: Birds of Australia (1848); also Handbook, vol. ii., p. 500 (1865); Campbell: Southern Science Record (1883), and Victorian Naturalist (1889); North: Austr. Mus. Cat., p. 364 (1889); Walker: Ibis, p. 259 (1892).

*Geographical Distribution.*—Seas of West, North-west Australia, Northern Territory, and Queensland; also tropical parts of the Indian and Pacific Oceans, ranging west to Madagascar and east to the Society Islands.

*Nest.*—Somewhat flat on top, composed of herbage and placed upon the ground, or close thereto, on short vegetation, in companies of from five to twenty on certain islands in the tropics. Dimensions, about 12 inches in diameter by about 12 inches in height.

*Eggs.*—Clutch, one; lengthened oval in form, or slightly more compressed at one end; texture of shell coarse; surface without gloss; colour, white, washed slightly in parts with lime. Dimensions in inches: (1) 2.6 × 1.64, (2) 2.58 × 1.68, (3) 2.55 × 1.65, (4) 2.42 × 1.65.

*Observations.*—The Lesser Frigate Bird is stated to be fairly abundant in the seas washing the tropical parts of Australia, especially in Torres Strait.

\*No dimensions given.

By its swift aerial movements and its love for plundering other sea birds it has well been termed a "Falcon of the Sea," and is easily mistaken for the other marine marauder—the Great Frigate Bird.

The Lesser Frigate Bird was found breeding on Raine Islet, in Torres Strait, by Commander Ince, R.N., during the surveying voyage of H.M.S. "Fly." His observations are recorded by Gould.

In his "Notes by a Naturalist," Professor Moseley writes respecting the nesting of the Lesser Frigate Bird on Raine Islet, 31st August, 1874: "Their nests were nearly all confined to a small area near the cleared patch already referred to (where two species of Gannets—the Brown and the Masked—were breeding). They are like those of the Red-legged Gannet (*S. piscator*), raised on the bushes, and are a compact, platform-like mass of twigs and grass, matted together with dung, about eight inches in diameter. There were no eggs of the birds in the nests, but mostly far advanced young, which were covered with frills of a rusty-coloured down. The old birds soared overhead, and could only be obtained by being shot; whereas the Gannets were easily knocked over on the nests with sticks. The main body of the Frigate Birds remained during our stay, soaring high up in the air, with their Eagle-like flight, far above the cloud of other birds (Terns, &c.) beneath."

Mr. J. T. Fox was good enough to make some observations of the birds frequenting Malden Island for me, and procured skins and eggs of same. Malden, which is in the mid-Pacific, and near the reported limits of this bird's range, is an integral part of the British Dominions, and is leased for its rich deposits of phosphoric guano by Messrs. Grice, Sumner & Co., of Melbourne. The Lesser Frigate Bird always frequents the island, but is to be found in greater numbers during the laying season, March and April, when they arrive in thousands to take up their quarters upon the islands in the lagoon. During the breeding season the male bird is very conspicuous with his bright-red gular pouch, which he proudly distends at times.

An extraordinary habit is possessed by this bird—and not by any other kind as far as I am aware—namely, that occasionally when disturbed it will lift its egg in its claws and ascend into the air. Mr. Fox assured me of this fact, and stated that on one occasion an incredulous visitor to the island was scrutinizing from below a bird that had risen, when by fright or accident it released the hold of its egg, which fell and smashed upon the spectator, who was then and there convinced of the peculiar trait of the bird, and was only too thankful that the egg was not addled.

Regarding the Lesser Frigate Bird breeding on Adèle Island, on the north-west coast, Mr. James Walker, H.M.S. "Penguin," who visited the locality, 2nd May, 1892, gives the following interesting account in the "Ibis" (1892): "These fine birds had been noticed while we were wading over the flats, soaring high above all the sea fowl, many of them, indeed, reduced to mere black specks against the blue sky. Extending for more than half a mile along the middle of the island was a narrow strip of open land, almost free from the usual high grass, and covered chiefly with the *Ipomoea*. Here the nests of the Frigate Birds were to be seen in clusters or bunches of from five or six to as many as twenty



together (very rarely singly), and built directly on the ground, of stalks of grass and *Ipomoea*, small twigs, &c. The average dimensions of each nest were about one foot in height by a little more in diameter, though frequently the clusters of old nests, which were evidently used for a succession of years, formed masses of very considerable size. As in the case of the Gannets and Cormorants, the hollow in the nests was very slightly defined, and in each was deposited a single egg, averaging  $2\frac{1}{10} \times 1\frac{1}{10}$  inches, pure white in colour, very thin-shelled with only a very slight limy coating. A few of the eggs were newly laid, and easily recognizable by their delicate and beautiful pink tinge; but the great majority were very 'hard set,' and there were a great many young birds in the nests. These, when just out of the shell, were quite naked, like the young Gannets, which they then greatly resembled; when more advanced they were covered with a scanty white down, and had a conspicuous saddle-shaped band of dark-grey feathers across the back and scapular region. Nearly all the brooding birds were females, some of them in quite immature dress; but among them were many fine old cocks, conspicuous by their deep, green-glossed, black plumage and scarlet throat-pouches. A few stray Gannets, usually of the white species (*S. cyanops*) had taken up their quarters for incubation among the Frigate Birds, but were evidently regarded with but little favour by the legitimate occupants of the ground.

"The tameness, or rather indifference, of these birds, especially of the females, was most surprising. As one walked among the nests, the sitting birds nearest at hand merely stretched out their necks, snapped their long, slender, hooked bills, and uttered a croak like that of the White Gannet, but very much more feeble; while to obtain the egg it was necessary to push the bird off the nest, when it took wing without apparent difficulty.

"The birds on the adjoining nests, little more than arm's length distant, meanwhile took absolutely no notice of the intruder. The young birds, when of any size, were much more vicious than their parents, and energetically resisted any attempt to take them off, croaking and snapping fiercely with their bills."

Mr. Walker's party gathered a large number of the Frigate Birds' eggs, which, when boiled hard, were by no means bad eating; the white, as is usually the case with sea birds' eggs, remained quite transparent and jelly-like, while the flavour was not in the least degree rank or disagreeable.

During his visit to Lacede Islands, August, 1877, to inspect the guano deposits there, Mr. L. H. Cogswell, of Messrs. Grice, Sumner & Co., observed, amongst other sea birds, a Frigate Bird breeding there. It was most probably referable to the species at present under consideration.

## FAMILY—PHAETHONTIDÆ: TROPIC BIRDS.

732.—*PHAETHON RUBRICAUDA*, Boddaert.—(660)

## RED-TAILED TROPIC BIRD.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 73.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 451.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 502 (1865); Crowfoot (Metcalf): Ibis, p. 268 (1885); Buller: Birds of New Zealand, vol. ii., p. 188 (1888); North: Austr. Mus. Cat., p. 362 and app., pl. 19, fig. 1 (1889).

*Geographical Distribution*.—Seas of West and North-west Australia, Northern Territory, Queensland, and New South Wales; also New Zealand and the tropical and sub-tropical portions of the Pacific and Indian Oceans.

*Nest*.—The bare floor of the ledge of a cliff, a hole under a shelving rock, and sometimes on the ground under a tree or bush bordering the beach.

*Eggs*.—Clutch, one usually; true oval in shape; texture of shell coarse: surface without gloss; colour, pinkish-buff, mottled and marked (like a Falcon's) over the whole surface with pinkish or purplish-red. Dimensions in inches: (1) 2.92 × 1.96, (2) 2.8 × 1.95, (3) 2.8 × 1.9. (Plate 26.)

*Observations*.—This singular sea-bird, with its general plumage white, suffused with a beautiful roseate tinge, and two lengthened central tail feathers of deep rich red (hence the name, Red-tailed), frequents tropical seas. However, it has been found as far south on the eastern coast of Australia as New South Wales, and on the west coast down to the district of Champion Bay.

Amongst sailors it is known as the Boatswain Bird, and often hovers round a ship at sea, occasionally alighting on the rigging.

Gould possessed eggs from both Norfolk Island, off the eastern coast of Australia, and Raine Islet, in Torres Strait.

Macgillivray, in communicating with Gould, wrote: "This Tropic Bird was found by us on Raine's Islet, where, during the month of June, about a dozen were procured. Upon one occasion, three were observed performing sweeping flights over and about the island, and soon afterwards one of them alighted; keeping my eye upon the spot. I ran up and found a male bird in a hole under the low shelving margin of the island bordering the beach, and succeeded in capturing it after a short scuffle, during which it snapped at me with its beak and uttered a loud, harsh, and oft-repeated croak. It makes no nest, but deposits

its two eggs on the bare floor of the hole, and both sexes assist in the task of incubation. It usually returns from sea about noon, soaring high in the air, and wheeling round in circles before alighting."

Mr. F. M. Nobbs, to whom I was indebted for several splendid specimens of these eggs, states that on Norfolk Island, where he lived for the greater part of his life, the Tropic Bird lays *one* egg. This statement is at variance with Macgillivray's, who says that two are the complement.

This bird is particularly attached to its eggs or young, and in defending them will allow itself to be caught. The eggs from Norfolk Island were dated 7th December, 1886; other specimens were collected in November.

From the other side of the Continent Mr. G. K. Beddoes writes: "Found Tropic Bird nesting on Pelsart Island (Abrolhos); month, February; two eggs, both hard set.

"Following February two nests same kind were taken on Rat Island; two eggs in each. I could not rescue the eggs, not being the finder."

### 733.—PHAETHON LEPTURUS, Daubin.

*P. candidus*, Temminck.

#### WHITE-TAILED TROPIC BIRD.

*Key note*.—Cat. Birds Brit. Mus., vol. xxvi., p. 457.

*Previous Description of Eggs*.—Legge: Birds of Ceylon, p. 1175 (1880).

*Geographical Distribution*.—The coasts of West and North-west Australia, Northern Territory, Queensland, and New South Wales; also tropical and sub-tropical seas of the world (except the east coast of North America).

*Nest*.—A hole or hollow of a rock or tree stump.

*Eggs*.—Clutch, one; resembles that of *P. americanus*, being oval in form, or more compressed towards one end; texture of shell somewhat coarse; surface has faint trace of gloss; colour, light stony-buff, finely freckled all over (thickest on the apex) with purplish-brown. Dimensions in inches: 2.08 × 1.52 (Legge); 2.04 × 1.48 (Nchrkorn).

*Observations*.—Although the White-tailed Tropic Bird is usually restricted to tropical waters, in Australia it has been observed as far south as Houtman's Abrolhos, on the west coast, while on the east coast an immature specimen was blown ashore at Botany Bay (New South Wales) during February, 1898, after an occurrence of easterly gales.

Concerning the White-tailed, or Yellow-billed, Tropic Bird, Colonel Legge records: "The nearest nesting place of this species to Ceylon

is probably to be found in the Seychelles Group. Here, Mr. E. Newton found a nest on Mahé, in January, and it was situated in the hole of a dead stump of a 'capucin,' about fifteen feet from the ground, and contained a young bird, the produce of a single egg which this species always lays. At Ascension, Mr. Gill, as recorded by Mr. Penrose, found it breeding on Boatswain Bird Island, so called from the large number of Tropic Birds which always nest there. It was scarcer than the large barred species, *P. athereus*, and was nesting in holes on the side of the island. Like its congeners, it is very tame when breeding, allowing itself to be pulled out of its nest, but biting vigorously notwithstanding."

Professor Moseley, in his fascinating book, "A Naturalist on the 'Challenger,'" graphically describes the breeding home of the White-tailed Tropic Bird, as well as those of several other species of Australian sea-birds, on far away Ascension Island. Boatswain Bird Island is a high rock separated from the mainland by a narrow channel. The sides of the rock are precipitous, but some of the sailors managed to climb up and fix a rope at the summit, so that it hung down the cliff. The face of the cliff was covered with guano, hanging everywhere upon it in large projecting masses of stalactite-like formation. The members of the nesting party clambered up the cliff by means of the rope, being half blinded and choked by the guano dust on the way. In holes on the side of the cliff, burrowed in the accumulated guano, were nests of two kinds of Tropic Birds (*P. lepturus* and *athereus*).

Although there has been no authenticated record of a third species of Tropic Bird occurring in Australian waters, I believe the largest White-tailed species, *P. athereus*, occasionally visits the north-east coast. Some years ago Mr. E. L. Layard, when British Consul at Noumea, New Caledonia, kindly sent me three eggs of a Tropic Bird marked "*candidus?*" collected on Bampton Shoals. Obviously, by their large size, these eggs are not those of *candidus* (now *lepturus*), nor by their colouration are they *rubricauda*; therefore, they are most probably referable to *P. athereus* of Linnæus.

The eggs may be thus described:—Oval in shape, or more or less pointed at one end; texture of shell coarse; surface without gloss; colour, warm-white, moderately marked with roundish blotches and spots of dark purplish-brown. Dimensions in inches: (1) 2.75 × 1.96, (2) 2.7 × 1.83, (3) 2.69 × 1.75.

The geographical distribution of *P. athereus* is the tropical portions of the Pacific and Atlantic Oceans.

## FAMILY—PELECANIDÆ: PELICANS.

## 734.—PELECANUS CONSPICILLATUS, Temminck.—(651)

## PELICAN.

*Figure.* Gould: Birds of Australia, fol., vol. vii., pl. 74.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvi., p. 483.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 487 (1895); North: Austr. Mus. Cat., p. 368 (1889); Le Souef: Ibis, p. 423 (1895).

*Geographical Distribution.*—Whole of Australia and Tasmania; also New Guinea.

*Nest.*—Almost flat and about 18 inches across; roughly constructed of dry herbage, &c., in some instances the nest is merely a slight hollow scraped in the ground; placed in a small rookery on the highest part of small islands at sea or in a lake.

*Eggs.*—Clutch, two to three; elliptical in shape; texture of shell coarse; surface glossy; colour, white, with a thick coating (sometimes smooth, in other instances rough) of lime. Dimensions in inches of a proper clutch: (1)  $3.7 \times 2.33$ , (2)  $3.65 \times 2.35$ ; of a smaller pair: (1)  $3.4 \times 2.15$ , (2)  $3.25 \times 2.23$ .

*Observations.*—The Pelican is an important bird. This large representative of the genus, with its seemingly unwieldy bill and pouch, needs no description, save to say that it has been declared by competent judges, by reason of its black and white dress, to be the most handsome of the six or seven species of Pelicans found in the world.

A company of these fine birds, flying high in a wedge-shaped phalanx, is a fine sight. "A camp of fishermen on Lake Charm, Victoria, skin and clean cat-fish before sending them to market. They do so at the water's edge. Coming within twenty yards of them is a flock of about 400 Pelicans, waiting for the heads and offal. The fishermen carry the offal in a basket about twenty yards along the shore, and throw it out. Then the scramble commences, and the basketful disappears in the twinkling of an eye. Pretty Marsh Terns hover overhead, and when the big birds have eaten the large parts, they dart down for the tit-bits." Such is a Pelican picture kindly sent me by Mr. G. H. Morton, J.P., when these birds were gathered during the recent droughty season (1897) not far from his home.

During the same season (October), Mr. J. W. Mellor, of Adelaide, witnessed a similar scene on Lake Albert. Captain Sturt, the explorer, saw the channel of a river seventy or eighty yards broad crowded with

Pelicans, while at another time the birds were in such numbers on the Darling that the sight was described as being quite dazzling to behold.

The Pelican is found in all parts of Australia and the neighbouring islands. The last example I happened to notice I saw from a railway carriage. It was solitary, standing in a sheltered swamp just outside the railway fence, as the Melbourne-Sydney express rushed past.

Pelicans haunt the shallows and islets of the sea, as well as inland waters. A Pelican rookery existed on a rocky islet off the north-west coast of Tasmania, which has been visited by field naturalists of late years. Owing to that visiting the birds have deserted the place, so I hear. I need not mention who was there last, but the following is Mr. Dudley Le Souëf's account:—"About a dozen pairs of these birds nested on Penguin Rocks, on a small patch of clear ground, just above high-water mark, and surrounded with high tussocky grass. The nests were very simple—a few sticks and bits of grass put together, and almost level with the ground. There were one or two eggs or young birds in the nests, the latter being of various ages, from three weeks old downwards. One little one, apparently about three days old, managed, in the absence of its parents, to crawl from its rightful nest into that of its neighbour, which contained a bird about three weeks old. The elder bird immediately commenced vigorously pecking the little stranger, and would soon have killed it had the latter not been removed. The young had no down on, and their skin was bare, the regular lines of growth where the young feathers were appearing were plainly discernible. When they crawl they appear to stick their beaks into the soft soil, and thus pull themselves along, as they have not power to stand up and walk."

Mr. E. D. Atkinson, C.E., to whom I was first indebted for Pelicans' eggs from this locality, said that the birds he robbed on the 8th October laid again, but on a different island. The atmosphere surrounding the nesting places was decidedly "strong" from the presence of stale fish, &c.

During our trip to the Furneaux Group, on the Tasmanian side of Bass Strait, we learnt that Pelicans were breeding on Sentinel Island, and that there was a large rookery on Little Green Island, between Dog and Flinders Islands. Formerly there used to be a large rookery on Pelican Island, Franklin Sound, which was destroyed by removing the guano deposits. Another rookery used to exist on Pascoe Island, but the depasturing of sheep disturbed the birds and drove them away.

The late Mr. Thomas M. Turner (H.M. Customs), when stationed at Port Albert in the early days, took young Pelicans on St. Margaret's Island, Shallow Inlet. Pelican Island, Westernport, was also a nesting place in the "sixties." Mr. William Smith writes: "On this islet, in March, 1864, Mr. Peters, a collector of natural history subjects, then residing at Queensferry, in the same locality, and myself landed, and captured forty young Pelicans, fully fledged, but unable to fly. These were sent to the Botanical Gardens, Melbourne. Great numbers of young birds in all stages of growth, and also eggs in nests, were present on the islet."

In "The Argus," during 1893, reference was made to a pathetic ballad by Mrs. Foott, of Queensland, entitled "Where the Pelican Builds Her Nest." This gave rise to interesting correspondence, exploding an error, apparently popular in parts of Queensland, that the Pelican only builds "in the mysterious drought-stricken solitudes of the 'Never-Never' country, and proving (as was well known to ornithologists) that the Pelican breeds by the sea as well as in the interior, or wherever the circumstances are favourable for food, &c.

Mr. John Phelps wrote: "I saw nests on the islands in the Boolaboolka and Ratecatcher Lakes, fifty miles east of Menindie, Darling River, on Tolarno and Albemarle stations.

"Boolaboolka (or Boolo Boolka) is a native name, literally meaning 'Pelican Lake.' It was on an island in that lake that I first saw a Pelican's nest in 1879. At that time the young birds were suffering from a parasite (similar to a sheep tick, but smaller), which attached itself to the inside of the pouch and throat. I have caught young birds (half-grown) on the nest, and opened the beak, when the ticks could be seen adhering to the throat." Pelicans were breeding in the Boolaboolka in the autumn of 1894.

Another correspondent wrote: "Any time in the season on Coongy station, Cooper's Creek, South Australia, on a small low island on the Coongy Lakes, hundreds of Pelicans are to be found hatching their young. . . . The eggs are so rank that even the blacks will not eat them, although they are very fond of the young birds, and obtain great numbers of them just before they are fully fledged."

Mr. B. H. Purcell stated that the natives (Wallumbooroo tribe) of Northern Territory call the Pelican "Wallumberry," and that a neighbouring tribe (Worku) call it "Wallumbooroo," but Mr. Purcell diminishes the value of his otherwise interesting contribution by stating that the Pelican lays up to a dozen eggs. The maximum is only three.

Pelicans usually lay during September, October, and November, but they occasionally breed in autumn. They did so on Pelican Rock, Westernport, 1864, and at Boolaboolka, River Darling, 1894; and I am informed that hundreds were breeding in April on Turtle Island, between Lacepede Islands and Cossack, West Australia.

I shall conclude my somewhat scattered observations on the Pelican by giving a realistic account of an outing "After Pelicans' Eggs," kindly written for me by Mr. John W. Mellor, an enthusiastic collector in South Australia: "My brother and I left Adelaide on the 18th September, 1894, en route for the Coorong. (The Coorong is an arm of the sea half-a-mile to a mile wide, separated from the ocean by a narrow strip of sandhills running parallel with the coast line for about 100 miles.) We took train to Lake Alexandrina, and then boarded a steamer and crossed over to the other side. Here we got into possession of a small boat, and neither of us being used to rowing, we found it rather heavy work in pulling, but in this way we proceeded up Lake Albert and disembarked at 'Narrung' station, about six miles down the lake. From this point we were obliged to take 'shank's pony,' and a nice little walk we had of about 100 miles, which took a considerable time to accomplish, as we had to carry our knapsacks and

everything required. On reaching the locality in which the birds are said to breed, we found that they were located on a small island about a mile from the shore, and access to which was impossible except by boat. We were non-plussed; we tried to get a boat from the blacks, but they had none, and we were told that the nearest boat that they knew of was owned by a small fisherman and boundary rider, who lived about ten miles further on, so that to gain this we should have to walk there, borrow the boat, and then come back to the place, after which we should have to return the boat and come back on foot again—and all this for only the *chance* of seeing or getting anything, was not at all encouraging. My brother wanted to return, but I, being more enthusiastic and also more experienced in roughing it, would not hear of this, and consequently pushed on, determined 'to do or die.' We reached the dilapidated abode of the fisherman on the morning of the last day of the month, but what was our disappointment to find that he had set out in the early morn boundary riding, and would not return till late that night. So there was nothing to do but stay here all day, as his 'missus,' who was a black, could not give us the boat, but told us we had better 'wait till the Boss came home.' He did not return till late that night, and we had to make the best of it until morning by stretching ourselves out, both wrapped up in a 'bluey,' so you may imagine our feelings. But we were up pretty early next morning from a rather restless night, and found our 'host' was up before us and left for the beach. We then had to chase him. After some conversation on the boat subject, we learned that he had only got a small canoe, and that it was unseaworthy, but if we liked to risk our lives we could have the loan of it. There was nothing for it but to run the risk, and as it was getting late and we were pushed for time, we arranged to take a black man and borrow a horse and cart from the fisherman. In this way we reached the point off the shore where we intended to launch our little skiff. (In these regions, and at this time of the year, the wind generally changes round from the land at about 1 o'clock p.m. and blows a stiff gale from the seaward.) With all speed our flat-bottom skiff was placed in the water, but it was found that two would be the utmost of its carrying powers, as it was only eight inches deep. Accordingly I took the black man and set off for the island, leaving my brother behind to look after the horse and cart. On arriving near the island, I could see the Pelicans sitting about on a bare piece of ground about the middle of the island; also a few Black Swans and White-breasted Cormorants, but it was not until I had landed that I could see their eggs. The birds rose in a body, and after circling about for a minute or two, went down into the water and started fishing. The island was somewhat elevated in the centre, and the birds had taken possession of a bare patch, running from almost the water's edge to the summit, with an aspect so that the sun would shine on them from early morning to evening. The extent of their nesting grounds was not very great, only about twelve or fourteen yards broad and about eighteen or twenty yards up the incline. Incubation was far advanced in some eggs, and in others it was early in the season, for some of the young were out of the shell several days, while others had only just



thought about nesting. A curious thing about the nesting place was the birds seemed to have commenced to lay at the lower end of the ground, and as others came, they had to take their places a little higher up the slope, and so on to the top, for at the lower end the young birds were large, and they gradually became smaller higher up, followed by eggs far advanced in incubation, which gradually became quite fresh at the top end, and then again above this there were a few fresh scratches in the sandy ground, showing that a few birds still intended to lay within a day or two. There must have been from 150 to 200 nests, or apologies for nests, situated from about three to four feet apart, apparently the sitting birds being just out of each other's reach. The eggs varied in size considerably, some being very much longer than others, and some very short and stumpy. The stench was very unpleasant, the weather for weeks had been hot, and the old birds had carried fish for their young in excess of the demand, and it lay about putrefying in the sun.

"But this was reduced to a considerable extent by the Crows, which settled every now and then and flew off with some of the 'delightful' booty. I also saw several nests of the Black Swan amongst the salt-bush growing on the island. The nests contained from three to six eggs of the usual size and colouring. The White-breasted Cormorant had also just commenced to incubate, for some of their nests were placed here and there amongst and near the Pelicans' abode. The weather looked threatening, and I could see a change was not far off. The black also became uneasy, and was anxious to return to *terra firma* of the mainland. So after procuring a few sets we started for the shore, but only just in time, for we had barely reached shelter when the change came, and the bosom of the water was changed into ripples, then from ripples to rough waves.

"We reloaded the dray with the boat as soon as possible, and as the black man had led the horse down with us, we sent him back in like fashion, while we retraced our steps to the first shelter we could get, which was about three or four miles along our homeward journey. We were late in getting along, and it was some time after dark when we arrived at the place, quite tired out with having such an anxious day, and also having little or no sleep the night before. But such are among the joys of a field naturalist."

## ORDER—PYGOPODES : DIVING-BIRDS.

## FAMILY—PODICIPEDIDÆ. GREBES.

735.—PODICIPES NOVE HOLLANDIÆ, Stephens.—(667)

## BLACK-THROATED GREBE.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 81.*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 519.*Previous Descriptions of Eggs*.—\*Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 514 (1865); Campbell: Southern Science Record (1883); North: Austr. Mus. Cat., p. 348 (1889).*Geographical Distribution*.—Australia in general and Tasmania; also New Guinea and Java; New Caledonia.*Nest*.—A floating structure, composed usually of aquatic weeds piled up in rounded form, the top being almost level with the surface of the water (in some instances the eggs are in the water), and stranded among rushes or submerged fallen trees, &c., or anywhere in flooded country. Sometimes these nests are placed near or amongst those of the large Tippet Grebe.*Eggs*.—Clutch, four to six usually, seven to eight rarely; elliptical in shape; texture of shell fine; surface glossy; colour, a thin, dull white coating of lime obscures a pale bluish-white shell, and becomes darker or of a shiny raw sienna shade as incubation proceeds. Dimensions in inches of a proper clutch: (1) 1.48 × 1.0, (2) 1.44 × 1.0, (3) 1.4 × 1.03, (4) 1.34 × 1.03.*Observations*.—The little Black-throated Grebe may be found in swamps and lagoons throughout the Continent and Tasmania, and is probably the most common of the three species of Australian Podicipes, as the birds are technically termed.

The bird, like the Hoary-headed Grebe, is likewise familiarly known as a "dabchick," and, although almost wingless, it is astonishing how quickly the bird can get under water, and show a "clean pair of heels" to the pot-hunter the instant he pulls the trigger.

In the "Catalogue" of the Australian Museum, Mr. North states that, "while sitting, the female covers herself over with the outer portions of the nest, her head and neck alone being visible; when leaving the nest she covers her eggs over and dives at once, reappearing about ten or fifteen yards away. During 1873 many nests of this species were procured in a single afternoon from the Albert Park Lake, near Melbourne."

Mr. Harry Barnard (Queensland) has watched the Black-throated Grebe concealing its eggs in the manner just described before darting into the water.

\*No dimensions given.

The following is another Queensland note, written by Mr. Hermann Lau:—"The little Grebe, like the Swan, makes its nest rest on the bed of a shallow ditch or lagoon. It is sometimes 2½ feet in thickness, its materials comprising the long, narrow leaves of water plants, lined with rootlets of the same. At night time the bird sits on its five eggs, but while it is day, and the sun shining, it covers the eggs with water weeds, the surface of the water being level with the brim of the nest, which, as a whole, forms the figure of a cone. Once I accidentally shot a mother bird, and found, when dead, she had under each wing a young one, and when I waded back to the nest found one egg. Breaking the egg, discovered a young one, which opened its beak and was quite lively. Only one brood is reared. Yandilla, October, 1877."

When out in the back-water lagoons of the Murray River, after Marsh Terns' eggs, 26th November, 1893, Mr. G. H. Morton found several nests of the little Black-throated Grebe among a breeding colony of the Terns. The Grebes' nests were built principally of black, decayed stalks of water plants, and were larger in size than those of the Terns, the eggs being invariably covered with the same material. The Grebes did not appear to be sitting; in fact, none of these birds were noticeable about. Probably they had been scared away by Mr. Morton's approach. But the Terns kept to their posts.

Breeding months are September to January or February. Mr. A. Watson informs me that on one occasion in Gippsland he found eight eggs in a nest of the Black-throated Grebe.

The food of Grebes consists chiefly of small fish, mollusca, and insects of various kinds. The Black-throated Grebe, as its name indicates, may be distinguished from the Hoary-headed Grebe, which it resembles in size and general colour, by having its throat and sides of the face black. There is also a conspicuous mark of deep-chestnut, beginning behind each eye and extending down the sides of the neck.

The young in down is whitish on the under parts, while the upper surface is striped alternately black and lightish-brown.

During the Calvert Expedition this bird was noted for West Australia for the first time. Large numbers of them were seen near Lake Way, and at the depot Mr. L. A. Wells killed one on firing into a flock of Teal. These Grebes were also found at many of the swamps formed by the heavy rains near the Fitzroy River.

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736.—*PODICIPES POLIOCEPHALUS*, Jardine and Selby.—(666)  
*P. nestor*, Gould.

#### HOARY-HEADED GREBE.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 82.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 522.

*Previous Descriptions of Eggs*.—\*Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 512 (1865); Campbell: Southern Science Record (1883); North: Austn. Mus. Cat., p. 347 (1889).

*Geographical Distribution*.—South Queensland, New South Wales, Victoria, South, West, and North-west Australia, and Tasmania.

\*No dimensions given.

*Nest*.—Similar to that of *P. nova hollandia*, somewhat flat, and composed of a floating mass of aquatic weeds submerged within an inch or two of the top of the water of swamps, &c.

*Eggs*.—Clutch, four to five, occasionally six; elliptical in shape; texture of shell fine; surface glossy, and frequently rough with limy nodules; colour, a thin, dull white coating obscures a greenish-white shell. As is usually the case with Grebes' eggs, they become darker and more polished as incubation proceeds. Dimensions in inches: (1) 1.59 × 1.13, (2) 1.58 × 1.12, (3) 1.57 × 1.11.

*Observations*.—The Hoary-headed Grebe, commonly called Dabchick, is a much smaller bird than the Tippet or Crested Grebe, being only 9 or 10 inches in total length, including 1 inch for the length of its bill. Its plumage is brownish above, and beautiful silvery-grey beneath, while its head is bushy and black, curiously ornamented with lengthened hair-like white plumes, hence the bird's vernacular name, Hoary-headed.

Like the frill on the large Tippet Grebe, the long hair-like plumes which adorn the face of this species are only donned during the breeding time. When family responsibilities are over for the season, the head becomes browner, and the white plumes disappear.

Grebes usually prefer quiet inland waters, but Mr. Tom Carter, Western Australia, tells me on one occasion, when coasting in a boat, a Hoary-headed Grebe was secured at sea. The bird appeared injured in some way, and was caught by one of his black boys diving after it. The nearest fresh-water pool, Mr. Carter reckoned, was a hundred miles distant. A distressing drought had been existing in the district for about two years and a half, which may have accounted for the little Grebe being found at sea. However, this bird has been found still further at sea, near the same region. Mr. G. K. Beddoes, writing from the Abrolhos Islands, which are about fifty miles off the coast, states: "Last winter (1897) there have been a great many small Water Hens round the islands, something like the Dabchick, a little dark bird, looking when swimming like a small duck, and a demon to dive. They are quite strangers to us as far as I am aware. I have not seen any for the past month, and think they must have cleared out again."

The breeding months for this species are from October to January.

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### 737.—PODICIPES CRISTATUS, Linnæus.—(665)

#### TIPPET GREBE.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 80.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 544.

*Previous Description of Eggs*.—Potts: Trans. New Zealand Inst., vol. ii., p. 74 (1870); Travers: Trans. New Zealand Inst., vol. iii., p. 113 (1871); Buller: Birds of New Zealand (1873), vol. ii., p. 286 (1888); Lucas: Victorian Naturalist (1884); North: Austr. Mus. Cat., p. 347 (1889); and others.

*Geographical Distribution*.—Australia in general and Tasmania; also New Zealand, Africa, Asia, Central and Southern Europe.

*Nest.*—Composed of aquatic weeds, and stranded so that the top is nearly level with the surface of the water, amongst rushes, &c., usually in large lagoons. Occasionally eight or ten nests may be found near each other.

*Eggs.*—Clutch, five to seven; elliptically inclined in shape; texture of shell somewhat fine; colour, a dull, white, limy coating obscures a greenish-white shell. The outside covering, however, soon becomes stained, and as incubation proceeds goes through various shades of polished, yellowish-brown to very dark olive-brown. Dimensions in inches of odd pairs: A (1) 2.06 × 1.46, (2) 2.05 × 1.4; B (1) 2.02 × 1.36, (2) 2.01 × 1.37.

*Observations.*—The Tippet Grebe, which is of strikingly odd appearance, is found in localities suitable to its mode of living throughout Australia. It is also found in Tasmania and New Zealand, and is identical with the great Crested Grebe of Europe. An ornithological conundrum—How has this peculiar species, devoid of almost any flying power, found its way to the antipodes? The Ven. Canon Tristram collected an adult male in the Sea of Galilee.

The ornamental frill, or collarette, from which the bird derives its name, is only worn during the breeding season, and by both sexes. The frill is black on the outer edge, and rich chestnut-colour in the centre, gradually passing into the buffy-white of the face. The rest of the plumage may be described as:—Upper surface, dark-brown; under surface, silvery-white. It is a large bird, measuring about 24 inches in length, including a straight and sharply-pointed bill  $2\frac{3}{4}$  inches. The feet are curiously shaped, by reason of the flattened, lobated toes. These birds are rare divers, and are occasionally caught in fishermen's nets.

Although usually an inland bird, large flocks of Tippet Grebes are sometimes seen on the waters of Port Phillip. Occasionally I have noticed odd pairs together with Hoary-headed Grebes gracefully riding the waves near the shipping in Hobson's Bay.

The late Mr. T. H. Potts, who was a good field naturalist, and a very descriptive writer, observed that in New Zealand the Tippet Grebe swims low in the water, "with a certain air of demure gravity," and that during incubation it maintains an upright posture, holding its long neck erect, which at a distance resembles a stick more than anything living.

Mr. W. T. L. Travers also enjoyed favourable opportunities of observing the habits of this great Grebe in New Zealand. According to the testimony of both Mr. Potts and Mr. Travers, the Grebe in that country only lays three eggs. In Australia the clutch varies from five to seven eggs. Mr. Travers states:—"Both male and female Grebes assist in the labour of incubation, although I believe the chief part devolves upon the female, and that she is only relieved by her partner for the purpose of enabling her to feed. Before the actual work of incubation commences, the eggs are usually covered with pond weed during the absence of the birds from the nest, but afterwards the nest is seldom, if ever, left by both birds, except under unusual circumstances.

"The New Zealand bird, as might be expected by its more recent contact with civilised man, is far less shy than the European one, and easily discriminates between persons who may be dangerous and those who are not. The children of my manager frequently visit the nests during the progress of incubation, and as they have never injured the nests or eggs, or interfered mischievously with the birds themselves, they are allowed to approach quite close without the latter thinking it necessary to quit the nest. When they do so, they glide into the water with a quick but stealthy motion, diving at once, and rising at a considerable distance from the nest.

"The eggs do not appear to suffer from immersion in the water, even for a considerable time, for on one occasion three eggs, which by some means had been thrown out of the nest, and had sunk below to a depth of several feet, and which must have been immersed in the water for twenty-four hours at least, were replaced by one of the children, and the bird having sat upon them, two out of the three produced chicks. When the water of the lake is rising, in consequence of heavy rain, the birds are seen busily engaged in procuring material and building up the nest, so as to raise the eggs above the reach of the flood. The added material is afterwards spread out after the water subsides; but on some rare occasions the rise of the lake has been so great and so rapid that the birds have been unable to meet it, and the eggs have become addled. In such cases no chicks have been produced that season.

