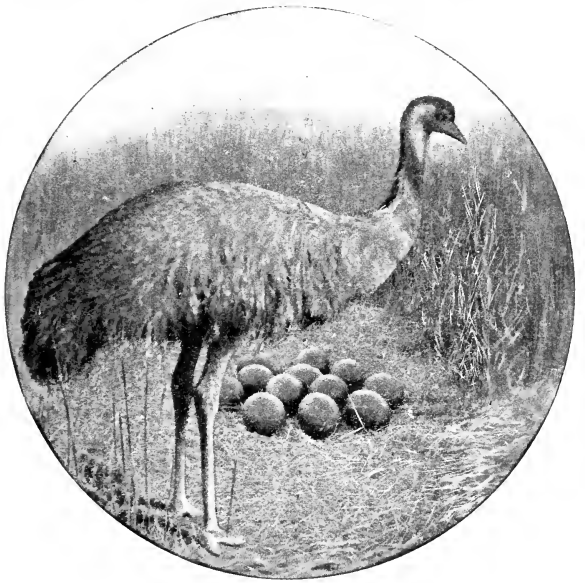
The Emu

A Quarterly Magazine to popularize the Study and Protection of Native Birds and to record Results of Scientific Research in Ornithology.

Official Organ of the ROYAL AUSTRALASIAN ORNITHOLOGISTS' UNION.



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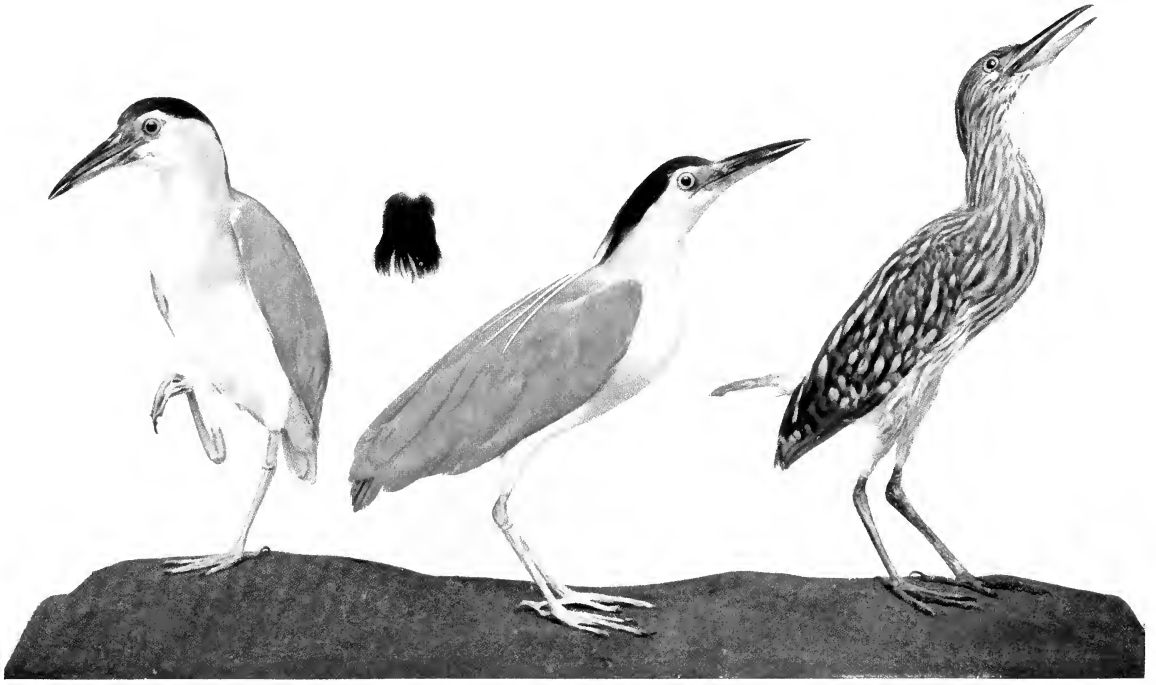

PLUMAGE CHANGES OF NANKEEN NIGHT-HERON.

Immature, after Second Moult. Full Plumage. Immature, before First Moult.

The Inset shows the Crown and Nape after the First Moult.

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Official Organ of the Royal Australasian Ornithologists' Union.

"Birds of a feather."

VOL. XX.] 1ST JULY, 1920. [PART 1.

Plumage Changes of the Nankeen Night-Heron (Nycticorax caledonicus).

BY C. F. COLE, R.A.O.U., WANGARATTA, VICTORIA.

MY chief object in keeping this species in captivity from nestlings to well over the adult stage was for the purpose of observing and recording the plumage changes that take place during each moult. Apart from the plumage question, I found these birds very interesting. Their habit of standing whilst seeking for prey in the twilight around the edge of a pool or dish of water, apparently motionless, with the body slightly bent forward and the head downwards, gazing with an expression of alertness, combined with cunning in their large nocturnal eyes, led the observer to wonder whether these birds have mesmerical powers.

There is a supposed aboriginal legend attached to the white nuchal plumes which adorn the head of the adult bird. These birds are supposed, whilst seeking in the shallow water for food, to allow the plumes to rest upon the surface, thus attracting their aquatic prey within reach of their bill. This is purely mythical. These birds are not adorned throughout the whole year with such plumes. Like the Egrets, they cast and grow their plumes at a certain season of the year.

The attitude of this bird towards others of the feathered tribe in captivity is a very pugnacious one.

Whilst undergoing the first moult, which begins to take place within 10 months from leaving the nest, there develops upon the nape four to five dark feathers, not so black as those upon the crown. Down the centre of each of these feathers is a golden-brown streak, which makes them very conspicuous. By the end of the second season's moult these feathers disappear, and the white nuchal plumes begin to make their appearance. These striped nape feathers indicate the position of the nuchal plumes.

After the end of the third year's moult the nuchal plumes attain perfection, and the bird has also acquired full adult plumage. The average total length of the nuchal plumes is $6\frac{7}{8}$ inches, and the colour is pure white streaked at the basal ends with pale brown. These plumes fit one within the other, resembling one long tubular-shaped feather.

The first signs of moulting take place at the base of the upper mandible, the brown-striped nestling feathers being replaced by black ones with black quills, as in the adult plumage. The moult gradually works back towards the nape and down the neck. The moulting of the body, wings, &c., is gradual and uniform all over. The moulting period was approximately four months with the specimens under observation.

Towards the latter stages of the first moult the bare patch about the eyes gradually underwent a change of colour, the pale sulphur-yellow tint in the green becoming a bluish tint. This same colour-change also took place in the legs. The bill also gradually changes within this period.

The greater change in plumage colour takes place during the first moult. The second moult brings the adult colours more pronounced, but not so deep and rich as in the fully matured bird.

(A.) IMMATURE PLUMAGE BEFORE THE FIRST MOULT.

At a glance the whole of the plumage appears brown, each feather being tipped or striped with pale buff, white, or cinnamon, giving the bird a mottled appearance. The centre of each feather of the forehead, crown, hinder crown, and nape is striped a dull golden brown, quills same colour, the outer webbing dark brown; ear coverts and cheeks pale buff splashed with dark brown; chin and throat white, lower throat white slightly mottled with brown; hind neck and chest pale buff, quills paler, outer webbing light brown; breast white, edged with brown; abdomen much paler; thighs pale buff, edged with brown; back pale buff, edged with dark brown, many feathers much darker; mantle pale buff, edged with dark brown; humeral feathers pale reddish-chestnut, splashed with dark brown; lesser, medium and greater wing coverts dark brown splashed with pale reddish-chestnut, mottled with pale buff, a few feathers mottled with white; primaries and secondaries —quills reddish-brown, inner webbing rich chestnut-red, outer dark brown, each feather tipped with white splashed with pale brown; tail quills reddish-brown, webbing pale chestnut-red, feathers tipped pale buff; upper tail coverts much paler; under tail coverts white, faintly splashed with brown; rump whitish, splashed with brown; bare patch in front of eyes pale green tinted with sulphur-yellow; irides straw-yellow; bill upper mandible, centre dark brown, edges pale buff, lower mandible grey splashed with dark brown towards the tip; legs pale green tinted with sulphur-yellow; feet brown; toe-nails reddish-brown, tipped dark brown.

(B.) IMMATURE PLUMAGE AFTER THE FIRST MOULT.

Forehead, crown, and hinder crown black, quills black; nape black, with a distinct brown tint, five feathers are brownish-black, having a distinct golden-brown streak down the centre, quills golden-brown, appearing at a glance as if the nuchal plumes were

beginning to grow; eyebrow pale buff, slightly flecked with dark brown, becoming paler towards the lores; chin and throat pale buff; lower throat pale buff; ear coverts and cheeks pale buff splashed with brown; hind neck deep chestnut-red; fore neck pale buff heavily splashed with pale chestnut-red and dark brown, giving a mottled appearance, base of feathers white; breast white splashed with brown; abdomen white; thighs (inner) white; thighs (outer) light reddish-brown, becoming white in the adult; flanks white splashed with brown; back dark rich chocolate (becoming a rich chestnut-red in the adult), the feathers, when raised, showing a pale bluish-slate colour; rump pale reddish-brown splashed with pale bluish-slate, and slightly mottled; upper tail coverts deep chestnut-red, but not so distinctive in colour as in the adult; tail rich chestnut-red, as in the adult; under tail coverts white; the whole of the humeral feathers, lesser, medium, and greater wing coverts dark chocolate, showing a tint of rich chestnut, a few feathers here and there being mottled; mantle similar; primaries—outer webbing rich chestnut-red, as in the adult, splashed dark chocolate at the tips, inner webbing much paler; secondaries vary in colour, some a rich chestnut-red, others mottled, general colour under the wing, primaries, and secondaries pale chestnut-red, tinted with bluish-slate, the smaller feathers white splashed with pale chestnut-red (this bluish-slate tint, so pronounced, passes off in the second moult); bare patch in front of eyes pale green, with bluish tint; rim of eyes pale greenish-yellow; irides deep straw-yellow; upper mandible black, with grey streak extending two-thirds along outer edge from the base; lower bluish-grey blotched with black; legs and feet pale green, with bluish tint; toe-nails grey.

(c.) Immature Plumage after the Second Moult.

Forehead, crown and hinder crown black, quills black; nape black, a few feathers tinted a chestnut-red, the white nuchal plumes are short and unattractive; eyebrow white; chin and throat white; ear coverts pale chestnut-red; hind neck rich chestnut-red splashed with black, a few feathers almost black; fore neck white, tinted with pale chestnut-red, the side feathers pale chestnut-red; chest pale chestnut-red, the side feathers much darker; breast white, a few feathers faintly tinted with chestnut-red; abdomen white; thighs (inner) white; thighs (outer) white, tinted with chestnut-red; under tail coverts white; flanks white; rump chestnut-red, faintly splashed with bluish-brown; upper tail coverts chestnut-red; tail rich chestnut-red, quills paler; back rich chestnut-red; lesser, medium, and greater wing coverts rich chestnut-red, quills paler; primaries and secondaries rich chestnut-red, quills paler; bare patch in front of eyes pale green; irides deep orange-yellow; upper mandible black, the sides streaked reddish-brown; lower mandible greyish-buff, tipped black; legs and feet pale chrome-yellow; toe-nails reddish-brown, tipped black.

(D.) FULL PLUMAGE, THIRD MOULT.

(Age from leaving the nest, 3 years 6 months.)

Forehead, crown, hinder crown, and nape black; nuchal plumes white, base streaked brown; eyebrow white; chin, throat, and lower throat white; ear coverts white, tinted pale chestnut-red; hind neck black, a few tinted chestnut-red; fore neck white, tinted pale chestnut-red; chest white, tinted pale chestnut-red, the side feathers a rich chestnut-red; breast, abdomen, thighs, under tail coverts white; flanks white; rump chestnut-red; back, the whole of the wing, and tail rich chestnut-red, quills paler; bare patch in front of eyes pale green; irides deep orange; upper mandible black, sides blotched reddish-brown, lower mandible greyish-buff, tipped black; legs and feet chrome-yellow; toe-nails reddish-brown, tipped brown.

With Camera and Field Glasses in North-West Victoria.

BY L. G. CHANDLER, R.A.O.U., "MALURUS," DIXON-STREET, MALVERN.

LEAVING Melbourne by the 6.40 a.m. train on 11th August, 1919, I reached Hattah at 4.10 a.m. on the following day. It was a slow, tiresome journey: but a few hours later, when on a memorable drive to Kulkyne Station, I forgot previous discomforts in the examination of the varied, interesting scenery and the presence of many birds and flowers new to me. Mr. Balmain, a local fisherman, who kindly drove me a distance of 18 miles, was an interesting companion, and we talked of bush-lore as the horses toiled through the heavy sand.

For miles the track wound through typical Mallee vegetation, and the oil mallee (*Eucalyptus oleosa*), giant mallee (*E. incrassata*), and hooked mallee (*E. uncinata*) were noticed, together with acacias and smaller shrubs and plants. The last two eucalypts were heavily in blossom, and the morning air was scented with their perfume. With the exception of a few Yellow-plumed Honey-eaters (*Ptilotis ornata*) and White-eared Honey-eaters (possibly *Ptilotis novæ-norciæ*), honey-eating birds were scarce. Near Hattah the familiar notes of a Scrub-Robin (*Drymodes brunneopygius*) were heard the only occasion on which I had evidence of its presence. Soon a beautiful pair of Ground-Birds (*Cinclosoma castanotum*) crossed the track, and this species also became a memory. Like Scrub-Robins, they apparently have not extended their range to the Murray River, or perhaps foxes and domestic cats gone wild have exterminated them in places. Unless drastic action is taken to reduce the pest, the cats will cause the complete disappearance of many birds. The value of a cat as a destroyer of rabbits is negligible when compared with the immense harm done to bird-life. Cats, by instinct, are bird-

hunters, and later I saw several eat-tenanted logs, and the amount of feathers strewn about was appalling.

When nearing Lake Hattah we crossed a sand-ridge where Murray pines (*Callitris robusta*) and the flat-fruited buloke (*Casuarina Luehmanni*) grew in profusion and contributed their special fauna. Here the noisy Striped Honey-eaters (*Plectorhyncha lanceolata*), the Spiny-cheeked Honey-eaters (*Acanthogenys rufigularis*), and the Black-capped Tree-runners (*Neositta pileata*) were observed.

Crossing the open slopes of a sand-ridge, where the tall thick-heads (*Myriocephalus Stuartii*) grew in thousands, we entered the flat country, which is frequently flooded in the spring months. The timber is principally box and red gum. This box-gum (*Eucalyptus Woollsiana*) grows everywhere in the areas liable to flood, but along the margin of the lakes, rivers, and creeks it is supplanted by the red gum (*Eucalyptus rostrata*). On our right lay Lake Hattah, which appeared to be 5 or 6 miles in circumference, with shores thickly lined with trees. Black Swans (*Chenopis atrata*), Grebes (*Podiceps gularis*), Ducks, and Cormorants dotted the surface of the water, but, considering that a large area, including several lakes, is a sanctuary for waterfowl, the scarcity of the birds was disappointing to a bird-lover.

Lakes Lockie and Cantala were passed, and we followed Chalka Creek, and finally crossed its dried bed, which was really a series of long water-holes. In flood times it is a large, semicircular arm of water, which feeds the chain of lakes with the Murray waters. Water-birds were also scarce on Lakes Lockie and Cantala. Among other birds observed here were flocks of Pelicans (*Pelecanus conspicillatus*), Avocets (*Recurvirostra rubricollis*), and Spoonbills (*Platibis flavipes*). The fewness of water-birds was understood later when I heard from several sources that this locality has been more favoured by shooters since it was officially proclaimed a sanctuary than at any other time. Not only is it visited during the open season for game, but at times when game-birds are supposed to be enjoying the protection of law, whether in sanctuaries or otherwise. During the Easter holidays, 1920, officers of the Fisheries and Game Department paid a surprise visit to Lake Hattah, and 10 men were apprehended for illegal shooting on a sanctuary, and convicted and fined in a country court.

The road passing the lakes was firm and hard, and as we drove briskly along we disturbed Spur-winged Plovers (*Lobivanellus lobatus*), small companies of Emus (*Dromaius novæ-hollandiæ*), Straw-necked Ibises (*Carphibis spinicollis*), and different species of Ducks, including the Maned Goose (*Chlamydochen jubata*), the Chestnut-breasted Shieldrake or Mountain Duck (*Casarca tadornoides*), the Black Duck (*Anas superciliosa*), the Grey Teal (*Nettium gibberifrons*), the Pink-eared Duck (*Malacorhynchus membranaceus*), and the White-eyed Duck (*Nyroca australis*). White Cockatoos (*Cacatua galerita*) and Rose-breasted Cockatoos (*Cacatua roseicapilla*) flew in screaming companies among the

trees. Yellow Parrots (*Platycercus flaveolus*) and Red-backed Parrots (*Psephotus hæmatonotus*) were investigating nesting-hollows, and bird-life in general was astir and preparing for the nesting season. Noisy Miners (*Myzantha garrula*) and Brown Tree-creepers (*Climacteris scandens*) were especially common. I was delighted with the variety and number of birds seen on this section of Chalka Creek.

The flood of 1917 was one of the biggest on record, and the Murray River in places was, possibly, over 20 miles wide. Water-birds then nested everywhere, and I noticed many trees on the lake margins studded with old nests of Cormorants and Darters. In a drought, my companion informed me, the Emus have a bad time. They become nearly blind from the attacks of sand-flies, and get so weak that they can scarcely walk.

After passing the boundary gate of Kulkyne Station, the track wound through several miles of dead timber, and an interesting feature was the large area covered by dead and fallen specimens of the introduced sea-green tobacco (*Nicotiana glauca*), possibly killed by the flood waters of 1917. This tree, at one time fostered by station-owners, has spread over hundreds of acres, and in places forms dense thickets. Mr. Balmain's camp was situated in a picturesque spot near the banks of the Murray, and I had my first glimpse of a red-gum bend, and by the noisy notes of innumerable birds I concluded that this would be the happy hunting-ground of many rambles. Ground-Doves (*Geopelia tranquilla*) called loudly from the tree-tops, White Cockatoos screamed, Honey-eaters chattered, and lovely Black-tailed Parrots (*Polytelis melanura*) flashed like gleams of light between the trees. In many places these beautiful old gums form natural avenues, and in their stately beauty resemble the columns and arches of a cathedral.

Here we transferred to a motor-boat, and went merrily down-stream until the landing-stage near the homestead was reached. A few Yellow-billed Spoonbills, Ducks, Pelicans, and a single White Egret (*Herodias syrmatophorus*) were noted, besides numerous Whistling-Eagles (*Haliastur sphenurus*), Ravens (*Corvus australis*), and Honey-eaters.

On arriving at Kulkyne homestead I was welcomed in true bush fashion by my kind host, Mr. Chas. Thompson—a keen naturalist, a careful observer, and a true bird-lover. The homestead nestled amongst pepper-trees, and the surrounding yards and paddocks were bounded by similar trees. This, my headquarters, was in reality a true bird sanctuary. No cats were allowed, and birds reared their young without fear of molestation. Red-backed Parrots, Brown Tree-creepers, Black-and-White Fantails (*Rhipidura motacilloides*), Peaceful or Ground-Doves, Crested Pigeons (*Ocyphaps lophotes*) Brown Quail, and other birds fed on the ground within a few yards, while feeding on the fruits of the pepper-trees were Yellow Parrots and an occasional Spotted Bower-Bird (*Chlamydera maculata*). From this haven of delight I made daily excursions—

Crested Pigeon on Nest.

PHOTO. BY L. G. CHANDLER, B.A.O.U.

sometimes on foot and often on horseback in Mr. Thompson's interesting company. I propose to mention only a few of the most notable birds.

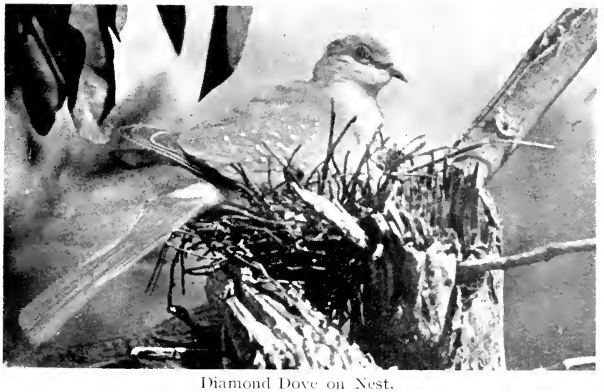
In the immediate vicinity of the homestead were box flats, dry lignum swamps, and a slight plateau known as "the horse paddock." Between the homestead and the river several shallow lagoons were usually frequented by water-birds. Red-kneed Dottrels (*Erythrogonys cinctus*) and Black-fronted Dottrels (*Egialitis nigrifrons*) paraded the banks. The principal vegetation in the "horse paddock" consisted of box gums (*Eucalyptus Woollsiana*), branching goosefoot (*Chenopodium nitrariaceum*), kidney saltbush (*Atriplex stipitata*), juicy saltbush (*Threlkeldia salsuginosa*), spotted Emu-bush (*Eremophila maculata*), prickly saltwort (*Salsola kali*), and a ground carpet of barley-grass (*Hordeum murinum*), and, in places, nardoo (*Marsilea quadrifolia*). The branching goosefoot was much favoured for nesting, and rarely the kidney saltbush was chosen by the Crested Pigeons. I found many Crested Pigeons' nests, the majority being among the branches of the goosefoot, and many were in the pepper-trees. This beautiful bird was interesting to watch, and, although apparently tame when feeding around one, proved very wild at the nest. The bird photographed had its nest in a branching goosefoot bush near the homestead, and would allow me to approach within a few feet before flying off with notes of protest. When I erected the camera she became alarmed, and quickly left. As the weather was windy and the nest in a bad position for snapshots, I spent three afternoons in gaining many interesting notes on the bird and getting her accustomed to the camera. The third day was ideal for photography, a cloudy sky preventing shadows and harsh contrasts. Crested Pigeons are fairly silent birds, but at times they give a loud call like "Woo, woo." When on the nest they have a soft "Wook, wook, wook." I know of no other bird that sits as close as this Pigeon. One nest observed always had the bird sitting on eggs or young. In one case the young could fly, and, although the day was comparatively warm and the nest in the shade, the parent bird was covering them. I concluded that the cause of this strange conduct was purely maternal consideration for the offspring, and was necessary for the preservation of the species. In fully a dozen cases the eggs or chicks disappeared from the nest—probably taken by marauding Hawks or Ravens. The nest is often easily seen, and the white eggs are conspicuous. The continual loss of eggs or young ones would possibly cause the bird to sit closer, and at the same time a more sheltered position would be chosen for the nest. It was noticed that nests which were well sheltered usually escaped harm. Another factor which may be considered is the frailness of the nest and the consequent degree of susceptibility to sudden cold upon the part of egg or chick, if left uncovered. At no time did the sitting bird leave the nest to feed, or was food brought to the sitting bird or young ones by the mate. Stranger still was the

fact that I did not observe the chicks at any time being fed. That they were well fed was evident from their full crops. The male Pigeon was either too shy or too wary to approach the nest while I was near. Perhaps the young Pigeons were fed in the mornings or evenings. My observations were always interrupted by the mysterious disappearance of the young birds. I often disturbed a Pigeon nest-building, and on no occasion was the nest completed. In this respect they were remarkably shy. The material used in the construction of the nest varied considerably. One nest, in a pepper-tree, had the base composed of twigs of the prickly saltwort (*Salsola kali*), and was built up of dry sticks and lined with the seed-bearing twigs of the pepper-tree. Another, placed in a lignum bush, was composed of lignum and eucalypt twigs, and lined with the leaves of an acacia. The old birds and fully-fledged young have a curious habit of jerking the head in a nervous manner when disturbed or alarmed.

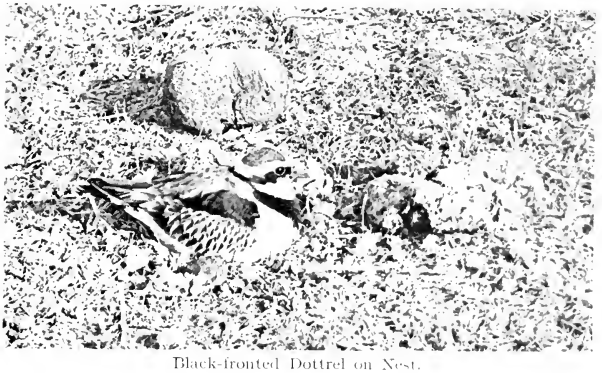
Ground-Doves (*Geopelia tranquilla*) were numerous at Kulkyne, but when I came to set up the camera the eggs had disappeared from the nest in several instances. They are noisy little birds, and a much-used note sounds like "Orioler." The soft cooing of the Diamond Dove (*Geopelia cuneata*) was pleasant to hear, but the species was not plentiful. At one spot where the sea-green tobacco grew thickly on a low sand-hill I could always find two pairs of these birds, and I found both nests: one was on the horizontal fork of a box-tree and the other where the main bole of a tobacco tree had broken and the top spur bent over, forming a suitable hollow for the nest. I had a long wait to secure a photograph, but it was a wait full of interest. Indeed, it is rarely that the bird-photographer has an uninteresting moment, and when he reviews his notes at the end of a day's work the discomforts endured through cramp, &c., are voted minor matters. My camera was camouflaged with leaves and branches, but the Ravens, Crows, and Hawks passing over were quick to notice the addition to the landscape, and in many instances circled slowly above the spot and viewed it carefully. Fearing for the safety of the eggs, I had several times to scare them away. When a Whistling-Eagle hovered near, the Dove remained perfectly still, and did not move until the Eagle had passed. The most pleasing experience of the wait was when a flock of five or six dozen Black-backed Magpies (*Gymnorhina tibicen*), including young birds, settled on the tree under which I was hidden and in adjacent trees, and for half an hour kept up a glorious warble of their flute-like notes. It was marred only by an occasional "Carr-r-r" from an old Raven who had settled on the tree to make a detailed examination of my camera or the eggs. This nest of the Diamond Dove was a frail structure, and was composed of twigs of the sea-green tobacco, with a few horsehairs woven in as a slight attempt at lining.

White-browed Babblers (*Pomatorhinus superciliosus*) were plentiful, and several nests were under observation. After careful

White-plumed Honey-eater at Nest.



Diamond Dove on Nest.



Black-fronted Dottrel on Nest.

PHOTOS. BY L. G. CHANDLER, R.A.O.U.

study I concluded that each nest was tenanted by one pair of birds, but the social instinct of this species is strong. Birds from more than one nest would assist in the building of a neighbour's home, and if not burdened by nesting cares would even help in feeding the young. The habit of building many nests is well known, and, judging by the noisy chatter, they find enjoyment in the task. Some of these nests are used for night shelters. I spent a day at two nests, unsuccessfully attempting to photograph the old birds. The camera was partially covered with leaves and branches, and I was 30 feet distant, behind a bush; but the Babblers would not come near the nest. I had often read of the advantages of an observation tent, and I determined to try it. I built a framework of sticks, sufficiently large to accommodate the camera and myself, and draped chaffbags around and over it, and then covered the whole with leaves. The bird returned to her nest without hesitation immediately I vacated the spot. Next morning, accompanied by Douglas Otey, I fixed my camera and made myself comfortable. My companion, after re-arranging my shelter, went away. The female bird was soon back at the nest, and I had no difficulty in securing photographs. I recommend brother photographers to try this method. This nest contained three eggs, and it was interesting to note that the bird usually brought a beakful of feathers or rabbit's fur as additional lining. To obtain photographs I drove the Babbler from her nest several times. She usually went some distance away to where another pair of Babblers had a nest in a pepper-tree. I could hear her calling as she flew from bush to bush. From observations previously made I concluded that her mate was possibly assisting to feed the brood in this nest, and during her absence—sometimes half an hour—she probably also assisted. Occasionally I noticed two birds feeding the young in this nest, and at times the number had increased to five or six. I can account for this only by the theory that the birds share the burden of nest-building and of rearing the young. I could visit any of the three nests, and, although perhaps only two birds would be in attendance at the time, by imitating the squeak of a young one the noisy alarm notes of the old birds would soon bring reinforcements. I feel almost certain that the additional birds came from the other nests.

Black-fronted Dottrels (*Egialitis nigrifrons*) were always about the margins of the lagoons, but I had little success with this species, and found only two nests. The eggs, three in number, illustrate protective coloration in a most striking manner. At a distance of five or six yards I was impressed by the time taken to re-locate a set of eggs. As the nest is merely a slight depression in the ground, the eggs would be readily picked up by Crows and Ravens if not protected in this manner. Ground-nesting birds like the Dottrel frequently leave their eggs during warm weather for hours at a time. The heat of the soil, combined with the sun's rays, is sufficient for incubation. The young Dottrel, on account

of its colour and markings, is also protected effectively. When first observed it lies flat and keeps perfectly still, but when handled it appears to realize that safety lies in distance, and a fresh place, before it may again squat in safety. By using the observation tent I obtained photographs of the Black-fronted Dottrel. I entered the shelter one day at 1 p.m. From previous observations I did not expect to see the bird until 4 p.m. or 5 p.m., but fifteen minutes after my companion had left she settled a few feet from the nest, and with the bobbing movements characteristic of these birds approached nearer. A few seconds' scrutiny appeared to satisfy her that all was right, and she quickly flew away. It was nearly 5 o'clock before she returned and came to the nest by a series of short runs, and settled down on the eggs. In order to obtain photographs in different positions, I wanted the bird to leave the nest. Whistling, shouting, and tapping the ground-glass of the camera had no effect, but when I started to cough she left hurriedly. Half an hour passed before she ventured back, but, once settled on the eggs, noise did not alarm her much. She sat with her back to the wind at first, but the heavy wind which prevailed ruffled her feathers, and she soon altered her position. At the same time she moved the eggs into place with her bill. I photographed the young in this nest when they were a day old, but could not find them again at a later date. The nest was situated several hundred yards from water, but in a normal season the flood-waters would have covered the site.

Near the homestead was a small area of land called the "Island." In flood-time it is surrounded and partly covered by water, and the remains of several Water-Hens' nests were seen. The vegetation was composed chiefly of branching goosefoot, lignum, and box-gum, and the locality was the haunt of many birds. White-plumed Honey-eaters (*Ptilotis penicillata*) nested freely in the gums and goosefoot, and the latter and lignum were a favourite nesting-site of the Crested Pigeons and White-browed Babblers. Hollow trees contained nesting-hollows of Red-tipped Pardalotes (*Pardalotus striatus*), Red-backed Parrots, Black-tailed Parrots, Tree-Martins (*Petrochelidon nigricans*), and Brown Tree-creepers.

The red gum bends of the Murray River were sources of endless delight. Apart from the beauty of the trees, bird-life was abundant, and the interesting evidence of the former presence of native tribes exercised a peculiar fascination over one's mind. Many trees were studded with the old nests of Cormorants, Herons, Darters, and others. When surrounded by flood waters, large colonies of birds must nest in these bends. The nests of Whistling-Eagles, White Cockatoos, and Black-tailed Parrots were often found. On account of the dryness of the season practically no water-birds were nesting, and the only nest of this class of bird noted was that of a Black Swan.

Nets for catching Ducks, made by the former aboriginal dwellers from a kind of grass belonging to the genus *Juncus*, were suspended between trees at the end of a lagoon, and the

lubras and piccaninnies would drive the Ducks from other lagoons towards the trap. As the birds came near, if they were flying high, the waiting blacks would imitate the alarm notes of the Noisy Miner, and throw pieces of bark into the air. The startled birds would immediately dash close to the surface of the water and become entangled in the net. The latter was then quickly lowered, the birds killed and left floating in the water as a decoy, and the net would be hoisted in readiness for more victims. Kangaroos or Emus were watched when they went to water down a bank, and, sneaking up, the blacks would run a net across the line of retreat, and as the creatures made a dash for liberty they were held by the net until speared. Out in the open plains Emus and kangaroos were stalked and speared by the black carrying a prepared shield of leaves in front of him.

Chalka Creek, previously mentioned, was a paradise for the bird-lover. The red gums fringing its banks were the favoured nesting-sites, and, with typical mallee on one side and box-gum flats and sand-ridges on the other, one saw a great variety of birds. On the mallee side such birds as the White-fronted Honey-eater (*Glyciphila albifrons*) and the Short-billed Tree-Tit (*Smicrornis brevirostris*) were met with, and the bugle-bush (*Ajuga australis*) and the tall thickheads made brilliant patches of colour where they grew in millions. In the mallee the silver mulga (*Acacia brachybotrya*) added a beautiful perfume to the scented air. At Kow Plains, in 1912, I found this acacia a favoured nesting bush of the Purple-gaped Honey-eater (*Ptilotis cratitia*). Under a lignum bush on the west side of Chalka Creek was a fine bower of the Spotted Bower-Bird, and one day, after crawling on my stomach for a hundred yards through dense thickets of stinkwort (*Inula graveolens*), I got within ten yards of a bird at play, and for half an hour watched the wonderful creature through my glasses. It was worrying something with commendable energy, at the same time emitting scolding notes, resembling "Sca-a-r, sca-a-r." I found this to be a piece of ice plant. Running back a foot or two, the bird would emit this scolding note and then hop to the bit of weed, seize it with mock ferocity, and beat it energetically on the ground. Every few seconds it would drop the leaf, jump back a few inches, then advance again to the attack, all the time keeping up an incessant scolding. This continued for some time, and then the bird selected a fresh toy from among the collection of bones, glass, quandong stones, berries, &c. This was a green-nettle leaf, and it was treated in a similar fashion. Nettle leaves were among the playthings each time I visited the bower. I had heard much about the mocking powers of this Bower-Bird when at play, but I was not fortunate enough to hear any attempt at mimicry. A single Bower-Bird was occasionally seen eating the fruits of the pepper-trees at the homestead. Bower-Birds were once numerous in the district, but they have been relentlessly persecuted by fruit-growers across the Murray River. It was a sad sight to see deserted bowers, with the playthings that had

been so carefully collected by the birds, all mouldering and decaying. It seems a crime that such marvellous creatures should be ruthlessly destroyed to satisfy man's greed.

The sand-hills near Chalka Creek were full of interest, and the scenery of a charming type. These sand-hills were timbered with Murray pines, flat-fruited buloke, and, in the hollows, with a *Melaleuca* (*M. parviflora*). The bulokes, in many instances, were thickly covered with the harlequin mistletoe (*Loranthus exocarpi*) and numerous nests of the Yellow-tailed Tit-Warbler (*Acanthiza chrysorrhoa*) were noticed in this parasite. Where the sand-hills sloped away to the creek, large areas of open grass land, dotted with clumps of pine, were a favourite haunt of Rose-breasted Cockatoos. The scenery here was particularly beautiful. A coloured carpet was formed by the broom-like fescue (*Festuca bromoides*), locally called "silver grass," bugle-bush, tall thick-heads, hairy blennodia (*Blennodia lasiocarpa*), twiggy guinea-flower (*Hibbertia virgata*), wiry podolepis (*Podolepis Siemssenif*), hairy swainsona (*Swainsona tephrotricha*), the introduced stork's-bill (*Erodium circutarium*) (local name "carrot weed"), Austral tobacco (*Nicotiana suaveolens*), and others. The Rose-breasted and White Cockatoos are often destructive to grass, and I examined many patches where barley-grass, silver-grass, and the stork's-bill had been systematically pulled up by the birds. On the other hand, while the caterpillar plague was at its worst, I frequently inspected ground from which Cockatoos had been flushed, and could find no evidence of the grass being destroyed, and the absence of caterpillars at these places led me to believe that the birds were feasting upon them. It was a common sight to see the Little Maned Goose and Ducks, fifty yards from the water, busily snapping up the caterpillars. Many Ravens and Crows daily visited the "horse paddock," and, with Straw-necked Ibises, Whistling-Eagles, and smaller birds, made short work of the pest.

A common bird in the Murray pines was the Red-capped Robin, and I noted some of their tiny nests. These lovely little birds appeared to have a fondness for pine country, but I frequently saw them in the box-gum flats. I observed a male bird stow away four caterpillars the length of his own body, and he apparently was quite ready for additional tit-bits. While waiting to photograph a pair of Robins I found for the first time the pit-trap of an ant-lion larva, and became so interested in this curious creature that I nearly forgot my original object, and the birds made several visits to the nest undisturbed.

While on a flying visit to Mildura I added a few more birds to my list, the most interesting being the Chestnut-crowned Babbler (*Pomatorhinus ruficeps*) and the Ground Cuckoo-Shrike (*Pteropodocys phasianella*). A single specimen of the latter was disturbed one evening from a Murray pine, and showed so much persistence in returning to the same tree that I thought it must have a nest there. While I stood under the tree the bird circled

around with a curious floating flight, the tips of the wings being much lower than the body. The notes emitted while flying were remarkably sweet. This habit of returning to a chosen roosting-site is mentioned by Mr. C. F. Cole.*

Mr. Thompson says that many years ago a smaller type of Wild Turkey, or Bustard, than the well-known form (*Choriotis australis*) lived in the Mallee. He frequently found the nest, and the single egg was about the size of that of a Black-breasted Plover. He saw the last of these birds about 30 years ago. Is it possible that such a bird has passed out, unrecorded by science?

The Black-cheeked Falcon (*Falco melanogenys*), he observes, usually kills a Duck with its breast, and he has often secured a free Duck by rousing birds from a lagoon when the Falcon was in the vicinity. It flies under the Duck, and, swooping upward, strikes the bird on the abdomen with its breast. The Duck is usually killed outright, and on skinning the abdomen is found to be greatly bruised. If the bird misses with its breast, it occasionally uses its talons and carries the Duck to the ground, when it nearly severs the head in killing it. I saw the Falcon on only one occasion, and was not able to watch it hunting.

Cockatoos, apparently without harm to themselves, eat the seeds of a small hairy melon which is said to cause blindness in horses. This is another point in favour of the Cockatoo.

Mr. Thompson has had unlimited opportunities of watching Cormorants, and, while he considers most of them destructive to fish, he states that the Little Cormorant (*Phalacrocorax melanoleucus*) lives largely on yabbies. If it is a fact that yabbies destroy fish ova, then the Cormorant is probably a necessity in fish preservation. Such a vexed question should be thoroughly investigated.

I must apologize for the incompleteness of this paper, but my object in dealing with only a few birds was to avoid going over ground already covered by other observers. In conclusion, I must offer my best thanks to Messrs. Chas. Thompson, H. Balmain, D. Otey, and others at Kulkyne for their great kindness and hospitality. I am indebted also to the staff at the National Herbarium, Melbourne, for naming the botanical specimens submitted to them.

Albino Laughing Kingfishers.—On the farm of Mr. Alf. Lukins, at Colac Colac, near Corryong, there are now to be seen four "white Jackasses." Mr. Lukins informs me that the number varies, and that there were six a short while ago. Though I have travelled much in Victoria and have always been interested in bird-life, I have not previously seen or heard of a pure "white Jackass." Emus are still to be seen about the Nariel Creek, 20 miles from Corryong.—J. G. EASTON, Geol. Survey Camp, Corryong.

* See *Emu*, vol. xv., p. 184.

Australian Species of Tubinares (Petrels and Albatrosses).

BY W. B. ALEXANDER, M.A., KEEPER OF BIOLOGY, WESTERN AUSTRALIAN MUSEUM, PERTH.

IN *The Emu*, vol. xviii. (1918), p. 82, Mr. G. M. Mathews published an article entitled "What are Australian Petrels?" In this article he pointed out that a number of species had been included on the Australian list of which no specimen from Australia was in existence, and he therefore proposed that these should be excluded from future lists until actual specimens were forthcoming. This suggestion was entirely in line with my personal views, and I had already, in *The Emu*, queried the inclusion of a number of species on the Western Australian list on the ground that no definite record of their occurrence in that State was available.

The chief point on which I disagree with Mr. Mathews is as to what constitutes a valid record. I do not deny that the most satisfactory record is an actual specimen procured on the coast of Australia or in Australian seas. But even in such cases we are dependent on the reliability of the history given on the label of the specimen. Several of the specimens recorded by Salvin in the British Museum Catalogue as from Australia were almost certainly not obtained at the localities to which they were attributed: for instance, the specimens of the White-bellied Storm-Petrel (*Fregetta leucogaster*) [*grallaria*], presented by Sir George Grey, labelled as from South Australia. Grey was at the time Governor of that colony, but it is practically certain that the specimens must have been obtained on one of his voyages to or from England. Each such case must be judged on its merits, and there may well be differences of opinion on such matters. It will rest with the Check-list Committee to decide the question on the balance of evidence.

Mr. Mathews would not admit any species to the list which have been observed within our limits but not secured. Personally, I think that such cases also should be decided on their merits. Skilled observers could not possibly mistake such species as the Giant Petrel (*Macronectes giganteus*) or the Cape Petrel (*Petrella capensis*): and even if skins of these species from Australia were not forthcoming I would be prepared to admit them if Gould, Giglioli, or other reliable ornithologists recorded having seen them within our limits. A case in point is the Light-mantled Sooty Albatross (*Phœbetria palpebrata*). Dr. E. M. Ferguson, Dr. W. Macgillivray, and I have all recorded in *The Emu* that we observed this species in the Bight. It is a species which is very easily recognized, and therefore I think it should be included. Mr. Mathews, though he constantly uses the word "species," is apparently really treating of sub-species. I quite admit that we shall not know whether the sub-species, *Phœbetria palpebrata*

huttoni, occurs in Australia until specimens have been obtained for examination, but I think the *species*, *Phœbetria palpebrata*, should appear in the list.

In discussing the localities whence various Petrels have been recorded, Mr. Mathews writes: "Ramsay, in his 'Tabular List,' wrote down localities where the species might, in his opinion, occur, not where they had been known to occur," thus attributing to Ramsay the origin of those wide ranges for Petrels on our coasts, which have been followed by Campbell, Hall, and other more recent authors. As Mr. Mathews had already made this charge against Ramsay in his "Birds of Australia," vol. ii., p. 158, and has repeated it since, I think it is worth pointing out that in the notes to both of his editions of his "Tabular List" Ramsay stated:—"All the land-birds except five species have been personally examined by me; the remainder are chiefly *Procellariidæ*, which I have had no opportunity of examining. Their names and the localities given are for the most part taken from Gould's 'Handbook.'" A comparison of Ramsay's tables with those given at the end of Gould's "Handbook" at once bears out this statement. It was Gould, not Ramsay, who gave what Mr. Mathews calls "most wonderful distribution of the majority of species of Petrels," so that these can no longer be attributed to an author "with very little knowledge of Petrels."

In *The Emu*, vol. xviii., p. 214, I pointed out that any discussion as to "What are Australian Petrels?" must be preceded by a decision as to what we are to understand by "Australian seas." I suggested that we should define Australian seas as "all those portions of the ocean nearer to Australia and Tasmania than to any other country." This suggestion was put forward at the annual meeting of the R.A.O.U. in 1918, and was adopted at the annual meeting in 1919, so that the time now seems opportune to prepare a list of the species which have been recorded for that area and to discuss the validity of the records.

In undertaking this review I have consulted the following works:—

1. Gould's "Handbook to the Birds of Australia," vol. ii., 1865.
2. A. Milne Edwards's "Faune des Regions Australes," 1870–82.
3. Ramsay's "Tabular List of Australian Birds," 1888.
4. Salvin's "Catalogue of Petrels in the British Museum," 1896.
5. Campbell's "Nests and Eggs of Australian Birds," 1900.
6. Godman's "Monograph of the Tubinares," 1907–10.
7. Mathews's "Birds of Australia," vol. ii., 1912-13.
8. North's "Nests and Eggs of Australian Birds," vol. iv., 1914.
9. Loomis's "Review of the Albatrosses, Petrels, and Diving Petrels," 1918.

To economize in space these works will be referred to by the numbers given. I am indebted to Mr. Loomis for his kindness in presenting me with a copy of his interesting work.

Important articles on Australian Petrels have recently appeared in *The Emu*, containing the observations of Mr. A. F. Basset Hull

and his assistants on the coast of New South Wales, and accounts of the birds observed at sea by Dr. E. M. Ferguson and Dr. W. Macgillivray. I have also made notes on the species seen on four voyages across the Bight, some of which have appeared in *The Emu*.

The editor, knowing that I contemplated preparing a list of Australian Petrels, has asked me to indicate the names which I think should be used for these birds in the forthcoming edition of the "Check-list," in order that these may serve as a basis for discussion. The directions given by the R.A.O.U. for the members of the Check-list Committee are that the names are to be based on the principles of the International Code, and that "such a generic standard be adopted as would indicate relationship."

I have decided to adopt as a generic standard in this group the genus *Puffinus*, as defined by Salvin in the British Museum "Catalogue" and followed by most subsequent writers. Divisions of this large genus had already been accepted by Gould in his "Handbook," but other Australian writers (until Mathews's work appeared) had refused to follow Gould's lead in this family, though they did so in others. Whilst using large genera in accordance with the direction given, I have indicated as sub-generic names the genera into which these large genera have been split by Gould and other writers.

I have not expressed any opinions as to the validity or otherwise of the sub-specific forms which have been recognized by Mathews, as, except in one or two cases, I have not the necessary material to form an opinion on this matter. I have given for each species all the vernacular names that have been used by recognized authorities. My own view is that sub-species do not need vernacular names, and I have not given those that have been suggested.

FAMILY HYDROBATIDÆ (Storm-Petrels or Mother Carey's Chickens).

This family has commonly been called *Procellariidæ*, but the type of the genus *Procellaria* of Linnæus is *P. æquinoctialis*, not *P. pelagica*, as has commonly been supposed, so that the genus *Procellaria* belongs to the family usually known as *Puffinidæ*.

GENUS *Oceanites*.

Sub-genus *Oceanites*.

Oceanites oceanicus (Kuhl). Yellow-webbed Storm-Petrel or Wilson Petrel.

This species, according to Littler ("Birds of Tasmania," p. 157), is common in Tasmanian seas, where it was observed by Gould in great numbers (1, p. 478). North of this latitude it is apparently uncommon, and very few specimens have been obtained. One was picked up dead 9 miles inland at Marshalltown, Vic. (Leach, "Austral. Bird Book," p. 31). Hull records two off the coast of

New South Wales in October, 1913, one of which was secured (*Emu*, xv., p. 214). Macgillivray saw one when one day's steam W.N.W. of Fremantle in May, 1917 (*Emu*, xix., p. 164). Specimens in the British Museum labelled "Port Essington" and "Coast of Queensland" respectively cannot be regarded as authentic in the absence of any further account of their origin (4, p. 360), but the Macleay Museum has a specimen collected 25 miles off Port Bowen, Queensland, on 27th May, 1875 (*Austral Avian Record*, iii., p. 95).

The type locality of the species is the South Atlantic, off the coast of Brazil. Mathews separates the form found in Australasian seas as *O. o. exasperatus*.

Sub-genus *Garrodia*.

Oceanites nereis (Gould). Grey-backed Storm-Petrel.

This species was observed by Gould in considerable numbers near the eastern entrance of Bass Strait in May, 1839, and the type was collected by him on that occasion (1, p. 476). The species had previously been obtained by Solander in April, 1770, rather further to the eastward (7, p. 17). J. Macgillivray, during the voyage of H.M.S. *Rattlesnake*, obtained one off the coast of New South Wales in July, and another in lat. 43° S., long. 140° E. (4, p. 362).

Mathews has separated sub-specifically birds from other countries.

GENUS *Pelagodroma*.

Pelagodroma marina (Latham). White-faced Storm-Petrel.

This species breeds on islands off the coasts of New South Wales, Victoria, Tasmania, and Western Australia, and in Bass Strait. On the east coast its range extends as far north as the Tweed River (8, p. 356), and on the west coast to Houtman's Abrolhos (1, p. 482).

The type locality of the species is the South Atlantic, off the coast of Brazil. Mathews separates sub-specifically the East Australian birds as *P. m. howei*, the Western Australian as *P. m. dulciæ*.

GENUS. *Fregetta*.

Sub-genus *Fregetta*.

Fregetta tropica (Gould). Black-bellied Storm-Petrel.

Gould states that he saw specimens of this species almost daily in August and September, 1839, from St. Paul and Amsterdam Islands to his arrival in Tasmania (1, p. 470). Giglioli records them from lat. 33° S. long. 101° E. till off Cape Otway, on the voyage of the *Magenta* (6, p. 62). The only authentic specimens procured in Australian waters appear to be one obtained by J. Macgillivray during the voyage of H.M.S. *Rattlesnake*, in lat. 43° S. long. 140° E. (4, p. 364), and one in the Macleay Museum, obtained off the New South Wales coast in May, 1875 (*Austral Avian Record*, iii., p. 95).

The type locality of the species is the South Atlantic. Birds from the South Indian Ocean were described by Gould as a

distinct species under the name *melanogaster*, though other authors have regarded these names as synonymous. Mathews ranks *melanogaster* as a sub-species of *tropica*, and has named the New Zealand race *F. t. australis*. This is the form that occurs in Australian seas.

[*Fregetta leucogaster* (Gould). White-bellied Storm-Petrel.

This species has commonly been regarded as the same as *F. grallaria*, but Mathews shows that it is distinct (7, p. 42).

The type locality is the South Atlantic, and there are two specimens in the British Museum, labelled as from South Australia, presented by Sir George Grey. No doubt these were collected on one of Grey's voyages.]

Fregetta tubulata (Mathews) (7, p. 42).

A specimen killed near the coast of Australia on a voyage to Sydney, by a Mr. Denison, who presented it to Gould, is in the British Museum. There seems no reason to doubt its authenticity, and Mathews has described it under the manuscript name which Gould had written on the label. No other known bird agrees with it.

Sub-genus *Fregettornis*.

Fregetta grallaria (Vieillot). White-bellied or White-breasted Storm-Petrel.

Mathews records a specimen obtained in lat. 35° S. long. 158° 5′ E.—a locality practically equidistant from Australia and Lord Howe Island (7, p. 40). He states that the bird agrees with the type in the Paris Museum, which is said to have come from Australia.

FAMILY PROCELLARIIDÆ.

This is the family generally known as *Puffinidæ*, but, as has been noted above, it includes *Procellaria*, the oldest Petrel genus, from which, therefore, it should take its name.

GENUS *Puffinus*—Shearwaters or Mutton-Birds.

Sub-genus *Alphapuffinus*.

Puffinus assimilis (Gould). Allied or Gould Petrel or Shearwater.

This species breeds on the Houtman's Abrolhos Islands, off the west coast of Western Australia, and in the Recherche Archipelago, off the south coast. Specimens are in the Western Australian Museum, obtained on the beach at Cottesloe, near Fremantle.

The type locality of the species is Norfolk Island, and the typical form may be expected to occur on the East Australian coast; but at present there is no record of its having done so. The West Australian form has been separated by Mathews as *P. a. tunneyi*.

[*Puffinus lherminieri* (Lesson). Black-and-White Petrel or Shearwater.

Mathews considers that a bird obtained by Solander on 6th June, 1770, off the Queensland coast, and described in his manu-

script as *Nectris nugax*, was of this species. The British Museum has a specimen from the New Hebrides, and another reputed to be from New Zealand; so it is not improbable that it may occur in East Australian seas. Solander's specimen is not in existence, and the description does not seem to me complete enough to decide to what bird it refers, so I do not consider the species should appear on our list.]