"The young birds are of a greyish-green colour, striped with black (dark-brown), and, particularly when of small sizes, are not easily detected whilst floating on the water. They take to the water immediately after being excluded from the shell, and both parents exhibit the greatest solicitude in tending and feeding them. When fatigued, they are carried on the back of the old birds, taking their station immediately behind the insertion of the wings, for which purpose the parent bird immerses itself deeper than usual in the water."

Both male and female aid in the construction of the nest. Usual breeding months, November to December. Amongst my notes there is a record of a nest of the Tippet Grebe having been observed during the season of 1887 on Lake Boort, Victoria, which contained ten eggs—possibly the combined clutches of two females.

ORDER—IMPENNES : PENGUINS.

738.—CATARRHACTES CHRYSOCOME, Forster.—(668)

CRESTED PENGUIN.

*Figure*.—Gould : Birds of Australia, fol., vol. vii., pl. 83.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 635.

*Previous Descriptions of Eggs*.—Buller : Birds of New Zealand (1873), vol. ii., p. 203 (1888) ; Verrill : Trans. Connect. Ac., vol. ix., p. 458 (1895) ; Hall : Ibis, p. 32 (:900).

*Geographical Distribution*.—Coasts of New South Wales, Victoria, South and West Australia and Tasmania ; also New Zealand and islands to the south, Terra del Fuego, Falkland Islands, South Georgia, Tristan da Cunha, Cape of Good Hope, Prince Edward Island, Marion Island, Crozet Islands, Kerguelen's Land, and St. Paul's Island.

*Nest*.—Sometimes trampled tussock or collected shingle, but usually the bare ground or rock.

*Eggs*.—Clutch, two ; round in form, more compressed at one end ; texture of shell coarse ; surface without gloss ; colour, bluish or greenish-white, with hard coating of lime and occasionally lime nodules. Dimensions in inches of two proper clutches : A (1st egg) 2.35 × 1.9, (2nd egg) 2.56 × 1.98 ; B (1st egg) 2.49 × 1.85, (2nd egg) 2.55 × 1.92.

*Observations*.—The true homes of this handsome yellow-crested Penguin are the desolate islands of the Southern Ocean, such as Macquarie Island, which it shares with the multitudes of King and Royal Penguins, Kerguelen's Land, South Georgia, and other places.

However, a few individuals occasionally reach the Tasmanian and southern coast of Australia. There are several skins of the Crested Penguin in the Hobart Museum which were taken in Tasmania. During the expedition of the Field Naturalists' Club of Victoria to Bass Strait, 1887, a Crested Penguin was captured alive among the rocks on King Island. I have recorded its occurrence in Western Australia, where one was caught close to Hamelin Harbour, near Cape Leeuwin.

The birds are called *Rock Hoppers* because of their manner of hopping from rock to rock, as if their legs were tied together. The description of a bird is : Head, neck, back, and sides, black ; over each eye is a stripe of pale yellow feathers, which are lengthened into a crest behind (hence the name crested) ; under surface silvery-white ; an imposing creature, standing about 2 feet 3 inches high.

A fine pair of eggs in my collection of the Crested Penguin is from Macquarie Island, where the bird is locally known as the Victoria Penguin, and where these birds commence to arrive in crowds about the beginning of November. Some eggs are laid by the middle of that

month. The nesting places are amongst the tumbled-down boulders, the pair of eggs being deposited on the bare ground or rock. It is remarkable that the first egg laid should be smaller than the other. The old birds take their young away in March, the former returning to moult in May, and finally leaving about the middle of June. It may not be generally known that a Penguin takes exactly 28 days to moult.

In the "Transactions of the Connecticut Academy" (U.S.A.), 1895, Mr. G. E. Verrill quotes a note of Mr. George Comer, who spent a season on the islands of Gough, Kerguelen, and South Georgia, and who states the Rock Hopper Penguins (*E. chrysocome*) have dark-yellow beaks, top of feet white, bottom black, pupil of eye dark, with red rim; topknots or crest dull-yellow, mixed with a few black feathers. They lay two eggs, the first one smaller than the other, and slightly tinted green. When these are taken the birds will lay again. They often were stained with green, so this is apparently not due to herbage, as there is none in the cave, and the birds would not have to pass over any in entering or leaving it for the sea. One most curious fact was that in no case did we find two eggs from one nest correspond in size or form."

Sir Wyville Thomson, in the "Voyage of the 'Challenger,'" writes: "Beyond the garden the tussock grass (*Spartina arundinacea*) of the Tristan group forms a dense jungle. The root-clumps, or 'tussocks,' are two or three feet in width and about a foot high, and the spaces between them one or two feet wide. The tuft of thick grass stems (seven or eight feet in height) rises strong and straight for a yard or so, and then the culms separate from one another and mingle with those of the neighbouring tussocks. This makes a bush very difficult to make one's way through, for the heads of grass are closely entangled together on a level with the face and chest. In this scrub one of the Crested Penguins, probably *Eudyptes chrysocome*, called by the natives in common with other species of the genus *Eudyptes* 'Rock Hoppers,' has established a rookery. From a great distance, even so far as the hut on the ship, one could hear an incessant noise, like the barking of a myriad of dogs in all possible keys, and as we came near the place bands of Penguins were seen constantly going and returning between the rookery and the sea. All at once, out at sea, a hundred yards or so from the shore, the water is seen in motion, a dark-red beak and sometimes a pair of eyes appearing now and then for a moment above the surface. The moving water approaches the shore in a wedge-shape, and with great rapidity a band of perhaps three or four hundred Penguins scramble out upon the stones, again exchanging the vigorous and graceful movements and attitudes for which they are so remarkable while in the water for helpless and ungainly ones, tumbling over the stones and apparently with difficulty assuming their normal position, upright on their feet, which are set far back, and with their fin-like wings hanging in a useless kind of way at their sides. When they have got fairly out of the water, beyond the reach of the surf, they stand together for a few minutes, drying and dressing themselves and talking loudly apparently congratulating themselves on their safe landing, and then they scramble in a body over the stony beach, many falling and pulling



themselves up again with the help of their flippers on the way, and make straight for one particular gangway into the scrub, along which they waddle in regular order up to the rookery. In the meantime a group of about equal number appears from the rookery at the end of another of the paths. When they get out of the grass on to the beach, they all stop and talk and look about them, sometimes for three or four minutes. They then with one consent scuttle down over the stones into the water, and long lines of ripple, radiating rapidly from their place of departure, are the only indications that the birds are speeding out to sea. The tussock-brake, which on Inaccessible Island is perhaps four or five acres in extent, was alive with Penguins breeding. (This was in the latter part of October.) The nests are built of the stems and leaves of the *Spartina*, in the space between the tussocks. They are two or three inches high, with a slight depression for the eggs, and about a foot in diameter. The gangways between the tussocks, along which the Penguins are constantly passing, are wet and slushy, and the tangled grass, the strong ammoniacal smell, and the deafening noise continually penetrated by loud separate sounds, which have a startling resemblance to the human voice, make a walk through the rookery neither easy nor pleasant.

"The Penguin is thickly covered with the closest felting of down and feathers, except a longitudinal band, which in the female extends along the middle line of the lower part of the abdomen, and which, at all events in the breeding season, is without feathers. The bird seats herself almost upright upon the eggs, supported by the feet and the stiff feathers of the tail, the feathers of the abdomen drawn apart, and the naked band directly applied to the eggs, doubtless with the object of bringing them into immediate contact with the source of warmth. The female and the male sit by turns; but the featherless space, if present, is not nearly so marked in the male. When they shift quarters they sidle up close together, and the change is made so rapidly that the eggs are scarcely uncovered for a moment. The young, which are hatched in about six weeks, are curious-looking little things, covered with black down. There seems to be little doubt that the Penguins properly belong to the sea, which they inhabit within moderate distance of the shore, and they only come to the land to breed and to moult and for the young to develop sufficiently to become independent. But all this takes so long that the birds are practically the greater part of their time about the shore. We have seen no reason as yet to question the old notion that their presence is an indication that land is not far off."

739.—*EUDYPTULA MINOR*, Forster.—(669)

## LITTLE PENGUIN.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 84.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 646.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 520 (1865); Potts: Trans. New Zealand Inst., vol. ii., p. 75 (1870); Buller: Birds of New Zealand (1873), vol. ii., p. 301 (1888); Legge: Proc. Roy. Soc., Tasmania, p. 134 (1888); North: Austr. Mus. Cat., p. 349 (1889); Le Souëf: Ibis, p. 420 (1895).

*Geographical Distribution*.—Coasts of New South Wales, Victoria, South and West Australia and Tasmania; also New Zealand.

*Nest*.—A little dry grass or weeds, placed in cavities under or between rocks, a hollow scraped out underneath tussock grass or other vegetation, or sometimes a deserted Petrel's burrow, usually on isolated islands.

*Eggs*.—Clutch, two; inclined to pyriform or roundish in shape; texture of shell coarse; surface slightly glossy; colour, white, with a faint greenish tinge, especially when fresh. Dimensions in inches of selected clutches: A (1) 2.32 × 1.68, (2) 2.31 × 1.67; B (1) 2.3 × 1.62, (2) 2.19 × 1.59; C (1) 2.24 × 1.67, (2) 2.2 × 1.68.

*Observations*.—These curious little creatures, marvellous for their diving powers, frequent the southern coast line of Australia, also the coasts of Tasmania and New Zealand, making their breeding homes on the islands adjacent thereto.

The Little Penguin has a coat of light-blue and a silvery-white under-surface. Total length, 18 inches. As Gould points out, Little Penguins are numerous on nearly all the islands in Bass Strait from September to January—the breeding season. Probably they are found far out at sea during the remainder of the year. From what he personally observed while residing on these islands, the task of incubation seemed mutually to be divided by both sexes, each regularly relieving the other during the night.

My introduction to these Penguins was on Phillip Island, October, 1880, where there was a small "rookery" on Red Point. What with the quarrying for red granite and other disturbances, the birds have departed. A few, however, may still be found about the Nobbies at the other, (western) end of the island.

In the vicinity of our camp on the Kent Group, numbers of Little Penguins made the night hideous with their weird, groaning cries. One afternoon, we explored a "rookery" on the side of Murray Pass, the locality being an ascent from the sea of about 1 in 2 for about 300 or 400 yards. Between the rocks thick crops of the yellow-flowering *Goodenia* and tussocky grass flourished under sturdy she-oaks. Hereabouts we found many nooks and crevices of rock, or snug places under rank herbage (see illustration), tenanted with a Penguin sitting upon



LITTLE PENGUIN'S NEST

*From a Photo by D. Le Souef*



a pair of eggs or downy young. With considerable spirit and with a free use of bill and claws the birds splendidly defended their offspring—and, it may be added, to the discomfiture of one or two of the party who attempted to take eggs. It was noticed how highly odorous most of the nesting-holes were; some, judging by their “strength,” we calculated had been constantly occupied since the days of Captain Cook. In a few instances we observed four eggs—two good and two addled—in one nest. Date, November, 1890.

Again, three years afterwards, we heard the familiar calls all night long, from an islet near where we lay at anchor in Franklin Sound, Furneaux Group. We intended to investigate the place, to ascertain if the two species (the Little and the Fairy Penguins) were there, but, putting off the chance for a more convenient time, the opportunity never again occurred.

Mr. D. Le Souëf, in his daring adventure with Mr. H. P. C. Ashworth on Albatross Rock, 1894, procured some very interesting information concerning the two species of small Penguins (*E. minor* and *E. undina*). In the “Ibis” for October, 1895, he states: “The birds were extremely numerous; they had their nests both under rocks and in crevices near the water’s edge, and also on the top of the island under tussocks of grass and other herbage; in fact, the whole island was a large Penguin rookery, as their nests were found everywhere. Just before dark they approached their landing places in flocks of some thirty birds. They waited about one hundred yards out from the land for some little time before coming in, and occasionally two flocks were to be seen not far from one another, the members of each flock keeping very close together. After a time one lot would rapidly approach the land, swimming both on and under the surface, and coming in just behind the break of the swell. Thus they looked exactly like a shoal of fish, with their shining bluish backs and silvery-white bellies, swimming quickly through the water. They all endeavoured to get a foothold on the rocks before the drawback carried them away again, and there was a great deal of squealing and splashing about in the water in their haste to accomplish it. This many of them did, but the remainder were carried back, only to be brought in again by the succeeding swell, when probably they made good their landing. To avoid being dashed to pieces against the rugged rocks by the heavy sea as it comes thundering in, they turn round and swim rapidly against the surf, which prevents their coming against any obstacle with so much force as they otherwise would when being carried in; and when the swell has spent itself, and just before the drawback occurs, they endeavour to secure a landing. Now and then a pair of birds may be seen hurrying in by themselves, but as a rule they arrive in companies.

“The birds, when first seen approaching the island, were in a compact flock, and did not collect together just before coming on shore, so it is probable that they keep together when out at sea during the day. After landing they assembled just above high-water mark, and remained there for some time preening their feathers. When about half an hour had elapsed after the first contingent landed, and the numbers had been augmented by fresh arrivals to over one hundred birds, one would start along their well-worn track, and the others would all follow, but they

soon branched off along the different paths that led to their various nests. Many ascended steep inclines to reach the top of the island, and it was astonishing to see them climbing up at an angle of 60 deg. and more, occasionally aiding themselves with their wings and beak, sometimes walking, sometimes hopping from rock to rock.

"On reaching their mates on the nest they commenced their peculiar braying sound, first one bird and then the other; and in the caves, where numbers of these birds had their nests, the sound was kept up more or less all night. The noise is very loud and discordant. Two slightly different notes were heard; possibly one was made by the Little and the other by the Fairy Penguin. The two kinds of birds did not seem to land at the same time, but got mixed up when congregating on the landing places. The Fairy Penguin appeared to be of a brighter colour than the larger species.

"The young of both species were covered with very dark-brown down, and obtained their food by putting their beak inside that of their parent—the young being very noisy at feeding time."

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740.—*EUDYPTULA UNDINA*, Gould.—(670)

FAIRY PENGUIN.

*Figure*.—Birds of Australia, fol., vol. vii., pl. 85.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvi., p. 646.

*Previous Descriptions of Eggs*.—Campbell: Southern Science Record (1883); North: Austr. Mus. Cat., p. 350 (1889).

*Geographical Distribution*.—Coasts of Victoria and Tasmania (including intermediate islands); also New Zealand.

*Nest*.—Crevice of a rock or a hollow scraped out under vegetation.

*Eggs*.—Clutch, two; roundish in form, but more compressed at one end; texture of shell coarse; surface slightly glossy, occasionally with some large limy nodules; colour, white, with a perceptible greenish tinge. Dimensions in inches of a pair: (1) 1.98 × 1.55, (2) 1.97 × 1.53.

*Observations*.—The Fairy Penguin is the smallest of its singular tribe, and frequents the seas surrounding Tasmania and New Zealand. It has been found in Port Phillip waters.

Many authorities regard the Fairy Penguin as the young of the *E. minor*, but it differs from that bird in being constantly less in size (about 14 inches in total length) and in the deeper glossy blue colouring of the upper surface of the body. Gould says: "I invariably found the young of that species (*E. minor*) while still partly clothed in the downy dress of immaturity, to exceed considerably in size all the examples of this species (*E. undina*), even when adorned in the adult livery and possessing the hard bill of maturity. There can be no question therefore of the two birds being distinct."

In Gould's day the Fairy Penguin was breeding on Waterhouse Island, off the north coast of Tasmania. The eggs in my collection were collected on Cape Maria van Diemen, New Zealand, September 10th, 1887.

Sir Walter Buller states he has found this Little Penguin far more tractable than the large crested species, for under judicious management it will soon become perfectly tame.

A correspondent ("H.M.N."), writing to "The Australasian," 25th May, 1898, states that "Small Penguins are common in the Derwent, where they may be seen sometimes in flocks of half a dozen. As a rule, they go about in pairs. They are seldom seen singly. I had an opportunity of watching one feeding. It had driven a shoal of garfish into a shallow in Sandy Bay, by darting backwards and forwards behind them in decreasing semi-circles. When I arrived it had the fish bailed up in about twelve inches of water, right against the rocks. The speed with which it swam along the bottom was astonishing. It used its wings as paddles with a quick fluttering motion. It seemed to be flying under water. When it had got the fish conveniently together, it made a dart into the shoal, and seized one nearly as long as itself, swallowing it instantly. So quickly were the fish disposed of that I could not see any act of swallowing. The fish was simply seized, and then it vanished. A few half-circles on the part of the Penguin brought the fish together again, and another was seized and swallowed. If I had not shown myself over the rocks, and alarmed the Penguin, I have no doubt it would have devoured the whole shoal. I watched for several minutes, and the Penguin did not once rise to the surface for breath."

I have been much entertained while witnessing the turning movements of wonderful rapidity made by the Little Penguin after small fry in the waters of Hobson's Bay. But I have noticed that the bird, at intervals, invariably brought its bill to the surface of the water to breathe, albeit for half a second only, and while keeping up the chase. Frequently when pursuer and pursued came to close quarters their movements were so rapid as almost to deceive the eye.

## ORDER—CHENOMORPHÆ.

## Sub-Order—Anseres: Geese, &amp;c.

## FAMILY—ANATIDÆ: DUCKS.

## SUB-FAMILY—CYGNINÆ: SWANS.

## 741.—CHENOPSIS ATRATA, Latham.—(577)

## BLACK SWAN.

*Figure.*—Gould: Birds of Australia, fol., vol. vii., pl. 6.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvii., p. 41.

*Previous Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 348 (1865); North: Austr. Mus. Cat., p. 333 (1889).

*Geographical Distribution.*—Whole of Australia and Tasmania.

*Nest.*—Large, open, usually constructed of coarse aquatic herbage, sticks, bark, &c., sometimes lined with a thick layer of finer material—such as leaves, bark, roots of grass, and finished inside with a few feathers and a small quantity of down. Generally situated amongst the sedges or rank vegetation of a swamp, or on débris at the base of a tree in the centre of a lagoon. Dimensions: base, at water, 39 inches in diameter by 17 inches high; top or egg cavity,  $12\frac{1}{2}$  inches across by  $3\frac{1}{2}$  inches deep.

*Eggs.*—Clutch, four to six, rarely seven to eight; elliptical in shape; texture of shell coarse; surface glossy; colour, dull greenish-white, more or less soiled with brownish stains: if the outside coating be removed a pale green shell is revealed. Dimensions in inches of a proper clutch: (1)  $4.2 \times 2.5$ , (2)  $4.15 \times 2.55$ , (3)  $4.1 \times 2.58$ , (4)  $4.05 \times 2.5$ , (5)  $4.0 \times 2.57$ . Average weight, when full, about 9 ounces.

*Observations.*—Few large birds are more ornamental and interesting than the Black Swan, which is found in almost every part of Australia, particularly in the southern portions, including Tasmania.

Its elegant figure is well known. Its dusky plumage is relieved with pinky-red eyes and bill, and more strikingly with white pinions, especially when the bird is on the wing. Black Swans love the sheltered salt waters, swamps, and estuaries of the coast, as well as the fresh lakes and lagoons of the interior.

These splendid birds are still numerous in the lakes and back-waters of Gippsland. Naturally the Black Swan was a conspicuous bird to the early discoverers of Australia, and gave rise to such geographical names as Swan River, Swan Bay, Swan Reach, &c. The history and





NEST OF THE BLACK SWAN.

*From a Photo by the Author.*



discovery of the first mentioned locality in Western Australia is especially interesting. On Christmas Day, 1697, the early navigator, Vlaming, discovered and named that river, the name being suggested by the great numbers of Black Swans, seen for the first time upon its waters. Several birds were captured and introduced by Vlaming into Europe, where they were quite unknown, therefore the Black Swan is probably the oldest known of Australian birds on record.

Gould was of opinion that the first recorded notice respecting the Black Swan occurs in a letter, written by Mr. Witsen to Dr. M. Lister *about* the year 1698, which states: "Here is returned a ship, which by our East India Company was sent to the south land, called *Hollandia Nova*," and mentions that Black Swans were found there.

In 1726 two were brought alive to Batavia, which were procured near Dirk Hartog Island, Western Australia. We all love to read ancient ornithological records.

The first mention we have of Black Swans in Victorian waters (then part of New South Wales) was, when Bass bravely coasted round from Sydney in an open whale-boat with six seamen and six weeks' provisions. On entering Western Port, 5th January, 1798, he said—"Black Swans went by hundreds in a flight. Later on when Captain Grant was surveying the place in the "*Lady Nelson*," 1801, his people, too, "saw many Swans," and "captured a couple of cygnets, one of which became tame and was presented to Governor King."

Lieutenant Murray, when discovering Port Phillip entrance, 4th February, 1802, has left on record, "Swans, Pelicans, and other birds of various sorts were seen in great numbers. The boat's crew lived on Swans all the time they were away."

Mentioning Western Port, my genial friend the late Thomas Charles King, when master of the schooner "*Redwing*," went into that port, 1850, and sent his ship's boat up to Yallock Creek one afternoon, which returned with no less than thirty-two dozen eggs.

At that particular creek what a joy it is, and a captivating sight for an observer from land, to break cautiously through the closely-packed tea-tree scrub and peep out on the waters of the Bay. Some Swans are seen yonder on land, hardly to be distinguished on account of their sombre garb assimilating so closely the colour of the dark loamy shore; however, they may be discovered by cygnets in greyish down pattering near. The middle distance is occupied with other Swans, with their long necks gracefully curved, finding bottom for food in shoaling waters; while beyond, far out, is a long regiment in black uniforms upon the bosom of the Bay, returning and advancing with the ebb and flow of each recurring tide. Such a picture I have witnessed.

Gould procured newly-hatched young at South Port River, Tasmania, and took five fresh eggs on Flinders Island, Bass Strait, 13th January, 1839.

I found a Black Swan's nest during a trip to Riverina, 16th September, 1894. It contained five eggs, partly incubated, and was placed on a fallen branch near the base of a box-tree, in the centre of a lagoon, where the water was about two feet deep. The nest was large and broad at the base, constructed of

sticks, bark, &c., and lined with fine material, including a few feathers and some down. On account of its picturesque situation it made an excellent photograph (see illustration), which, however, was not taken without difficulty, although I was ably assisted by my companion, Mr. J. Gabriel. In the first place our frail flatty was wretchedly leaky; in the second place, owing to the depth of water about the nest, the tripod of my camera would not stick in the mud—the buoyant legs, first one and then another, were always struggling to the surface of the water.

Gould believed in the great fecundity of the Black Swan. However, his test was hardly a satisfactory one, considering the pair of birds was kept in captivity, and in England. They bred sixteen times in seven years, laying 111 eggs, or an average of seven to a sitting. It was observed that the male and female relieved each other in incubating.\*

The young Swans, or Flappers as they are called, are readily rowed down and captured for sport; the old birds, too, when they shed their primary quill-feathers and are unable to fly. Moulters may be found at almost any time of the year, but chiefly in summer—the middle of November to the middle of February.

It is music to the naturalist's ear to hear overhead the wild cries of Swans passing by in the night. In provinces where the waters are drying up, Swans travel their young overland by night, a precaution, no doubt, against attacks of diurnal birds of prey. The daring little White-fronted Falcon has been known to beat a Swan on flight to the ground in a state of terror.

Black Swans appear to lay in winter sometimes, as well as under a summer's sun. I possess a note from West Australia of five eggs having been taken on the Gascoyne River one 12th July, and young were seen on the Minilya the 7th of the same month. During July, 1894, hundreds of Swans' eggs were taken on Moira Lakes, River Murray, by the blacks at the Cumberagunja Mission Station.

On the other hand, in January, 1885, a Black Swan's nest (six eggs) was observed on Lake Hindmarsh, Victoria. Again, on the 31st January, 1894, about two dozen fresh eggs were taken on Lake Buloke, near Donald, Victoria, and found their way into the fish market. Mr. T. Lewis, the inspector, kindly gave me one, which I helped to eat, its flavour being as delicious as a domestic duck's.

Usual breeding season August to January. An old observer says that in Riverina they lay six weeks earlier or later, according to the rains. Two or three broods are supposed to be reared a season.

Writing of the Black Swan in South Queensland, Mr. Hermann Lau quaintly says:—"Nest, three feet thick, placed in quiet water, firm on the bottom. The female only sits (?). Floating grass stalks, should they pass by, are added to the nest. Six eggs are laid. Breeds three times a year: in March, August, and November. The duty of the mate is to protect; but before the female lays again he chases the grown-up young away."

Cygnets about a week old are clothed in lightish-coloured down, tipped with dark-grey. Many eggs and young are destroyed by water-

\* Usually the female sitting by day and the male by night.—A. J. C.

rats—by the white-bellied species in Gippsland, and by the golden-bellied in Riverina.

Mr. H. E. Hill in his "Bendigo Bird Notes," relates that on the 8th August, 1896, two Black Swans while flying across the town struck the top of the Town Hall, apparently dazzled by the electric light, and fell dead in the street below.

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SUB-FAMILY—ANSERANATINÆ.

**742.**—ANSERANAS SEMIPALMATA, Latham.—(579)

PIED GOOSE.

*Figure.*—Gould: Birds of Australia, fol., vol. vii., pl. 2.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvii., p. 44.

*Previous Descriptions of Eggs.*—Campbell: Southern Science Record (1883); North: Austn. Mus. Cat., p. 335 (1889).

*Geographical Distribution.*—Australia in general and Tasmania.

*Nest.*—Round, bulky, composed entirely of dead flags and placed amongst the growing flags or reeds of a swamp or lagoon. A platform about 48 inches long leads up to the nest. Dimensions over all, 28 to 30 inches by about 20 inches from the top to the surface of the water, not including about 12 inches for submerged foundation; egg cavity, 12 inches across by 4 inches deep.

*Eggs.*—Clutch, five to thirteen, but usually nine to eleven; elliptical in form; texture of shell coarse; surface pitted, but glossy; colour, creamy or yellowish-white, soon soiled with nest stains. Dimensions in inches of half a clutch: (1)  $3.1 \times 2.22$ , (2)  $3.05 \times 2.26$ , (3)  $3.02 \times 2.31$ , (4)  $3.0 \times 2.3$ , (5)  $3.0 \times 2.26$ ; of a pair from a set of six: (1)  $3.0 \times 2.25$ , (2)  $2.98 \times 2.27$ .

*Observations.*—The Semipalmated Goose is so named on account of its feet being half-webbed, but it is more frequently called the Pied Goose, because of its conspicuous black and white plumage. It is a fine bird. It ranks next in importance to the Black Swan and Cape Barren Goose. Like these species, it is peculiar to Australia.

The Semipalmated Goose is found in places throughout the Continent, but only occasionally in Tasmania. Its greatest numbers are probably in tropical Australia, where, in the wet (summer) season, according to explorers and others, the Geese sometimes fly in countless flocks. They were at one time tolerably abundant in Riverina, making their homes in the rush-covered lagoons and overflow waters of the rivers and billabongs. But, as Gould truly remarks—and it is melancholy for naturalists and lovers of nature to contemplate the fact—the advancement of civilisation invariably leads to the gradual extirpation of the conspicuous natural productions of the country. So, owing to the settling of

Riverina, and the taking up of the great river frontages, the black and white Semipalmated Goose is rapidly disappearing. Why do land-owners not preserve their swamps? Why are birds shot in close season and on Sundays? Why do our police treat the Game Act as a dead letter?

Some of the domains of the Pied Goose remain undisturbed in the reed beds of the Murray Lagoons. The naturalist feels an ecstasy of delight in wading through such places to examine the haunts of wild fowl, notwithstanding such localities abound with tiger snakes and leeches and myriads of flies and mosquitoes. (See illustration, "Haunt of Wild Fowl.")

One bright day (14th November, 1892) Mr. J. Gabriel and I, accompanied by the Messrs. Sach—two young farmers—explored a beautiful lagoon parallel with the Murray, full of aquatic vegetation—floating lily leaves, russet-coloured seeding plants, circular patches of "cumbungie" reeds, &c., with here and there tall flags, and an occasional red gum-tree.

After a small "rookery" of White Ibis and a Bittern's nest, we discovered amongst the living flags a large, round, bulky nest, composed entirely of dead flags, containing a full complement of ten eggs of the Semipalmated Goose, the water round about being about a foot deep. We took a photograph (picture herewith). The nest had a singular platform or landing at one side about four feet long, extending from the top down to the water. The dimensions over all were 28-30 inches by about 20 inches from the top to the water-line, but not including 12 inches for the submerged foundation. The eggs were partially incubating, as were two other sets (of five and six) found in other parts of the swamp, which we took for museum purposes.

Mr. George H. Morton, of Benjeroop, who has made many wading excursions after water-fowl in the swamps contiguous to his farm on the Murray, tells me that eleven eggs are a usual complement for the Semipalmated Goose, and on one occasion he found thirteen. His collection of fresh wild Geese eggs once furnished material for the cakes and custards at a Sunday school picnic.

Many species of swimming birds—i.e., Ducks and Geese—have remarkable windings in the trachea, or windpipe, but in no bird are they more singular than in the Semipalmated Goose, the total length of the windpipe being 4 feet 8 inches, while the length of the bird's own body from tip of bill to tail is only 2 feet 8 inches. The legs are yellowish, while the eyes and bill are reddish-brown.

The Semipalmated Goose feeds mostly on grass and herbage. Like the Black Swan and Cape Barren Goose, it is gregarious. Near the Murray during favourable seasons, at sundown, when the Native Companions are coming in, black and white Geese may be seen passing in strings over the fringe of red-gums that mark the river's course, as they proceed to the plains and feeding-places for the night. An early riser may see the flocks in the morning returning, re-crossed by regiments of Native Companions outgoing on heavy outstretched wings.



NEST OF THE PIED GOOSE.

*From a Photo by the Author.*





## SUB-FAMILY—PLECTROPTERINÆ.

## 743.—NETTOPUS PULCHELLUS, Gould.—(581)

## GREEN GOOSE TEAL.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 4.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvii., p. 67.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia, (1848), also Handbook, vol. ii., p. 358 (1865).

*Geographical Distribution*.—North-west Australia, Northern Territory, and North Queensland; also New Guinea, Tenimber Islands, Moluccas, and Celebes.

*Nest*.—Constructed of long dry grasses, the slight cavity for the eggs being sometimes lined with feathers and down; usually resting upon the surface of the water among the herbage of a swamp or lagoon. Possibly the eggs are occasionally deposited in hollow trees.

*Eggs*.—Clutch, eight to ten probably; colour, whitish. Dimensions in inches: 1.88 × 1.38 (Gould).

*Observations*.—Of these beautiful little Geese, hardly as large as a Teal (hence the apt name, Goose Teal), there are two species found in Australia, chiefly in the northern portion. The Green Goose Teal (*N. pulchellus*) may be described as having neck, back, and wings of a beautiful, deep, glossy-green; underneath surface white in general, with arrow-head-like markings of black on the flanks; eyes and legs dark-brown, and bill greenish-grey; total length, about 13 inches. This lovely Goose Teal is an intertropical species, being found not only in the northern parts of Australia, but also in Austro-Malayan regions.

During our Cardwell encampment my companions (Messrs. A and F. Coles) shot a brace of these neat little Geese in a placid lagoon, where large, blue water-lilies grew. They experienced much difficulty in retrieving the specimens by having to swim through the tough, interlacing coils of the water-lily stems and leaves. Persons have been drowned in such places, by getting entangled in these ready-made vegetable ropes, when bathing or after game.

In the Port Darwin district, Gilbert, on January 16th, first saw a pair of these beautiful birds swimming on a quiet, secluded lake, shut in on all sides by very high grass. The two birds he succeeded in killing at one shot. On dissecting the female, Gilbert found a nearly-developed egg in the ovarium, and was induced to search for the nest, which he found built up from the water in the long grass. The nest had no lining, probably because the female had not commenced laying. Subsequently, a nest brought in by the aborigines, containing six eggs,

was furnished with feathers. Further research may prove that this pigmy Goose, like the Goose Teal of India, may, in some instances, breed in hollow trees.

Mr. T. A. Gulliver, Townsville (Queensland), with whom this little Goose was a special favourite, from observations made at Normanton, Gulf of Carpentaria, came to the conclusion that the bird breeds in the large fresh-water lakes some distance inland, and migrates to the shores of the Gulf as soon as the young can fly. About the middle of February, or as soon as the water in the lagoons at Normanton gets low, and consequently brackish, the little Goose makes its exit, and is not seen again until the beginning of the next wet season. On their first arrival, numbers of them are of a dull colour, and proved to be young birds. Before they take their departure they are all full plumaged.

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**744.**—NETTOPUS ALBIPENNIS, Gould—(582)

WHITE-QUILLED GOOSE TEAL.

*Figure.*—Gould: Birds of Australia, fol., vol. vii., pl. 5.

*Reference.*—Cat Birds Brit. Mus., vol. xxvii., p. 72.

*Previous Descriptions of Eggs.*—Campbell: Southern Science Record (1883); North: Austr. Mus. Cat., p. 337 (1889).

*Geographical Distribution.*—Queensland and New South Wales.

*Nest.*—In the hollow spout of a tree near water.

*Eggs.*—Clutch, eight to ten probably; oval in shape; texture of shell comparatively fine; surface glossy; colour, creamy-white. Dimensions in inches: 1.95 × 1.49.

*Observations.*—The White-quilled Goose Teal resembles the preceding, and may be distinguished by its white pinions, and its under surface being more freckled about the flanks. This more southern species of diminutive Goose is found in Queensland and New South Wales, chiefly frequenting the rivers and swamps of the coastal region.

Like its northern ally, not much is known of its habits. I possess a single egg, received from Dr. A. E. Cox. Save that it was taken in the Clarence River district, it was without data. Its description coincides with a specimen subsequently described (1889) in the "Catalogue" of the Australian Museum, which was taken from the oviduct of a bird shot by Mr. J. Macgillivray, at South Grafton, during October, 1864.

In answer to a question of mine, Mr. James C. Wilcox, of the same district, has kindly sent me the following note:—"One of the birds had its nest in the spout of a gum-tree, about seventy feet from the ground, in my garden at South Grafton, and, from what I remember, there were seven or eight young ones, which she carried out in her bill after they were hatched. The spout almost overhangs a small creek. I recollect a young one falling out of the nest into the water, but it swam away unconcerned. I know of other nests in trees about our swamps."



A MURRAY LAGOON—HAUNT OF WILD FOWL

*From a Photo by the Author.*



## SUB-FAMILY—CEREOPSINÆ.

## 745. —CEREOPSIS NOVÆ HOLLANDIÆ, Latham.—(578)

## CAPE BARREN GOOSE.

*Figure.* Gould: Birds of Australia, fol., vol. vii., pl. 1.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvii., p. 79.

*Precious Descriptions of Eggs.*—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 351 (1865); North: Austr. Mus. Cat., p. 334 (1880); Campbell: Victorian Naturalist (1894).

*Geographical Distribution.*—Victoria, South and West Australia, and Tasmania, including islands in Bass Strait.

*Nest.*—Somewhat flat, constructed of a good layer of grass, &c., lined inside plentifully with down, and usually situated on the ground amongst saltbush or tussock grass, but occasionally placed a few feet from the ground on thick scrub. Dimensions over all, about 18 inches; inside, 9 to 10 inches across by 3 inches deep.

*Eggs.*—Clutch, four to six; elliptical in form, sometimes rather pointed at either end; texture of shell coarse; surface, a trifle liny but glossy; colour, a very thin outer creamy-white coating, on being scratched or otherwise removed reveals a white shell. Dimensions in inches of a proper clutch: (1)  $3.03 \times 2.16$ , (2)  $2.95 \times 2.11$ , (3)  $2.92 \times 2.15$ , (4)  $2.92 \times 2.14$ , (5)  $2.88 \times 2.12$ .

*Observations.*—This singular and scarce Goose is more terrestrial than aquatic. It inhabits some of the isolated islands off the southern coast of Australia. It occasionally visits the mainland, or is driven thither through stress of weather.

Mr. H. W. Wheelwright recollects seeing Cape Barren Geese at Mordialloe, Victoria, in the "fifties"—once in a small flock, and again when two pitched among some domestic Geese and were captured. They soon became tame. More recently (season 1898) a small flock alighted near a swamp at the back of Williamstown. One fell to a fowler's gun.

At one time it was thought that the Cape Barren Goose was restricted to the islands in Bass Strait, but I was glad to be able to record (in 1890) its presence in Western Australia, having seen birds from Bald Island, near King George's Sound. I have since learnt the bird also exists in Recherche Archipelago, and other islands in the Great Australian Bight.

Mr. Alfred Crompton, writing from Adelaide, in "The Australasian," says: "The Cape Barren Goose is almost common on parts of the coast of the mainland here, or visits certain districts frequently. I have

questioned some of our small craft coasting men, and the general answer was that the bird is very numerous on all the grassy uninhabited islands between here and the head of the Australian Bight. Birds are to be found at times on practically all the inhabited islands; only, as the people settle, the birds become scarce in the neighbourhood.

"Some years ago fishermen in Spencer Gulf did a thriving trade in the spring catching young birds and fattening them for Christmas, but the Government stopped all that by enforcing the close season laws.

"The only places I have seen them wild are on the coast near Port Elliott, at the head of Encounter Bay, and at Port Willunga, about thirty miles south of Adelaide.

"All along this coast the wheat-fields go within 100 to 500 yards of the sea. The young birds leave the islands to the west when they are fledged (about November), and some find their way to the wheat-fields, where they sometimes do a great deal of harm (so the farmers will tell you)."

Their numbers in Bass Strait are becoming alarmingly small. A bird so valuable and important should be rigidly protected. The close season is faulty. On the Victorian side the Geese are protected from June 14th; in Tasmania—to which the majority of the islands in Bass Strait belong—from August 1st. It can be proved that the birds in the wild state sometimes lay as early as April and May, while the female of a pair at the Zoological Gardens last season laid her full clutch by the middle of June.

We read that in the early days Cape Barren Geese were so tame that they might be knocked down with sticks, or even captured by hand. Since then they must have changed their habits, because the Geese flew away long before we even approached their island homes. On the expedition of the Field Naturalists' Club of Victoria to Furceux Group, in 1893, we saw a flock of about thirty birds on Woody Island. The protective colour of the grey plumage in a remarkable degree prevented the birds from being readily noticed on shore, amongst the grey lichen-covered rocks, where they were feeding. As we landed the birds rose, wheeled round the island, then flew down Franklin Sound to some other islet. Cape Barren Geese received their name from the early voyagers, who found them on Cape Barren Island, which forms the south side of the sound. We saw a flock of about twenty on Chalky Island, while a few, including large goslings, were observed on the Babel Islands, off the east coast of Flinders Island. Here we shot two, which were roasted for camp purposes. The flesh, although somewhat dry, is excellent, being tasty and gamey.

Mrs. Robinson, of Green Island, who has observed the birds for many years, as well as kept some in captivity, furnished us with an interesting account of their habits.

Each bird possesses its own mate. Should a Goose in captivity lose her mate, the probability is that she joins a wild flock, and never returns. Should the gander lose his wife, he entices a wild bird to dwell with him. An old bird never mates with a young one, nor do young from the same clutch pair or breed. The birds do not lay till they are two years old. The Geese have a voracious appetite, their

chief food being herbage. They eat nearly all day, and frequently by night, quickly digesting their food. Sheep will not graze after them, as in the case of the domesticated Goose.

When a nest is robbed of its eggs the birds lay again, and even three times, in the same nest.

When we visited Cape Barren Island, an islander presented me with a pair of the previous season's birds, which I brought home. They proved docile pets, and amused my friends and neighbours with their deep hoarse voice, resembling the loud grunt of a pig. I was told I might expect a visit from the inspector of nuisances, because it was supposed I was keeping swine, contrary to the town regulations. Much to my sorrow, one of the Geese partook too freely of the Pigeons' hard food, became crop-bound, and died. I transferred its mate to the Zoological Gardens, Melbourne.

*Crocopsis* (the scientific name) is given to the Cape Barren Goose because it has a peculiar greenish-yellow cere or skinny patch on its short bill. Its plumage is of drab, or greyish colour, the tail is black, eyes bright, yellowish-brown, with large dark pupils; legs brick-red, blending into black feet. When the legs are red, that colour is a sign of maturity. For the first two seasons in the young bird the legs are dark. The sexes are alike in colouring. Total length of a bird, about 33 inches.

The eggs of Cape Barren Geese are rare. The first pair I received was from a very suggestive locality, namely, Goose Island, Bass Strait, 1885. I am informed these birds also used to breed on Cape Portland, Tasmania, the nest being placed among the flags or rushes a short distance from the sea. A second fine pair of eggs was presented to me by Dr. Charles Ryan, who received some clutches from Neptune Island, off the South Australian coast, collected about the end of April (1896).

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SUB-FAMILY—CHENONETTINÆ.

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**746.**—CHENONETTA JUBATA, Latham.—(580)

WOOD DUCK.

*Figure.*—Gould: Birds of Australia, fol., vol. vii., pl. 3.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvii., p. 140.

*Previous Descriptions of Eggs.*—Campbell: Southern Science Record (1883), also Victorian Naturalist (1888); North: Austr. Mus. Cat., p. 336 (1889).

*Geographical Distribution.*—Whole of Australia and Tasmania.

*Nest.*—Within a hole or hollow spout of a tree, usually standing in or near water, the place containing the eggs being lined with greyish-white down, lightest coloured in the centre and on the tips of each particle.

*Eggs.*—Clutch, 9 to 12; oval in shape, or more compressed at one end; texture of shell comparatively fine; surface glossy; colour, creamy white. Dimensions in inches of five examples *ex* a clutch of eleven: (1) 2.24 × 1.6, (2) 2.24 × 1.59, (3) 2.22 × 1.57, (4) 2.2 × 1.58, (5) 2.08 × 1.58.

*Observations.*—The Maned Goose, more commonly called the Wood Duck, is one of the most beautifully marked of its tribe. It is a tolerably tame and well-known species, being found throughout Australia, and occasionally visiting Tasmania. I suppose it is called Wood Duck because, unlike most other Ducks, it frequently perches upon trees. Its note is remarkable, being loud and trumpet-like, uttered while the mandibles are widely extended.

The Maned Goose was so called on account of the lengthened black plumes down the back of the neck, but although the term Goose was applied to this bird by Gould himself, he regarded the application as trivial. No doubt Australians will continue to call this beautiful bird the Wood Duck. In total length it measures nearly 20 inches. Its flesh is somewhat dry eating, and has not the gamey flavour of some of the other members of its tribe. The Wood Duck feeds chiefly on grasses and aquatic plants and insects.

I recollect getting two Wood Ducks without expending ammunition. One night, years ago, I was at the bottom of Williams road, near the Yarra, at Toorak. Some person was flight shooting on the river, and after one shot a fine fat Duck fell near me, dead. On another occasion during the day I was on the margin of the brackish swamp (a great resort of game, long since reclaimed) at the back of the West Beach, St. Kilda. Shots were fired at the far end, and while a flock of Ducks was wheeling over where I stood, one bird fell plump to the ground. In both instances I carried the booty home.

However much I like to shoot these Ducks for sport, I enjoy better still to see them in repose or stretching their pinions upon some grassy bank as I pass by, afloat in a flatty or boat. One admires their freckled and grey mottled plumage, especially that of the males, so much enriched with their glossy black abdomens.

During a memorable trip I made "Through a Riverina Flood," with Mr. J. Gabriel and the Macaulay Brothers, our first find was a Wood Duck's nest. It was in the hollow part of a red gum, standing in a flooded creek. One of our party temporarily turned himself into a member of the "Natatores" tribe by entering the water, then, ascending the tree, secured a full clutch of eleven eggs and a quantity of the bird's down (see illustration). The eggs were much incubated.—Date, 8th September, 1894.

Previously I had described eggs from Coomooboolaroo (Q.); also a pair from a clutch of nine taken by Mr. A. Watson, a teacher, who got them from a dead red gum, standing in a lagoon near Sale, Victoria. There was a considerable quantity of light-coloured down surrounding the eggs, which were three feet or four feet from the entrance of the spout.

A brief note from Mr. Hermann Lau's (Queensland) MS. states that the Wood Duck "invariably breeds in the hollow of a tree, some-





TAKING A WOOD DUCK'S NEST

*From a Photo by the Author.*



times at the height of thirty feet. When the young are hatched, the mother takes them in her bill, placing them one after another between her shoulder and neck, and so descends to the ground. If surprised, the parents fly away, feigning lameness, &c., while the young hide." I agree with Mr. Lau when he states the Duck takes the young "in her bill" in order to convey them to the ground; but I hardly think it possible for her to carry them "between her shoulder and neck." Mr. Lau, I fear, has been duped into believing the plausible bush yarn that Ducks carry their young on their back. They certainly do so sometimes, when a family are playing together in the water.

Wood Ducks are amongst the earliest of breeders. The young are out and swimming when other Ducks are only laying. On our "Flood" trip, already mentioned, we saw a brood on the Yalakool, 24th September, 1894. The breeding time generally lasts from August to January, but it is regulated by the state of the season in some parts, because during the journey of the Horn Scientific Expedition to Central Australia, 1894, the black-boys attached to the party caught several young Wood Ducks, on the 19th May, unable to fly.

The young in down are dull-white underneath, and sooty-brown above, with two stripes along the face.

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SUB-FAMILY—ANATINÆ.

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**747.**—*DENDROCYCNA ARCUATA*, Cuvier.—(591)  
*D. vagans*, Eyton.

WHISTLING DUCK.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 14.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvii., p. 153.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 375 (1865); North: Austn. Mus. Cat., app. (1890).

*Geographical Distribution*.—Australia in general; also New Guinea, New Caledonia, Fiji, Moluccas, Sumba, Timor, Java, Borneo, Celebes and Philippines.

*Nest*.—Composed of grass, &c., and placed upon the ground in rank grass or other herbage, but possibly the eggs are sometimes placed in a hollow tree, or even in a deserted stick-made nest of some other bird.

*Eggs*.—Clutch, 10 to 12 usually, 15 maximum; elliptical in shape, but more or less swollen about the centre, and peculiarly pointed at either end; texture of shell fine; surface glossy; colour, a thin outer-coating, creamy-buff or light stone, on being removed, reveals a light creamy-white shell. Dimensions in inches of four examples *per* a clutch

of fifteen: (1)  $2.13 \times 1.42$ , (2)  $2.12 \times 1.4$ , (3)  $2.09 \times 1.43$ , (4)  $2.05 \times 1.49$ . Occasionally the eggs of this Duck have here and there (sometimes on the end, at other times on the side) reddish or purplish-brown spots underlying the surface of the shell. These singular markings (for Ducks' eggs) have been observed in more than one clutch.

*Observations.*—There are two species of Whistling Ducks in Australia. The one under notice wears, in general, a rich reddish-brown coat, with short dark bill and large feet (suitable for occasionally perching on trees), also dark. The flanks are singularly ornamented with lengthened, whitish feathers, margined on either side with strips of black.

This exceedingly fine Whistling Duck enjoys a range extending not only throughout the greater part of Australia, but to Austro-Malayan regions, and parts of the Pacific. In his original work, Gould was correct in calling it *arcuata*, believing it to be the Java bird. But apparently he allowed his vanity to get the upper hand, because, for a few minor differences found in the Australian bird, he afterwards accepted Prince Charles Bonaparte's new specific name, *gouldi*.

The wings of all Ducks produce, more or less, a whistling noise when the birds are rapidly flying, but the vernacular name of this bird is derived from its loud and very characteristic whistling note, generally emitted when the bird is at rest or alarmed.

During the months from September to December, Gilbert found the Whistling Ducks in vast flocks on the lakes in the Port Darwin district. Some eggs brought to the settlement of Port Essington by the natives, said to belong to this Duck, were taken early in March, from nests built in long grass on the small islands adjacent to the harbour.

To the late Mr. George Barnard I was indebted for a pair of eggs from an unusually large clutch of fifteen, found in a tussock of grass at Coomooboolaroo. Mr. Barnard wrote:—"Coming home with cattle on the 25th May, 1890, my sons flushed a duck of some sort off a nest in the grass too hurriedly to see what it was. They left it till next day, when one of them rode out to identify the species. It proved to be a 'Whistler.' The nest was made in the grass, without any lining of feathers or down, and contained fifteen eggs in an early stage of incubation, several of which he took. This Duck is very common in the neighbourhood, and is found frequenting the large swamps, but this is the first time we have obtained the nest."

Mr. S. W. Jackson, South Grafton, Clarence River, New South Wales, writes:—"Re the Whistling Duck's eggs and situation of nest. The set of these rare eggs (four) I forwarded to you were found by myself in the following manner, on November 9th, 1894. I found the eggs in a nest constructed of grass, laid flat on the ground, among a field of oats, which were half dead, and these were bent down to the ground to form the nest. Upon this was a deep layer of bent dead grass, upon which were twenty or thirty eucalypt (gum) leaves. Strange to say, there was not a feather in the nest. I shot both male and female as they flew away from the nest, for identification. Their description agreed with that given in Gould's 'Handbook.' I have visited the same locality several times since, but without further success."

In the North-west, Mr. Keartland found these birds in large flocks on the margin of the pools near the Fitzroy River. During the day they sleep under the shade of the bushes around the water, but at night travel out on to the open plains to feed. They deposit their eggs amongst the spinifex and cane-grass some distance from water.

748.—DENDROCYCNA EYTONI, Gould.—(592)

PLUMED WHISTLING DUCK.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 15.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvii., p. 165.

*Previous Descriptions of Eggs*.—Ramsay: Proc. Zool. Soc., p. 346 (1877); North: Proc. Linn. Soc., N.S. Wales, vol. xxii., p. 60 (1897).

*Geographical Distribution*.—Australia in general and Tasmania; also New Zealand (accidental).

*Nest*.—Similarly situated to that of the other Whistling Duck, upon the plains, in herbage, generally far from water. Has no down.

*Eggs*.—Clutch, 10 to 12 probably; roundish in form; texture of shell fine; surface glossy; colour, a light creamy outer-coating, on being removed reveals a lighter coloured shell. Occasionally specimens are stained, or minutely spotted with light brown. Dimensions in inches: (1) 1.94 × 1.54, (2) 1.93 × 1.54, (3) 1.97 × 1.55, (4) 1.96 × 1.56.\*

*Observations*.—The Eyton or Plumed Whistling Duck is a somewhat lighter coloured bird than the other species, with flesh-coloured feet, and with the ornamental flank plumes more lengthened, and is peculiar to Australia (being more numerous in the north) and Tasmania. Stragglers are said to have reached New Zealand. I believe this interesting Duck is one of the most numerous in the Gulf of Carpentaria district, where nests are often found, invariably on the ground in herbage, and in some instances far from water, out on the plains.

Mr. S. White informed Gould that he found a nest of this species in a log. He (Mr. White) was not certain as to the complement of eggs laid by this Whistling Duck, but he learned from the aborigines that eight or ten were laid, mostly in the sand-hills at Cooper's Creek. I was fortunate in obtaining, from the Adelaide Museum, a pair of eggs from a clutch of ten that were collected on the Adelaide River, May, 1891, during the overland journey of Governor Kintore's party.

Mr. G. A. Keartland's testimony concerning these fine Ducks in the North-west is that:—"The open plains near the Fitzroy River appear to be a stronghold of this species. Whilst travelling at night near Noon-

\* Half a set taken 16/3/98, Nicholson river, North Queensland, measures (1) 1.94 × 1.52, (2) 1.9 × 1.5, (3) 1.9 × 1.4, (4) 1.88 × 1.44.

koombah, we frequently disturbed them in thousands as they were feeding amongst the dry grass, probably on the seed. Towards morning they return to the water, and after a short bath repair to the shelter of the bushes on the margin. These birds lie so close together when sleeping that seven or eight are often secured at one discharge. On several occasions I killed birds of the two species (*cytoni* and *vagans*) at the one shot. Both species breed very freely in the coarse grass near Mount Campbell, and the natives in that neighbourhood make sad havoc amongst their eggs."

Mr. A. J. North says that for the opportunity of examining and describing the eggs of Eyton Tree Duck, he was indebted to an *ardent sportsman*, who found them when out shooting on the Macquarie Marshes on the 23rd September, 1893 (*then close season*). Mr. North proceeds to state:—"In the long cane-grass, about one-third of a mile from an ana-branch of the Macquarie River, he (his correspondent) flushed one of these birds, which he quickly fired at, and it fell. As he moved forward to pick it up he almost stepped on the nest, which was built at the side of a tussock of cane-grass. It was a slight hollow in the soil, lined only with short pieces of cane-grass, and contained nine fresh eggs. Evidently the Ducks had just begun to lay, for, although twelve of them were obtained, only one more nest was found that day, which was similarly constructed, and had two fresh eggs in it. Later on, in the same locality, another nest was found containing seven fresh eggs. From these nests the Ducks had made runs or tracks through the long grass to the water's edge. All the eggs when found were immaculate, and entirely free from the usual feet marks of the female, or stains of any kind. Two average eggs from the set of nine are oval in form, tapering somewhat sharply towards the smaller end, and are comparatively small for the size of the bird. In colour they are milk-white, with an almost imperceptible tinge of cream; smooth in texture, and having a slight satiny lustre. The shell is thick and exceedingly hard, and the funder of the nests compared it to flint when he was engaged in drilling the eggs. Length: (A) 1.92 × 1.36 inches, (B) 1.88 × 1.36 inches. These eggs may be easily distinguished from those of any member of the family *Anatinae*, in Australia, by their being almost pure white."

Dr. Ramsay's original description of the eggs of this species was from a specimen found in the oviduct of a bird shot near Port Denison (Q.) by Mr. Rainbird. It measured 1.95 × 1.5 inches.

Dr. Wm. Macgillivray has favoured me with the following note:—"The Whistling Ducks were well known to me in my old home in Queensland (Gulf of Carpentaria District), especially *cytoni*, these latter being more numerous than the other species up there, going in immense flocks and generally keeping to themselves, mixing only with *D. arcuata* when they were present. With regard to their eggs, I have a pair of *cytoni* which are long-pointed ovals, answering to the description you gave of those of the *arcuata* received from Mr. Barnard.\* I may also add a

\* It is just possible there may have been a transposition somehow in describing the eggs of the two species. Mr. Jackson kindly sent me a pair as *vagans* (*arcuata*) which entirely differed from those received from Mr. Barnard and resembled those of *cytoni* which I obtained from the Adelaide Museum. Further remarks will prove which "Whistler" lays the peculiarly pointed eggs that I have seen in several collections.

word of praise of *D. cytoni*, and that is, their flesh is very good eating."

The last supper poor Gilbert ever ate was on Plumed Whistling Ducks, the night he was so suddenly and treacherously murdered by blacks at one of Leichhardt's camps.

749.—TADORNA RADJAH, Garnot.—(583)

WHITE-HEADED SHIELDRAKE.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 8.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvii., p. 175.

*Previous Description of Eggs*.—North: Proc. Linn. Soc., N.S. Wales, vol. ii., 2nd ser., p. 446 (1887).

*Geographical Distribution*.—North-west Australia, Northern Territory, and Queensland; also New Guinea and Moluccas.

*Nest*.—Within a hole or hollow spout of a tree, not necessarily near water.

*Eggs*.—Clutch, probably about ten; texture of shell fine; surface smooth; colour, rich creamy-white. Dimensions in inches of a set of five: (1) 2.2 × 1.63, (2) 2.2 × 1.59, (3) 2.2 × 1.58, (4) 2.17 × 1.58, (5) 2.13 × 1.61. (North.)

*Observations*.—This splendid and conspicuous Shieldrake is an inhabitant of the lakes and lagoons of tropical Australia. Its flocks are sometimes numerous, especially in the North-west, during the rainy season. But they are generally found in pairs or in flocks of from four to eight. If shot at and disturbed, they will return to the same spot during the night.

Persons who have observed them perched say it is a singular sight to see a number of these beautiful birds, with snowy heads and necks—hence the very apt name, White-headed Shieldrake. Sometimes the bird is locally known as the Burdekin Duck.

Dr. Ramsay found this species breeding on the Burnett River, Queensland, during November, December, and January, 1873-4, but unfortunately he was unable to procure eggs.

Mr. North has described five eggs taken from the hollow branch of a tree. The date, except the year (1875) and the locality are not mentioned. In January (1897), a pair of adults and eleven newly-hatched young ones were seen in the Margaret River (North-west). They apparently came from a hollow spout of a eucalypt overhanging the water.

750.—CASARCA TADORNOIDES, Jardine.—(584)

SHIELDRAKE, OR MOUNTAIN DUCK.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 7.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvii., p. 185.

*Previous Descriptions of Eggs*.—Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 58 (1882); Campbell: Southern Science Record (1883); North: Austr. Mus. Cat., p. 339 (1889).

*Geographical Distribution*.—New South Wales, Victoria, South, West and North-west Australia, and Tasmania.

*Nest*.—Usually within a hollow spout of a tree, or hole of cliff, generally bordering a stream, &c., but not unfrequently away from water; occasionally the nest is constructed of herbage upon the ground. The nesting place is furnished with a quantity of down intermixed with grass, the down being greyish, each particle with a whitish centre but with dark tips.

*Eggs*.—Clutch, ten to twelve usually, thirteen to seventeen rarely; roundish oval in shape; surface comparatively fine, glossy or greasy to the touch; colour, light creamy-white. Dimensions in inches of a set of eight: (1) 2.84 × 1.96, (2) 2.8 × 1.97, (3) 2.79 × 1.96, (4) 2.76 × 1.99, (5) 2.76 × 1.9, (6) 2.75 × 1.97, (7) 2.74 × 1.96, (8) 2.7 × 1.96.

*Observations*.—As the fine Rajah Shieldrake inhabits the northern half of Australia, so the splendid Chestnut-coloured Shieldrake, or more commonly called Mountain Duck, belongs to the southern part, including Tasmania. The Mountain Duck is about 27 inches in total length. The sexes may be distinguished by the smaller size of the female, and her markings not being so pronounced. Their food consists of small fish, crustacea, molluscs and such like, found in swamps, &c.

The largest flock of Mountain Ducks I have seen contained about forty birds, which were floating upon a remarkable salt lake in the centre of Rottneet Island, West Australia. I approached near enough to discern the shining dark-green heads and necks of some of the birds. The shooting season had not yet opened, which probably accounted for the tameness of the birds. When the flock took flight for the far margin of the lake, their pure white wing-coverts showed most conspicuously.

In Gould's day, Mountain Ducks used to breed annually on the alluvial flats at Gawler, South Australia, depositing their eggs in the spouts of trees. In some parts of that State, I am told, the birds arrive about August, and, after breeding, the old birds leave about November, the young ones following at the end of summer or about March. On account of this nomadic instinct they are difficult to retain as pets. Strange (the collector) informed Gould that a nest is formed of the down plucked by the bird from its own breast, and that he had taken thirteen eggs from a single nest. An old Duck-shooter tells me



that, although the Mountain Duck usually breeds in trees, he has sometimes seen nests on the ground, while two instances of nests being found on the ground are mentioned in the Australian Museum's "Descriptive Catalogue" of nests and eggs.

For a complement of eggs to a nest I can go several higher than the record of Mr. Strange. I saw a pair of birds that were captured when young by Mr. G. W. Warner, on Wharparilla, near Echuca. They were from a brood of fourteen, which Mr. Warner intercepted and carefully counted on the plains. There was no doubt in Mr. Warner's mind that the little fellows were one happy family, and not members of amalgamated broods. Interesting statements relative to the Mountain Duck were made to me by Mr. and Mrs. John Macaulay, who were eye-witnesses of the scene. There was a nest in a tall red gum (*Eucalyptus*) overhanging the Collegen, Riverina, on the opposite side of the creek to their house at Durvegan. Towards the end of August, 1894, Mr. and Mrs. Macaulay had their attention directed to the peculiar antics and calling of a pair of Mountain Ducks, which were on the water below the tree. Presently they saw two Ducklings tumble out of the hole, which was fifty feet or more above the stream, their little wings acting like parachutes, and drop with a light splash into the water. They then sailed beside their parents, apparently none the worse for their first fall. Shortly afterwards the others aloft performed similar feats, until no fewer than seventeen fell (the number being again counted after the birds were on the water). They were piloted safely away down stream by the old birds—one swimming before and the other behind the precious flock.

When Mr. and Mrs. Macaulay were pointing out to me the exact tree, a Teal came and lodged on the edge of the hole where the Mountain Duck's nest had been. It was, no doubt, prospecting for a likely place to deposit its own eggs. The date was 22nd September.

The question naturally arises, How do Mountain Ducks, or any Ducks in fact, get their little ones out of the nesting hole when there is no water underneath to break their fall? It is reasonable to suppose that the young are conveyed to the ground in the mouth of their parents. On this important point I give the valuable testimony of an eye-witness, who, writing to "The Australasian" under the nom de plume of "Nemo," states:—"On the morning of October 12th, 1899, I was riding through the ranges at the head of Waratah Bay. It was just at the break of dawn. I had pulled up my horse, and was watching the first rays of light flashing upon the granite peaks of Wilson's Promontory, when the silence was suddenly broken by the hoarse croak of a Mountain Duck. I was surprised to hear it in such a place, and on looking round I saw a bird come struggling backwards out of the hollow limb of a tall gum on the opposite side of the gorge. It tumbled from the limb to the ground, fluttering in its downward course as though it were shot. Immediately it reached the foot of the tree it darted off, flying low along tops of the heather, and disappeared in the dark shadows of the forest. I got off my horse and approached the tree. As I drew near, a second Duck, which I had not seen, rose from the top of a neighbouring tree and circled round me for a few minutes, and then flew off out of sight.

I resolved to watch the tree for a time, and concealed myself under a fallen log. After waiting for about an hour, the two birds returned and alighted on a tree close by. They sat quietly surveying the surroundings for a considerable time. Then one of them (the female, I believe) flew to the hollow limb and disappeared into it. She came out afterwards, dragging a little Duckling, covered in yellow down and streaked with a dark colour. The old bird had seized the youngster either by the tip of its head or the nape of the neck, holding it with the extreme tip of her bill, and in this fashion came tumbling and fluttering down to within a few inches of the ground, when she dropped the chick, and darted away as I had seen her do before. In about five minutes she came back and repeated the performance. I thus saw her carry down six chicks, and then both birds disappeared. I went and searched the ferns and heath at the foot of the tree, but could not find any of the little ones. I again concealed myself, and after waiting a long time was rewarded by seeing the old bird alight on a bare cattle-track, some fifty yards from the tree. She uttered a few croaks, and in an instant her brood of eight or nine little ones were round her; she started off, waddling along the track in the direction of the coast, which lay about a mile and a half below, and the nearest lagoon or water-marshes were not less than one or two miles off, though the surrounding hills were of a wet and boggy nature. In this part of the State (South Gippsland) the Mountain Duck is seldom seen on the inland swamps, confining itself to the bays and coast marshes, and they go a great distance inland to find suitable trees to nest in. I have often seen them away back in the hazel country of Leongatha, where they build in the tall hollow spouts of the black-butt gum."

Mr. Wm. Bateman, of Echuca, a good field observer, writing to me, states that in August, 1893, he found a nest in a hollow box tree on the plains. His attention was first directed to the spot by seeing a Mountain Duck fly round, pitch on a spout, and descend into the tree. His brother immediately placed his hat over the hole to prevent the bird from escaping. This precaution was not needed, because the bird remained quietly on her nest, which was on the ground, the tree being hollow to its base. The bird was so tame that she suffered the tree to be chopped and wedged open, and herself to be taken by hand off her charge of ten eggs without a struggle.

The eggs in my collection are from an unfinished or deserted clutch, taken by my friend Mr. Robert Walpole, from a hollow tree near Woodside, South Gippsland, October, 1887.

The Mountain Duck is an early breeder, usually laying during July, August, or September.

Young in down are marked on the head, along the back and across the wings, with dark grey tending to black, the rest of the upper surface and underneath parts being whitish.

## 751.—ANAS SUPERCILIOSA, Gmelin.—(585)

## BLACK DUCK.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 9.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvii., p. 206.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 364 (1865); Potts: Trans. New Zealand Inst., vol. ii., p. 72 (1870); Buller: Birds of New Zealand (1873), vol. ii., p. 256 (1888); Ramsay: Proc. Linn. Soc., N.S. Wales, 2nd ser., vol. i., p. 1152 (1886).

*Geographical Distribution*.—Whole of Australia and Tasmania; also New Zealand, Polynesia, Timor, and Java.

*Nest*.—As frequently placed in herbage upon the ground as in a hole of a tree or stump, generally near water, but often at a distance from it. Occasionally the deserted nest of a Raven, &c., is used. Dimensions of a nest or hollow upon the ground, about 7 inches across by 3 to 4 inches deep, which is encircled more or less with fine grass, a few feathers, and chiefly down, the down being umber or olive-brown, each particle whitish in the centre and light-coloured on the tips.

*Eggs*.—Clutch, ten to twelve usually, fifteen maximum; elliptical in shape; texture of shell comparatively fine; surface glossy and greasy; colour, light greenish-white or light creamy-white, with a faint greenish tinge. Dimensions in inches of a proper clutch: (1) 2.44 × 1.66, (2) 2.36 × 1.65, (3) 2.33 × 1.62, (4) 2.33 × 1.62, (5) 2.32 × 1.65, (6) 2.32 × 1.64, (7) 2.31 × 1.66, (8) 2.3 × 1.62, (9) 2.3 × 1.62, (10) 2.29 × 1.63, (11) 2.29 × 1.62, (12) 2.28 × 1.63.

*Observations*.—No Duck is so familiarly known to Australians as the common Black or Wild Duck.\* It may be found singly, in pairs, or in teeming numbers on every creek, river, lagoon, or waterhole. It extends its habitat to regions beyond Australia, notably to Austro-Malayan parts and to the islands of Polynesia, while I possess a far south note from Mr. J. R. Burton of it breeding on Macquarie Island, where eggs were taken during November last year and a duckling was caught by his dog.

To the naturalist, this Duck, with its beautiful bronze reflections on the wings, is most interesting. With the sportsman and the epicure it is an especial favourite.

Who has not enjoyed flight-shooting at night when Ducks have been winging their way to the upper waters of shady creeks or to lonely lagoons? Many are the pleasant reminiscences I have of night and day shooting. On a sultry afternoon in Riverina, if the shooter can crawl on "all fours" under the cover of timber or scrub to the margin

\* General colour, dark brown, with beautiful glossy-green on each wing; eyes and feet yellowish-brown; bill, bluish lead-colour; total length in inches, 24; wing, 10; tail, 4; bill, 2½; feet, 1⅞.

of a sequestered lagoon, he will often be rewarded by a sight that will gladden his heart. There is a flock of fine Black Ducks. Most of them are in repose, some are standing on logs preening their quills, some are posed on one leg with head behind their wing, and a few in playful mood are darting and diving and spraying water into the air. What a pity to mar the peace of such a pleasant picture! In an instant, at the discharge of the right barrel of the gun, the scene changes into splashing, quacking, and a burr of feathers. Two or three birds tumble off the log and struggle in the water, never more to rise, and ere their mates get fairly away the left-hand barrel brings down another brace. Soon the Ducks reach the far end of the long lagoon, and puffs of white smoke appear from behind the line of large red gums, where the shooter's companions have stationed themselves by arrangement. Completely nonplussed, the Ducks wheel, and some fall to the earth. When the flock returns past the first shooter, they keep well out of gunshot range, and, with a final wheel, flying high and very rapidly, they pass up the river, or on to a distant lagoon.

I have been present at the finding of many Wild Ducks' nests. As Gould truly states, the Duck, in its choice of a breeding place, seems to be influenced by circumstances. The first nest which I have distinct recollections of finding contained twelve eggs. It was situated on the ground, where we flushed the Duck among the branches of a fallen tree at a considerable distance from the nearest river (Goulburn); date, 4th October, 1887. On the Murray frontage, 2nd December, 1890, I found a set of eleven eggs on the ground in a slight hollow, encircled with a light band of grass and down. Another nest discovered the following day among thistles, about thirty paces from the river, contained thirteen eggs, with a good warm circle of down about them. In a subsequent season (6th November, 1892) a nest was pointed out to me snugly hidden in tall grass at the base of an orange tree in an orchard by the river. The nest, with its ten eggs encircled in down, made the subject of a photograph, which is here reproduced.

The most recent Wild Duck nesting I have enjoyed was in the company of Mr. J. Gabriel, when we were the guests of the Messrs. Macaulay Bros., Riverina, during the big September flood of 1894. We found various Ducks laying in hollow trees. One nest of the Black species was in the trunk of a red gum tree standing in a stream. The entrance-hole was about nine feet above the water, and the clutch of nine eggs was about three feet down the barrel in a quantity of down. One of the eggs was abnormally large, and contained a double yolk. Another nest was similarly situated at the height of about twenty feet, the eggs (also nine in number) partly incubated, being about a foot in from the entrance. The sitting bird, on being disturbed, flew out and lodged for a moment on the water before flying down the creek. Mr. Rod. Macaulay, at considerable inconvenience, was good enough to swim into the swirling creek, and climbed, almost naked, with a basket on his back, to both of these awkwardly-situated nesting places in order to enrich our collections with the eggs. Two other Black Ducks' nests, with incomplete sets, were seen in trees. In one case the eggs were exposed, being in a hollow at the top of a tall stump, and the Ravens took them.



BLACK DUCK'S NEST.

*From a Photo by the Author*



On the 18th September, while walking over a cotton-bush plain with Mr. Gabriel, in search of White-winged Wrens (*Malurus*) and Yellow-fronted Bush Chats (*Ephthianura*), I flushed a Duck from her cosy nest on the ground in the centre of a bush. The nest was some distance from water, and contained eleven eggs.

Eggs are always surrounded by down, plucked probably from the Duck's own breast. When she first lays there is no down, but as laying proceeds a quantity appears, and when the clutch is completed there is usually quite a thick, elastic circle of warm down about the eggs. This down, which is a natural protection for the eggs when the parent is absent from the nest, retains its warmth for a considerable time. Of all Ducks' nests, excepting the Pink-eared Duck, probably that of the Black Duck is the most amply provided with down. Nests are often found by observing particles of down adhering to holes in trees. I believe the Duck is not assisted or relieved (unless it be at night) by the Drake in the task of incubation.

The question is frequently asked, How do Ducks that breed in trees get their ducklings to the ground, seeing the young are removed to water shortly after they are hatched? It is only common sense to suppose that the young are conveyed in a very natural way, namely, in the bill of the parent. Even aborigines tell you that. Unfortunately, I have not been an eye-witness myself to the interesting performance, but I can quote the statements of those who have.

"Nemo," in writing to "The Australasian" from South Gippsland, on June 4th, 1894, says: "I notice some of your readers still seem to cling to the idea that the Black Duck carries its young on its back from the tree to the ground. This is an error. With all due deference to those bushmen who have seen the Duck fly from the tree to the water with its brood on its back, I must say that after years of close observation of birds, game in particular (having at one stage of my existence to depend upon that knowledge to an extent for my living), I can assert without hesitation that the Duck simply drags its young ones out of the hole in the tree, and flops down to the ground, carrying the little ones singly in her bill. When all are down she walks with them to water. If some of those old bushmen will think for a moment that the nest of the Mountain and Black Duck (when in trees) is usually at the bottom of some deep, hollow spout or limb, up and down the inside of which the Duck has to scramble like a 'possum, they must see the absurdity of the bird getting out with her flock of young on her back. Both the Swan and Duck, when floating on the lagoons, may be seen with their little ones perched on their backs. Hence, no doubt, originated the idea that they were thus carried from the trees." "Nemo" further states that from his observations the Ducks carry their young from the trees always in the early morning. It is known, however, that Ducks with their young travel overland at night, thus enabling them to avoid hurtful birds of prey.