Sub-genus *Reinholdia*.

Puffinus gavia (Forster). Forster, Brown-backed, or Fluttering Petrel or Shearwater.

Specimens of this species have been obtained on the coasts of New South Wales and Victoria, and Hull met with large numbers on the coast at Ulladulla, New South Wales, in December, 1915 (*Emu*, xv., p. 210). Up to the present they have not been found breeding.

The type of Forster's *Puffinus gavia* came from New Zealand. Mathews considers that Forster's bird was really the New Zealand form of *P. assimilis*, and renamed this species *P. reinholdi*. Loomis considers that the reasons given for making this change are unconvincing (9, p. 60), and I quite agree with him, and therefore use *P. gavia*. Mathews separated the species from the genus *Puffinus*, providing the genus *Reinholdia*. Subsequently Hull described the birds he obtained at Ulladulla under the name of *Cinathisma cyaneoleuca* (*Emu*, xv., p. 205), apparently misled by the difference between the freshly-killed bird and old, faded skins.

Mathews separates the Australian birds from the typical New Zealand race under the name *byroni*. A specimen in the British Museum, presented by the South Australian Museum, and labelled "Adelaide," belongs, according to Mathews, to the race which breeds at Snares Island, New Zealand, named by him *huttoni*. He states, however, that there is no evidence that it was obtained in South Australia.

Sub-genus *Thyellodroma*.

Puffinus pacificus (Gmelin). Wedge-tailed Petrel, Shearwater, or Mutton-Bird.

This species breeds on islands off the coasts of East and West Australia. On the east coast from Montague Island (36° S. lat.) to Raine Island (11° S. lat.); on the west coast, from Carnac Island, off Fremantle, north, at least, to the Dampier Archipelago.

This species exhibits a light-breasted phase, which has been named *P. cuneatus*, and which, in some localities, is the only form found, whilst in others the two occur together. Mathews has stated that this form is absent in Australia, but Gould figured one in his "Birds of Australia," vol. vii. Hull states that in East Australian birds the under surface shows a range from light to dark (*Emu*, xv., p. 208); and there is in the West Australian Museum a light-breasted individual obtained by Mr. T. Carter at Shark Bay.

This bird has usually been known as *P. chlororhynchus*, Lesson

having given this name to a bird from Shark Bay, W.A. Gould subsequently described specimens from Houtman's Abrolhos, W.A., as *P. sphenurus*. Mathews has shown that Gmelin's earlier name of *P. pacificus* almost certainly applies to this species, and he has designated the Kermadec Islands as the type locality. For the West Australian race he uses the name of *chlororhynchus*, and designates the East Australian birds *P. p. royanus*.

[*Puffinus leucomelas* (Temminck). White-fronted or Streaked Shearwater or Petrel.

A specimen of this bird is in the British Museum labelled "Coast of N.E. Australia" (4, p. 370). It was collected by Cockerell, and, as the localities given by this collector are known to be unreliable, it cannot be admitted to the list until another is obtained. The species has been obtained in the Philippines, Borneo, and the Moluccas, so it is not improbable that it sometimes visits the north coast of Australia.]

Sub-genus *Hemipuffinus*.

Puffinus carneipes, Gould. Fleshy-footed Petrel, Shearwater, or Mutton-Bird.

This species breeds on islands off the south coast of Western Australia from Cape Leeuwin to the Recherche Archipelago. Specimens have been obtained as far north as Cottesloe, on the west coast (*Emu*, xvii., p. 40), and as far to the east as South Australia (*Emu*, xviii., p. 61). The type locality for the species is Cape Leeuwin, and Mathews separates the birds found in other localities as distinct sub-species.

Sub-genus *Neonectris*.

Puffinus griseus (Gmelin). Sombre or Sooty Petrel, Shearwater, or Mutton-Bird.

This species has been found breeding on Broughton Island, New South Wales (*Emu*, xiv., p. 97), and several specimens have been picked up dead on the beach near Sydney (7, p. 93). The type locality of the species is New Zealand, and Mathews has separated the Australian birds under the name of *nutcheri* (*Austral Avian Record*, iii., p. 54).

Puffinus tenuirostris (Temminck). Short-tailed Petrel, Shearwater, or Mutton-Bird.

This species breeds on islands in Bass Strait and off the coasts of Tasmania, Victoria, and South Australia.

The type locality of the species is Japan, and Mathews regards the Bass Strait breeding bird as sub-specifically distinct, using for it Gould's name of *brevicaudus*. Hull has described two other sub-species from the coast of New South Wales *grantianus* from Ulladulla and *intermedius* from Cabbage-tree Island, Port Stephens. Mathews regards specimens in his collection from the Barrier Reef, Queensland, and Phillip Island, Victoria, as belonging to the latter race.

GENUS *Procellaria.*

The birds of this genus have been generally known under the name of *Majaqueus*, a genus created by Reichenbach in 1852, with *Procellaria æquinoctialis*, Linn., as type. This species had, however, in 1840 been designated by Gray as the type of the genus *Procellaria*, so that *Majaqueus* is an absolute synonym.

Sub-genus *Procellaria.*

[*Procellaria æquinoctialis* (Linn.) White-chinned Petrel, Black Fulmar, or Cape-Hen.

A specimen in the British Museum, supposed to have come from Tasmania, is stated by Mathews to belong to the New Zealand form of this species, which he has named *P. æ. steadi* (7, p. 114). There is, however, no authenticity to the record (*Emu*, xviii., p. 84), and the species must be removed from the list.]

Procellaria conspicillata (Gould). Spectacled Petrel or Black Fulmar.

Gould states that he observed this bird about St. Paul and Amsterdam Islands, and thence to Tasmania. Subsequent writers have generally not distinguished this species from *P. æquinoctialis*, but Iredale has shown its claim to specific distinction (*Austral Avian Record*, ii., p. 21). There are several specimens in the British Museum labelled "Australia," but none of them has authentic data, and Mathews considers the species should be removed from the list of Australian birds (*Emu*, xviii., p. 84). I think, however, that Gould's definite statement is sufficient ground for admitting that it occurs in Australian seas as now defined, as the bird is quite unmistakable.

Procellaria parkinsoni (Gray). Black Petrel or Parkinson Black Fulmar.

A specimen obtained near Sydney Heads in May, 1875, recorded by Masters (*Proc. Linn. Soc. N.S.W.*, 1878, p. 21), is the only example of this species at present known from Australia.

On two voyages across the Bight I have seen what I believe to have been examples of this species. On the first occasion I only saw two (*Emu*, xvii., p. 41), but on 23rd and 24th March, 1919, small black Petrels were the most plentiful birds about the R.M.S. *Karmala* in the western part of the Bight, and, though I watched them for hours through field-glasses, I could see no sign of any white colour on the head. Macgillivray records seeing black Petrels rather further to the southward on 20th, 21st, 22nd, and 23rd June, 1919 (*Emu*, xix., p. 174).

Sub-genus *Priofinus.*

Procellaria cinerea (Gmelin). Grey or Brown Petrel or Shearwater.

Gould states that he obtained specimens of this species on his voyage from Hobart to Sydney (1, p. 447), but Mathews states that no skins collected by Gould on this occasion can be traced (*Emu*, xviii., p. 84). Gigfioli observed it in Bass Strait during the

voyage of the *Magenta* (6, p. 158). Macgillivray observed it in the Southern Indian Ocean and the western part of the Bight in June, 1919 (*Emu*, xix., p. 174). Mathews would not admit the species to the list in the absence of authentic specimens collected in Australian waters, but I think the above records are sufficient.

GENUS *Priocella*.

Priocella antarctica (Stephens). Silver-grey or Slender-billed Petrel or Fulmar.

Gould states that he frequently saw this bird from the Cape across the South Indian Ocean to New South Wales (1, p. 467). I cannot find any more definite record, but Mathews does not include this species in his list of those of which no Australian specimens are known. Stephens's name of *antarctica* has precedence of 14 years over Smith's name, *glacialoides*, which has commonly been used. Mathews has named the New Zealand form *P. æ. addenda*, but it is not known whether Australian birds belong to this race.

GENUS *Pterodroma*.

Sub-genus *Pterodroma*.

Pterodroma macroptera (Smith). Grey-faced, Great-winged, or Long-winged Petrel or Fulmar.

This species breeds on Rabbit Island, King George's Sound, W.A., and is met with in the seas to the southward of Western Australia (*Emu*, xix., p. 173). A specimen has been obtained in South Australia (*Emu*, xviii., p. 62). Gould found it tolerably abundant off the coast of Tasmania on 30th August, 1839 (1, p. 449), and a specimen was obtained by J. Macgillivray during the voyage of H.M.S. *Rattlesnake*, in June, in lat. $40\frac{3}{4}^{\circ}$ S., long. 123° E. (4, p. 390).

The type locality of the species is the Cape of Good Hope, and Mathews separates the Western Australian form under the name of *P. m. albani*. The New Zealand form was named *gouldi* by Hutton, and Mathews regards Gould's Tasmanian specimen as belonging to this race.

Pterodroma inexpectata (J. R. Forster). Mottled Petrel or Fulmar.

Mathews has recorded that a specimen of this species was obtained at Circular Head, Tasmania, on 6th February, 1890 (*Austral Avian Record*, ii., p. 125). The type locality of the species is New Zealand, and the Australian bird is regarded by Mathews as the type of a race which he has named *P. i. thompsoni*.

Pterodroma melanopus (Gmelin). Brown-headed or Solander Petrel or Fulmar.

A specimen was obtained by Gould in Bass Strait on 13th March, 1839, and described by him as *Procellaria solandri*. Mathews has shown that this bird was almost certainly the same as that which Gmelin named *Procellaria melanopus*, which breeds on Lord Howe Island, and formerly also bred on Norfolk Island (7, p. 142). Loomis prefers Gould's name, as the type is in existence, whereas there must always be some doubt as to the identity

of Gmelin's *P. melanopus*, which was "said to inhabit North America" (9, p. 58). The description seems to me to be good enough to remove all reasonable doubt, hence I think Gmelin's name should be used for this species.

Sub-genus *Estrelata*.

The name *Estrelata* more often spelt *Œstrelata* has commonly been used for the genus, but *Pterodroma* has priority, as it occurs earlier on the same page.

The type of *Pterodroma* is *Procellaria macroptera*, Smith, whilst that of *Estrelata* is *P. hasitata* (Kuhl), so that those who do not consider these species congeneric can use both names.

Pterodroma lessonii (Garnot). White-headed or Lesson Petrel or Fulmar.

This species is not uncommon during the winter in the seas to the south of Australia, and specimens have been obtained in Australian waters by Solander (7, p. 156), Gould (1, p. 452), and Capt. Stanley, of H.M.S. *Rattlesnake* (4, p. 401). Capt. Hutton records meeting with it from long. 102° 41′ E. until his arrival in New Zealand (6, p. 182). W. Macgillivray observed it in the Southern Indian Ocean and the western part of the Bight in June, 1919 (*Emu*, xix., pp. 172–174). I observed specimens in the eastern part of the Bight on 23rd March, 1919, during a voyage from Melbourne to Fremantle. Specimens have been obtained on the east coast at Sydney and on the west coast at Cottesloe (*Emu*, xv., p. 196), and one blown inland was found on the Richmond River, N.S.W., in June, 1879.

The type locality of the species is Cape Horn. Mathews has made a specimen obtained at Sydney the type of a sub-species named *australis*.

Pterodroma mollis (Gould). Soft-plumaged or Downy Petrel or Shearwater.

Giglioli met with this species on the voyage of the *Magenta* in Australian waters until he arrived off Port Phillip Heads. I observed birds which I believe were of this species in the western part of the Bight on 24th March, 1919. A specimen picked up dead on the beach at Cottesloe, W.A., by Mr. F. L. Stromach, on 8th August, 1919, is now in the W.A. Museum. In the British Museum is a specimen presented by Capt. Beckett, labelled "N.W. Australia," and three presented by Sir George Grey labelled "S. Australia," but these were probably obtained at sea. The species was added to the Australian list by Gould on the expectation that it would be found in Australian seas, though he definitely stated that he had not observed it there. It was removed from the list by Mathews in 1913, as no authentic Australian specimens were known. After more than 50 years Gould's expectation has been fulfilled, and the species can be restored to the list on the strength of the Cottesloe specimen.

The type locality of the species is the South Atlantic, and no sub-species have been differentiated.

Sub-genus *Cookilaria.*

Pterodroma cookii (Gray). White-winged or Cook Petrel or Fulmar.

This species breeds on Cabbage-tree Island, Port Stephens, N.S.W. The type locality of the species is New Zealand, and the Australian bird was differentiated by Gould as *P. leucoptera.* Mathews regards it as only sub-specifically distinct. Gould records that he oberved both *P. cookii* and *P. leucoptera* in the seas between Australia and New Zealand, and included *P. cookii* in the tabular list given in his Handbook as found in Queensland and New South Wales. As Mathews points out, it would hardly be possible to differentiate between the two forms at sea, and *P. c. cookii* must be removed from the Australian list.

[*Pterodroma brevipes* (Peale). White-throated Petrel or Fulmar.

This species has been included in lists of Australian birds, but there is no record of its occurrence in Australian seas. As it breeds in the New Hebrides and has been obtained in the Moluccas, it is probable that it may occur in the seas of North Queensland.]

[*Pterodroma neglecta* (Schlegel). Kermadec or Neglected or Phillip Petrel or Fulmar.

This bird has been included in Australian lists owing to confusion with *P. melanopus.* It breeds in the Kermadec Islands, and may, perhaps, be expected to wander occasionally into East Australian seas.]

(*To be continued.*)

Penguins.

BY R. STUART-SUTHERLAND, R.A.O.U., PUYSEGUR POINT, INVERCARGILL, N.Z.

PART I.—GENERAL SURVEY OF PENGUIN FAMILY.

NEW ZEALAND is commonly considered the headquarters of the Penguin group, all the genera except *Spheniscus* being found here. I am one of the many naturalists who incline to the opinion that New Zealand and its adjacent islands should be granted a place as a separate region in the consideration of the geographical distribution of animals. My idea of the extent of the region may be taken as to include the North and South Islands of New Zealand, with Stewart, Lord Howe, Norfolk, and Kermadec Islands, and the Chatham, Auckland, and Macquarie groups, as well as Antipodes Island, Emerald Island, and the Ballany Islands.

Evidence points to New Zealand as also being the centre of dispersion. The oldest known form of Penguin, *Anthropornis nordenskioldi,* from the Eocene (Tertiary) formations of Seymour Island, South Shetland Group, is apparently contemporary with *Palæudyptes antarcticus* of the Oligocene or Eocene rocks of New

Zealand. Remains of *Palæeudyptes*, said to be from the freestone of Oamaru, have been fully described by Prof. Huxley. It was an enormous bird compared to the present existing species, and apparently stood upwards of 5 feet in height, with a wing measurement of approximately 26 inches. The Seymour Island Penguin must have been a veritable giant, standing over 6 feet in height, and possessing wings of a far greater relative length, and of a somewhat less modified type than its existing descendants. Four other fossil Penguins from the Miocene of Patagonia are recorded by Profs. Merceret and Moreni under the specific titles of *Paraptenodytes antarcticus*, *Palæospheniscus patagonicus*, *P. menzbieri*, and *P. bergii*. Strange to relate, these four species also show a proportionately greater length of wing. The Giant Penguin of Seymour Island differs from the other fossils in the greater length and slenderness of the metatarsus.

Fossils differing little if at all from the present type of the Little Blue Penguin (*Eudyptula minor*) are numerously recorded from the Pliocene and Miocene of New Zealand.

Prof. Watson considers "that the Penguins are the surviving members of a group that branched off early from the primitive 'avian' stem, but that at the time of their separation the stem had so far diverged from reptiles as to possess true wings, though the metatarsal bones had not lost their distinctness and become fused into the single bone so characteristic of all existing birds. The ancestral Penguin," he argues, "must have had functional wings, the muscles of which, through atrophy, have been converted into non-contractile tendinous bands." "This view agrees practically with that taken by Dr. Gadow and Prof. Furbringer."

The majority of the Penguins still retain the habit of sleeping with the head tucked under the wing, although very little warmth can be obtained from such a fin-like member. This is undoubtedly a relic of the habit formed when the Penguin did indeed possess a warmth-giving wing.

Penguins approximate to the Grebes (*Podicipes*) and the Divers (*Colymbus*) in the upright position when on land, in the somewhat backward position of their short legs, and they also bear some resemblance to them in the structure of their soft internal parts. The digestive system of the Penguins is very specialized, but possesses points in common with the *Colymbidæ* and *Podicipididæ*; but, as the gut is very long and is thrown into numerous straight, oblique, and irregular convolutions, it is extremely difficult to form conclusions. Roughly speaking, they may be said to be straight-gutted—that is, the loops of the intestine generally run parallel to each other—a condition technically known as orthocœlous. On the one hand they show undoubted affinities to the Petrels and Albatrosses, as one would naturally infer; and on the other they are connected to the Herons and Redbills by the Divers and Grebes.

A Penguin flies through the water just as another bird flies through the air. The action of the wings is somewhat different,

for in flying birds the principal stroke of the wings is downwards, whereas in the Penguins it is upwards, so as to keep the bird under water, for when on the surface the Penguin is only an indifferent swimmer. This change of wing strokes has, of course, caused a corresponding increase in the muscles which give the up-stroke to the wing, and also an increase in the size of the shoulder-blade (scapula). The wings are reduced to flippers, having no power of flexure, the bones being broadened and flattened, and the first and second digits are completely co-ossified.

Worthy of special notice in this connection is the peculiar form of the metatarsus, in which the three essential lengthwise bones are incompletely fused together, being united only at their extremities—a modification usually attributed to arrest of development, for Prof. Gegenbaur's researches have shown that the embryos of all birds possess these bones in an independent condition. Prof. Newton inclines to the opinion that this is a case of relapse produced in adaptation to the peculiar plantigrade functions of the feet of these birds.

As before mentioned, the legs are set far back, the tibia is hardly visible, and the short thick toes are directed forward and connected with a strong web, the small hallux being also turned forward and joined to the tarsus by a very small web.

The skull agrees with that of the Divers and Grebes in having the palate of the schizognathous or cleft type; the internasal septum is incomplete, and there are hollows on the forehead for the reception of glands. The horny sheath of the maxilla is composed of from three to five more or less distinct pieces according to the genera, while the powerful bill may be long, thin, and slightly decurved, as in the members of the genera *Aptenodytes* and *Pygoscelis*, shorter and fairly stout in *Catarrhactes*, and very stout, short, and compressed, as in *Spheniscus*, where the prominent hook of the culmen overhangs a truncated mandible.

The furcula or "wish-bone" is U-shaped. The organ of voice consists of one pair of tracheo-bronchial muscles, arising from the windpipe and attached to the bronchial semi-rings. The tongue, which is rudimentary, is very much reduced in some members of the family.

On the body we find no naked tracts, but a uniform covering of small scale-like feathers with or without barbs, and an equally uniform distribution of down both in the adults and young. Even more striking are the wings, which are totally devoid of normally developed quills, though the number of feathers is very large, the primaries amounting to 36, being more numerous than the quills or wing coverts of any other known bird. The process of moulting is very peculiar, and is accomplished in an exceptional manner, the plumage being shed in patches, and that of the wings gradually flaking off above the new coat. The time occupied in the moulting process varies in the different species, but is seldom longer than fourteen days; seven to ten days is the usual. As the bird never enters the water during the moulting period, and

consequently obtains no food, it is imperative that the time occupied in renewing the plumage be as short as possible. Buller remarks, in the case of the Thick-billed Penguin, that the time occupied was only three days. On the other hand, Dr. Wilson states twenty-one days was the time of the Emperor Penguin. Long superciliary crests occur in some members of the genus *Catarrhactes*. The mandible is more or less feathered in *Aptenodytes* and *Pygoscelis*, and the metatarsi are also clothed in *Aptenodytes forsteri*.

Penguins, when on shore, rest on the whole metatarsus, with the bill usually pointing upwards. Their gait on land is ludicrous, but often fast. A vertical position is generally preserved while they endeavour to waddle along on their toes, every now and then losing their balance and regaining it by the aid of the flippers. The foot cannot then be said to be exactly plantigrade, as the bird only rests on the whole foot or end of the metatarsus, but moves on the toes. When submerged the wings act as paddles, with alternating rotatory action, and the feet as rudders. In habit the Penguin—the only bird able to swallow its food under water—is carnivorous and marine. The usual food is small fish, cuttlefish, and crustaceans, and, according to Gould, marine vegetation, in the case of *Eudyptula*.

Some authors recognize as many as 23 species, and some as few as 14; some divide the family into 8 genera, and others, again, into only 3. Amongst the latter I might mention Profs. Newton and Watson. Not to dwell on this point here, which I have done at greater length elsewhere, I may say I am prepared to admit 18 species, and one melanistic form and also one geographical sub-variety, and to class them in six genera, although I think perhaps five might suffice. The single species of *Megadyptes* could be included in *Catarrhactes*, save that it has twenty feathers in the tail, whereas the members of *Catarrhactes* have only fourteen or sixteen. In outward appearance this species is somewhat similar to *C. schlegeli*.

Various names, both specific and vernacular, have been applied to the different varieties. The following list includes the 18 species here recognized, with some of the names variously applied to them:—

FAMILY SPHENISCIDÆ: Penguins.

Aptenodytes—2 species.
Pygoscelis—3 species.
Catarrhactes—5 species, also 1 sub-species.
Megadyptes—1 species.
Eudyptula—3 species.
Spheniscus—4 species.

Aptenodytes.—Bill long and curved downward towards the tip; tail short, of 20 feathers, partly hidden by upper tail coverts; tarsi feathered. Antarctic Seas.

A. forsteri (Emperor Penguin).

A. pennanti (*longirostris*) (King Penguin).

The names *patagonica* and *longirostris* are sometimes given in reversed order to the above.

Pygoscelis.—This genus is included in the above by Profs. Watson and Milne-Edwards. Bill moderate both in length and stoutness; lower mandible more or less feathered; tail moderate, of 12 to 16 feathers; upper tail coverts short. Antarctic Seas.

P. adeliæ. Adelie-Land Penguin (Black-throated Penguin of Bruce).

P. papua (*taeniata*). Gentoo or Gentu Penguin (Johnny).

P. antarctica. Ringed Penguin (most agile of all the Penguins; sometimes mistaken for a young *adeliæ*).

Catarrhactes.—Bill moderately long, very stout, sides of the upper mandible much swollen near the base; tail long, of 14 or 16 feathers; upper tail coverts moderate to short. Southern oceans.

C. pachyrhynchus. Thick-billed Penguin (*Eudyptes pachyrhynchus*, Buller. Crested, Tufted, or Victoria Penguin. Tawhaki).

C. chrysocome. Yellow-crested Penguin (*E. chrysocoma*, Buller; *E. chrysolopha*, Brandt; Tufted Rock-hopper or Jackass Penguin).

The above is found on most islands of the Southern Ocean, but principally at the Snares, Auckland, Campbell, and Macquarie Islands; but the following (*C. sclateri*) is confined to Bounty and Antipodes Islands.

C. sclateri. Crested Penguin (sub-species).

C. schlegeli. Royal Penguin (*E. schlegeli*, Buller; Grand or Yellow-crowned Penguin. Mistaken for *Megadyptes antipodum*).

C. filholi. Campbell Island Penguin (a little-known variety).

C. vittata. Southern Penguin (*Eudyptes vittata*, Finsch, who says: —"If, indeed a true *Eudyptes*, is easily distinguished from all other members of the Penguin group by its broad white superciliary streak, which runs from the base of bill to the back of head, but which does not consist of elongated feathers").

C. atrata. Listed as a distinct species by Buller, but now considered a melanistic form of the above, although Prof. Evans ("Cambridge Natural History," vol. ix.) states, in his opinion, of *Eudyptes pachyrhynchus*.

Megadyptes.—Bill moderately long, not so stout as in *Catarrhactes*, swelling at base of upper mandible hardly noticeable; tail moderate, of 20 feathers. South Island of New Zealand.

M. antipodum. Yellow-eyed Penguin (*Eudyptes diadematus*, Gould; *E. antipodum*, Buller; recorded from Kerguelen by Saunders as *E. saltator*; "Hoiho" of the Maoris).

Eudyptula.—Bill short and stout, nostrils rounded, placed in middle of bill; tail very short, almost wholly concealed by upper tail coverts. New Zealand, Tasmania, South Australia.

E. minor. Blue Penguin (Little Blue or Pigmy Penguin; Korora).

E. undina. Little Blue Penguin.

E. albosignata. White-flippered Penguin (said to be recorded only from Banks Peninsula).

Spheniscus.—Confined to the Neotropical (South American) region. Bill short, wide, and very deep, upper half slightly hooked, lower truncated; metatarsus longer proportionally than in other genera; tail variable.

S. demersa. Black-footed or Cape Penguin.

S. magellanicus. Jackass Penguin (referred to by Darwin as *Aptenodytes demersa,* "Voyage of *Beagle*").

S. humboldti. Humboldt's Penguin.

S. mendiculus. Galapagos Penguin.

Of the 18 species, 11 are found in the Australian region, but only 7 are peculiar to it. These 7 belong to *Catarrhactes* and *Megadyptes.* In the Ethiopian region, which takes in all Africa excepting the north-western corner, and includes Madagascar, are found 6 species, but only one—the Cape Penguin—is confined to it. Nine species are found in the Neotropical area, but only 4 are peculiar to it; these all belonging to the genus *Spheniscus.*

The range extends southwards from the Galapagos Group (which has an endemic species) round Cape Horn to the Falkland Islands—a few stragglers reaching Brazil—thence breeding stations are found eastwards in Tristan d'Acunha, off the Cape of Good Hope, in the Crozets, Marion, and Amsterdam Islands, Kerguelen Land, and so on to the south of Australia and New Zealand, with the Antarctic Regions as far as man has yet penetrated. The Penguins, then, are not only found amongst the Antarctic ice, but in South Africa, South America, Australia, and New Zealand, as well as on nearly all the islands of the Southern oceans. Four Penguins are characteristic of the Antarctic, these being the Emperor, Adelie, Ringed, and Yellow-crested Penguins.

The nesting habits vary greatly in the different genera. In *Aptenodytes* only one egg is laid in a season, which egg is incubated in a sort of pouch. The egg is carried resting on the feet, and wedged between the legs and the lower portion of the abdomen, whilst over it falls a fold of heavily-feathered skin, which is very loose, and can completely cover the egg. The chick is similarly carried. The males are also equipped with a pouch, in which they also carry the chick on occasions. The young are fed as with Cormorants and similar birds, the chick finding regurgitated food when it thrusts its head inside the parent's mouth. Worthy of note here is the remarkable difference between the chicks of the two species of this genus, which are themselves, save in size, so remarkably alike. The young King Penguins look like young bears in their long grey-brown down, whereas those of the Emperor are silvery-white, with the head wholly black, except for a patch of white on each side, including the cheek and eye.

Remarkable also is the fact that the Emperor nidificates during the Antarctic winter, but the King commences to lay at the Macquarie Island rookeries about November.

In *Pygoscelis* two eggs are laid, in the Adelie or Gentu the nest being built of stones, which the birds often gather from a great distance. The nest is similar in the Ringed Penguin, but the bird has the peculiarity of laying the second egg after the first is hatched. This has apparently given rise to the belief that this species has two stages of down.

In *Catarrhactes* a rough nest is formed of sticks and leaves, said to be gathered by the male, whilst the female does the building in a cave or under large rocks. Two eggs are laid—rare instances are recorded of three—which the parents incubate in turns. The position adopted by the sitting bird, as in all the Penguins, is nearly upright, leaning somewhat forward, with the lower portion of the abdomen covering the eggs.

In *Megadyptes* no rookeries or large assemblies are formed. Only a few pairs live together and breed amongst the tussock grass, of which they form a rough nest.

In *Eudyptula* the two white eggs are laid in burrows under rocks or in caves. The bird is said to dig the burrows, sometimes over 5 feet in depth, with the feet and beak. A few pieces of straw or grass are sometimes employed on which to lay the eggs.

In *Spheniscus* the habit differs with the species, and even with individuals. Generally speaking, nidification is carried on either as in *Catarrhactes* or *Eudyptula*, or in a combination of both styles. Three eggs in a clutch is common, and four is in one instance recorded of the Jackass Penguin.

The name "Penguin" is said to have been originally applied to the Garefowl or Great Auk (*Alca impennis*) of the northern hemisphere, and to have been given to the Penguins by early voyagers, who saw in the Penguin a somewhat similar bird. Others say that the name is derived from the Latin *pinguis*, meaning fat, or from the Welsh *pengwen*, meaning white-head (an early name for the Great Auk); but such appellations are usually obscure.

(To be continued.)

Recent Figures of Acanthizæ.

By GREGORY M. MATHEWS, F.R.S.E.

IN *The Emu*, vol. xix., p. 81, pl. xix., October, 1919, a figure was given of the Allied Buff-rumped Tit-Warbler (*Geobasileus hedleyi rosinæ*), the text by Captain S. A. White. In the next number, on p. 161, an article entitled "The Small-billed Tit-Warbler (*Acanthiza morgani*)" appears, by A. J. Campbell. Therein, apparently, a direct denial to Captain S. A. White's identification

of the species figured is made, but the matter provided by Mr. Campbell is not clear, so that I state the following facts:

Mr. Campbell states that *Geobasileus hedleyi* appears "without ornithological description—practically a 'nude name.'" It was *described* in the *Austral Avian Record*, vol. i., p. 78, 8th June, 1912, as a sub-species of *Acanthiza iredalei*, and "its supposed sub-species *rosinæ*—also without technical description" was described in detail in the *Austral Avian Record*, vol. ii., p. 9, 2nd August, 1913.

The facts in the present case read thus:—

Zietz named a bird *Acanthiza tenuirostris* from South Australia—a name which had been used before, and consequently the specific name falls, *and cannot be maintained in any circumstances.* I named a bird from Western Australia (interior) *Acanthiza iredalei*, and then provided for Zietz's form the new name *A. morgani*. These prove to be sub-species only, so that the first name becomes the species name. I received a form from the south-east of South Australia which I confused with *A. iredalei*, and I described it as *Acanthiza iredalei hedleyi*. Later, I received a new form, which I described as *Acanthiza rosinæ*. When I prepared my list I recognized the true affinities of the forms, and separated the former as a new species of *Geobasileus* and ranked *rosinæ* as a sub-species of it. This species is quite distinct, when the characters are known, from *Acanthiza iredalei*. As the latter is still a rare bird, it is not surprising that F. E. Wilson described the Victorian form as a new species—*A. winiamida*.

As to the other memo. by Mr. Campbell, he is quite right in confirming Howe's suggestion that Captain S. A. White's *Acanthiza marianæ* (*Emu*, xvi., pl. xxxiii.) is the Everard Range representative of Milligan's *A. robustirostris*, for which I introduced the genus *Milliganía*. These Acanthizas are puzzling enough without unnecessary complications, so that I recapitulate:—

Acanthiza iredalei iredalei (Mathews).
Interior of Western Australia (Lake Way).
Acanthiza iredalei morgani (Mathews).
Interior of South Australia (Leigh's Creek).
Acanthiza iredalei winiamida (F. E. Wilson).
Mallee of Victoria.
Geobasileus hedleyi hedleyi (Mathews).
South-east of South Australia.
Geobasileus hedleyi rosinæ (Mathews).
North of Adelaide, South Australia.
Milliganía robustirostris (Milligan).
Murchison, Western Australia.
Milliganía robustirostris marianæ (S. A. White).
Everard Range, Central Australia.

Little Penguin in Queensland.—Ornithologists will be interested in the fact that the Queensland Museum has recently received a fine specimen of a Little Penguin taken in Queensland waters.

Aboriginal Names of Birds.

BY E. S. SORENSON, R.A.O.U.

I WOULD like to suggest to members of the R.A.O.U. and others that aboriginal names of birds be obtained whenever possible from the different "towris" (aboriginal territories). Many of these names, properly pronounced, are euphonious; they have the virtue of originality, and are much better for general use than many of the popular names now on the bird list. The surest way to popularize a bird, to make it loved and known to everybody, is to give it a name that appeals to the child and the poet.

I append a few aboriginal names to start with:—

Maned Goose (Wood-Duck)	Gnaroo.
Pigmy Goose	Widgelow.
Green Pigmy Goose	Loombi.
Cape Barren Goose	Lowrie.
Pied (Magpie) Goose	Muldrie.
"Black" Duck	Mara; Koona.
Whistling-Duck	Chipala.
Plumed Whistler	Nowee.
Blue-billed Duck	Boodoo.
Pink-eared Duck	Wymbin.
Mountain-Duck (Chestnut-breasted Shieldrake)	Perna.
Rajah Shieldrake	Mahdo or Mardo.
White-eyed Duck	Bubbuloo.
Little Cormorant	Go Go.
Pied Cormorant	Mahdee.
Cormorant (Black Shag)	Muloora.
Pectoral Rail	Kullee.
Black Moor-Hen	Kilkie.
Blue Bald-Coot	Goolima.
Australian Crane (Native Companion)	Brolga.
Nankeen Night-Heron	Gnalgan.
Australian Bittern	Boon Boon.
Mangrove-Bittern	Woggal.
Plain Turkey (Bustard)	Kio; Gumblegubbin
Brown Kingfisher (*Dacelo gigas*)	Kitticarrara.
Brush-Turkey	Gweela.
Barnard's Brush-Turkey	Wundoora.
Jungle-Fowl	Koogerri.
Mallee-Fowl	Lowan.
Collared Sparrow-Hawk	Bil Bil.
Allied Kite	Jilli Jilli.
Nankeen Kestrel	Min Min.
Winking Owl	Gooragang.
Owlet Nightjar	Teringing.
Pied Bell-Magpie	Kurrawong.
Grey Bell-Magpie	Koolardi.
Grass-Parrot	Linden.

Ground (Swamp) Parrot	Goolimang.
Night (Spinifex) Parrot	Myrlumbing.
Blue Mountain Lorikeet	Warren.
Purple-crowned Lorikeet	Kowa.
Little Lorikeet	Jerriang.
Varied Lorikeet	Weto.
Little Green Pigeon	Punkaree.
Bronzewing Pigeon	Warri Warri.
Crested Bronzewing	Warracoutah.
Squatter or Partridge Bronzewing	Manga.
Sun-Bird	Tirridirri.
Chestnut-crowned Babbler	Pirrigilgilli.
Grey-crowned Babbler	Wirrbing.
Spotted Diamond-Bird	Weetuwee } Birds'
Spine-tailed Log-runner	Chow-chilla } own
White-plumed Honey-eater	Chickowee } notes.

Such names as Galah, Corella, Budgerigar, Quarrian, Weejugla, Kookaburra, &c., are in common use. Why not place them first, as with Gang-Gang and Wonga Wonga, instead of Rose-breasted Cockatoo, Long-billed Cockatoo, Warbling Grass-Parrot, and so forth ?

The Little Eagle.

By R. G. Hays, R.A.O.U., Sentry Box, N.S.W.

In June last I was attracted by the strange flight and whistle of a new bird in the district (*Entolmaetus morphnoides*). Flying at a great height, it kept closing its wings and dropping as low as the tree-tops, then rising again to where it had started from almost perpendicularly; this it repeated for several minutes at a time, all the while calling to its mate, who was on the wing higher up. Its call is three little whistles, the first and last higher pitched than the middle one, and it is so penetrating that you can hear the whistle while the bird is still too high to see. Hearing the whistle every day, I could generally see the bird after a time, very high in the air, going through these manœuvres of his, rising and falling hundreds of feet at a time, as if to work off his superfluous energy, and one day I saw him alight on a very tall dead tree overlooking a rabbit warren. This was the first time I had seen him resting, and then it was only to watch for young rabbits to come out, on which he was living. Saw him on two occasions pick up small kittens and carry them off. After watching this pair off and on for nearly two months I discovered where they were nesting in a tree over another rabbit warren, and secured a photograph of the nest and egg (*in situ*), and the female bird was taken for identification. Wing measurements were 22 inches much larger than before described. The male bird was never seen helping in nest-building, but was always near, flying high above the tree. They seldom flap the wings when once up in the air, and rival the Wedge-tailed

Eagle (*Uroaëtus audax*) in flight if wishing to ascend. The male bird has since got a new mate. The two are using the old nest of his former mate, and now (27th October) have hatched out their one and only offspring. This seems very peculiar, after being so interfered with in the first attempt. While the female is sitting on the egg the male bird carries her food, which she tears to pieces and eats on the side of the nest. These birds are evidently following the rabbits as they extend further north to New England, as I have not seen them here before, and since finding these have located another pair, nesting also. As these birds live to a great extent on young rabbits, they should be rigidly protected.

Birds Nesting in the Drought, and its Effects on Same.

BY R. G. HAYS, R.A.O.U., SENTRY BOX, BUNDARRA, N.S.W.

As early as 30th August this year I found the Yellow-tufted Honey-eaters (*Ptilotis melanops*) nesting, and, as these birds are not very common in this district, I became interested in them and watched their nesting operations. I am convinced that all birds group for nesting more or less, and these were a very decided instance, as I found fifteen nests within a circumference of one mile, and outside of that group you could not find a single nest or hear the familiar "Cheop, cheop" of a single bird. Of the fifteen nests found, two only hatched out. One of these was destroyed by a fox when the young birds were nearly able to fly; the other nest was built on the side of a tree, about 6 feet from the ground, and the young survived.

Two others laid two eggs each, sat on them for a while, and then deserted them. Of the other eleven nests completed, all were deserted without having eggs laid in them, and, as this is the 30th October, and all the birds have departed, the nests are still empty, so it looks as if the increase in this particular species will be *nil*, unless rain induces them to start nesting operations all over again in some other locality. It would appear certain that the drought was the indirect cause, and the lack of blossoms, natural food, and water caused by the long-continued dry spell the direct cause. Only one nest was built higher than 4 feet from the ground, one was almost on the ground, the others all about 2 feet high, in small ironbark bushes in most cases, one case on the side of a tree, one in the dead leaves of a fallen tree, and several in a low heath bush. This desertion of nests (all ready for egg-laying) was found also with the Fuscous Honey-eater (*Ptilotis fusca*). Of twenty-two nests found, only three hatched out. The remainder, as far as could be ascertained, never had eggs laid in them; but, as most of these birds build very high, I could not be sure, though I am certain that no others hatched out. Most other Honey-eaters here have not attempted to build yet, as the drought is still in full force (31st October, 1919).

Discovery and Early History and Notes on the Lyre-Bird (Menura superba).

By H. V. EDWARDS, R.A.O.U., BEGA, N.S.W.

ACCORDING to Collins ("Account of the English Colony of New South Wales"), the Lyre-Bird (*Menura superba*) was accidentally discovered in January, 1798, by "a party of Irishmen" allowed by Governor King to go out in search of land suited for a separate settlement for themselves. These amateur explorers, who were unsuccessful in their quest, penetrated to the Blue Mountains, where they obtained and brought back to the settlement on Port Jackson specimens of a "new variety of the Bird-of-Paradise," which was subsequently named the "Lyre-tail"—*Menura superba*. Collins gives an accurate figure of this avian treasure trove from the "pencil of a capital artist." Then apparently arose the difficulty of classification. Temminck began by placing the bird among the Thrushes, between the forms *Cinclus* and *Pitta*—an arrangement followed pretty closely by Cuvier. Vieillot, however, differed, placing the Lyre-tail near the group *Columba*; while Illiger, in his "Prodromus," placed it among the Rasores, as also did Vigors, who included the bird in his family of *Coracidæ*. The new bird was also referred to occasionally as "Lyre-Pheasant," or "Pheasant of the Woods," and classed with the Hornbills. Swainson, however, in his "Classification of Birds," made *Menura* the first genus of his group *Megapodiinæ*, or "Great-foots."

As regards the habits of the Lyre-Bird, early observers arrived at some strange conclusions. Collins says:—"They (the Lyre-Birds) sing for two hours in the morning, beginning from the time when they quit the valley for the hills"; while Chief Justice Field, of Gibraltar, who was long resident in New Holland, asserted that the *Menura* was in "all its habits a Gallinaceous bird, living on the ground in small societies, and being very fond of rolling in the dust." At a much later time, Bennett, in his "Wanderings in New South Wales," &c., 1832-34, records that tails from the male Lyre-Birds were sold in Sydney as curios—first at low prices, and then, as the birds grew scarce through constant destruction, at from 20s. to 50s. the pair. He then makes a most remarkable statement. "The nest of the Lyre-Bird," he says, "is formed merely of dried grass or dried leaves scraped together: the female lays from twelve to sixteen eggs, of a white colour, with a few scattered blue spots." The single egg of the Lyre-Bird is, of course, blotched with chocolate-brown on a ground of bluish-grey, while the huge nest is cleverly constructed from sticks, twigs, mosses, bark, &c., and shaped like that of a Blue Wren or Superb Warbler. From an accidental resemblance, too, between the European Wren and its nest and the Lyre-Bird and nest, the latter has been classed by some superficial writers as a "Giant Wren." The breeding-time of the Lyre-Bird, according to Bennett, is December, "when all the wild animals in the colony (New South Wales) are produced."

Even in these early days (about 1834) Bennett had cause to lament the rapid disappearance from settled parts of "the kangaroo, Emu, and Lyre-Pheasant," while the writer (in the "Penny Cyclopædia," 1839) to whom I am indebted for much of the above information "hopes that some spirited individual will not suffer the Lyre-tail to become extinct, but will bestir himself to import these magnificent birds into our country (England), where they would form a striking addition to our aviaries." This beneficent hope was, unfortunately, doomed never to be fulfilled —for obvious reasons.

Although the Lyre-Bird (*Menura superba*) is tending to some extent to place its huge nest in elevated situations—such as tall stumps, tree-ferns, &c., it still breeds in many instances on or close to the ground. The two nests, recently photographed, were built—one in the heart of dense ferns and the other in perfectly open forest recently devastated by a bush-fire. One nest was well concealed and the other totally destitute of cover. In both instances, however, the egg and the loud-voiced chick were quite at the mercy of prowling foxes. In another instance the nest was built at the butt of a tree-fern, again quite destitute of cover, and, from its great size, a most conspicuous object. Many other birds, at times, exhibit the same want of caution in the selection of a nesting-site. Thus, the common Magpie (Crow-Shrike) has been known to build its conspicuous nest on a heap of road-metal.

Some Bird Notes from Bega.

BY H. V. EDWARDS, R.A.O.U., BEGA, N.S.W.

THE White-browed Wood-Swallows arrived here about the middle of this month (October), as they do pretty regularly. Not very long after their advent the big brown chafer beetles began to emerge from the ground. These beetles now annually defoliate the finest gum-trees in many districts. In early years on Monaro, N.S.W., I only remember them as appearing sparsely on gum suckers and small gums—chiefly cabbage gum, white gum, and box. Is the reduction in the number of insectivorous birds responsible for the increase in this pest?

Quail have also put in an appearance. I found one (of the Stubble variety, *Coturnix pectoralis*) impaled by the neck on the top (barb) wire of a fence. It had flown directly into a barb, and was just beginning to decompose when found.

The Cormorants are arriving from their breeding-grounds contemporaneously with the stirring of mullet fry in the ponds and rivers and the awakening of aquatic life generally.

The Oriole (*Oriolus viridis*) arrived in August. These birds were rather troublesome in orchards last summer. I also saw them feeding on the purple-black berries of a species of laurel. The

spring traps set by rabbiters seem to capture incidentally a good many birds. I found a White-backed Magpie caught by the leg, which was almost severed. I completed the severance without protest from the bird, and it flew off; but in another instance I found one of these birds with its beak cut clean off, not far from the root. It could not eat, and died a day or so after discovery. In another instance a fairly large black snake, furious at its detention, was found imprisoned in the jaws of a rabbit trap.

The Soldier-Bird.—Professor Newton, "Dictionary of Birds," page 428, makes a curious misstatement regarding the Sanguineous Honey-eater or "Blood-Bird" (*Myzomela sanguinolenta*), which, he says, is "called 'Soldier-Bird' by the colonists owing to the colouring of its plumage—crimson or scarlet." It is, of course, the Garrulous Honey-eater (*Myzantha garrula*) which is known as "Soldier-Bird," from its pugnacious disposition. By the way, at a time when the whey from cheese factories was allowed to remain outside in open barrels, &c. (to be subsequently fed to hand-reared calves), the "Soldier-Birds" in some South Coastal (N.S.W.) districts manifested a strange fondness for this by-product, and many of the birds fell into the receptacles and were drowned. This winter—a very dry one—these bold birds, with Magpie-Larks, Common Magpies (Crow-Shrike), Black-and-White Fantails, &c., are drinking from my horse's water-tub.

Stray Feathers.

Migration of Crows.—Lately I have noticed an exceedingly interesting migration of Crows. As many as 2,000 of these birds were seen in one flock, all flying in one direction. They all seemed to be cawing at the same time, and made a noise like a train going through timbered country in gloomy weather. I have never noticed such a large flock apparently migrating before. It is probably due to the dry weather and the consequent lack of water.—J. R. CHISHOLM. Prairie, North Queensland, 25/4/20.

* * *

Native Companions.—Probably owing to the severe drought in New South Wales, two fine specimens of Native Companions (*Antigone australasiana*) visited Mr. R. Sammon's farm, Boorhaman, during September, 1919. These two birds became very tame, strutting about the homestead paddocks, and were a source of pleasure to the Sammon family, who fed them with wheat. Early in December one of the birds disappeared, probably being shot. The remaining bird is still to be seen gracefully strolling around. The writer, on 31st May, 1920, drove within 15 yards of this lonely bird. The Native Companion was a common species in this district years ago, Mr. Sammon informing the writer that these two birds are the first he has seen for 16 years or so. What

a pity this only Australian species of Crane is becoming extinct in Victoria—so graceful of movement, so interesting to watch!—C. F. COLE. Wangaratta (Vic.), 5/6/1920.

* * *

Albatrosses at Sea.—My friend Dr. Macgillivray has given some very valuable notes on sea-birds, and I wish at once to draw attention to his records of the Flat-billed Albatross in Australian waters. I have just questioned the occurrence of this species, and I note that under date 14th June (p. 171) he wrote:—"The bill is black, with culmen yellow to the tip. One also had a good deal of yellow along the lower border of the mandible." This last is characteristic of *chrysostoma*, but this specimen was not near Australia. Then, on 20th June (p. 173), about 300 miles S.E. from Cape Leeuwin and directly south of King George's Sound, he recorded *T. chrysostoma*, and, giving a good description, stated—"Broad yellow stripe on culmen; no yellow on mandible except at base." This is diagnostic of *chlororhynchus*. On the 23rd June (p. 175), near Kangaroo Island, he added for the first time *T. chlororhynchus*, giving distinguishing features as to coloration of head, &c., and also notes *T. chrysostoma*. In view of the discrepancies noted above, it is urgent that some sea expeditions should be undertaken to procure specimens, as there is still a strong doubt as to the status of the Flat-billed Albatross in Australian waters.—GREGORY M. MATHEWS. Foulis Court, Fair Oak, Hants., England, 28/2/20.

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Correction *re* **Cuckoos.**—Mr. Gregory M. Mathews writes:—"I am gratified that Mr. A. J. Campbell has drawn attention to an apparent oversight with regard to the identification of a Cuckoo by his son, whose note I published in "The Birds of Australia," vol. vii., p. 316. Wherever possible I have introduced original notes in preference to copying already published ones, but I have found that many cases of duplication occur, as there is in this instance. Mr. A. G. Campbell sent me the original note which I published, and he also introduced the same matter into a paper which was published in *The Emu*. Apparently, in the latter place he reconsidered the matter, and gave the correct identification of the Cuckoo, which he had wrongly identified in the note he sent to me. I am dependent upon the accuracy of the worker for the identification of birds when they are good enough to send me notes of habits, &c., and I cannot accept any responsibility for errors, but always try to correct such when pointed out."

Mr. Campbell replies:—"Mr. Mathews is welcome to the correction. My son was reared amongst the Square-tailed Cuckoos, and not likely to confuse these birds with the Fan-tailed species, which he also knows well. Moreover, I was present when the specimen in question (nestling of the Square-tailed) was procured on the Upper Yarra Ranges. Therefore, any error in identification most likely has occurred on Mr. Mathews's side of the world, and not here."

PLATE IV.

Singing Honey-eater at Drinking Vessel.

Spotted Bower-Bird Coming to Drink.

PHOTOS. BY D. W. GAUKRODGER, R.A.O.U., QUEENSLAND.

Camera Craft Notes.

Attracting Birds. Among the growing army of bird-photographers in Queensland, and especially those living in the country, a favourite device for attracting birds is to place small tanks, dishes, and other receptacles containing water in suitable positions. By the exercise of this humane method, Mr. E. M. Cornwall, of Mackay, has, as readers of *The Emu* are aware, obtained many excellent photographs; and it has been used to advantage of late by Mr. D. W. Caukrodger, of Alice Downs station, Blackall, Central Queensland. During the bad spell of dry weather recently experienced in Queensland Mr. Caukrodger "snapped," at his water-tins, many species of birds, a couple of which are here reproduced.—A. H. Chisholm. Brisbane.

State Secretaries' Reports.

Tasmania.

I have pleasure in reporting that the *Animals and Birds Protection Act* is now in operation in this State. The Act is the outome of over ten years' agitation by the nature lovers of Tasmania, and, while not a perfect measure in some respects, yet it is a vast improvement upon the *Game Protection Act* which it superseded. One essential difference is that the management is now in the hands of the Police Department, and not the Lands Department, as formerly. The Act will do much good as regards the indiscriminate destruction of our native fauna, and the skin trade will be subjected to closer inspection in the future than it has been in the past. Several heavy penalties, including one of £62 and one of £50, have already been imposed for offences against the Act.

Up to the present the authorities had little knowledge of the extent of the skin trade. When the measure was being drafted and discussed the question of the cost of administration was naturally considered, and some objection raised on this account. It was held in some quarters that the revenue derived from the Act would not amount to £1,000, but those of us who were advocating the measure maintained it would be more like £5,000 per annum. As a matter of fact, even our estimate has been exceeded, and already £8,000 (eight thousand pounds) has been received in licence fees, &c., apart from fines.

At a recent meeting of the Fisheries Commissioners a report was received from a sub-committee dealing with certain of the inland lakes. One clause recommended that, as the Australian Coots were eating all the weed and interfering with the fish, steps be taken to reduce their numbers, which, owing to the dry season, had become very plentiful in certain areas. I was able to have this clause deferred for further consideration, and in the

meantime have collected certain information, which I hope to lay before my fellow-commissioners with the object of inducing them not to agree to the recommendation of the sub-committee.

The Tasmanian *Animals and Birds Protection Act.*—Under the provisions of this Act all native and other birds are protected, with the exception of the following:—Native-Hen (*Tribonyx mortieri*), Cormorants (*Phalacrocorax*), Goshawk (*Astur novæ-hollandiæ*), Sparrow-Hawk (*Accipiter cirrhocephalus*), Wedge-tailed Eagle (*Uroaetus audax*), Falcons (*Falco*), Brown Hawk (*Hieracidea berigora*), Starling (*Sturnus vulgaris*), Lorikeets (*Glossopsittacus*), Green Parrot (*Platycercus flaviventris*), White Cockatoo (*Cacatua galerita*), Raven (*Corvus australis*), Crow-Shrikes (*Strepera*), Sparrows, Blackbirds, and Goldfinches. Mutton-Birds (*Puffinus tenuirostris*) are protected for such time in each year as may be proclaimed by the Government. Cape Barren Geese, Bronzewing and Brush Bronzewing Pigeons, Wild Duck, Coot, Bald-Coot, Teal, and Black Swans are protected from 1st July in each year until the last day of February in the following year. Quail and Wattle-Birds are protected from the 1st July in each year until the 31st May in the following year.