The late Mr. Gilbert Bateman informed me that once, while out shooting and waiting for Ducks, one appeared about fifty yards away on the water, and called for her mate, which came; at the same moment a young one was seen. One of the birds flew away, and

returned seven or eight times; each time the young brood increased by one. Owing to the distance between Mr. Bateman and this interesting family, he did not actually see the young brought in the bill of the mother, but from circumstantial evidence he entertained no doubt that such was a fact. Mr. Bateman said the speed at which the bird arrived, not to mention her dodging movements, while passing between the trees, was such that no duckling could possibly have retained hold on her back.

Mr. George Warner (Echuca) recollects many years ago—about the end of the "sixties"—seeing a Black Duck fly from the fork of a tree, carrying a young one, grasping it in its bill across the chest and back, and deposit in the water of a swamp near. Mr. Warner and another person, who accompanied him, remained quiet, and were rewarded by seeing the performance repeated six or seven times. When the observers showed themselves the old Duck sounded a warning note, which caused the brood, young as it was, to instantly swim to covert, while the old bird flew around in a solicitous manner.

It would appear that the Ducks instinctively know that if water is below the nesting trees, they need not be careful about carrying the young down, but may simply throw them out. Captain F. C. Hansen, master for many years of the inland river steamers, and a great lover of birds, who was accidentally killed while attending to the loading of the "Maggie," at the Echuca Wharf, on the 9th of July, 1897, gave me a very graphic account how he saw young Black Ducks taken out of a tree. Captain Hansen and his wife were sitting in a boat on the back waters of the Darling River, and chanced to see a Duck throwing her young from a height of ten or fifteen feet into the water, where the Drake was keeping the little ones together. When the mother dragged a duckling from the hole, she did so emerging tail first, and, balancing herself at the entrance, she jerked her head sideways, throwing the youngster, as the captain said, "clean overboard."

Referring to Black Ducks laying in the stick-made nests of other birds, I have a note from Mr. Tom Musgrove, who, on the Murray Plains, near Wharparilla, found three clutches of Ducks' eggs in the old nest of Ravens. One instance in particular he remembers, in the season 1893, when he counted no fewer than fourteen eggs, a "record" clutch, in a Raven's nest. A correspondent in "The Australasian" stated that about the beginning of September, 1893, he flushed a Black Duck from the large covered-in nest of the Babbler (*Pomatorhinus*), which was situated in a she-oak (*Casuarina*), about nine miles away from water. Climbing to the nest he found it contained nine fresh eggs. Some Ducks have the habit of concealing their eggs before leaving the nest. Mr. G. H. Morton noticed on more than one occasion that a Black Duck had covered its clutch with eucalypt leaves.

The breeding season for the Black Duck in the more southern part of Australia is usually from August to December, sometimes as early as June, as the following note from Mr. R. J. Dalton, Paroo district, New South Wales, proves. Writing in June, 1894, he says: "Quantities of Duck's eggs are now on the Cuttaburra, which is flooded." On the other hand, it is not an uncommon event to find Ducks' eggs at



Christmas and New Year, especially in Gippsland, while Captain Doveton, a sportsman, told me that when shooting on the 28th April, 1888, he saw young just able to fly. Mr. Isaac Batey gives an instance of Ducks breeding late in Riverina, where there was a tremendous rainfall during the month of January, 1860 or 1861. Ducks came, apparently from the coast, commenced to breed, and young were hatched in April, if not sooner. Mr. Batey remarks, by the way, that this incident shows how wonderful it is that the breeding time of these birds can be hastened or delayed, according to circumstances, i.e., the rainfall. *Appropos* of this, Mr. R. J. Dalton informs me that after a good rainfall on the Paroo, New South Wales, in February, 1898, several clutches of Ducks' eggs were observed at the end of April.

Naturally, in Tropical Australia, the rainy summer season there regulates the breeding Ducks, which lay mostly during January, February, and March.

Although the fact is not established, it is probable the Black Duck rears two broods during a season.

Young in down are brown on the upper surface, darkest on the crown of the head, and with two stripes along each cheek; under surface dirty yellow.

**752.**—NETTION CASTANEUM, Eyton.—(586)

*Anas punctata*, Cuvier.

TEAL.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 11.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvii., p. 252.

*Previous Descriptions of Eggs*.—Campbell: Southern Science Record (1883), also Nests and Eggs Austr. Birds, pl. 3, fig. 586 (1883); North: Austr. Mus. Cat., p. 341 (1889).

*Geographical Distribution*.—Australia in general and Tasmania; also accidental to Java and Celebes.

*Nest*.—Usually in a hollow tree, but occasionally on the ground in grass or other herbage in the vicinity of water; furnished with a plentiful supply of down. Should the nest be on the ground, fine grass is sometimes intermixed with the fuscous-coloured down, each particle whitish in the centre, and with light coloured tips. Apparently slightly darker than the nest-down of the Grey Teal. Dimensions: inside, 5 inches across by  $2\frac{1}{2}$  inches deep.

*Eggs*.—Clutch, nine to ten usually, thirteen maximum; elliptical in shape; texture of shell fine; surface glossy and greasy; colour, rich cream. Dimensions in inches of odd examples: (1)  $2.04 \times 1.5$ , (2)  $1.9 \times 1.45$ ; of four from a set: (1)  $2.14 \times 1.5$ , (2)  $2.1 \times 1.49$ , (3)  $2.09 \times 1.52$ , (4)  $2.08 \times 1.48$ .

*Observations.*—The Teal is a pretty little Duck, especially the male of the Chestnut-breasted variety, with its rich, reddish-brown coat, enhanced by the beautiful deep bronzy-green head and neck, and ruby-coloured eyes. This bird is known to the shooter as the Mountain Teal.

The Chestnut-breasted Teal (*N. castaneum*), although it is supposed to range throughout Australia, is, for the most part, a southern bird,\* and it is partial to waters, salt and fresh, on or near the coast—such as it finds in Gippsland, on some of the islands in Bass Strait, and in Tasmania. Five Chestnut Teal were procured on King Island by the Field Naturalists' Club expedition in November, 1887, the males being in full nuptial plumage. The birds took readily to the sea, notwithstanding their fresh water proclivities.

I like reading old-time memories, especially when birds are mentioned. Here is one by Mr. Isaac Batey, of Sumbury, taken from "The Australasian":—"The lake-like swamps on the Melbourne side of Melton were a great Teal shooting ground, and talking of them recalls my recollections of the year 1853. The autumn and early part of the winter of that season were unusually wet, cold, and stormy, which had the effect of causing Ducks of nearly every known species to locate themselves in myriads all over this quarter. The creeks, not alone, were full of them, but the forest and the plain, wherever there was a pool of water, had its bunch of Teal or other Ducks. S. W. and E. Page, pioneers of 1835, told us that they never remembered such an irruption of water fowl in their eighteen years' experience." I may be allowed to add, never has there been such an exceptional number of Ducks in the locality since. Two Teals' nests came under Gould's observation, one in December, 1839, when he flushed a female of the Chestnut-breasted variety from a nest among herbage on Green Island, D'Entrecasteaux's Channel; the other, probably that of a Grey Teal, was found in October, 1840, in a hole near the top of a large tree growing on the flats about Aberdeen, on the Upper Hunter, New South Wales. In both instances the eggs were nine in number. It is somewhat strange that Gould omitted to describe them.

The eggs of the Chestnut variety, or so-called Mountain Teal, I first described in 1882, were secured from a clutch from which a bird in full nuptial plumage was flushed.

Mr. D. Le Souëf found Chestnut-breasted Teal numerous at Malla-coota Inlet, where he noticed them breeding in November, 1895.

The breeding season lasts from June to December. With regard to second broods, Mr. Wm. Morton, Mt. Wallace (Vict.), paid particular attention to a bird in his vicinity. She hatched her first brood about the 14th August, and laid again about the 7th October. The first brood was able to fly about the 21st October.

\* However Mr. T. Carter has noticed it as far north as the North-west Cape, where he found a bird with young, apparently reared in the salt water among mangroves. Date, July, 1900.

## 753.—NETTION GIBBERIFRONS, Müller.

## GREY TEAL.

Figure—Cat. Birds Brit. Mus., vol. xxvii., pl. 2, fig. 2.

Reference.—Cat. Birds Brit. Mus., vol. xxvii., p. 254.

Previous Descriptions of Eggs.—Hume: Nests and Eggs Indian Birds (1875), also (Oates' ed.) vol. iii., p. 290 (1890); Campbell: Southern Science Record (1883); Ramsay: Proc. Linn. Soc., N.S. Wales, 2nd ser., vol. i., p. 1151 (1886); North: Austr. Mus. Cat., p. 342 (1889).

*Geographical Distribution.*—Australia in general and Tasmania; also New Zealand, New Guinea, Timor, Java, Celebes, Flores, and Sumba.

*Nest.*—Usually a hole or hollow spout of a tree, furnished with a quantity of down, but sometimes situated upon the ground in herbage, in the vicinity of water, but often, as in the case of the Black Duck, at a distance from that element. Nest-down, greyish-brown, each particle whitish in the centre, with light-coloured tips.

*Eggs.*—Clutch, nine to twelve usually, a record of eighteen; elliptical in shape; texture of shell fine; surface glossy and greasy; colour, light creamy-white. Dimensions in inches of a proper clutch: (1) 1.96 × 1.39, (2) 1.94 × 1.4, (3) 1.92 × 1.37, (4) 1.9 × 1.4, (5) 1.9 × 1.37, (6) 1.89 × 1.38, (7) 1.89 × 1.37, (8) 1.87 × 1.39, (9) 1.87 × 1.36, (10) 1.86 × 1.35, (11) 1.84 × 1.34.

*Observations.*—The Grey Teal (*N. gibberifrons*) has a more extensive habitat than the Chestnut-breasted, ranging from Austro-Malayan regions down through Australia to New Zealand, even to Macquarie Island.

Field observers and collectors now have no doubt about the existence of this second variety of Teal in Australia. Some systematists appear to entertain a doubt. Count Salvadori, who classified the Anseres in the British Museum "Catalogue," referring to the Grey Teal, says: "This species is absolutely similar to the supposed female of *N. castaneum*, both in its colour and dimensions, so that I am utterly unable to distinguish it; still it seems quite certain that they are not identical, as the birds in plumage of *N. gibberifrons* have bred and, perhaps, are still breeding, in the Zoological Gardens of London. . . . We must wait for additional information in order to settle the question of the specific differences between *N. castaneum* and *N. gibberifrons*."

Mr. G. A. Keartland, having weighed two species of Teal in the flesh, has kindly furnished me with the average results:—Chestnut Teal—male, 1 lb. 9 oz.; female, 1 lb. 8 oz. Grey Teal, male 1 lb. 2 oz.; female, 1 lb. 1 oz. This is evidence that seems to speak for itself. The Count could find no difference between the females. According to the above figures there is nearly a third difference in the weights.

At the time of the visit of Mr. J. Gabriel and myself to Riverina, during the big flood of September, 1894, several Grey Teals' nests were found, in every instance in hollow trees. We were fortunately situated for our work in being the guests of Mrs. Macaulay and her daughters, who lived on the Ooroonong Creek, near Moulamein. Miss Marguerite was used to following her brothers over the marshy meadows Snipe shooting. When she ascertained that I required Teal for critical examination, she suggested that, in order to make sure of our getting the birds, she might be permitted to take up a position at one end of the swamp, while I took the other. The lady cleverly shot birds on the wing, and retrieved them herself. We had no difficulty in securing three and a-half brace of Teal.

During a drive through tracts of flooded country we discovered two Teals' nests. When I was out with the brothers fording a billabong, a bird was observed to flush from the hollow of a spouted limb of an overhanging dead tree. Standing upon the seat of the buggy, we could just discern eleven creamy-white eggs within the hollow. They were surrounded by an elastic circle of down. The date was 8th October, 1894. It is somewhat remarkable that the down collected from this nest retained its warmth in our collecting basket for two or three hours afterwards. A Teal was observed to fly from a low hollow tree standing in a swamp. This nest contained nine eggs, fresh. The dead stump standing in its weird surroundings, my companion in the act of taking the eggs, and the buggy, with its fair occupants, waiting in the background, yielded a good picture for the camera, with the title, "Taking a Teal's Nest." (See illustration.) Date, 17th October, 1894.

We had the good fortune to find a nest containing the maximum complement, twelve eggs, which were taken from a dead tree near the centre of a great flooded expanse. This nest Mr. Gabriel and I discovered by flushing the bird when rowing our flatty through the timber. These flooded overflows are rendered dreary by reason of the dead rung timber, with its thousands upon thousands of leafless twigs cutting the clear blue sky all round. Here and there a smooth-barked living red gum indicates the permanent channel of the stream, and croaking frogs and chirping insects are everywhere heard. Another Teal's nest was taken, but several seen could not be reached. A fifth clutch, containing nine eggs, was presented to us by a drover.

Teal sometimes feign lameness in order to divert attention from their eggs or young. It is probable that Teal convey their young to the ground in the same manner as Black and other Ducks. Mr. Wm. Bateman, of Echuca, described to me a curious incident. He was in his boat, Duck shooting on Kow Swamp, when he saw nine downy young Teal tumble tail over head about thirty feet from a hollow spouting limb of a red gum into the water. They were not hurt in the least by their fall. They immediately bunched themselves together, so that a hat might have covered the lot. The strangest part of the affair was that the parents were nowhere to be seen; possibly they had been shot or frightened away by shooting.

Mr. Leslie Cameron, Grassmere, Riverina, has kindly sent me this interesting note: "Three or four years ago, when the flood waters were



TAKING A TEAL'S NEST

*From a Photo by the Author*



out here, and good grass grew in the mallee. Ducks used to lay there, as well as in the swamps. One day I saw two Teal flying from the mallee to a swamp. Both birds were carrying a young one in their bill. After safely dropping the young, one old bird stopped to look after them, while the other returned for the balance of the brood, bringing one at a time. I have taken as many as eighteen eggs from a Teal's nest.\* I have also taken a Spoonbill (Shoveller) Duck's nest in one part of a tree, while in another limb a Teal was hatching at the same time."

The principal breeding season for the Grey Teal is from August to November, but, as with other Ducks, the time varies according to localities and wet seasons, as the following incidents prove: Mr. H. C. Burkitt, at Cooper's Creek, 25th March, 1887, took Teal's eggs from a stick nest in a polygonum bush. On the 10th April, Mr. Arthur Bradley took ten Teal's eggs from a hollow box-tree in a swamp near Narandera, New South Wales. Eight eggs were taken from a nest near the coast, Rockhampton, Queensland, by Mr. Charles Barnard, June, 1887. At the opposite side of the Continent Mr. Tom Carter writes me he has seen Teals' nests during July, while during the Calvert Expedition fresh eggs of the Teal were taken from hollow trees at the Fitzroy River during January and February—the rainy season.

It is probable that two broods are reared in one season.

This Teal has a general brownish, mottled plumage. On its wings is a bright, bronzy patch, divided by a stripe of white; eyes, hazel; bill and feet, bluish lead-colour; total length in inches, 17; wing, 8; tail, 4; feet, 1 $\frac{1}{4}$ .

In shooting and other circles keen interest was taken in 1897 in the seizure by the authorities of a large quantity of frozen game birds. Of Teal and other Ducks 7,655 were found stored in the various freezing chambers in Melbourne and suburbs. Section 7 of the Game Act for Victoria provides that "if any person shall buy, sell, or knowingly have in his possession, house, or control any native game" within the prohibited season, he shall be liable to a penalty. There was some doubt about the "possession." Some legal authorities construed it to mean possession of native game killed in Victoria during the close season only, therefore, as the seized birds were admitted to have been shot during the open season, and were merely stored for commercial purposes, the alleged transgressors received the benefit of the doubt, and proceedings were stayed. From a naturalist's point of view, which is supported by several sound lawyers, it is contended that the Game Act was created for the protection of the birds, and that on a given date buying, selling, and traffic of any kind with the birds is to cease for a period in each year. It was not expected that enough birds would be slaughtered during the open season to satisfy the demand throughout the whole year. "Sufficient unto the day is the evil thereof." If such a state of things be allowed to continue there will shortly be no Ducks to shoot at any time. No doubt the Act as it stands will be amended.

The close season for Ducks of all kinds in Victoria is from the 1st August to 20th December; in New South Wales, from 1st September

\* May have been laid by *two* females.—A.J.C.

to end of February. Of course it is a close season for their eggs also, and I may here explain with regard to the nests taken by myself, I had the necessary authority in writing from the Administrators of the Game Act in Victoria and in New South Wales to collect eggs purely in the interests of research.

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754.—*QUERQUEDULA CIRCIA*, Linnaeus.

BLUE-WINGED OR GARGANEY TEAL.

*Figure*.—Gould: Birds of Great Britain, vol. v., pl. 17.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvii., p. 293.

*Previous Descriptions of Eggs*.—Various.

*Geographical Distribution*.—Victoria (accidental), Austro-Malayan region, Africa, breeding in Europe and Asia.

*Nest*.—A mere depression in the ground in a meadow, or a grassy mound in a morass, usually near water (Butler).

*Eggs*.—Clutch, eight to twelve usually; buff colour. Dimensions in inches: 1.75 × 1.25 (Gould).

*Observations*.—Concerning the beauty and elegance of the nuptial dress of the male of this little Duck, Gould enthusiastically writes: "The beautiful pencillings of its flanks, the lengthened and pointed form of its scapularies, the delicacy of its grey tints, the crescentic edgings of the feathers of its breast and the conspicuous white superciliary mark, contrasted with the darker colouring of the surrounding parts, render it second to none of the *Anatidae*."

When the male throws off his handsome dress he assumes the more sombre garb of the female.

A pair of these birds was exhibited by me at the Field Naturalists' Club of Victoria, March, 1889. They were kindly loaned by Mr. Wm. Shaw, of Geelong, and were shot out of a flock of Australian Teal at Lake Connemare, Victoria, in March or April, 1896. The shooter who obtained them was of opinion that there were more of the strange species among the birds that got away. Previously the Garganey Teal had not been recorded nearer Australia than the Malayan Islands. It is hardly likely that these birds had escaped from confinement, which, by the way, they easily reconcile themselves to.

It is worthy of remark *re* the male being in nuptial dress about April, that this month corresponds with the commencement of spring in the northern latitudes, where the birds should have been, instead of probably having lost their track and proceeded southward.

The Garganey is an animated and sportive creature, with a cry sounding like "kree-kree."



755.—*SPATULA CLYPEATA*, LINNÆUS.—(589)

## COMMON SHOVELLER.

*Figure*.—Gould: Birds of Great Britain, vol. v., pl. 14.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvii., p. 306.

*Previous Descriptions of Eggs*.—Legge: Birds of Ceylon, p. 1091 (1880); Campbell: Southern Science Record (1883); others.

*Geographical Distribution*.—South Queensland and New South Wales (accidental); also many parts of both old and new worlds, breeding as far north as latitude 68 deg.

*Nest*.—Merely a hole scratched in the soil, lined with grass and a quantity of down; usually near water, amongst herbage or under a low bush (Butler). The nest-down is small, dark-brown, with small, plainly-defined whitish centres, without pale tips (Legge).

*Eggs*.—Clutch, nine to twelve usually, fourteen maximum; roundish oval in shape, or elliptically inclined; texture of shell somewhat fine; surface glossy and greasy; colour, dull greenish-white. Dimensions in inches of a pair *ex a* clutch: (1) 2.05 × 1.46, (2) 2.02 × 1.5.

*Observations*.—Gould writes:—"Although I have no Australian skin of this species to confirm the following remarks, I must ask my ornithological readers, both in Australia and Europe, to take my word for the occasional appearance of this bird in Australia. When I visited New South Wales during the rainy season of 1839, all the depressed parts of the land were filled with water, and the lagoons here, there, and everywhere, were tenanted by hundreds of Ducks of various species, and every now and then one, two, or more beautifully plumaged Shovelers were seen amongst them; but I did not succeed in shooting one of them, and must have left the matter in doubt as to the particular species if the late Mr. Coxen, of Yarrundi, had not had the skin of a splendid old male in his possession, which he had himself shot, and which, after a careful examination, I found to be identical with the *Spatula clypeata* of Britain and the European Continent. Misfortune, I regret to say, attended Mr. Coxen's specimen, for a day or two afterwards a rat or some other kind of vermin entered the room in which it was kept, ate off its bill and legs, and so otherwise mutilated the skin as to render it useless. The debris would still have been saved had I not hoped and felt assured of obtaining other examples with my gun; this hope, however, was never realized.

"To this subject, therefore, I recommend the attention of those in Australia, who will doubtless meet with the bird some day when the country is subject to a partial inundation. That this species should extend its wanderings to Australia is not a matter of surprise, when we know that it has been found within the tropics, both in the old and new worlds."

Gould's prognostications have not altogether been realized. So far as I am aware there is not an Australian skin of the Common Shoveller, with its bronzy-green head and neck, white chest and conspicuous chestnut abdomen, in any of our local museums, but a correspondent from Queensland sends a description of a strange Duck he shot near Yandilla some years ago. From its "being similar to the Shoveller, commonly called 'Bluewing,' but it had a snow-white ring round its neck, and snow-white upper-half of its breast, the two joined," I have not the slightest doubt that the Duck was the Common Shoveller, of Europe.

**756.**—*SPATULA RHYNCHOTIS*, Latham.—(588)  
*S. variegata*, Gould.

SHOVELLER.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 12.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvii., p. 314.

*Previous Descriptions of Eggs*.—Potts: Trans. New Zealand Inst., vol. iii, p. 103 (1871); Buller: Birds of New Zealand (1873), also vol. ii p. 272 (1888); Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 57 (1882); Campbell: Southern Science Record (1883); North: Austn. Mus. Cat., p. 343 (1889), also app. ii. (1890).

*Geographical Distribution*.—Australia in general and Tasmania; also New Zealand.

*Nest*.—Usually a slight hollow upon the ground, lined with grass, a few feathers and down, and situated amongst herbage—grass, thistles, crops, &c., frequently away from water; rarely in a hollow tree. Nest-down brownish-grey, each particle lighter-coloured on the tips, and whitish in the centre.

*Eggs*.—Clutch, seven to nine usually, eleven maximum; roundish oval in shape, or elliptically inclined; texture of shell fine; surface glossy and greasy; colour, light creamy-white, with a faint greenish tinge. Dimensions in inches of a proper clutch: (1) 2.18 × 1.52, (2) 2.15 × 1.55, (3) 2.13 × 1.52, (4) 2.1 × 1.53, (5) 2.09 × 1.5, (6) 2.08 × 1.53, (7) 2.07 × 1.54, (8) 2.06 × 1.5, (9) 2.05 × 1.54.

*Observations*.—The Shoveller, or the Bluewing of the sportsman, is a most beautiful Duck, and probably the wildest of its tribe. I was once close to a pair that pitched on a rocky river pool, shaded by black wattles (acacia). The male was lovely in his dark-brownish coat, with the underneath parts rich, reddish-chestnut, each feather being touched with black at the tip. The plumage generally was enhanced by the beauty of the light-bluish patch on each shoulder, which is divided from the glossy green secondaries by a white stripe. The eyes were yellowish, which should match the feet in colour, while the broad bill (hence the name Shoveller) was purplish-black. The female was not so highly

coloured, and the blue on the wing was less brilliant. If these Ducks were a typical pair, Gould's plates, which are usually excellent, are not richly enough coloured to do the birds justice.

The Shoveller ranges chiefly over the southern half of the Continent, including Tasmania. According to Count Salvadori, the handsome *Spatula variegata* (Gould) of New Zealand, reported to have been taken in Tasmania, is merely a variety of the Australian Shoveller. Colonel Legge believes that the two varieties are simply "races" of the one species.

Not only do "birds of a feather flock together," but Ducks of different species fraternise on favourite feeding-grounds. I have witnessed, as doubtless many other collectors have, Shovellers, Black and other Ducks in one flock. Gould, in 1839, records having seen on the flats between Aberdeen and Scone, New South Wales, hundreds of Shovellers, White-eyed and Pink-eared Ducks in company. He writes:—"I did not succeed in finding the breeding-place of this species, consequently I am unable to give any account of its incubation, nest, or eggs."

The first nest I was fortunate enough to find of the Shoveller was discovered by flushing a bird from tussock grass on Phillip Island, Westernport. The nest contained the full complement of nine eggs. As they were partly incubated, I took two only; date, 18th October, 1880. On December 2nd, 1890, among thistles growing on an embankment in a Murray swamp, I found two, evidently the commencement of a clutch. There was no down about the specimens, but the presence of a few feathers of the Shoveller Duck was sufficient to identify the parentage of the eggs.

During our trip to Riverina in September, 1894, Shovellers were commencing to lay in the crops at Bannockburn. After our departure several nests were found. The birds, when suddenly flushed, have an objectionable practice of fouling the nest. This I have occasionally noticed in the case of the Black Duck. Whether this is the result of sudden fright, or it is done as a protection for the eggs, has not been proved. Probably fright is the cause.

Although the Shoveller usually lays on the ground, sometimes it takes to hollow trees. The late Captain F. C. Hansen, of the Murray steamer "Maggie," recollected seeing a Shoveller carrying its young out of a tree. He took particular notice, because he was aware of the proclivities of this Duck for breeding on the ground. He casually mentioned that the season of 1887 was remarkable for the number of Ducks of various kinds in the Murray district.

In New Zealand, according to the late Mr. T. H. Potts, the complement for a clutch of Shoveller's eggs is ten.

The breeding season for the Australian bird is usually from August to November.

The Shoveller is not so heavy as the Black Duck—the male, with a total length of 21½ inches, weighing 1 lb. 10 oz.; the female, length 20 inches, 1 lb. 4 oz.

Here is another instance of Ducks covering their eggs before temporarily leaving them. Mr. C. H. M'Lennan, writing to me from the mallee, Victoria, says:—"There was a Bluewing's (Shoveller) nest

on the ground, near the butt of a bull-oak (*Casuarina*), not far from my camp. I often saw the old bird on her nest as I passed going round my traps. Sometimes she flushed. She was sitting on nine eggs. One morning, going past as usual, I did not notice the Duck, so I went to see if anything had happened. I could not find the nest for some time, for it was splendidly covered over with the dry foliage of the bull-oak, and other debris. There was a layer of down on top of the eggs, and the things mentioned lay on it. The old bird must have been away, looking for something to eat."

**757.**—MALACORIYNCHUS MEMBRANACEUS, Latkum.—(590)

PINK-EARED DUCK (WIDGEON).

*Figure.*—Gould: Birds of Australia, fol., vol. vii., pl. 13.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvii., p. 319.

*Previous Descriptions of Eggs.*—Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 58 (1882); North: Austr. Mus. Cat., app. ii (1890).

*Geographical Distribution.*—Australia in general and Tasmania.

*Nest.*—Usually the deserted nest of a Raven, Heron, &c., sometimes on a thick flat limb, profusely lined with down, light drab or greyish in colour, each particle white or lightest in the centre and on the tips.

*Eggs.*—Clutch, seven to nine usually; oval in shape, or more compressed at one end; texture of shell fine; surface glossy; colour, light creamy-white. Dimensions in inches of a part of a set: (1) 1.92 × 1.4, (2) 1.92 × 1.37, (3) 1.9 × 1.37, (4) 1.82 × 1.35, (5) 1.82 × 1.3.

*Observations.*—This very interesting and beautiful little species has the length and breadth of Australia and Tasmania for its habitat, showing preference for the fresh-water shallows of the central and northern parts of the continent.

In the Carpentaria district, Mr. Price Fletcher states it appears to take the place of the Teal. On the large lagoons of the Alexandra Creek, which runs into the Leichhardt River, he found them exceedingly plentiful, literally in thousands. So numerous were they, that, when camping there, Mr. Fletcher's party for a week ate nothing but Pink-eared Ducks, morning, noon, and night. The Pink-eared Duck is by no means numerous in southern parts, except when dry seasons in the north or in the interior drive them towards the seaboard, as happened in the drought of 1896-7. That season, numbers of this little Duck found their way into the Melbourne markets, and at the close of the shooting season nearly 1,500 were stored in the freezing-chambers.

The Pink-eared Duck is called by shooters and dealers, Widgeon. It may be described as dark above and light-coloured underneath, where are numerous dark-brown fasciæ, the markings being narrow or broad

as the case may be. The somewhat broad bill is greenish or bluish-grey, eyes reddish-brown, and feet variable in colour from green to yellowish-brown. The bird takes its common name from a singular oblong mark of rose-pink behind the eye.

Mr. Price Fletcher remarked, that in Northern Queensland the little Pink-eared Duck takes the place of the Teal. So it does in southern parts on the tables of restaurants, where it is always sold as Teal.

Gould records, "No one of the tribe that I have observed in a state of nature presents a more elegant and graceful appearance than this little Duck, which is generally seen in small companies of from six to twenty in number swimming over the placid lagoons, and betraying so little fear and shyness on the approach of man as to present a singular contrast in this respect to the other members of the family."

Mr. Gregory Bateman, who loved the Bohemian life of a trapper and shooter, enjoyed exceptionally good opportunities of observing Water Fowl, especially in Riverina. His observation regarding the Pink-eared Duck was that it generally laid during September or October, or according to the amount of rain, depositing its eggs in the deserted stick-nests of Ibises, Herons, &c., which old structures the Duck abundantly lines with down. In fact, no other species of Duck's nest Mr. Bateman was acquainted with contained such an abundance of down. The eggs of this species kindly presented to me by Mr. Bateman were taken from a set of nine, found in a White-fronted Heron's nest.

Dr. Ramsay, who first published a description of this Duck's nidification in the P.L.S. of New South Wales (1882), states:—"For a member of the *Anatide*, this bird certainly selects the most unique spots imaginable in which to make its nests. The first instance was brought under my notice by Mr. K. H. Bennett, of Yandembah, a most enterprising naturalist, to whom the Australian Museum is indebted for several rare specimens. Mr. Bennett informs me that, having occasion to visit a nest of the White-fronted Heron (*Ardea novæ-hollandiæ*), he was much surprised to find it much altered in appearance, and from the mass of down which covered the whole of the upper part of the Heron's nest the Duck flew off, leaving two eggs, which, with the nest, have been transmitted to the Museum. The eggs, unfortunately, were broken in transit. This deficiency, however, is supplied by specimens taken by Mr. Whittell, from a similar mass of dark, slate-grey down, which was placed on a flattened portion of a thick horizontal bough, overhanging the water, on the bank of the Darling River, near Wilcannia. In this instance the eggs were six in number, of a rich light-cream colour, rather pointed ovals. Length: (A) 1.85 × 1.3 inches, (B) 1.82 × 1.3 inches. The beautiful structure above-mentioned, sent by Mr. Bennett, consisted of the platform of sticks which formed the nest of the Heron, being thickly covered with down, which formed a rim four inches in height. A large quantity of down was worked in among the sticks, and covered the greater part of the sides; it closed over the eggs above in an elastic mass, quite hiding them."

There are exhibited in the Australian Museum two interesting, bulky bunches (one measuring about ten or eleven inches across) of lightish-coloured down from the Pink-eared Ducks' nests, taken from the

deserted nests respectively of a White-fronted Heron and a Straw-necked Ibis. Another mass of down, found upon the ground in the nest of a Black-tailed Native Hen (*Tribonyx*), also exhibited, is so much lighter in colour than the other two as to lead one to suppose it might belong to another species of Duck.

In the "Descriptive Catalogue" (No. 12) of that Institution, it is stated:—

"The Trustees of the Australian Museum have lately received from Mr. K. H. Bennett several nests of the Pink-eared Duck, taken at Yandembah during 1889; one of them is placed on the deserted nest of *Geronticus spinicollis*, which was built on the top of a *Polygonum* bush, about eighteen inches above the water. The nest of *G. spinicollis* is a flat structure composed of thorny sticks and twigs interlaced through one another, and measures eighteen inches in width by five inches in height. That of *M. membranaceus* is elliptical in form, and is composed entirely of down plucked from the breast of the parent bird, and measures twelve inches in width by five inches in height. To another nest Mr. Bennett has attached the following note:—'Taken at Yandembah, 26th August, 1889. The nest is placed on an old disused nest of the *Tribonyx ventralis*, built on the lower dead horizontal stems of a *Polygonum* bush about a foot above the water, and was screened from view in a great measure by the overhanging green top of the bush. The eggs were placed as now in the nest, and were completely covered by the down.'

"Mr. Bennett also records finding a nest of this species on 30th July, in a slight hollow of a stump standing in the water, containing six eggs enveloped as usual in a mass of down, and another on 12th September, in the disused nest of *Corone australis*, on the branches of a tree about twelve or fourteen feet above the water."

The usual breeding season for the Pink-eared Duck in the southern part of the continent is from July or August to November.

A Waranga correspondent of the Rushworth (Victoria) newspaper is responsible for the story of an "attack" by Widgeons:—"As I was going by Gunn's Swamp I was surprised at my hat being knocked off, and I thought it was a Magpie, whose nest I had approached too closely, but imagine my astonishment when I looked up and saw that a pair of Widgeon were darting at me, and I could not drive them off, and as they began to make my head pretty sore, I cleared out as fast as my horse could carry me and left them in possession. I suppose I must have been very close to their nest, but I never heard of Ducks doing the like before, as they are usually very timid birds."

758.—*STICTONETTA NEVOSA*, Gould.—(587)

## FRECKLED DUCK.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 10.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvii., p. 324.

*Previous Descriptions of Eggs*.—Campbell: Southern Science Record (1883); North: Austr. Mus. Cat., p. 340 (1889).

*Geographical Distribution*.—Queensland (Flinders River, 1896) New South Wales, Victoria, South and West (as far up as the North-west Cape) Australia, and Tasmania.

*Nest*.—Similarly situated to those of most Ducks, in herbage upon the ground.

*Eggs*.—Clutch, ten to twelve probably; long ellipse in form; texture of shell comparatively fine; surface glossy or greasy to the touch; colour, light greenish-white. Most resemble those of the Black Duck. Dimensions in inches:  $2.5 \times 1.66$ ; of two specimens, according to the Catalogue of the Australian Museum: (1)  $2.3 \times 1.7$ , (2)  $2.26 \times 1.65$ .

*Observations*.—This very remarkable species of Duck would appear to be partial to the southern portion of Australia. However, it has been found in Queensland, and occasionally in Tasmania. Its plumage is dark-brown, minutely and curiously freckled with white, the under surface being lighter coloured. Some birds have a large patch of rusty-brown on the chest. Eyes are light-brown, while bill and feet are greenish-grey. Shooters sometimes call the bird by the name of the "Monkey" Duck. Why, I do not know.

The eggs of the Freckled Duck are exceedingly rare in collections. A single egg in my possession was taken in the neighbourhood of Warrnambool. There is also a single specimen in the Macleayan collection, Sydney, while the Catalogue of the Australian Museum (1889) records the finding of a nest on the margin of a swamp, in the Western district of Victoria, containing seven eggs. The date given is October, 1868. There is probably a typographical error in the date. One hardly supposes that such an astute authority as the author of the "Catalogue of Nests and Eggs" would leave a rare egg undescribed so long.

Freckled Ducks were more plentiful in the Melbourne markets during the season 1896-7 than they had been for years.

Acting on the suggestion of Professor Alfred Newton (Cambridge), that if I should come across a male Freckled Duck, his trachea would be worth looking to to ascertain whether it has the bony "labyrinth" at the forking of the bronchial tubes, and if so, whether it differs and in what way, from that of other Drakes, I secured some of the birds, which Mr. Ed. Degen has been kind enough to examine. He states: "The trachea belonging to a male bird shows that the bony labyrinth,

which is asymmetrical in the common domestic Drake, is replaced by a slight swelling of the inferior larynx only in the above-named specimen, and is, moreover, symmetrically developed.

"So far there is no difference with regard to the two sexes. Where the male bird differs from the female is in the two expansions occurring at irregular distances in the course of the trachea. The upper one is about equidistant from the pharynx proper and the second, while the lower one is placed somewhat higher from the inferior pharynx than the first one is from the pharynx. These swellings when the trachea is *in situ*, are 'compressed,' and, accordingly, when viewed from the front, are not conspicuous. Viewed in the profile, however, these contours are plainly visible.

"The trachea of the female bird is more or less cylindrical throughout its entire length."

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SUB-FAMILY—FULIGULINÆ.

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**759.**—*NYROCA AUSTRALIS*, Gould.—(593)

WHITE-EYED DUCK (HARDHEAD).

*Figure.*—Gould: Birds of Australia, fol., vol. vii., pl. 16.

*Reference.*—Cat. Birds Brit. Mus., vol. xxvii., p. 350.

*Previous Descriptions of Eggs.*—Ramsay: Proc. Linn. Soc., N.S. Wales, vol. vii., p. 59 (1882); Campbell: Southern Science Record (1883); North: Austr. Mus. Cat., p. 345 (1889).

*Geographical Distribution.*—Australia in general and Tasmania; also New Zealand, Auckland Islands, New Caledonia, and Papuan Islands, westward as far as Waigiou.

*Nest.*—Sometimes a hole or hollow spout of a tree, at other times situated upon the ground in herbage; if the latter, the nesting place is lined with grass mixed with down and feathers. Nest-down, brownish-grey or greyish-brown, each particle being lighter coloured on the tips and whitish in the centre.

*Eggs.*—Clutch, eleven to thirteen; elliptical in shape; texture of shell comparatively fine; surface glossy and greasy; colour, light creamy-white. Dimensions in inches of a pair: (1) 2.27 × 1.67, (2) 2.26 × 1.64.

*Observations.*—This fine Duck is known by various vernacular names—Hardhead, Brownhead, &c. It is found throughout Australia and Tasmania, and is probably nowhere more plentiful than in the river reaches, lagoons, and sheltered backwaters of the southern parts of the Continent. On the Gippsland lakes White-eyed Ducks are, or were, exceedingly numerous. When a flock takes flight across the water the flashing of the multitude of the white pinions is most conspicuous.



In addition to the white across the wings, the under tail coverts are white. The eyes are also white, hence the distinctive name of the bird. The balance of the plumage in general is chestnut or dark-brown.

The White-eyed Duck is an exceedingly swift flier. The lightning like rapidity with which a flock sometimes flies down stream, especially with a good breeze behind, often baffles the best sportsman for a successful shot.

Authenticated eggs of the White-eyed Duck are rare in collections. If Gould, as he states, had eggs of this species taken on the banks of the Derwent, Tasmania, he did not describe them. Eggs were first described by Dr. Ramsay, 1882. The examples in my cabinet were from a clutch (incompleted, probably) of seven, from which a bird was flushed, and they were taken from a hollow tree, Riverina, by the late Mr. Gilbert Bateman. He also took two sets, each containing eleven eggs, from box-trees (eucalypt). Several seasons Mr. Bateman observed these Ducks used to breed during September or October at Eurola, Riverina. The White-eyed Duck does not always lay in trees. I was advised of a nest found on the ground by some shooters on "The Marsh," just north of Lake Bael Bael, Victoria. In December, 1894, a friend of Mr. G. H. Morton, of Murray Meadows, found a nest with eight eggs of the White-eyed Duck on the ground.

Touching the number of eggs laid by this Duck, I have mentioned two instances of eleven each, but Mr. Tom Musgrove, a reliable observer, recollects distinctly counting a young brood of thirteen. In the "Catalogue" of the Australian Museum it is officially stated that seven to nine is the number of eggs for a sitting. It is left to some other oologist to prove which statement is correct.

In concluding my general observations anent our edible Ducks, I may be allowed to remark that, when Ducks are about, open season or not, it is very tempting to go shooting. Many persons, especially those in the bush, go shooting on Sunday, seemingly unaware that it is an offence against the police statutes to carry a gun on that day. With regard to shooting in close season, it is to be hoped that the people of Australia will see the wisdom of not "killing the Geese that lay the golden eggs," or else, sooner or later, we shall be hedged about with fierce enactments and objectionable gun licenses for the proper protection of birds, as in Canada and elsewhere. As has been truly said, "Civilised man is Nature's worst enemy."

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SUB-FAMILY—ERISMATURINÆ.

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760.—ERISMATURA AUSTRALIS, Gould. (594)

BLUE-BILLED DUCK.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 17.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvii., p. 451.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 380 (1865).

*Geographical Distribution*.—Victoria, New South Wales (Riverina), South and West Australia, and Tasmania (accidental).

*Nest.*—Not unlike that of a Musk Duck, well concealed in the herbage of a marsh or swamp, and lined with grass and down.

*Eggs.*—Clutch, four to five probably (two to nine or ten, Gould); elliptically inclined in shape; texture of shell coarse; surface very slightly glossy and rough; colour, light greenish white. Dimensions in inches of examples from two clutches: (1)  $2.81 \times 1.95$ , (2)  $2.73 \times 2.07$ , (3)  $2.66 \times 1.9$ , (4)  $2.59 \times 1.84$ .

*Observations.*—This remarkable diving Duck, with its feeble Grebe-like flight and habit, has only been recorded for the southern part of Australia, and one for Tasmania.\* It usually frequents the lakes and lagoons running parallel with the coast. It is found inland also, and has been observed breeding in the Murray River district and Riverina.

The Blue-billed Drake wears a rich chestnut coat. The head is dark, showing off the light blue-coloured bill. Underneath surface is brownish-grey, transversely marked with dark-brown. The whole of the plumage of the female is dark-brown, transversely marked with light-brown.

I received the scarce eggs of the Blue-billed Duck through the instrumentality of Mr. G. H. Morton, of Murray Meadows, who obtained them from shooters. Two nests were found about the middle of December, 1893, in "The Marsh," north of Lake Bael Bael. The nests contained respectively three eggs (addled) and four eggs (fresh).

To his remarks on the Blue-billed Duck, Gould appended the statement that the *E. leucocephala* of Africa laid eight eggs, which fact, he asserts, confirms the assertion that the eggs of the Australian bird are from two to ten in number (surely a wide margin). He says this is a remarkable circumstance, seeing that the Musk Duck, which is nearly allied to the Blue-billed Duck, only lays two. It certainly appears as if Gould doubted his own statement that the Blue-billed Duck lays a maximum complement of ten eggs. I share his doubt, and have stated the number as five. My principal reason for giving that figure is, that several reputed Musk Ducks' nests containing five eggs have been reported to me, which I believe are referable to the Blue-billed species. The nests and eggs of these Ducks are similar, therefore a case of mistaken identity may have easily occurred. Moreover, I think it can be proved that the Musk Duck never lays more than a pair or three eggs at most.

Breeding months, August to December.

\* Three specimens were obtained in 1892.

## 761.—BIZIURA LOBATA, Shaw.—(595)

## MUSK DUCK.

*Figure*.—Gould: Birds of Australia, fol., vol. vii., pl. 18.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvii., p. 452.

*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 383 (1865); Ramsay: Ibis, p. 413, pl. 8, fig. 1 (1867); Campbell: Proc. Roy. Soc., Victoria, p. 5 (1890).

*Geographical Distribution*.—South Queensland, New South Wales, Victoria, South and West Australia, and Tasmania.

*Nest*.—A hollow in the ground, in rushes, grass, &c., on a bank or knoll in a swamp, or in a short hollow stump or log; occasionally rushes growing in water are trodden down and bent over so as to form a covered nest; lined warmly with grass, down, &c. Dimensions,  $5\frac{1}{2}$  inches across by  $3\frac{1}{2}$  inches deep. Nest-down light-grey, whitest in the centre of each particle.

*Eggs*.—Clutch, two to three; elliptical in shape, both ends somewhat pointed; texture of shell thick and coarse; surface slightly glossy and rough; colour, a coating of dirty greenish-white or pale-olive, on being removed, reveals a light greenish-white shell. Dimensions in inches of a proper clutch: (1)  $3\cdot16 \times 2\cdot17$ , (2)  $3\cdot16 \times 2\cdot11$ , (3)  $3\cdot12 \times 2\cdot16$ .

*Observations*.—The habitat of this curious Duck ranges across the southern half of Australia, including Tasmania and some of the islands in Bass Strait.

The Musk Duck is found in the waters of sheltered bays, estuaries, &c., as well as in the placid lagoons of the interior. Altogether, it is a remarkable bird, and little appears to be understood of its economy. The colour is brownish-black, crossed by numerous narrow freckled bars of buffy-white, eyes dark-brown, bill also dark, and legs leaden-colour. The male is about twice the size of the female, and it is furnished with a semi-circular pouch under the throat. This appendage is not the seat, as is popularly supposed, of the strong musky odour emitted by the bird. The odour comes from the oil gland near the extremity of the tail, and is so powerful that even dogs will not retrieve the bird. A skin will retain its musky smell for years. I once saw four fine male Musk Ducks—a somewhat unusual consignment of cargo—which were waiting removal from the Customs Examination Shed at the Victorian Railways, Melbourne. Their characteristic powerful scent filled the whole place.

Although more than a pair of Musk Ducks is rarely seen at one time, I have observed numbers together in the waters of Port Phillip, near the eastern shore, notably at St. Kilda, Mordialloc, and Dromana. On a stormy evening it is pleasant to hear their whistle-like notes borne in on the wind. I imagine the birds occasionally come ashore at night.

The note of the male, especially during the breeding season, is extraordinary, and difficult to describe in words. Gould likened it to the sound caused by a large drop of water falling to the bottom of a deep well; or it may be imitated by the sudden opening of one's lips. These similes are very good, if it be understood that the sound is loud, sharp, and a hissing-like whistle. I have frequently watched the bird floating on the surface of a lagoon, as well as on the sea, while it was making this peculiar sound. It seemingly makes the noise with considerable effort, simultaneously giving a spasmodic kick with one or both its legs, which causes a small wreath of water to be thrown up behind.\*

Musk Ducks are clever divers, but they occasionally get caught in nets set for fish. To diving they trust for their safety when danger threatens. It is also the means of procuring food from the bottom of murky swamps. The length of such dives I have variously timed from thirty seconds to sixty seconds. It is stated that an old bird can dive with young ones on its back. I have heard it solemnly declared that Musk Ducks can fly like other Ducks. I could never force one to flight, or do more than flap along the surface of the water when hard pushed.

A lady correspondent sends the following interesting note:—"As far back as 1849, when a girl, I crossed the River Murray from Adelaide with my father and family. We crossed in a punt with Mr. Carter, owner of Wellington, South Australia. We struck across for the Coorong, and found a beautiful creek running for miles, and made our home there. The locality was swampy, and the swamps were full of Black Swans and every other kind of water bird. We made friends with the Long Desert tribe, and every day in summer, unless wanted at home, I was out in the swamps, shepherding sheep with two black girls. They taught me native names, and showed me where to look for nests. They pronounced the name almost the same as the whistle of the bird, 'Sheerip.' I have found many nests in clumps of cutting grass. We could tell by a few dead blades of grass on the top. I never saw more than three eggs. When the mother went out for food and water, the eggs were left covered with down. They can only dive. I never saw one fly, and the natives tell me they never fly. The swamps were then covered with beautiful Black Swans ('Coonorwar') and Mountain Ducks ('Perner'), which built in gum trees. Peelech Peelech a Pa was an island covered with Ducks, Water Hens, Turce, Teal Ducks, 'Nygrahc,' Native Companions, and 'Jerolyows.' The swamps are full of a small fish called 'lap lap.' The blacks only counted as high as three, and whenever we saw a Musk Duck's nest—never before October—they would guess 'Wyntook' (1), or 'Boolach' (2), but never higher than 'Boolach a Wyntook' (3), so that makes me positive their belief was in three. We never destroyed any nests. That was in the south-east district of South Australia, where A. L. Gordon made his home for many years."

\* It has been stated that the bird splashes the water with its wings. But as the bird makes a slight progressive movement each time, it is evidently performed by the feet.

There is some doubt as to the number of eggs laid by the Musk Duck. Gould, Ramsay, and other authorities state that a pair usually is laid. Both in Eastern and Western Australia I have taken nests containing three eggs, flushing the birds therefrom. Such excellent field observers as Mr. A. E. Brent, the late Mr. Gilbert Bateman, and Mr. William Bateman, assert that the maximum number of eggs laid is five. I have recently received a letter from a Tasmanian correspondent, who says: "I have found as many as five eggs in a Musk Duck's nest, and twice I have found four." I feel confident that the usual complement is not more than two or three eggs, and that the sets of five found belong to another species of Duck, possibly the Blue-billed—a bird that lays eggs like the Musk Duck's, but somewhat smaller, or they may have been combination clutches. The bird, when quitting her nest of her own accord, sometimes conceals the eggs by covering them with down.

The nest I observed in Western Australia, containing three eggs, was situated in a melaleuca (tea tree) swamp in the heart of the forest. It was about two feet above the water, concealed in long herbage at the side of a stump. Date, 1st November, 1889. I learnt that it was usual in Western Australia to find three eggs in the nest of the Musk Duck. The other triplet I found was on a thistle-covered bank by a Murray swamp in Riverina. The nesting place was narrower than that of the ordinary Black Duck, and it was warmly lined with grass and down. Date, 2nd December, 1890. In the same district, a season or two subsequently, Mr. G. H. Morton took two Musk Ducks' nests with each three eggs, and identified the parents.

With regard to combination clutches, here is a curious illustration. On the 31st December, 1893, Mr. Morton flushed a Black Duck from one Musk Duck's egg and seventeen Black Duck's eggs, while five other eggs were scattered round the nest. All were fresh. Mr. Morton hatched some of them under a domestic fowl.

The breeding months for the Musk Duck are July to December.

Some importance may be attached to the description of the nest-down of Ducks as an aid to identification of the species should the parent be absent from her eggs. I regret I have been unable to describe more than I have done. However, I hope some of our collectors will shortly furnish us with complete descriptions of the nest-down from all species of Australian Ducks' nests.

My question in "The Australasian," 1897, "Can Musk Ducks fly?" gave rise to a considerable amount of correspondence fruitful of interesting facts. I cannot do better than quote extracts from the evidence of some of the observers. First, there are those who have never seen Musk Ducks fly. Mrs. Cornwall writes from Cudgegong, New South Wales: "My experience of them is that they cannot. When they made their first appearance in the backed-up waters of the Goulburn River above the weir, a number of us went out in boats and chased them down the river for sport; the Ducks would dive, and then would flap over the surface of the water, in a peculiar waddling manner. Not one of them ever rose up. We got them down within 150 yards of the weir, and the Ducks (there were about twenty of them) dived in all directions,

and so got past our boats into the back waters. Often and often have we tried to make Musk Ducks fly by shooting at them, &c., but never once succeeded."

"Teal" (Ballarat) writes: "Musk Ducks can no more be said to actually fly than, say, flying-fish. They simply skim the surface of the water, flapping their wings, when disturbed."

Mr. John G. Gray, Kentucky, New South Wales, writes: "I quite agree with Mr. Campbell regarding the disinclination to fly the Musk Duck shows. I have been shooting Ducks in Riverina, near Corowa, on the Murray, for more than thirty years, and cannot remember having ever seen one on the wing. Here they only frequent the deep waters of dams on the creeks, and depend for safety on their diving powers, which are extraordinary."

"C. M.L." (Wonga Lake) writes: "Having read all the correspondence in 'The Australasian' *re* the Musk Duck, I thought I would tell you my experience of it. I do not think that they can fly, for I have met them travelling on foot from one lake to another, and I have run them down; so I am sure if they could fly they would not attempt to walk over the heavy sandhills that are to be met between the different lakes about these parts."

"H.O.," writing from Kongwak, via Jumbunna, says: "I, as an old bushman, was of opinion that they (Musk Ducks) could; otherwise, it seemed to me unaccountable how they could suddenly arrive at swamps, &c., up country, newly-filled or filling by the first rains. From what I saw a few days ago, I am now inclined to think that they cannot fly. I was walking to a neighbour's, when there straddled and fluttered in ungainly fashion across the main road a female Musk Duck—I at first thought wounded or fluttering from a nest. But when she gained the drain at the side of the road she shot up and down it in a tremendous fuss at my approach. After some trouble I caught her, and had my fingers viciously snapped. All the time I was examining her legs and wings she had fast hold of my coat. I found nothing the matter with either legs or wings. On letting her go, I flung her a little in the air, thinking she might fly with a 'fair start,' but she only plumped into the drain without making an effort to fly. She had evidently come across a marshy paddock, and was making for the river, about one hundred yards distant."

On the other hand there are those persons who have seen Musk Ducks fly.

Mr. W. H. Ford, F.G.S., whom I know to be a reliable field observer, writing from Moolort, Victoria, after stating that on one occasion, when on the Aird River, Cape Otway, he forced a Musk Duck to flight, about 300 yards, says: "In the winter of 1893 I had a party down at Altona Bay Estate, and my brother, out after game one night at a swamp on Cherry's property, shot a Musk Duck flying into the swamp from the bay. He thought it was a Black Duck until shot, and then could not believe it was only a Musk till brought to light at camp. These are the only two instances I know of Musk Ducks flying."

Dr. H. Breton writes: "My experience is they (Musk Ducks) can fly, although they seldom resort to this mode of progression. I am

satisfied that when hunted and fired at they never fly, but dive, and would never be hit unless taken off their guard. I have had repeated shots at them on the billabongs, in New South Wales, ineffectually, as their very keen sight enables them to dive out of reach instantaneously on the explosion of a gun. Only once did I meet with success. I borrowed a gun from a patient of mine and sauntered along the banks of the River Merri, about four miles from Warrnambool, towards Woolaston, when suddenly I saw a Duck come flying round an elbow of the river, on the opposite side. I fired and bagged, as I thought, a Black Duck, but which, to my great disappointment, turned out to be a Musk Duck. No doubt they fly for a spurt occasionally, but never when shot at, as their immunity is assured them by diving. They are every bit as quick as the Diver in avoiding shot."

Mr. J. Carmody, writing from Urana, New South Wales, states: "Two years ago I was at Colombo Creek, and saw four Ducks fly down on the water just in front of me. I fired and killed two. Congratulating myself on having secured two Black Ducks, I drew them out of the water, and was greatly surprised to find they were Musk Ducks, as, up to then, I had shared in the belief that these birds do not fly. They were flying strongly when I first observed them, and appeared to have come from some distance down the creek."

"S. J.," writing from Adelaide Club, South Australia, says: "When on a visit to Point Lowly lighthouse some few years since, I was shown by one of the keepers the skin of a male bird which, he informed me, had flown against and broken the glass around the lantern. This bird must have been flying at a good height, and swiftly, to break such very thick glass."

Mr. Benjamin Culley recollects, in 1853, shooting a Musk Duck flying by night in Hobson's Bay. "Since then," he adds, "I have been very familiar with the Musk Duck, both on the Murray lagoons and on the dams in Riverina, and although I have shot one now and again by error as it fluttered from the high banks of the river into the water, I could only say that the effort to fly was the effect of surprise; therefore, I take it to mean that its power to do so may be always present, but that its nature is to fly either in the dark or moonlight. I may say that the one referred to above flew with short and rapid flaps, similar to a Magpie, when returning to roost at evening. With us were Messrs. David Goodsir and Henry Gale, both well known in Melbourne afterwards."

I have purposely kept "T.A.G.'s" (Yandilla, Queensland) communication to the last, because it appears to contain the solution of the problem, namely, that Musk Ducks do *not* or rarely fly by day, but do so occasionally by night. "I have only once seen one fly in daylight here, and he flew past me and alighted within twenty yards of me, and there was no doubt it was a Musk Duck.

"We have a small steam launch here, and used to have it on the Broadwater for a time, and go out for moonlight excursions, and when we came to the part where the Musk Ducks congregated, as the launch came up to them they used to get up and fly, whereas in daytime

they would merely flutter along the top and dive. There is no doubt they flew, as they used to get quite close before they started, so that you could see them distinctly in the moonlight, and, besides, no other kinds of Duck frequented that part.

"It seems to me that they do not, as a rule, fly in the day, because they are heavy fliers, and cannot steer well or turn quickly, so they know that the Hawks would soon have them, whereas at night they are safe."

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## ORDER - CASUARI.

### FAMILY—DROMÆIDÆ: EMUS.

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762.—DROMÆUS NOVÆ HOLLANDIÆ, Latham.—(492)

#### EMU.

*Figure*.—Gould: Birds of Australia, fol., vol. vi., pl. 1

*Reference*.—Cat. Birds Brit. Mus., vol. xxvii., p. 586.

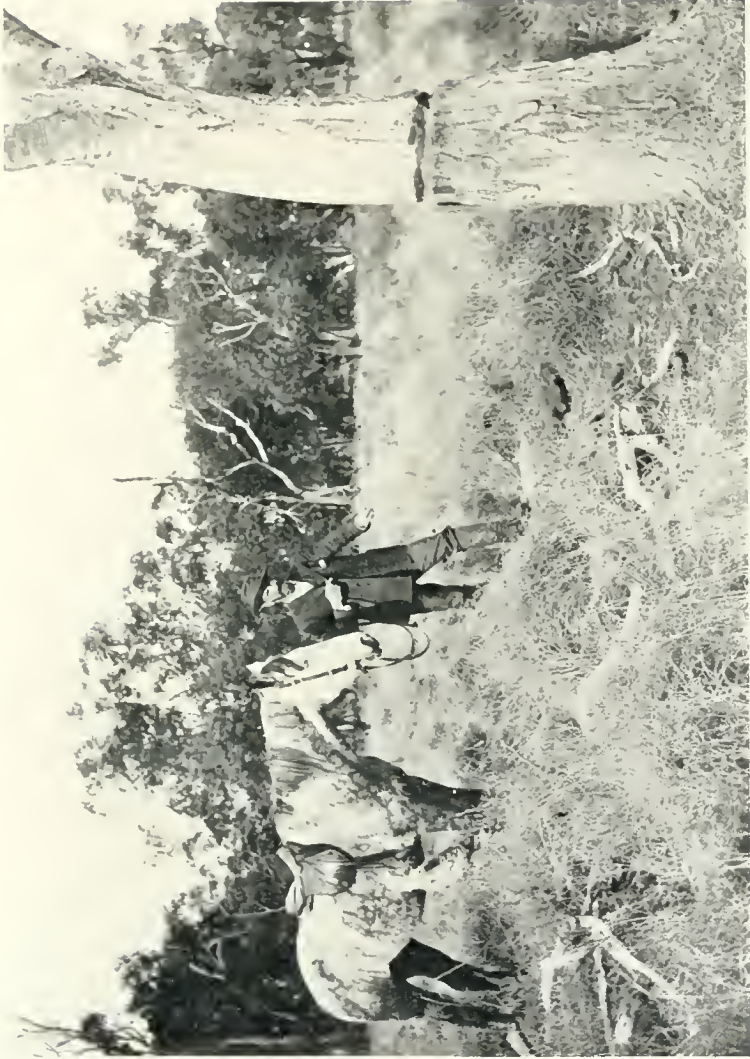
*Previous Descriptions of Eggs*.—Gould: Birds of Australia (1848), also Handbook, vol. ii., p. 203 (1865); Bennett: Gatherings of a Naturalist, p. 218 (1860); North: Austn. Mus. Cat., p. 292 (1880); Campbell: Roy. Phys. Soc., Edin., vol. xiii., p. 215 pl. 6 (1896).

*Geographical Distribution*.—Australia in general.

*Nest*.—Usually a flat bed or platform composed of grass or other herbage plucked by the bird round about the site, and trampled down. Sometimes bark, pieces of sticks, and leaves of trees are used, intermingled with a few of the bird's own feathers. Shape generally oval, about 4 feet by 2½ feet in size, and about 2 inches in thickness. Situation in open country, usually near the base of a tree or stump; at other times in rank herbage or in a dry bed of a polygonum swamp. Some authorities state that on the plains the eggs are deposited on the bare earth, while in the Mallee country the nest is formed almost entirely of strips of bark plucked from these trees by the bird. The nest or bed is constructed or augmented as the laying and incubation of the eggs proceed.

*Eggs*.—Clutch, usual average nine, but varies from seven to eighteen; elliptical in shape, a few exceptions being more swollen about the centre. The appearance of a collection of freshly-gathered unblown specimens is very beautiful; the surfaces are rough (not unlike shagreen), with granulations of dark-green upon a shell of light metallic or verdigris-green. In some clutches the granulations are so closely placed and flattened or squeezed down as to hide completely the interstices of light-green. In such instances the eggs are of a more uniform





FINING AN EMU'S NEST.

*From a Photo by the Author.*



dark-green. The granules are slightly lustrous, but as incubation proceeds become much darker and polished, while the interstices become bluer or dingy in shade. Dimensions in inches of a normal clutch of eight eggs: (1)  $5.62 \times 3.62$ , (2)  $5.56 \times 3.62$ , (3)  $5.5 \times 3.68$ , (4)  $5.5 \times 3.68$ , (5)  $5.5 \times 3.62$ , (6)  $5.43 \times 3.68$ , (7)  $5.31 \times 3.5$ , (8)  $5.06 \times 3.31$ . The eggs in this clutch are somewhat long ellipses. No. 2 is much lighter in colour, caused by the granulations being less or more scattered over the shell (an exception not unfrequently seen in a set, and probably the last laid egg), while No. 8 is noticeably the smallest in the set.

Another clutch, of eight rather small but beautiful eggs, gives average dimensions of  $5.05 \times 3.37$  inches. A remarkably regular-sized set of twelve gives  $5.22 \times 3.59$  inches, while in a set of thirteen exceedingly dark-green specimens (as explained by reason of the granulations completely covering the lighter coloured part of the shell), the average measurements are  $5.16 \times 3.66$  inches.

Weight of nine examples of various sizes selected promiscuously when full.—The smallest weighed  $16\frac{1}{2}$  ounces, the heaviest  $23\frac{1}{2}$  ounces; average of the nine barely  $20\frac{1}{2}$  ounces. (Plate 27.)

*Observations.*—It is always a pleasant occupation to read, write, or diffuse information about such a notable and noble creature as the Emu. The "King of the Australian fauna" the bird has been fitly termed. Whether seen in private reserves, parks, or in the open, the Emu always arrests attention. Even the bushman, who has seen hundreds of Emus in the wilds, will always glance at the bird or remain to admire its handsome eggs. A full-grown bird, when erect, stands about 6 feet high. Its coat, at a distance, has more of the appearance of hair than feathers, which are loose, and spring in pairs from one shaft. Down the back there is a parting, where the hair-like plumage falls gracefully over on either side. The colour of the plumage is an obscure greyish-brown. On the head and neck the feathers are short, and so thinly placed that the purplish colouration of the skin shows through them. The eyes are brownish and the bill black-coloured. The sexes are similar in appearance, but the male may be distinguished by his usually larger size and darker colouration. It must be noticeable how protective is the colouration of the Emu, the greyish coat assimilating to the shade of the dead timber and the bark of the trees where the birds love to roam.

The young when first hatched are very pretty, being greyish-white, with several longitudinal, broad, black stripes along their bodies. (See illustration.) Stripes on young birds are protective mimicry.

Considering that the Emu is such an important and ornamental bird, soon likely to become scarce, or altogether extinct, as is now the case in Tasmania, it is somewhat remarkable that so little information is published with regard to this giant amongst the feathered tribes. If we wish to augment our knowledge of the habits of this most interesting bird, we should do so without loss of time; because, however the bird may hold its own in the little disturbed districts of the interior, it is becoming astonishingly scarce within, say, two hundred miles of the sea-board, and will rapidly become more so, except the

Parliaments, and especially the people, aid in its protection. It has been for many years extinct in Tasmania and Kangaroo Island. The State of Victoria, where comparatively few Emus now remain, will soon rank with those islands. For what few birds do remain, perpetual protection to them and their progeny might rightly be demanded. The meagre protection existing in that State is faulty, inasmuch as the close season for Emus only commences on the 14th June in each year, whereas some of the birds lay in April and May.\* In the neighbouring State of New South Wales, Emus are protected absolutely for periods of five years. However, the law there is almost a dead letter, and, as I myself have witnessed, is more honoured in the breach than in the observance.

Gould's far-seeing remarks should be written in capital letters:—  
 "And now a word to Australians, particularly to those who are interesting themselves about acclimatising animals (sparrows and rabbits, and such like vermin, may I add) from other countries—wishing for things they have not, and neglecting those they possess. . . . I must content myself by praying that protection may be offered to that noble bird, the Emu. . . . How much will the loss of this fine bird be regretted by every right-minded person who claims Australia as his fatherland!"

In addition to many notes supplied to me by friends favourably situated, I made a special but albeit brief excursion during the breeding season of 1895 into the Wakool district of Riverina to gather information personally with regard to the Emu. I was fortunately favoured with an invitation to stay at "Strathdon," the farm of my friend Mr. Neil Macaulay (in fact, to Neil and his brothers I have been indebted on different occasions for information as well as for specimens), which is situated in the midst of the best Emu country; and I was still further fortunate in falling in with a professional Emu-eggers' camp, pitched, by permission, within one of Mr. Macaulay's paddocks. I went hunting with these Emu-eggers (there were four in camp) and "caught on" much of their experiences gained during the last three seasons; some of their information, being either confirmatory of what was already known or being altogether original, was exceedingly valuable to me.

A few of the earlier breeders lay towards the end of April or after the autumnal rains, some in May, while the majority have laid by June or July, the young appearing during August and September. Of course, eggs may be seen as late as August, but on account of the lengthened incubation needed, they may have been deposited weeks previously. The hunters informed me the first young noticed by them that season (1895) was at the end of June. Mr. Murdoch Macaulay, to whose kindness I am indebted for a specially selected set of eggs, informs me in the season of 1891 the Emus did not commence to lay till the middle of May. The laying period is much regulated by the rainy season of the year, and they do not lay, or only do so in small proportions, when the seasons are droughty or bad.

\* Since the above was written the Emu has been protected for the whole year.



EMU'S NEST.

*From a Photo by the Author.*



With regard to the maximum number of eggs laid by Emu, I cite the following Riverina data:—Mr. George Warner saw a clutch containing sixteen eggs on the Tulla run; Mr. D. Parker, a hunter, took on the 26th May, 1895, on Nyang, seventeen eggs from one nest, and, remarkable to state, the eggs were in two tiers, twelve in the bottom and five above; but I think Mr. Neil Macaulay takes the record with eighteen, which he counted in a nest at Dunvegan. I have no records of fifteen eggs, but know of several instances of fourteen.

As a test for the general average number of eggs laid by the Emu, the following statement shows a number of nests containing seven eggs and over, found during two successive seasons in Riverina.

1894.				1895.			
Found by Messrs. Macaulay Bros.				Found by Emu-Eggers' Camp.			
Date.	Nest.	Eggs.		Date.	Nest.	Eggs.	
10th May .. ..	1	9		April .. ..	1	10	
27th „ .. ..	1	7		May .. ..	1	17	
27th „ .. ..	1	12		„ .. ..	1	12	
28th „ .. ..	2	(each 7)	14	„ .. ..	3	(each 11)	33
31st „ .. ..	1	10		„ .. ..	4	(each 10)	40
3rd June .. ..	4	(each 8)	32	„ .. ..	2	(each 8)	16
3rd „ .. ..	1	11		June .. ..	1	12	
3rd „ .. ..	1	12		„ .. ..	2	(each 9)	18
8th „ .. ..	1	8		„ .. ..	7	(each 8)	56
8th „ .. ..	1	7		„ .. ..	1	7	
9th „ .. ..	1	8					
9th „ .. ..	1	10					
21st „ .. ..	1	9					
6th July .. ..	1	9					
10th „ .. ..	1	8					
11th „ .. ..	1	8					
12th „ .. ..	1	10					
Total .. ..	21	184		Total .. ..	23	221	
Average, $8\frac{1}{2}$ eggs per nest.				Average, $9\frac{1}{2}$ eggs per nest.			

Nests.	Eggs.
21	184
23	221
—	—
44	405
Combined average .. ..	$1 = 9\frac{0}{4}$ , or 9 2.

The incubation of Emu eggs takes about eight weeks. A reference to a record kept at the Zoological Gardens, Melbourne, shows that in 1892 young were noticed there on the 57th day after the male bird commenced to sit. At the September (1889) meeting of the Linnæan Society of New South Wales, Mr. A. J. North read a "Note on the

successful hatching of an egg of the Emu under a domestic fowl." It took two fowls to complete the task: the first fowl, after sitting upon the large egg for two weeks, became refractory and had to be relieved by another bird. The egg was turned every day, and was hatched at the end of seven weeks. This interesting experiment was made by Mrs. M. Walker, Newtown, Sydney.

The male bird takes the task of incubation, during the day at all events. This has been proved by birds being flushed from the nest, run down by dogs, and dissected on the spot. I unintentionally "aided and abetted" in this cruel act, but once only. Then I can plead in extenuation that the bird was started accidentally when we were kangarooing. Hunters invariably endeavour to keep their hounds off brooding Emus.

It has not been proved satisfactorily that the female never sits or never relieves the male at night, but it has been proved she lays at night, or between sunset and sunrise. A hunter, while on the rounds to his traps, tested two nests, examining them every night and morning. He found an egg was deposited every second day between sunset and sunrise, and I can vouch for his statement. However, other observers are at variance on this point. One says, when the Emu commences to lay she deposits an egg every day until the clutch is completed. Another, referring to a pair of birds he watched closely in his private reserve, says: "The laying was commenced and continued for about a month, until there were nine eggs in the nest."

The male tends the brood of young when hatched; but up to what age? I have seen a female accompanied by the previous season's nearly grown birds. This may be a reason why her lord attends to the current brood, while it is also an argument against any supposition that she relieves her mate on the nest at night.

In answer to a query of mine in the columns of "The Australasian," the following most interesting reply was received from a correspondent in South Gippsland (Victoria), and published in the issue of the 9th October, 1886: "The Emu's nest was not in a bush paddock, but in a small rye-grass paddock of about four acres, close to the homestead, such paddock being clear of timber or trees except a few pines and willows, and is enclosed by a paling fence and live hedge. The hatching was completed at the expiration of eight weeks from the time the bird commenced to sit, but it would depend whether the bird sat very closely or not if the hatching would be completed one or two days before or after the expiration of the eight weeks. There were four young birds brought out, of which two, unfortunately, were drowned shortly after, and the remaining two are now alive and thriving admirably. The male bird still takes charge of the young ones, and protects and nestles them, and will not permit the female or any others of the species to approach them, and he is at times quite fierce in his jealous care of the young. I may say that during the term of incubation the female was kept out of the paddock in which the nest is situated for as long as a fortnight at a time, and was occasionally allowed to go in, but she never took any part in the hatching process. The male bird, who was watched during the time he was sitting, was not seen to leave





EMU-EGGERS RETURNING WITH SPOIL

*From a Photo by the Author.*



the nest during the daytime, and if he fed at all it must have been at night."

Mr. Dudley Le Souëf, the Assistant-Director of the Zoological Gardens, Melbourne, has obligingly favoured me with the following significant note: "Female (Emu) killed accidentally just when finished laying. Male bird hatched and reared five young himself."

Why do Emus lay during winter, when the great majority of birds breed during spring and summer?—an interesting question. We are aware that such birds as Finches and Parrots usually lay towards the end of spring or in summer, when the grass-seeds, &c., are ripe enough for their young. So I suspect the Emu lays during the winter because the eggs, taking a long term of incubation, are hatched just as the tender blades of grass and herbage, upon which the young Emus feed, sprout on the first approach of spring.

I may now venture to give my Emu-nesting experiences in company with the hunters previously referred to. The locality is near the Neimur, a billabong (or ana-branch) of the Edwards River, and may be characterised as flat, open, forest country, where red-gum (*Eucalyptus rostrata*) fringes the course of the streams, now mostly waterless. Back from and between the water-courses are short box-tree (another species of *Eucalyptus*) flats. In paddocks where the trees are "rung" for pastoral purposes, they appear dull and dead, relieved only by the green suckers springing from their base, and in keeping with the ground, which is clothed with the dead herbage of last season's growth. An occasional dry bed of a polygonum swamp adds to the monotony of these box-flats, while "a rise" of graceful pines (*Callitris*) is a cheerful contrast to the sight.