Protection of Quail and Plover in Tasmania.—While Quail may be shot during the month of June, neither Quail nor Plover may be offered for sale. This should go far in assisting to preserve these valuable economic species. In the past a considerable traffic has been done, especially in Quail. The practice used to be to obtain large numbers during the open season and place them in cold storage. It was wonderful the number of birds which came "off the ice" during the close season. Fortunately, this traffic is now stopped, and the elimination of commercialism should give satisfaction not only to the bird-lover but to the true sportsman as well.

Under a regulation recently gazetted, Plovers were placed on the wholly protected list. The economic qualities of this bird are gradually becoming recognized by the agriculturist and sheep-farmer.

CLIVE E. LORD, *State Secretary.*

NEW SOUTH WALES.

THIS State is still suffering from the dry period, and the birds west of the Dividing Range are having rather a hard time. Mrs. Norton, of Boree station, Walcha, reports that many resident species have disappeared, apparently moved eastwards to where conditions are a little more equitable.

Pulba Island, an area of about 156 acres, in Lake Macquarie, has been gazetted as a sanctuary, and a trust appointed to control it. The island is well wooded, with some thick semi-tropical scrub and with permanent water. It is the intention of the trust to put a caretaker in charge, plant with food-bearing trees, shrubs, and vines, and stock it with such of the rarer Australian fauna as is calculated to thrive there.

It is interesting to note that among the many Birds-of-Paradise kept at Taronga Park, Rudolf's Blue-Bird has taken three years to reach full plumage. In 1917 there were no plumes visible, though the bird was fully adult and performed his "display." In 1918 the plumes were about 2 inches in length, and double that in 1919, but this year they appear to be fairly fully developed, and the two long black feathers in the centre of the tail have appeared for the first time. The bird spends an hour or so every day in display. This is done by hanging down beneath a bough and working the feathers of the breast and abdomen with a rhythmic motion and uttering a soft creak the while.

Most of the branches of the Gould League are active, and the spirit of the work is being kept up. Many centres have urged that Quail and Pigeon slaughter of indiscriminate nature be stopped, and a general interest in the value and beauty of bird-life is manifest.

Messrs. Angus and Robertson are endeavouring to fill a decided want among ornithologists in bringing out a book on the Australian birds that will contain a coloured illustration, full description, and a few notes on the habits, &c., of every species recognized by the R.A.O.U. "Check-list." This work will be in a handy form and issued at a reasonable price. It will first come out in parts. Mr. A. S. Le Souëf is doing the letterpress and Mr. Neville Cayley has the illustrations in hand.

The new Act for the protection of the birds and animals of New South Wales is now in force, and has been found to be effective, but it will require the whole-hearted co-operation of the land-owners and more general education as to the objects aimed at for it to get the backing that it deserves. This Act is largely the work of the Wild Life Preservation Society a body which is doing excellent work and will make it their business to see that its provisions are carried out as far as lies in their power.

A. S. Le Souëf, *State Secretary.*

Reviews.

THE EVOLUTION OF GREGORY M. MATHEWS'S "CHECK-LIST" OF THE BIRDS OF AUSTRALIA.

By A. F. Basset Hull, President R.A.O.U., Hon. Ornithologist Australian Museum, Sydney.

As a necessary preliminary to the preparation of his "Birds of Australia," Gregory M. Mathews published a "Hand-list of the Birds of Australia."* He admitted that this "Hand-list" was imperfect, especially as regards knowledge of the geographical distribution of species. The nomenclature was in so far at fault as the starting-point was Linné's twelfth edition (1766), instead of

* *The Emu*, vol. vii., January, 1908.

the tenth edition (1758), as required by the laws of the International Zoological Congresses. The "Hand-list" was, nevertheless, gratefully accepted by Australian ornithologists, as it was based on Bowdler Sharpe's "Hand-list of Birds," and was a distinct advance on Hall's "Key,"* comprising 883 species as compared with Hall's 816. The "Hand-list," however, included the species found on Lord Howe and Norfolk Islands.

This "Hand-list" did not retain its usefulness for Mathews's purposes for any lengthy period, and upon completion of the first volume of his *magnum opus* he published "A Reference-list† to the Birds of Australia," following the style of the "Check-list" of the American Ornithological Union. Whereas the "Hand-list" afforded no indication of the relationship of any one species to another, the "Reference-list" distinguished what Mathews regarded as sub-species by the adoption of the trinomial system in all cases where varieties were listed. Where there were no recorded sub-species the species name was given in binomial form. The inclusion of his numerous sub-species increased the total number of species listed to 1,451, exclusive of the birds of Lord Howe and Norfolk Islands, which were separately listed in accordance with my proposal that the birds of these islands should be included in the "Phillipian" sub-region.‡

The printing ink of the "Reference-list" had hardly dried before Mathews published "A List of the Birds of Australia" (November, 1913) as a "logical sequence" to the "Reference-list." The introduction to this "List," however, shows that its publication was largely influenced by the appearance of the "Official Check-list" prepared by the Committee of the Royal Australasian Ornithologists' Union.§ The Report of the Committee was severely criticised, and the only part of this report in respect of which he expressed approval was my suggestion that "the inclusion of all described sub-species under the dominant species-number would enable the general collector to confine himself to dominants only." The "List" was prepared under this suggestion:—"Every sub-species at present recognizable is admitted, but they are grouped under the oldest name which appears as a binomial for the species-name, and is placed in heavier type." The number of species was thus contracted to 663, but the sub-species numbered nearly 1,000! The birds of Lord Howe and Norfolk Islands were again separately listed under the Phillipian sub-reigon.

Valuable as this "List" undoubtedly was, as a further guide to the relationship of certain sub-species, its usefulness became gradually discounted by the frequent alterations and emendations appearing from time to time in the pages of the *Austral Avian Record*, a journal edited by Mathews and "issued in connection

* "A Key to the Birds of Australia," Robert Hall, 2nd ed., 1906.
† *Novitates Zoologicæ*, vol. xviii., January, 1912.
‡ *The Emu*, vol. xi., p. 58, July, 1911.
§ *Id.*, vol. xii., January, 1913.

with the Austral Avian Museum, Watford, Herts., England." It was in this journal * that Mathews commenced to split the genera *Menura, Micraca, Petroica, Pachycephala, Artamus, Malurus,* and others—a feature which marked the "List," and, as subsequent events go far to prove, was of doubtful utility.

I have recently had the pleasure of perusing Mathews's "Check-list of the Birds of Australia," published on 16th February, 1920, as Supplement No. 1. to his folio work. This "Check-list" contains the Orders *Casuariiformes* to *Menuriformes*, and numbers 334 distinct species. In the introduction Mathews says:—"All sub-species are grouped upon a binomial species heading, as there can be no doubt that lists prepared in this way will be more useful to the general worker. The first-named species is given in heavier type, but this must not be taken to indicate that that is the only sub-species I recognize. The number of sub-species accepted must always be a variable one, according to the material available and to a certain extent upon the personal idiosyncrasy of the worker, even if such be quite unprejudiced in the matter."

While the 1913 "List" assigned trinomials to *all* the sub-species grouped under each species (to which I applied the term "dominant" in my note to the R.A.O.U. "Check-list"), the 1920 "Check-list" recognizes the author's right to an exact quotation of his name, and thus the sub-species are listed in binomial or trinomial form as originally described. This arrangement of sub-species is a long step in the direction of sinking all such varieties in the comparative oblivion of synonymy.

The introduction also contains a brief defence of "genus-splitting," with a comparison between the author's efforts in this direction with the "B.O.U. List" for 1915.

In a most useful Appendix Mathews lists the casual visitors, the occurrence of which has been recorded less than three times. This Appendix is prefaced by the following:—"In dividing the work up like this I have put in the main list all the birds that can properly be called Australian, and in the Appendix all those that so far are only recorded as visitors." With regard to some of these "visitors" one cannot help thinking that their exclusion from the main list is a mistake, as their breeding-places are so near to the Australian coast, and their feeding range is so extensive, that the paucity of records must be largely due to the fact that they have been accepted as Australian and their occurrence not stressed by observers. I refer particularly to *Fregetta tropica, F. tubulata, Procellaria parkinsoni, Priofinus cinereus, Pterodroma melanopus,* and *Phaebetria fusca.*

This "Check-list," though the latest, will probably not be the last of Mathews's lists. The second volume will, no doubt, be constructed on similar lines to the first, but I live in hope that the completed work will be followed by a final crowning work in which the sub-species will be listed as geographical varieties of

* *The Austral Avian Record,* vol. i., No. 5, December, 1912.

the dominant species, and the split genera will be once more lumped, as in the 1908 "Hand-list." Mathews's three genera, *Pachyptila*, *Pseudoprion*, and *Heteroprion*, with their four species and twelve sub-species, have been "lumped" by Loomis in one genus and species,* *Pachyptila vittata* breeding only in the southern hemisphere. Townsend and Wetmore,† in commenting on Mathews's separation of the Australian representatives of the *Sulidæ* into four genera, say:—"There is no question that the three species of Gannets form a well-characterized genus; but that there are trenchant lines separating the smaller species known as the Boobies into groups that may be considered of generic rank seems at present uncertain. The differences indicated rather signify only sub-generic differences. For the present it is proposed to ignore them and to include all of the smaller *Sulidæ* in *Sula*, pending further study of available material that may throw light on the subject from another angle."

It will be seen from the foregoing notes on the four lists issued by Mathews that he built up a great edifice of sub-species only to proceed to pull it down again. Perhaps it would have been better for the peace of mind of Australian students if the erection and demolition had been confined to the author's study; but the details of the work having been exhibited to the public, it remains only to render a merited tribute of praise and appreciation of the vast amount of care and concentrated labour that has been expended on the work. The indefatigable author will permit me, perhaps, in rendering him this tribute, to couple with his name that of Tom Iredale, one of the most capable taxonomists of the present day, and whose talents in that direction have, we know, been at the author's disposal. The labours of Mathews and Iredale in seeking out the solution to the puzzle of priority are worthily evidenced in the monumental folio work, "The Birds of Australia," and the "Check-list."

MR. MATHEWS'S 1920 "LIST."

Australian ornithologists have given a hearty welcome to Mr. Mathews's latest List—the fourth so far in his series, and certainly not the last. It is marked "Part I.," and contains names of about half the birds of Australia, from the Emu to the Lyre-Birds.

At length, having been legally authorized to begin operations and anxious to see that Australia plays its part in the great world-struggle to reach finality by means of an authoritative list of the birds of the world, the members of the "Check-list" Committee are keenly at work using the mass of valuable material so painstakingly gathered and so well displayed by Mr. Mathews. The

* "A Review of the Albatrosses, Petrels, and Diving Petrels," Leverett Mills Loomis, Proc. Cal. Acad. Sci., 4th series, vol. xi., 1918.

† *Bulletin of the Museum of Comparative Zoology at Harvard College*, Cambridge, Mass., Aug., 1919.

British Ornithologists' Union has a committee at work on the birds of the Old World; the American Ornithologists' Union has a committee at work on the birds of the New World; and it is fitting that the Australian committee should "do its bit" towards the preparation of the great "Systema Avium" which is to end the troublous ten years and more of unrest in ornithological circles.

Members of the R.A.O.U. Check-list Committee, elected at the special general meeting on 9th June, 1920, are indeed fortunate. The results of the researches and labours of the past twelve years and more by Mr. Mathews have been placed in such a full, clear form that the complete evidence connected with almost every disputed point in the nomenclature of Australian ornithology is plainly and succinctly stated. The "List" is a model of good arrangement and thoroughness.

Mr. Mathews is to be complimented, too, on his candour and fairness. There is no attempt anywhere to influence the position or to impress his own opinion. There is "no prejudice"—just the statement of the facts and the decision which, in each case, agrees with the evidence submitted.

The differences between the "Official Check-list" and Mr. Mathews's 1920 "List" are less than might have been expected. Of course, the generic names of some of the cosmopolitan birds, being listed by Mathews according to priority, based, as the American "Check-list" was, on the tenth edition of Linné's "Systema Naturæ" (1758), differ from those used in the "Official Check-list," which were based, as British lists previously were, on the twelfth edition of the "Systema Naturæ" (1766). The names of only about 15 purely Australian genera are in question. This is apart from the "generic standard," which, of course, is not fixed—indeed, does not exist, and is largely a matter of "personal idiosyncrasy" or opinion, as Mr. Mathews has clearly shown. First he was a "lumper" in the "Reference-list," and then a "splitter" in the 1913 "List"; but now he is revealed in the 1920 "List" as adopting a middle course, tending back to the "happy medium." He further stated, when desiring that Australians should co-operate in the great world work, that he was "without prejudice," and was ready to take his place as one of a committee, and would abide by the decision of the majority.

The "Official Check-list" and the 1920 "List" agree well as to the "specific standard," the standard of division, and of the species listed. Two main causes of differences are the ignorance of early ornithologists of the Asiatic migration of many Australian birds, with the result that some, though really Asiatic birds, were named as separate species here. A second cause of difference is due to a practice that hampered students and hindered knowledge by naming forms from remote places as distinct until they were proved to be the same. Mr. Mathews shows many species to be the same as those of other lands, and the Australian names become synonyms or serve for the sub-species. This is appreciated by student and ornithologist, as it shows the relation more clearly of the Australian avifauna to that of other regions.

Mr. Mathews's thoroughness in collecting evidence regarding the date of publication of works connected with Australian ornithology is apparent in the complete data given. It is shown that some changes are necessary. One of the most noticeable, perhaps, is the work of Vieillot, published in April, 1816, antedating the often-used work of Cuvier, published in December, 1816. *Rostratula*, Vieillot's name for the Painted Snipe, supersedes Cuvier's *Rhynchæa*.

Not fewer than 134 of the 212 generic names of the Official "Check-list" are also used in Mr. Mathews's 1920 "List." Apart from "splitting," 33 of the generic names of the Official "Check-list" require investigation for various reasons—priority, 18 (4 purely Australian); "one-letterism," 4 (3 Australian); type designation (3 Australian); disputed names, 6 (3 Australian); pre-occupied names (3); and "indeterminable" (2, *Catarrhactes* and *Prion*). Thus, 15 Australian generic names are in question.

The names for the splitting of 68 of the "Check-list" genera by other authors have been accepted by Mr. Mathews, who gives the names for 57 cases of splitting genera proposed by himself. He has, however, already reduced 18 of these to synonyms. Few authors are so candid or fair-minded; still, 18 generic names withdrawn out of 57 proposed for splitting by Mr. Mathews—*i.e.*, 31.9 per cent.—is a very large margin for hasty work.

Thirteen Mathewsian generic names to be used as substitutes for others rendered invalid for various reasons have been listed by Mr. Mathews.

Thus this 1920 "List"—half a list of the birds of Australia—perhaps indicates the long-looked-for reaction in the direction of attaining a sound standard for genera. Mr. Mathews has swung away from the extreme position of 300 genera for the 340 species of "List" and Appendix—practically 9 genera for every 10 species—a ridiculous position, indeed, when it is considered that a genus is a *group of related species*, though to the man in the street it may be considered farcical to form 9 groups from 10 species, and that not in one order, but, on the average, for half the birds of a continent. However, Mr. Mathews has now retreated to 201 genera for the 340 species, or 6 genera for each 7 species, and it is hoped that his present frame of mind will continue until he strikes the happy mean between the "lumping" position of the "Reference-list" and the excessively fine "splitting" of the 1920 "List."

Mr. Mathews's reference to the B.O.U. "List" for 1915, with an average of 1.82 species to each of the 146 genera used for the birds of the corresponding section of the work, is unfortunate for his case. When making a comparison, it is usual to compare likes. Here, however, Mr. Mathews compares the list of a small area, little larger than that of Victoria and Tasmania, and not containing even one genus, with that of a continent, with the complete distribution of most genera. The result is really to emphasize strongly his fine splitting (1.19 species for a continent

as against 1.82 for a small fragment), and not to excuse it, as he perhaps intended. He uses capital letters to emphasize the point that the B.O.U. "List" uses NINETY genera containing one species each on that small area, but 230 of the 270 genera (84 per cent.) of his half-list proper are monotypic for a continent, and only 6 genera (3 with 3 species each, 2 with 4, and 1 with 7 species) contain more than 2 species each.

At the end of the list Mr. Mathews gives a table of the authors responsible for the names of Australian species. He is credited with a modest 5, while Gould has 65, Latham 38, Linné 32, Gmelin 30, Temminck 24, Vieillot 16, and Gray 11. Had Mr. Mathews listed the generic authors the effects of his splitting would possibly have been more apparent to him. The chief authors so responsible are Mathews 52 (all splitting practically no new forms), Prince Bonaparte (1856) 31, Reichenbach (1852) 16, Brisson (about 1760) 15, Gould 15, Kaup (1844) 15, and Linné 12.

Priority has recently caused considerable stir in ornithological circles in Australia. It is surprising to find that only 4 generic names of purely Australian birds are concerned. The "Official Check-list" uses *Catheturus*, Swainson, 1837, for *Alectura*, Latham (disputed), 1824, the Brush-Turkey; *Rhynchaea*, Cuvier, Dec., 1816, for *Rostratula*, Vieillot, April, 1816, the Painted Snipe; *Chlamydochen*, Bonaparte, 1856, for *Chenonetta*, Brandt, 1836, the Maned Goose; and *Calopsitta*, Lesson, 1835, for *Leptolophus*, Swainson, 1832, the Cockatoo-Parrot. *Cacatua* (the White Cockatoo) and *Dromaius* (the Emu) are spelt *Kakatoe* and *Dromiceius* respectively. Of 20 specific names in question through priority, 11 of the older names were quoted by Gould in his synonymy. Gould changed two in his "Handbook," 1865, though the "Official Check-list" followed the older "Birds of Australia," completed in 1848. It is also a surprise to find that only 3 specific names of purely Australian birds are involved under "priority"—those for the Brown Quail, the Native Companion (Crane), and the Glossy Black Cockatoo. Priority, when it can apply to only 1.8 per cent. of the genera and less than 1 per cent. of the species, ceases to be of importance as a disturbing factor.

Sub-species, the most noticeable feature of Mr. Mathews's Reference and 1913 "Lists," are not conspicuous in this "List." They are placed with the synonyms under the binomial species heading, one line being usually devoted to each. This is a simple method of disposing of a difficult phase of the list, and one that the "Check-list" Committee could follow with advantage. Mr. Mathews adds: "The number of sub-species accepted must always be a variable one, according to the material available, and to a certain extent upon the personal idiosyncrasy of the worker, even if such be quite unprejudiced in the matter." It is hoped that Mr. Mathews will apply this fair, broad-minded view when the matter of the number of genera is being finally settled. It is hoped further that the second part of Mr. Mathews's new list will be available at an early date.

Obituary.

BRYANT—On the 6th May, 1920, at Brighton, Lieutenant-Colonel Henry William Bryant, V.D., in his 61st year.

All, especially Melbourne members of the R.A.O.U., will regret the death of Lieut.-Col. H. W. Bryant, who was a genial and popular member of the Union for many years. His last contribution to *The Emu*—"A Trip to the Far Upper Murray"—appeared in the July issue last year, and contained many bird observations of interest.

Lieut.-Col. Bryant was the son of the late Mr. James Bryant, and was born in February, 1860. His father was a well-known cricketer in the early days of Victoria, and his uncle was Mr. W. J. Hammersley, for many years sporting editor of *The Australasian*. Lieut.-Col. Bryant entered the Melbourne Grammar School in 1869, and during his stay there was prominent in most branches of sport. He captained the school rifle team for two years. Deciding on a medical career, he continued his studies at the Melbourne and Edinburgh Universities. On taking the degree of L.R.C.P. and L.R.C.S.-at Edinburgh he returned to Melbourne, and settled in the Williamstown district, where he soon acquired a large practice. About 14 years ago he removed to Collins-street, where he continued his good practice. In the sporting world Lieut.-Col. Bryant was a keen follower of cricket and angling. He was a recognized authority on Australian birds, and was one of the founders of the Bird Observers' Club. When at Williamstown he joined the Naval Brigade as a surgeon, but transferred to the military forces in 1897, and continued to be connected with the Australian Army Medical Corps up till his death. He was awarded the Victoria Decoration for long service. On the outbreak of the Great War Lieut.-Col. Bryant offered to serve overseas, and was appointed to the command of No. 1 Australian Stationary Hospital. He embarked with that command on the hospital transport *Kyarra* at the end of 1914. His hospital was sent to Mudros in March, 1915, and did magnificent service under almost heart-breaking conditions in attending to the sick and wounded during the early days of the fierce Gallipoli campaign. For his share in that work Lieut.-Col. Bryant received mention in Sir Ian Hamilton's despatches. The strain and hardships of the campaign affected his health, and he was invalided to Australia. On regaining convalescence he resumed practice, and also assisted the Defence Department with the assessment of war pensions. His mortal remains were laid to rest, with military honours, at the Brighton Cemetery. The late Lieut.-Colonel's life's partner died in 1915, while he was at the war. The deepest sympathy of the Union goes out to their daughters, the two Misses Bryant.

One permanent result of the printers' strike is a great increase in cost. Two temporary results are a reduction in size and publication delayed until 17th August, 1920.

(From a drawing by Neville W. Cayley.)

THE YELLOW-SPOTTED HONEY-EATER
(Ptilotis notata).

THE LESSER YELLOW-SPOTTED HONEY-EATER
(Ptilotis gracilis).

The Emu

Official Organ of the Royal Australasian Ornithologists' Union.

"Birds of a feather."

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Notes on Additions to the "H. L. White Collection."

BY A. J. CAMPBELL, C.M.B.O.U.

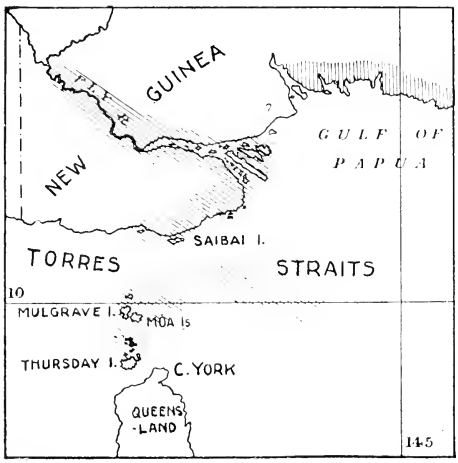
BIRDS FROM TORRES STRAIT ISLANDS.

THE islands of Torres Strait have been frequently touched by passing naturalists, but have not been systematically explored ornithologically. So the thought occurred to Mr. H. L. White, of Belltrees, to promote and finance, in his usual unobtrusive and patriotic manner, the task of "rounding up" that portion of the avifauna of Australia—all the islands of Torres Strait, even those close to New Guinea shore, being politically part of Queensland. The Queensland Government agreeably acquiesced in the undertaking, and was good enough to grant the necessary permission.

Mr. White was again fortunate in securing the services of Mr. W. R. M'Lennan (late of the A.I.F.), who, during the season 1915–16, performed most excellent and reliable field-work for Mr. White in Arnhem Land, Northern Territory (see *Emu*, xvi., p. 117).

The collecting and observing in Torres Strait was chiefly confined to and about Moa Island, Banks Group. The group is situated about 35 miles north-west from Cape York and about 50 miles from the southern coast of New Guinea. Moa Island country is typical of many coastal parts of North Queensland: rank-grassed flats, open forest of blood-wood and Moreton Bay ash (eucalypts) and other trees, paper-barked tea-tree (*Melaleuca*) tracts, jungle scrub in patches, especially along creeks, the mouths of which and other portions fringing the coast had the usual mosquito-infested growths of mangroves, while in the centre of the island was a ridge of rugged hills, much boulder-strewn and difficult to traverse on account of the long grass hiding these awkward obstacles.

Mr. M'Lennan constructed his camp in the midst of his work, away from the habitations, native or other, and was frequently and obligingly assisted by Mr. and Mrs. Luscombe, of the Mission Station, and others, in the furtherance of his exploration labours. It was a pity Mr. M'Lennan just missed the spring migration of northern birds, but he recorded a few observations of "returns"



during the latter part of his stay. It was also unfortunate that he was debarred by the authorities from landing on Saibai Island, close to the New Guinea coast. An epidemic (influenza, so called) was raging among the inhabitants of the Strait islands, and Saibai was declared, up to that time, "clean"; therefore strangers were not permitted to land. Moreover, Mr. M'Lennan, with considerable Christian fortitude, had been assisting at the Thursday Island hospital to nurse sick and dying inmates, both white and coloured.

The period of field-work extended from 1st November, 1919, to 13th April, 1920. During that period Mr. M'Lennan observed 116 species, of which, by excessive toil and patience, he secured 118 specimens, representing 61 kinds, of which 40 or 41 are common to both Australia and New Guinea—an extremely interesting and valuable collection.

The following are some critical remarks and general observations on the material collected, which I have had the privilege of examining at the National Museum, Melbourne, and by the kind permission of Mr. White I was enabled to peruse the collector's field-notes, a few of which I furnish, within brackets, following my remarks on the species concerned.

(*Nomenclature according to the R.A.O.U. "Check-list" and Mathews's "1913 List." Names with an asterisk* (*) *are species common to both Australia and New Guinea.*)

Megapodius assimilis, Masters. Eastern Scrub-Fowl.
M. reinwardt assimilis.

One ♂, 1 ♀. These insular examples are lighter-coloured and are smaller in size compared with Northern Territory representatives, and agree with the *assimilis* race.

[24/1/20.—Flushed a young Scrub-Fowl. Judging by its size, it had not long left the mound.]

***Synoicus cervinus,** Gould. Northern Brown Quail.
Ypsilophorus v. queenslandicus.

One ♀. Same as King River (N.T.) specimens (see *Emu,* xviii., p. 176).

[16/1/20.—A few yards from camp, flush a pair of Brown Quail. Try a shot at one, but miss. Watch where it lands, and try to flush it again, without success. Hear one calling, and imitate the call. The bird keeps answering and coming towards me. Catch a glimpse of it running through short grass; cannot flush it. Imitate the call again, and a couple of birds answer several times, but can neither see nor flush them. Later, call up Quail; one answers and I flush it. Try a shot, but do not bring it down. Go through some patches of light scrub. Clouds of mosquitoes, and very vicious. Have to keep slashing them off my back with a leafy branch.]

***Turnix melanotus,** Gould. Black-backed Quail.
T. maculosa yorki.

Two ♂♂: apparently typical. *T. maculosa yorki,* described simply as "lighter" coloured, has no ornithological standing. Oftener flushed than the Brown Quail. Except for their different (thinner) bills, these males remind one of *T. pyrrhothorax.*

Chalcophaps chrysochlora, Gould. Little Green-Pigeon.
C. c. kempi.

One ♂, 2 ♀♀. Similar to Northern Territory birds; more bronzy-green than southern form, while the brown coloration of the females is not so chocolate (bright) on the head, neck, and under surface (notably breast) as seen in the male—an index, possibly, of the sexes.

***Lamprotreron superba,** Temminck and Knip. Purple-crowned Fruit-Pigeon.

Two ♂♂. Truly superb and perfect skins of a Dove-like species.

[31/12/19.—Hear some Nutmeg-Pigeons calling half-way up Lady Peak. Go after them, as I have not had fresh meat for a few days. Just get within range when I see a Koel and shoot at it, whereat all the Pigeons fly, including four male Superb Pigeons from the same feeding tree.]

***Myristicivora spilorrhoa,** Gray. Nutmeg-Pigeon.
M. bicolor spilorrhoa.

Two ♀♀. Typical. Common during most of the period Mr. M'Lennan was on the island. He last noted the birds 1st March. They were his chief supply of fresh meat.

***Megaloprepia assimilis,** Gould. Allied Fruit-Pigeon.
M. magnifica assimilis.

Two ♂♂. This beautiful Fruit-Pigeon was fairly common, and was breeding. The skins are typical of *magnifica*, only are smaller. Dimensions in millimetres :—Length, 360–368 ; wing, 180–186 ; tarsus, 26–27 ; culmen, 16–17.

[2/12/19.—Found nest of Purple-breasted Pigeon, with bird sitting, on horizontal branch 8 feet from bed of the creek. Cut a hooked stick to pull nest within reach. The bird sits until touched with the stick ; then it drops to bed of the creek and flutters away, as if badly wounded.

13/12/19.—Found another nest of this Pigeon with the bird sitting, 6 feet from the ground, in a mangrove. The bird allowed me to approach quite close before it left its nest and fluttered away amongst the mangrove roots to a log about 40 yards distant. It sat there raising and lowering its wings to attract my attention. When I moved towards the bird it fluttered away again as if wounded, then flew swiftly out of sight. The nest contained a newly-hatched young one.]

***Ptilinopus swainsoni.** Red-crowned Fruit-Pigeon.
P. r. regina.

Two ♂♂, 1 ♂ (juv.) Interesting material, but similar to that of the species collected on the north-eastern coast of Australia. A familiar bird on Moa. The nestling may be described as golden-green (bronzed at certain angles of light), feathers all edged with yellow and abdomen and under tail coverts yellowish. Length, 103 mm. ; wing, 94 mm.

***Geopelia placida,** Gould. Ground-Dove.

One ♂. Similar to a skin from Northern Territory. Smallest of the species (not much larger than the Diamond Dove, *G. cuneata*), and lighter-coloured than Queensland birds. Wing, 94 mm., as against a southern specimen (*tranquilla*), wing 103 mm. Seen three times.

***Geopelia humeralis,** Temminck. Barred-shouldered Dove.
Chrysauchœna h. humeralis.

One ♂. Judging by this single specimen, it is almost typical. The species has a wide range, chiefly coastal, from the region of the North-West Cape round to New South Wales, besides the southern portion of New Guinea. As pointed out in a previous paper (*Emu*, xviii., p. 255), two males from Barrow Island, Western Australia, are smaller in size and paler-coloured than typical eastern birds. Dimensions in millimetres :—Length, 300 ; wing, 133 ; culmen, 18 ; tarsus, 25 (M'Lennan).

***Hypotænidia philippensis,** Linnæus. Pectoral Rail.
H. p. australis.

One ♂. The example of this well-known and wandering Rail is most interesting, and does not differ from a male procured in New South Wales (wing also same size). Mathews's *yorki* ("differs from *H. p. australis* in its smaller size and in having the buff band on the chest much darker") is not convincing as a good

race. Dimensions in millimetres:—Length, 303; wing, 141; culmen, 33; tarsus, 38 (M'Lennan).

***Actitis hypoleucus,** Linnæus. Common Sandpiper.
A. h. auritus.

One ♂, 1 ♀. These and the two following species are all in their usual winter plumage. This Sandpiper was noted twice—13th November, again 13th December.

***Glottis glottoides,** Vigors. Greenshank.
G. nebularis.

One ♀.

[20/11/19.—A creek comes out on the beach a mile and a half from the Mission Station. Curlews (*Numenius cyanopus*) and Greenshanks were noticed here. Further on a Greenshank was seen on a rock about 40 yards out. A shot caused the bird to fall into the water, and it commenced to swim to sea. One of the boys went after it and caught it about 300 yards out.]

***Heteractitis brevipes,** Vieillot. Grey-rumped Sandpiper.
H. incanus brevipes.

Two ♂♂.

[With this species were observed, on the beach near the Mission Station, 9/11/19, Lesser Golden Plover (*Charadrius fulvus*), Large Sand-Dottrel (*Ochthodromus geoffroyi*), Little Stint (*Pisobia ruficollis*), Whimbrel (*Numenius variegatus*), and a large Sandpiper a little darker and slightly smaller than a Whimbrel, also a Godwit (*Limosa* ——?)]

Glareola orientalis, Leach. Oriental Pratincole.
G. maldivarum orientalis.

One ♂, 3 ♀♀. A fine series, with throats mostly in the striated form of plumage.

[30/11/19.—High up the side of Lady Peak several birds can be seen hawking after insects disturbed by a raging bush-fire. They are new to me, so I get back to camp for my gun and field-glasses and return. The birds are now hawking over the level country at the base of the Peak. There are about thirty birds, flying very fast, now low along the edge of the fire, at times almost dashing through the flames in their eagerness to secure the disturbed insects, then high up in the air amongst billowy clouds of dense smoke, and again low down over the burnt area. Cannot place them at all. At last they come out over the unburnt grass and I get a shot, and bring one down; it is the Oriental Pratincole. Try two more shots without success, and the birds ascend high up, almost out of sight, and soar lazily in great circles. After a while they come down again and engage in their mad, rapacious rush. How they can fly so close to the flames and through the smoke and the freshly-burnt tracts without harm I do not know. The heat is so intense as to be almost unbearable at a distance of 20 feet; yet these birds fly, apparently, within four feet of the flames. A number of White-rumped Wood-Swallows and Fairy Martins join, hawking for insect prey high up along the edge of

the smoke-cloud. Try another couple of shots at the Pratincoles, and they ascend and soar again, and eventually disappear into the blue. 3/12/19.—Dozens of Pratincoles about the burnt country, hawking high in the air. Get another bird. Towards evening a flock of Pratincoles came from the north. 4/12/19.—Oriental Pratincoles are in numbers all along the track. The majority seem to be arriving.]

Œdicnemus grallarius, Latham. Southern Stone-Plover.
Burhinus m. magnirostris.

One ♂, 1 ♀. A fine pair, and valuable material. It is not often one examines the Southern Stone-Plover from so far north. These insular birds are lighter-coloured—notably throat, abdomen, and lesser wing coverts—and are smaller than typical birds, and appear to agree with Ramsay's *Œ. longipes* (see "Tab. List Austr. Birds," p. 35). The female is darker than the male about the breast; tarsus, 133 mm. Male, tarsus 143 mm.

The following is Mr. M'Lennan's history of the interesting pair, for posterity:—"20/11/19.—About 8.30 p.m., outside tent, hear a low whistle several times repeated. I imitate the note, and it is again sounded louder and nearer. Get gun and torch and go out. Hear a patter of feet on the fallen leaves, and flash the torch (electric) in the direction. A Stone-Curlew is revealed, which drops on the ground with outspread wings. Then it rises and runs to the edge of the beam of light, where I stop it. An hour later I heard a similar whistle; I repeated the previous performance, and secured the other Curlew."

***Mesophoyx plumifera,** Gould. Plumed Egret.
M. intermedia plumiferus.

One ♂. Typical. Seen once.

***Dupetor gouldi,** Bonaparte. Yellow-necked Bittern.
D. flavicollis olivei.

One ♂. Upper surface lighter-coloured, otherwise similar to Northern Territory specimens. Noted on two occasions.

Hieracidea occidentalis, Gould. Striped Brown Hawk.
H. berigora orientalis.

One ♂. An exceedingly fine skin, striped on the under surface even to the tibia feathers, and agreeing with another example in the "H. L. White Collection" from the Gulf of Carpentaria country.

Two other large Hawks were frequently seen, which were believed to be the Spotted Harrier (*Circus assimilis*) and the Red Goshawk (*Erythrotriorchis radiatus*), but long and persistent stalkings by Mr. M'Lennan failed to secure a specimen of either.

Elanus axillaris, Gould. Australian Black-shouldered Kite.
E. notatus.

One ♀. This Kite, the second skin secured of *Accipitres* from Moa Island, would appear to be a northern record. It ranges as far south as Western Port, Victoria. *Parryi* (Mathews), from

the North-West, is stated to differ from typical birds "in its lighter coloration above" a description hardly consistent, seeing some examples both from New South Wales and Victoria in the National Museum are lighter still in colour than North-West examples.

Strix candida, Tickell. Grass-Owl.
Tyto longimembris walleri.

One ♂, 1 ♀. A handsome pair and a valuable addition to the "H. L. White Collection." The specimens possibly are not so richly coloured (brownish) as depicted in Gould's figure. The Grass-Owl is sometimes confused with the Masked Owl, although the latter has feathered legs, and with the Delicate Owl, which is smaller in size, with tarsi much shorter than those of the Grass-Owl.

[25/11/19.—Walking through some open grass-country looking for Grass-Warblers, I flushed a Grass-Owl from a tussock at the base of an ant-hillock. Examined the place from which the bird flushed. There was a shallow hole scratched in the earth under the tussock, containing several pellets of fur, bones, and moulted feathers of the bird, showing it had been camped for some time. 26/11/19.—Thoroughly searched through area of grass-country where I flushed the Owl yesterday. Found several camping-places in large grass tussocks growing about old ant-hillocks. In each place were pellets of fur (rats') and bones and a few feathers. I was about to give up the search and return to camp when I flushed a bird. Got in a shot and brought it down—a fine specimen in good plumage.]

Ninox peninsularis, Salvadori. Cape York Owl.
Hieracoglaux connivens peninsularis.

One ♂ (juv.), 1 ♀. New to the "H. L. White Collection," and apparently do not differ from a Cape York specimen described by the late Mr. A. J. North ("Nests and Eggs of Birds," iii., p. 308), being similar to the southern form but smaller. Wing, 260 mm., as against that of typical *connivens*, 295–300 mm. A sub-species (*assimilis*) is found in New Guinea.

These Owls were frequently heard calling during the day, notably one time after thunder crashes, when a bird called at intervals throughout the afternoon.

Trichoglossus septentrionalis, Robinson. Northern Blue-bellied Lorikeet.
T. moluccanus septentrionalis.

One ♂. This sole "Parrot" in the Moa Island collection most resembles *septentrionalis*, but has more red on the breast, like its dominant species, *novæ-hollandiæ*, in the south.* This high-flying and wandering species from over the islands in the Strait must have New Guinea in sight. It would be interesting to learn if this Lorikeet ever visits that land.

* Typical *septentrionalis* are inclined to be more yellow on the breast

[18/11/19.—Midnight, Blue-bellied Lorikeets heard screeching in direction of the mangroves; probably disturbed by flying foxes.* 11/12/19.—A few Lorikeets (and Dusky Honey-eaters) observed feeding in some flowering paper-barks (*Melaleuca*).]

***Eurystomus pacificus,** Latham. Australian Roller.
E. orientalis pacificus.

One ♂. Resembles two males from King River, Northern Territory, and is similar to New South Wales birds in colour, but slightly smaller in size. Wing, 190 mm. A single bird seen on two occasions—20th November and 1st March. The assumption is that the majority was down south.

Tanysiptera sylvia, Gould. White-tailed Kingfisher.
Uralcyon sylvia.

Two ♀♀. Similar to Cape York birds, the males of which have the light markings of the mantle whitest. As the tail feathers in individuals vary in length, so does the brown colour (under surface) vary in tone. This fine Kingfisher, at Cape York, has been observed in numbers migrating to and from the mainland. To what country do they go and return? There is a near subspecies (*salvadoriana*) in southern New Guinea.

[24/1/20.—Worked through several small patches of scrub. In one shot a White-tailed Kingfisher—a female, with a hard-shelled egg in oviduct. No signs of ant-hillock for bird to nest in.]

***Halcyon macleayi,** Jardine and Selby. Forest Kingfisher.
Lazulena m. barnardi.

One ♂, 1 ♂ (?). Similar to birds found at Cape York.

***Cypselus pacificus,** Latham. White-rumped Swift.
Micropus p. pacificus.

One ♂, 1 ♀. Differs from typical birds taken in Australia by their larger size and in the steel-blue sheen of the upper plumage instead of the usual steel-green. Wing of male, 188 mm., as against 177 mm. of an example taken in North-West Australia, and 179 mm. of a specimen from New South Wales. As for the difference in tone of plumage, may not the Moa specimens be newly moulted birds? They were taken about the middle of January. However, Mr. Mathews has suggested the name *colcloughi* for this Swift taken at Cape York (see *Austral Av. Rec.*, ii., p. 129).

[18/12/19.—Out over an open grass patch the air is alive with hundreds of Australian Swifts. They are hawking fairly low down. I double over and try three shots, but do not get a bird. They fly at top speed, taking their prey—flying termites—without pause in flight. The air is full of sound with the hissing "Chuff, chuff, chuff" noise of wings. The Swifts circle well up when I fire, but are soon down again to the feast. How they manage to take their prey at such a high rate of speed is astonishing.

* In their sleeping quarters these Lorikeets have a habit sometimes of "talking" at night.—A.J.C.

3/1/20.—Hundreds of Swifts hawking high overhead. Later, Swifts hawking low here. Try four shots without success. Still later, come out into open forest again. Swifts hawking low amongst the trees. Ten shots do not get a bird; seemingly, they must be flying at nearly 200 miles an hour. Hundreds of birds are making the air vibrant with the humming rush of wings. One minute the birds are down about the tree-tops; the next they are hundreds of feet on high, speeding elsewhere, whilst other flying forms take their place. Further on I get a view of a couple of miles around. Swifts are everywhere; the air is simply alive with them. 11/1/20.—Over an open grass patch hundreds of Swifts are hawking low. Stop one with my eleventh shot.]

***Eudynamys cyanocephala,** Latham. Koel.
E. orientalis cyanocephalus.

One ♂. A curious specimen, showing transition stage of plumage from drab to glossy black. In the tail some of the feathers are black, others brown barred.

[20/11/19.—8 p.m., Koels heard calling as they pass over going south; 11 p.m., again hear Koels going south. 28/11/19.—10 p.m., Koel heard calling as it passed south. 27/3/20.—Koels heard calling as they passed over, going *north*.]

***Cuculus optatus,** Gould. Australian Cuckoo.

Two ♂♂, two ♀♀ (imm.) A most interesting series, especially the two immature females, one of which Mr. White has commissioned Mr. Neville Cayley to figure. The figure will probably appear in the following issue of the *Emu*.

[3/12/19.—First observed; flew from the scrub into the forest country. 29/12/19.—Near a pocket of paper-barks (*Melaleuca*) saw two Australian Cuckoos chasing one another and uttering a low, harsh, short, hissing "Churr, churr, churr, churr, churr, churr, churr." Some birds are flying down into grass and up again. At last one of the Cuckoos comes within range and I shoot it. Have a look where the birds were feeding; hundreds of small caterpillars in the grass. 12/1/20.—In open forest country Australian Cuckoos numerous; several heard calling in the low, harsh "Churr" note, several times repeated; this note can be heard only at a few yards distant.]

***Cacomantis variolosus,** Horsfield. Square-tailed Cuckoo.
C. pyrrhophanus dumetorum.

Two ♂♂, 1 ♀. Similar to Northern Territory examples, and smaller and lighter-coloured than specimens taken in New South Wales or Victoria. Nestlings from northern localities are also lighter-coloured than those from south. These Cuckoos were numerous on Moa Island.

[18/11/19.—A Square-tailed Cuckoo was seen perched on a stump. Dusky, Graceful (Lesser Yellow-spotted), and Brown-backed Honey-eaters were fluttering over and scolding it. The Cuckoo, mouth agape, was uttering a low, hissing note. 27/12/19. —Inside the edge of some timber a number of Square-tailed

Cuckoos were holding a concert. Got pretty close to them; counted six birds in one tree. Every couple of minutes all called at the same time. There were three different calls—(*a*) three notes repeated several times in ascending half-tones; (*b*) single note several times repeated, in descending half-tones; and (*c*) a shrill, sharp, trilling, long note.]

* ? **Chalcococcyx basalis,** Horsfield. Narrow-billed Bronze-Cuckoo. *Chalcites b. modesta.*

One ♂, 1 ♀ (juv.) These specimens are referable to the widely-distributed species *basalis,* which no doubt extends to localities beyond Australia proper.

***Chalcococcyx russata,** Gould. Rufous-throated Bronze-Cuckoo. *Neochalcites russatus.*

Two ♂♂. In a previous article (*Emu,* xviii., p. 180) I commented on this species and *C. minutillus* as separate species easily differentiated from skins, but may have to modify the views expressed regarding the colour of their eggs. In a private letter from Dr. Wm. Macgillivray he expresses the opinion that *russata* lays an olive-coloured egg, as does *minutillus.*

Centropus phasianus, Latham. Pheasant-Coucal. *Polophilus p. phasianus.*

One ♂. In full plumage, and mostly resembles *macrourus,* from Northern Territory. Surely *macrourus* and *melanurus* are sufficient names to designate northern races of the Coucal without inventing yet another—*yorki.* Prof. Thompson, of Aberdeen, reminds us that "entities should not be multiplied beyond necessity."

[12/1/20.—Great Coucal chorus heard all the morning. 29/3/20.—Flushed a Coucal from its nest in a tussock of grass. In places the grass was very high, the seed-stems running up to from 8 to 10 feet. 31/3/20.—Found Coucal's nest containing four eggs, much incubated, in a tussock in open country. 17/12/19.—Saw an Australian Goshawk in full chase after a Coucal, which flew into a tree, then dropped to the ground, where it stood with wings and tail outspread and feathers of back, neck, and head erected, uttering its short, scolding call, the Goshawk meanwhile perching in the tree above. After a time the Coucal flew off, when the Goshawk again gave chase. Both disappeared into a patch of scrub, where I again heard the protesting cries of the Coucal. When I reached the place the two birds had disappeared.]

***Pitta simillima,** Gould. Lesser Pitta. *Austropitta versicolor simillima.*

Three ♂♂, 2 ♀♀. A remarkably valuable series, especially the males, which, taken during February on Jama or Turtleback Island, show a transition stage of plumage apparently seasonal. The old plumage of the upper surface is abraded and bluish, while the new patches show golden-green. The brownish under surface, too, is different, being lighter and a greenish-buff.

In the mature females, taken November on Moa Island, the oil-green backs, when held at certain angles of light, show more yellowish iridescence than do birds of the southern form, thus more resembling the backs of *P. iris*. Again, the insular birds on the under surface are lighter-coloured than those from Cape York. The shoulders and upper tail coverts are pale silvery (lumiere) blue, and the under surface light (buckthorn) brown.

Under Gould's name (*simillima*) this northern race may be recognized.* But where does it break from the true *strepitans*? Mr. Mathews, with his *intermedia*, points to the Bellenden-Ker Range. But birds from that region and Cardwell can hardly be separated from those of type locality—New South Wales.

[18/12/19.—*Pitta* calling in scrub on Lady Peak, but could not locate it. Again hear Pittas calling in the scrub. On imitating call one bird comes within view, and I secure it. Cannot get a glimpse of the other; it is too wary. Another female flushed later (24/1/20) appeared to be breeding. 19/12/19.—9 p.m., heard *Pitta* calls.]

* ? **Gerygone magnirostris,** Gould. Long-billed Fly-eater.
Ethelornis m. magnirostris.

One ♀. This little species is found on other islands in Torres Strait, and it would be interesting to learn if it also frequents the mangrove tracts of the southern coasts of New Guinea, as Dr. Ramsay has hinted.

[20/11/19.—Heard Gerygones calling, and located them feeding amongst the tops of the mangroves, fully 40 feet up.]

***Pachycephala melanura,** Gould. Black-tailed Whistler.

One ♂. Evidently immature, the breast, &c., not being fully yellow. The specimen more resembles the female of the species.

Rhipidura rufirons, Latham. Rufous-fronted Fantail.
Howeavis r. kempi.

One ♀. Much has yet to be learned about this migratory favourite. I can observe no difference between this female from the far-away north and a specimen taken in Victoria in summer time. Both have tails tipped with greyish or dull white, not, as in *dryas*, with some tail feathers white for nearly half their length; and yet, between these localities, we have an *inexpectata*, an *intermedia*, and a *kempi*! Are they not ornithologically the same entity—the same organism?

Myiagra latirostris, Gould. Broad-billed Flycatcher.
Mastersornis ruficollis kempi.

One ♂, 1 ♀ (juv.) The male is typical, but the immature female is lighter-coloured.

* Under the name *simillima*, the "Brit. Mus. Catalogues," xxiv., p. 429, record a specimen from West Island, Torres Strait. Mr. M'Lennan passed close to West Island 6/12/19. He states that it is noted for a certain species of pink orchid that grows nowhere else except on the rocky and rugged surface of that island.

[2/12/19. — Broad-billed Flycatcher seen, the first noted. 16/12/19.—Saw this Flycatcher feeding a fully-fledged young one.]

***Myiagra concinna,** Gould. Blue Flycatcher.
Mastersornis rubeculus concinnus.

Two ♂♂, 3 ♀♀. A good series of a pretty and interesting species. As the late Mr. A. J. North has pointed out ("Nests and Eggs of Birds," i., p. 145), Dr. Bowdler Sharpe considered *concinna* to be really a distinct species, but on totally different grounds from those given by Gould. Dr. Sharpe states :—"The chief difference in the male birds is the presence of the black frontal line and black lores of *M. concinna,*" compared with southern examples of *M. rubecula* (*i.e.*, *M. plumbea*). However, North states, "by picking out the extremes of a large series from all parts of Australia, one could easily distinguish a smaller northern race, but not a distinct species."

[17/11/19.—Pair of Blue Flycatchers busy building 25 feet from the ground on a small dead limb of a blood-wood (eucalypt). The male visited the nest once, the female five times, in 10 minutes. 1/12/19.—Nest of the Blue Flycatcher noted on the 17th ult. was untouched by the recent fire, though the topmost leaves of the tree were well scorched. The male was sitting on a pair of eggs; the female nowhere to be seen. 13/12/19.—Heard the call of Blue Flycatcher. Located the bird as it was flying to its nest, 20 feet from the ground, in a mangrove. Climbed to it and secured three eggs, also the nest. The female returned shortly afterwards. Rather unusual for these birds to build in mangroves.]

***Piezorhynchus alecto,** Temminck. Papuan Shining Flycatcher.
P. a. campbelli.

Two ♂♂, 1 ♀. These shining black Flycatchers are exceedingly puzzling in colour. In a former article, "Birds from the Gouldian–Gilbert Type-locality" (*Emu,* xviii., p. 183), I stated—"In *alecto* the male has a bluish-black sheen, as against greenish-black of all the other males." Of the two males collected on Moa Island, one skin, dated 11/11/19, is greenish-black; the other, dated 13/12/19, is more bluish, and was taken when breeding. The female of the former is chestnut-brown, like the females taken on the mainland, and this particular pair resemble Northern Territory birds, and are therefore *P. nitidus.* The female of *alecto* is more tawny or cinnamon-rufous. For this and other reasons it would appear as if *alecto* and *nitidus* were distinct species, inosculating somewhere about the region of Cape York.

[13/12/19.—Saw female Shining Flycatcher fly to its nest and relieve the male, which was sitting. Nest fully 40 feet from the ground, in dead limb of tall, thin mangrove. Made an egg-scoop by fixing a small pill-box to a stick and padding it with cotton-wool. Climbed up, and after a bit of juggling secured the two eggs, and afterwards the limb with the nest attached. Following day again in the mangroves. Saw a pair of Shining Flycatchers seeking a nesting site. The male would choose a position and

call until the female arrived. She would examine the site and then fly elsewhere. This performance was repeated several times, and then the pair flew out of sight.]

Monarcha albiventris, Gould. White-bellied Flycatcher.
Symposiachurus trivirgata albiventris.

One ♂, 2 ♂♂ (imm. ?), 1 ♀. Typical, and by their pure white lower breast and flanks differ from more southern form *-gouldi* which has notably brownish flanks. The sexes appear alike in colouring. Frequently noted up to the 1st March.