Being winter, the days are calm and cloudless as a rule, with much warmth in the sunshine, while the nights are cold, clear, and frosty.

We perambulate the country on foot, or sometimes take horseback, spreading out and proceeding in line. The nest is nearly always discovered by the Emu starting up and running directly away swiftly through the bush. Not much time is lost in finding her, or rather his, starting-point, and there is revealed a solid oval of large and beautiful dark-green eggs, side by side, touching or nearly so, with all their long diameters running in the one direction, or with the long way of the oval. If the eggs be warm, either one or other of their ends feels cold to the touch. I suppose embryologists could assign a reason for this.

The hunters tell me that occasionally, on going through country quietly and coming suddenly upon a sitting bird, he will extend his neck out upon the ground as if to escape observation before being forced to run. In one particular instance an old bird sat so closely to his charge that he had to be removed with the aid of a stick. The clutch (fourteen eggs) was nearly hatched, which accounted, no doubt, for the poor bird's unwillingness to quit.

The eggs gathered are placed down the legs of old pants, in arms of singlets, or rolled in cravats, the division between each egg being tied tightly with string, the garments when charged resembling so many strings of great squat-shaped sausages. These rings of eggs are now carried round the hunter, over his shoulder and under the opposite

arm. The next ring is balanced *vice versa*; and should the clutches be large in number and weighty, a third ring in the shape of a collar is placed round the horse's neck.

The following are the data of some of the nests I examined on the spot:—

1.—10th June, 1895. Nest placed among dry herbage about a foot high (chiefly *Calocephalus*), three feet from the base of two small trees (one dead). Herbage plucked from round about, mixed with a few of the bird's own feathers, and formed into a bed of about four feet in diameter. Eggs eight in number.

2.—Nest situated six feet from base of medium-sized dead tree. Seemed to be a good layer of dry *Calocephalus* tramped down into the form of an oval bed, 4 feet long by  $2\frac{1}{2}$  feet broad. Eggs, eight.

3.—11th June. Nest situated four feet from base of tree in a comparatively open locality, composed of bark, grass, and herbage, evidently gathered or plucked from close round about by the sitting bird, there being a clear space or ring  $1\frac{1}{2}$  feet broad surrounding the bed, which was oval in shape, 4 feet by  $2\frac{1}{2}$  feet in dimensions. Eggs, eight. Sitting bird, after being flushed, was unhappily run down by the dogs. On dissection it proved to be a male.

4.—12th June. Nest in a slight hollow in a patch of herbage, chiefly cane-grass, locally so-called, in open timber. As usual, the grass was cleared up immediately round about and formed into a good bed 5 feet long by 3 feet broad and about 2 inches in thickness. Eggs again eight. This nest, from which I flushed the bird, was only fifty yards from a frequently used buggy track.

5.—Nest placed under small dead tree, with some saplings sprouting from base. Bed formed of dead leaves (eucalyptus) and grass in addition to a few of the bird's feathers, but chiefly the eucalyptus leaves, evidently plucked from the branchlets above. Eggs eight, and one fractured shell. This nest was picturesquely situated, being protected in front by dead branches, and made a splendid photograph.

6.—13th June. Nest found about fifty paces from a wire boundary fence, and under a small tree with branching suckers from base, surrounded with a few large fallen sticks; altogether, with the beautiful green eggs, forming a pretty picture. There was the usual amount of bedding for the eggs, which were an uncompleted clutch of six. The bird was not sitting, but was seen loitering not far distant. In the uncertain light (it being sundown) the bird appeared to be the female.

As I was sure the eggs in the last-mentioned clutch were perfectly fresh, I brought one full to my home in Melbourne. It weighed 1 lb.  $7\frac{1}{2}$  ozs. (a weight about equal to a dozen ordinary domestic fowl's eggs), the shell weighing 3 oz., leaving a net result of  $20\frac{1}{2}$  oz. This quite filled a medium-sized frying-pan, making a substantial breakfast for a family. Contrary to expectation, the flavour was, if anything, milder than that of the domestic fowl's, which was cooked afterwards in the same pan for comparison; therefore some palates may consider the Emu's egg tasteless, but we proved it a delicacy. Moreover, the appearance when cooked was clean and tempting; the yolk was light-yellow; the albumen firm but semi-transparent, not an opaque white, like that of an ordi-



EMU-EGGER'S CAMP

*From a Photo by the Author.*



nary fowl's egg, or so glutinous as a Mutton Bird's (Petrel) or other sea-fowl's. To boil an Emu's egg, I believe, takes about twenty minutes.

The aborigines cook Emus' eggs by boring a small hole at one end, and violently shaking the contents into the hot ashes of their camp fire; every few minutes the shaking is renewed, while the whole mess is turned repeatedly until properly cooked. Only aborigines appreciate Emu's flesh, although sometimes white men use the oil. The aborigines stalk and spear the birds by stealth, but like better to wait at a water-hole where birds come to drink. When the Emu is on his hunkers at the water's brink, the dusky hunter in ambush drops a tomahawk or spear upon the unsuspecting bird. In parts of Central Australia the natives taint the water with a weed of narcotic propensities, thus stupefying the birds that drink. On this subject Professor W. Baldwin Spencer remarks: "Attention is drawn to the curious use which the natives make of some plants, such as pituri. In certain parts of Central Australia, as, for example, to the south of Lake Amadeus, a decoction is made of the leaves of the plant, which is found growing amongst the sandhills, and the liquid is placed where the Emu can drink it, the result being that the bird is stupefied, and falls an easy prey to the spear of the native."

To show how prolific Emus were in some parts of Australia, likewise to demonstrate how flagrantly the "Game Act" is broken, during the season 1894, according to a Sydney newspaper, a boundary rider in Queensland sold or sent to that city 1,123 Emu eggs, which realised 12s. per dozen, or a total value amounting to more than his wages for the year.

With reference to the question whether Emus swim or not, Mr. Geo. F. Armitage (Mildura) thoughtfully sent the following note: "On Christmas, 1893, I was travelling to Swan Hill from Mildura in the steamer 'Ellen,' when, rounding a bend of the river, I was astonished to see, about 100 yards ahead, a small flock of five Emus just taking the water (from the Victorian side). They either did not see the boat, or were oblivious of danger, for they swam on in order to reach the opposite bank, and although the boat dashed right into the midst of them, scattering some to one side and some to the other, so that they became perfectly deluged with water, they soon righted themselves, and reached the shore in safety, where they rejoined their companions, who apparently had previously crossed."

I shall conclude my observations on the Emu with a pretty scene I witnessed in Riverina one balmy day in September. After a tedious plodding with a buggy and pair through flooded lignum country, we emerged on a grassy rise where we noticed Emus gamboling—running sideways, kicking, &c. Seeing they were hemmed in by water on one side and by a fence on the other side we put the horses hard to their collars, and were soon galloping amongst a splendid flock of twenty-eight birds, some remarkably large and dark. At the imminent risk of our flying vehicle colliding with tree-stumps and fallen logs, we enjoy a merry spin with the fleet-footed birds. How graceful is their high-stepping action! We can hear the peculiar rustling noise of the feathers caused by the birds in rapid motion. When a bird puts on a spurt, or

goes at top speed, it carries its body together with neck extended at an angle of about 45 deg. with the plain. Of course the fine birds soon distance us by making "tracks" amid wreaths of spray through a flooded shallow, while we wheel and continue our own track.

On cloudless, moonless nights, especially in winter, there may be seen in the southern sky the shadow of a great Emu in the act of running, as it were, eastward. Its head is formed by the "Devil's stoke-hole" against the Southern Cross constellation, then the neck and body may be traced downward through the "Milky Way," the legs being lost on the horizon. I am informed that an aboriginal tribe ("Bell-yoon-mah") on the Upper Murchison (West Australia), possesses a legend about this "Emu in the Sky."

In connection with the Emu the following illustrations are given: (1) "Finding an Emu's Nest," (2) "An Emu's Nest," (3) "Emu-eggers, Returning with the Spoil," (4) "An Emu-eggers' Camp," (5) "A Pet Emu," (6) "Emu Chicks."

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763.—DROMÆUS IRRORATUS, Bartlett.—(493)

SPOTTED EMU.

*Figure*.—Slater: Trans. Zool. Soc., iv., pl. 76 (1862).

*Reference*.—Cat. Birds Brit. Mus., vol. xxvii., p. 589.

*Previous Descriptions of Eggs*.—Campbell: Victorian Naturalist (1888), also Roy. Phys. Soc., Edin., vol. xiii., p. 226 (1896).  
North: Austr. Mus. Cat., p. 294 (1889).

*Geographical Distribution*.—Northern Territory (probably), West and North-west Australia, interior of South Australia, and Victoria (accidental).

*Nest*.—Similar to that of the Common Emu (*D. nova hollandia*), being a flat bed of herbage upon the ground.

*Eggs*.—Clutch, average eight to ten. As in the other variety, a maximum of eighteen has been reported. Of the usual elliptical form, both ends being alike in shape, superficially in appearance like shagreen, or rough American cloth; general colour, of a beautiful dark green; but if examined closely only the raised or rough particles or granulations of the shell will be found to be dark green, which, at certain angles of light, are polished and assume a very dark indigo colour, while the interstices are of a light green. In general appearance the eggs resemble those of the Common Emu. Dimensions in inches of a proper clutch. (1) 5.25 × 3.68, (2) 5.25 × 3.62, (3) 5.18 × 3.62, (4) 5.18 × 3.62, (5) 5.06 × 3.56, (6) 5.0 × 3.62, (7) 5.0 × 3.62.

*Observations*.—During my visit to Western Australia I gathered what information I could referring to the Emus, and although





A PET EMU.

*From a Photo by the Author.*

EMU CHICKS.

*From a Photo by D. Le Souëf.*



the Common bird certainly inhabits that territory, there appears to exist a Spotted variety also, which exhibits a preference, so it is reported, for the "silver" grass country of the interior and possibly extends its range to the north-west. That it also wanders far eastward is known by the fact that a specimen of the Spotted Emu taken in Victoria is in the National Museum, Melbourne.

The two species, as contrasted in Gould, represent the feathers of the Spotted variety as being barred or spotted alternately with dull white and grey, with a marginal tip of black, whereas the feathers of the Common variety are grey only, tipped with black. The general appearance of the whole coat of the Spotted bird is frequently of a decided brownish tinge. This I observed in skins I saw used as mats in some of the dwellings of the West Australians. The Spotted Emu is not so heavy in the legs as the Common variety.

On my return home from Western Australia, Captain Thomas W. Smith, of the Government schooner "Meda," thoughtfully forwarded a young Emu, which was taken in the north-west. The bird remained on my premises until it grew out of all proportion to the size of its quarters, therefore was transferred to the Zoological Gardens, where it developed into a splendid male bird, with more of a reddish tinge about his coat, while the feathers are sooty grey (not pale grey), and darker down the centre compared with the eastern birds in the same enclosure. He mated with an eastern bird. Result, a maximum clutch of eighteen eggs, which unfortunately were deserted after the male had incubated them about fourteen days.

He was particularly fond of the children. When they romped, the bird would do so too, racing round the yard and gamboling about, occasionally "planting" with his neck outstretched along the ground, as if hiding. He would devour almost anything. One day a pedlar called, was wroth because his basket of wares was not patronised, and while holding forth as to the iniquitous conduct of the householder, "Spottie," as we called the Emu, because his juvenile plumage was decidedly spotted, stole up quietly from behind, and commenced throwing thimbles and trinkets of trifling value down his throat.

I found some confusion of dates existed among West Australians as to when the Emu lays there, some saying autumn or winter, others affirming positively that spring is the time. Probably all are right, as the breeding season is greatly affected by the seasons of rain. The following notes are culled from Mr. Tom Carter's letters to me. During a season of distressing drought in 1891, he writes from Point Cloates:—"Shot an Emu (female) in very poor condition. Doubtless hard up for water, the nearest known pool being forty miles distant, and I do not know if that be dry too. The natives say the Emus drink the sea. A shepherd killed one on the beach a short time ago." Again: "Emus are drinking salt-water and dying in numbers."

Another season, Mr Carter writes under various dates:—"March 20th. Shot female with large clutch of eggs within her."

"Minilya, May 18th. Emu eggs brought in by natives."

"Gascoyne, May 25th. Five eggs (Emu) seen in nest."

Mr. Douglas Cadden, who kindly forwarded me, in 1886, a fine clutch of seven eggs of the Spotted Emu from the Murchison district, says the birds usually lay there about May and June; while in the south-west, Mr. A. J. Bussell (Wallcliff) writes:—"Emus lay according to the season, but never earlier than the middle of June, or later than middle of August."

In 1889, when I visited Western Australia, young Emus about a week old were observed on the last day of October by an employé of Wallcliff. In that case the eggs would have been laid towards the end of August.

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**764.**—*DROMÆUS ATER*, Vieillot.

(EXTINCT).

*Reference.*—Cat. Birds Brit. Mus., vol xxvii., p. 588.

*Geographical Distribution.*—Kangaroo Island (South Australia).

*Observations.*—It may, perhaps, appear to be folly to include an extinct bird in this work. But I do so as a timely warning to my fellow countrymen. It is sad to contemplate that many of our birds, more especially such feathered giants as the Emu and the Cassowary, may be swept off the face of the earth by the ever-advancing tide of civilization, and perhaps even sooner than we anticipate, be numbered with the extinct Moas of New Zealand, and the more recently defunct Emus of Tasmania and Kangaroo Island. Provincial Parliaments may pass enactments for the proper protection of birds and animals, but it surely rests with the people to see that these laws are strictly observed.

When the French expedition under Baudin explored Kangaroo Island in 1803, Péron the naturalist captured three Emus alive and took them to Paris. A pair was sent to the residence of the Empress Josephine, and the remaining one to the Jardin des Plantes. In 1822, two of the birds died. One was stuffed and the other mounted as a skeleton, while the third specimen was apparently lost. However it has been recently re-discovered in a singular manner.

Professor H. H. Giglioli, of the R. Zoological Museum, Florence, wrote an interesting letter in "Nature," 31st May last, on "A third Specimen of the Extinct *Dromæus ater*," and concludes thus:—"For some years past my attention had been drawn to a small skeleton of a Ratitæ in the old didactic collection of the R. Zoological Museum under my direction. It was labelled 'Casuaris,' but was in many ways different from a Cassowary; but other work kept me from the proposed closer investigation, and it was only quite recently, during a visit of the Hon Walter Rothschild, on his telling me that he was working out the Cassowaries, that I remembered the enigmatical skeleton. A better inspection showed us that it is, without the least doubt, a specimen of the lost *Dromæus ater*. I afterwards ascertained that it had been first catalogued in this Museum in 1833; that most of the bones bore written

on them in a bold round hand, very characteristic of the first quarter of the nineteenth century, the words 'Casuar male'; and lastly, that during the latter part of Cuvier's life, about 1825-30, an exchange of specimens had taken place between the Paris and Florence Museums. I have thus very little doubt that our specimen is the missing *third* one brought alive to Paris by Péron in 1804-5."

The melancholy part of the history in connection with the specimens, is that Péron was not aware that the Emu he discovered on Kangaroo Island, being smaller and darker, was specifically quite distinct from the mainland bird. When Vieillot's species was pronounced to be a good one it was too late—much too late—to procure more birds, for it is stated that the first settler (who shall be nameless) on Kangaroo Island deliberately exterminated not only all the Emus there, but the Kangaroos also.

I have often thought the extinct Emu of Tasmania (of which the only relics remaining are one or two eggs) was possibly distinct from the mainland Emu. Judging from an egg now in the possession of Mr J. W. Mellor, Fulham, South Australia, the bird was small like the Kangaroo Island one.

The egg may be described as elliptical in shape and otherwise similar to that of *D. nova hollandiæ*, but smaller. Dimensions in inches: 4·8 × 3·5.

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## FAMILY—CASUARIIDÆ: CASSOWARIES.

### 765.—CASUARIUS AUSTRALIS, Wall.—(494)

#### CASSOWARY.

*Figure*.—Gould: Birds of Australia, fol., supp., pls. 70 and 71.

*Reference*.—Cat. Birds Brit. Mus., vol. xxvii., p. 594.

*Previous Descriptions of Eggs*.—Ramsay: Proc. Zool. Soc., p. 119 (1876); Campbell: Victorian Naturalist (1886); Lumholtz: Among Cannibals, p. 99 (1890); North: Austr. Mus. Cat., p. 15 (1889); Campbell: Roy. Phys. Soc., Edin., vol. xiii., p. 229 (1896); Meston: Proc. Roy. Soc., Q., vol. x.—xii. (1892-7)

*Geographical Distribution*.—North Queensland.

*Nest*.—A bed of sticks, leaves, and such-like vegetable débris, usually placed near the base of a large tree in dense scrub.

*Eggs*.—Clutch, four to six; some authorities state three to five; of a graceful elliptical form, and superficially like shagreen or rough American cloth, but not so rough or granulated as the Emu's (*Dromaius*) egg. General appearance in colour, beautiful light pea-green, but if examined vertically the raised rough particles only of the shell will be found to be green, while the minute interstices are greenish-white. Dimensions in inches: (1) 5·56 × 3·75, (2) 5·43 × 3·81, (3) 5·43 × 3·62; of an elongated example in Mr. S. A. White's collection: 6·25 × 3·75. (Plate 27.)

*Observations.*—The eggs of the Cassowary are especially interesting, not only for their great beauty, but for being the largest and amongst the rarest of Australian eggs. The splendid birds themselves possess a limited habitat, being confined to a narrow strip of coastal scrub-country, about three hundred miles in length, in Northern Queensland, the southern boundary being the Herbert River (where the birds are now almost unknown), the northern limit being well up into the head of the Cape York Peninsula.

On account of the Cassowary's naturally restricted area being taken up by planters and others, the noble bird should be rigorously protected, or it will as surely soon become extinct like the Emus of Tasmania and Kangaroo Island. It has been suggested that the large scrub-clad island of Hinchinbrook, adjacent to the mainland, be a reserve for the perpetual protection of Cassowaries. A more suitable place for the purpose could not well be found.

Really little is yet known of the habits of the Cassowary—a great bird full of speculative interest to naturalists, inasmuch as it is supposed to be one of the living representatives, or, perhaps, the surviving contemporary of such large extinct birds as the Moas of New Zealand. The Australian Cassowary was first discovered by the late Thomas Wall, naturalist to the expedition commanded by the ill-fated explorer Kennedy, and was described as *Casuaris australis* in the "Illustrated Sydney Herald," 3rd June, 1854.\* The second specimen was shot, September, 1866, by Mr. R. Johnson, Inspector of Police—now Police Magistrate, Queensland. The bird is still called, in some parts of that colony, Johnson's Cassowary.

Dr. E. P. Ramsay, in the "Proceedings of the Zoological Society" for 1876, furnishes an exceedingly interesting account of the Cassowary.

I fully concur with Dr. Ramsay's remarks about the wariness and shyness of the Cassowary, and repeated his experience by returning without a specimen, although my companions and myself endeavoured persistently to obtain a bird in the flesh, which we wanted for a museum. Once we divided our party for a week—two proceeding twenty miles in one direction, and two a like distance in an opposite direction. Frequently we noticed the bird's fresh tracks by the banks of streams, but at the end of our appointed time we returned to our starting-point (camp) without "Yun-gun," as the aboriginals call the Cassowary, or in pigeon-English, "Big-fellow Chookie-chookie."

A considerate selector (*i.e.*, a person who selects and dwells upon the land under Government regulations), hoping to do us a service, brought us a mangled skin, which had every appearance of having been skinned with his axe.

It is difficult to understand how such a bulky bird as the Cassowary can push its way through the entanglement of vines, canes and creepers, in such a rapid, free, and easy manner as it is credited with. To aid the bird in so quickly threading the scrub when pursued, no doubt its

\* It was described by Mr. Wm. S. Wall, brother of Mr. Thomas Wall, who succumbed to the privations of the expedition on the 28th December, 1848. The Cassowary was shot on the 4th of the previous month, by "Jackey," a faithful aborigine, and had to be abandoned.

sloping, horny helmet, and the long quills of the spurious wings, play an important part.

I had the opportunity of viewing a handsome pair of full-grown Cassowaries, the property of Mr. B. Gulliver, at Acacia-Vale Nurseries, Townsville (Queensland). They were beautiful creatures in their jet-black, hair-like coats, shorter in build, and with much more powerful legs than the Emu. The head and neck were destitute of feathers, but covered with a beautiful blue and pink skin, there being also two small pinkish lobes of wattle hanging from the breast or neck. The birds stood about four feet high, but when fully erect were a foot higher. Their horny helmets should have been about six inches in length, but these head-pieces had been considerably battered down in various duels, for both birds were males. To fight one another, they have been observed to clear at a single bound a dividing fence seven or eight feet high. They were fed almost entirely on the fruit of the papaw-tree (*Carica papaya*), cut up into morsels about an inch or so square, which are taken between the points of the mandibles, and by a graceful uplifting of the head jerked into the gullet. When a bird is scared or alarmed it makes a most peculiar, ventriloquial sound, repeated five or six times. To produce this noise the bird is seemingly put to an immense effort. It doubles its head downwards, placing its chin close to its neck, all the back and rear feathers being erected, while, with spasmodic jerks, it pumps, so to speak, a sound resembling distant thunder. Mr. B. Gulliver captured these Cassowaries when young, in the Cairns district, in October, 1883.

The handsome pair of eggs which I described in 1886 was from the collection of Dr. T. P. Lucas. The following year Mr. Joseph Barker, in my interest, annexed from the natives (aborigines), just as they were about to cook and eat them, two specimens, fresh and beautiful. The eggs, which were found in the Cardwell district, 3rd October, reached my collection safely. Mr. Barker, who is a keen field observer, happened to be at Oak Hills, in the same district, during one of Mr. K. Broadbent's (the able collector attached to the Queensland Museum) visits. I understand, together, they found a Cassowary's nest in September, 1886, containing three fresh eggs. The nesting place was merely a hollow on a dry stony ridge, in the centre of a dense scrub.

Dr. Lumboltz, in his fascinating book "Among Cannibals," referring to the Cassowary, under date 6th October (1882), says:—"Natives brought me two eggs, and a young bird just hatched. Eggs, three in number, are frequently laid at long intervals. In this instance there was the bird just hatched, one egg almost hatched, and another egg the contents of which could easily be blown. Thus we see that the young are not hatched all at one time, and that the female must therefore take care of them while the male bird is sitting."

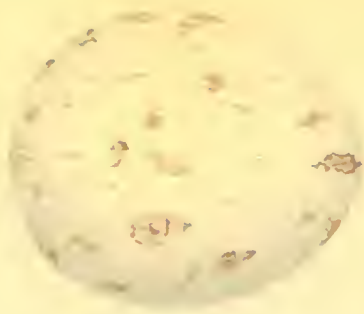
As in the Emu, so in the Cassowary, upon the male devolves the task of incubating the eggs. The laying season may be said to be from the end of August or the beginning of September to October, and the period of incubation probably seven weeks or over.

I do not recollect ever seeing a published description of the young of *Casuaris australis*. About the end of January, 1891, I saw in

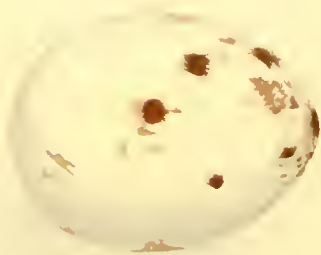
Melbourne four young Cassowaries (presumably about three or four months old) that were captured in the Johnston district of Northern Queensland. Down the back was a broad, dark stripe, succeeded by two others on either side, then by smaller ones (two or three) more or less indistinct or broken as they approached the stomach, the interstices and stomach being dirty-brown or yellowish-white; wattles on face and neck, white, and feet also whitish; bill also whitish, but upper mandible bluish-black, with greenish tinge before the eyes. Eyes steel blue, transforming intermittently in the daylight into a greenish shade.







White Goshawk



Sparrow-hawk.



Wedge-tailed Eagle (Eagle-hawk).

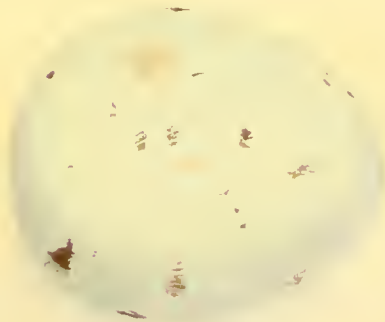




Little Eagle .



White headed Sea Eagle.



Kite.





Square-tailed Kite.



Black-shouldered Kite.  
(Letter-winged Kite)

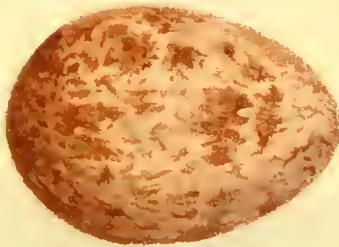


Black-Breasted Buzzard.





Black-cheeked Falcon.



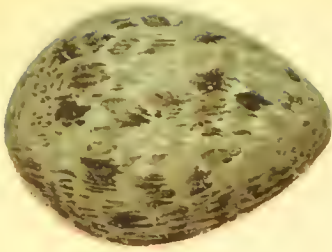
Little Falcon .



Brown Hawk







Raven.



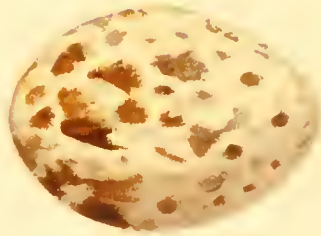
Hill Crow-Shrike.



Grey Jumper.



Kestrel.



White-winged Chough.

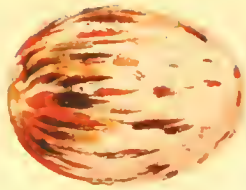


Osprey (Fish-hawk)



Black Crow-Shrike.

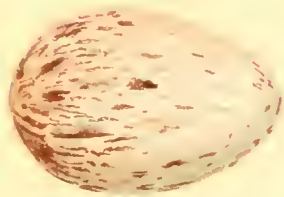




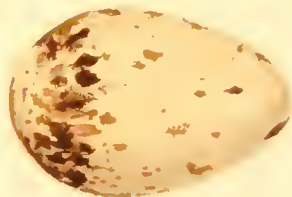
Rifle bird.



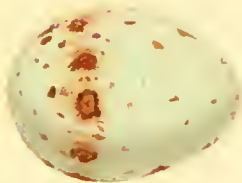
Albert Rifle-bird



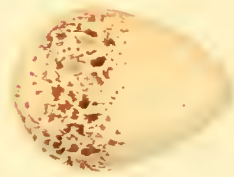
Manucode.



Oriole.



Yellow-bellied Fig-bird.



Magpie Lark.



Drongo.

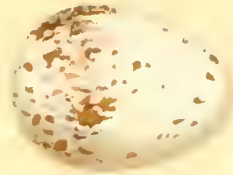


Grey Shrike-Thrush.

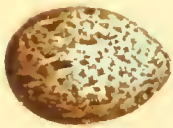




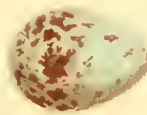
Black-faced Cuckoo-Shrike.



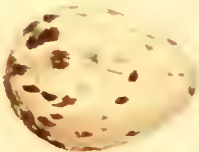
Barred Cuckoo-Shrike.



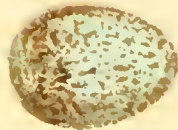
White-shouldered Caterpillar-eater.



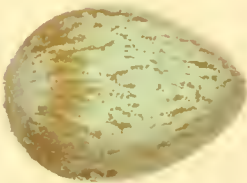
Brown Fly-catcher.



Rufous-breasted Shrike Thrush.



Pied Caterpillar-eater.

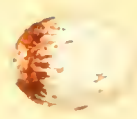


Ground Cuckoo Shrike.

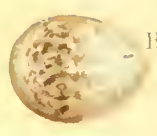


Caterpillar-eater.

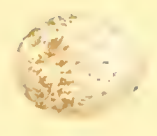




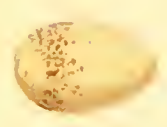
Black-throated Fly-eater.



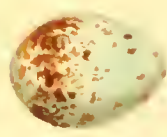
Scarlet-breasted Robin.



Rose-breasted Robin



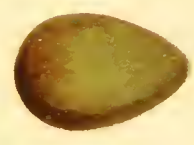
Rufous Fan-tail.



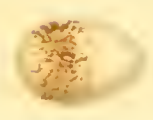
White-browed Robin.



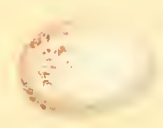
Blue Wren.



Hooded Robin.



White-shafted Fan-tail.



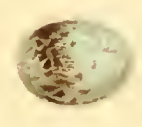
White-throated Fly-eater.



Short-billed Tree-tit.



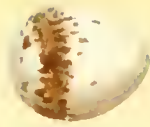
Black and White Fan-tail.



Red-capped Robin.







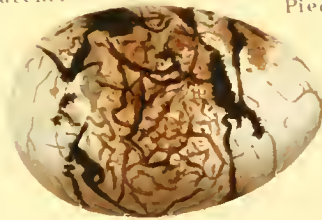
Satin Fly-catcher



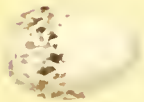
Pied Fly-catcher



Yellow-breasted Fly-catcher



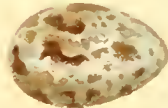
Spotted Bower-bird



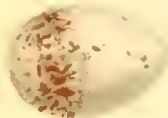
Leaden Fly-catcher



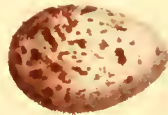
Shining Fly-catcher



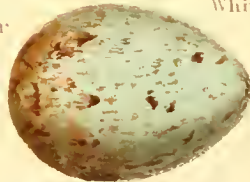
Reed-Warbler



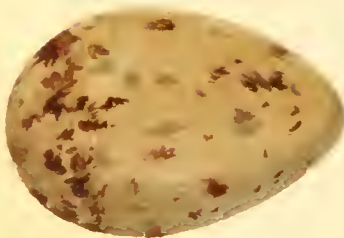
Restless Fly-catcher



White-bellied Fly-catcher



Ground-Thrush

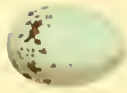


Satin Bower-bird

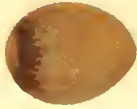


Spotted-Cat bird





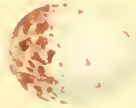
Grass-Warbler



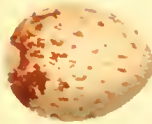
Red-throat



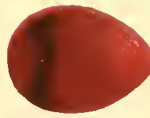
Emu Wren



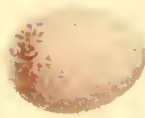
Scrub-Tit



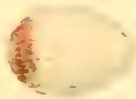
Grass-Wren



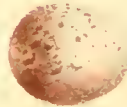
Little Field-Wren



Large-billed Scrub-Wren



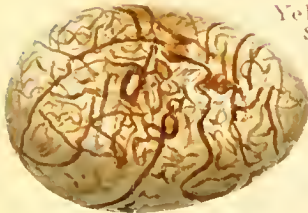
Brown Tit



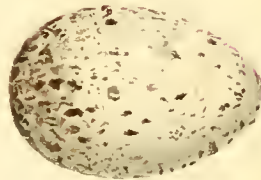
Grass-Bird



Yellow-throated  
Scrub-Wren



Regent Bird

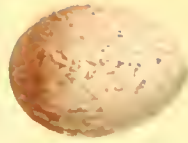


Spotted Ground Bird

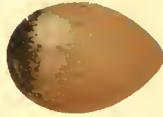




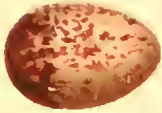
Pilot bird



Brown Song-Lark



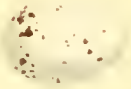
Chestnut rumped  
Ground-Wren



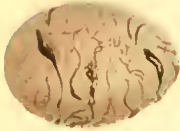
Rufous Song-Lark



White-face



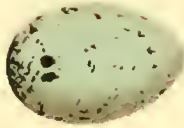
Orange-fronted Chat



White-browed Babbler



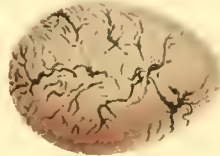
Striated Field-Wren



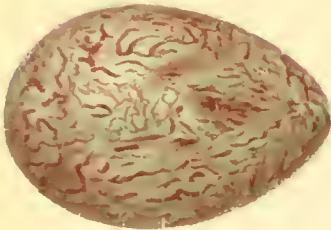
Wedge-bill



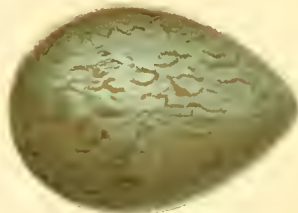
Coachwhip-bird



Babbler

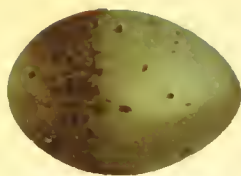


Long-billed Magpie



White-backed Magpie

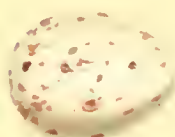




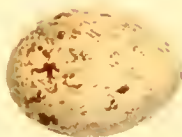
Butcher-bird



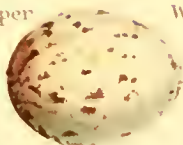
Black-throated Butcher-bird



White-throated Tree-creeper



White-throated Thickhead



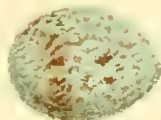
Ashy-fronted Fly-Robin



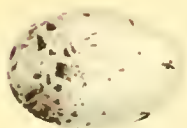
Northern Thickhead



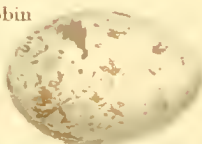
White-breasted Robin



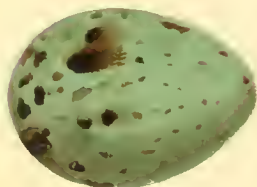
Yellow-breasted Shrike Robin



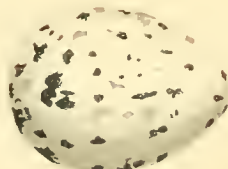
Shrike Tit



Olive Thickhead



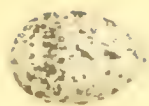
Black Butcher-bird



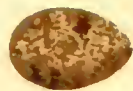
Bell-bird







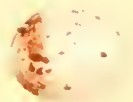
Orange-winged Tree runner



Sun bird



Brown Tree creeper



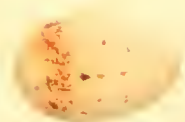
Dusky Honey-eater



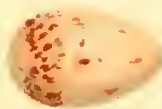
White-browed Spine-bill



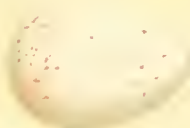
White-eye



White-naped Honey-eater



Strong-billed Honey-eater



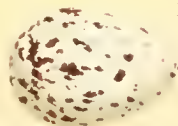
Striped Honey-eater



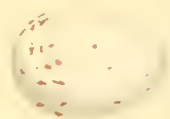
Brown Honey-eater



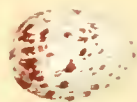
Brown-backed Honey-eater



Pied Honey-eater



Tawny-crowned Honey-eater  
Fulvous-fronted



Red-throated Honey-eater





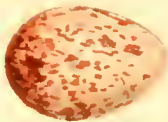
Singing Honey-eater



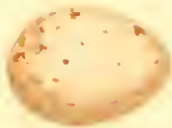
Warty-faced Honey-eater



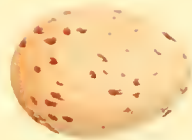
Yellow-eared Honey-eater



Yellow-faced Honey-eater



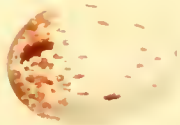
Yellow-throated Honey-eater



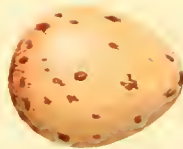
Helmeted Honey-eater



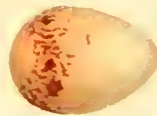
Yellow-plumed Honey-eater



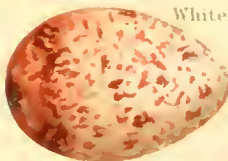
Yellow-tinted Honey-eater



Bell Miner



White-bearded Honey-eater



Miner

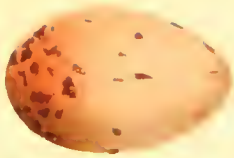


Dusky Miner



Red Wattle-bird

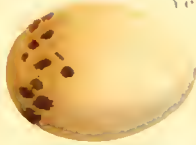




Little Wattle bird



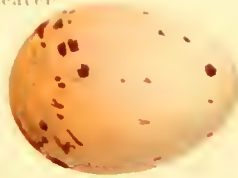
Yellow throated Friar bird



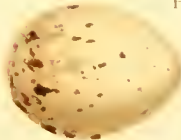
Spiny checked honey eater



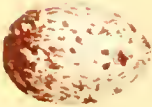
Friar bird



Blue-faced Honey-eater



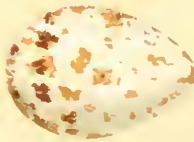
Wood Swallow



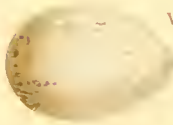
Swallow



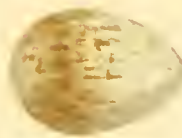
Tree Martin



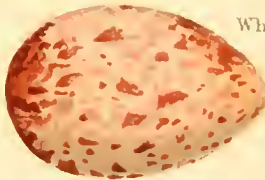
White-rumped Wood Swallow



Ground Lark

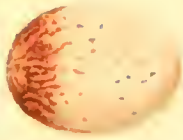


White-browed Wood Swallow



Helmeted Friar bird

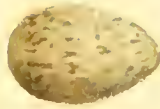




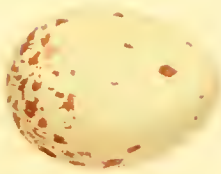
Rufous Scrub bird



Pallid Cuckoo



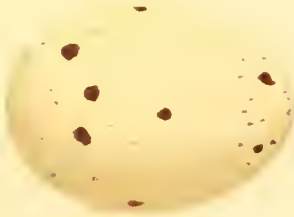
Bush Lark



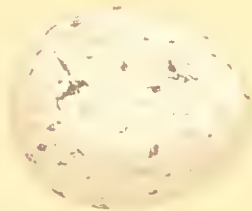
Shining Starling



Large-tailed Nightjar



Spotted Nightjar



Pitta



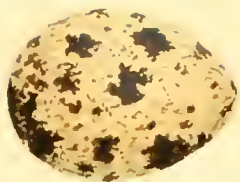
Victoria Lyre-bird



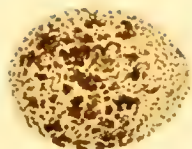




Brown Quail



Stubble Quail



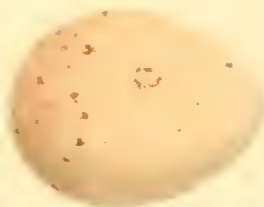
Chestnut-bellied Quail



Narrow-billed Bronze-Cuckoo



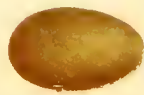
Square-tailed (Brush) Cuckoo



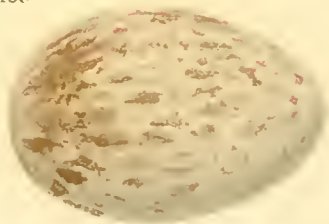
Koel



Fan-tailed Cuckoo

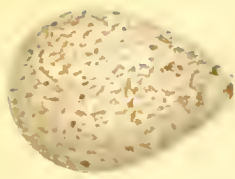


Bronze-Cuckoo

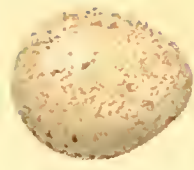


Channel-bill





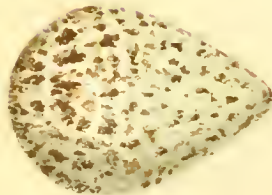
Painted Quail



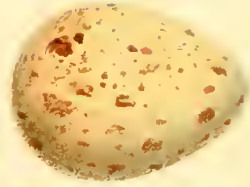
Little Quail



Pectoral Rail



Plain Wanderer

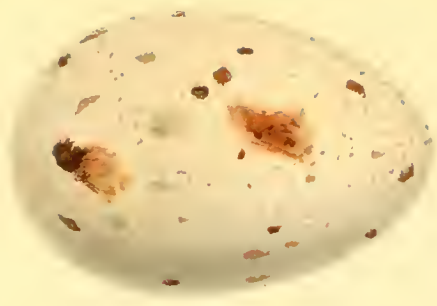


Spotted Crake



Kallee Fowl (Native Pheasant)