***Graucalus melanops,** Latham. Black-faced Cuckoo-Shrike.
G. novæhollandiæ melanops.

One ♂. In plumage change—*i.e.*, does not show the black throat and forehead, which parts are mottled black and grey, and the tail feathers are much abraded. The bill, however, is larger than that of any other example of the species in the collection. Wing, 177 mm., as against wing 200 mm. for a Victorian specimen.

***Graucalus hypoleucus,** Gould. White-bellied Cuckoo-Shrike.
G. h. stalkeri.

One ♀. This species is found in New Guinea, also the Solomons.* It does not appear to vary from North Australian birds. Specimens from all localities appear to have more or less a greyish tone on the breast. Seen a few times.

***Edoliisoma jardinii,** Rüppell. Great Caterpillar-eater.
Metagraucalus tenuirostris obscurus.

One ♀. Smaller size generally (wing, 120 mm.) and shows less striations on the under surface than does a female from Richmond River, New South Wales (wing, 130 mm.) A male from Port Moresby, New Guinea, is similar to a male obtained by Mr. H. G. Barnard and myself at Cardwell. There are in the National Museum collection a female and a male showing a transition stage of plumage, from the Solomon Islands. The species is a migrant to New South Wales and Victoria, and eggs have been taken as far south as Western Port (see "Nests and Eggs," Campbell, p. 101).

Mr. M'Lennan first heard this Caterpillar-eater calling near some mangroves, 18/12/19, and procured the female above mentioned, 12/1/20.

***Campephaga leucomela,** Vigors and Horsfield. Pied Caterpillar-eater.
Karua l. yorki.

One ♀. Similar to mainland birds, especially those from North-West (same wing, 98 mm.), but lighter underneath, particularly the tail coverts, which are not so rufous as seen on some Richmond River and Cairns specimens. Numerous, and breeding.

***Cisticola exilis,** Vigors and Horsfield. Grass-Warbler.
C. e. mixta.

Two ♂♂, 2 ♀♀. The Grass-Warbler enjoys a wide range, and

* Examples from both localities are in the National Museum, Melbourne.

is exceedingly variable both in summer and winter plumage. The above quartet generally may be regarded as typical. The two males have cinnamon-coloured crowns, which part in the females is dark striped. Dr. Sharpe regards the four species described and figured by Gould as referable to the one species—*exilis*. Grass-Warblers were numerous on Moa, and many nests were observed.

Megalurus galactotes, Temminck. Tawny Grass-Bird.
Dulciornis alisteri dulciei.

One ♂, 3 ♀♀. Seemingly identical with specimens procured in Northern Territory and North-West Australia. The species shows a preference for coastal regions and islands adjacent thereto. This is the first record of the bird being found in the locality of Cape York. Mr. H. G. Barnard and I, when at Cardwell, 1916, flushed this species on the flats of long grass among the timber and obtained a specimen. (See former remarks, *Emu*, xvii., p. 27.) It is probable that the same species frequents New Guinea.

***Artamus leucopygialis,** Gould. White-rumped Wood-Swallow.
A. leucorhynchus leucopygialis.

One ♂. Beautifully typical of the Australian and New Guinea birds. Noted several times—once hawking for insects with Fairy Martins and Pratincoles over a burning tract of country.

***Colluricincla parvissima,** Gould. Allied Rufous Shrike-Thrush.
Caleya megarhyncha griseata.

One ♂, 1 ♀. Evidently a good northern race of *rufigaster*, being smaller, lighter-coloured (buffy-brown), and not so striped on the breast as the more southern form. The male is larger (wing, 98 mm.) and browner (russet) on the secondaries and wing coverts than the female (wing, 93 mm.)—characteristic sexual distinctions, no doubt. *Caleya megarhyncha* (Quoy et Gaimard, "Voy. *l'Astrol.*, Zool.," i., p. 172, pl. 3), cited by Mr. Mathews, has a dark-coloured (warm sepia) upper surface, likewise a New Guinea specimen in the National Museum, with its olive-brown back, and is therefore unlike *parvissima*. Again, Mr. Mathews gives priority to Gray's two names, *gouldi* and *griseata*, over *parvissima*. According to a good Australian authority, the late Dr. E. P. Ramsay, both Gray's names are doubtful as to species.* That two distinct species should exist on islands so close to each other (and to the mainland) as Barnard Islands and Dunk Island—respectively the supposed habitats for *gouldi* and *griseata*—is extremely doubtful. Both names should be "decently forgotten."

This small Shrike-Thrush is exceedingly common on Moa Island, where it breeds.

[14/12/19.—My attention was attracted to a minute Shrike-Thrush which was fluttering round and round a trunk of a mangrove in chase of something, which a few seconds later fell with a splash into the water. The bird followed, fluttering above it. I went over to investigate; saw a small wood-adder, and got it.]

* "Tab. List Austr. Birds" (1888), p. 35.

***Cyrtostomus frenatus,** S. Müller. Sun-Bird.
C. f. macgillivrayi.

Two ♂♂. Absolutely no difference between these, Cape York, and Cardwell specimens, and are doubtless typical *frenatus*. Common, and found nesting.

Dicæum hirundinaceum, Shaw. Mistletoe-Bird.
Austrodinaceum h. hirundinaceum.

One ♂. Typical. Observed several times, and breeding.

***Myzomela obscura,** Gould. Dusky Honey-eater.
Melomyza o. harterti.

One ♀. Resembles King River (N.T.) skins, but is much lighter-coloured than examples obtained in the heavy country at Cardwell which Mr. Mathews designates as *harterti*. Numerous.

[23/1/20.—Saw three Dusky Honey-eaters, and shot one. Could not find the others. Have been on the look-out for this bird for about three weeks; was beginning to think they had all left the island.]

***Glyciphila modesta,** Gray. Brown-backed Honey-eater.
Ramsayornis m. subfasciatus.

One ♂, 1 ♀. Fairly numerous on Moa.

[25/1/20.—Follow a creek along which paper-barks (*Melaleuca*) are growing. Creek has been running several feet deep, but only occasional pools are now left. Three pairs of Brown-backed Honey-eaters observed building in trees overhanging water.]

***Myzomela erythrocephala,** Gould. Red-headed Honey-eater.
M. e. kempi.

One ♂, 1 ♀. Both this and the preceding New Guinea and Australian Honey-eaters appear typical. If so desired, my previous remarks on the species may be referred to—for *Glyciphila modesta*, *Emu*, xvii., p. 32, with plate of nest, and *Myzomela erythrocephala*, *Emu*, xviii., p. 185.

This beautiful Honey-eater was occasionally seen on Moa Island, and once (20/11/19) Mr. M'Lennan observed five red-headed males in one mangrove tree.

***Ptilotis notata,** Gould. Yellow-spotted Honey-eater.
Ptilotina analoga notata.

Two ♂♂, 1 ♀. *P. chrysotis* (*lewinii*) and this distinct species both being found in Northern Queensland, and similar in size and coloration, are sometimes confusing to field observers, but the examination of cabinet skins shows that *P. notata*, besides being smaller, is lighter-coloured and more yellowish on the under surface than *P. chrysotis*. As expected, *notata* from the luxuriant scrubs of the mainland is a trifle darker than these Torres Strait skins.

This and the Lesser Spotted Honey-eater were two of the commonest species on the island, and both were observed breeding in the paper-barks. (For illustrations of typical nests of the two, reference may be made to *Emu*, xvii., pl. 8.)

Again we are indebted to Mr. H. L. White's generosity in

commissioning Mr. Neville Cayley to execute the original drawing of the coloured plate which appears in this issue, the subject being the Yellow-spotted Honey-eater and the following species, the Lesser Yellow-spotted Honey-eater. These birds, also frequenting the same scrubs, are sometimes, in the field, if not seen together, mistaken one for the other. Reference to the illustrations above mentioned of the respective nests will show that both are lined with the same kind of white silky substance. The eggs of the Spotted Honey-eater are white, sparingly spotted, resembling those of *P. lewinii*, while the eggs of the Lesser Yellow-spotted bird, besides being smaller, are more flesh-tinted, and are not unlike typical eggs of the Crescent Honey-eater (*Lichmera australasiana*).

The Australian habitat of the Yellow-spotted and Lesser Yellow-spotted Honey-eaters extends from Rockingham Bay district to Cape York, and probably includes the Gulf of Carpentaria country.

***Ptilotis gracilis,** Gould. Lesser Yellow-spotted Honey-eater.
Microptilotis g. gracilis.

One ♂, 1 ♀. A typical pair, forming useful material, and agreeing with skins from the Cape York mainland. Birds Mr. H. G. Barnard and I obtained in Cardwell scrubs are apparently slightly darker above and lighter on the under surface, especially the throat—the result of different environment, doubtless—but there is not the slightest ornithological or other need to emphasize trinomially such natural variation in plumage. Hear a few thrusts by Dr. Jonathan Dwight (*Auk*, xxi., p. 65) on the subject of the exaltation of sub-species:—"Its value . . . is impaired by the undue prominence which it has attained." "We must beware lest we name that which exists only in our expectant mind." "We forget that, as names multiply, they lose in definiteness of meaning." "True science does not receive much uplifting from the mere re-naming . . . of skin and feathers," &c.

Tropidorhynchus buceroides, Swainson. Helmeted Friar-Bird.
Neophilemon b. yorki.

One ♀. Typical of the mainland species, and identical with a female obtained at Cardwell by Mr. H. G. Barnard while collecting for Mr. H. L. White.

On Moa this large Honey-eater was frequently seen, and was nesting.

[Heard a bird call that I thought was a Rail of some sort. Sat down and started to imitate the call—rather a difficult job. In about half an hour the bird called again, apparently from the ground, about 50 yards away. It called again, this time in the tree above me. It was a Friar-Bird. I never heard one utter this call previously—a hissing, throaty "Kurr-rk," slowly repeated eight or ten times.]

Munia assimilis, Mathews. Dark-breasted Finch.
Lonchura c. castaneothorax.

Two ♂♂. These were the only Finches collected on Moa Island by Mr. M'Lennan. They resemble *assimilis* except having lighter-coloured (cinnamon-buff) upper tail coverts. Observed several times in families or small flocks about the grass flats.

Mimeta affinis, Gould. Northern Oriole.
Amimeta sagittata subaffinis.

One ♀. Slightly lighter-coloured (less greenish) than birds from Northern Territory, but similar to a female taken in Victoria save its smaller size—wing, 140 mm., as against the southern example, 150 mm. Migrating birds taken in Victoria are similar to those at Cardwell, the bills of which, however, are larger. In northern birds the white spots on the terminal end of the tail feathers are smaller, and almost disappear in some specimens. Observed on three occasions.

***Chibia bracteata,** Gould. Spangled Drongo.
Dicruropsis b. bracteatus.

One ♂, 1 ♀. These shining and spangled specimens are typical. There does not appear sufficient grounds for two races or subspecies in Australia. This migratory species was commonly seen during November, December, and up to about the middle of January.

***Aplonis metallica,** Temminck. Shining Starling.
Metallopsar m. purpurascens.

One ♂, 1 ♀. Their plum colour (coal-tar purple and green, according to the angle of light) is exquisite. Both male and female have coats of "shining splendour," the creamy-white under surface of the latter being beautifully streaked. The species is migratory, and similar to New Guinea birds.

[18/11/19.—Hear Shining Starlings singing and mimicking calls of other birds—Drongo, Fig-Bird, Yellow-spotted and Lesser Spotted Honey-eaters. 11/12/19.—Strike an open pocket, at the edge of which Shining Starlings have built. Some broken egg-shells on the ground beneath show that the young are hatched. 20/12/19.—Large colony of Starlings building in a tall white mangrove. Later, found another colony of the birds building in a similar tree. 19/1/20.—Have a look at the colony of Starlings noted 20/12/19. Several small limbs with nests attached are lying on the ground; each contains eggs, majority broken by the fall.]

CONCLUSION.

Fifty-five other species of birds were noted by Mr. M'Lennan, but no material was collected. Of the fifty-five, about thirty-five are found both in Australia and New Guinea.

The Snipe flushed on two occasions (16th December and 31st March)—was it *Gallinago australis* or *G. megala*? Most likely the latter. Birds identified that do not previously appear to have been recorded for the Cape York region were Bald-Coot (*Porphyrio melanotus*), Straw-necked Ibis (*Carphibis spinicollis*), Black-billed Spoonbill (*Platalea regia*), Lesser Egret (*Garzetta immaculata*),

Spotted Harrier (*Circus assimilis*), and Fairy Martin (*Petrochelidon ariel*), while the Red Goshawk (*Erythrotriorchis radiatus*) was doubtfully identified.

Regarding the movements of partially migratory species, data have been briefly mentioned, where available, under their respective names, except the Bee-eater (*Merops ornatus*), of which there was no skin. These birds were seen or heard every day during March, and on the 11th and 12th April were observed or heard calling as they flew northward. Mr. M'Lennan left the following day.

Australian Species of Tubinares (Petrels and Albatrosses).

By W. B. Alexander, M.A., Keeper of Biology, Western Australian Museum, Perth.

(*Continued from page* 24.)

[Genus *Pagodroma*.

Pagodroma nivea (Gmelin.) Snowy Petrel.

This has been included in Australian lists, but there is no record of its occurrence in our area. It is an inhabitant of Antarctic seas, and has never been met with far north of the ice.]

Genus *Macronectes*.

This genus has usually been known under the name of *Ossifraga*, Hombron et Jacquinot, 1844; but Wood had previously used this name for a genus in 1836. Richmond renamed the genus *Macronectes* in 1906.

Macronectes giganteus (Gmelin). Giant Petrel or Fulmar, Nelly, or Stinkpot.

A regular winter visitor to the southern coasts of Australia; not infrequently blown ashore. It has been obtained on the east coast as far north as Sydney, and on the west coast as far north as Houtman's Abrolhos. A white form of the species occurs, but it is very rare in Australian waters. One was obtained on the coast of New South Wales in September, 1914 (*Emu*, xv., p. 215). The suggestion quoted by Mathews—that the Giant Petrel breeds on islands off Fremantle—is certainly without foundation (7, p. 188).

The type locality of the species is Staten Island, Tierra del Fuego, and Mathews distinguishes the birds found in Australian waters as *M. g. dovei* (*Austral Avian Record*, iii., p. 54).

[Genus *Thalassoica*.

Thalassoica antarctica (Gmelin). Antarctic Fulmar.

This bird has been included in Australian lists, perhaps through confusion with *Priocella antarctica* (Stephens). There is no record of its occurrence in our region.]

GENUS *Petrella.*

This genus has been commonly known by the name of *Daption*, bestowed on *Procellaria capensis* by Stephens in 1826. Zimmerman had, however, used the name of *Petrella* for this bird in 1793.

Petrella capensis (Linn.) Cape Petrel or Fulmar, Pintado, or Cape Pigeon.

This species is common in the seas to the south of Australia during the winter, and has been observed by many travellers. Its chequered plumage, unlike that of any other bird, makes its identification easy. Gould states that it is nowhere more numerous than off the south coast of Tasmania, and that it was very numerous off King George's Sound on 8th September, 1838 (1, p. 469). He also met with it when travelling from Hobart to Sydney. Peron observed it in Geographe Bay, W.A., in 1801 ("Voyage aux Terres Australes," vol. i., p. 212). More recently it has been met with by Giglioli, Ferguson, W. Macgillivray, and myself. I know of no record of the actual capture of a specimen in Australia, the authenticity of the birds in the British Museum labelled "Australia" being doubtful.

The type locality of the species is the Cape of Good Hope, and Mathews has separated the New Zealand form sub-specifically under the name of *australe*. He refers the Australian birds to this race.

GENUS *Pachyptila.*

This genus has commonly been known as *Prion*. Lacepede introduced that name in 1799, but his genus is indeterminable (*Austral Avian Record*, ii., p. 25). In 1828 Lesson defined the genus, making *Procellaria vittata* the type, but in the meantime Illiger, in 1811, had introduced the genus *Pachyptila* with the same species as type, and this name, therefore, has priority.

Sub-genus *Halobæna.*

This has generally been regarded as a separate genus, but *H. cærulea* does not differ from the other Prions more than do species of *Puffinus*, as that genus is commonly used.

Pachyptila cærulea (Gmelin). Blue Petrel.

Gould observed this species in the South Indian Ocean. It gradually increased in numbers as he proceeded, and was very plentiful off the coast of Tasmania. He also met with it on his voyages from Hobart to South Australia and Sydney (1, p. 457). Diggles captured one off the south coast of Western Australia in October, 1853 (*Austral Avian Record*, iii., p. 100). Mathews records a specimen picked up dead in Victoria (7, p. 195). This bird he made the type of a sub-species—*victoriæ* (*Austral Avian Record*, iii., p. 54).

Sub-genus *Pachyptila.*

Pachyptila vittata (Gmelin). Broad-billed Prion, Dove-Petrel, Blue Fulmar, or Whale-Bird.

During the voyage of the *Rattlesnake* Macgillivray procured a specimen of this species at the eastern end of Bass Strait on 11th

July, 1847 (6, p. 285). Specimens have been picked up dead on the beach after storms in all the southern States during the winter. No less than 35 were found by Mr. F. L. Stronach and myself in August, 1910, on the beach at Cottesloe, W.A., on three succeeding days.

The type locality of the species is New Zealand, and Mathews considers that a bird obtained at Sydney belongs to the New Zealand race. Bass Strait birds he separates as *P. v. gouldi* and West Australian birds as *P. v. missa*.

Sub-genus *Pseudoprion*.

Pachyptila turtur (Kuhl). Fairy Prion or Dove-Petrel.

This species breeds on islands in Bass Strait and off the coasts of Tasmania and Victoria. Gould obtained specimens off Cape Howe on 16th April, 1839 (1, pp. 472 and 473, *P. ariel*). North observed them near Montague Island and Gabo Island as well as in Bass Strait, and states that odd birds have been obtained in Sydney Harbour (8, p. 374). Dead birds have been picked up on beaches in New South Wales and Victoria.

The type locality of the species is Bass Strait, and Mathews has separated birds from Sydney as *P. t. nova* (*Austral Avian Record*, iii., p. 55).

The species has usually been known as *P. ariel*, but Kuhl's name has priority.

Sub-genus *Heteroprion*.

This division of the genus presents great difficulty, and it seems almost impossible to decide how many species should be admitted. The sole method of solving the question will be the discovery of the breeding-places of these little birds and the examination of series from each.

After careful study of numerous specimens obtained in Western Australia, and consideration of the views put forward by Salvin, Godman, Mathews, and Loomis, I think that it would be best for the present only to admit a single species.

Pachyptila desolata (Gmelin). Prion or Dove-Petrel.

This "species" can be distinguished from *P. vittata* and *P. turtur* owing to differences in the form of the bill—a fact which Mathews has emphasized by placing the birds in different genera. Loomis does not admit this, but regards them all as of one species. I have never found any difficulty in distinguishing *P. vittata* from the narrower-billed form at sight on the beach, and it is undoubtedly a larger and heavier bird. I have never met with *P. turtur*, but it is evidently equally easily distinguished by its short beak. The intermediate birds have usually been divided into two species—*desolatus* and *banksi*; but I find that all authors have expressed doubt as to the possibility of separating these forms. Mathews has apparently united them and described a new narrow-billed form under the name of *belcheri*; but whether this can be maintained remains to be proved.

These birds are picked up dead on the beaches in all the southern States after winter storms. Records of birds observed

at sea cannot be relied upon, owing to the difficulty of distinguishing the species. Mattingley's account of the breeding of Prions off Portland, Victoria, which Mathews places under this species (7, p. 226), more probably refers to *P. turtur*, the only species of Prion which has been proved to breed in our seas.

FAMILY PELECANOIDIDÆ (Diving-Petrels).

GENUS *Pelecanoides*.

Pelecanoides urinatrix (Gmelin). Diving-Petrel.

This species breeds on islands off the coasts of Victoria and Tasmania and in Bass Strait. There seems to be no record of its occurrence in any of the other States.

The type locality of the species is New Zealand, and Mathews has separated the Australian bird sub-specifically under the name of *P. u. belcheri*.

FAMILY DIOMEDEIDÆ (Albatrosses and Mollymawks).

Owing to their large size and their fondness for following steamers, often taking advantage of the rush of air caused by the passage of the boat to sail motionless close over the stern for many minutes at a time, these birds are readily observed on ocean voyages, and most of the species are easily recognizable. Thanks to the valuable notes made by Ferguson (*Emu*, xv., pp. 243–249) and W. Macgillivray (*Emu*, xix., pp. 162–176), and those published by Hull with regard to species seen on the New South Wales coast (*Emu*, xv., p. 215), we now have a good idea of the distribution of the different species in our seas. My own observations made on four recent voyages between Fremantle and Melbourne serve to confirm those already mentioned.

GENUS *Diomedea*.

Sub-genus *Diomedea*.

Diomedea exulans (Linn.) Wandering Albatross.

This species is common in the seas to the south of Australia, ranging north at least as far as Sydney on the east coast and Fremantle on the west coast. Some seem to be present in our waters at all times of year, as Ferguson saw specimens off Fremantle in January. I have seen them in the Bight and off the south coast of Western Australia in March, April, May, and July; W. Macgillivray met with them there in May and June, and Ferguson in August. On the coast of New South Wales they are found from June to November. Undoubtedly they are commonest in the Bight in the winter months.

The type locality of the species is the Cape of Good Hope, and Mathews has named the form occurring in Australian seas *D. e. rothschildi*.

Diomedea chionoptera (Salvin). Snowy Albatross.

Mathews states that he has specimens of this species from Australian waters, but that it is much rarer than *D. exulans*, and less easily approached (*Emu*, xviii., p. 87).

The type locality of the species is Kerguelen, and Mathews has named a bird obtained at Sydney *D. c. rohui*. This is presumably the form usually found in Australian seas, but in his "Birds of Australia" Mathews attributed to the typical race a bird which was caught at the Crozets by some shipwrecked sailors and liberated with a message round its neck, and which was subsequently captured at Fremantle. In *The Emu*, vol. xviii., p. 86, he wrote:—"I understand that doubt has now been cast upon that record"—apparently referring to remarks made by me, in which I queried the advisability of including this species in the list of West Australian species (*Emu*, xv., p. 183). There is no doubt about the record; my doubt is as to the justification for the assumption that a bird caught on the Crozet Islands, and only described as "an Albatross," must have been a specimen of *D. c. chionoptera*. Might it not have been *D. exulans*?

The specimen caught on the coast of New South Wales, and referred to in *The Emu* (vol. xv., p. 215) under the name of *D. regia*, was presumably the type of *D. c. rohui*.

[Sub-genus *Rhothonia*.

Diomedea epomophora (Lesson). Royal Albatross.

Mathews considers that a bird captured on Capt. Cook's first voyage to the east of Bass Strait, on 11th April, 1770, and described by Solander, was of this species, better known under the name of *D. regia*.

There is apparently no more recent record, but, as New Zealand is the type locality, the species probably occurs in the seas off S.E. Australia.]

[Sub-genus *Phœbastria*.

Diomedea albatrus (Pallas). Short-tailed or Steller's Albatross.

Gould included this species in his "Birds of Australia" "more for the purpose of including a second species of the restricted genus *Diomedea* than for its being, strictly speaking, an Australian bird; still, the chances are that it does frequently visit the northern coasts of that country" (1, p. 433). There is no record of its occurrence south of the equator, it being confined to the North Pacific, and it should have no place on the Australian list.]

GENUS *Thalassarche*.

Sub-genus *Thalassarche*.

Thalassarche melanophris (Temm.) Black-browed or Spectacled Mollymawk or Albatross.

This species is the commonest member of the family in the Bight and on the south coast of Western Australia during the winter months, and Ferguson and I have both recorded its occurrence there in January. Curiously enough, at the beginning of April, 1917, I saw none when crossing the Bight, though they were numerous off the coast of Western Australia, and I also saw them in the Gulf of St. Vincent, South Australia; but in March, 1919, May, 1917, and July, 1916, I found them plentiful all the

way across. Though so abundant in the Bight, they are not at all common on the east and west coasts, where they are replaced by *T. chlororhynchus*. Ferguson met with them as far north as Cape Naturaliste, W.A., and there can be little doubt that this is the species with yellow beak and yellow eyes recorded as noted on the coast of New South Wales in June, July, and August (*Emu*, xv., p. 215).

The type locality of the species is the Cape of Good Hope, and Mathews has named the Australian race *T. m. impavida*.

Sub-genus *Thalassogeron*.

Thalassarche chrysostoma (Forster). Grey-headed, Flat-billed, or Culminated Mollymawk or Albatross.

Gould states that numbers of these birds came under his notice during a voyage from Launceston to Adelaide, particularly off Capes Jervis and Northumberland (1, p. 436). One collected by him on the coast of Tasmania in August, 1839, is in the British Museum (4, p. 451). A specimen was captured alive by Mr. F. L. Stronach on the sand-hills at Cottesloe, W.A., in June, 1917 (*Emu*, xix., p. 59); I erroneously stated that it had been "picked up on the beach at Fremantle," but Mr. Stronach has since given me full particulars of the capture.

The species is apparently common in that portion of the Indian Ocean lying to the south-west and south of Western Australia, according to W. Macgillivray's observations in June, 1919, and Ferguson also observed it in that region in January, 1916. It is probably the species met with on the coast of New South Wales from August to the beginning of December, with grey head and grey neck (*Emu*, xv., p. 215).

Gould named the species *Diomedea culminata*, the type locality being Bass Strait, and Mathews uses this name sub-specifically for East Australian birds. The West Australian race has been named by him *T. c. alexanderi*.

Sub-genus *Nealbatrus*.

Thalassarche chlororhynchus (Gmelin). Yellow-nosed or Carter Mollymawk or Albatross.

This is the commonest member of the family on the New South Wales coast, outnumbering all other species by at least three to one (*Emu*, xv., p. 215). It is met with from March until December. It often enters Sydney Harbour, and, according to Ferguson, is very common between Sydney and Brisbane. Gould observed it off Capes Howe and Northumberland, and I have seen it in St. Vincent's Gulf. In the Bight it is almost absent, but reappears in the neighbourhood of Albany, and is again plentiful on the west coast from Cape Leeuwin to Geraldton, whilst the bird which was made the type of *Diomedea carteri* was captured by Mr. T. Carter as far north as Point Cloates.

The type locality of the species is the Cape of Good Hope. For the West Australian bird Mathews uses the name *carteri* sub-

specifically, whilst he has named the East Australian race *T. c. bassi*.

Sub-genus *Diomedella*.

Thalassarche cautus (Gould). White-capped or Shy Mollymawk or Albatross.

This species breeds on Albatross Island, in Bass Strait, and perhaps also on Mewstone Island, off the south coast of Tasmania. It does not seem to range far from its breeding-places, but is met with in the seas of Tasmania and S.E. Australia, on the south coast as far west as Cape Northumberland, S.A., and on the east coast as far north as Sydney. On the New South Wales coast it is said to occur only in June, July, and August, being very plentiful in July (*Emu*, xv., p. 215).

The type locality of the species is Recherche Bay, Tasmania, where it was first obtained by Gould. Mathews has named a bird obtained at Sydney *wallaca* (*Austral Avian Record*, iii., p. 160).

GENUS *Phœbetria*.

Phœbetria fusca (Hilsenberg). Sooty Albatross.

This species is met with across the Bight and in the South Indian Ocean. Ferguson met with it in January and August, W. Macgillivray in June, and I have observed it in March, April, May, and July. Until recently the two species of dark Albatrosses were not distinguished, so that earlier references can only with doubt be attributed to either form, but it was probably this bird which was met with by Peron on 7th January, 1802, off the south coast of Western Australia ("Voyage aux Terres Australes," vol. i., p. 215). It would appear that this was the only species met with by Gould, as he could not fail to have noticed the light-mantled form if he had seen it. A specimen captured in Port Phillip is in the Melbourne Museum (*Austral Avian Record*, ii., p. 135).

The type locality of the species is the Mozambique Channel, and Mathews has separated the Australian race under the name *P. f. campbelli*.

Phœbetria palpebrata (Forster). Light-mantled or Hutton Sooty Albatross.

This species is much less common in Australian seas than the foregoing. Ferguson met with it in January, 1916, in the Bight, and W. Macgillivray in May, 1917, and June, 1919, in the Southern Indian Ocean and the Bight. I observed three specimens when crossing the Bight in May, 1917.

The type locality of the species is Kerguelen, and Mathews has named the New Zealand race *P. p. huttoni*. It is not known which of these forms occurs in Australian seas, though Macgillivray's observations suggest that our birds range from the Indian Ocean. Mathews would omit this bird from the Australian list until a specimen is secured, but I think the fact of its occurrence in our waters as now defined is sufficiently established.

SUMMARY.

The Petrels found in Australian seas may be divided into those species known to breed on our coasts and those which occur more or less regularly as visitors from more distant breeding localities.

When breeding birds are considered, the Australian coast-line may be divided into four regions, each with its characteristic species. These are :—

(1) The coasts of Queensland and New South Wales (Eastern region).
(2) The coasts of Tasmania, Victoria, and South Australia, with Bass Strait (South-eastern region).
(3) The south coast of Western Australia (South-western region).
(4) The west coast of Western Australia (Western region).

Only one species (*Pelagodroma marina*) breeds in all four regions, and only one (*Puffinus pacificus*) is known to breed north of 28° S. lat.

BREEDING SPECIES.	REGION. E.	S.E.	S.W.	W.
Pelagodroma marina	×	×	×	×
Puffinus assimilis	—	—	×	×
Puffinus pacificus	×	—	—	×
Puffinus carneipes	—	—	×	—
Puffinus griseus	×	—	—	—
Puffinus tenuirostris	—	×	—	—
Pterodroma macroptera	—	—	×	—
Pterodroma cookii	×	—	—	—
Pachyptila turtur	—	×	—	—
Pelecanoides urinatrix	—	×	—	—
Thalassarche cauta	—	×	—	—

The visiting species whose claims to a place in our list are admitted in this paper are as follows. It is not improbable that some of them—*e.g.*, *Puffinus gavia*—will ultimately be found to breed on our coast-line. I have attempted to give an idea of the regions in which they have been observed by dividing the records into four groups—viz., those in (1) the South Pacific, (2) Bass Strait and Tasmanian seas, (3) the Great Australian Bight, and (4) the South Indian Ocean.

VISITING SPECIES.	S. Pacific.	Bass St. and Tasmania.	Bight.	S. Indian.
Oceanites oceanicus	×	×	—	×
Oceanites nereis	×	×	—	—
Fregetta tropica	×	—	×	—
Fregetta tubulata	(Unknown)			
Fregetta grallaria	×	—	—	—
Puffinus gavia	×	—	—	—
Procellaria conspicillata	—	—	—	—
Procellaria parkinsoni	×	—	—	—

VISITING SPECIES.	Bass St. and S. Pacific.	Tasmania.	Bight.	S. Indian.
Procellaria cinerea	—	×	×	×
Priocella antarctica	—	—	×	×
Pterodroma inexpectata	—	×	—	—
Pterodroma melanopus	—	×	—	—
Pterodroma lessonii	×	×	×	×
Pterodroma mollis	—	—	×	×
Macronectes giganteus	×	×	—	×
Petrella capensis	—	×	×	×
Pachyptila cærulea	—	×	×	×
Pachyptila vittata	×	×	—	×
Pachyptila desolata	×	×	—	×
Diomedea exulans	×	×	×	×
Diomedea chionoptera	×	—	—	—
Thalassarche melanophris	×	×	×	×
Thalassarche chrysostoma	×	×	—	×
Thalassarche chlororhynchus	×	×	×	×
Phœbetria fusca	—	×	×	×
Phœbetria palpebrata	—	—	×	×

The following species, which have appeared in lists of Australian birds, are rejected for want of evidence as to their occurrence :—*Fregetta leucogaster, Puffinus leucomelas, Puffinus therminieri, Procellaria æquinoctialis, Pterodroma brevipes, Pterodroma neglecta, Pagodroma nivea, Thalassoica antarctica, Diomedea epomophora,* and *Diomedea albatrus.*

There remain 11 breeding species and 26 visiting species.

In conclusion, I would like to express the deep obligation of all Australian workers on these birds to Mr. G. M. Mathews, who, in his "Birds of Australia," has brought together such a valuable amount of information concerning the literature of birds of this order.

Penguins.

BY R. STUART-SUTHERLAND, R.A.O.U., INVERCARGILL, N.Z.

PART II.—PENGUINS OF THE AUSTRALASIAN REGION.

ELEVEN species of Penguins belonging to five genera (of the recognized six) are found in this region, the most numerous being probably the members of the genus *Eudyptula* (the Blue and Little Blue Penguins). The genus *Catarrhactes* is, however, the most interesting, on account of the large number of species, and that a pronounced melanistic form occurs, as well as a geographical variety. All the descriptions are taken from actual specimens (dried skins), and the measurements from the flesh, unless otherwise stated.

GENUS *Aptenodytes.*

"Bill longer than the head, rather slender; lower mandible

covered with a smooth, naked skin ; tail very short ; tarsi covered with short feathers."—Buller.

Aptenodytes pennanti. King Penguin.—The upper surface, including the head, throat, and fore neck, bluish-grey, becoming darker on the hind part of the neck. A patch of golden yellow on each side of the nape, which is continued downwards, to meet on the front of the neck, the yellow colour gradually fading away into the white of the upper breast. The under parts white or whitish-cream ; bill black, save the base of the lower mandible, which is pinkish ; legs and feet black. Length very variable (dried skins)—34 to 37 inches ; wings, 10.75 to 11.25 inches ; bill, 4.2 to 4.5 inches. Egg, 4.0 to 4.3 inches, tapering at one end ; colour—inside shell beautiful pale blue, outside chalky-white.

My acquaintance with this variety is only in zoological gardens, museums, and the examination of skins (adults and young) and eggs. Hutton and Drummond give the Macquarie Islands only as the habitat. Sir Douglas Mawson says :—" The site of the rookery (Macquaries) is a stony flat about one hundred yards from the water's edge, and here are collected five or six thousand birds—all that now remain on this island." Dr. Kidder states that it breeds at Kerguelen Island, but he secured no eggs there. One at least of the adult skins I have examined was secured at Stewart Island, where Buller says it breeds. It does not do so now, although it has been reported by some, who mistake the Yellow-eyed Penguin for this species. Stragglers are said to occur in the most unlikely places. I have even been told that it is occasionally seen at and around Taiaroa Heads, but I did not meet with it during a two and a half years' stay in that district. During the months of November and December, when, according to locality, the nesting season commences, only one egg is laid, which is incubated in a sort of pouch formed by a fold of heavily-feathered skin completely covering the egg when it is rested on and between the feet. The period of incubation is said to be 35 days. The chick is covered with a greyish-brown, coarse, furry growth, and looks far larger when three or four months old than an adult. The full plumage, with the characteristic yellow patches, is not assumed until the second year.

GENUS *Pygoscelis.*

Bill moderate both in length and stoutness ; lower mandible more or less feathered. Tail long, of 12 to 16 feathers. Upper tail coverts short.

Pygoscelis papua. Rock-Hopper, or "Johnny" ("Gentoo Penguin" of Dr. Bruce).—The upper plumage slaty-grey, with the head and neck darker. The summit of the head marked with a conspicuous white patch. Bill dark reddish. Eye brown. Length variable—29 to 31 inches ; wing, 8.8 to 9.3 inches ; bill, 2.9 to 3.2 inches ; tail, 1.3 inches. Egg roundish in shape, 2.6 to 2.9 inches in length ; colour dark sea-green inside, chalky-white outside, though generally stained with soil and guano.

This Penguin, even as a straggler, is not seen on the New Zealand coast, and is not mentioned by Buller in his manual. The principal rookeries are on the Macquarie Islands, but the greatest numbers are found on the South Orkney and South Shetland island groups. Bruce says it was estimated that upwards of one hundred thousand "Gentoos" nested in the Scotia Bay rookeries in 1903. On the Macquaries one or sometimes two eggs are laid during October or November in a nest formed of a few stones, but little or no attempt is made at nest-building proper. The young, after the downy stage is past, are similar in plumage to the adult save that the throat and chin are white.

GENUS *Catarrhactes*.

Bill moderate in length, but very stout; sides of the upper mandible much swollen near the base. Tail long, of 14 or 16 feathers. Upper tail coverts moderate to short.

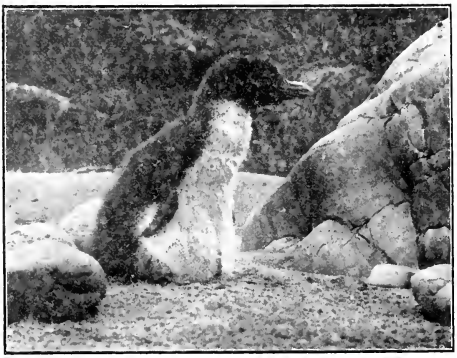
Catarrhactes pachyrhynchus. Thick-billed Penguin.—Upper surface of the body bluish-black, darker on the head and throat; a plume of golden-yellow feathers over each eye. Hutton says:—"Posterior margin of the flipper with a very narrow white band of one row of white feathers only." Eye brown. Feet pinkish-flesh colour above, black beneath. Length fairly constant—28 inches; wing, 8.4 to 9.1 inches; bill, 2.8 to 3.0 inches; tail, 1.2 inches (measurements taken in the flesh). Egg varying in shape from long and tapering to short and globular; size, 2.3 to 3.3 inches, the average being 2.8 inches; colour—chalky outside, very pale blue inside.

This showy bird breeds in small colonies in caves at Preservation Inlet. Upwards of sixty were found nesting in one cave, and numerous observations and measurements were made of the adults, young, and eggs. Several very interesting trips were made, although the floor of the cave was coated with several inches of slimy mud, and the walls and roof dripped horrible ooze. The stench was awful, and breathing somewhat difficult, a match or lantern burning with a dull yellowish flame. The first trip was made on the 16th August, 1919, and only eggs were seen, some heavily incubated. On the first fine day following—namely, the 22nd—we were lucky enough to strike a pair of chicks at the moment of chipping the shells. One was taken and carefully examined, and I concluded that the young are born blind. The measurements are as follows:—Length, 6.1 inches; wing, 1.4 inches; and bill, 0.6 inch. The nail on the upper surface of the mandible is ivory-white, and both mandibles are tipped with reddish. There is a decided unfeathered tract down the centre of the lower breast and abdomen.

To be sure that the young are born blind, another visit was undertaken six days later, and a chick then approximately six days old was examined and found to be still blind. Bad weather—heavy gales and hail squalls—then came on, and it was impossible to go again in a small flat-bottomed boat for nearly a fortnight,

when all the chicks were too far advanced, and it was then too late to make further observations on this very interesting point.

Hutton says that in the young the chin and throat are greyish-white; but after examining about three dozen young ones I am able to say that this is wrong, as in all those seen these parts were decidedly a dull black (see photograph of young one about ten days old).



Young of the Thick-billed Penguin, showing black chin and throat.

No trace of any nest—not even a stick, stone, or hollow—was found. The eggs were in some instances in an inch of mud, and the sitting birds, bespattered and stained, were maintaining positions as nearly upright as possible. One and two eggs were the usual clutches, although one was seen with three, one of which was very large (3.3 inches in length), and the others very small (2.3 and 2.4 inches respectively). It was interesting to watch the parent carrying the chick in her beak to escape the human marauders. One was reminded of a cat carrying a kitten.

By the end of September the cave was deserted, and no more notice was taken of it: but when passing on our way to the fishing grounds on 13th December, 1919, nearly four months after the first visit, the loud, hurried, screaming cries of Penguins were heard, and we put ashore to investigate. About twenty of these birds were found, but our greatest discovery was that of eggs. Eggs in all stages of incubation, judging by the feel, were strewn in every direction—in the mud, in crevices in the rocks, and under ledges—in every case plentifully spattered with the sticky mud. This is the first time that the fact of Penguins nesting twice in one year has been recorded, as far as I can learn. I was much struck with the grand condition of the birds observed, and again noted the fact that absolutely no nest of any description

was attempted, the eggs in every instance being laid and incubated in an inch or so of mud. Nest-forming material of every sort—fine sticks, small stones, fern and other leaves—were obtainable by the birds at the entrance of the cave, if required.

[Since writing the above a most thorough search of the cave was made with a powerful light, and in one very inaccessible corner, previously overlooked, two nests, one of which was occupied, were found formed of short sticks. This corner was fairly dry, and the sticks, which were coated with dried mud, were from 6 inches to a foot in length and a quarter to a half inch in thickness. Each nest was composed of about two handfuls of such sticks. A very careful examination revealed the fact that these were the only formed nests in the whole colony of approximately 60 birds.]

*Catarrhactes filholi.** Campbell Island Penguin.—The upper plumage bluish-black, becoming darker on the hind neck, crown, and throat. Yellow crest composed of fine feathers which spread fan-wise, the inner ones on both sides inclining towards centre of top of the head. The crest commences behind the termination of the culmen, and not between the nostrils and the end of the culmen, as in the other crested varieties. Bill brownish-red; feet flesh-colour; eye brown. Length, 23 inches; wing, 5.7 inches; bill, narrow, 2.0 inches; tail, 1.1 inches. The egg is very pale blue in colour, and is comparatively large. One specimen measured 3.3 inches. This may, of course, be abnormal.

Although said to breed only at the Campbell and Auckland Islands, this Penguin is occasionally seen at Preservation Point, and I believe stragglers breed here in small numbers. It is readily distinguished on shore by the peculiar form of its crest.

Catarrhactes chrysocome. Yellow-crested Penguin (*Eudyptes chrysocomus* of Buller).—Throat and the hind part of neck, with the sides of the face and crown, black, the remainder of the upper plumage bluish-black; under surface white. From the base of the upper mandible on each side a broad line of canary-yellow passes over the eye, and is continued beyond into a crest of fine filamentous feathers. Edge of flipper white. Eye reddish-brown. Length, 26 inches; wing, 8.3 inches; bill, 2.6 inches; tail, 1.6 inches. Egg very pale blue, 2.4 to 2.8 inches in length.

This striking Penguin breeds on most islands in the Southern Ocean, but principally on the Snares, Aucklands, Campbells, and Macquaries. It is replaced on the Bounty and Antipodes Islands by a slightly larger geographical sub-species known as *C. sclateri.*

Catarrhactes sclateri. Great-crested Penguin.—Similar to *C. chrysocome,* save that the crest is much reduced in length and the wing is more broadly edged with white in the majority of birds. Length, 29 inches; wing, 9.2 inches; bill, 2.9 inches; tail, 1.7 inches. Egg pale bluish inside, chalky outside, 2.7 to 3.1 inches in length.

* Some authorities claim this is synonymous with *C. chrysocome.*—EDS.

This species forms moderately large rookeries, differing thereby from *C. chrysocome*, which nests only in very small colonies.

A melanistic form of probably *C. pachyrhynchus* or *C. chrysocome* also occurs, which is listed by many writers as a separate species under the title of *Catarrhactes* (*Eudyptes*) *atrata*. I think it is generally admitted that all melanistic forms differ somewhat in structure from their normal variety, and this is no exception. Prof. Evans says in his opinion a form of *E. vittata*, but this can hardly be so, if due regard is paid to the thin broken line of yellow running from the bill over the eye, and produced posteriorly into a long yellow crest.

Catarrhactes atrata. Black Penguin.—The upper surface dark bluish-black, with the sides of the head and throat jet black; under surface also jet black. Crest yellow, inclining to orange. Bill very massive and deep, light brownish-red. Feet black excepting the toes, which are dark reddish-brown; hind toes very much reduced. Length (dried skin), 27 inches; wing, 7.6 inches; bill, 2.7 inches.

Specimens are very rarely taken at the Snares and Campbell Islands, but I think that if systematic searches were made amongst the nesting colonies of Crested and Thick-billed Penguins, probably many more would be secured. I have no record of any albino forms in this genus.

Catarrhactes schlegeli. Royal Penguin.—The upper plumage dark slaty-grey; under surface, including the throat, white, sometimes marked with isolated slaty-grey feathers. The yellow eye stripes, which meet on the forehead and form a crown rather than a crest, are continued backwards and very finely streaked with black. The gape pale yellowish. Bill reddish-brown. Length very variable, ranging from 26 to 30 inches; wing, 6.5 to 8.2 inches; bill, 2.6 to 2.9 inches; tail, 1.4 inches. Egg chalky white, 3.1 to 3.4 inches.

As a straggler I have on numerous occasions observed this variety on the beaches around Taiaroa Heads (Otago Peninsula). The majority of the specimens seen, however, were injured in some manner. Of three seen on one day, two had injured legs and one had a damaged wing. This is peculiar, and would give one the impression that the birds only landed when absolutely compelled to do so. An injured bird, although repeatedly placed in the water, always returned to the same spot. One specimen had scraped a hollow in the sand just a few feet above high water mark, and allowed itself to be handled without the least movement. Its leg had been injured in some manner. When placed in the water it swam away, always below the surface, but within one hour had returned to the hollow in the sand. This happened repeatedly, but our game was cut short by a sportsman, who despatched the dangerous beast with a military rifle at close range. I have no records of its breeding on the New Zealand coast, the principal rookeries being on the Macquarie and Campbell Islands.

Catarrhactes vittata.* Southern Penguin.—This Penguin I have seen only as a museum exhibit. Sir W. L. Buller's description is as follows:—"*Eudyptes vittata*.—Top of head brown, inclining to bluish on the front, and passing into pale brown towards the back of the head. Sides of the head and throat brown, with a broad superciliary white streak; upper part of neck and back brown, inclining to bluish in places; under surface pure white. Bill reddish-brown. Feet red, with blackened webs. Length, 28 inches; wing, 7.1 inches; bill, 2.32 inches (culmen 2.1). Habitat, southern extremity of New Zealand."

GENUS *Megadyptes*.

Bill moderately long, not so stout as in *Catarrhactes*; swelling at base of upper mandible hardly noticeable. Tail short, of 20 feathers.

Megadyptes antipodum. Yellow-eyed Penguin.—The crown of the head light yellow very finely streaked with black, margined with a quarter-inch band of clear yellow without streaks. The throat and face on the sides lightly tinged with yellowish-grey, becoming more yellow below the gape. The upper surface dark slaty-grey; under surface white. Bill reddish-horn. Feet large proportionally, fleshy-pink in colour. Eye lemon yellow. Length variable—29 to 31.5 inches; wing, 8.7 to 9.1 inches; bill, 2.9 to 3.2 inches; tail, 1.3 inches. Egg white, 3.1 to 3.5 inches.

This Penguin is more often wrongly named than any other. "Royal," "King," "Crowned," and "Crested" are some names so applied. The eye of this bird is peculiar, the power of sight being apparently confined to the lower portion, if notice is taken of the remarkable manner of holding the head. Especially is this noticeable if the object looked at is on a level or higher than the bird's head. The nesting season commences in September at Stewart Island, where the nest is formed of sticks and lined with leaves, generally on the outskirts of the bush at the foot of a tree or under a fallen trunk. The nest is better made than in any other variety, and one—but sometimes two—chalky-white eggs are laid. The period of incubation is said to be 32 days. Never breeding on the mainland, the principal rookeries—if a score or so birds nesting together can be called a rookery—are located at Stewart Island, the Snares, Auckland, Campbell, and Macquarie Islands. As a straggler, I have on several occasions observed this species around Taiaroa Heads, and the above description and measurements are taken from a specimen secured there. The egg is described from specimens taken at the Snares and Stewart Island.

* Through the kindness of Prof. Hutton, I have received a minute description and photographs of the typical specimen of *E. vittatus* in the Canterbury Museum, Christchurch. There can scarcely be any doubt that the species is founded on a worn and faded example of *C. pachyrhynchus*."—W. R. Ogilvie-Grant, "Cat. of Birds Brit. Mus.," vol. xxvi., p. 638.

PLATE VI

1. Yellow-eyed. 2. Thick-billed. 3. Blue.
Penguins.

PHOTOS. BY R. SQUARE-SUTHERLAND, B.A.O.U.

GENUS *Eudyptula.*

Bill short and stout. Tail very short, almost wholly concealed by the upper tail coverts.

Eudyptula minor. Blue Penguin.—Upper plumage variable, ranging from pale metallic blue to dull bluish-grey; each feather streaked centrally with black. Under surface up to the throat and chin glossy white; the chin is sometimes pale greyish. The flipper edged on the posterior margin with white. Eye silvery-grey. Length fairly constant—17.5 inches—but specimens measure from 16.5 to 18.5 inches or more; wing, 5.75 inches; bill, 1.0 inches. Egg white, roundish; 2.2 to 2.5 inches in length.

The Blue Penguin is too well known to need much special treatment. The range extends from about 32° S. latitude to some of the islands off the New Zealand coast, most numerous at the Chathams. Small numbers nest in caves and holes in Preservation Inlet, and the young are a common sight on the beaches. The foregoing remarks apply also to the beaches between Cape Saunders and Taiaroa Heads. Hutton says the female is smaller than the male, but I do not think regularly so. I have a female skin (dried) which measures 19.4 inches.

Eudyptula undina. Little Blue or Fairy Penguin. Similar to the last in general appearance; the white patch formed by the under tail coverts relatively larger than in the preceding. Length, 13.0 to 14.3 inches; bill, 1.1 or 1.2 inches; wing, 4.7 to 4.9 inches. Egg similar to the above, but smaller: 1.9 to 2.1 inches.

Probably even more abundant on the coast than *E. minor.* As far as the southern portion of the South Island is concerned, I might add that it does not nest in the same cave rookeries as its larger congener, although they mingle freely at other than nesting times. However, the usual nesting-place is a burrow, which may sometimes extend 10 feet in soft soil. The two eggs are laid in November, and the young when hatched are a dingy drab colour on the back and head and a dull dirty white on the under surface.

Eudyptula albosignata. White-flippered Penguin.—Like *E. minor,* save that the wings are widely bordered on both edges with white; and Hutton says, "with a more or less distinct white patch near the middle of the posterior margin." Length, 17.0 inches; wing, 5.6 inches; bill, 1.8 inches; tail, 0.8 inch. Egg white; 2.1 to 2.3 inches.

When my attention was first drawn to this variety I somewhat doubted its existence, thinking that it was probably only a freak; but I had the opportunity of seeing a couple of skins and an egg in Dunedin, and am now quite convinced. I know little about this bird, which is said to be obtained only in the vicinity of Banks Peninsula. In nesting and other habits it apparently does not differ from *E. minor* and *E. undina.*

The Birds of Sydney.

BY A. S. LE SOUËF, C.M.Z.S., AND DR. JOHN MACPHERSON, R.A.O.U.

THE district included in this survey is the city of Sydney and its suburbs, including two large parks, the Botanical and Zoological Gardens. The gardens and the parks are well within the city, and are surrounded by dwellings.

Practically all large cities have their characteristic birds, and it is very pleasant to note the number of wild species which manage to hold their own in the vicinity of Sydney in spite of many restraining circumstances in the shape of cats and the ubiquitous egg-hunting boy, and in competition with the large number of imported Sparrows and Starlings that are specially fitted to live in towns.