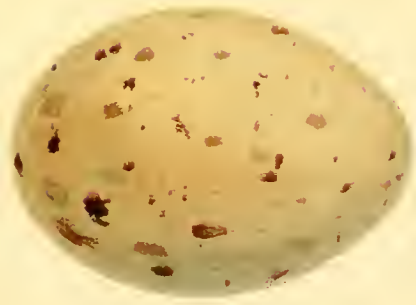
Native-hen



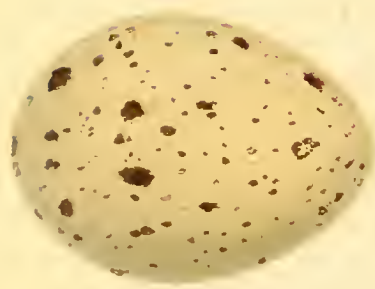
Spotless Crake



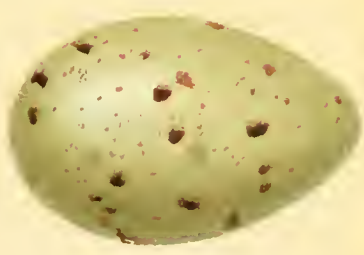
Little Crake



Bald Coot

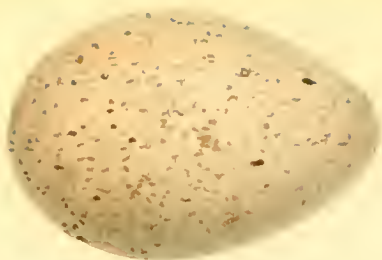


Black Moor-hen



Black-tailed Native-hen





Coot



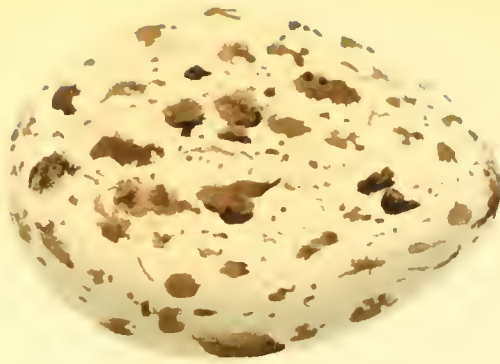
Bustard or Wild Turkey



Crane or Native Companion







Long-billed Stone Plover



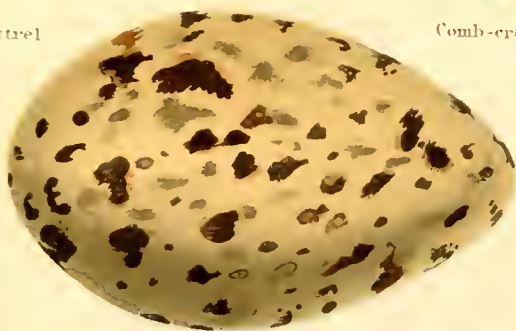
Pratincole



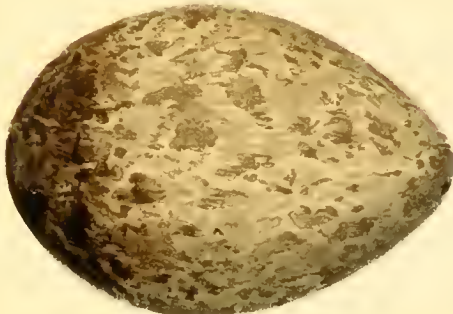
Red-kneed Dotterel



Comb-crested Jacana



Pied Oyster-catcher

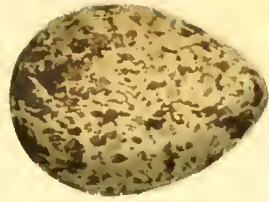


Stone Plover

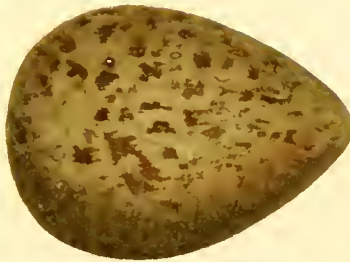




Dottrel



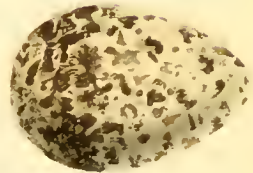
Double-banded Dottrel



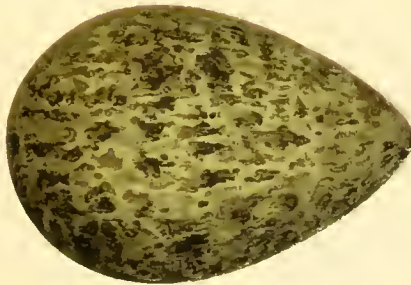
Black-breasted Plover



Black-fronted Dottrel

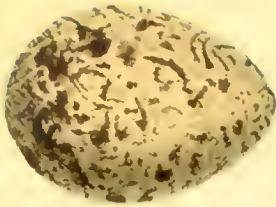


Red-capped Dottrel

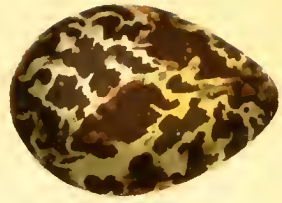


Spur-winged Plover





Marsh Tern



Painted Snipe



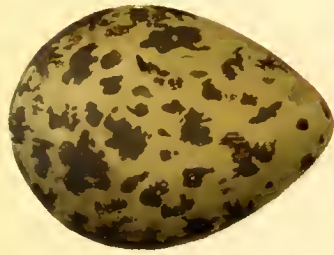
Caspian Tern



Roseate Tern



Snipe

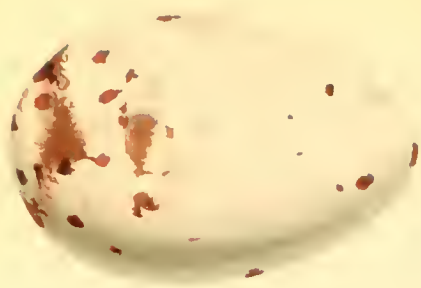


White-headed Stilt

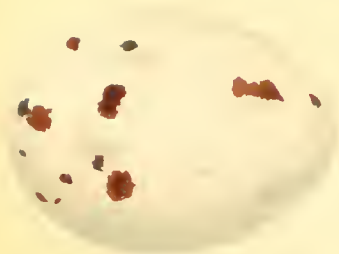


Red-necked Avocet

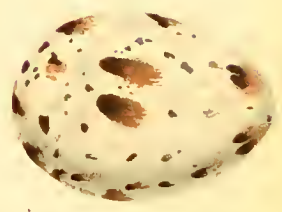




Noddy



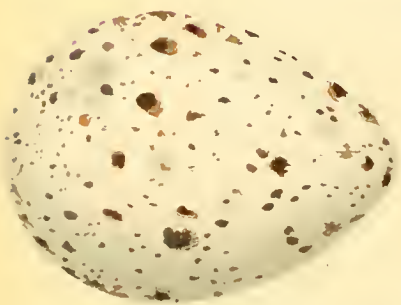
Lesser Noddy



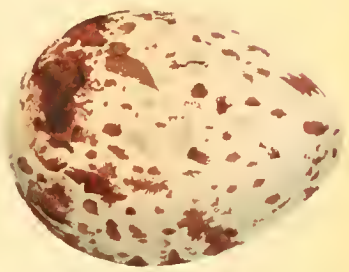
White-faced Ternlet



Crested Tern



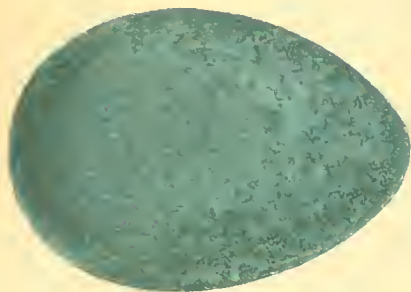
Lesser Crested Tern



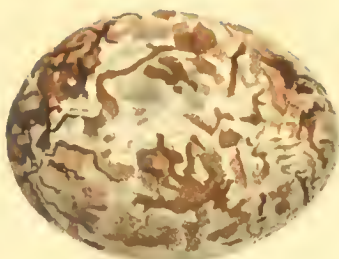
Brown-winged Tern



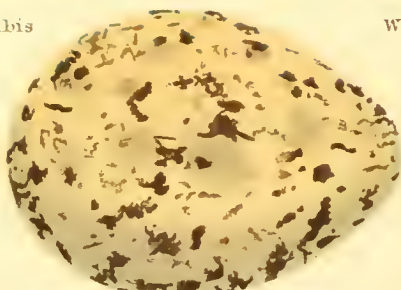




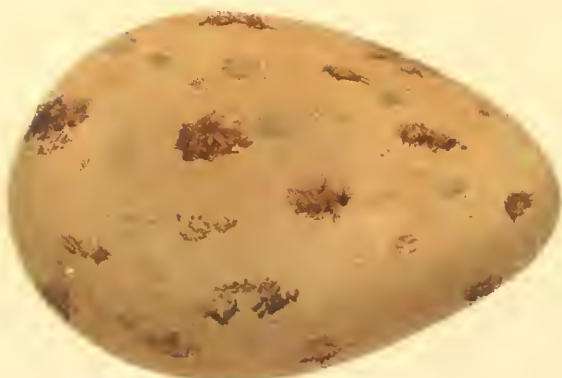
Glossy Ibis



White Tern



Silver Gull



Scaup

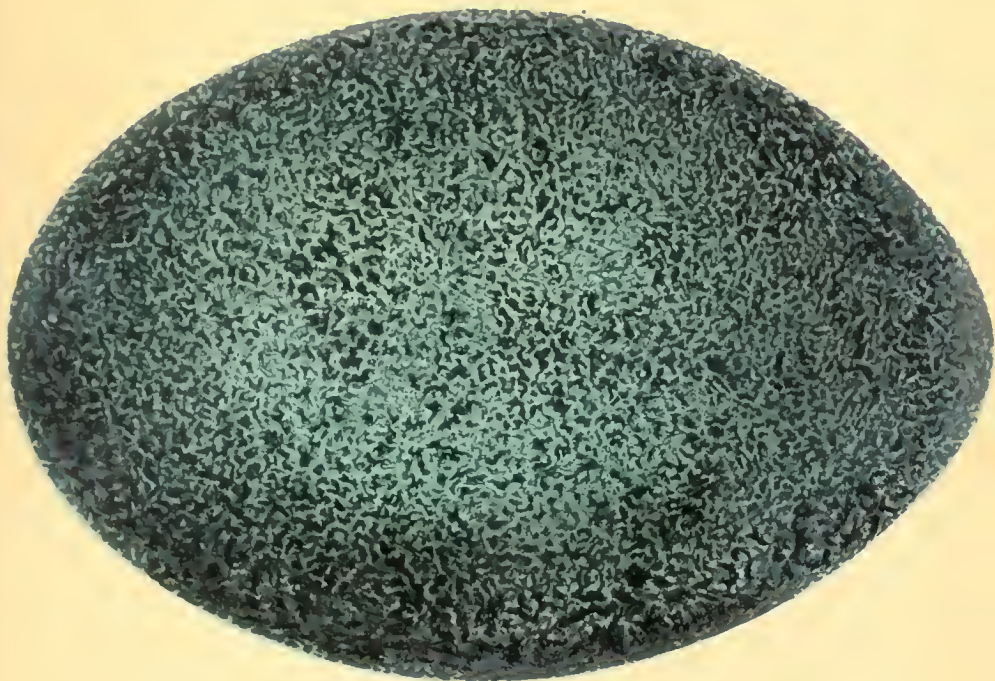


Pacific Gull









Emu



Cassowary



## APPENDIX.

THE MSS. for this volume were completed in 1899, but through the unavoidable delay, chiefly caused in sending the proofs thereof between England and Australia, another year has elapsed. The delay, however, has enabled the Author to make a few important additions of items that have been overlooked in the bulk of the work, or of new descriptions (some by other workers) which have recently come to hand. For the sake of priority the general work may be quoted for 1899, the Appendix for 1900.

## 54.—PTILORHIS PARADISEA.

## RIFLE BIRD.

Mr. S. W. Jackson, of Sydney, who camped in the scrubs of the Richmond River district this season (1899), for the purpose of observing Rifle and other scrub birds, has most thoughtfully sent me his advance field notes respecting the finding of five nests of the Rifle Bird. These nests were found at altitudes varying from fifteen to forty-five feet from the ground, all in "cherry" trees,\* and, with one exception, in the massive and thorny lawyer (palm) vines, which enveloped the tree trunks. First nest, containing two beautiful eggs, was taken 2nd November. The nest was exceedingly difficult to take on account of the troublesome lawyer vines, which had to be negotiated by the aid of a pole secured to the ground by guys. The nest was so completely hidden among the vines that it could not be seen from the ground. The capital picture (given elsewhere) of this nest, from a photograph by Mr. Jackson, shows the remarkable ornamentation of snake-skins which completely covers the top and sides of the nest. Otherwise the nest is composed of dead leaves, twigs, and the green, glossy fronds of a climbing fern (*Polypodium*), and measures about ten inches across.

Second nest (two eggs) was taken 20th November. This nest was only about thirty yards from Mr. Jackson's tent, and was first observed

\* Mr. J. G. Luehmann, National Herbarium, Melbourne, informs me that these trees are probably the *Elæodendron australe* of botanists. (A. J. C.)

building on the 18th October. It had also plentiful decorations of snake-skin, one piece of which hung down three feet seven inches.

Third nest, taken 29th November, contained a single egg in an advanced stage of incubation.

Fourth nest, found 30th November, and arrangements were made to take it the following day. But during the night a violent storm brought down a giant fig-tree, which, clearing a path for itself in the scrub, in turn brought down the tree with the Rifle's nest. In looking amongst the fallen debris afterwards, Mr. Jackson found part of the nest and fragments of egg shell. Hard luck!

The fifth nest was discovered 4th December, was situated in a mass of parasitical fern (*Polypodium*), on the top of a tree, and contained young. Regarding this nest and other interesting items, Mr. Jackson concludes: "I observed the female Rifle Bird placing a piece of snake-skin, fully four feet long, on the nest. I could see it quite plainly as I lay in the shade with my field glasses, therefore I concluded she had not finished building. I returned again in seven days in hopes of procuring a set of eggs, but I was very much upset and disappointed on finding half an egg shell on the ground, and on climbing up to the nest I was more than surprised to find two newly-hatched young birds, which were quite black and devoid of feathers or down of any kind.

"This now proves that the Rifle Bird had eggs in the nest the day I saw her building, or rather putting snake-skins on it, though I of course naturally fancied the nest was not finished.

"My experience is that the Rifle Birds never come to the ground for material for their nests, because on several occasions I have noticed them collecting snake-skins from limbs of trees and in among vines. It is impossible to follow the birds when they fly through dense scrub to their nests with the skin.

"All material used in the Rifle Bird's nest is collected among the topmost limbs of tall trees. I have watched for hours the birds building. The male does not feed the female while she is sitting, nor does he build any portion of the nest, all being done by the female as far as I have observed. The female leaves her nest and goes to feed every morning at about 10.30, and again in the afternoon at 4.30."

Subsequently I had the pleasure of examining the above mentioned nests and eggs in Mr. Jackson's collection at Sydney. The nests resembled the one I had described, but the singular ornamentations of snake-skins were more intact. One nest seemed to have almost a complete skin. In the first pair of eggs taken (November 2nd, 1899) by Mr. Jackson, one (1) is similar in shape and character to the colouring of the type egg described by me; while the other (2) is an elongated oval, pinker in the ground-colour, and has the striped markings about the apex more numerous and richer. Dimensions: (1)  $1.29 \times .94$ , (2)  $1.38 \times .92$ . (This pair is now in the collection of Dr. Charles Ryan, Melbourne.) The pair Mr. Jackson retained for himself (taken November 20th, 1899) are elongated ovals. Dimensions: (1)  $1.36 \times .92$ , (2)  $1.36 \times .9$ .

The male belonging to the first nest was in a transition state of plumage, as was the case with the male of the type nest, proving



that the males occasionally breed before their full and beautiful livery is donned. I handled one of these partly-plumaged males which Mr. Jackson obtained. The upper surface is similar to the female's, with one or two black feathers appearing about the back of the neck and some of the brownish primaries becoming dusky-coloured. On the under surface the arrow-shaped markings on the feathers are generally darker and slightly mottled in parts; the chest has a few shining shields and patches of sooty black; the thighs also are sooty, and on the abdomen is a patch of feathers margined with rich olive green.

Before leaving the interesting subject of Rifle-birds I should state I have omitted the Magnificent (*P. magnifica*) from the Australian list because I deem it is the New Guinea variety of *P. alberti*. The former bird may be distinguished (1) by its slightly larger size, (2) by the crescent of shining yellowish-green on the breast below, the velvety-black band being broader, and (3) by the shining metallic green on the head and throat being more "peacock" green in tone. The female of *magnifica* is the brighter brown of the two varieties. For these reasons I believe the skins and eggs exhibited at the May (1900) meeting of the Field Naturalists' Club of Victoria by Messrs. G. A. Keartland and A. Coles as *P. magnifica*, from Cape York, should be referable to *P. alberti*.

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### 83.—MICRÆCA ASSIMILIS.

#### LESSER BROWN FLYCATCHER.

Gilbert probably procured the first Lesser Brown Flycatcher nearly sixty years ago. Its nest and eggs remained undescribed until Mr. Dudley Le Souëf visited the great western territory this (1899) season. Writing to the "Ibis," he says: "I noticed this bird on two occasions near York (Western Australia). Its small, compact nest was found near Katanning during the latter end of October, was situated in a fork near the end of a horizontal branch, and measured  $1\frac{1}{2}$  inches in diameter by  $\frac{1}{2}$  inch in depth. It was composed of grass, and the exterior had small pieces of bark fastened on to it with cobwebs, which made it difficult to distinguish the nest from the branch bearing it. There were two eggs in the nest, their ground colour being pale bluish-green, with irregular, dark, reddish-brown markings, slightly more numerous on the larger end, and with underlying markings of pale grey. Dimensions in inches: (1)  $\cdot67 \times \cdot54$ , (2)  $\cdot66 \times \cdot52$ ."

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### 85.—MICRÆCA PALLIDA.

#### PALE FLY CATCHER.

The Pale Flycatcher, as its name implies, is a paler coloured bird than its southern and near ally, from which it may be further distinguished by the greater amount of white in the tail feathers.

According to Mr. A. J. North, who first described its eggs, two nests were discovered by Mr. A. S. Macgillivray, Leilavale Station, Fullerton River, North Queensland, December, 1897. They were built on horizontal branches of gidgea (*Acacia*) scrub.

Other nests have since been found in the forest country in the neighbourhood of Cooktown. One in the collection of Mr. D. Le Souëf, taken 11th December, 1899, contains two eggs, and was accompanied by a skin of one of the parents. This nest, in keeping with those of the other members of the genus, is small and shallow, composed of yellowish grass, and ornamented round the outside with scale-like pieces of tea-tree (*Melaleuca*) bark, which adhere by means of cobweb. Dimensions in inches over all,  $2\frac{1}{2}$  inches by  $1\frac{1}{4}$  inches in depth; egg cavity,  $1\frac{1}{4}$  inches by  $\frac{1}{2}$  inch deep. The nest was situated just within reach from the ground in the angle of a forked branchlet of a low melaleuca.

The eggs are oval in form; texture of shell fine; surface slightly glossy; colour, bluish-grey, spotted and blotched with chestnut and dull purple. Dimensions in inches: (1)  $\cdot 7 \times \cdot 54$ , (2)  $\cdot 67 \times \cdot 53$ .

Now that the eggs of the four *Microrane* have been discovered, it may be observed that those of the Brown, Lesser Brown, and Pale, as may be expected, resemble each other; but the Lesser Brown has the surface markings apparently more defined, while the egg of the Lemon-breasted bird is the largest and palest-coloured of all.

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### 111.—PETROECA CAMPBELLI.

#### WESTERN SCARLET-BREASTED ROBIN.

In order that the description of the nest and eggs of my namesake may appear in my book, Mr. D. Le Souëf has kindly permitted me to extract the following from a paper he is forwarding to the "Ibis" after his return from Western Australia:—"A nest was found 17th October, 1899. It was a compact, cup-shaped structure, composed almost entirely of fine shreds of bark, the outside being a little coarser in material than the lining. A few feathers were also woven into the lower portion of the nest. The exterior was lightly covered with cobwebs, on which were fastened small, thin flakes of bark, taken off the tree on which the nest was built. It measures: external diameter,  $2\frac{3}{4}$  inches; internal diameter,  $1\frac{3}{4}$  inches; external depth,  $2\frac{1}{4}$  inches; internal depth,  $1\frac{1}{4}$  inches. The two eggs (clutch) are swollen ovals, having a whitish ground-colour, with fine, very dark-brown markings, which are mostly on the larger end, where they form an irregular zone. There are also underlying markings of grey. Dimensions in inches: (1)  $\cdot 71 \times \cdot 58$ , (2)  $\cdot 68 \times \cdot 54$ . The nesting season extends from September to December."

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### 127.—SMICRORNIS FLAVESCENS.

#### YELLOW-TINTED TREE TIT.

This season (1899) Mr. D. Le Souëf received from the forest country in the neighbourhood of Cooktown a beautiful nest, together with an

egg and the skin of its tiny architect, taken 22nd October. Describing it for the "Ibis," Mr. Le Souëf remarks: "The nest is a beautiful structure, built in a thick bunch of leaves and flowers at the end of a branch of red-flowering melaleuca. It is very small, and domed, and is composed almost entirely of the soft, downy, young melaleuca leaves and buds, all well bound together with cobwebs among the larger leaves of the tree, which almost completely hide the wonderful structure. It is lined at the bottom with a little white down and some yellowish cobwebs, and measures, externally: breadth,  $1\frac{3}{4}$  inches; depth, 3 inches. The small entrance is near the top, and without any porch."

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140.—MALURUS ELIZABETHÆ.—Campbell.

DARK-BLUE WREN.

*Reference*—Ibis, October, 1900.

*Habitat*.—King Island (Bass Strait).

*Observations*.—Some naturalists, especially younger ones, are apt to jump at conclusions without sufficient proof, while older ones occasionally take things for granted, as in the case of the Western (Long-billed) Magpie. Of course everybody knows a Magpie, and the Western bird was put down as identical with its Eastern congener. So it has been with the beautiful Blue Wrens. Those procured on King Island by the Expedition of the Field Naturalists' Club of Victoria, twelve years ago, were put down by collectors (including myself) as *Malurus gouldi*; of course they could be no other. But I have since obtained a series of skins of Blue Wrens from Tasmania to the tropics, and find the King Island to be very distinct; in fact there is more difference between it and the other Blue Wrens than the apparent difference between *M. cyaneus* and *M. gouldi*.

The characteristics of the King Island bird are, that it is the largest of all, and has a decided darker shade of blue—brilliant ultramarine being the nearest colour.

The tail is dark-blue, while there is quite a wash of blue on the buffy-white undersurface below the band of velvety-black, and on the outer edges of some of the primaries. The female is similar to *M. cyaneus*, but much larger and slightly darker-brown in colour, with a slight bluish tinge in the feathers of the tail.

Out of compliment to my wife, who has assisted me much by transcribing and correcting rough drafts of my work (often much interlined, and not always written like *copper-plate*), and who has shown much forbearance when the study of my "hobby" has, I fear, oftentimes ridden rough-shod over domestic duties, I propose the name *M. elizabethæ* for the new species or variety, and that it be known on the vernacular list as the Dark Blue Wren, in contradistinction to Dr. Sharpe's Silvery (Light) Blue Wren of the tropics.

The greatest favourite, and the most familiar object of our King Island camps, was the Dark Blue Wren, not only because of its trilling little song, but more especially for the rich-coloured plumage of the male—the beautiful brilliant blue, set in velvety-black. The birds did not appear at all shy, but boldly displayed, with tail erect, their lovely little bodies from the top of any convenient bush.

A nest I took in tussock grass, near our main camp on the Yellow Rock Rivulet, is similar to those of other Blue Wrens, but the eggs are the largest of all the *Maluri*. Dimensions of the clutch in inches: (1)  $\cdot 7 \times \cdot 52$ , (2)  $\cdot 68 \times \cdot 53$ , (3)  $\cdot 68 \times \cdot 52$ . In shape the eggs are roundish ovals; texture of shell fine; surface slightly glossy; colour, warm or pinkish-white, lightly spotted and splashed with reddish-brown, the markings being thickest about the upper quarter.

Comparative dimensions, in inches, of Blue Wrens (males):—

<i>M. elizabethæ</i>	—Length	5·75	; bill	·33	; wing	2·1	; tail	2·35	; tarsus	1·0
<i>M. gouldi</i>	—	5·0	; „	·33	; „	2·05	; „	2·3	; „	·8
<i>M. cyanæus</i>	—	5·0	; „	·28	; „	2·0	; „	2·2	; „	·8
<i>M. cyanochlamys</i>	„	4·75	; „	·3	; „	2·0	; „	2·05	; „	·75

Dimensions of *M. elizabethæ* (female): Length 5·5; bill ·32; wing 2·08; tail 2·3; tarsus 1·0.

### 163.—CHLAMYDODERA GUTTATA.

#### YELLOW-SPOTTED BOWER BIRD.

That persevering field naturalist, Mr. G. A. Keartland, is to be congratulated on receiving the first and only egg (up to the present) of the rare Guttated Bower Bird of the interior. It was collected for him by Mr. James F. Field, during the first week of February (1899), from a frail nest—a few dried bits of cotton-bush, lined with coarse grass stalks—built in a low bush in the neighbourhood of Alice Springs.

Mr. A. J. North, who came to Melbourne to examine various oological collections, was kindly permitted to describe the egg. Vide "Victorian Naturalist," vol. xvi., page 10 (1899). The following is his description: "It is elongate oval in form, of a faint greenish-grey ground-colour, with the usual labyrinthine network of zig-zag wavy hair and thread-like loop-lines, scrolls and figures, crossing and re-crossing each other, so characteristic of typical eggs of the *Chlamydochloa*. In this specimen there are but very few underlying markings, nearly all of them being well defined, and appearing as if they had been placed on the shell with a pen dipped in different shades of umber-brown and violet-grey, the former colour predominating and being more thickly disposed towards the thinner end, where in some places the lines are confluent and form broad irregular-shaped patches and short wavy streaks. The texture of the shell is very fine, and its surface lustreless. Length,  $1\cdot56 \times 1\cdot02$  inches. In shape, size, colour, and disposition of its markings it cannot be distinguished from fairly typical eggs of its near ally *C. maculata*."

## 305.—MELITHREPTUS LÆTIOR.

## GOLDEN-BACKED HONEYEATER.

Mr. A. J. North, who described a single egg of this beautiful Honeyeater, from Mr. G. A. Keartland's collection, states:—"During the first week of February, 1899, Mr. E. J. Harris took an egg of this species from a small cup-shaped nest, built in the drooping leafy twigs of a bauhinia, about ten feet from the ground, and close to the junction of the Fitzroy and Margaret Rivers, North-west Australia. It is oval in form, gently tapering towards the smaller end, and is of a pale, fleshy-buff ground-colour, which gradually passes into a warm reddish-buff on the larger end, where there are spots and blotches of a slightly darker hue, intermingled with underlying markings of faint purplish-buff, the surface of the shell being smooth and slightly glossy. Length,  $\cdot 86 \times \cdot 61$  inches. This egg resembles some of the delicately-coloured varieties of those of *Ptilotis auricomis*."

## 312.—GLYPHILA SUBOCULARIS

## LEAST HONEYEATER.

According to Mr. D. Le Souëf, whose collector, Mr. R. Hislop, found two nests of this small Honeyeater—one 14th June, and the other 3rd October (1899), on the Cape York Peninsula—the first found nest "was suspended from a forked branch of a melaleuca, about twenty feet from the ground. It is lightly constructed of fine shreds of bark, interwoven with very thin white pieces of so-called paper (*Melaleuca*) bark, and has a small quantity of cobweb on the outside, which helps to fasten it to the branch. It is lined with a white fluffy substance, and measures: external diameter,  $2\frac{1}{2}$  inches; internal,  $1\frac{1}{2}$  inches; external depth,  $2\frac{1}{4}$  inches; internal, 2 inches. The two eggs of the clutch vary both in size and colour, one being pure white, with a few faint specks round the larger end, the other being very delicate reddish-pink, with a faint zone of reddish markings round the larger end. Dimensions in inches: (1)  $\cdot 66 \times \cdot 5$ , (2)  $\cdot 63 \times \cdot 46$ ." Mr. Le Souëf has described the eggs of this bird in the "Ibis," p. 458 (1900).

## 361.—ENTOMYZA ALBIPENNIS.

## WHITE-QUILLED HONEYEATER.

Mr. D. Le Souëf has described the nest and eggs of this fine northern species in the "Victorian Naturalist," vol. xvi., p. 101 (1899). He has since received a splendid series of eggs, collected in the forest country on Cape York Peninsula. The eggs are only about half the size of those of the Blue-faced Honeyeater, and vary in shape from elliptical to more pointed specimens. A typical pair is fine in texture, slightly glossy, and a beautiful pinkish-buff, blotched chiefly about the larger end with rich reddish-brown and dull purple. Dimensions in inches: (1)  $1\cdot 1 \times \cdot 83$ , (2)  $1\cdot 1 \times \cdot 8$ . There are sometimes three eggs to a clutch. Chief laying months are October and November.

\* "Victorian Naturalist," vol. xvi., p. 12 (1899).

## 363.—PHILEMON ARGENTICEPS.

## SILVERY-CROWNED FRIAR BIRD.

*Nest*.—Similar to that of *P. corniculatus*; composed of long shreds of bark, and lined inside with grass seed-stalks. Dimensions over all, 5 inches by 7 inches in depth; egg cavity,  $2\frac{3}{4}$  inches across by 3 inches deep.

*Eggs*.—Clutch, two usually; true oval in shape; texture, fine; surface slightly glossy; colour, most delicate pinkish-buff, finely and indistinctly spotted with rufous, purplish-brown, and dull purple, the markings being thickest round the apex. Dimensions in inches of odd (roundish) examples from the Cape York Peninsula: (1)  $1\cdot1 \times \cdot84$ , (2)  $1\cdot11 \times \cdot84$ ; of a proper pair: (1)  $1\cdot18 \times \cdot8$ , (2)  $1\cdot16 \times \cdot81$ .

Mr. D. Le Souëf described similar eggs from the same locality before the Field Naturalists' Club of Victoria, 15th April, 1899, which were collected by Mr. R. Hislop, in the forest country of the Bloomfield River district, 24th December, 1896. He subsequently received a beautiful series (the majority remarkable for their delicate light colouring) from the same district this (1899) season, taken during October, November, and December. In twelve nests, none contained more than a pair of eggs except one, which, in addition, had a fine egg of the Koel, concerning which Mr. Le Souëf's collector wrote:—"In the clutch taken 27th December there was one egg, which, I think, is that of the Flinders' Cuckoo, and, strange to say, it was the first egg laid. It was in the nest when we found it, and it was not until two or three days later that the Friar Bird laid her two eggs, as on going back four days afterwards we found the three eggs in the nest."