Several species are especially numerous. In the streets we find numbers of Welcome Swallows, whilst almost any bit of greenery will give shelter to the "Jacky Winter" (*Microeca fascinans*), the Wren-Warbler (*Malurus cyaneus*) and the familiar "Willie Wagtail" (*Rhipidura motacilloides*), while a shrubbery will be the stronghold of a Yellow Robin (*Eopsaltria australis*), and a Spinebill (*Acanthorhynchus*) will soon locate and visit any flowers. The Silver-eyes and the Grallinas are more widely spread: the former seem to visit any odd trees about the city, and the latter look after lawns and bowling greens wherever they are not molested.

The class of birds in a city is governed to some extent by the kind of trees which have been planted in the parks and suburbs; and, as so many of our Australian birds are specialists on the eucalypts, the presence of these trees naturally attracts many species, and Sydney is especially fortunate in this respect, as the parks round the harbour have to a large extent been left in their original state, and are a splendid sanctuary for the wild birds.

In good seasons a few Painted Quail (*Turnix varia*) are often to be found in the Sydney parks. In the spring of 1919 a little covey lived for some time in a thick patch of Paspalum grass growing on a rise in Ashton Park and adjoining some tea-tree scrub.

A pair of Little Crakes (*Porzana palustris*) live in Centennial Park; they are generally hard to observe, being wary and quick to take cover.

Black Moor-Hens (*Gallinula tenebrosa*) have recently taken possession of the water-lily pond in Centennial Park and also the ornamental waters of the Botanic Gardens, where they have become quite tame. They come to be fed by the public, and between times will be seen diving in the shallow water, evidently after water-plants, or searching round the banks of the islands after insects. They seem to be resident, and probably nest.

Numbers of Australian Coots (*Fulica australis*) are to be seen all the year round in the ponds in Centennial Park, and they will

come right to one's feet after tit-bits. Small flocks can usually be seen diving about in the shallow water after water-weeds which grow on the bottom. They do not rise more than a few inches from the water when flying, and hang their legs down. They have a sharp little screech call-note. They nest in the park, often within a few feet of the banks. They are useful in keeping the water-weeds in check, which would otherwise materially help to silt up the ponds.

Black-throated (*Podiceps gularis*) and Hoary-headed Grebes (*P. poliocephalus*).—The little Dabchicks are quite at home in the ornamental waters of the parks and Botanic Gardens, though they usually keep well out from the shore, and go about in small family parties of from four to six; they procure most of their food by diving.

The beautiful Silver Gull (*Larus novæ-hollandiæ*) is quite one of the ornaments of Centennial Park and the Botanic Gardens: a hundred or more birds may sometimes be seen in the former place, attracted, we think, by the bull-frogs. They travel back to the harbour in small flocks, circling round and reaching a great height before gradually drifting off to the east towards the coast.

Several of the pretty Black-fronted Dottrels (*Egialitis nigrifrons*) can be seen around the ponds in Centennial Park. They are tame, and their feeding habits can be observed at close range. They specially like feeding on the muddy banks, and will be seen digging vigorously into the earth after insects and worms. Their flight is rather laboured, and they utter their call-note, "Pink, pink," only when on the wing.

A small colony of Night-Herons (*Nycticorax caledonicus*) nest in a clump of large pines in front of Macleay House, in the suburb of Potts Point. They fly off in the evening, making for the feeding-grounds, and when they have young return in the early dawn, and the fledgelings make a great clacking noise when being fed.

The Black Duck (*Anas superciliosa*) is quite as tame as the domesticated species, and may be seen in the Botanic Gardens and the Centennial Park ponds; they cross with the white domestic birds, and party-coloured specimens are sometimes observed.

The handsome Chestnut-breasted Teal (*Nettium castaneum*) is a regular visitor to the ponds in Centennial Park, and there are sometimes hundreds round the islands.

Sometimes hundreds of the Grey Teal (*Nettium gibberifrons*) are to be seen in Centennial Park; they usually keep well away from the shores, and out of harm's way.

White-eyed Duck (*Nyroca australis*).—This Duck is generally present, sometimes in numbers, in Centennial Park. They keep to the middle of the ponds, and are expert divers. They sit low in the water, and are, in appearance, somewhat like the Musk-Duck.

Many hundreds of Cormorants come into Centennial Park to

roost every night. The birds arrive during the later afternoon and evening in small flocks, and settle down on the willow-trees growing on the islands in the lakes, and also on the banks. Some birds spend the day in the park, evidently not requiring food every day, but the great majority leave early in the morning for the fishing grounds in the harbour and along the coast. Four species have been noted.

One or two Brown Hawks (*Hieracidea berigora*) usually take up their quarters in Taronga Park, where they find an easy living among the numbers of wild birds.

The Nankeen Kestrel (*Cerchneis cenchroides*) is often in evidence over the city in the autumn, but it usually does not stay long. This year one has been for some time in Centennial Park, hawking about for its prey, quite unconcerned by dozens of cars, cycles, and pedestrians that are continually about.

White-bellied Sea-Eagle (*Haliæetus leucogaster*).—A pair of these birds live about Middle Harbour, and are not infrequently seen over the adjacent suburbs. In November, 1919, a terrific battle took place between two males. For over half an hour they waged fierce combat, one bird trying its utmost to catch the other, which managed to elude its onset; finally, one dived into the undergrowth in part of Ashton Park, and the victor sailed away.

The Boobook Owl (*Ninox boobook*) is not as numerous as one would expect it to be, considering the amount of food it would be able to find. The reason is that probably no suitable nesting-places are available. A pair of these birds live in the Quarantine grounds, spending the day in low banksia bushes.

A pair of Delicate Owls (*Strix delicatula*) lived in Taronga Park, but they were suspected of frightening the aviary birds against the wire at night and pulling them through, so they were caught and put into the bird-of-prey enclosure.

No Cockatoos and Parrots are now resident about Sydney, but attempts have been made to get some species to establish themselves by liberating birds from Taronga Park. Rosellas and Crimson Parrots have disappeared almost at once. The Sulphur-crested Cockatoo is quite willing to stay, but proves so destructive to the flower-gardens that the birds had to be captured again. Better success has been obtained with the Galah and the Pink Cockatoo. Both these stay in the grounds, and do not do any damage, with the exception that the Galahs have started to ringbark an apple (*Angophora*) tree. This tree contains no hollow, so it is not for the purpose of protecting a nest. Both species have become very tame, and will readily take food from the visitors' hands. The Pink Cockatoos always attack a Hawk if one comes over, and will hold aerial combats as long as it is in their particular locality.

One or two pairs of Frogmouths (*Podargus strigoides*) live in the parks adjacent to the city. Two young birds were reared in Ashton Park in 1919.

The familiar Great Brown Kingfisher (*Dacelo gigas*) is always

in evidence in the suburbs, and seems to get a living if there are any large gardens about. It, however, prefers the parks that have been left in their natural state, and is more numerous in the thickly-wooded grounds round the harbour than in the cleared areas such as Centennial Park. These birds breed regularly in Ashton Park.

The call of the Sacred Kingfisher (*Halcyon sanctus*) is heard in the spring, and many take up their summer residence in the parks round the city, and make use of any white ants' nests in which to make their own home, and very fussy and noisy they are about it. They are the first of the visitors to go north again, leaving in February as soon as the young can fend for themselves. Eight were noted in Ashton Park on 27th November, 1919.

Pallid Cuckoos (*Cuculus pallidus*) arrive in numbers in September. They were especially numerous in 1919. Two pairs took up temporary quarters in Mosman, adjoining Ashton Park. At daylight each morning they would start chasing about, flying at a tremendous pace through the trees, and evidently acting under excitement, and chiefly uttering their "shriek" call; but later in the day their "scale" note is heard. The birds only stayed about a fortnight, and then passed on, presumably going further south.

The Fan-tailed Cuckoo (*Cacomantis flabelliformis*) is a resident and quite a suburban bird, making itself at home in our gardens, and is often seen on the telephone or electric light wires above the roadways. One was observed swallowing a large caterpillar, and it seemed quite a difficult process, for it took about a minute to get it down. On the 22nd of May about half a dozen of these birds were noted in the hospital grounds at Long Bay; they were flying about the low tea-tree and banksia scrub, but made their headquarters in a large banksia tree. This tree also attracted a number of New Holland Honey-eaters.

Bronze-Cuckoos (*Chalcococcyx plagosus*) are often to be seen in the city parks, but, owing to their quiet habits, they are perhaps generally overlooked.

The wonderful Lyre-Bird (*Menura superba*) is not scared away by habitation, and will take up its quarters in any natural scrub-land if not molested. A pair have survived on the shores of Middle Harbour, and still nest there, within two miles of the General Post-Office.

The familiar Welcome Swallow (*Hirundo neoxena*) is very numerous in the city and suburbs, and is the only wild bird that lives in the streets, where they are often seen sailing about, in and out of the busy traffic. They nest in houses fronting busy streets. One pair made their home on the portal of the Athenæum Club, in Castlereagh-street, where thousands of people passed daily. Many of them flock in the autumn, making the Post-Office and the Commonwealth Bank their headquarters, and sometimes fifty or a hundred can be seen flying round there in the evening preparatory to migrating. Many, however, stay for the winter.

The friendly little Fairy Martin (*Petrochelidon ariel*) is also a city dweller, though keeping more to the suburbs, where they are often seen mingling with the Swallows. They go north in the winter.

The "Jacky Winter" or Brown Flycatcher (*Microeca fascinans*) is much associated with Sydney, and has established itself wherever it can get a footing. One sees them in the parks and gardens and along the suburban roadways. They seem to feed almost exclusively from the ground, taking, as far as we have noticed, ants. They have a very varied repertoire in the spring and summer, and a particular note for the winter. They are very tame, and will nest in close proximity to crowded paths.

The tiny Short-billed Tree-Tit (*Smicrornis brevirostris*) is not uncommon among the eucalypts and angophora trees. It resembles an animated ball of feathers, very jerky in its movements, and often springing into the air after small insects, and occasionally hovering for a moment while it examines a leaf.

The cheery song of the little White-throated Fly-eater (*Gerygone albogularis*) is heard regularly in the early spring as the birds come along on their journey south. A few pairs stay in the city parks and suburbs, and several breed in the eucalyptus breaks, to which trees they almost exclusively adhere. They stay in the spot they select all the season. In the year 1919 two pairs remained in Ashton Park, but only one pair nested; the others wandered over a fair extent of country. The wild birds take a great interest in any new arrival, and when the nesting pair were house-hunting they came into prominence. First some Sparrows came down to investigate, then a Rufous-breasted Whistler made a hostile demonstration, a Shrike-Robin peered at them, and a Spinebill fussed around, and they evidently felt the place rather crowded, and ultimately made their headqaurters about a hundred yards away in a small, isolated Angophora tree; they left this year about the 25th of April.

Wherever there is a bit of moderately thick bush in garden or park, one is sure to find the "Yellow Bob"—Yellow-breasted Shrike-Robin (*Eopsaltria australis*). These birds are numerous in the harbour parks, and will establish themselves in a garden if there is sufficient cover available.

Yellow-breasted Shrike-Tits (*Falcunculus frontalis*) are more numerous than one would suppose, as they generally go about their work quietly, and the only clue to their presence is the noise they make in tearing away bits of bark in their search after insects, or their soft whistle. They mainly keep to the eucalyptus trees.

The Yellow-breasted Whistler (*Pachycephala gutturalis*) is sparingly present in Ashton Park, keeping to the thicker gullies in the summer, but reaching out to the higher grounds and adjoining suburban gardens in the winter, more especially if such contain eucalyptus trees.

The Rufous-breasted Whistler (*Pachycephala rufiventris*) is quite one of the joys of the bush. Although some stay with us all the

year, a good many appear to arrive from the north in September, and many stay in and around the city to breed and make the air ring with their delightful singing as does no other bird. Ten pairs were noted in Ashton and Taronga Parks in October. They are very tame, and, having selected their nesting-site, they remain in the vicinity, within an area of a hundred yards, until the autumn. The female attends strictly to the business of nidification, and is very seldom seen. She leaves the nest every afternoon on a feeding trip, and the intent way in which she goes about this is most marked. The young are on the wing in January, and are chiefly attended to by the male. The old birds moult in March, and this year most left about the 23rd of April, though some stayed the winter through.

The friendly little White-shafted Fantails (*Rhipidura albiscapa*) are resident with us, though they change their habitat somewhat, coming more into the open gardens in the winter. Five birds were noted in Ashton Park in October.

The active Rufous-fronted Fantail (*Rhipidura rufifrons*) only pays fleeting visits to our parks and suburban gardens during its migration. It selects a quiet spot, remains a day or two, and then goes off again on its journey, following the same route probably every year, for we have noted a bird in the same spot, at the same time of the year, for three years in succession.

The familiar "Willie Wagtail"—Black-and-White Fantail (*Rhipidura motacilloides*)—delights to dwell near human habitations, and will be found in many suburban gardens, successfully holding its own against the over-numerous household cats. They sometimes take up their quarters in odd corners of the city where there is a tree and a little open ground, and are not much disturbed by heavy traffic.

During its migrations the Restless Flycatcher (*Seisura inquieta*) is often seen in the suburbs, generally over the roads and open spaces. It sometimes sits on telegraph wires over roads crowded with traffic.

The Leaden Flycatcher (*Myiagra plumbea*) is a rare visitor to Sydney. One pair stayed this season in Ashton Park, and during misty or wet weather were sometimes seen in the more open spaces in the suburb of Mosman. Its actions are more decided and its flight stronger than that of most others of the family. Its note is clear and distinct, consisting of a rather loud whistle followed by a wheezing, crackling note.

The beautiful White-shouldered Caterpillar-eater (*Campephaga humeralis*) can often be seen in the spring. One pair nested this season in a private garden, building in the fork of a horizontal eucalypt. It was noted that the male did a good deal of the incubation, and was fed on the nest by the female.

The Coachwhip-Bird (*Psophodes crepitans*) will stay in its particular hunting-ground even after such is surrounded by houses. A pair lives in Ashton Park, and sometimes ventures into adjoining gardens in Mosman, and in this the male is much more venture-

some than the female. He will cross an open space in order to hunt a little shrubbery, but his mate is wary, and rarely leaves cover. This pair travels over a fairly large extent of country, coming more into the open in the winter.

The tuneful Australian Reed-Warbler (*Acrocephalus australis*) is a regular visitor to Centennial Park, and is plentiful in clumps of reeds.

A few Emu-Wrens (*Stipiturus malachurus*) survive close to the city in the well-protected grounds of the Coast Hospital. Here a little of their "typical country" of short, matted scrub, with patches of higher bushes, exists, and gives them perfect cover.

It is very pleasing to find that in the grounds of the Coast Hospital there are also some Bristle-Birds (*Sphenura brachyptera*). They live in a tangled mass of scrub and rank vegetation growing along a small creek and over some swampy land. The male bird has been observed by Mr. Harry Burrell. If one enters his domain he will rise to the top of the bushes for a moment to view the intruder, and drop to cover again; the female is apparently not to be seen.

The White-browed Wood-Swallows (*Artamus superciliosus*) frequently breed in suburban gardens where they have plenty of room. Several times they have nested in Mr. Hugh Dixon's garden in Summer Hill, and last year a flock bred in a patch of low scrubby bushes close to a main road in Granville, but they are uncertain in their appearances, and some years may not be seen at all.

The familiar Grey Shrike-Thrush (*Colluricincla harmonica*) is a very welcome resident, living sometimes in the larger gardens. It seems to feed a good deal on the ground, and will be seen hopping along the paths in the morning after stray worms and snails. It is quite local, and each pair seems to live in a comparatively small area.

The Magpie-Lark (*Grallina picata*) is numerous throughout the city and suburbs, and will often be seen in small flocks walking over lawns and open spaces, searching for food among the grass. They like to roost in special places, and fairly large flocks wend their way homeward in the evening, making for the more outlying wooded areas. The Victorian aboriginals called this bird "Gean Gean."

The Tree-runners (*Neositta chrysoptera*) are specialists on the encalypts, feeding on the small black ants that they find on the bark. One can generally find them in the vicinity of the parks and larger gardens, and they always seem very busy and in a hurry. Each flock works over a fairly large area, and the birds are sometimes not seen for weeks.

A couple of pairs of Grass-Warblers (*Cisticola exilis*) have their home in a bit of swampy land in Centennial Park.

The perky little Yellow-tailed Tit-Warbler (*Acanthiza chrysorrhoa*) is very common throughout the year, and will be met with in small flocks in almost any of the more open gardens and parks. Two or three pairs breed regularly in Taronga Park, usually choosing

an araucaria within a few feet of a public footpath, and building the nest largely of string. In the spring of 1919 they chose a new site in an angophora tree 40 feet up, but this year (in June) they are again busy in the old spot.

The Striated Tit (*Acanthiza lineata*) is numerous in the eucalyptus and acacia areas, wandering about in small flocks and working each tree quickly and thoroughly. Either this species or the Little Tit (*A. nana*) is common about Double Bay in pepper, robinia, and jacaranda trees.

The Brown Tit-Warbler (*Acanthiza pusilla*) inhabits the melaleucas, and is very local. A pair live in a small patch of tea-tree outside the office at Taronga Park all the year, and one can always hear their pleasing little warble.

The White-browed Scrub-Wren (*Sericornis frontalis*) is found in many little gullies and secluded pockets of thick vegetation in the parks around the harbour. When nesting it always gives away the situation by noisy protests when anyone comes near, but at other times it is full of curiosity, and will come to within a few feet of the intruder.

The gay little Blue Wren-Warbler (*Malurus cyaneus*) sometimes maintains a foothold in situations that only Sparrows can live in. It is numerous throughout the suburbs even in comparatively small gardens. One family party sometimes visits the Darlinghurst gaol gardens, where there is only a small patch of greenery, surrounded by the city, with its noise and dust and numerous cats. A pair nested in Double Bay and reared their young, the nest being 5 feet from the ground, within a few feet of a front door, and close to the street.

There are a few pairs of Lambert's Wren-Warbler (*Malurus lamberti*) in the parks around the harbour; but, as they keep to the undergrowth, they are not so often seen. However, they come more often in the open in the autumn, and even overlap the domain of the Blue Wren. In March last a party of Lambert Wrens were heard uttering their little trills in rather an excited way, and investigation showed that they were in a small bush scolding something in the grass below. A male "Blue" also came to see what the fuss was about, and flew into the same bush, only to be promptly chased out again by the female Lamberts, but the male Lambert ignored him. The cause of the trouble was a rat, which ran away through the bushes and was closely followed by the birds.

The White-eyes (*Zosterops dorsalis*) are perhaps the most numerous of our local native birds. They will be seen in any patch of greenery eagerly searching for insects, but they certainly come in for a good deal of condemnation from the fruit-growers during summer. In the autumn they flock, and presumably a good many leave, but their place is probably taken by others from further south, for there are numbers with us all the winter. Flocks are not infrequently heard going over at night. A few years ago a flock of about 100 were making a great to-do one

evening about sundown. Twice they started off, only to be recalled by the waverers for further argument; for the third time the flock moved off, and got away about 100 yards, when with many shrill cries about one-third of them returned, but the main body kept on towards the north.

The Mistletoe-Bird (*Dicæum hirundinaceum*) is a friendly little being and not much disturbed by human presence. The sharp whistle is frequently heard in trees bearing the food plant (*Loranthus*). At the end of February a male took up its quarters during the moulting period in a small patch of melaleuca and casuarina scrub, where there was no mistletoe, and must have maintained itself for a week at least on insects.

Spotted Pardalote (*Pardalotus punctatus*).—This is one of the most numerous of the wild birds where there are any eucalyptus or angophora trees about. Their single, double, or treble whistle is often heard; generally the male and female will answer each other, but sometimes a male bird will perch high up on a bare bough and whistle away, giving all the usual notes, for some minutes on end. A pair endeavoured to make a nesting-burrow in one of the monkey enclosures in Taronga Park in 1919.

The pretty little White-naped Honey-eater (*Melithreptus lunulatus*) is often seen among the eucalypts in the parks, usually betraying its presence by its single plaintive whistle.

Brown-headed Honey-eater (*Melithreptus brevirostris*). — This species is rather numerous in Taronga Park, where a combination of eucalyptus and flower-beds is much to its liking. It is very happy when the cannas are in flower, and bores holes at the base of the blossom to extract the nectar. These birds are very tame, and usually go about in small flocks, and have a chuckling note.

The brightest of the Honey-eaters, the Sanguineous Honey-eater (*Myzomela sanguineolenta*), arrives from the north in numbers in September, and a few take up their quarters in the city parks. The male bird is very conspicuous, and whistles constantly, but the female is not so often seen. About the middle of the season they become quiet, and this year a small flock was seen on its way north again in February.

Spinebill (*Acanthorhynchus tenuirostris*).—This active bird is a resident, numerous in our gardens, but more especially those in the vicinity of the parks. It is often seen flitting about the flower-beds, taking nectar from the flowers and chasing insects. The wings move very rapidly in flight, and make a "Thirup" sound.

Yellow-faced Honey-eater (*Ptilotis chrysops*).—The "Chickup" is numerous in Sydney wherever there are eucalyptus trees, but it sometimes invades the flower-beds. It takes the place of the "Greenie" (*P. penicillata*), so common round Melbourne.

Yellow-tufted Honey-eater (*Ptilotis auricomis*).—The Yellow-tuft, or, as it is often called, the "Whiskey," is common in some of the outlying suburbs, where they sometimes attack soft fruits in the summer, though they feed largely on insects for the most

part of the year. One will at times see a single Yellow-tuft fly into a tree and start calling, and as many as 20 or 30 of the same species will flock round him and sit with expanded wings or flit about uttering a short note, evidently holding a sort of council meeting—a phase of action noted in many specie of this family.

White-bearded Honey-eater (*Meliornis novæ-hollandiæ*).—This species is somewhat nomadic, and changes its habits according to the flowering season of the eucalypts and banksias. It is numerous in Centennial Park, and may be seen in dozens among the low coastal scrubs at the Little Bay Hospital.

The Diamond-Sparrow or Spotted-sided Finch (*Stagonopleura guttata*) is often numerous in the comparatively open country of some of the outlying suburbs.

Red-browed Finch (*Egintha temporalis*).—The pretty little "Red-head" is always present in Ashton and Taronga Parks and other places, where it nests freely, often close to crowded thoroughfares. It keeps to the timbered areas.

Crow (*Corvus coronoides*).—A pair of Crows live in the suburb of Mosman, and each year rear a family. They chiefly live in Ashton Park, but are often seen over the harbour and city.

Butcher-Bird (*Cracticus destructor*).—There are generally a few of these carollers about the parks and gardens, but they do not seem to stay in one spot for very long. One year they reared two young ones in Double Bay. One day the beautiful song of a Butcher-Bird was heard, and shortly afterwards the same bird's voice was a fierce shriek of anger, and the bird was seen giving battle to an Indian Turtle-Dove, which was trying to defend its young. The Dove was soon vanquished, and fell limply to the ground, where it crouched, dazed. The Butcher-Bird then took each of the young Doves in turn from the nest, dashed them against the branch of a tree, and threw their bodies to the ground.

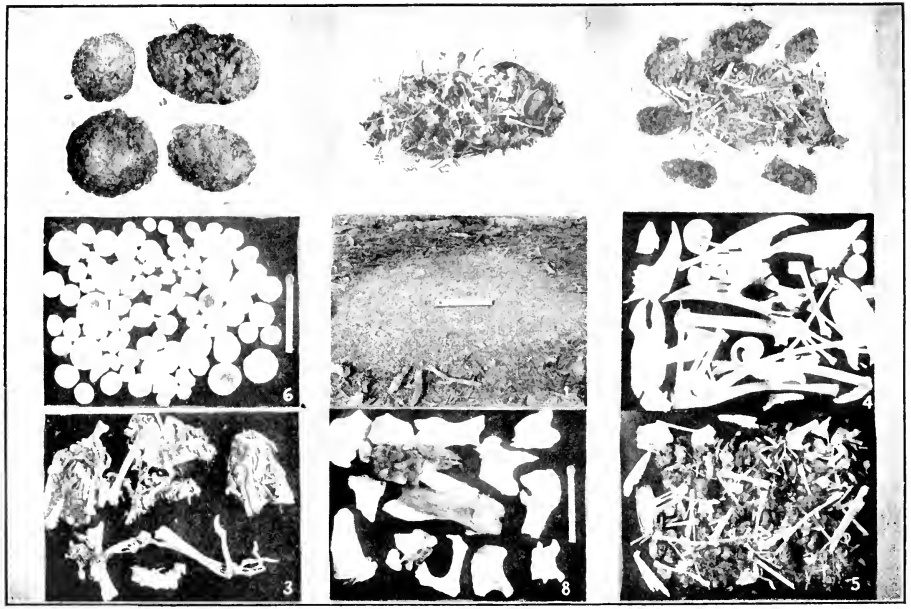
Food Pellets of Kingfishers.

By Reg. Hays, R.A.O.U., Sentry Box, Bundarra, N.S.W.

Amongst the many Australian birds that "void" their "undigested food matter," none, perhaps, surpasses the Laughing Kingfisher (*Dacelo gigas*), either in quantity or variety of the contents. Having been particularly interested in this subject lately, I find that the Laughing Kingfishers collect in companies of 6, 8, 10, or more after sunset to have their last good old laugh of the day, perched side by side on some horizontal branch of a particular tree (generally the highest in the vicinity); there they also sleep for the night. This selected site is used by the same birds every night, and, as they void most of their undigested food pellets at night (although I have seen them do it in the day time), these pellets form quite a mound of the most varied accumulation of bones, insect remains, &c. One of these mounds (photograph

No. 1), found on J. B. Sandiland's place, Roumalla, Uralla, is 5 feet in diameter and 2 to 3 inches in depth, and must have taken months, perhaps years, to form. Others found have not been quite so large, but were just as interesting. Photograph No. 2 shows some fresh pellets before they have broken up with the weather. Photograph No. 3 shows pellets composed mostly of birds' bones, one bird's leg still being intact. Photograph No. 4 is of some large bones picked up from different mounds, showing what large bones, &c., they can swallow. The Crow's jaw in the centre, also pieces of rabbits' jaws and crayfish claws still intact, are easily seen. Photograph No. 5 is siftings washed from a couple of handfuls of pellets from the mound in photograph No. 1, showing the variety of contents. Photograph No. 6 shows the lime pellets ("crabs' eyes") which are found in the heads of "fresh-water crayfish," first swallowed by the Kingfisher, then voided up in the food pellets, and afterwards picked up on the mounds. I have picked up 70 of these on the one mound, showing what great destroyers of "crayfish" these birds are. Photograph No. 7 is a single pellet just breaking up; it contains the whole indigestible remains of a lizard, picked up on the mound shown in photograph No. 1. Photograph No. 8 shows some rabbit bones (chopped up) which I had fed to some birds (tame, about the house), and later collected from the mound over which they sleep. Photograph No. 9 contains pellets of the Red-backed Kingfisher (*Halcyon pyrrhopygius*) and some siftings washed from broken-up pellets, showing how similar, in smaller form, the contents are to that of the Kookaburra (*Dacelo gigas*). Gould mentions in his "Handbook on Australian Birds," vol. i., page 140, concerning the Blue Kingfisher (*Alcyone azurea*), that the hole occupied by this bird when nesting is often almost filled up with the bones of small fish, which are discharged from the *throat*, and piled up round the young in the form of a nest. I feel sure most of these bones are voided by the *young*, as the Red-backed Kingfishers do, only the latter drop them out of the nest at the entrance. Pellets shown in photograph No. 9 were found there when the young were only two weeks old. Of course, the old bird may drop some when sitting on the eggs. From this it seems reasonable to suppose that all the Kingfisher family void "food pellets," though as yet I have not found that the Sacred Kingfisher (*Halcyon sanctus*) does so.

The Chestnut-shouldered Grass-Parrot near Sydney.—I am glad to be able to report the appearance of a small flock of Chestnut-shouldered Grass-Parrots (*Euphema pulchella*) in the Camden district, near Sydney. The last bird of this species of which I have record was offered for sale in Sydney about seven years ago; it had then been 22 years in an aviary.—A. S. LE SOUËF. Taronga Park, Sydney, N.S.W., 8/9/20.



The Contents of Food Pellets of Kingfishers.

Note the foot-rule on the mound in 1.

PHOTOS. BY J. B. SANDILAND, R.A.O.U.

Drought Notes from Western New South Wales.

BY DR. W. MACGILLIVRAY, EX-PRESIDENT R.A.O.U., BROKEN HILL, N.S.W.

WHEN I returned to Broken Hill at the end of last winter (1919) I found that no rain had fallen in sufficient amount to replenish dams and lakes since early in 1917, consequently most dams were dry, and the few large lakes were rapidly diminishing. By the end of the summer all surface water except that conserved in the Broken Hill reservoirs had disappeared. Fortunately for these latter, a strike had been in existence then for nearly a year, and no water had been required for the mines. This condition of things has had its effect on the local bird-life. Many species went elsewhere, and others put in an appearance that were previously strangers—no doubt forced to leave their usual haunts in a search for some more favoured locality. One species, the Red-winged Parrot (*Aprosmictus erythropterus*), came south-west from its usual habitat, appearing on the upper part of the River Darling, at Kallara station, in fair numbers. A few strayed down the Barrier Range to within a few miles of Broken Hill, and others were noted for the first time in South Australia by Mr. J. N. M'Gilp, in the neighbourhood of Lake Frome. The Common Silver-eye (*Zosterops dorsalis*) also appeared for the first time in Broken Hill; was also noted by Mr. M'Gilp, and became quite common, on the upper part of the Darling River.

The Bare-eyed or Blood-stained Cockatoo (*Cacatua sanguinea*), usually a common bird on all the creeks about here, disappeared from the district early in the drought; it went north to more fertile country in Western Queensland. The Galah (*Cacatua roseicapilla*), however, remained, congregating in immense flocks in the vicinity of water, whether the town supply or troughs supplied from wells. It fed on the shed seeds of grasses and salsolaceous plants.

The scarcity of rabbits resulted in most of the raptorial birds, such as the Whistling-Eagle (*Haliastur sphenurus*), Little Eagle (*Hieractus morphnoides*), and Kite (*Milvus affinis*), which usually live on this pest, leaving the district. A notable exception was the Wedge-tailed Eagle (*Uroaetus audax*), which became, if anything, more numerous than in normal times, and, emboldened by hunger, harried and killed kangaroos and Emus weakened by want, and took toll from the immense flocks of Water-Hens (*Microtribonyx australis*) that congregated in the neighbourhood of the rapidly-drying waters of early summer.

Mr. J. Osman, who lives with his wife and six children at Stitt's Well, on the South Australian border of Yanco station, in South-Western Queensland, gave me an interesting note. His house is surrounded by mulga (*Acacia aneura*) scrub, and he has always afforded protection and encouraged the wild birds to come about the place. He rarely uses a gun, and never fires a shot within a mile of the house, and his children have been taught not to molest

the birds nor to rob their nests. When all surface water had about disappeared, towards the end of last summer, many wild birds, particularly grain-eaters, came to drink at a large camp-oven which held water for the fowls, and many of the smaller ones were being drowned in their eagerness to get at the water. Stones were placed in the oven to prevent this, and very soon the birds came in such numbers that three more receptacles for water were put down, each holding three gallons, making four in all, and yet all four had to be replenished two or three times before mid-day every day. The Mulga trees about the house were so crowded with birds, mostly Chestnut-eared Finches (*Tæniopygia castanotis*) and Budgerigars (*Melopsittacus undulatus*), waiting their turn to drink, that no part of the trees could be seen. These two species and the Crested Bronzewing (*Ocyphaps lophotes*) formed the greater number. But for Mr. Osman's humane consideration for these creatures, great numbers must have perished.

Mr. Clive Conrick, of Nappa Merrie station, tells me that four of the extremely rare Spinifex or Night Parrots (*Geopsittacus occidentalis*) were seen on the station early this year—the first noted for many years.

Although rain has fallen over most of this district since April, only in places has it been sufficient to fill dams, and all lakes are still dry. The Darling River is now in flood, and it is expected that the waters will almost reach the level of the last big flood, in 1890, when Boolaboolka Lake, on Tolarno station, a favourite nesting-place for Pelicans, was last filled. When filled this lake holds water for about seven years, and the Pelicans resort to an island in the lake to breed. Since they last nested there the fox has invaded this district, and it remains to be seen whether he will make a difference to the number that nest.

It has been lately quite a usual thing to see numbers of Ravens and Short-billed Crows waiting about the schools for the scraps of food left from the children's lunches.

The White-fronted Chat at Home.

BY DONALD F. THOMSON, R.A.O.U., CANTERBURY (VIC.)

DURING the past season I spent a good deal of time in the haunts of the White-fronted Chat (*Ephthianura albifrons*) on the quiet, grassy slopes which border the Yarra near Kew. Here the extensive open paddocks, studded as they are with numerous clumps of reeds, coarse grass, and dense thickets of gorse, form an ideal home for this singular little bird—at once interesting and useful. Apparently the White-fronted Chat is especially partial to that acclimatized pest, the gorse.

Even before reaching the usual nesting-site—a bush in an isolated clump of gorse—the birds would fly out into the open paddocks, uttering their peculiar wheezing note and circling with

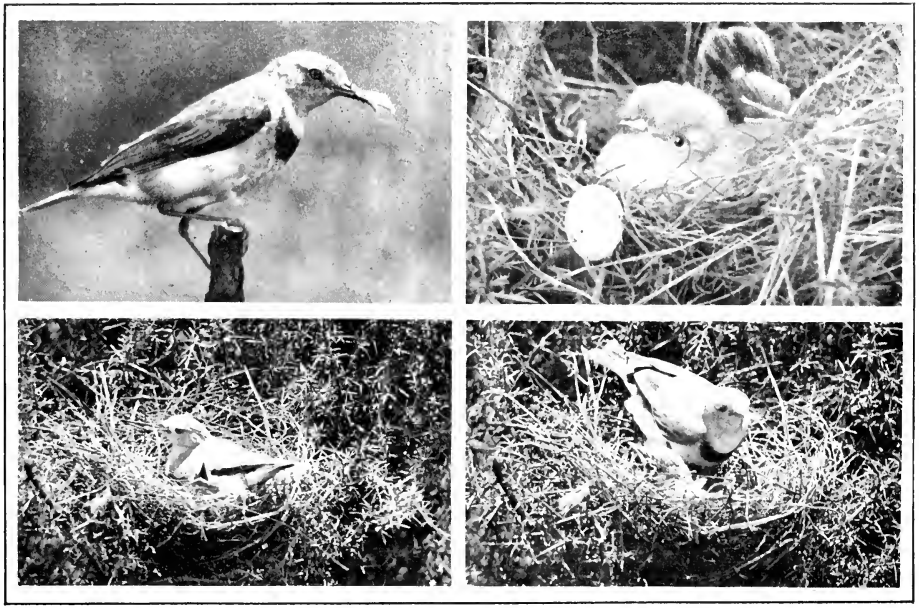


PLATE VIII

Female Chat about the Nest.

1. Female with insect.
2. Young Cuckoo and Egg of Chat.
3. Female protecting young from heat.
4. Female removing excreta.

PHOTOS. BY D. THOMSON, R.A.O.U.

erratic flight as they escorted me to the clump of gorse in which the nest was hidden, where their alarm was at once manifested. Very often they betrayed their nests by their alarm alone, for they would go through the most amazing antics. Both birds, but more especially the male, simulated injury, and, settling close to me, would ruffle their feathers and flutter along the ground with every manifestation of the most acute injury, seeming as if they had lost their powers of flight. When these attempts to lure me away proved unavailing, they would fly back to some point of vantage, only to recommence their antics, going through them again and again at intervals.

The nest, which is open and cup-shaped, is fairly deep, and is composed chiefly of fine grass-stems woven together and lined with finer grass and horsehair. I do not think that feathers are ever used as a lining material. The nest is usually placed low down, amongst dense herbage. Three eggs form the usual clutch, but I have rarely, if ever, met with more than two well-grown young birds in a nest. The ground colour of the eggs is pure white, spotted (especially around the longer end) with reddish-brown. As the nesting period commences about August or September, several broods may be reared in a season.

As a rule I found the males a little shyer than the females, and more inclined to the simulation of injury mentioned before. Although both birds feed the young, I have never observed the male to take any part in the cleaning of the nest; this was invariably done by the female. The latter, after feeding a nestling, would sit on the side of the nest and pick any excreta from the lining, and would carry it several yards away before dropping it. It has sometimes been my good fortune to watch this and the feeding operations from a position only about 4 or 5 feet from the nest. Most of the accompanying photographs were taken thus. Sometimes while we were observing the male would sit close at hand while the female, with an insect in her beak, would fly from one point to another, as if uncertain whether to feed the young ones or not. The male apparently did not reassure her, for he would constantly utter his wheezing alarm note as she approached, perhaps varying this programme with his acrobatic simulations, till finally the female overcame her fears.

One very hot day in December there were two fully-fledged young birds in a nest. The old birds would attempt to call them away from the glowing eye of the camera until I was tired of replacing one of them in the nest. The other bird, exposed to the sun, felt the heat intensely, and the female, although she too felt it acutely—her beak was gaping wide open, and although, on the previous day, she had been very shy—came to the nest and brooded over the young bird. I was able to remain within a few feet, and neither my presence nor the rattling of the shutter seemed to frighten her, although the changing of the slides would cause her to leave the nest for a few seconds.

The White-fronted Chat is a favourite foster-parent of the

Narrow-billed Bronze-Cuckoo (*Chalcococcyx basalis*). On one occasion last season I came upon two nests on a hill, in adjacent clumps of gorse, one of which contained a Cuckoo's egg and two of the Chat's, while in the other was a well-grown Cuckoo nestling, probably of the same species. This youngster, when hungry (and this is a chronic state with young Cuckoos), kept up the monotonous whining cry which is so well known in the bush. No matter how much food the two birds brought, or how long they worked, he was always ready for more, and still more, which disappeared with alarming rapidity down that cavernous yellow throat. What an amount of insect-life must be devoured by one young Cuckoo in a single day! One of the accompanying photographs shows this young Cuckoo in the nest, with an egg of the foster-parent in the foreground. This egg had evidently been ejected by the young Cuckoo.

When nesting duties are over the White-fronted Chats associate together in small flocks or family parties, which roam the open paddocks in search of insect-life, of which they must in the year destroy an incredible amount. Thus passes a year in the life of one of our most useful birds—so familiar, yet so little known.

New Species of Australian Birds Since the Time of John Gould.

BY GREGORY M. MATHEWS, F.R.S.E.

THE following is of interest as showing the advance in Australian ornithology this century. From Gould's time to the end of 1899, 22 species had been added to the Australian list (see *Austral Avian Record*, vol. iii., pp. 74–77).

The following species had been added to the Australian list from Gould's time to the end of 1899:—*Corvus coecilæ* (Mathews), Sharpe, "Cat. Birds Brit. Mus.," vol. iii., p. 38 (1877); *Prionodura newtoniana* (De Vis) (1883); *Bowyercea bowerí* (Ramsay) (1885); *Orphryzone lorealis* (De Vis), *Sacramela keartlandi* (North) (1895); *Leucotreron alligator* (Collett), *Petrophassa rufipennis* (Collett) (1898); *Oreoscopus gutturalis* (De Vis) (1899).

Of regular Australian visitors or sub-species of extra-limital species we have:—*Mattingleya griseiceps* (Gray), Ramsay, *Proc. Zool. Soc. Lond.*, p. 604, as *Eopsaltria inornata* (1874); *Leptophaethon lepturus* (Daudin), Ramsay, *Proc. Linn. Soc. N.S.W.*, vol. ii., p. 203 (1878); *Stercorarius parasiticus* (Linné), Campbell, "Nests and Eggs Australian Birds," p. 65 (1883); *Virago gibberifrons* (Müller), Ramsay, "Tab. List Austral. Birds," p. 22 (1888); *Lamprococcyx lucidus* (Gmelin), Shelly, "Cat. Birds Brit. Mus.," vol. xix., p. 296, *Chlidonias leucoptera* (Temminck), Saunders, *ib.*, vol. xxv., p. 10, *Reinholdia reinholdia* (Mathews), Salvin, *ib.*, p. 381, as *Puffinus gavia*, *Neonectris griseus* (Gmelin), Salvin, *ib.*, *Rhyacophilus glareola* (Linné), Sharp, *ib.*, vol. xxiv., p. 499

(1890); *Tregellasia leucops* (Salvadori), Hall, "Key Birds Austr.," p. 15 (1899). And the following to the list of birds that have occurred less than three times: *Procellaria parkinsoni* (Gray), Masters, *Proc. Linn. Soc. N.S.W.*, vol. iii., p. 21 (1878); *Crex crex* (Linné), North, *Rec. Austr. Mus.*, vol. ii., p. 82 (1893); *Pisobia submiuuta* (Middendorff), Sharpe, "Cat. Birds Brit. Mus.," vol. xxiv., p. 555, as *Limonites damascensis* (1896); *Querquedula querquedula* (Linné), Campbell, *Vict. Nat.*, vol. xv., p. 150, as *Querquedula circia* (1899).

Of purely Australian species we have: *Anstroturnix olivii* (Robinson), *Eremiornis carteri* (North), *Acanthiza tenuirostris* (Zietz) = *A. iredalei* (Mathews) (1900); *Ethelornis tenebrosa* (Hall), *Corvus bennetti* (North) (1901); *Microeca brunneicauda* (Campbell), *Magnamytis housei* (Milligan) (1902); *Milligania robustirostris* (Milligan) (1903); *Magnamytis woodwardi* (Hartert), *Colluricincla woodwardi* (Hartert) (1905); *Samuela alisteri* (Mathews), *Geobasileus flaviventris* (Ashby), *Lacustroica whitei* (North) (1910); *Ashbyia lovensis* (Ashby) (1911); *Heteroprion belcheri* (Mathews), *Butorides rogersi* (Mathews), *Geobasileus hedleyi* (Mathews) (1912); *Kempiella kempi* (Mathews) (1913); *Diaphorillas purnelli* (Mathews), *Magnamytis dorothæ* (Mathews) (1914); *Meliphaga albilineata* (White) (1917).

Of regular Australian visitors or sub-species of extra-limital species we have:—*Bulestes mentalis* (Salvadori), Campbell, Bull. No. 2, R.A.O.U. (1911); *Limicola falcinellus* (Brünnich), Mathews, *Austral Av. Rec.*, vol. i., p. 31, *Subspilura megala* (Swinhoe), Mathews, *ib.*, p. 125 (1912); *Geoffroyus geoffroyi* (Bechstein), Macgillivray, *Emu*, vol. xiii., p. 105, as *Pseudopsittacus maclennani*, *Lorius pectoralis* (Müller), Mathews, *Austral Av. Record*, vol. ii., p. 75 (1913); *Glycichæra fallax* (Salvadori), Mathews, *South Austr. Ornith.*, vol. i., p. 13, as *Macgillivrayornis claudi*, *Erythura trichroa* (Kittlitz), Mathews, *Austral Av. Rec.*, vol. ii., p. 103 (1914); *Eudyptes sclateri* (Oustalet), Mathews, *Emu*, vol. xvi., p. 184 (1917).

And the following to the list of birds that have occurred less than three times:—*Budytes flava* (Linné), North, *Proc. Linn. Soc. N.S.W.*, vol. xxx., p. 579 (1906); *Sphecotheres salvadori* (Sharpe), Ingram, Bull. Brit. Orn. Club, vol. xxi., p. 100 (1908); *Aptenodytes patagonica* (Miller), Hall, *Emu*, vol. ix., p. 250, *Fregetta tubulata* (Mathews), *Puffinus therminieri* (Lesson), Mathews, "Birds Austral.," vol. ii., p. 72 (1912); *Globicera pacifica* (Gmelin), Mathews, *Austral Av. Rec.*, vol. ii., p. 85 (1914); *Pterodroma inexpectata* (Forster), Mathews, *ib.*, p. 125, *Diomedea chionoptera* (Salvin), Mathews, *ib.* (1915); *Zoonava fuciphaga* (Thunberg), Mathews, Bull. Brit. Ornith. Club, vol. xxxvi., pp. 77, 92 (1916); *Fregetta tropica* (Gould), Mathews, *Austral Av. Rec.*, vol. iii., p. 96, *Coprotheres pomarinus* (Temminck), Mathews, *ib.*, p. 72 (1917); *Fregata minor* (Gmelin), Alexander, *Emu*, vol. xvii., p. 238 (1918).

In the "Birds of Australia, Supplement I." I gave the names of

those who had described the species up to the *Passeriformes*. I now give the names of those who have described the species in the *Passeriformes* :—Gould, 123 ; Latham, 43 ; Vigors and Horsfield, 17 ; Vieillot, 12 ; Mathews, Quoy and Gaimard, 11 ; Ramsay, 7 ; North, 6 ; Gmelin, Temminck, Shaw, and Swainson, 5 ; De Vis, 4 ; Gray, Lewin, Lesson, Linné, and White, 3 ; Ashby, Hartert, Jardine and Selby, Lesson and Garnot, M'Coy, Milligan, Reichenbach, Salvadori, Sharpe, Shaw and Nodder, and Stephens, 2 ; Campbell, Castelnau and Ramsay, Bechstein, Bonaparte, Daudin, Drapiez, Dumont, Hall, Hartlaub, Hombron and Jacquinot, Iredale, Jardine, King, Kittlitz, Masters, Müller, Paykull, Rüppell, Weatherill, and White, 1 each.

The following list of describers of Australian species includes about 668 species, but is subject to alteration, and is not claimed as final :—Gould, 188 ; Latham, 81 ; Gmelin, 35 ; Linné, 34 ; Temminck, 30 ; Vieillot, 28 ; Vigors and Horsfield, 26 ; Mathews, 16 ; Gray, 14 ; Quoy and Gaimard, 13 ; Lesson, Shaw and Nodder, 9 ; Jardine and Selby, Kuhl, and Swainson, 8 ; Boddaert, and Ramsay, 7 ; North, Shaw, Stephens, and White, 6 ; Horsfield, 5 ; Bechstein, Bonaparte, De Vis, Forster, Müller, and Pallas, 4 ; Collett, Eyton, Lewin, M'Coy, Salvadori, Scopoli, Vroeg, and Wagler, 3 ; Ashley, Brünnich, Daudin, Dumont, Garnot, Hartert, Kerr, Lear, Lesson and Garnot, Lichenstein, Milligan, Raffles, Reichenbach, and Sharpe, 2 ; Bosc, Boie, Campbell, Castelnau and Ramsay, Cuvier, Clark, Drapiez, Dietrichsen, Du Bus, Desmarest, Gueldenstadt, Gunnerus, Hall, Hartlaub, Hombron and Jacquinot, Hilsenberg, Iredale, Jardine, Jameson, Jerdon, King, Kittlitz, Masters, Montagu, Miller, Middendorff, Oustalet, Paykull, Perry, Peal, Rüppell, Rothschild, Robinson, Smith, Swinhoe, Salvin, Turnstall, Thunberg, Vigors, Weatherill, Wallace, and White (H. L.), 1 each.

Breeding of Bustards.

BY A. H. CHISHOLM, STATE SECRETARY R.A.O.U., BRISBANE.

IT seems a curious dispensation of Providence that the Australian Bustard (*Choriotis australis*) and the Native Companion (*Antigone australasiana*) should be severely restricted in their egg-producing ability, while other large inland ground-breeding birds, such as the Emu, the Brush-Turkey, the Mallee-Fowl, and the Scrub-Fowl, are all very fertile. In the case of the Emu, and to a lesser extent in the case of the Cassowary (which is protected by its jungle environment), inability to fly seems sufficient reason for prolific breeding, but this consideration does not hold good in regard to the mound-builders. And yet the large clutches of the latter birds' eggs are much more screened than the limited ones of the Plain Turkey. Certainly, at all events, Nature did not anticipate the introduction of the pestiferous fox when fixing the breeding habits of the Bustard.

"Great have been the arguments whether the Bustard lays one or more eggs," writes Mr. A. J. Campbell in "Nests and Eggs." It was the same veteran ornithologist who introduced a discussion on the subject at a meeting of the R.A.O.U. at the Melbourne Museum in January. As a result of this discussion I have been interested in collecting observations upon the subject in Queensland, where the noble species is still plentiful. From these it would seem that if this fine Australian bird is (or was) usually restricted to one egg to the clutch in the south, such is not the case in the north.

Mr. P. A. Tarrant (Brisbane) writes:—"With reference to the Plain Turkey, I have always understood that this bird lays two eggs to a clutch, and I remember three specific instances at Croydon (N.Q.) to bear this out. On two distinct occasions I surprised two chicks with their mothers, and once I dropped upon the female sitting on two eggs. These eggs were on the ground, in a small, bare patch surrounded by tall grass. When visiting the locality later the eggs had been hatched. In the Gulf country Turkeys breed from January to April, but, as with the Black Duck, a good deal depends upon the season—an early 'wet' means an early breeding, and a late wet season a late breeding. I have seen, on occasions," adds Mr. Tarrant, "large numbers of Turkeys, generally during March and April, flying from south to north. The flight would be from just after daylight until 8 a.m., and would be resumed again from 5 p.m. until dusk. These birds were found to be very poor in condition, and I have no doubt they were forced to leave the dry Downs country for the more favoured Gulf. It is very likely they found their way back again when conditions were more favourable."

Mr. T. M. Pitt, of Pittsworth (Darling Downs), after stating that on more than one occasion he has seen two Plain Turkeys' eggs, or two young birds, tells this interesting story:—"On 23rd December, 1873, when at a cattle muster on Boondoo Station, Balonne River, about 80 miles below St. George, I saw a Turkey get up, and I picked up two eggs. These I gave to Mr. Adolphus Tuckerman, manager of the station, who took them home and put them on the dining table. Mr. Tuckerman left the following morning for St. George. He was away for a few days, and, as he was a bachelor, the house was pretty well shut up during the time. The stockman's wife was surprised one day to see two young Turkeys walking about on the table. The weather was dry and very hot at the time."

Further interesting notes regarding the breeding of the Bustard come from Mr. E. R. Caldwell, R.A.O.U., of Charleville, who states that many bushmen claim that two eggs are more often found to the clutch than one egg. "In the eighties," continues Mr. Caldwell, "these birds used to come in droves on to the hot plains of Northern Victoria, but it was not until I came to Queensland that I had the opportunity of finding a nest. In a paddock of mine on the Darling Downs a pair nested for three or four years

without result in a belt of gum timber, on the edge of a small plain, about six chains from the bank of the Condamine River and 600 yards from my house. Two brownish eggs were laid on the bare ground (for no nest is made), but owing to some farming operations the sitting bird was unavoidably disturbed for an hour or two, giving the ever-watchful 'Kelly' (the Crow) his chance, and the two eggs were carried away. Not dismayed, the Turkey laid two more eggs a few yards from the old spot; but disaster came along again in the shape of some mischievous young cattle that amused themselves chasing the sitting bird. One morning I noticed a change in the old order of things, and found the cattle bolting for their lives, with the Turkey with outstretched wings in pursuit. Upon this change of attitude I felt certain that young birds had appeared, so I rode down purposely and found the bird on the nest. It proved so quiet that it allowed my horse to stand within a yard for several minutes, and only flew off when the horse became restive with fly worry. One of the eggs had been broken by the cattle, and in a day or two the nest was deserted, so I took the remaining egg. In the following year two birds reappeared, and two more eggs were laid near the original nesting-place; but in a few days the birds were missed, and, looking at the nest, I found the eggs had gone, with nothing but wing and other feathers left to tell the tale. Reynard had arrived, and had come so quickly that the hundreds of kangaroo rats that infested the district were cleaned up in a few months.

"No Bustards ever nested again in that paddock," continues Mr. Caldwell. "Indeed, it is doubtful whether, during the last five years, any Plain Turkeys have been reared on the vast plains between Dalby and Pittsworth—once, and not long ago, the home of thousands of these fine birds. Grass-fires must destroy many young and eggs that the foxes happen to miss, and I think it will only be a short time before the birds get out and remain in the back country. All game-birds out in these parts seem unduly shy, and I think the fox is responsible. Curlews, usually common everywhere, are seldom heard with their melancholy wail at night. Ducks also suffer terribly from the depredations of Reynard—in fact, all ground birds are faced with extermination. Something will have to be done in the near future in the way of netted sanctuaries, and Dillalah State Station, once cleared of dingoes, foxes, and rabbits, would be an ideal property for the purpose."

Mr. Caldwell adds that during the last mice plague on the Darling Downs he opened the crops of two Bustards that had been shot, and took from each a large double handful of masticated mice. Further indication of the economic value of the bird is given in a note from Mr. H. F. Jones, who has frequently noted the ravages of Turkeys among grasshoppers in the Gulf country.

Bird Notes from Dookie.

By H. PYE, R.A.O.U., AGRICULTURAL COLLEGE, DOOKIE, VIC.

MANY and great changes have taken place in the bird-life of this district since I first came here in 1887. In the fields below the College I have seen the Native Companions in their quaint dance in quite great numbers; now not a solitary one has graced the scene for years. The Wild Turkey (Bustard) shuns the neighbourhood; yet at one time a few could be seen. Stilts, Grebes, and Dabchicks, and some Gull-like birds were plentiful on the swamps; now none deigns to visit them. I have not seen a Leatherhead here for years; yet at one time they were plentiful, and took toll of the grapes when ripe. That terror of chickens, the Derwent Jackass (Australian Butcher-Bird), has fled the scene, but the Kookaburra still laughs in chorus, and the small Kingfisher, with its sheeny plumage, may be seen darting here and hither, near the Broken River. Occasional Bee-eaters, too, nest about there, though I have not seen a burrow for ages. Miners, whose voice used to irritate me, are so scarce now that when I hear one I feel inclined to write a stanza of poetry to old remembrances waked. I was called back to youth a few days ago hearing the note of the Red Lory (Crimson Parrot), and saw one or two, and a few green ones. They have gone onward. The Native Thrush's beautiful note I hear each year for a month or so, and I am grateful. Thank heaven the Magpie still carols on the tree-tops! I know no note that breathes so much of freedom and *joie de vivre*. It must be in the air, for Australian character seems to be embodied in that note. How those birds dare an intruder near their nests! Those lethal baits for rabbits have thinned their ranks terribly. Even Crows are passing hence. Eagles used to nest in the high trees not half a mile away, but for twenty years there has not been one nest built about here. The birds still can be seen, but the deadly breechloader carries the message of death to each one coming within shot. The smaller Hawks are becoming fewer the more enthusiastic the poultry men become. Possibly, with eggs at 3s. a dozen, as they were a little time ago, the mental worry, time, and shot and powder are being paid for. Like the blacks, bird-life is dwindling fast. Cockatoos and Galahs are still numerous, but when one sees a hundred or more dead ones scattered over a field, their time will come, and their chief will say, "Let us depart in peace." The wise old ancients of the flock will moralize together and say in sorrow, "And this is civilization!" Rosellas but a few years back were in thousands; now only a few pairs may be seen. Grass (Red-backed) Parrots still seem to hold out. An occasional Woodpecker (Tree-creeper), may be still seen, and a few impudent "Willie Wagtails" (Black-and-White Fantail). I even saw a pair of Stone-Plovers last Saturday on a lonely hill, and a few Water-Hens among the reeds by the river-bank. A Rail has not appeared for many years. There are several kinds of Robins

about each year, mostly the Red-capped. The pretty Blue-capped Wren still delights us, and passing flocks of Love-Birds (Budgerigars) and Cockatoo-Parrots. The latter reminded me of my youth when I stuffed birds. I was at Connewarre, shooting birds to stuff, and I saw on the fence two birds that I had not seen before. I shot both at one shot. I had not gone far when the late Mr. Andrew White rode up at a gallop and called out to me, with a rather convincing mien, "I have just let go two Cockatoo-Parrots. If you shoot them, I'll use this stockwhip on you until you'll wish you were in heaven." I felt my knees a bit wobbly, and a silent prayer went up that he would not look in my bag. He did not. I left Connewarre out of my shooting itinerary for a whole year. I learned the name of the birds, though. Now, every time I see one my thoughts flash back to the summertime of youth. The poetry of bird-life will be lost to generations of youth in the near future. Beautiful birds will only appeal as myths, or disembodied spirits. The past will be measured by their present bird-life, such as Starlings, Sparrows, and birds every man's hand is against. What a vast amount of happy imagery will be lost! Materialism gloats over the sacrifice. "Man's Place in Nature" should have in the appendix "Birds' Place in Nature." There is no doubt the Education Department has saved the lives of thousands of birds through the efforts of the bird-lovers among the teachers. Still, it is decreed that until the wood-lot on the farm is a fact instead of a fetich bird-life will almost be a memory. The leaden interest by the community generally in reafforestation is more than a pity—it's a calamity to any country, and a positive millstone around the neck of the most willing Government. Unless the people generally and individually act as guardians to great national interests, the wealth expended on them is worse than lost.

Stray Feathers.

Long-lived Corella.—Mr. R. Eastway, of Sydney, has in his possession a Corella that has been in the family for 35 years, and has every year for that time laid three eggs.—A. S. LE SOUËF. Taronga Park, Sydney, N.S.W. 8/9/20.

* * *

Acclimatized Birds in Tasmania.—There are many acclimatized birds, such as Sparrows, Goldfinches, and Starlings, here. Orchardists complain about the latter bird, but on the pastoral areas the Starling has been the salvation of many properties, as it has cleared out the small snail which acts as a host to the fluke. European Skylarks have only reached here during the last six years, and are increasing.—CHAS. BURBURY. Hobart (Tas.)

Extension of Locality.—During last week I recorded the extension of range of two birds, both of which have hitherto not been noted for this (Upper Hunter) district, New South Wales. On Monday a beautiful specimen of *Ptilorhis paradisea* (Rifle-Bird) was sent to me by a resident of Stewart's Brook, a tributary of the Upper Hunter River, the bird having been shot (in a scrub just over the watershed of the Paterson River, and about 15 miles due east of Belltrees) by an opossum hunter, who, while flashing an acetylene lamp at night, had mistaken the bird for an opossum. This establishes a farthest west range of the Rifle-Bird. On Wednesday last a party of four *Struthidea cinerea* (Grey Jumper) settled in a tree close to my office here. The birds were on the move, and remained for a few moments only. This is the furthest east record for the species. It is interesting to note that the *Struthidea*, a western bird, has been noted within 15 miles of *Ptilorhis*, a strictly coastal scrub-bird.—H. L. White. Belltrees, N.S.W., 5/9/20.

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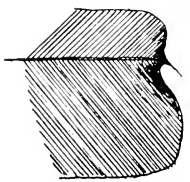
Rifle-Bird Feathers.—When skinning the above-mentioned Rifle-Bird I noticed a peculiarity (not previously recorded) at the end of several of the feathers in each wing, and taking the form of a



Showing peculiar pointed tips on wing feathers of male *Ptilorhis paradisea* shot on Mt. Royal Range, Upper Hunter River, New South Wales, on 28th August, 1920.

Shade larger than natural size.

small "thorn-shaped" appendage, which followed on at the extremity of the fine shaft end of the feather.—Sid. W. Jackson. 6/9/20.

* * *

Nest of the Brown Hawk.—As regards the question whether the Brown Hawk is its own architect, I may mention that one nest of this bird, built on a dead "apple-tree" (*Angophora*) near the sea, on South Coast, N.S.W., from the coarseness of the material, seemed to be entirely of its own construction, though I did not see the Hawks actually at work upon it. The species was, I think, *Hieracidea orientalis*. In other instances I have found this bird add a few coarse sticks—usually to the nest of a Magpie or Crow-Shrike. I have often watched these useful birds rabbit-hunting in small companies on sandy flats near the sea, while they, of course, include grasshoppers and other noxious insects in their diet: yet they are sometimes (unlawfully) shot as being chicken-stealers! The *berigora* does not, I think, prey on other birds. I have seen a Magpie-Lark calmly perch within two feet of a *berigora*, while

in another instance a pair of these Hawks, though they made continuous endeavours to rob a Great White Egret, feeding in a mud-pool, of its prey (eel fry, chiefly), never attempted to injure it. The Egret, not in the least alarmed, effectually kept the bandits off with vigorous thrusts from its sharp beak.—H. V. EDWARDS. Bega, N.S.W.

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Some Vagaries of a Southern Stone-Curlew.—During a visit to "The Homestead," Goorambat, Victoria, in 1918, I was interested in seeing a tame Southern Stone-Curlew (*Œdicnemus grallarius*) standing in daylight pose close to one of the wheels of a motor-cycle upon the verandah. Drawing the attention of Lieut. Hall, a scion of this pioneer family, he informed me that ever since his sister reared this bird it took a fancy to the motor-cycle. No matter where the cycle was placed, this bird always slept during the daytime close to one of the wheels. Lieut. Hall having occasion to visit adjacent towns upon military duties at night-time, this bird would accompany him and return with the cycle, flying close to the motor the whole journey. During a visit to Goorambat township one evening the bird failed to return home with the cycle. A few days later, Lieut. Hall, being informed by Mr. Mitchell, storekeeper of this town, that the bird was in his garden along with a tame Stone-Plover he had, the sight of the cycle failed to entice this bird home again, and up to the time of writing it enjoys the company of one of its own kind.—C. F. COLE. Wangaratta (Vic.), 5/6/1920.

* * *

Spring Birds in Tasmania.—Spring in Southern Tasmania opened definitely early this year. It is usual for her to make a slender show, several feints, and dawdle for months—at least two. The birds do their best to impress the season, but low and many changes of temperature are common. This 15th June was the end of a mild winter. A Spotted Diamond-Bird (*Pardalotus punctatus*) flew to the edge of the cultivated ground on that date, followed a few days later by the Dusky Fantail (*Rhipidura diemenensis*). Early in July the Fire-tailed Finches (*Zonæginthus bellus*) had returned to their several gullies and to definite parts of them. The Yellow-throated Honey-eater (*Ptilotis flavigaster*) in the sunshine was filling the air with its hard, strong, single note, which is double on close acquaintance. The silver wattle has come into blossom three weeks before its usual time, and almond bloom was well out in June. Invertebrate life is again just beginning to move and offer itself as food for the birds, which in June must be in other countries or starve. The bush then is silent; now it is relatively full of sounds.—ROBERT HALL. Bellerive, Hobart, 17/7/20.

* * *

Notes from Karooka.—Many nests were noticed during last spring when I was spending a fortnight at Karooka, 25 miles east. This is a splendid place for studying bird-life. I watched a pair

of Rufous Whistlers building their nest quite close to the house, also four pairs of Blue Wrens, three pairs of Scarlet-breasted Robins, one pair of Flame-breasted Robins, and endless Tits and Wattled Honey-eaters, Fly-catchers, Yellow-faced Honey-eaters, &c., &c. One day I noticed a very small White-throated Fly-catcher building its delicate little nest in a low bush. She was so tame that I could sit within six feet of her and watch her working. This season has been a bad one generally, and a good many birds are not nesting at all, and many tragedies of young dead birds have occurred amongst the few nests I have found here. Almost every Magpie's nest I found this season failed to rear its young, the little bird being found dead beneath the tree when half-fledged; food evidently was scarce. A Little Falcon swooped down above a Magpie's nest, and, without pausing a second in its flight, snatched a nestling in its talons and swept upwards, pursued by the shrieking parent. These Falcons have a chuckling call, which they frequently repeat while sitting on the branch of a tree. They are also keen on catching young rabbits—the more they catch the better.—Mrs. A. Norton. Walcha (N.S.W.)

* * *

Invasion of Musk Lorikeets.—The gardens of Devonport are at present invaded by large flocks of green 'Keets, which seem to have been driven away from the higher plateaux, where they absorb the nectar from blossoming eucalypts, by the severe weather. Although heavy falls of snow have taken place in the high country, down here on the coast the days are still warm and delightful, and the 'Keets are revelling in the sunshine and in the feast of late pears which still remain on some of the tall trees. There is an old tree near me from which the fruit was not gathered, and the birds spend the whole day there, their musical notes being evident quite a distance away. They have no fear, and I have walked up to within a few feet when dozens of them have been on the ground feasting on fallen fruit. Sometimes four or five will surround a single pear, all pegging away together until the spirit of jealousy seizes one, when he immediately attacks the rest, and there is a "rough and tumble" for a few minutes until matters are adjusted. Although in flocks, the pairs still cling together, and it is charming to see a male and female, when they can hold no more sweet fruit, sit on a branch nestling closely and caressing each other with their bills. All appear to be "Musks" (*Glossopsittacus concinnus*); there are no Little Lorikeets (*G. pusillus*) in the flocks which I have examined.—H. Stuart Dove. West Devonport (Tas.), 22/5/20.

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One Effect of Land Clearing.—It is stated that Cormorants are largely on the increase, but this may not really be the case, but that the birds from outlying parts are being forced into the more settled parts. When the blacks were plentiful in Central

Queensland they undoubtedly consumed large quantities of Cormorants' eggs, but in the days of the blacks there were numerous large swamps where the birds bred freely. Now, like the blacks, these swamps are gone, and the Cormorants breed there no more. Queensland is fast becoming a "dry" country; by "dry" I mean that the surface water is fast disappearing—not merely for a time, but for good. Thirty or forty years ago we had numerous large creeks, which formed chains of large water-holes and swamps, where the various kinds of waterfowl bred in considerable numbers, and which were teeming with fish, and which even a protracted drought could not dry. What do we find to-day? Where these large holes existed are beds of sand. One can follow the creeks from end to end, even after rain, and not find a drop of water; consequently the fish are restricted in their breeding-grounds, and the Cormorants are forced to remain at those waters that do not dry up, with the result that they are rapidly cleaning the fish out. Nor are the Cormorants the only culprits; the Pelican takes his toll—and it is not a small one.—H. GREENSILL BARNARD, R.A.O.U. Rio Station, Edungalba, Q.

* * *

The Black-listed Shag.—While in the Monaro district of New South Wales, in April and May last, I noticed a considerable number of Black Shags fishing in the rivers—probably in quest of the fry of "English" perch, which are fairly abundant. The rivers in that quarter were at one time well stocked with trout—Brown, Loch Leven, and Rainbow—but now, apparently, only the Rainbow trout is present. These fish, in the main, seem to have died out during severe droughts, when the streams became abnormally sluggish, and therefore unsuited for the healthy existence of the trout. Their disappearance cannot fairly be attributed to Cormorants, as the carcasses of many adult fish were found lying near the banks. Yet the Cormorants were, say, 30 years ago, much less numerous in that quarter. The presence of tasty introduced fish has no doubt attracted these birds thither in greater numbers, though they always, to some extent, fed in these streams on the native minnows and young eels. Cormorants have, I think, at any rate two good points—viz., they include the young of the lagoon or river tortoise (*Chelidon longicollis*) and those of the brown eel (*Anguilla reinhardtii*) in their diet. The adults of both tortoise and eel are themselves greedy devourers of the spawn and fry of our valuable food fishes, which, by the way, do not include the dainty and fastidious trout. The latter fish is, I think, too difficult to catch ever to be of much economic value.—H. V. EDWARDS. Bega, N.S.W.

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Macpherson Range Scrub-Birds.—In his interesting description of his expedition to the Macpherson Range (*Emu*, April, 1920), Mr. Sid. W. Jackson, R.A.O.U., mentions that specimens of the

Crimson Parrot (*Platycercus elegans*) secured there, when compared with others received from different parts of Australia, were found to be a different shade of colour, the back being a peculiar brick-red. This bird is plentiful in the Blue Mountains, and I have noticed a similar shade of colour there among a lot in a trapper's possession, but the shade changed as the birds grew older. So far as my observation goes, the bird is over two years old before it dons its full adult livery. The colouring of the back is very gradual. The red and black shades show out first at the base of the neck, and slowly progress downwards until the limit of their surface is covered. The head and neck, hitherto a comparatively dull red, now blaze into a beautiful crimson. The red on the back does not brighten till some time longer. The Macpherson Range is the refuge of many beautiful scrub-birds that were once numerous along the eastern streams, as the Clarence, Richmond, and Tweed, and the area recently set apart as a sanctuary should be netted to keep back the fox, which is rapidly following the rough country northward. I knew the Richmond in boyhood, when every bend was clothed with thick scrub from the range down to the junction of the two arms, and those scrubs sheltered many beautiful birds that are now strange in the neighbourhood. When the wild cherries were ripe the trees would be alive with Satin Bower-Birds. These wandered from one scrub to another along the river. The Cat-Bird, Regent-Bird, Whip-Bird, Scrub-Turkey, and King Parrot were common, and about the thickly-wooded foothills on each side of the range, at the heads of the Richmond and Logan Rivers, Bell-Miners were very numerous. They, at least, still tinkle sweetly where they gladdened the bush in the years gone by.—E. S. Sorenson, R.A.O.U. Sydney.

Camera Craft Notes.

The Tawny Frogmouth (*Podargus strigoides*).—Last September I came across a nest of the Tawny Frogmouth placed in a large sugar gum (*Eucalyptus corynocalyx*), while on an excursion up the George's River, near Sydney. One of the birds was on the nest, and, not having climbing gear with me, I decided to return the following week to get one of the birds, if possible, to photograph. On returning a week later I found the bird still sitting. With the assistance of climbing gear and a net attached to the end of a long stick, I succeeded in capturing the sitting bird, which turned out to be the female. I managed to get it home, though it made several attempts to get free, and all the time made a noise like a worried Crow. The nest, containing two young, I left without a guilty conscience, for I knew that the other bird, which I discovered in a near-by tree, would come to the rescue. When I arrived home I placed "Tawny" in the fowl-pen and

took several photographs. As can be seen, the bird became very scared, and I experienced great trouble in trying to get it on the perch specially arranged for the purpose. The lens of the camera seemed to attract it more than anything, and it kept darting at it every now and then, at the same time snapping its mandibles with a loud metallic noise. At dusk, when I went to take the bird back to its nest, I was surprised at not being able, at first sight, to see it. Upon closer examination I found it mimicking the branch I photographed it on. So well was it camouflaged that it took my brother quite a time to discover it. Imagine my disgust when I discovered I had not a plate left to take this wonderful example of mimicry.* On releasing the bird near its nest it flew to a near-by tree and remained there for some time. I discovered the other bird sitting on the nest as if nothing had happened at all. I went a week later with the intention of capturing the young, only to find the whole family missing. Very likely one of those destructive "tame-wild" cats was to blame. The measurements of the photographed bird are—tip to tip, 26 inches; length of body, 17½ inches.—JAMES POTTER, R.A.O.U. Houghton, Carlton-parade, Carlton, N.S.W.

State Secretaries' Reports.

NEW SOUTH WALES.

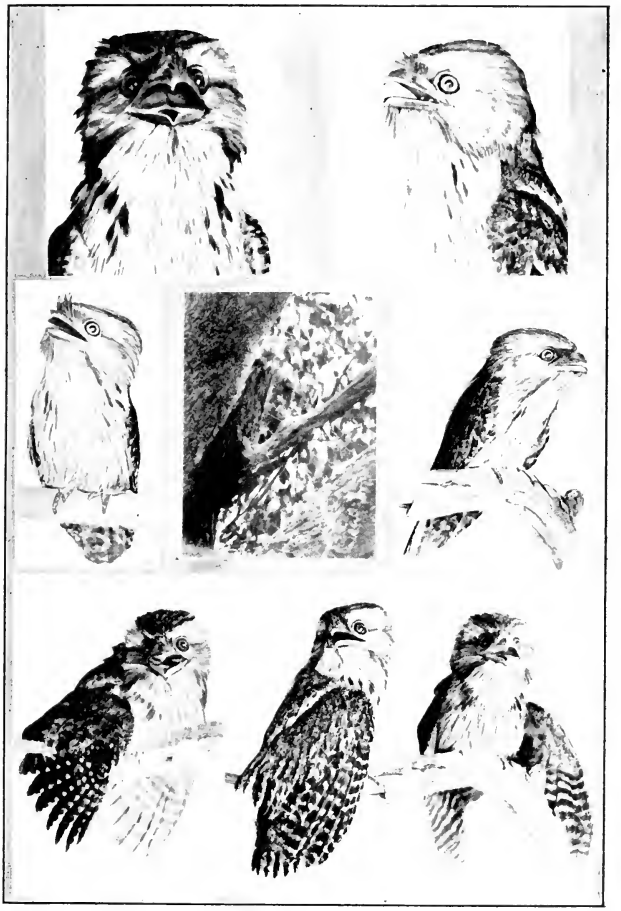
IN order to secure uniform action in the various States and to assist the Governments in having the *Bird and Animal Protection Acts* observed, there has been formed "The Australian Zoological Control Board," consisting of representatives of the various zoological gardens, together with nominees of the State Governments and probably of the Customs Department. In the past there has been very little restriction on the export of our fauna, and thousands of birds were taken away every year by dealers, very often for the benefit of foreign firms; but it is hoped now that everything that goes out will be through the Board, who will see that our birds are not exploited for trade purposes, and those that are sent away go under the best possible conditions to scientific institutions.

The Customs recently, under a Federal proclamation prohibiting the export of plumage, prohibited the export of upwards of 2,500 Galahs and Parrots that had been taken in the open season under the State Acts. The Control Board had then to take these over and consign them direct to the New York Zoological Gardens, with a request that the Director, Dr. Hornaday, would see they were distributed, in accordance with the spirit of the proclamation, to zoological and scientific institutions only.

A. S. LE SOUËF, *State Secretary.*

* Mr. D. Le Souëf has kindly supplied a picture of the bird in camouflage position.

PLATE IX



Poses of the Podargus.

The central picture, showing the protective position, is from a photograph by Mr. D. Le Souef, C.M.Z.S.

PHOTOS. BY JAMES POTTER, R.A.O.U.

Queensland.

Activity in the ornithological world of Queensland during the past few months has centred chiefly in the operations of the Gould League of Bird-Lovers. Abandoning the practice of giving formal lectures, this body has conducted of late a series of conversaziones, a particular family of native birds being discussed at each monthly meeting. On each occasion the leader of the discussion was a member of the R.A.O.U.—viz., Messrs. A. H. Chisholm (Cockatoos and Parrots), J. O'Neil Brenan (Game Birds), H. A. Longman (Birds-of-Paradise), G. H. Barker (Honey-eaters), and Dr. R. H. La Barte Cummins (Flycatchers and Robins). It had been intended to close the series with the September fixture, but the success of the meetings prompted the adoption of a recommendation to the council of the League making for their continuance.

Local members of the Union have also been closely interested in matters affecting the National Parks (of which Queensland has two large and seven small ones), chiefly the big reservation on the Macpherson Range. The Bunya Mountains "Park" is being made accessible through the efforts of the public-spirited citizens of Dalby, but, so far from the larger reserve being made available, its primeval beauty and wonderful birds (including *Menura* and *Atrichornis*) have been menaced. One point in this connection is explained in the following paragraph, clipped from the *Brisbane Courier* of 7th September:—"Unusual features attached to proceedings before the Brisbane Land Agent yesterday in a case which concerned the Queensland National Park, Macpherson Range. About 2¼ square miles of this big reservation had been thrown open for use under occupation license, and there were three applicants for the area—namely, Messrs. H. Markwell (Hill View), P. J. O'Reilly (Roberts's Plateau), and A. H. Chisholm (Brisbane). When the case was called Mr. Chisholm explained that he attended as an officer of various natural history bodies to object to a portion of the National Park being alienated in any way. This reservation, he said, had been dedicated by Parliament to the people, and it was wholly wrong to allow private encroachment, even if such were legal. Apart from this consideration, the presence of cattle would affect the primeval nature of the park, and tempt the licensee to ringbark trees in order to strengthen the grass. In the event of the policy of opening being persisted in, he was prepared to pay the rent in order to keep the land free from possible harm. The case was then adjourned until the afternoon to allow of the Minister being consulted. It was announced on resumption that the occupation was to be proceeded with, and the area was submitted to auction, with an upset price of £2 10s. a square mile per annum. The successful bidder was Mr. Markwell, at £12 5s. a square mile, a higher bid by Mr. Chisholm being adjudged to have come too late." On the following day the Minister for Lands (Mr. Coyne) defended the action of the Department, and said he proposed to safeguard the "Park."

Sanctuaries continue to be created throughout the State. A splendid concession (and one which will interest members who attended the Brisbane congress last year) is the proclamation of the whole of Stradbroke Island, Moreton Bay, as a sanctuary for native birds and animals. This island has an area of 123 square miles, and ranks next to Hinchinbrook Island (North Queensland) as the largest insular reservation in Australia. The greatest sanctuary of all is the Barron Shire (N.Q.), the whole 490 square miles of which were proclaimed a sanctuary at the request of the shire council.

Late in August Brisbane members of the Union had the pleasure of entertaining at tea Professor J. Burton Cleland, R.A.O.U. (South Australia) and Colonel (Dr.) Horne, R.A.O.U. (Victoria), both of whom were in Brisbane in connection with the Australasian Medical Congress.

Queensland will be represented at the annual meeting of the R.A.O.U. in Perth. The distance is too great, however, to ensure a good attendance from this State.

A. H. Chisholm, *State Secretary.*

Review.

["The Birds of Australia." By Gregory M. Mathews, F.R.S.E. Vol. viii., parts 1 and 2.]

It is a relief to Australian ornithologists to see again the parts of this great work. It was feared that, on account of the enormous increase in costs, publication would have to be suspended: but fortunately that catastrophe has been averted.

The high standard set up at the beginning, so many years ago, is well maintained in the parts under notice. Indeed, it is surprising that, whilst in every other direction the effects of shortage of material and increased costs are plainly visible, yet this remarkable work has gone on in a marvellous way unimpaired, and on a uniformly high level of excellence. As a matter of fact, increased excellence is seen in these parts, for all the plates are by the famous bird artist Grönvold—a sufficient guarantee of their accuracy and high finish. However, the placing of two or more species on a plate may possibly be due to the demands of economy.

The field notes are, as usual, varied and interesting, and are contributed by many of the best-known Australian field workers. The researches into the past history of the species are thorough, and the essential facts are fully set out.

Approval, too, may be expressed of some general remarks on the classification of birds made by Mr. Mathews. These suggest a hope that his many years of constant, faithful, and critical study of masses of material and literature have placed Mr. Mathews in the position of being able to suggest an up-to-date classification of birds.

The first part deals with the Pittas, Scrub-Birds, Swallows and Martins, and three Flycatchers. The Australian Robins, here subdivided into seven genera of one species each, the Short-billed Tree-Tit, and the White-throated and Brown Fly-eaters are treated in Part II.

Mr. Mathews has worked himself during the past fifteen years into a leading position amongst the world's ornithologists, and Australians are proud that their avifauna is being so thoroughly studied and so excellently depicted. They approve of the splendid treatment given by Mr. Mathews, but regret that in one matter they are unable to follow his lead. Attention has previously been drawn to Mr. Mathews's excessive splitting of genera. In the parts under notice Mr. Mathews has quite out-Heroded Herod by using 21 genera for the 22 species described, *Micraca* alone having two species. Six of the generic names are due to fine splitting by Mr. Mathews, and he has adopted all previous suggestions of generic subdivision.

In Mr. Mathews's "Check-list," Part I., 1920, recently issued, a tendency to moderation and to the adoption of a middle position was noted, but in these parts an extreme position is apparent. Possibly the parts were prepared for press before the completion of the "Check-list." This extreme position is the one factor likely to depreciate the value of Mr. Mathews's monumental work. He started in a medium position as regards genera; then became a violent lumper, and is now in the extreme splitting position. Indeed, with one more split he would have reached in these parts the physical limit of generic splitting—a genus for each species. It is with regret that we have again to draw attention to this rendering useless of generic names.

Additions to the Library.

By F. Erasmus Wilson, R.A.O.U., Hon. Librarian.

Owing to pressure on space I am not able to comment on any of the articles appearing in the following publications:—

Victorian Naturalist, vol. xxxvi., parts 11 and 12; vol. xxxvii., parts 1, 2, and 3.

Science and Industry, vol. ii., parts 3 and 4.

Australian Naturalist, vol. iv., part 10.

Hawkesbury Agricultural College Journal, vol. xvii., parts 4 and 5; vol. xviii., part 1.

Ibis, vol. ii., part 1.

British Birds, vol. xiii., parts 2 and 4.

Avicultural Magazine, vol. xi., parts 2 and 4.

Bird Lore, vol. xxii., part 1.

Le Gerfaut, 1919, fas. 1 and 2; 1920, fas. 1.

Proceedings of the Royal Society of Tasmania, 1919.

Proceedings of the Linnean Society of New South Wales, vol. xliv., part 4.

Revue Francaise d'Ornithologie, No. 131.

Condor, vol. xxii., part 2.

Journal of the Museum of Comparative Oology, vol. i., parts 3 and 4.

Auk, vol. xxxvii., part 1. Contains an *in memoriam* article by H. W. Henshaw on the grand old American ornithologist, William Brewster.

South Australian Ornithologist, vol. iv., parts 2 and 3.

"University of California Publications in Zoology," vol. xix., part 10.

"A Geographical Bibliography of British Ornithology," by W. H. Mullens, H. K. Swan, and the Rev. F. C. R. Jourdain. Part II. Witherby and Co., London.

"New and Noteworthy Philippine Birds," by R. C. M'Gregor. (Reprint from *Philippine Journal of Science.*) From the author.

"A Handlist of the Birds of the Philippine Islands," by R. C. M'Gregor and D. C. Worcester. From R. C. M'Gregor.

"Suggestions for Ornithological Work in Canada," by P. A. Taverner. (Reprint from *Ottawa Naturalist.*) From the author.

Five Reprints, by Walter F. Collinge — (*a*) "On the Value of Different Methods of Estimating the Stomach Contents of Wild Birds," (*b*) "On the Food and Feeding Habits of British Game Birds," (*c*) "Some Observations on the Food of Nestling Sparrows," (*d*) "The Value of Insectivorous Birds," (*e*) "Some Recent Investigations of the Food of Certain Wild Birds." From the author.

"The Birds of Red Deer River, Alberta, U.S.A.," by P. A. Taverner. From the author.

Notes.

Many members of the R.A.O.U. have assisted and given of their time and substance for patriotic enterprises during the war. Mr. Rowland Archer's was a novel method. In the interests of the Y.M.C.A. he had on exhibition for two years his fine oological collection, and realized a handsome sum for the cause.

On Friday, 15th October, a strong party of Queensland, New South Wales, and Victorian delegates will leave Melbourne per the transcontinental express for Perth, where the Annual Congress of the R.A.O.U. will be held. Many important subjects are on the agenda paper for consideration. Several papers will be read, and the draft report of the second edition of the "Official Check-list" will also be presented.

THE ALLIED SHRIKE THRUSH (*Colluricincla parvissima*).

THE AUSTRALIAN CUCKOO (*Cuculus optatus*).

The Emu

Official Organ of the Royal Australasian Ornithologists' Union.

"Birds of a feather."

VOL. XX.] 1ST JANUARY, 1921. [PART 3.

The Coloured Plate.

MEMBERS of the R.A.O.U. are again indebted to Mr. H. L. White, of Belltrees, for his goodness in wholly financing the coloured plate in this issue of *The Emu*. It is from an original drawing by Mr. Neville Cayley.

For remarks on the Cuckoo (*Cuculus optatus*) reference may be made to the October *Emu*, p. 57. The figure given represents one of the two immature females mentioned. There are hopes that the egg (yet unknown) for this species may be soon found. The other figure in the plate represents the Allied Rufous Shrike-Thrush (*Colluricincla pravissima*). For critical remarks see also October *Emu*, p. 62.

The figures are taken from specimens collected by Mr. W. M'Lennan on Moa Is., Torres St., and which are in the "H. L. White Collection," National Museum, Melbourne. —A. J. C.

IN connection with the Perth session of the R.A.O.U., our Western Australian friends will appreciate the accompanying picture bearing on the great western territory's emblem —"*Cygnis insignis*" ("remarkable for Swans"). The photograph was taken some time ago for *The Emu* by Mr. W. M'Gowan, jun., of Launceston, whose father at the time wrote :—"The Black Swan's nest is elevated about a foot above the ground, and consists of a miscellaneous collection of rough sticks, twigs, leaves, roots, and long pieces of the New Zealand flax, which is growing near. The inside of the nest is lined with the finer roots, leaves, &c., and is basin-shaped, containing four eggs. The work of incubation seems to be shared by both birds. The one depicted seems to be the male, and, when disturbed, fights strenuously to protect the nest, smart blows being delivered by the secondary joint of the wing. After a change of position the bird is very careful to pack all the small leaves and roots about its body so as to fit into the changed position—in fact, it seems to while away much time in re-adjusting and gathering all the material within reach. It is very interesting to watch the bird sitting half up and turning over and adjusting the eggs into a more comfortable position, the sinuous, snake-like movement of the neck performing the necessary operations with infinite grace."

Annual Congress and Field Excursion of the R.A.O.U.

FOR the first time, the annual congress and field excursion of the R.A.O.U. were held in Western Australia. The Transcontinental Railway having been completed and obligations to Queensland discharged, the Union seized the first opportunity of meeting in the distant "Golden West."

The large party started in the person of the president-elect, Mr. C. A. Barnard, from the north-east of the continent on the 4,000-mile rail journey to Perth and Busselton, where the rail was left for the field to be explored ornithologically near the south-west extremity. Mr. E. H. Barker, of Brisbane, completed the Queensland delegation; Messrs. A. S. Le Souëf, G. Goldsmith, and J. F. Thomas represented New South Wales; and Miss Macdonald, Tasmania. These made the party leaving Melbourne on Friday, 15th October, up to 21, and 10 others joined in South Australia.

As magnificent rains had fallen since the end of July, all were looking forward to their trip across the great "desert." However, little desert was seen. The country looked well, and wherever cattle or sheep were observed they were in forward condition.

A keen look-out was kept for birds along the Transcontinental Railway, and at every stopping-place in daylight parties hurriedly left the train to gather some of the beautiful wild-flowers and to make a chance observation of the animal life.

The train being luxuriously fitted and excellently managed, the weather cool and dust little in evidence, the journey was a pleasure to all. The various committees, notably the Check-list committee, kept steadily at work, and time passed rapidly and pleasantly.

Kalgoorlie, with its wide, tar-paved streets and electric trams, was reached according to time-table. Full use was made by botanists, entomologists, ornithologists, and photographers of the stay of some hours. Perth was reached in time for breakfast on Tuesday, 19th October. The party was welcomed by the acting State secretary, Major E. A. Le Souëf, who had stepped into the breach and performed well the difficult task of gathering up the threads when, at short notice, Mr. W. B. Alexander, State secretary of the R.A.O.U. for Western Australia, absent on a visit to England, was commandeered for scientific research in America. The morning was occupied in settling preliminaries and in paying official calls.

At 2 o'clock the congress began at the Western Australian Museum, Perth, where a meeting-room was kindly placed at our disposal by the trustees, for whom Mr. Battye welcomed the delegates. Representatives of all the States were present. Dr. J. A. Leach occupied the chair.

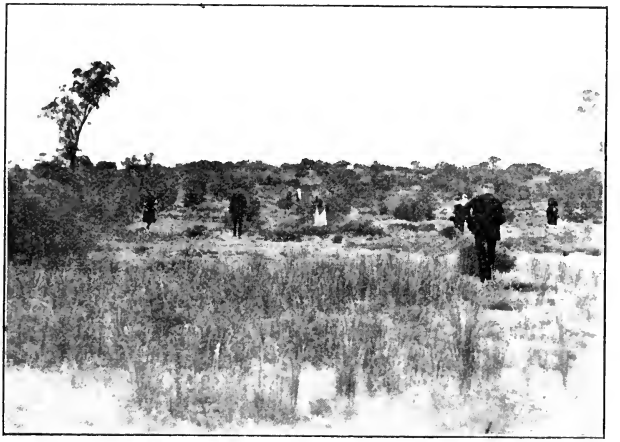
Economy dictates a summarized report. The annual report, indicating a busy and prosperous year of varied activities, was

The Black Swan on Nest.

PHOTO. BY W. M'GOWAN, JUN.

adopted. The balance-sheet showed a reduced credit and the need for economy, especially as printing prices had doubled and paper and costs were still mounting.

The election of officers resulted as follows: President, C. A. Barnard (Q.); vice-presidents, J. A. Leach (Vic.) and E. A. Le Souëf (W.A.); hon. general secretary, G. Finlay; hon. treasurer, Z. Gray; hon. editor *The Emu*, J. A. Leach; assistant editor, R. H. Croll; hon. librarian, F. E. Wilson; curators (*a*) Skins, J. E. Chubb, (*b*) Eggs, J. A. Ross, (*c*) Photographs, &c., L. G. Chandler; hon. auditors, J. Barr and J. Hedding. State secretaries: A. S. Le Souëf (N.S.W.), A. H. Chisholm (Q.), Capt. S. A. White



Delegates leaving the train in the Desert.

PHOTO. BY H. E. HIEST, R.A.O.U., GEELONG.

(S.A.), B. Leake (W.A.), C. Lord (Tas.), W. Oliver (N.Z.), G. Hill (N.T.), and C. Zimmer (Papua). Members of Council: Victoria, C. L. Barrett and Col. G. Horne; New South Wales, Dr. E. A. D'Ombrain, F. C. Morse, and N. Cayley; Queensland, E. M. Cornwall, H. Longman, and Henry Tryon; South Australia, E. Ashby and Prof. J. B. Cleland; Western Australia, P. T. Sandland and T. P. Draper; Tasmania, H. S. Dove, Colonel F. M. Evans; ex-presidents (*ex-officio* members), Surg.-Gen. Sir C. S. Ryan, A. J. Campbell, A. H. E. Mattingley, D. Le Souëf, R. Hall, A. F. Basset Hull, J. W. Mellor, and Dr. W. MacGillivray.

Many new members were elected, and D. Le Souëf, late hon general secretary and the first hon. secretary of the R.A.O.U.,

was unanimously elected an honorary member in recognition of distinguished service rendered to the R.A.O.U. since its inception.

Many matters were discussed and resolutions agreed to at meetings continued at the Museum and at the Cave House, Yallingup. The chief of these stated that the State Game Laws should be co-ordinated (sub-committee appointed); that strong representations be made to State Governments to restrict grazing rights and timber-cutting in National Parks and bird sanctuaries; that the use of the pea-rifle be restricted to persons over 18 years of age; that the time required for notice of congress business be reduced to the minimum necessary to secure adequate notice; that provision be made for voting by proxy and by post; that a system of distinctions in ornithology be instituted; that fellowships not exceeding three in any one year be awarded those who had done good work in the science of ornithology; and that members in States desiring it should form themselves into branches and meet regularly to discuss ornithological matters; that as each formal change in the rules necessitates considerable expense, the Council take action with regard to such matters as do not necessitate a change of rules and await an opportune time to deal with the other matters; and that the editors of *The Emu* adopt as soon as possible the approved names accepted by the Check-list committee for the second edition.

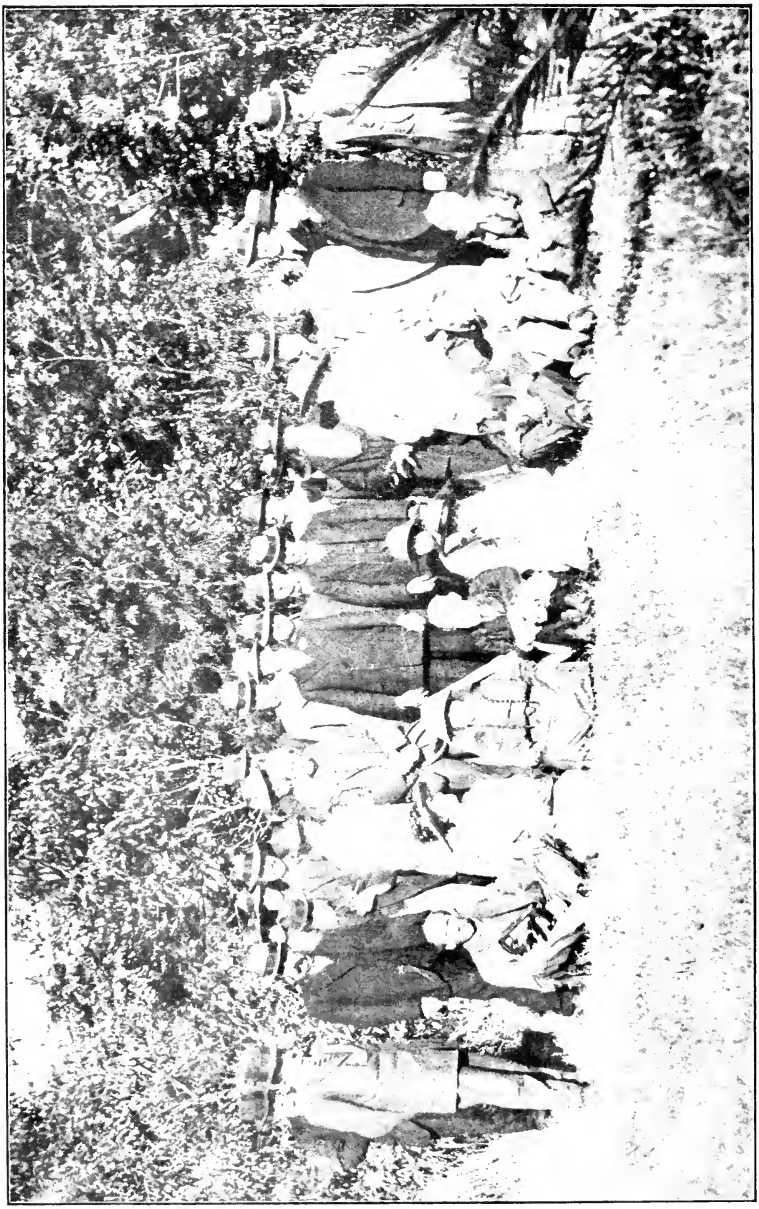
The address of the retiring president, Mr. A. F. Basset Hull, unfortunately prevented from attending by Parliamentary duties, was well received, and gave rise to a valuable discussion. The address was ordered to be printed in *The Emu*.

Several papers were presented and discussed — "Forgotten Feathers," by A. J. Campbell; "The Watling Drawings," by A. H. Chisholm; "The Birds of the Perth District," by W. B. Alexander; "The Relationship of the Western Australian Avifauna," by Robert Hall; "The *Times* Review of John Gould's 'Birds of Australia'"; "The Migration and Movements of Australian Birds," by A. Gilbert (a committee—Messrs. A. J. Campbell, C. L. Barrett, and A. H. Mattingley—was appointed to collate statistics).

Specimens were exhibited and examined. E. Ashby (S.A.) exhibited a unique specimen of the Pink-breasted Robin, from Tasmania, and several Humming-Birds; A. J. Campbell exhibited the skin of a Western Australian Bristle-Bird taken about 50 years ago. A. S. Le Souëf showed beautiful plates of birds and eggs painted by Mr. Neville Cayley, R.A.O.U., for the forthcoming work on the birds of Australia.

E. Ashby introduced a valuable discussion on the necessity of active propaganda for bird protection. Members should address school children whenever possible. A discussion showed unanimity of belief that the tame cat gone wild is the worst enemy of native bird-life.

Mr. F. Lawson Whitlock, who had just arrived from an ornithological expedition to Dirk Hartog Island, gave some interesting notes.



It was decided to hold the next congress in Sydney during October, 1921, and to hold the 21st anniversary the following year in Adelaide, where the inaugural meeting of the R.A.O.U. was held.

The bird collections of the Museum were examined, and the numerous living birds (many free) at the Zoo were admired.

Official meetings and receptions were held at the Town Hall, Perth, by the Lord Mayor; at the beautiful and well-kept Zoological Gardens, by the trustees of the Zoological and Acclimatization Society; by the State Government at Rottnest Island, some miles out in the open ocean, where many relics of the early days were examined with interest; and at the great Mundaring Weir, the source of the water supply carried over 450 miles to the goldfields at Kalgoorlie and the Boulder. Many small parties made day trips, and were always well and hospitably treated.

Public lectures on birds and general and economic ornithology were given at the University by D. Le Souëf (His Excellency the Governor, Sir Francis Newdegate, K.C.M.G., presiding) and Dr. J. A. Leach (Prof. Dakin presiding). Capt. White lectured to 1,200 pupils of combined schools (C. Andrews, Esq., Director of Education, presiding), and the three lecturers named visited educational institutions and addressed the students.

A profitable week was spent on the south-west coast. The Cave House at Yallingup was a good centre. The large party was comfortably accommodated, and found interesting material and good facilities for work. Parties, under the guidance of Mr. Dugdale, postmaster at Yallingup, visited the Canal Rocks and the famous Osprey's nest at Cape Mentelle, near the mouth of the Margaret River, within a few miles of the place where Grace Bussell, the "Australian Grace Darling," performed the remarkable feat of saving many lives from the wreck of the *Georgette*. Helenbrook, the home of the Bussells; the deserted timber town of Karridale, with its disused church, school, houses, and railway; Augusta, on its beautiful harbour; and Cape Leeuwin, at the south-west corner of Australia, were visited. Motor-cars travelled rapidly over the well-made roads of this generally level and heavily-timbered locality of high rainfall. Caves were abundant and interesting. The extremely rough coast, with many sunken rocks, swept by huge waves and masses of spray, lent variety and interested some photographers, though the rough conditions disappointed the experts on the *Chiton* group of Mollusca (shell-fish).

The officials of the Railway, Education, and Forests Departments, and the Tourist Bureau, assisted in every way possible, while Mr. C. Herbert, Government Botanist, and Mr. Clarke, Entomologist of the Forests Department, accompanied the delegates on some of the excursions.

The wild-flowers of Western Australia are outstandingly beautiful, and are known and appreciated by all visitors and residents. Local birds, however, are not so well known. Fortunately, we were able to dissipate the widespread belief that Western Australia

ANNUAL

Year ended

RECEIPTS.

	£ s. d.	£ s. d.
To Balance, 1st July, 1919	...	72 14 2
,, Subscriptions	218 4 6	
,, ,, Arrears	51 10 0	
,, ,, Prepaid	34 2 6	
		303 17 6
,, Sales, £18 3s. 6d.; Check-lists, 17s. 6d.; Covers, £1 1s. 2d.; Blocks, £3; Exchange, £3 2s. 9d.		26 4 11
,, Color Fund Donations	43 18 6	
H. L. W.	18 0 0	
Advertisement	1 0 0	
		62 18 6
,, Trust Fund—Interest	...	45 0 0
		£510 14 7

ASSETS.

	£ s. d.	£ s. d.
Royal Bank—Credit Balance	... ...	0 18 8
Subscription Arrears	48 12 6	
Less prepaid	38 12 6	
		10 0 0
Library	... ...	325 0 0
Furniture and Specimens	... ...	185 0 0
Emus and Blocks	... ...	220 0 0
Tent and Material, &c.	... ...	3 17 6
Trust Account—Commonwealth 4½ % Bond	...	1,000 0 0
		£1,744 16 2

Z. GRAY, L.C.A., *Hon. Treasurer.*

MELBOURNE, 1st *July*, 1920

STATEMENT

30th June, 1920.

EXPENDITURE.

			£ s. d.	£ s. d.
By *The Emu*, vol. xix.	Printing, &c.	...	261 6 3	
,, ,, ,,	Blocks ...	...	63 14 2	
,, ,, ,,	Color Plates ...	...	62 9 6	
,, ,, ,,	Reprints ...	...	19 15 9	
,, ,, ,,	Vol. xviii. Patrons	...	1 2 6	
				408 8 2
,, Postage, £17 8s. 3d.; Stationery, £16 6s.; Insurance, £2 12s. 3d.; Commission, £1 10s. 8d.; Covers, £1 12s. 11d.; Binding, 15s.; Exchange, £2 18s. 2d.; Bank, 12s. 6d.				43 15 9
,, Room—Gas, 10s. 3d.; Fittings, £1 2s.; Photos., 10s.; Cleaning, £1 6s.; Cartage, £2 2s.; Paste, 1s. 9d.; Honour Board, £7				12 12 0
,, Trust Fund—Rent, £32 10s.; Library, £7 17s.; Honour Board, £4 13s.				45 0 0
,, Credit Balance, Royal Bank				0 18 8
				£510 14 7

LIABILITIES.

Nil.

	£ s. d.
Balance	1,744 16 2
	£1,744 16 2

Audited and found correct.

JAS. BARR, F.C.P.A., } *Hon. Auditors.*
JAS. HEDDING, }

MELBOURNE, *8th September*, 1920.

had little in the way of bird-life and to remove the impression that, while a "Bird Day" was a good thing for eastern boys and girls, it was useless in the West. Interest in ornithology has been intensified, and it is probable that an annual Bird Day will be celebrated in the schools, and that a Gould League of Bird-Lovers of Western Australia will be established as the direct outcome of the visit of the R.A.O.U. to the western State.

Some members returned to the Eastern States by steamer, and utilized good opportunities for study of the flight of the numerous and interesting Albatrosses.*

Other members made excursions to many parts of the huge State. Reports following give some of the results. This first visit serves also to indicate the best localities for future visits to the West.

PRESIDENT'S ADDRESS.

To the Members Present at the 1920 Annual Meeting.

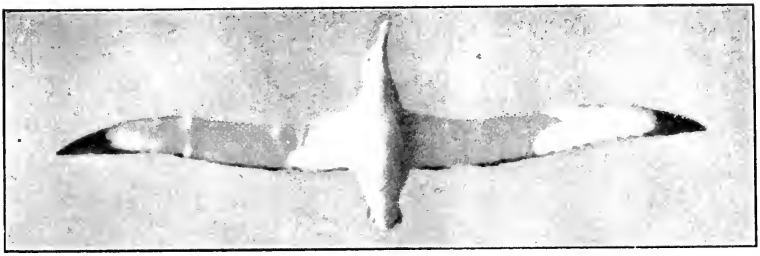
Ladies and Gentlemen,—For the second time I have to express my regret at being unable to address you personally at the annual meeting. You have paid me the highest honour in electing me as your President for two years in succession, and I have been prevented by official duties from acknowledging my indebtedness to you or voicing the *non sum dignus* that I feel so deeply.

Our general honorary secretary has given you a *résumé* of the work of the past year—in which, unfortunately, I have taken but small share—and you will now be called upon to place the seal of your approval on the labours of the Council. Inevitably, in such an association as ours, the bulk of the work falls upon the shoulders of the few who have the opportunity of gathering together at stated intervals in the home of the Union. We who are situated so far from that centre can only sympathize and (I fear too often) criticise! For my own shortcomings I can only plead want of leisure and that stimulus to greater effort which arises from association with keener fellow-workers.

To the future, then, I will direct the remainder of my few remarks, lightly sketching the lines upon which much useful work remains to be done.