## 401.—MUNIA PECTORALIS.

## WHITE-BREASTED FINCH.

The eggs are long ovals in shape; texture fine; surface without gloss; colour, white, with the faintest bluish tinge. A pair from a clutch of four, taken by Mr. G. A. Keartland, in North-west Australia, measures in inches: (1)  $\cdot62 \times \cdot43$ , (2)  $\cdot6 \times \cdot42$ . The nest was the usual flask-shaped structure of grass, lined inside with finer material, and was situated in a bush about ten feet from the ground. Date, end of February, 1897.

## 414.—ATRICHIA CLAMOSA.

## NOISY SCRUB BIRD.

To Mr. A. T. Hassell, Western Australia, belongs the honour of discovering, and to Mr. D. Le Souëf, Melbourne, of describing the first

authenticated nest and eggs (a long-standing oological desideratum) of the Noisy Scrub Bird. Although not known at the time, the discovery of this nest was actually made a season sooner than Mr. S. W. Jackson's discovery of the nest and eggs of the eastern species (the *rufescens*), in the Bulabulah Scrubs of New South Wales.

Mr. Le Souëf, who has kindly favoured me with his description, states: "The nest and eggs were found by Mr. Hassell, in October, 1897, near Albany. He was passing along a narrow track through thick scrub when he heard the bird uttering its loud note. He forced his way to the place, and when doing so, suddenly saw the hen\* bird fly from what appeared to be a bunch of grass near his feet, but which, on examination, proved to be the nest. It was situated on the ground, alongside the root of a eucalyptus tree, which was about seven inches out of the ground. The nest was dome-shaped, constructed of grass and rootlets, with a few leaves, and lined with a white, downy substance. It measured: height,  $8\frac{1}{2}$  inches; breadth,  $5\frac{3}{4}$  inches; and contained two eggs (slightly incubated), swollen oval in shape, ground-colour of reddish-white, with purplish-brown markings, more numerous on the larger end, where they are confluent. The markings beneath the surface are light purple. The eggs measure: (1)  $\cdot 9 \times \cdot 69$ , (2)  $\cdot 85 \times \cdot 67$  inches." Mr Le Souëf has since described the eggs of this bird in the "Ibis," p. 458 (1900).

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### 433.—*PODARGUS MARMORATUS*.

#### MARBLED FROGMOUTH.

Regarding this beautifully marked and smallest of the Australian *Podargi*, Mr. D. Le Souëf writes: †—It is especially plentiful at Cape York, North Queensland, and I have also had specimens from some distance south of Cooktown. They build the usual flat stick-nest,  $3\frac{1}{2}$  inches in diameter, generally on a horizontal bough, and the bird sits close, and is very difficult to detect. A nest found by Mr. R. Hislop, 12th August, 1898, contained one egg, white in colour, slightly lustrous, the two ends being nearly of a uniform size, and measured  $1\cdot44 \times 1\cdot0$  inches."

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### 526.—*NEOPHEMA SPLENDIDA*.

#### SCARLET-CHESTED PARRAKEET.

*Eggs*.—Round in form; texture of shell fine; surface glossy; colour, white, slightly discoloured, apparently with wood dust of the nest. Dimensions in inches: (1)  $\cdot 88 \times \cdot 77$ , (2)  $\cdot 87 \times \cdot 77$ . These eggs are amongst the largest of the family, coming next in size to those of the Rock Parrakeet.

\* Presumably. The female of either species of *Atyichia* has never yet been taken.—A. J. C.

† "Ibis," p. 361 (1899).

*Observations.*—During a recent trip to Adelaide, when looking over the collection of my venerable friend, Mr. William White, the pair of eggs (above described), dated 29th September, 1863, attracted my attention. As they are now the type eggs, as far as I am aware, their history given to me by their discoverer, may be interesting. Mr. White was in the company of Mr. J. Taylor, of Pudnookna Station, River Murray, South Australia, and, when stock-hunting to the north-east of the station, flushed a splendid Scarlet-chested Grass Parrakeet from a hole in a mallee-tree. Mr. White being desirous of securing one of the parents as well as the eggs, he left, and returned again when the bird was sitting. Binding his handkerchief to the end of a long stick, he placed it over the hole. Then his companion held the stick while he ascended the smooth tree by the aid of a notched stick placed against it, and secured the bird (a female) and two eggs. There were four eggs in the nesting hole, but unfortunately two were broken while Mr. White was awkwardly clinging to the smooth stem taking them. The bird lived in Mr. White's aviary for several years, but was always solitary and shy. Mr. White says this was also his experience of the bird in the bush. They were seen singly or in pairs in the most scrubby localities, often far from water. Like the rest of the family, the male has a very feeble, rippling call.

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The "Geographical Distribution" of the following species may be extended, namely:—

- 4.—White Goshawk, North-west Australia (R. Hall).
- 70.—Little Shrike Thrush, North-west Australia (Gould).
- 73.—Ground Cuckoo Shrike, North-west Australia (R. Hall).
- 267.—Brown Thickhead, North-west Australia (Gould).
- 276.—White-browed Tree Creeper, Victoria (A. C. Smart).
- 301.—Black-chinned Honeyeater, North-west Australia (R. Hall).
- 315.—Painted Honeyeater, Queensland (Gould).
- 385.—Masked Wood Swallow, North Queensland (Dr. Macgillivray).
- 395.—Painted Finch, North Queensland (Dr. Macgillivray).
- 400.—Yellow-rumped Finch, North-west Australia (Gould).

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#### ADDITIONAL BREEDING SEASONS.

- 162.—Spotted Bower Bird—January and February, Cloncurry district, Queensland (Dr. Macgillivray).
- 262.—Northern Thickhead—October to February.
- 366.—Little Friar Bird—October to May.

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NOTE.—With regard to the young of *Geophaps scripta* (550) not being able to fly until the usual age for Pigeons, I should have given a foot-note reference for remarks (which I did not see until after I had written my own) by Dr. Selater, on some of these birds hatched at the Zoological Gardens, London. *Vide*, P.Z.S., 1892, pp. 76-7.



## ADDITIONAL BIRDS.

*Eremiornis carteri*, North : Carter Desert Bird.

Reference.—Victorian Naturalist, vol. xvii., pp. 78 and 93 (1900).

At the end of my "Observations" on the Tawny Grass Bird (No. 180), I made some remarks on one of these birds (dated 16th April, 1898), which Mr. Carter sent me from Point Cloates. I took it to be a bleached or anomalous form of *Megalurus*, but Mr. North in his technical description states:—"The slender bill, short tarsi, small feet, and abnormally long upper and under tail coverts which conceal the greater portion of its long and broad tail feathers, will serve to distinguish it from any other Australian genus."

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*Barnardius macgillivrayi*, North : Macgillivray Parrakeet.

Reference.—Victorian Naturalist, vol. xvii. p. 91 (1900).

This new Parrakeet is from the Gulf of Carpentaria district, and in general colouring resembles *B. zonarius* and *B. occidentalis*, but has the head almost uniform in colour with the greenish upper parts, instead of black or blackish-brown as in the other species named.

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*Turnix olivii*, Rothschild : Olive Quail.

Reference.—Ibis, p. 375 (1900).

Habitat.—North Queensland. Mostly nearly allied to *T. castanonota*, but is larger in size.

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Trinomial nomenclature has been employed to describe four other birds doubtfully sub-specific, from North Queensland, namely:—

*Artamus leucogaster parvirostris*, Hartert.

*Zosterops westernensis vergeta*, Hartert.

Reference.—Nov. Zool. vol. vi., p. 423 (1899).

*Dacelo gigas minor*, Robinson.

*Trichoglossus novæ-hollandiæ septentrionalis*, Robinson.

Reference.—Bull. Liverp. Mus. vol. ii., p. 115 (1900).

In all probability Australians will not take kindly to three-fold names. Such terms do not tend to popularise ornithology. However, with the student the trinomial system will open up such very large questions regarding numerous Australian birds, as, whether some other species should not with equal right be divided, or again, whether others now separated on exceedingly slender grounds should not be amalgamated. These questions may very well be left to (say) a select committee of the proposed Australian Ornithologists' Union to settle.





<b>B</b>	No. of bird	No of page	<b>B</b>	No. of bird	No. o page
Black-headed Honeyeater ...	304	366	Broadbent Ground Thrush ...	158	191
Black-headed Log Runner ...	205	253	Broadbent Honeyeater ...	314	377
Black-headed Pardalote ...	374	447	Broad-billed Bronze Cuckoo ...	456	580
Black-naped Tern ...	650	849	Broad-billed Dove Petrel ...	686	914
Black-necked Stork ...	719	969	Broad-billed Flycatcher ...	98	122
Black-rumped Grass Finch ...	409	406	Broad-billed Prion ...	686	914
Black-shouldered Kite ...	19	27	Broad-tailed Tit ...	187	233
Black-tailed Godwit ...	622	809	Bronze Cuckoo ...	457	582
Black-tailed Native Hen ...	585	752	"  "  Broad-billed ...	456	580
Black-tailed Parrakeet ...	400	625	"  "  Little ...	458	584
Black-tailed Thickhead ...	258	318	"  "  Narrow-billed ...	455	576
Black-throated Butcher Bird ...	242	301	Bronze-winged Pigeon ...	545	680
Black-throated Fly Eater ...	136	161	Brown Flycatcher ...	82	105
Black-throated Grass Finch ...	406	404	"  "  Lesser ...	83	106
Black-throated Grebe ...	735	1002	"  "  " ...	1073	
Black-throated Whip Bird ...	218	268	Brown Fly Eater ...	133	159
Black-vented Ground Bird ...	210	258	Brown Gannet ...	729	958
Black-winged Crow Shrike ...	50	61	Brown Hawk ...	27	37
Blood Honeyeater ...	201	352	Brown Hawk, Striped ...	26	36
Blood-stained Cockatoo ...	483	614	Brown Honeyeater ...	311	374
Blue Bald Coot ...	587	756	Brown Kingfisher ...	441	551
Blue Flycatcher ...	96	120	Brown Petrel ...	673	895
Blue Kingfisher ...	437	547	Brown Quail ...	562-3	924
Blue Petrel ...	685	913	Brown Scrub Wren ...	202	251
Blue Wren ...	137	163	Brown Shrike Thrush ...	67	91
"  "  Long-tailed ...	130	169	Brown Tail ...	180	232
Blue-bellied Lorikeet ...	403	592	Brown Thickhead ...	267	328
Blue-billed Duck ...	760	1051	"  "  " ...	1082	
Blue-breasted Pitta ...	421	528	Brown Tit ...	185	230
Blue-checked Parrakeet ...	500	634	Brown Tree Creeper ...	274	334
Blue-faced Honeyeater ...	360	439	Brown-backed Honeyeater ...	313	376
Blue-faced Lorileet ...	471	599	Brown-breasted Flyeater ...	131	158
Blue-winged Grass Parrakeet ...	521	649	Brown-headed Honeyeater ...	303	364
Blue-winged Teal ...	754	1042	Brown-headed Petrel ...	680	907
Boobook Owl ...	39	43	Brown-winged Tern ...	646	842
Booby ...	729	988	Brush Turkey ...	558	708
Bourke Grass Parrakeet ...	520	649	"  "  Barnard ...	559	714
Bower Bird, Fawn-breasted ...	169	206	Brush Bronze-winged Pigeon ...	546	683
"  "  Golden ...	169	212	Brush Wattle Bird ...	357	425
"  "  Great ...	164	203	Buff-bellied Shrike Thrush ...	68	91
"  "  Guttated ...	163	202	Buff-breasted Scrub Wren ...	109	249
"  "  " ...	1078		Buff-breasted Fly Eater ...	134	160
"  "  Queensland ...	165	204	Buff-rumped Tit ...	193	239
"  "  Satin ...	159	191	Buff-sided Robin ...	122	150
"  "  Spotted ...	162	198	Bush Chat, Orange-fronted ...	232	285
"  "  " ...	1082		"  "  Tri-coloured ...	231	284
"  "  Tooth-billed ...	167	207	"  "  White-fronted ...	230	282
"  "  Yellow-spotted ...	163	202	"  "  Yellow-breasted ...	233	286
Bower Shrike Thrush ...	60	92	Bush Lark ...	412	501
Bridled Honeyeater ...	324	388	"  "  Lesser ...	413	503
Bristle Bird ...	172	218	Bustard ...	591	762
"  "  Long-billed ...	173	219	Butcher Bird ...	246	304
"  "  Rufous ...	174	219	"  "  Black ...	241	299

	No. of bird	No. of page
<b>B</b>		
Butcher Bird, Black-throated	242	301
" " Grey	247	305
" " Pied	243	302
" " Rufous	249	306
" " Silver-backed	245	304
" " Spalding	248	306
" " White-winged	244	303
Buzzard Eagle, White-eyed	12	16
" Black-breasted	18	25

	No. of bird	No. of page
<b>C</b>		
Campbell Parrakeet	495	630
Cape Barren Goose	745	1021
Cape Petrel	684	911
Cape York Owl	35	47
Cape York Thickhead	266	327
Carter Desert Bird		1083
Carter Honeyeater	339	405
Caspian Tern	641	832
Cassowary	765	1069
Cat Bird	161	196
" Spotted	160	195
Caterpillar Catcher	79	100
" Pied	81	104
" White-shouldered	80	103
Channel Bill	461	588
Chat, Orange-fronted Bush	232	285
" Tricoloured Bush	231	284
" White-fronted Bush	230	282
" Yellow-breasted Bush	233	286
Chatterer	220	270
Chestnut-backed Ground Bird	207	256
Chestnut-backed Quail	569	733
Chestnut-backed Rail	576	742
Chestnut-bellied Quail	565	728
Chestnut breasted Cuckoo	453	574
Chestnut-breasted Finch	399	487
Chestnut-breasted Ground Bird	200	257
Chestnut-breasted White Face	235	289
Chestnut-crowned Babbler	222	273
Chestnut-crowned Parrakeet	517	647
Chestnut-eared Finch	306	483
Chestnut-faced Owl	40	50
Chestnut-quilled Rock Pigeon	540	688
Chestnut-rumped Ground Wren	215	263
Chestnut-rumped Pardalote	375	448
Chestnut-rumped Tit	190	236
Chough, White-winged	53	65
Cinnamon-coloured Ground Bird	208	256
Coach-whip Bird	217	265

	No. of bird	No. of page
<b>C</b>		
Cockatoo, Bare-eyed	482	613
" Banksian	475	606
" Black	474	602
" Blood-stained	483	614
" Dampier	486	620
" Gang-gang	479	610
" Glossy	478	609
" Great-billed	476	607
" Long-billed	485	619
" Palm	472	600
" Parrakeet	487	621
" Pink	481	612
" Red-tailed	477	608
" Rose-breasted	484	617
" White	480	611
" White-tailed	473	601
Cockerell Honeyeater	333	397
Comb-crested Jacana	596	773
Common Heron	704	950
Common Sandpiper	626	812
Common Shoveller	755	1043
Cook Petrel	682	908
Coot	589	758
" Bald	588	757
" Blue Bald	587	756
Corella	485	619
Cormorant, Black	720	971
" Little	724	977
" Little Black	721	972
" Pied	723	975
" White-breasted	722	973
Corn Crake	578	744
Coucal	462	590
Crake, Corn	578	744
" Little	580	747
" Spotless	581	748
" Spotted	579	745
" White-browed	582	749
Crane	590	760
Creeper, Black Tree	270	329
" Black-backed Tree	271	330
" Brown Tree	274	334
" Red-browed Tree	275	335
" Rufous Tree	272	331
" White-browed Tree	276	336
" White-throated Tree	273	332
Crescent Honeyeater	345	411
Crested Hawk	21	29
Crested Penguin	738	1007
Crested Pigeon	555	695
Crested Tern	644	837
" Lesser	643	835



F	No. of bird	No. of page	F	No. of bird	No. of page
Falcon, Black-checked	22	31	Flower Pecker	367	437
„ Black	24	33	Flycatcher, Black-faced	108	132
„ Grey	23	33	„ Blue	96	120
„ Little	25	34	„ Broad-billed	98	122
Fantail, Black and White	94	115	„ Brown	82	105
„ Dusky	88	112	„ „ Lesser	83	106
„ Northern	91	114	„ „		1075
„ Pheasant	93	116	„ Frill-necked	103	128
„ Rufous	89	112	„ Leaden-coloured	95	119
„ Western	87	110	„ Lemon-breasted	84	107
„ White-fronted	93	116	„ Little	101	126
„ White-shafted	86	108	„ Pale	85	108
„ White-tailed	92	115	„ „		1075
„ Wood	90	114	„ Pearly	109	134
Fan-tailed Cuckoo	451	568	„ Pied	102	126
Fasciated Honeyeater	331	395	„ Restless	100	124
Fawn-breasted Bower Bird	166	206	„ Satin	97	121
Fawn-breasted Kingfisher	443	555	„ Shining	104	129
Fiery Parrakeet	505	638	„ Spectacled	105	130
Fig Bird	61	82	„ White-bellied	106	131
„ „ Yellow-bellied	62	84	„ White-eared	107	132
Field Wren	227	279	„ Yellow-breasted	99	123
„ „ Little	229	281	Fly Eater, Black-throated	136	161
„ „ Striated	226	278	„ „ Brown	133	159
Finch, Banded	397	485	„ „ Brown-breasted	131	158
„ Black-rumped Grass	409	496	„ „ Buff-breasted	134	160
„ Black-throated Grass	406	494	„ „ Green-backed	135	161
„ Chestnut-breasted	399	487	„ „ Grey	129	156
„ Chestnut-eared	396	483	„ „ Large-billed	132	158
„ Crimson	411	409	„ „ Southern	130	157
„ Fire-tailed	393	479	„ „ White-throated	128	155
„ Gouldian Grass	410	497	Fly Robin	257	317
„ Long-tailed Grass	405	493	Forest Kingfisher	444	556
„ Masked Grass	407	495	Forster Petrel	672	894
„ Painted	395	481	Forty-spotted Pardalote	376	440
„ „		1082	Freckled Duck	758	1049
„ Plum-head	402	489	Freckled Frogmouth	432	549
„ Red-browed	403	490	Friar Bird	362	432
„ Red-eared	394	480	„ „ Helmeted	364	434
„ Red-faced	404	492	„ „ Little	366	436
„ Ringed	398	486	„ „		1082
„ Spotted-sided	392	478	„ „ Silvery-crowned	363	434
„ White-breasted	401	489	„ „		1080
„ „		1080	„ „ Yellow-throated	365	435
„ White-eared Grass	408	496	Frigate Bird	730	989
„ Yellow-rumped	400	488	„ „ Lesser	731	991
„ „		1082	Frill-necked Flycatcher	103	128
Fire-tailed Finch	393	470	Frogmouth, Freckled	432	549
Flame-breasted Robin	112	136	„ Marbled	433	542
Flat-billed Albatross	605	934	„ „		1081
Fleshy-footed Petrel	668	880	„ Plumed	430	538
Flock Pigeon	547	684	„ Tawny	431	539

<b>F</b>		No. of bird	No. of page	<b>G</b>		No. of bird	No. of page
Fruit Pigeon, Allied ... ..	...	536	667	Grass Owl ... ..	...	43	53
" " Black-banded .....	533	663	Grass Parrakeet	...	522	651	
" " Purple-breasted	535	666	" " Blue-winged	...	521	649	
" " Purple-crowned	534	664	" " Bourke	...	520	649	
" " Red-crowned ...	531	661	" " Orange-bellied	...	523	652	
" " Rose-crowned ...	532	663	" " Red-shouldered ...	525	654		
" " White-headed ...	539	672	" " Scarlet-chested	526	654		
Fulvous-fronted Honeyeater	308	370	" " " "	...	1881		
Fuscous Honeyeater ... ..	322	385	" " Warbling	...	528	656	
<b>G</b>				Grass Warbler ... ..	...	182	227
Galah ... ..	...	484	617	Grass Wren ... ..	...	175	221
Gang-Gang Cockatoo ... ..	479	610	" " Goyder ... ..	178	223		
Gannet ... ..	726	981	" " Large-tailed	...	177	223	
" Brown ... ..	729	988	" " Striated	...	176	222	
" Masked ... ..	727	985	Great Bower Bird ... ..	164	203		
" Red-legged ... ..	728	987	Great Sandpiper ... ..	635	821		
Garganey Teal ... ..	754	1042	Great-billed Cockatoo	...	476	607	
Gay-tinted Honeyeater ... ..	306	369	Great-billed Heron ... ..	703	950		
Giant Petrel ... ..	683	919	Great-winged Petrel ... ..	677	902		
Gilbert Variegated Wren ... ..	149	177	Greater Brown Quail ... ..	564	727		
Glossy Cockatoo ... ..	478	609	Grebe, Black-throated	...	735	1002	
Glossy Ibis ... ..	700	944	" Hoary-headed	...	736	1003	
Godwit, Barred-rumped	...	621	808	" Tippet	...	737	1004
" Black-tailed	...	622	809	Green Goose Teal ... ..	743	1019	
Golden Bower Bird ... ..	169	212	Green Parrakeet ... ..	498	633		
Golden Plover, Lesser ... ..	605	788	Green Pigeon, Little ... ..	544	679		
Golden-backed Honeyeater	305	368	Green-backed Fly Eater	...	135	161	
" " "	...	1082	Green-backed White Eye	...	287	350	
Golden-shouldered Parrakeet	...	516	646	Green-leek Parrakeet	...	488	623
Goose, Pied ... ..	742	1017	Greenshank ... ..	628	814		
" Cape Barrea ... ..	745	1021	Greenshank, Little ... ..	623	810		
Goose Teal, Green ... ..	743	1019	Grey Butcher Bird ... ..	247	305		
" " White-quilled	...	744	1020	Grey Crow Shrike ... ..	48	60	
Goshawk ... ..	6	6	Grey Falcon ... ..	23	33		
" Grey ... ..	3	4	Grey Fly Eater ... ..	129	156		
" Lesser ... ..	7	8	Grey Goshawk ... ..	3	4		
" Lesser White ... ..	5	6	Grey Heron ... ..	704	950		
" " " "	...	1082	Grey Jumper ... ..	52	63		
" Red ... ..	9	10	Grey Noddy ... ..	651	850		
" White ... ..	4	4	Grey Plover ... ..	604	786		
Gouldian Grass Finch ... ..	410	497	Grey Shrike Thrush ... ..	65	88		
Goyder Grass Wren ... ..	178	223	Grey Teal ... ..	753	1039		
Grass Bird ... ..	179	224	Grey-backed Storm-Petrel	...	662	871	
" " Tawny ... ..	180	225	Grey-breasted Shrike Robin	...	255	315	
Grass Finch, Black-rumped	...	409	496	Grey-breasted Wood Swallow	...	386	469
" " Black-throated	...	406	494	Grey-rumped Sandpiper ... ..	624	811	
" " Gouldian ... ..	410	497	Grey-rumped American Sandpiper...	625	812		
" " Long-tailed ... ..	405	493	Grey-rumped Swiftlet ... ..	425	532		
" " Masked ... ..	407	495	Grey-tailed Thickhead ... ..	261	322		
" " White-eared ... ..	408	496	Ground Bird, Black-vented ... ..	210	258		
			" " Chestnut-backed ... ..	207	256		
			" " Cinnamon-coloured	208	256		



<b>G</b>		No. of No. of bird page	
Ground Bird, Chestnut-breasted	...	209	257
" " Northern	...	210	258
" " Spotted	...	216	254
Ground Cuckoo Shrike	...	73	95
" " "	...	1082	
Ground Dove	...	542	676
Ground Lark	...	382	450
Ground Parakeet	...	520	638
Ground Thrush	...	155	184
" " Broadbent	...	158	191
" " Large-billed	...	156	188
" " Russet	...	157	192
Ground Wren, Chestnut-rumped	...	215	263
" " Rufous-rumped	...	216	264
Gull, Silver	...	656	860
" Pacific	...	657	862
Gull-billed Tern	...	640	830
Gulliver White Eye	...	299	352
Guttated Bower Bird	...	163	202

**H**

Hardhead	...	759	1050
Harrier, Spotted	...	1	1
" or Swamp Hawk	...	2	2
Hawk, Crested	...	21	29
" Brown	...	27	37
" Eagle	...	10	11
" Sparrow	...	8	9
" Striped Brown	...	26	36
" Swamp	...	2	2
Helmeted Honeyeater	...	335	400
" Friar Bird	...	364	434
Hen, Native	...	584	752
" Black-tailed Native	...	585	752
Heron, Common	...	704	950
" Great-billed	...	703	950
" Grey	...	704	950
" Night	...	713	962
" Pacific	...	708	955
" Reef	...	712	959
" White-fronted	...	707	954
" White-necked	...	708	955
Hill Crow Shrike	...	47	59
Hoary-headed Grebe	...	736	1003
Honeyeater, Banded	...	294	355
" Black	...	293	354
" Black-chinned	...	301	363
" "	...	1082	
" Black-headed	...	304	366
" Blood	...	291	352
" Blue-faced	...	360	429

<b>H</b>		No. of No. of bird page	
Honeyeater, Bridled	...	344	388
" Broadbent	...	314	377
" Brown	...	311	374
" Brown-backed	...	313	376
" Brown-headed	...	303	364
" Carter	...	339	405
" Cockerell	...	333	397
" Crescent	...	345	411
" Dusky	...	295	356
" Fasciated	...	331	395
" Fulvous-fronted	...	308	372
" Fuscous	...	322	385
" Gay-tinted	...	306	369
" Golden-backed	...	305	368
" "	...	1079	
" Helmeted	...	335	400
" Keartland	...	337	402
" Least	...	312	375
" "	...	1079	
" Lesser Yellow-spotted	...	321	384
" Long-billed	...	347	413
" Moustached	...	349	415
" Painted	...	315	377
" "	...	1082	
" Pied	...	318	380
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" White-gaped	...	344	410
" White-naped	...	298	359
" White-plumed	...	338	403
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" Yellow-eared	...	323	386
" Yellow-faced	...	328	392
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Oriole	...	...	60	81	"	Bourke Grass	...	520	649	
"	Northern	...	58	79	"	Campbell	...	495	630	
"	Yellow	...	59	80	"	Chestnut-crowned	...	517	647	
Oriental Cuckoo	...	...	449	563	"	Cockatoo	...	487	621	
Oriental Dotted	...	...	607	701	"	Crimson	...	494	620	
"	Pratincole	...	595	771	"	Fiery	...	505	638	
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"	Cape York	...	35	47	"	Green	...	498	633	
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"	Winking	...	34	46	"	Red-capped	...	508	630	
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" Orange-tipped	...	369	442	Pied Goose	...	742	1017
" Red-browed	...	373	446	Pied Egret	...	709	957
" Red-tipped	...	368	443	Pied Flycatcher	...	102	126
" Spotted	...	371	444	Pied Honeyeater	...	318	380
" Yellow-rumped	...	372	445	Pied Oyster Catcher	...	598	770
" Yellow-tipped	...	370	443	Pied Robin	...	118	146
Partridge Pigeon	...	580	680	Pied Tree Runner	...	279	340
" "	...		1082	Pigeon, Allied Fruit	...	536	667
" " Naked-eyed	...	551	691	" Black-banded Fruit	...	533	663
Pearly Flycatcher	...	109	134	" Bronze-winged	...	545	680
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" Cape	...	684	911	" Red Plumed	...	553	692
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" Fairy Dove	...	689	918	" White-bellied Plumed	...	554	693
" Fleshy-footed	...	668	880	" White-headed Fruit	...	539	672
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" Grey-backed Storm	...	662	871	Pink-eared Duck	...	757	1046
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" Soft-plumaged	...	679	906	" Blue-breasted	...	421	545
" Sombre	...	671	893	" Lesser	...	420	526
" Spectacled	...	675	897	" Rainbow	...	422	529
" Wedge-tailed	...	666	876	Plain Wanderer	...	573	737
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" White-headed	...	678	904	" Lesser Golden	...	605	788
" White-winged	...	681	907	" Long-billed Stone	...	593	768
" Yellow-webbed Storm	...	661	860	" Masked	...	602	782
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"  Oriental ... ..		595	771	Red-chested Quail ... ..	570	733
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				Tooth-billed Bower Bird		167	207
				Top-knot Pigeon ... ..		538	671
				Tree Creeper, Black ...		270	329
				,, " Black-backed ...		271	330
				,, " Brown ... ..		274	334
				,, " Red-browed ... ..		275	335
				,, " Rufous ... ..		272	331



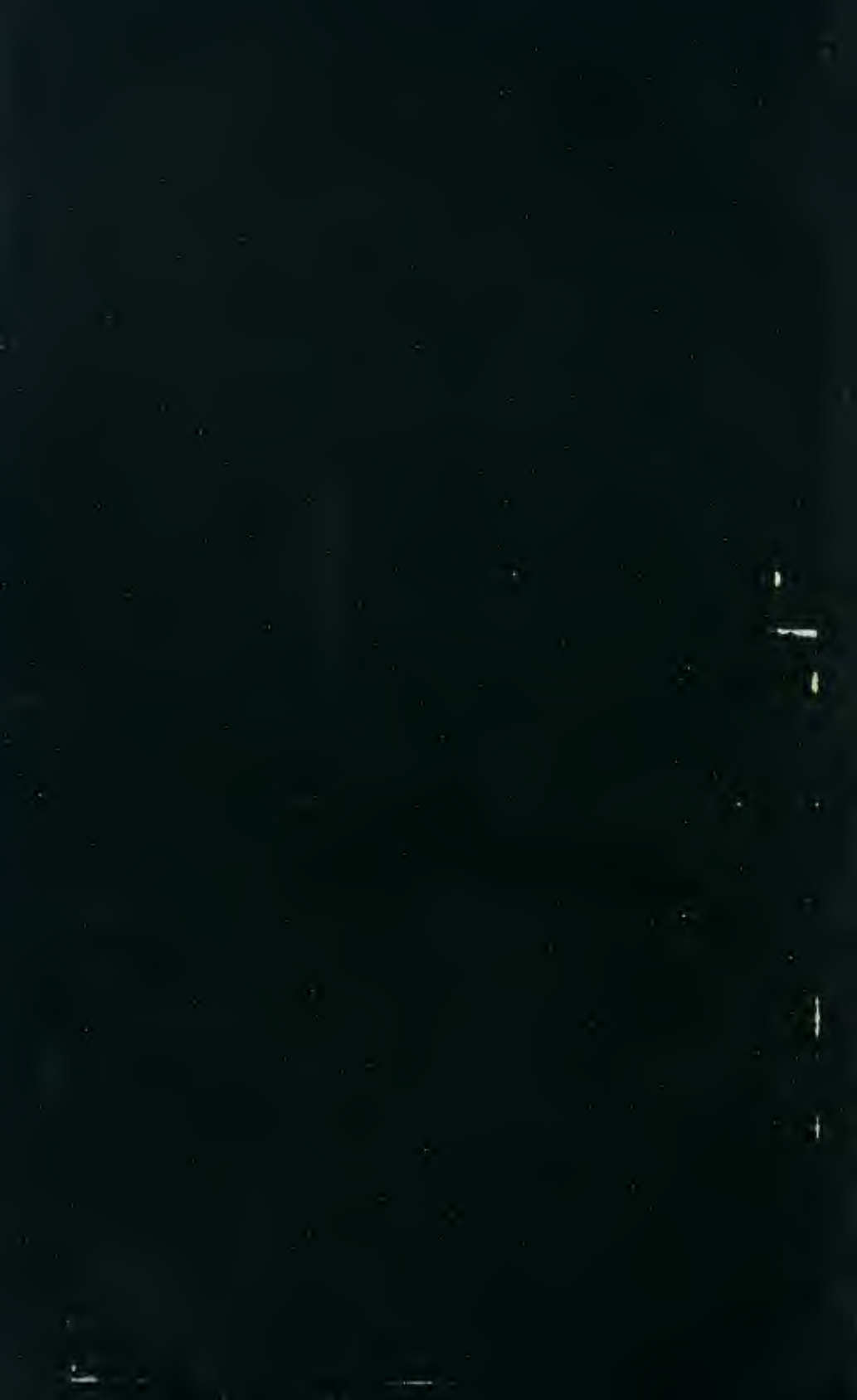
	No. of bird	No. of page		No. of bird	No. of page
White-eared Honeyeater	332	306	Wild Turkey	591	762
White-eyed Buzzard Eagle	12	16	Winking Owl	34	46
White-eyed Duck	759	1050	Wonga-wonga Pigeon	556	696
White-faced Robin	125	152	Wood Duck	746	1023
White-faced Storm Petrel	663	872	Wood Fantail	90	114
White-faced Ternlet	648	847	Wood Swallow	389	471
White-fronted Bush Chat	230	282	"    "    Black-faced	388	471
White-fronted Fantail	93	116	"    "    Grey-breasted	386	469
White-fronted Heron	707	954	"    "    Little	399	474
White-fronted Honeyeater	309	372	"    "    Masked	385	466
White-fronted Petrel	670	893	"    "    "    "    "    "    "    "		1082
White-fronted Tern	645	849	"    "    White-bellied	387	470
White-gaped Honeyeater	344	410	"    "    White-browed	384	463
White-headed Fruit Pigeon	539	672	"    "    White-rumped	383	461
White-headed Osprey	29	40	Wren, Banded	143	172
White-headed Petrel	678	904	"    Black-backed	141	169
White-headed Sea Eagle	14	19	"    Blue	137	163
White-headed Shieldrake	749	1029	"    Brown Scrub	292	251
White-headed Sittella	278	339	"    Buff breasted Scrub	169	249
White-headed Stilt	615	801	"    Chestnut-rumped Ground	215	263
White-headed Tree Runner	278	339	"    Dark-blue	149	169
White-naped Honeyeater	298	359	"    "    "    "    "    "    "    "		1077
White-necked Heron	708	955	"    Desert	228	280
White-plumed Honeyeater	338	403	"    Emu	170	214
White-quilled Goose Teal	744	1020	"    Field	227	279
White-quilled Honeyeater	391	432	"    Gilbert Variegated	149	177
"    "    "    "    "    "    "    "		1079	"    Goyder Grass	178	223
White rumped Swift	423	530	"    Grass	175	221
White rumped Wood Swallow	383	461	"    Large-billed Scrub	198	247
White-shafted Fantail	86	108	"    Large-tailed Grass	177	223
White-shafted Ternlet	649	848	"    Little Field	229	281
White-shouldered Caterpillar Catcher	80	193	"    Long-tailed Blue	139	169
White-tailed Cockatoo	473	601	"    Lovely	148	176
White-tailed Fantail	92	115	"    Orange-backed	152	180
White-tailed Kingfisher	448	561	"    Purple-crowned	150	178
White-tailed Shrike Robin	256	316	"    Red-backed	151	179
White-tailed Tropic Bird	733	995	"    Red-winged	146	175
White-throated Flyeater	128	155	"    Rufous-crowned Emu	171	217
White-throated Honeyeater	390	362	"    Rufous-rumped Ground	216	264
White-throated Nightjar	428	535	"    Sivery-blue	138	168
White-throated Scrub Wren	203	252	"    Spotted Scrub	209	249
White-throated Thickhead	259	319	"    Spotted-throated Scrub	201	250
White-throated Tree Creeper	273	332	"    Striated Grass	176	222
White-winged Butcher Bird	244	303	"    Striated Field	226	278
White-winged Chough	53	65	"    Turquoise	142	170
White-winged Petrel	681	907	"    Variegated	147	176
White-winged Sittella	282	343	"    White-backed	145	174
White-winged Tern	638	828	"    White-browed Scrub	197	245
White-winged Tree Runner	282	343	"    White-throated Scrub	203	252
White-winged Wren	144	173	"    White-winged	144	173
Widgeon	757	1046	"    Yellow-throated Scrub	196	243













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