Notwithstanding the considerable amount of field work that has been accomplished during the past ten years, largely under the guiding hand of Mr. H. L. White, by Messrs. M'Lennan, Jackson, and Whitlock, together with the individual efforts of Captain White, Dr. Macgillivray, and others, there are many avenues still open to the earnest field ornithologist, and especially to him who has the leisure to devote to the sustained study of some problem. Let me instance one subject of investigation that

* The photographs of flying Albatrosses were taken by Hugh Macknight, late A.I.F., from the troopship *Argyleshire*, on 6th September, 1919, about ten days before reaching Adelaide from Durban.



Studies in Albatross Flight.

PHOTOS. BY HUGH MACKNIGHT, NYAH, VICTORIA.

will require some years of attention during the months of September, October, and November. I refer to the movement of the Short-tailed and Wedge-tailed Petrels. Year after year the former species passes along the eastern coast of Australia in numbers that can safely be estimated in millions. Periodically countless thousands die and are cast up on the beaches. Examination shows that the birds have died from starvation. Why? That is only one of the many questions that require answering. Why do they go so far from their known breeding-places in Bass Strait and on the Victorian coast? Do they spread far and wide over the Australian seas from March to September and then gather together towards the latter end of the last-named month? If so, again, Why? On the 5th of this month (October, 1920) it was reported that dense flocks of "Mutton-Birds" passed Cape Byron on the border between New South Wales and Queensland, flying south, the stream taking three hours to pass a given point. Shortly we will hear of dead bodies being washed on shore, and the tale of successive years will be repeated. Sometimes the dead and dying Petrels coming ashore prove to be of the Wedge-tailed species. Emaciated bodies and empty stomachs tell the same story of starvation, but the numbers are never so great as in the case of the Short-tailed species. To fully elucidate this mystery will require undivided attention by a worker who can go out at call from any point between Gabo Island (on the south-east of the continent) and Broken Bay (farther north) to watch the movements of the birds and take specimens for examination; to visit the islands where they breed, or where they are trying to gain a footing; and he must, in addition, be prepared to study the migrations of the fish and the nature and sources of the food supply.

The Penguins will provide another field for investigation. My own limited researches point to there being a steady northward extension of their range. Twenty years ago the Little Penguin was unknown as far north as Sydney, but it now breeds all along the coast of New South Wales up to Port Stephens, and stragglers are reported from Moreton Bay. The Crested Penguins are undoubtedly making exploratory visits ever farther northward, and the reason for this extension is yet to be discovered. Stuart-Sutherland, in the last *Emu*, records, with expressions of wonder, the fact that the Thick-billed Penguin nests twice in the one year. My experience is that the Little Penguin breeds practically all the year round! Here is room for at least one year's close investigation, involving periodical visits to islands and headlands from Tasmania to Tweed Heads.

The Storm-Petrels, Prions, and Diving-Petrels will afford material for quite a band of workers. We know very little of their breeding-places and habits, excepting in the case of the White-faced Storm-Petrel. On a small rock—one of the Friars, off South Bruni Island—I found one of the Thin-billed Prions breeding nearly 35 years ago. The colony occupied a patch of

sloping rock, thinly overgrown with *Mesembryanthemum*, and in a space of barely a hundred square yards there were several dozens of these birds sitting on eggs or nestlings, the eggs being close to the water's edge, fresh or in progressive stages of incubation the higher the situation, until at the topmost ridge the young birds were almost fully fledged. Such densely-packed colonies may exist on many of the islets and rocks scattered through Bass Strait and along the coasts of the mainland. Numbers of these rocks are inaccessible unless under exceptionally fine weather conditions, and only a man of abundant leisure and means can hope to carry out the necessary prolonged investigations to clear up the existing uncertainty as to whether, and if so, where, these small Petrels that frequent our seas have their breeding-places on our islands.

Only one Albatross is known to breed in the Australian region. Who knows but that the Black-browed, Flat-billed, and Yellow-nosed Albatrosses have some isolated spot where a few dozen pairs annually rear their broods? It is by no means a far-fetched idea. To what extent have the islets of the Recherché and Nuyt's Archipelagoes been exhaustively searched?

These few suggestions as to fields for future endeavour are limited to the sea-birds. Are there no land-birds requiring further study and investigation? Glance over your "Check-list" and count up the species about which we know everything there is to know of their life-histories. Can you honestly exhaust the fingers of both hands in making the count?

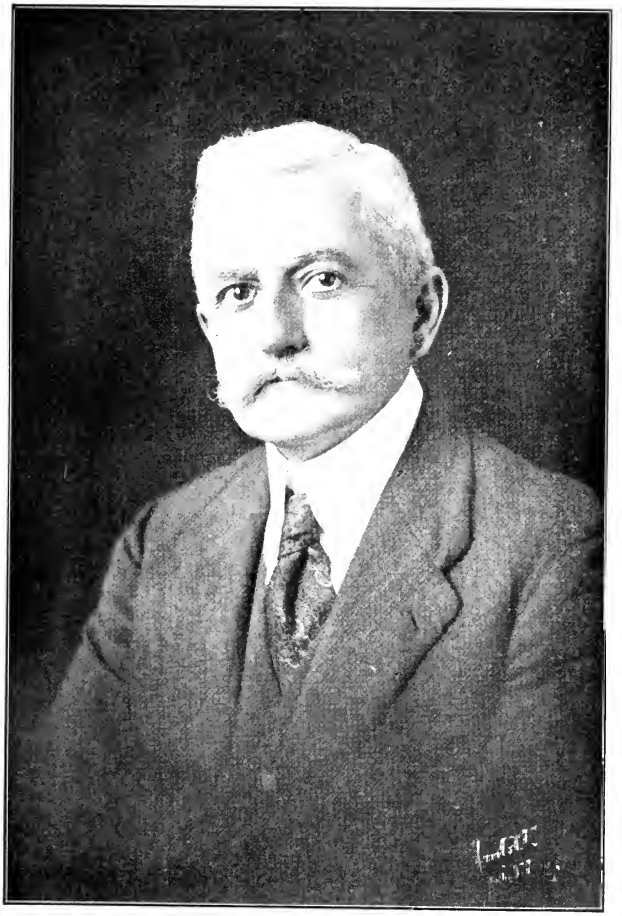
In conclusion, let each seeker after truth take one genus, or even one species, and work it out thoroughly. Too many objectives tend to blurred results. Good luck to you all!

A. F. Basset Hull,
Retiring President R.A.O.U.

CHECK-LIST COMMITTEE'S REPORT.

The convener, Dr. J. A. Leach, presented the report on behalf of the Check-list Committee. This showed that, except for a few cases of incomplete information and disputed status, finality and unanimity had been reached by the committee. Pleasure was expressed that the differences which were expected to be serious proved slight and easily removed. It was decided that the A.O.U. and B.O.U. names for birds found in those countries as well as in Australia be accepted: that in all cases where the evidence is complete the oldest valid name be used; and that in cases of doubt or incomplete evidence the name of the "Official Check-list" be not altered. The committee found that its generic standard approximated closely to that of the "Official Check-list"—indeed, it found the "Check-list" most helpful and its standards in the main satisfactory. Mr. Campbell and Dr. Leach were deputed to investigate the disputed points and to

PLATE XIV.



A. F. Basset Hull, R.A.O.U., Retiring President.

complete the proposed draft for the printer. Fifty copies of the proposed draft list are to be printed and distributed for criticism and comment. Such will be fully considered by the committee, and it is hoped that the second edition of the "Check-list" will be finalized at the Sydney congress next year.

NOTES ON THE SUPPOSED "EXTINCT" BIRDS OF THE SOUTH-WEST CORNER OF WESTERN AUSTRALIA.

By Edwin Ashby, F.L.S., M.B.O.U., Wittunga, Blackwood, S.A.

Following on the R.A.O.U. Congress at Perth and Yallingup, the president of the Union (Mr. C. A. Barnard), Mr. J. W. Mellor, and the writer proceeded to Ellensbrook, on the coast, half-way between Cape Naturaliste and the Leeuwin, this being the type-locality for Mr. Milligan's *Sphenura littoralis* (the Lesser Bristle-Bird), also an old habitat of *Psophodes nigrigularis* (the Black-throated Coachwhip-Bird). It also is not far from one of the recorded localities for *Atrichornis clamosa* (the Noisy Scrub-Bird). While many interesting birds were noted during our three days' stay in that charming locality, none of the species named was met with. Nevertheless, information was obtained respecting the causes of their disappearance and the localities where they should now be looked for.

At Ellensbrook the hills slope steeply from the elevated forest country down to the coast, and that portion fronting the Indian Ocean for half a mile or more back is more or less sandy and covered densely with low bushes, one of the commonest being a pink *Pimelea*, which forms a low, dense cover. We were informed that in years gone by this scrub used to be about 4 feet high, but the continual fires put through with a view to improving the herbage for sheep have effectually reduced the scrub to the height of 18 inches or 2 feet. Large patches of sedge and rushes are still to be found on the flats. Miss Bussell showed us the spot, close to the homestead, where Mr. Milligan obtained the type of *Sphenura littoralis*. Being close to the house, on the side of the creek, a little patch of unburnt scrub still remains, and it was in this surviving patch of low bush that Mr. Milligan obtained the bird, called by Miss Bussell the "Rain-Bird." Evidently it must be searched for in low coastal scrubs not swept by constant fires. The same applies to the Black-throated Coachwhip-Bird, which frequented the same spots as the Bristle-Bird. No doubt such unburnt country exists between Ellensbrook and the Leeuwin, but it is probably difficult of access. We learnt that such bush exists about Cape Naturaliste. We saw something of it during our stay at Yallingup, and have reason to believe that the Bristle-Bird is in the immediate neighbourhood.

Another interesting fact is that *Leipoa ocellata* (the Mallee-Fowl) is to be found at Cape Naturaliste. My informant had seen the birds and found the nests quite recently. This bird needs in-

vestigating in this locality. It seems almost certain that the *Leipoa* living in this apparently isolated and certainly wet locality will show some specialized differences; one would expect that, at least, it will prove to be a new sub-species.

I met one resident living back from the coast in the forest who evidently knew the Noisy Scrub-Bird. He described its loud ascending whistle and its build and colour most accurately. He said he had heard it occasionally in the big timber, close to the spot where we were talking, within the last 18 months. He said it kept to the thick under-bushes in the karri country, and would sometimes, when disturbed, fly up a few feet and cling to the rough bark at the base of the tree-trunks, apparently to enable it to take stock of the intruder, but otherwise it kept close to the ground or in the low bushes. I feel confident that this bird still exists in these extensive untouched forests. Probably it should be searched for at the pairing season, when it will be calling: otherwise the finding of it in these immense forests is next to impossible.

BIRDS OBSERVED DURING THE VISIT OF THE R.A.O.U. TO THE SOUTH-WESTERN DISTRICT—OFFICIAL REPORT.

By S. A. White, C.M.B.O.U., C.F.A.O.U.

The period over which the following observations were made ran into barely a week. The area worked extended from Cape Naturaliste in the north to the Margaret River (although observations were made down to Cape Leeuwin). Our field extended from the sea on the west for some distance inland to the east. The country varied much in character. First there were sand dunes in places facing the ocean, and at other times rugged rocky coast-line, at the back of which was invariably a narrow belt of dwarf vegetation characteristic of such an exposed situation. Further back, undulating country covered in forest trees and undergrowth. In places deep ravines extended to the very coast-line, and here and there down these ravines small streams found their way to the sea. The rainfall in the winter months is very heavy, and during our stay the days were bright and often warm; yet there was not one night that rain did not fall, but not a sign of water lying about could be seen next morning. But this can easily be understood when it is seen that the country consists mostly of a light sandy soil over a very porous limestone, with in places a network of caves underneath.

The vegetation was striking, for there were big forest trees stretching over vast areas of country—first of all the jarrah (*Eucalyptus marginata*), karri (*E. diversicolor*); but the most widely distributed tree is the so-called "red gum" (*E. calophylla*), the latter bearing a wealth of white blossoms. The undergrowth consists of a wonderful growth of flowering shrubs and plants, forming much food for bird-life. First of all the banksias play a

big part, some of them bearing gigantic flowers, such as *Banksia prionotes*. There is a large number of wattles (*Acacia*), the seeds of which form good food for many birds. A very ornate shrub, growing to 25 feet, is one of the *Agonis*, locally called "peppermint." There are also many "paper-barks" or tea-trees (*Melaleuca*). Several species of *Grevillea* and *Hakea* (including the "wooden pear"—a tree often over 20 feet high) produce seeds which may be eaten by birds. Even the "blackboys" or grass-trees (*Xanthorrhœa*) throw up their flowering spikes, which, in full blossom, produce much honey for the Honey-eaters, and the seed is much sought after by the Black Cockatoos. Closer to the ground are the cycads (*Macrozamia fraseri*), also no end of shrubs and plants bearing honey-laden flowers and also berries. The vegetation of the coastal fringe is composed principally of stunted *Melaleuca* and *Acacia*, forming a dense cover for such birds as the Bristle-Bird (*Sphenura*).

The following list of birds observed would not be an exhaustive one, for it would be impossible to compile a list embracing all the species in so short a time. I have to thank many members of the party for their ready assistance in comparing lists and giving information. I wish to thank especially Mr. J. Neil M'Gilp for his valuable notes upon the nesting birds. Mr. M'Gilp is a very painstaking and keen oologist, and accomplished some good work during our visit to the south-western district.

The birds observed and field notes made are as follow:—

Phaps elegans. Brush Bronze-winged Pigeon.—The writer flushed two of these birds from the dense tea-tree scrub on the coast-line near Cape Naturaliste. They appeared to be of an exceptionally ruddy coloration.

Sterna bergii. Crested Tern.—Small parties seen in many places along the coast-line.

Bruchigavia novæ-hollandiæ. Silver Gull.—Numbers were seen all along the coast; sometimes they were in large parties of from forty to one hundred or more.

Charadrius ruficapillus. Red-capped Dottrel.—Several pairs were seen on the sandy beaches of the bays along the coast-line. Nests containing both eggs and young were found just above high water mark.

Charadrius cucullatus. Hooded Dottrel.—One or two pairs met with on the sandy beaches.

Burhinus grallarius. Southern Stone-Plover.—Heard calling at night in the clearings.

Notophoyx novæ-hollandiæ. White-fronted Heron.—Fairly plentiful through the district where water was found.

Demiegretta sacra. Blue Reef-Heron.—Met with along the coast-line. One party reported that they had been found nesting under the rocks (?).

Phalacrocorax varius. Pied Cormorant.—Met with on the rocks along the coast-line.

Phalacrocorax melanoleucus. Little Cormorant.—Not plentiful; only an odd bird here and there met with.

Astur fasciata. Australian Goshawk.—Recorded by several members of the party.

Uroaetus audax. Wedge-tailed Eagle.—Not many seen; it does not seem to be a common bird.

Hieracidea occidentalis. Western Brown Hawk.—An odd bird here and there was met with in the forest country.

Pandion haliaëtus. Osprey.—The historical nest at Cape Mentelle was found to have been occupied this season, for broken egg-shells were seen in the nest.*

Glossopsitta porphyrocephala. Purple-crowned Lorikeet.—A few of these birds were moving about in small parties.

Zanda baudini. White-tailed Black Cockatoo.—A number of these birds were met with in the forest country. The writer observed as many as forty in one flock. They were feeding upon the seed of the banksia, and were also tearing the blossoms to pieces in search of the young seeds in the cones. Their crops and stomachs were distended with particles of the tender white seeds.

Barnardius semitorquatus. Twenty-eight or Yellow-collared Parrot.—This bird was not as numerous as one would expect; only a few examples came under notice.

Purpureicephalus spurius. Red-capped Parrot.—These birds were not numerous, and only a few examples were seen.

Dacelo gigas. Great Brown Kingfisher.—This bird was introduced about 1866, and it has now practically spread all over the south-western district. It seems quite at home, and thriving well. It is wonderful what a large scope of country it has now taken possession of.

Halcyon sanctus. Western Sacred Kingfisher.—Quite a common bird, but does not seem to warrant a specific separation.

Merops ornatus. Australian Bee-eater.—Very numerous; seen congregating up to a dozen upon the tops of dry trees.

Cacomantis flabelliformis. Western Fan-tailed Cuckoo.—Reported by some of the party as having been seen.

Lamprococcyx plagosus. Western Bronze-Cuckoo.—Observed upon several occasions.

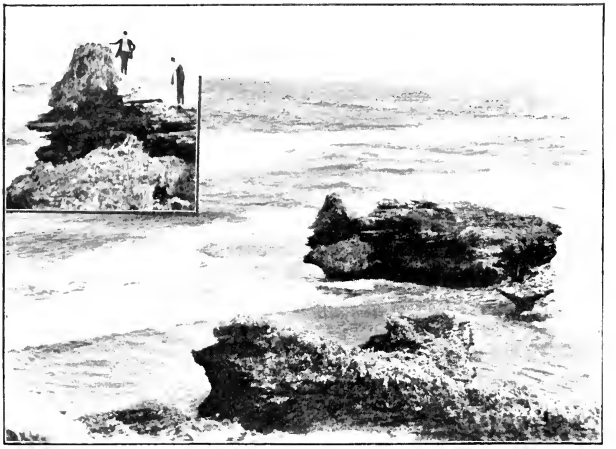
Hylochelidon nigricans neglecta. Western Tree-Martin.—Met with in the forest country.

Lagenoplastes ariel. Fairy Martin.—Not plentiful; seen upon several occasions.

Petroica multicolor campbelli. Western Scarlet-breasted Robin.—Quite a common bird; seen flitting about amongst the timbered country, and there is no doubt it was nesting.

Gerygone culicivora. Western Fly-eater.—A very common bird, found in many situations—in the forest country and out in the open in the low vegetation between the timber and the sea. It is a very

* The photograph of the Osprey's nest with three eggs was taken on the South Keppel Is., Queensland, by Mr. E. M. Stretton, Rockhampton, and was communicated by D. S. A. Dram, Gracemere, Rockhampton.



Nest of Osprey, Cape Mentelle, W.A.
The inset shows two members of the party at the nest.

PHOTOS. BY H. E. HURST, R.A.O.U., GEELONG.

Osprey's Nest with Three Eggs on South Keppel Island, Queensland.

PHOTO. BY E. M. STRETTON, ROCKHAMPTON.

lively little bird, seems to be always on the move, and possesses a most wonderful range of notes, which are loud and clear for so small a bird. Mr. M'Gilp kindly supplied me with the following notes of a nest he observed: "Nest pear-shaped; entrance near the top, with a small hood, having the usual tail-like appendage at bottom of nest. Formed of fine shreds of bark, grass, and spiders' cocoons; inside lined at bottom with fine grass and feathers, attached to small branches of a mistletoe *Loranthus* about 20 feet from the ground."

Pachycephala pectoralis occidentalis. Western Thickhead.—Found all through the timber country; found nesting. A nest observed by Mr. M'Gilp is as follows: A cup-shaped structure formed of very fine rootlets and a few leaves, placed 16 feet from the ground in a small sapling overgrown by a creeper.

Eopsaltria griseogularis. Grey-breasted Shrike-Robin.—Found in pairs all through the timbered country. They were nesting at the time of our visit, and nests with young birds were found.

Rhipidura preissi. Western Fantail.—Quite a common bird, and its strange little soft note would be heard very often in the deep ravines near the sea.

Graucalus novæ-hollandiæ. Black-faced Cuckoo-Shrike.—Often seen, and a pair was found nesting in a red gum *Eucalyptus calophylla*.

Acanthiza apicalis. Broad-tailed Tit-Warbler.—A very common bird, met with in almost every locality—sometimes high up in the forest trees, at others near the ground. They were nesting while we were there. One nest was composed of strips of bark fastened together by cobweb. It was dome-shaped, with entrance high up, placed in a sapling 13 feet from the ground.

Geobasileus chrysorrhous. Yellow-rumped Tit-Warbler.—Quite a common bird, and several nests were seen. One had been added to for some time, and there must have been three or four nests attached. Mr. M'Gilp observed a nest with two eggs and one of the Bronze-Cuckoo.

Sericornis maculata. Spotted Scrub-Wren.—A common bird in the thick, dwarf vegetation along the coast-line. Mr. M'Gilp found three nests, all containing young. I fancied this bird to be different from *S. m. osculans*, but upon comparing a series I find that it would be impossible to separate them, so that *maculata* has a wide range.

Malurus splendens. Banded Wren-Warbler. This bird was not nearly so plentiful as the writer expected it to be. In 1880, during my first visit to Western Australia, these birds were exceedingly plentiful. Probably the domestic cat gone wild has accounted for their disappearance. These birds were nesting. Mr. M'Gilp discovered a nest with three eggs. It was the usual dome-shaped structure placed in a thick tea-tree three feet six inches from the ground, constructed of soft grass lined with fur and feathers.

Sphenura longirostris. Long-billed Bristle-Bird. The writer made a determined effort to locate this bird, but, other than noting a call which he feels sure was that of this bird, and the tracks on the sand in the low scrub south of Cape Naturaliste (the tracks were identical with those made by the South Australian form), nothing more was recorded; but there is little doubt the bird is still there.

Colluricincla rufiventris. Buff-bellied Shrike-Thrush.—This bird was met with in the timbered country, but was not plentiful anywhere. The habits of this form seem identical with those of the South Australian bird, but the note is not so deep or rich as that of *C. harmonica*.

Neositta pileata. Black-capped Tree-runner.—This bird was reported as having been seen in the timbered country, but did not come under the writer's notice.

Climacteris rufa. Rufous Tree-creeper.—Only seen once, in the timber country.

Zosterops gouldi. Green-backed White-eye.—A very plentiful bird, especially along the sea-coast, where it was nesting amongst the tea-tree and low shrubs. Its call is a short, mournful one, like that of the other members of this family of birds. Its bright coloration is very noticeable. Several nests were seen containing eggs. The position of the nest must vary very much, for the writer saw a nest 20 feet from the ground in a large tea-tree, one 12 feet, and Mr. M'Gilp tells me he discovered a nest of this bird "ten feet from the ground, in an overhanging tea-tree bough; a compact, cup-shaped structure, composed of dry grass bound together with fibrous roots and tendrils"; in some instances cobweb is used.

Dicæum hirundinaceum. Mistletoe-Bird.—Seen only upon one occasion.

Pardalotus striatus. Red-tipped Pardalote.—This bird is identical with the South Australian bird. The writer fails to see the slightest variation.

Melithreptus chloropsis. Western White-naped Honey-eater.—The birds had paired off, no doubt owing to the nesting season, and often their loud musical note was heard in the tree-tops.

Acanthorhynchus superciliosus. White-browed Spinebill.—This charming little bird was found all over the country—in the big timber, brush, and heath-like country on the coast—and their sharp note was to be heard all through the day. They were often seen clinging to the large bottle-shaped banksia flowers. These birds were nesting during our visit. Two nests were found; one contained one young one and the other two.

Glyciphila fulvifrons. Tawny-fronted Honey-eater.—Recorded from the coastal belt.

Stigmatops indistincta. Brown Honey-eater.—A common bird on the coast-line, where every ravine running down to the sea was clothed in thick undergrowth, and here these birds had their homes. Their beautiful notes were much admired for their full and liquid silvery ring. The birds were nesting at the time of our visit. Mr. M'Gilp gave me the following notes in reference to a nest taken by him:—"A neat, cup-shaped structure of dried grass, bark, and spiders' cocoons, beautifully lined with Zamia-palm wool, forming a felt-like lining. It contained two eggs, and was placed four feet from the ground in the top of a flowering shrub not far from the seashore."

Ptilotis sonora. Singing Honey-eater.—This bird was reported as having been seen by members of the party.

Meliornis longirostris. Long-billed Honey-eater. A plentiful bird, especially along the coast-line. The writer is doubtful of this being a good species, for many birds in South Australia have just as long a bill. They were nesting, and Mr. M'Gilp kindly gives me the following notes :—" Nest found with two eggs ; cup-shaped, formed of flower-stems, lined with grasses and flower down, placed four feet from the ground in a low tea-tree."

Myzantha obscura. Dusky Miner.—Only one bird was seen.

Anthochæra carunculata. Red Wattle-Bird.—These birds were fairly plentiful, and they were calling in their harsh tone. The flowering banksias seemed to be attracting them. Did not see or hear of their nesting.

Anellobia lunulata. Little Wattle-Bird.—These birds were very numerous, and in habits and call resembled the more eastern Brush Wattle-Bird (*A. chrysoptera*). They were nesting at the time, and a nest with its single egg came under observation.

Anthus australis. Australian Pipit.—Almost every clearing or open space had a pair or so of these birds.

Zonæginthus oculatus. Red-eared Finch.—We met with these beautiful little birds on the coastal belt, where they were rare. A pair was building a nest at the time of our departure.

Corvus coronoides. Australian Raven.—Not plentiful ; one would not expect them to be so in a heavily-timbered country.

Strepera plumbea. Leaden Crow-Shrike.—These birds were occasionally seen and heard, but they did not give one a chance to make any observation, for they were very timid and wary.

Cracticus leucopterus. White-winged Butcher-Bird.—Very few of these birds were seen. An occasional pair or odd bird would be met with in the forest country. The nesting season seemed to be over at the time of our visit.

Gymnorhina dorsalis. Varied Magpie.—This is a very puzzling bird, and one would require a good long series to give a definite opinion upon the colour-phases. The mottled coloration of the immature bird is very remarkable, and the writer is of the opinion that this bird is worthy of specific difference.

The party under the leadership of the president, Mr. C. A. Barnard, visited Ellenbrook, a few miles south of the Cave House at Yallingup, and recorded in addition :—

Platycercus icterotis. Yellow-cheeked Parrot.—One bird, not fully adult, seen in low scrub close to the coast.

Lophoictinia isura. Square-tailed Kite.—It was strange to see this inland bird so far south, but the party, including the president, Mr. C. A. Barnard, who is familiar with the bird, had a good view.

Mr. A. J. Campbell spent a week in the forests of Leeuwin Land, where he was the guest of Mr. and Mrs. Wm. Lightly, of the Kauri Timber Station, Barabup, near Nannup. From that centre Mr. Campbell was enabled to explore in various directions, but no trace of the Scrub-Bird (*Atrichornis*) was observed, nor had

the oldest timber-getters in the district heard anything of it. Birds generally, both for numbers and species, were remarkably scarce. The reason was not far to seek. The forests bore ample evidence of fire, both recent and remote. However, one interesting sight was a flock of about 30 Black Cockatoos (the White-tailed species, *baudini*) seen on the ground by the wayside. As the birds rose and flew from tree to tree, dispersing, they uttered quaint cries like that of a captured domestic hen. Although the bush-fires had played havoc with the fauna, the flora had been greatly refreshed, as evinced by the abundance and beauty of remarkable flowers seen everywhere.

On the return journey Mr. Dudley Le Souëf and Mr. A. J. Campbell together spent a week-end with Mr. Bruce W. Leake and family at Woolundra, which is 140 miles inland from Perth. The district was typical jam-wood (*Acacia*) and salmon gum (*Eucalyptus*) country, and was brightened by many flowering bushes. One "Daisy of the Desert," by its elegance and keeping qualities, threatens to rival the fame of the flannel-flower of New South Wales. Specimens kept fresh, in water, for a fortnight after they were gathered. Birds were not numerous, but a few were observed nesting about the homestead, notably Grallinas or Magpie-Larks, which had a curious and very distinctive call compared with that given by the same species in eastern parts. The Black-tailed Parrot (*Polytelis melanura*) is reported as occasionally seen in the district. One has since been obtained.

NOTES ON BIRDS OBSERVED IN WESTERN AUSTRALIA, FROM PERTH NORTHWARDS TO GERALDTON.

By Edwin Ashby, F.L.S., M.B.O.U., Wittunga, Blackwood, S.A.

Mr. J. W. Mellor and the writer visited Geraldton, 370 miles north of Perth; but, except for one day at Geraldton and part of a day at Moora, our observations were made separately. By this means we were able to cover more ground, each visiting different localities. We beg to acknowledge the courtesy of the Western Australian Government and the officials of the Midland Railway Co. in granting us facilities without which it would have been impossible to cover as much ground in the limited time at our disposal.

The occurrence of two rare species of Sandpiper at Dongara is interesting, and suggests that these may possibly be regular visitors to the North-West coast of Australia, and only accidental visitors on the eastern side of the continent. The replacement of *Barnardius semitorquatus* by *B. zonarius* or its ally such a short distance inland and northwards is remarkable; also, the fact that the Purple-backed Wren-Warbler (*Malurus assimilis*) takes the place of the Red-winged Wren-Warbler (*M. elegans*) at Dongara and Geraldton suggests that the latter has a limited range. The discovery of the Yellow-tinted Honey-eater (*Ptilotis flavescens*)

or an allied form at Dongara and Geraldton is of particular interest, as we had been given to understand that the Carter Honey-eater (*P. carteri*) was the species occurring there.

Sterna bergii. Crested Tern.—Numerous at Dongara. Most had black outer margins to their wings—a form of immature plumage not noted in birds along the South Australian coast. I thought at the time the Dongara birds were a different species.

Sternula nereis. White-faced Ternlet.—A small flock of what I concluded were this species at Dongara.

Larus novæ-hollandiæ. Silver Gull.—All along the coast.

Erythrogonys cinctus. Red-kneed Dottrel.—These charming birds were numerous on a swamp at Moora.

Charadrius ruficapilla. Red-capped Dottrel.—Numerous on the swamps near Moora.

Himantopus leucocephalus. White-headed Stilt.—Fully a hundred of these Stilts were on the Moora swamp. The long, trailing legs, stretched-out necks, and loud, barking cries as they flew overhead on being disturbed made one of the most charming exhibitions of bird-life met with on the trip.

Totanus brevipes. Grey-rumped Sandpiper.—At Dongara I saw several Sandpipers new to me in the field, although I had a specimen from Europe in my cabinet. At high tide this species and the following sheltered about the low, overhanging cliffs, only taking flight when the intruder was a few yards away. The Grey-rumped Sandpiper has a most distinctive action, bobbing its tail up and down on settling. It is possible that a large Sandpiper seen at Moora may be referable to this species.

Actitis hypoleucus. Common Sandpiper.—A rare visitant to our shores. There were several companies of three or four each, which hugged the rocks at Dongara so closely that the first intimation of their presence would be their rising practically at one's feet. The dark colour of the upper side marked them easily as distinct from the two following species. When handled the feathers have a decided wash of green.

Pisobia ruficollis. Eastern Little Stint.—Large flocks were feeding on the sands and banks of weed at Dongara and on the drying up swamps near Moora.

Pisobia acuminata. Sharp-tailed Stint.—Flocks were on the same lagoon as the preceding, near Moora.

Burhinus grallarius. Southern Stone-Curlew.—Saw several near Watheroo.

Eupodotis australis. Australian Bustard.—I saw several both going and coming from the magnetic observatory out in the sand-plains from Watheroo.

Carphibis spinicollis. Straw-necked Ibis.—On Moora lagoon.

Platibis flavipes. Yellow-billed Spoonbill.—Saw one on the same lagoon as the preceding.

Notophoyx novæ-hollandiæ. White-fronted Heron.—Several fishing at the mouth of the Dongara River.

Nycticorax caledonicus. Nankeen Night-Heron.—Saw several on swampy ground on the Perth side of Watheroo.

Anas superciliosa. Australian Black Duck.—Swamp at Moora.

Nettium gibberifrons. Grey Teal.—A few on swamp at Moora.

Phalacrocorax gouldi. White-breasted Cormorant.—Fishing at mouth of the Dongara River.

Hieracidea berigora. Brown Hawk.—A bird obtained at Ellensbrook was much smaller than any specimen I have seen in the East. Common at all places visited.

Cerchneis cenchroides. Nankeen Kestrel.—Seen at Watheroo and Dongara. A pair was feeding four almost fledged young in the roof of one of the barns, close to the jetty; I saw the parent bird bring a small snake in its talons. The plumage of these parent birds was different from any observed by me before. Possibly it was Mr. Milligan's species *unicolor*. As the birds had young, I did not kill a specimen to make sure.

Calyptorhynchus baudini. White-tailed Cockatoo.—Flocks at Watheroo and Moora. At the latter place Mr. Orton showed us their nesting-holes in fairly tall salmon gums near his homestead.

Cacatua roseicapilla. Galah.—A pair of these handsome Cockatoos had taken up their residence in the small clump of trees at the soak near the Watheroo Observatory.

Barnardius zonarius and **B. occidentalis.** The Yellow-banded Parrot and the Northern Yellow-banded Parrot.—It was interesting to find that the Parrot known as the "Twenty-eight" (the vernacular name of *B. semitorquatus*, the common "Ring-neck" of the Busselton to Leeuwin district) at Watheroo to Geraldton—in fact, from Moora northwards—was a variant of our familiar South Australian Parrot, more often called "The Port Lincoln Parrot." In our opinion, *B. semitorquatus* is a good species; its long tail, general coloration, and red frontal band distinguish it from all the variants of *zonarius*. There seem to be two distinct forms of *B. semitorquatus*. All we saw at Yallingup and Ellensbrook were entirely green on the under side, but I collected several at Eticup in 1901 which have the lower half of the abdomen bright yellow. These Watheroo and Moora birds have no red frontal band, have the yellow abdomen and a decidedly shorter tail than *B. semitorquatus*, though it is certainly longer than that of the typical *B. zonarius*, and also the shade of colour is distinct. It may be that the specimens are North's sub-species *occidentalis* or a transition stage thereof. Mr. Orton told us that *B. semitorquatus* and the Red-capped Parrot or King Parrot, both observed at Ellensbrook, in the south, follow a narrow belt of red gums between Moora and the coast. Most likely Moora is their northern limit. I did not hear of either in the neighbourhood of Watheroo.

Psephotus multicolor. Many-coloured Parrot.—A pair in splendid plumage on one of the soaks near Watheroo Observatory. Except for a slightly deeper shade of colour, they cannot be distinguished from South Australian specimens.

I did not see any specimens of the Western Ground-Parrot (**Pezoporus flaviventris**), but I got such an accurate description of it, both its appearance, habits, and flight, that there is not the slightest doubt in my mind that 25 years ago it was scattered freely through

the sand-plain country between Dongara and Watheroo. Since then the denseness of the bush has been greatly reduced by the constant fires. My informant—an old man of exceptional observing powers—was confident that fires are the real cause of the disappearance of this and other birds. This view endorses my own observations. I was not aware of the "Ground-Parrot" having been before recorded as inhabiting these northerly sand-plains, and it should still be searched for in such districts that have been missed by fires.

Podargus brachypterus. Short-winged Frogmouth. We were interested in watching a family of these birds in an old Magpie-Lark's nest. With the field-glass we watched the two young ones almost ready to leave the nest and the old bird sitting stiff and upright on the bough alongside, resembling a broken-off branch jutting from the bough on which the nest was situated.

Halcyon sanctus. Sacred Kingfisher.—Observed at Watheroo and Dongara. Mr. Mellor identified the Red-backed Kingfisher as well at Geraldton.

Merops ornatus. Australian Bee-eater.—Numerous around Watheroo. Specimens show some difference in shade from South Australian skins. About Ellenbrook these birds were known, not inappropriately, as "Gold-miners."

Cuculus pallidus. Pallid Cuckoo.—Calling between the Observatory and the Watheroo station.

Chalcococcyx basalis. Narrow-billed Bronze-Cuckoo.—Calling in the same locality as the previous species.

Hirundo neoxena. Welcome Swallow.—Watheroo and Dongara.

Cheramœca leucosternum. White-backed Swallow.—Noticed at Geraldton; one was perched on a fence by the roadside.

Hylochelidon nigricans. Tree-Martin.—Numerous in all localities visited.

Micrœca assimilis. Allied Brown Flycatcher.—Noted at Moora, and probably found at the other localities visited.

Petroica campbelli. Western Scarlet-breasted Robin.—Common at Claremont. A comparison of specimens collected in South Australia with those obtained at Claremont, Mundaring, and Ellensbrook reveals no difference in the size of the frontal spot and little divergence in colour; the whole series must be referred to *P. multicolor*.

Petroica goodenovii. Red-capped Robin.—Noted at Moora and Dongara.

Melanodryas bicolor. Hooded Robin.—Saw a few on the sand-plains at Watheroo; although small, they do not otherwise differ from the South Australian form. In comparing my series I note a large form obtained in the New England country, on the Queensland border, which has white tips to the tail feathers. Have other members of the Union collected in that locality? If so, it will be interesting to know whether theirs have this feature.

Gerygone culicivora. Southern Fly-eater.—This delightful little songster is numerous at Claremont, and I noted it at one of the northern localities.

Eopsaltria griseogularis. Grey-breasted Shrike-Robin.—Noted at Claremont.

Oreoica cristata. Crested Bell-Bird.—The ventriloquizing notes of the Bell-Bird were seldom out of hearing during my stay at the Observatory station near Watheroo.

Pachycephala rufiventris. Rufous-breasted Whistler.—This fine song-bird filled the woods around Claremont with melody, and I listened to its splendid efforts at Watheroo. One cannot help making comparisons between the song of *P. occidentalis* (Western Yellow-breasted Whistler), so numerous at Ellensbrook, and the Rufous-breasted species. While both have some notes as full and as melodious as those of the European Nightingale, the Rufous-breasted Whistler certainly takes the prize.

Rhipidura preissi. Western Fantail.—Found at Claremont.

Rhipidura motacilloides. Black-and-White Fantail.—Noted everywhere.

Graucalus melanops. Black-faced Cuckoo-Shrike.—Noted in most places visited.

Campephaga humeralis. White-shouldered Caterpillar-eater.—Fairly numerous on the sand-plains near Watheroo.

Hylacola cauta. Rufous-rumped Ground-Wren.—The identification of this bird at Dongara is uncertain. I had one glimpse of the rich chestnut rump so characteristic of this species as it disappeared into a dense bush, but I was unable to rouse it into view again. We certainly identified it at Kalgoorlie.

Pomatostomus superciliosus. White-browed Babbler.—Noted at Geraldton.

Acanthiza inornata. Western Tit-Warbler.—I noted this inconspicuous little bird at Claremont.

Geobasileus chrysorrhous. Yellow-tailed Tit-Warbler.—Noted at Claremont and Moora. Specimens obtained at Watheroo, in the sand-plains, in the scrub around a "soak," proved on examination to be decidedly smaller and less spotted on the crown of the head than those observed farther south.

Acanthiza uropygialis. Chestnut-rumped Tit-Warbler.—Noted near the railway at Watheroo.

A. apicalis. Broad-tailed Tit-Warbler.—Numerous at Claremont. Although the examination of a cabinet specimen might lead one to treat this bird as a sub-species of *A. pusilla* (the Brown Tit-Warbler), the observation of its habits in the bush inclines me to give it full specific rank. Its notes are quite distinct from those of *A. pusilla*; its tail is decidedly longer; it carries its tail distinctly elevated—not erect or even at an angle of 45°, but still with a distinct elevation, so different from *A. pusilla*. In the specimen examined the eye was yellow, with a tinge of orange, and not decidedly red, as in *A. pusilla*.

Sericornis maculata. Spotted Scrub-Wren.—Numerous in coastal scrub at Geraldton and Dongara.

Malurus splendens. Banded Wren-Warbler.—Numerous and tame at Claremont. It no doubt occurs in low scrub at Geraldton, as it was described to us by local residents.

Malurus assimilis. Purple-backed Wren-Warbler.—A female taken at Dongara in coastal bush; Mr. Mellor obtained a male at Geraldton.

We were hoping to get *M. elegans* (the Red-winged Wren-Warbler), which occurs near Perth. *M. elegans* seems to be limited to the south-west corner of the State.

Malurus cyanotus. White-winged Wren-Warbler.—Observed at Geraldton and Dongara, and heard of it in the sand-plains at Watheroo. Three species of *Malurus* occur in the low bush on the promontory on which the town of Geraldton is built.

Artamus cinereus. Grey-breasted Wood-Swallow.—At the Watheroo Observatory many were hawking for insects in the hot sunshine out on the plains. They settled on the higher bushes after each short flight, in a moment or so soaring off again. They were difficult to approach. The fully matured young had the head and back beautifully striated. Numerous at Dongara and Moora, but at Moora they were only just beginning to nest. Possibly Moora is a second nesting-place, the first having been much earlier in the sand-plains.

Colluricincla rufiventris. Buff-bellied Shrike-Thrush.—Common at Geraldton and at Dongara, but we did not secure any specimens there; I am sorry for this, as the skin I procured at Ellensbrook differs considerably from a specimen I took in 1901 at Callion, on the goldfields.

Grallina picata. Magpie-Lark.—A pair at one of the "soaks" near Watheroo.

Neositta pileata. Black-capped Tree-runner.—Found on the sand plains at Watheroo. They are slightly lighter in colour than South Australian specimens, and have considerably less white on the head and under side than is the case with a skin from Lake Austin, W.A., that is labelled *N. tenuirostris* (Slender-billed Tree-runner); but age might account for the difference. There is no material difference in the bills.

Climacteris rufa. Rufous Tree-creeper.—Not seen, but Mr. Orton pointed out some scrub where they still are. The ringing and destruction of the timber, with the assistance of cats, are fast clearing them out of the district.

Zosterops gouldi. Green-backed White-eye.—Almost the counterpart of the handsome Yellow-throated species common in the tropical brush on the Northern Rivers, New South Wales, and which I have always identified as *Z. ramsayi*, except that the eastern bird has a grey back and the western one a green back. I think *Z. ramsayi* should not be omitted from the "Check-list." The birds at Geraldton are smaller and brighter in tint than birds observed at Perth.

Pardalotus striatus. Red-tipped Pardalote.—Common at Claremont and Watheroo.

Acanthorhynchus superciliosus. White-browed Spinebill.—Common at Claremont.

Glyciphila fulvifrons. Tawny-crowned Honey-eater.—Common on the sand-plains. I believe *G. albifrons* was there as well.

Stigmatops ocularis. Brown Honey-eater.—This little songster was common at Claremont, also at the "soaks" at Watheroo and at Dongara and Geraldton. The song of this diminutive songster made a great appeal to us. More than once we thought that its song strikingly resembled that of the Reed-Warbler. I think it easily the

best songster amongst the Honey-eaters, and should greatly like to have the charm of its notes resounding in our South Australian bush. The fact of this bird having spread from the tropics down the west coast to the Leeuwin and having failed to extend down the east coast of Australia gives scope for research.

Ptilotis sonora. Singing Honey-eater.—Common at places visited.

Ptilotis geraldtonensis. New species Honey-eater.—It was exceedingly interesting to find this bird at Geraldton and Dongara, where it takes the place of *P. penicillata* (the White-plumed Honey-eater) in South Australia, with similar notes and habits. We expected *P. carteri*, but our specimens differ considerably from specimens in my collection of that bird, and, although considerably larger and darker in colour than specimens of *P. flavescens* from Derby, the specimens collected are certainly nearer that species than to my representatives of *P. flava*, *P. carteri*, or *P. keartlandi*. I give the name *geraldtonensis*, that being the first locality in which I found it, although I afterwards found it even more numerous at Dongara. It prefers creek beds.

Meliornis mystacalis. Moustached Honey-eater.—Seen near the Watheroo Observatory, its white cheek-mark being most conspicuous.

Myzantha obscura. Dusky Miner.—Numerous at Moora, but not seen elsewhere. An examination of the skins obtained shows decided differences from a skin I collected near Perth in 1901. The Perth specimen has a strikingly large beak and is generally much darker; the Moora specimens have a light rump, almost as light as in the Yellow-throated Miner (*M. flavigula*). Possibly the difference may be due to sex; anyhow, the Moora specimens are nearer to *M. flavigula* than to the Perth one.

Anthochæra carunculata. Red Wattle-Bird.—Common at Claremont.

Anellobia lunulata. Little Wattle-Bird.—Common at Claremont.

Chlamydera maculata. Spotted Bower-Bird.—Mr. Gardner, of Geraldton, described the mauve-coloured crown of the head—or, rather, nape—and it seems certain that no other bird but a Bower-Bird could fit the description. He had, I understood, only seen it once, close to Geraldton, in the thick sand-hill scrub. Probably it was attracted by the berries on a low scrub, and which were, at the time of our visit, being greedily fed upon by the Green-backed White-eye (*Zosterops gouldi*).

Corvus coronoides. Australian Raven.—Common at Watheroo, but wary.

Cracticus nigrogularis. Black-throated Butcher-Bird.—Noted at Watheroo and Moora. Its flute or flageolet-like notes surpass those of any of its congeners it has been my privilege to hear.

Cracticus leucopterus. White-winged Butcher-Bird.—Noted in same localities as the preceding.

Gymnorhina dorsalis. Varied Magpie.—Common at Claremont and Watheroo, but wary. I secured a female which is remarkably like the Black-backed species, except that the white neck collar is much less pronounced, and there are some white flecks in the middle of the black saddle. It seems a fully adult bird, in mature plumage. The male birds appeared to be similar to our White-backed species.

Truly, the combination is not only remarkable, but also most distinctive.

In conclusion, I wish to acknowledge our indebtedness to Messrs. Bullock and Orton for the opportunity of seeing something of the bird-life of Moora. In the few hours at our disposal we were taken by motor from place to place, saw something of the breeding-places of many of the water-birds and waders, and were told that lagoons similar to the two visited continued in a sort of string for fully 20 miles. What a happy hunting-ground for the bird-lover!

UPON THE MURCHISON.

By J. W. Mellor, Sometime President R.A.O.U.

As Mr. Ashby has dealt with the southern portion of the ornithological expedition undertaken by us in Western Australia, I shall deal with the farthest north—the Murchison River district.

Having dropped my co-worker from the train on the Watheroo sand-plain at mid-day, I continued the journey to Geraldton, and arrived there at midnight. By 6 p.m. next day the head of the railway line was reached at Ajana. This still left many miles to travel before the River Murchison could be reached. Happily, I found a friend in Mr. George Wyly, who had an interest in a mine on the Murchison, and Mr. Tom Johnston, who was "going that way" in a springcart. My luggage and self were soon stowed away, and the journey started through sand-plain and open country, with many beautiful flowers fit for any garden. Soon our way became rougher, and at times everyone and everything left the dray as we got into scrub country; the stones and ruts were bad, and the darkness intense. Quite unexpectedly we came upon a camp-fire in the scrub at the Block 7 Lead Mine, where I found another friend in need—Mr. W. F. Thring, a son of the well-known South Australian explorer—and we were soon discussing things, "parliamentary and otherwise," over a mug of steaming hot tea, which was most acceptable, as the night was bitterly cold, although the day had been intensely hot. Mr. Thring drove me that night to the Murchison, to the camp of Mr. Harry Leader, a part owner of the Boobee Copper Mine, where I received a hearty bush welcome, and it was midnight before I got to bunk under the shelter of an open tent and dreamed of the mighty flowing Murchison and the innumerable water-fowl impressions that were so soon to be shattered on the morrow, for, on forcing my way to the river next morning, I was surprised to find a rocky-bottomed course, dry but for occasional pools some 30 or 40 yards long, and salter than the sea, the only water available for drinking purposes being a solitary soak, giving a few kerosene tins per day, or a little thick mud from the bottom of the copper mine. The day was scorching—considerably over 100 degrees in the shade, "if you could find it," as, for the most

part, the vegetation consisted of low acacias of various species, a few sandal-woods and jam-woods, all of small size, with here and there a currajong. However, the country was most interesting to the naturalist and ornithologist. I made as much of the time as possible. Bird-life was fairly plentiful both along the river-bed and out in the low scrub country which skirts it for miles on either side.

I wish here to record my heartiest thanks to those mentioned and others who so generously assisted me.

Dromaius novæ-hollandiæ. Emu.—Emus came in to the river to drink ; tracks were numerous, but the birds were seldom seen. Once a somewhat dark specimen ran some distance before the cart and then made off across country.

Ægialitis nigrifrons. Black-fronted Dottrel.—Seen along the bed of the Murchison.

Eupodotis australis. Australian Bustard.—Several seen in the more open country.

Notophoyx novæ-hollandiæ. White-fronted Heron.—A few seen along the pools of the Murchison.

Anas superciliosa. Black Duck.—Pairs noted here and there in the pools ; they were very timid.

Nettium gibberifrons. Grey Teal.—In small lots on the narrow strips of water.

Cerchneis cenchroides. Nankeen Kestrel.—Several seen. One pair had young just out of a hollow limb of a small tree on the river bank. The old birds were feeding the young and warning and taking them on the wing to escape the intruder. They were of an exceptionally rusty-red colour, and may have been Milligan's sub-species (*C. c. unicolor*).

Calyptorhynchus banksi stellatus. Red-tailed Cockatoo.—A few fine Black Cockatoos were flying over in the evening, but were wild and wary.

Cacatua roseicapilla. Rose-breasted Cockatoo.—A few were noted.

Barnardius zonarius connectens. Yellow-banded Parrot.—This form of the common "Port Lincoln Parrot" was seen along the Murchison. The birds were noisy and quarrelsome. Several young ones were flying with the old ones. They have the back and rump of a uniform green, and the yellow abdominal band not so bright as in the Port Lincoln Parrot.

Halcyon pyrrhopygius. Red-backed Kingfisher.—Several seen were uttering their usual plaintive notes.

Merops ornatus. Bee-eater.—In pairs in all situations.

Hirundo neoxena. Welcome Swallow.—Few about.

Cheramœca leucosternum. White-backed Swallow.—A few seen, and their nesting burrows noted on sand-banks.

Smicrornis flavescens. Yellow-tinted Tree-Tit.—Few, in the small trees.

Oreoica cristata. Crested Bell-Bird.—Seen in the acacia scrub ; their well-known notes of "Reep, reep, reephook" were heard.

Campephaga humeralis. White-shouldered Caterpillar-eater. — Scarce; only few seen.

Geobasileus chrysorrhous pallidus. Yellow-rumped Tit-Warbler. — A few seen in several places.

Malurus splendens. Banded Blue Wren-Warbler.—One male, in full livery, was seen, with several females. This may be Mathews's northern sub-species, *M. s. riordani*.

Malurus cyanotus exsul. White-winged Wren-Warbler.—First met on the Murchison, where I observed a male in three-quarter livery, and later a full-plumaged male at Geraldton, where they were very wary. They came out of the thick bush about sunset, but showed themselves very little. They are rare, and differ from South Australian birds in living in low bush country, and not amongst salt-bush and blue-bush country.

Malurus lamberti occidentalis. Variegated Wren-Warbler. — An exceedingly wary bird, especially the full-liveried males. It was only after days of patient searching at Geraldton that I could settle the identity of the species. It seems to take the place of *M. elegans* of more southerly parts.

Zosterops gouldi. Green-backed Silver-eye.—Fairly common in all situations.

Stigmatops ocularis. Brown Honey-eater. — This pretty-noted Honey-eater was observed several times.

Ptilotis geraldtonensis. Geraldton White-plumed Honey-eater.— Species new. This species, which we discovered, and which Mr. Ashby is describing as above, I first saw in the bed of the Murchison, and later in the bed of the Chapman River at Geraldton, when in company with Mr. Ashby. Its habits resembled those of the South Australian and Victorian sub-species (*P. p. whitei* and *P. p. mellori*). This bird, from description, resembles Mathews's *Ptilotula penicillata ladasi*, and may prove to be that sub-species.

Anthochæra carunculata. Red Wattle-Bird.—Only few seen.

Acanthogenys rufigularis. Spiny-cheeked Honey-eater. — Not common.

Anthus australis. Pipit.—Few on open land.

Tæniopygia castanotis. Chestnut-eared Finch.—One pair seen drinking at a pool in the river bed.

Corvus australis. Raven.—A few birds which I believe were Ravens were seen.

Strepera plumbea. Leaden Bell-Magpie.—One pair seen; extremely shy and wary.

Cracticus leucopterus. White-winged Butcher-Bird.—Noted along the river in company with young. Their beautiful, clear, silvery notes were often heard, especially in the early morning.

Gymnorhina dorsalis. Varied Magpie.—A few were seen, but not common, as in the south. The call is quite different from that of the nearly allied White-backed species. One of its call-notes resembles the double call of the Brown Hawk, uttered when flying. On several occasions I paused to make certain that the call was not made by a Hawk.

NOTES ON BIRDS SEEN ON THE PORONGORUP MOUNTAINS (NEAR ALBANY), GERALDTON, AND OOLDEA (TRANSCONTINENTAL LINE).

By A. S. Le Souëf, Taronga Park, Sydney, State Secretary New South Wales.

As I was able to visit parts of Western Australia not visited by other members of the Union, some notes on the birds of these districts may be of interest.

I stayed at Ooldea, near the eastern edge of the Nullarbor Plain, on the return journey, mainly to find out what the numerous Eagles and Hawks noted on the Nullarbor Plain were feeding on. As far as I could learn, their food was rabbit-eared and fasciated bandicoots, rat-kangaroos, rats of three species, and some smaller marsupials, and, to a lesser extent, rabbits. Animals on this waterless plain were numerous; they apparently get their moisture from the succulent plants and the blood of their victims. Bird-life at Ooldea was abundant and of great interest, and the birds themselves, being quite undisturbed, were very tame. The list given is not by any means complete, for many of the smaller species were not identified.

Emu (*Dromaius novæ-hollandiæ*).—Emus were reported to be numerous near Yuna, in the middle North-West, and the local farmers had some difficulty in keeping them off the wheat crops. A female with five half-grown young and several odd birds were seen about 30 miles out from Geraldton. Mr. Crawford, the Chief Rabbit Inspector of Western Australia, stated that he had driven an Emu for 10 miles in a car, and that its speed was 31 miles per hour, beyond which it could not go.

Mallee-Fowl (*Leipoa ocellata*).—A nest was found at Ooldea, or, rather, the excavation ready for the leaves, &c.; this was perfectly circular, 5 feet 6 inches in diameter, and the slope from the middle to the circumference accurately graded on all sides. The depth in the centre was about 18 inches. There was no sign of the birds.

Australian Snipe (*Gallinago australis*).—One of these birds was noted at Ooldea, on the edge of the Nullarbor Plain; it was resting on the grass, and was probably over a hundred miles from the nearest surface water.

Bustard (*Choriotis australis*).—I was pleased to find the Bustard numerous on the open grass country near Geraldton. A large flock of 32 birds made an interesting sight as they stalked slowly along, eating up grasshoppers; curiously enough, they were all males.

Straw-necked Ibis (*Carphibis spinicollis*).—The Ibis was fairly numerous on the salt-pans between Perth and Geraldton.

White-fronted Heron (*Notophoyx novæ-hollandiæ*).—Odd pairs of the White-fronted Heron were seen out from Geraldton.

Black Duck (*Anas superciliosa*).—The Black Duck was found with young birds about 40 miles out from Geraldton. The celerity with which the young birds could disappear, and the extreme

difficulty of seeing them among the dead brushwood, was astonishing.

Black Cormorant (*Phalacrocorax carbo*). At 6 a.m., at Ooldea, I saw a black object approaching from the south-west; it turned out to be a Black Shag, flying steadily about 50 feet up, and it disappeared in the distance, travelling in a direct line, evidently making for one of the salt lakes in the North-West.

Nankeen Kestrel (*Cerchneis cenchroides*).—One of these little Hawks was found nesting on a ledge in a "blowhole" on the Nullarbor Plain. In the same hole were a pair of Chestnut-faced Owls, which roosted a few feet lower down.

Chestnut-faced Owl (*Strix castanops*).—These Owls were the rather strange fellow-boarders with the Nankeen Kestrel in the "blowhole" last mentioned; they roosted a few feet below the Hawk, and when disturbed flew to the bottom of the hole and disappeared in a further cave. I climbed down, but could not locate them, as the entrance to the continuation cave was only a few inches. Numerous pellets collected showed that they were feeding on birds (35 per cent.), rodents (45 per cent.), small marsupials (10 per cent.), and rabbits (10 per cent.) Included in the marsupials taken were two moles, two Banded Ant-eaters, and others not determined.

Purple-crowned Lorikeet (*Glossopsitta porphyrocephala*).—These little Lorikeets were numerous in the south-west. They had a favourite feeding-patch close to a wire-netting fence, and the owner of the gardens told me that they frequently flew into the wire, and were maimed or killed. A flock of about 20 did this when I was there, and four were more or less injured.

White-tailed Black Cockatoo (*Calyptorhynchus baudini*).—These fine birds were, with the exception of the Tit-Warbler (probably *Acanthiza inornata*), the commonest bird in the South-West. Flocks up to 25 in number were seen feeding on the seed of the grass-tree and also on the seeds of the red-flowering gum (*Eucalyptus ficifolia*). It was a marvel to me how the birds could extract the black seed from the hard nut. They inserted the tip of the upper bill into the top of the nut and pulled out the seed from the narrow, circular top opening. I failed to do this trick with a good penknife; but the bird's bill must be specially constructed for the job, for these seeds seem to form their chief food. Odd pairs were starting to nest.

Yellow-cheeked Parrot (*Platycercus icterotis*).—I found many of these handsome Parrots in the South-West. They were feeding on the ground, and when disturbed flew up vertically to a low tree, and were not at all shy.

Short-winged Frogmouth (*Podargus brachypterus*).—One of these birds was noted on the Porongorup Mountains.

Bee-eater (*Merops ornatus*).—Bee-eaters were numerous between Perth and Geraldton. According to Mr. M'Kenzie Grant, they arrive every year at about the same date in his district (14th October).

Tree-Martin (*Petrochelidon nigricans*).—The Tree-Swallow was fairly common on the Porongorups. One pair were seen entering a hollow limb about 200 feet from the ground.

Allied Brown Flycatcher (*Micrœca assimilis*).—Several were seen on the Porongorups, where they are locally called "Stumpers," from their habit of sitting on stumps.

Western Scarlet-breasted Robin (*Petroica campbelli*).—A pair of these Robins were noted in a cleared paddock on the Porongorups. In actions and notes they were similar to the eastern birds.

Hooded Robin (*Melanodryas bicolor*).—Several specimens were seen on the sand-hills at Ooldea.

Western Whistler (*Pachycephala occidentalis*).—In the high timber growing on the ironstone ridges on the Porongorups these beautiful songsters were seen and heard answering each other with their lovely notes, which scarcely differ from those of the eastern birds.

Rufous-breasted Whistler (*Pachycephala rufiventris*).—This most charming of songsters was numerous in the scrub on the sand-hills at Ooldea.

Restless Flycatcher (*Seisura inquieta*).—A pair of "Scissors-grinders" were seen in an open paddock in the South-West. They were evidently new arrivals in the district, for a Willie Wagtail (Black-and-White Fantail) was taking an interest in their movements.

White-browed Babbler (*Pomatorhinus superciliosus*).—These Babblers were very numerous at Ooldea, inhabiting the low trees on the sand-hills. Flocks of about eight were flitting about, and one occupied nest was located.

Crested Bell-Bird (*Orcoica cristata*).—These birds were numerous in the more open bush country round Ooldea. Their clear notes could be heard from every quarter. Several nests were found.

Bush-Chats (*Ephthianura*).—Three species were noted in the open country round Ooldea. The Tricoloured (*E. tricolor*) was nesting and had young on the wing; the White-fronted (*E. albifrons*) were in flocks of about 25; while the Orange-fronted (*E. aurifrons*) was less numerous and more scattered.

Western Tit-Warbler (*Acanthiza inornata*).—This familiar little bird was very numerous on the Porongorups, and at Ooldea they were noted in the open scrubby country, keeping to the low trees and bushes, either in pairs or small flocks of about half a dozen.

Yellow-tailed Tit-Warbler (*Acanthiza chrysorrhoa*).—These lively and tuneful Tits were also numerous on the Porongorups, and were just as tame and as confiding as the eastern form. They inhabited the open forest country.

Two other species of *Acanthiza* were noted, but were not identified.

Redthroat (*Pyrrholæmus brunneus*).—This sweet songster was numerous in the open scrub country at Ooldea. Some of them were very tame, and approached to within a foot of the observer.

Banded Wren-Warbler (*Malurus splendens*).—This splendid

Wren was found on the hills close to Perth, occupying sheltered gullies, and also at Geraldton on scrub-covered sand-hills.

Chestnut-backed Ground-Bird (*Cinclosoma castanotum*).—One bird was found nesting at Ooldea, just on the edge of the Nullarbor Plain. Two roundish, darkly-marked eggs were placed in a bark-and-stick nest, neatly made, under a small blue-bush. The birds were very shy, left the nest like a flash, and disappeared in the bushes; they could not be flushed again.

Nest of Ground-Bird under a Blue-bush.

PHOTO. BY A. S. LE SOUËF, R.A.O.U.

Red-winged Wren-Warbler (*Malurus elegans*).—Noted in deep gullies on the Porongorups.

Purple-backed Wren-Warbler (*Malurus assimilis*).—This species was very numerous in some scrub-land bordering the Greenough River, near Geraldton, and also in the scrub on the sand-hills at Ooldea.

Black-backed Wren-Warbler (*Malurus melanotus*).—The Black-backed Wren was numerous in the more open country round Ooldea.

Masked Wood-Swallow (*Artamus personatus*).—A flock of about 100 of these birds was noted near Ooldea. They were feeding

on insects and caterpillars on the acacia trees, and were searching the fresh young foliage at the tips of the branches.

Buff-bellied Shrike-Thrush (*Colluricincla rufiventris*). — This species was fairly plentiful on the Porongorups. I heard what was probably this species at Ooldea, but the only bird I saw for a moment had a dark brown chest and abdomen, similar to that of *C. woodwardi*.

Whiteface (*Aphelocephala leucopsis*).—Whitefaces were numerous in the open country round Ooldea: they were very tame.

Rufous Tree-creeper (*Climacteris rufa*).—The Rufous Tree-creeper was numerous on the Porongorups, where their habits were somewhat different from those of the eastern birds in that they fed high on the trunks of the large trees. I did not see one fly to the base of a tree and run up, as the Brown Tree-creeper (*C. scandens*) does. One specimen alighted on a large dead eucalypt about 100 feet up, and started his upward run from there.

White-browed Spinebill (*Acanthorhynchus superciliosus*).—A fair number of this Spinebill was seen on the Porongorups. They are much quieter, less demonstrative, and have weaker notes than has the eastern bird.

Brown Honey-eater (*Stigmatops ocularis*).—I was glad to hear this cheerful songster at Mr. M'Kenzie Grant's station near Geraldton. It was singing with its Reed-Warbler note in exactly the same way as we heard it at Stradbroke Island, Queensland, last year.

Bush-Lark (*Mirafra horsfieldi*).—This bird was very numerous in the vicinity of Geraldton. One often saw small flocks of them fly up from the fields and roadside.

FORGOTTEN FEATHERS.

By A. J. Campbell, C.M.B.O.U.

[*Read at Perth Session R.A.O.U., 20/10/20.*]

It is stated that in 1843 Gray, Gould, and Strickland examined the Watling drawings,* not knowing their origin, except that they were formerly in the possession of a Mr. A. B. Lambert and afterwards became the property of the Earl of Derby. There were three volumes, or about 300 painted pictures, depicting Australian birds. The set was finally bequeathed to the British Museum.

In "Notes on Australian Artists," by William Dixon (*Journal*

* In his entertaining chapter on the Winking Owl (*Ninox connivens*), "Birds of Australia," vol. v., p. 338, in reference to the mysterious "Watling Drawings" and discussions by various writers thereon, Gregory M. Mathews says:—"Of course, the action of the above writers (meaning North and Campbell) was due to prejudice and ignorance of the drawings and their history." I called them the crude drawings of a "botanist." Now it appears that Mathews has himself possibly missed the original history of the drawings. Who was Watling?

and Proceedings Royal Australian Hist. Soc., v., part 5, Sydney, 1919), it is stated: —"Thomas Watling, according to his own story, was convicted by a Scotch jury and sentenced to transportation. He was sent out in the *Pitt*, which sailed from England early in July, 1791. He escaped at the Cape, was recaptured after a month, and kept in prison for seven months waiting a ship. He was sent on in the *Royal Admiral*, which left the Cape on 30th August, 1792, and arrived in Sydney 7th October, 1792." Watling himself wrote afterwards, presumably to some friend in England:—"My employment is painting for J. W——, Esqre., the nondescript production of the country."

Between three and four years after Watling's enforced arrival at Sydney, or on 16th January, 1796, there was a theatrical performance given at The Cove, and no doubt a person of Watling's artistic temperament would be in the limited company. The celebrated "prologue" included the couplet—

> "True patriots we, for be it understood
> We left our country for our country's good."

Now, I am going to take this utterance as a prophecy literally fulfilled in our days so far as Watling is concerned, and to show what he has done "for *his* country's good" in the earliest days of ornithology, particularly as the astute Dr. John Latham used (without stating where he obtained his originals) the batch of Watling drawings, so many of which became "types" for Latham's species of Australian birds, and consequently the names in use to-day in our "Check-list." Of course, in the limited time at our disposal I cannot mention every one, but will cull a few observations from a volume by Dr. R. Bowdler Sharpe on "Birds of the British Museum,"* for which I am indebted for loan by our ever-faithful friend and member, Mr. D. Le Souëf.

Dr. Sharpe, in his opening remarks, writes:—"Of additional interest to Latham's published works, which give us an idea of the contents of the bird-cases in the British Museum in the latter half of the 18th century, is the naming of certain Australian birds in the 'Supplements' to the 'Synopsis' and to the 'Index Ornithologicus.' Up to the present time it has never been known where Latham obtained the material for describing so many Australian—or, as they were then called, 'New Holland'—birds.

"In 1902 the Museum acquired from Mr. James Lee, a grandson of the famous horticulturist of Hammersmith, a large volume of paintings executed for the latter by one of his collectors, Thomas Watling, between 1788 and 1792. These drawings had evidently been shown to Latham, who named most of the birds, and seems to have referred to these pictures as 'Mr. Lambert's drawings.' They do not seem, however, to have been Lambert's property at any time."

Dr. Sharpe further mentions that a Mr. James Britten, who

* History of the collections contained in the Natural History Department of the British Museum (for review see *Emu*, vol. vii., p. 193).

examined the series of drawings, and who, writing to the *Journ. Botany*, xl., p. 302 (1902) stated that "Watling was sent out by James Lee, of Hammersmith (from whose great grandson, bearing the same name, the collection was published), with a view to obtaining material for a book on the natural history of the country." This is obviously a mistake. So is the year 1788 above mentioned; Watling did not reach Australia until 1792.*

Picture No. 9 (an Owl) is the type of *Ninox connivens* (*Falco connivens*, Lath.) Latham does not acknowledge the origin of his descriptions, but copies the substance of Watling's MS., which gives the native name as "Goo-ree-a-gang," and that "this bird has a wonderful power of contracting and dilating the iris and pupil."

10. "New Falcon." *Erythrotriorchis radiatus* (*Falco radiatus*, Lath.) —Watling's note :—"This bird measures, from the top of the head to the end of the tail, 22 in., and from the tip of one wing to the other 4 feet. Iris doubtful. A new Falcon."

11. Another painting of Radiated Falcon, with Watling's note :— "The skin of this bird I found nailed up to a settler's hut. It is the only one of the kind ever seen. This drawing is a faithful copy. The settler who shot it says the iris was brown, and remarked that he never saw any bird fly with such swiftness. Its claws, which were long, small, and sharp, when he took it up, it drove quite through the end of his fingers. A new Falcon. This bird measures, from bill to extremity of the tail, 24 inches." Latham copied the notes, but did not say who wrote them.

24. Boobook Owl (*Strix boobook*, Lath.)—Figure is the type. Watling's note :—"This bird is about the size of the common English Owl. Native name, 'Boo-book.'"

27. Butcher-Bird (*Lanius torquatus*, Lath.).—Type of *Cracticus torquatus*, although Dr. Sharpe observes it has been generally referred to *C. destructor*, which name becomes a synonym. Watling's note :— "This drawing is about the natural size."

57. *Scythrops novæ-hollandiæ*, Lath. (Channelbill).—Watling notes the native name is "Goe-re-e-gang." Then follow lengthy observations, finishing with :—"I had a wounded bird two days alive, but could not get it to eat; it bit everything that approached it very severely." Latham transferred the note to his "General History," attributing the story of the wounded bird to a "Mr. White."

58. Type of the Black-faced Graucalus (*Corvus melanops*, Lath.)— Watling's observation :—"Natural size. This is a bird of prey. The native name, 'Kai-a-lora.'"

*Mr. A. H. Chisholm, R.A.O.U., Brisbane, who also contributed some remarks on this subject, concludes thus :—"White's (Surgeon-General John) *Journal* was printed in 1790, and all the plates were dated 29th Dec., 1789. Accordingly, if Mr. Dixon's dates are correct, the Museum was wrong in stating that Watling executed some of the drawings in White's *Journal*, just as it appears to have been wrong in stating that he was sent out by James Lee. It seems certain, however, that Watling executed many delineations (both paintings and rough sketches) of Australian birds and flowers; and, taking the English and Australian evidence in conjunction, we arrive at the conclusion that many of our best known birds were first named from paintings of a talented convict."

64. Roller (*Coracias pacifica*, Lath.)—Type of *Eurystomus pacificus*. Watling's note :—"Half the size of the bird was taken. It is a rare bird—the third only that we have seen. The colours are much too dull."

65. Piping Roller Magpie) (*Coracias tibicen*, Lath.)—The type of *Gymnorhina tibicen*. Watling's note :—"Natural size. Native name, 'Iarra-won-nang.' This bird has a soft note not unlike the sound of a well-tuned flute. It is a bird of prey." Sharpe remarks :—"Latham, as usual, has published the original note without acknowledgment, and has twisted it into 'it preys often on small birds,' which is not what Watling wrote."

72. Blue-headed Cuckoo (*Cuculus cyanocephalus*, Lath.—Sharpe remarks :—"This drawing is the type of the species, and is a very good representation of the Australian Koel."

73. Pheasant-Cuckoo (*Cuculus phasianus*, Lath.—This drawing is the type of *Centropus* or well-known Coucal. Watling's note :—"One-half the natural size. Native name, 'Tem-minck.' The New South Wales Pheasant. The only one seen as yet."

75. Fan-tailed Cuckoo (*Cuculus flabelliformis*, Lath.—Dr. Sharpe states that "Latham's description and figure (Gen. Syn. Suppl., ii., p. 138, pl. cxxvi.) are both taken from Watling's drawings, but his plate represents the bird as of a deeper red colour underneath than Watling's picture, which may have faded a little. The latter writer says the figure was of the 'natural size.' It is the type of the species."

76. Glossy Cuckoo (*Cuculus plagosus*, Lath.), of which Sharpe remarks :—"This is the type of *Chalcococcyx plagosus* of Latham, who says he is indebted to Mr. Lambert for some of the birds described by him ; so it may be that Latham, when he had these drawings before him, had received them from Mr. Lambert. It is curious that Watling's name is not mentioned, as many of the drawings bear his signature ; nor is that of his employer, Mr. James Lee." Watling's note :—"The natural size. The yellow does not appear so bright as in the bird, and, what is very singular in this bird, it has two claws before and behind the feet."

81. Orange-winged Nuthatch (*Sitta chrysoptera*, Lath.)—This is the type of the familiar Orange-winged Sittella. "Latham's figure seems," Sharpe remarks, "to have been copied from Watling's drawing." Watling wrote :—"Three-fourths of its natural size. Native name, 'Mur-ri-gang.' Very rare."

89 and 90. Golden-winged Bee-eater (*Merops chrysopterus*, Lath.)—These represent the Brush Wattle-Bird. Sharpe says :—"The oldest name for *Anellobia mellivora* appears to be *A. chrysoptera* (Lath.), both being founded on Watling's drawings.* His notes are quoted by Latham as follow :—'One-half the natural size. Called by our English people "Quirrick," from its note. Native name, "Wad-de-ar-gal."'"

Under drawing 90 Watling wrote :—"This genus of Flycatcher is very numerous in New South Wales, and seldom seen but near the seashore, especially about the natives' resort. It is a most active, lively bird, constantly in action, either sucking honey, taking flies, or

*A. *mellivora* is derived from Mellivorous Creeper (*Certhia mellivora*, Lath.) Watling drawing, 104.

contending with other birds. Two or three of these birds will rout a flock of Blue-bellied Parrots, a genus which they are often engaged with."

92. Black-and-yellow Bee-eater (*Merops phrygius*, Lath.)—This is the type of the beautiful "Mock Regent-Bird" or Warty-faced Honey-eater. Latham states his description is taken from the "drawings of Mr. Lambert." Watling's note under another drawing (No. 93) of the same bird :—"About half the natural size. The light tint round the eye is not plumage, but a kind of fleshy excrescence, resembling in substance the gills of a cock or hen."

102 and 103. Slender-billed Creeper (*Certhia tenuirostris*, Lath.)—The type of the Spinebill. Watling's note :—"Natural size. This bird lives on flies and honey. When flying it makes a singular noise as if the tips of its wings were beat together under the bird's belly. It hovers over flowers, and extracts honey with its brush tongue."

121 and 122. Black-eyed Thrush.—These are the co-types of the beautiful Yellow-tufted Honey-eater, to which Latham has apparently given two names—the first, *Turdus melanops* ; the second, *Muscicapa auricomis*.

124. Lunulated Thrush (*Turdus lunulatus*, Lath.)—Sharpe says :—"It is a good figure of an *Oreocichla*, and is the type of *O. lunulata* (Lath.)" According to Watling's note, it is of the 'natural size.'"

134. Black-cheeked Warbler (*Sylvia chrysops*, Lath.)—Type of the Yellow-faced Honey-eater (*Ptilotis chrysops*). Watling's note :—"Half the natural size. It has a brush tongue, and is a lively little bird. It lives a good deal on honey."

140. No. 1. Black-breasted Flycatcher (*Muscicapa pectoralis*, Lath.)

140. No. 2. Guttural Thrush (*Turdus gutturalis*, Lath.)—Watling's note of the latter says :—"Natural size. The yellow is much brighter than the bird supposed to be a female of No. 1." Notwithstanding this *leading* field observation of Watling's, Latham gave the two drawings separate names.

149. Black-browed Thrush (*Turdus melanophrys*, Lath.)—This is the type of the Bell-Miner. Watling's note :—"The tongue is short and very brushy. Native name, 'Dill-ring'"—a strange coincidence in name for a Bell-Bird.

152. Sordid Thrush (*Turdus sordidus*, Lath.)—This figure is the type of the Common Wood-Swallow. Watling's note :—"Natural size. Native name, 'Goo-le-bee.'" Here, again, we have a little confusion in names, for Latham called a previous painting (No. 144) representing the young of the Wood-Swallow, *Turdus tenebrosus*.

154. Short-winged Thrush (*Turdus brachypterus*, Lath.)—The type of the Bristle-Bird (*Sphenura*). Watling's note :—"Natural size. This is a ground bird, with very small wings and very short flight."

164. Black-lined Grosbeak (*Loxia bellus*, Lath.)—Type of the Fire-tailed Finch. Watling says :—"Native name, 'Wee-bong.' Natural size. The only one yet seen. May."

166. Temporal Finch (*Fringilla temporalis*, Lath.)—This is the well-known Red-browed Finch. Watling says :—"Native name, 'Goo-lung-ag-ga.' It is a very common bird in New South Wales, easily domesticated, and of a lively disposition even in a cage, and in a day or two it is easily reconciled."

176 and 177. Rufous-fronted Flycatcher (*Muscicapa rufifrons*, Lath.)—These are the types of a familiar Flycatcher (*Rhipidura rufifrons*). Watling remarks:—"This bird is of very short flight, and found among brush, rotten wood, and long grass. Native name, 'Burril.' November."

187. Orange-rumped Flycatcher (*Muscicapa melanocephala*, Lath. —Type of the brilliant Orange-backed Malurus or Wren-Warbler.

196. Streaked Warbler (*Sylvia sagittata*, Lath.)—The type of the Speckled Warbler (*Chthonicola*). Watling's note:—"This bird sings remarkably well."

209. Ciliary Warbler (*Zosterops cærulescens*, Lath.)—The well-known White-eye. Watling's note:—"One-half the natural size. This little bird is the only one of the kind ever seen. The white round the ciliary process of the eye is composed of the most beautiful small white feathers. *The pride and vanity of the draughtsman has (have) induced him to put his name to all the drawings, but should you publish them I think the name may be left out.*"

There are further interesting notes on the Latham-Watling types, namely:—

216 and 217. Two Swifts (*Chætura caudacuta* and *Micropus pacificus*).

220. Frogmouth (*Podargus strigoides*).

226. Pallid Cuckoo (described as a Pigeon, *Columba pallida*, Lath.)

227. Brown Quail (*Synoicus australis*).

238. Pacific Heron (*Notophoyx pacifica*).

275 and 277. Two Gulls (*Gabianus pacificus* and *Larus novæ-hollandiæ*), &c., &c.,

besides much fascinating and informative history of many "long-forgotten feathers," the elucidation of which history the world at large, and particularly Australia, are for ever debtor to that painstaking and conscientious scientist and servant of the British Museum—the late R. Bowdler-Sharpe, F.R.S.

THE BIRDS OF THE SWAN RIVER DISTRICT, WESTERN AUSTRALIA.

By W. B. Alexander, M.A., R.A.O.U.

I.—Introduction.

A writer in *The Ibis* recently remarked that it would be possible to compile a list of the birds likely to be met with in any locality in the world from existing literature. This is possibly true of other continents, but is certainly far from being true of Australia. An ornithologist who had never resided in Perth would, I suppose, imagine that all the birds generally described in text-books as found throughout Australia would be met with in course of time, together with those recorded as occurring in South-West Australia. A list compiled in this way would contain far more

species than actually occur or have occurred in the Swan River district. Many of the species found throughout the rest of Australia are either entirely absent from the South-West or have been met with only occasionally in this large region, whilst a considerable proportion of the species which occur in the South-West are either confined to the interior districts or are limited to the country near the south coast.

It has often been a matter of surprise to me that there are practically no accounts to be found of the birds which occur in the neighbourhood of the principal cities of the Commonwealth. North's "Birds of County Cumberland (Sydney)" and Belcher's "Birds of Geelong" are, I think, the only exceptions. If we add to these Carter's "Birds of the North-West Cape" and Berney's "Birds of the Richmond District, North Queensland," we shall almost exhaust the list of works on the avifauna of particular districts of Australia written by men who have been residents in the districts concerned.

The writer was from 1912 to 1920 on the staff of the Western Australian Museum in Perth as biologist. For nearly three years (from 1916 to 1919), however, he was absent from Perth, so that he can only claim to have been observing the birds about Perth for five years. As he has now left Western Australia, he thinks it may meet with the approval of Australian ornithologists if he attempts to place on record his views as to the status of the species found in the area which he knows best.

II.—Bibliography.

In compiling these notes the writer has supplemented his own observations by adding records of all specimens from the district, in the collection of the Western Australian Museum, of species he has not met with. He has also utilized information previously published, but this is comparatively scanty. The following is, as far as he is aware, a complete bibliography of ornithological articles on the Perth district :—

"Notes on Lake Yanchep," by A. W. Milligan, *Emu*, vol. iii., p. 20, 1903.

"Notes from Guildford, W.A.," by H. E. Hill, *Emu*, vol. iii., p. 226, 1904.

"A Visit to Rottnest Island, W.A.," by F. Lawson Whitlock, *Emu*, vol. iv., p. 129, 1905.

In addition, records of observations of a few species in the neighbourhood of Perth will be found in Gould's "Handbook to the Birds of Australia" and Campbell's "Nests and Eggs of Australian Birds," as well as in the following papers :—

"List of Birds Collected by the Calvert Exploring Expedition," by G. A. Keartland, *Trans. Roy. Soc. S. Australia*, xxii., p. 125, 1898.

"List of Birds Collected in Western Australia," by E. Ashby, *Trans. Roy. Soc. S. Australia*, xxv., p. 132, 1901.

"New Records for South-Western Australia," by W. B. Alexander, *Emu*, xv., p. 25, 1915.

"*Procellariiformes* in Western Australia," by W. B. Alexander, *Emu*, xv., p. 182, 1916.

The following ornithologists have at various times contributed notes which have appeared in *The Emu*:—A. W. Milligan, T. Carter, D. Le Souëf, S. Le Souëf, C. P. Conigrave, E. A. Le Souëf, and W. B. Alexander.

Early records of the natural history of Western Australia have been collected by the writer and published in a series of articles on "The History of Zoology in Western Australia" in the *Journal of the Royal Society of Western Australia*.

III.—Boundaries and Physiography.

For the purposes of this paper the Swan River district may be defined as that portion of Western Australia bounded on the east by the Darling Range escarpment, on the north by the Gingin Brook, and on the south by the Murray River. The islands off the coast are also included.

The district thus forms a portion of the coastal plain of Western Australia, whose surface consists entirely of geologically recent beds. Two main belts of country may be distinguished—first, the sandy country extending from the foot of the Darling Ranges to the coastal hills; and, second, the hills of coastal limestone running along the coast and in some cases actually separated from the coast to form islands, of which the two principal ones are Rottnest Island and Garden Island.

The sandy country is partially covered with stunted jarrah (*Eucalyptus marginata*) and red gum (*E. calophylla*) trees in its drier parts, and has also stretches of fairly open heathy country. Much of it is swampy, and in these parts, where water stands in the winter, the characteristic trees are Christmas-tree (*Nuytsia floribunda*) and paper-bark (*Melaleuca*). The coastal hills are usually treeless on their summits near the sea, with peppermint-trees (*Agonis flexuosa*) in the valleys. Their eastern slopes are characterized by tuart (*Eucalyptus gomphocephala*), which, in the valleys, grows into a fine forest tree. The line of junction between the coastal hills and sandy plains is occupied by a series of large swamps or lakes extending more or less continuously from north to south, some of which have been drained since the country was settled. They almost all are fringed with great belts of reeds, and are thus magnificent homes for water-birds. The best known of these lakes are Lake Yanchep, Lake Pinjar, and Herdsman's Lake, but there are scores of smaller ones, and the estuary of the Swan River itself no doubt occupies one of these lake basins, from which an outlet has been cut to the sea at Fremantle, so that it is now salt.

Four rivers flow across the district, coming down through gorges in the Darling Ranges and flowing fairly directly across the plain.

Of these, three—the Swan, Helena, and Canning—flow into the Swan River estuary. The Serpentine, further south, flows into the Murray River just before the latter enters another large estuary, the Peel Inlet. The Gingin Brook, on the northern boundary of the district, flows into the Moore River just before the latter enters the sea. Along the banks of these rivers various trees occur which are not found on the more open plains.

The accompanying sketch map (fig. 1) indicates the features referred to.

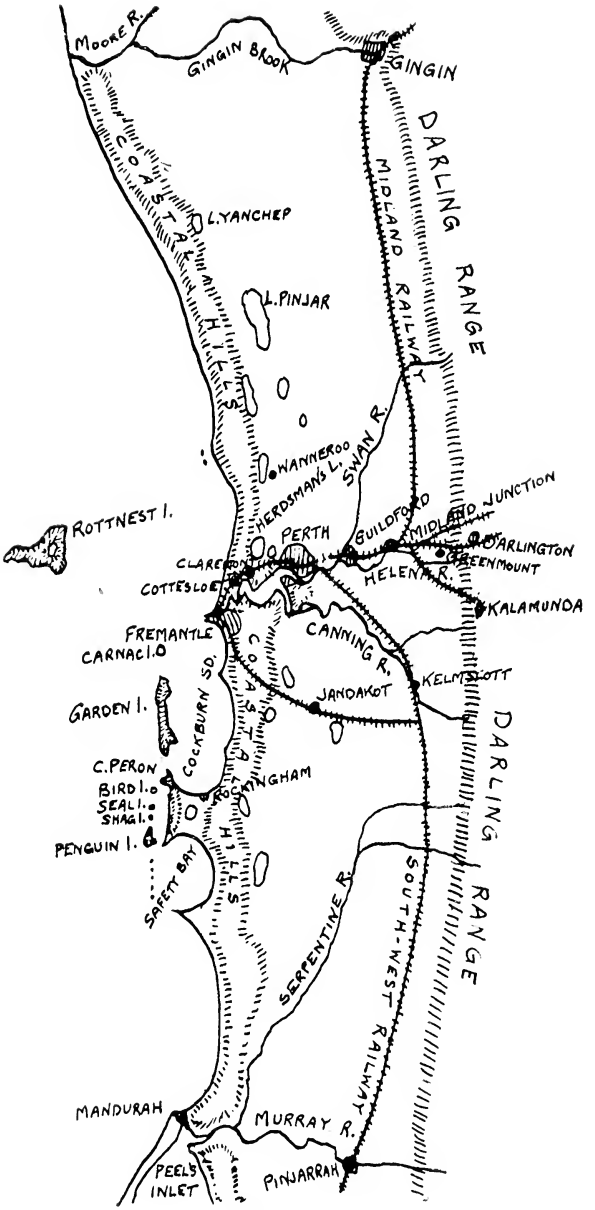
IV.—General Remarks on the Birds.

Up to the present 191 species of birds have been met with in the region described above, and of these 126 are believed to be resident. One former resident, the Ground-Parrot, is now extinct in the district, but three species have been acclimatized—viz., the Laughing Jackass (*Dacelo gigas*), and the Indian and Senegal Turtle Doves, all of which are firmly established. Other introduced birds which have escaped from confinement, but have not become established, have not been included in the list.

Many of the resident birds receive great accessions to their numbers in the winter, and it is not very easy to decide in every case whether a bird should be regarded as a true resident when it is not known to breed in the district. There seems little doubt that the number of residents is still increasing. The union of south-western Australia with the rest of the continent is still probably recent in a geological sense, and the former island of the south-west is probably still being stocked with birds. Almost certainly the Black-breasted Plover, White-necked Heron, and Straw-necked Ibis are recent arrivals, and it is to be hoped that shortly the White Egret may be added to our list of residents. It is to be hoped that the Starling and Sparrow will not manage to reach the south-west by the overland route now open.

Of the visitors, 40 may be regarded as fairly regular, though a great deal more study will have to be devoted to them before we have a proper understanding of their movements. The Long-billed Cockatoo, which was formerly a regular winter visitor to the district, is now extinct, though still found further north. Six species arrive in the spring and breed in the district—viz., the Australian Bee-eater, four species of Cuckoo, and the White-shouldered Caterpillar-eater. Eight species which breed in the northern hemisphere are also regular summer visitors to the district—viz., Turnstone, Golden Plover, Curlew, Common Sandpiper, Greenshank, Little Stint, Sharp-tailed Stint, and Curlew-Sandpiper—whilst the Wood-Sandpiper and White-rumped Swift, also northern breeders, have each occurred once. Probably further observation will show that other northern waders sometimes visit the district.

The regular winter visitors, like the summer visitors, fall into two classes. Seven sea-birds which breed further south, either on the Australian coast or in the Antarctic regions, are found on



The Swan River District, W.A.

our shores in winter—viz., the Giant Petrel, two or three species of Dove-Petrels, Wandering Albatross, Yellow-nosed Mollymawk, Southern Skua, and Australian Gannet. Five other southern sea-birds have been met with once each—viz., Crested Penguin, Fleshy-footed Petrel, White-headed Petrel, Soft-plumaged Petrel, and Grey-headed Mollymawk. Six birds which breed further north occur regularly in the district in winter—viz., Red-kneed Dottrel, White-headed Stilt, Banded Stilt, Red-necked Avocet, White Egret, and Black-faced Wood-Swallow ; whilst two sea-birds which breed on islands both north and south occur on our coast in winter—viz., White-faced Storm-Petrel and Allied Petrel.

The following species are irregular though fairly frequent visitors to the district, viz. :—Stubble-Quail, Painted Quail, Little Quail, Buff-banded Rail, Black-tailed Native-Hen, Tippet Grebe, Marsh Tern, White-bellied Sea-Eagle, Square-tailed Kite, Red-tailed Black Cockatoo, and Tricoloured Chat.

The rare occasional visitors include White-tailed Black Tern (two records of irruptions of many individuals), Spotted Nightjar, Painted Snipe and Glossy Ibis (2 records each), and White-backed Swallow, Ground Cuckoo-Shrike, White-bellied Shrike-Tit, Whistling-Duck, Greater Frigate-Bird, Black-shouldered Kite, and Black-eared Cuckoo (1 record each).

It is extremely probable that the apparent rarity of some of these birds is due to the lack of observers, and that they will be found to occur regularly in small numbers in some parts of the district.

Of the families of birds represented on the Australian continent, no less than 26 are unrepresented in the Perth district. Of these, 12 are mainly tropical, though some of them occur in the tropical brushes of New South Wales as far south as the latitude of Perth ; nevertheless, their absence is not surprising. The following families which have representatives throughout Eastern Australia are absent from the south-west, and therefore are not represented in our list :—*Glareolidæ* (Pratincole), *Gruidæ* (Native Companion), *Plataleidæ* (Spoonbills), *Coraciidæ* (Dollar-Bird), *Turdidæ* (Thrushes), *Alaudidæ* (Bush-Lark), and *Ptilonorhynchidæ* (Bower-Birds). Lyre-Birds (*Menuridæ*), being peculiar to South-East Australia, are also unrepresented, as are the Diving-Petrels (*Pelecanoididæ*). The Whitefaces (*Paridæ*) are birds of the interior, and their absence is not surprising. It is remarkable, however, that the Mallee-Hen (*Leipoa ocellata*), the southern representative of the *Megapodiidæ*, though it occurs inland from Perth, and its range reaches the coast both north and south, does not occur in the Swan River district. An even more surprising gap is due to the entire absence of Finches (*Ploceidæ*). The Red-eared Finch (*Zonæginthus oculatus*) occurs all along the south coast of the State, whilst the Chestnut-eared Finch (*Tæniopygia castanotis*) appears a short way inland, but neither reaches the Swan River district. Can it be that the coastal plain has been formed since the range of these birds became defined, and that

they have not yet discovered it? There is no evidence that the extinct Noisy Scrub-Bird (*Atrichornis clamosa*)—our sole representative of the *Atrichornithidæ*—ever occurred near Perth.

V.—Detailed List of Species.

(The scientific names are those of the R.A.O.U. "Check-list," with those given in Mathews's 1913 List in brackets where they differ.)

1. **Emu.** *Dromaius novæ-hollandiæ* (*Dromiceius n. rothschildi*).—Resident. Plentiful in the early days of the Swan River Colony, but now very rarely seen in the Perth district.

2. **Crested Penguin.** *Catarrhactes chrysocome* (*Eudyptes pachyrhynchus*).—Occasional winter visitor. At present the sole record for the district is a bird captured at Rottnest in 1909 (*Emu*, ix., p. 92).

3. **Little Penguin.** *Eudyptula minor* (*E. m. woodwardi*).—Resident. Breeding on Penguin Island, Shag Island, Seal Island, and Bird Island, in the neighbourhood of Rockingham. The breeding season appears to extend at least from September to December. The nests are usually in hollows under ledges of rock high up on the islands, occasionally under bushes. One egg is the usual clutch. The birds frequently enter Cockburn Sound and occasionally ascend the Swan River.

4. **Stubble Quail.** *Coturnix pectoralis* (*C. p. prætermissa*).—Irregular visitor. Like the other Quails, this species appears to be a wanderer. It is not common in the district, but sometimes nests quite near Perth.

5. **Painted Quail.** *Turnix varia* (*Ortygodes v. scintillans*).—Irregular visitor. The same remarks apply as in the case of the previous species.

6. **Little Quail.** *Turnix velox* (*Austroturnix v.*, sub-sp. ?)—Irregular visitor. Not known to breed in the district.

7. **Bronze-winged Pigeon.** *Phaps chalcoptera* (*P. c. murchisoni*).—Resident. Formerly plentiful, now scarce, and chiefly found in localities of dense wattle scrub.

8. **Brush Bronze-winged Pigeon.** *Phaps elegans* (*Cosmopelia e. neglecta*).—Resident. Probably also scarcer than formerly. Is found with the common Bronze-wing in inland localities, but occurs also among the coastal dunes, including those of Garden Island.

9. **Indian Turtle Dove.** *Spilopelia suratensis*.—Acclimatized resident. Plentiful in Perth and the nearer suburbs.

10. **Senegal Turtle Dove.** *Stigmatopelia senegalensis*.—Acclimatized resident. Plentiful about Perth, and extends further into the surrounding country than the Indian species. In January, 1920, one reached Garden Island, having doubtless been blown there by strong easterly winds.

11. **Buff-banded Rail.** *Hypotænidia philippensis* (*H. p. mellori*).—Irregular visitor.

12. **Spotted Crake.** *Porzana fluminea* (*P. f.*, sub-sp. ?—Resident. This is probably a rare species, but formerly nested at Herdsman's Lake, and probably still does so in some of the less accessible swamps.

13. **Little Crake.** *Porzana palustris* (*Zapornia pusilla*, sub-sp. ?—Resident. Probably commoner than the last, but not often met with. Formerly nested at Herdsman's Lake.

14. **Spotless Crake.** *Porzana immaculata* (*Porzanoidea plumbea roberti*).—Resident. Comparatively common, though its habits lead to its being overlooked. A specimen in the W.A. Museum was obtained on the Swan River, but the large swamps are its usual habitat.

15. **Black-tailed Native-Hen.** *Tribonyx ventralis* (*Microtribonyx v. ventralis*).—Irregular visitor. Sometimes occurs in very large numbers throughout the district. The earliest recorded invasion of the sort occurred in May, 1833, and a bird secured on this occasion is the type of the species. There is no record of the species breeding in the district.

16. **Black Moor-Hen.** *Gallinula tenebrosa* (*G. t. magnirostris*).—Resident. Common on the banks of streams and on swamps.

17. **Blue Bald-Coot.** *Porphyrio bellus* (*P. melanotus woodwardi* and *P. bellus*).—Resident. Very plentiful on all the swamps. I feel confident that there is only one species, which should be ranked as a geographical race of *P. melanotus*.

18. **Coot.** *Fulica australis* (*F. atra australis*).—Resident. The numbers of this species seem to be greatly increased in some winters by migrants from other districts.

19. **Tippet Grebe.** *Podiceps australis* (*P. cristatus christiani*).—Irregular visitor. Occasionally met with on the larger swamps.

20. **Black-throated Grebe.** *Podiceps gularis* (*Tachybaptus ruficollis cartera*).—Resident. Very plentiful, breeding in large numbers on the swamps and dams.

21. **Hoary-headed Grebe.** *Podiceps poliocephalus* (*Poliocephalus p. cloatesi*).—Resident. Much less common than the last, though, except in the breeding season, the birds are difficult to distinguish; There is no record of this species nesting in the district, and it may be only a visitor.

22. **White-faced Storm-Petrel.** *Pelagodroma marina* (*P. m. dulciæ*).—Winter visitor. This species is very possibly found off the coast all the year round, but the only evidence of its occurrence at present is that it is sometimes washed up on the beach during the winter. As it breeds further north, at the Abrolhos Islands, and also on islands further south, it is not improbable that it may breed on some of the islands off this portion of the coast.

23. **Allied Petrel.** *Puffinus assimilis* (*P. a. tunneyi*).—Winter visitor. The status of this species is exactly the same as that of the last, and the same remarks apply as to the possibility of its really breeding in the district.

24. **Wedge-tailed Petrel.** *Puffinus sphenurus* (*Thyellodroma pacifica chlororhyncha*).—Resident. Breeds in large numbers on Rottnest, and a few also on Carnac Island, which appears to be their southern outpost. Possibly the species moves north in the winter for a few months, but for the greater part of the year the birds are plentiful in Cockburn Sound and on the sea round the islands.

25. **Fleshy-footed Petrel.** *Puffinus carneipes* (*Hemipuffinus c. carneipes*).—Occasional winter visitor. A single specimen found dead on the beach at Cottesloe in May, 1916, is the only record of this species in the district (*Emu*, xvii., p. 40).

26. **White-headed Petrel.** *Œstrelata lessoni* (*Estrelata lessonii leucocephala*).—Occasional winter visitor. A single specimen found dead on the beach at Cottesloe in August, 1915, is the only record for the district (*Emu*, xv., p. 106).

27. **Soft-plumaged Petrel.** *Œstrelata mollis* (*Pterodroma mollis*). Occasional winter visitor. A single specimen found dead on the beach at Cottesloe is the only record for the district.

28. **Giant Petrel.** *Ossifraga gigantea* (*Macronectes g. albus*). Winter visitor. Frequently obtained on the coast in the winter, and is evidently a regular visitor. It has even been suggested that it breeds on the islands, but this is certainly not the case. I do not know of any white specimen obtained in Western Australia.

29. **Broad-billed Dove-Petrel.** *Prion vittatus* (*Pachyptila v. missa*).—Winter visitor. Judging by the numbers sometimes washed up on the beach after a storm, this species is frequent off the coast in winter.

30. **Dove-Petrel.** *Prion banksi* or *P. turtur* (*Heteroprion desolatus* or *H. belcheri*).—Winter visitor. Often washed up in considerable numbers on the beach. Mr. J. B. Higham informs me that he has seen Prions of some species flying over the water in Fremantle Harbour.

31. **Wandering Albatross.** *Diomedea exulans* (*D. e. chionoptera*).—Winter visitor. This species is probably not uncommon in winter some distance out from the shore-line, but owing to its powers of flight it rarely falls a victim to storms like the other members of the Petrel family; hence it has only once been actually obtained in the district.

32. **Grey-headed Mollymawk.** *Diomedea culminata* (*Thalassogeron chrysostoma culminatus*).—Occasional winter visitor. A specimen captured alive near Cottesloe in June, 1917, is the sole record (*Emu*, xix., p. 59). The statement that it was picked up at Fremantle, which I made in that place, is, I regret to say, incorrect.

33. **Yellow-nosed Mollymawk.** *Diomedea chlororhynchus* and *D. carteri* (*Neabatrus chlororhynchus carteri*).—Winter visitor. Frequent off the coast in winter and often washed up dead on the beach.

34. **White-tailed Black Tern.** *Hydrochelidon leucoptera* (*H. l. grisea*).—Irregular visitor. A great irruption of this species occurred in April, 1917 (*Emu*, xvii., p. 95), when they were to be seen on the Swan River, on all the swamps, and on the shores of Garden Island. A few apparently appeared on the Swan River in the following year (*Emu*, xviii., p. 134).

35. **Marsh Tern.** *Hydrochelidon fluviatilis* (*H. leucopareia rogersi*).—Irregular visitor. Parties sometimes visit the swamps, where they may remain for some time, but there is no evidence that the species breeds in the district.

36. **Caspian Tern.** *Sylochelidon caspia* (*Hydroprogne tschegrava strenua*).—Resident. A few pairs may usually be seen on the coast, and they doubtless breed either on the beach or on some of the islets, though I know of no definite record of their nesting in the district.

37. **Crested Tern.** *Sterna cristata* (*Thalasseus bergii gavendolena*).—Resident. Common on the coast and on the Swan River. Breeds on islets off Rottnest Island and in Safety Bay.

38. **White-faced Ternlet.** *Sternula nereis* (*S. n. horni*).—Resident. Abundant on the coast and on the Swan River. Breeds on sandy beaches on the mainland and islands.

39. **Sooty Tern.** *Onychoprion fuliginosa* (*O. fuscata serrata*).—Occasional visitor. One was captured on the Swan River in December, 1917. This is at present the only record for the district.

40. **Bridled Tern.** *Onychoprion anæstheta* (*Melanosterna anæthetus novæhollandiæ*).—Resident. Breeds on islets off Rottnest, Carnac, and Garden Islands, and in Safety Bay. The single egg is laid in a crevice in the limestone rocks. Possibly the species is only a summer visitor, as I do not know of any observation as to its occurrence in winter. Even during the summer it seems always to go out to sea to procure its food, and is never observed on the coast or in Cockburn Sound.

41. **Silver Gull.** *Larus novæ-hollandiæ* (*Bruchigavia n. longirostris*).—Resident. Plentiful on the coast and on the Swan River. Nests on the cliffs at Rottnest and Garden Islands and on many of the smaller islets and rocks.

42. **Pacific Gull.** *Gabianus pacificus* (*G. p. georgii*).—Resident. A few birds may generally be seen about the coast. They probably nest in the district, though there is no definite record of the occurrence.

43. **Southern Skua.** *Megalestris antarctica* (*Catharacta l. lonnbergi*).—Winter visitor. Usually to be seen in Cockburn Sound during the winter.

44. **Turnstone.** *Strepsilas interpres* (*Arenaria i. oahuensis*).—Summer visitor. Occurs on the shores of Rottnest and Garden Islands during the summer, but is not plentiful.

45. **Pied Oyster-catcher.** *Hæmatopus longirostris* (*H. ostralegus longirostris*).—Resident. A few are to be seen on sandy beaches, and Milligan records them as occurring on Lake Yanchep.

46. **Black Oyster-catcher.** *Hæmatopus fuliginosus* (*H. niger bernieri*).—Resident. A few on rocky parts of the coast, especially Rottnest Island.

47. **Red-kneed Dottrel.** *Erythrogonys cinctus* (*E. c. cinctus*).—Winter visitor. Large numbers are often to be seen about the swamps and in samphire flats on the Swan River in winter, usually in company with the Black-fronted Dottrel.

48. **Black-breasted Plover.** *Zonifer pectoralis* (*Z. tricolor gwendolenæ*).—Resident. This species does not occur in the immediate neighbourhood of Perth, but has recently become common on cleared land at the foot of the hills about Gingin, and also occurs near Pinjarrah.

49. **Golden Plover.** *Charadrius fulvus* (*Pluvialis dominicus fulvus*).—Summer visitor. Flocks occur on Rottnest and probably on other parts of the coast.

50. **Red-capped Dottrel.** *Ægialitis ruficapilla* (*Leucopolius r. ruficapillus*).—Resident. Very plentiful on all the sandy parts of the coast, breeding on the sand-hills. Occasionally met with about the swamps.

51. **Hooded Dottrel.** *Ægialitis monacha* (*Charadrius cucullatus tregellasi*).—Resident. Much less common than the preceding.

52. **Black-fronted Dottrel.** *Egialitis nigrifrons* (*Elseya m. melanops*). —Resident. Common on the shores of all the fresh-water swamps wherever these are not covered with rushes or tea-trees. The birds, which breed in the district, are probably reinforced during the winter by the arrival of others from further north or east.

53. **White-headed Stilt.** *Himantopus leucocephalus* (*H. l.*, sub-sp. ?) —Winter visitor. Small parties occur on the swamps in winter, but I know of no record of their breeding in the district.

54. **Banded Stilt.** *Cladorhynchus pectoralis* (*C. leucocephalus*).—Winter visitor. Visits the salt lakes on Rottnest in large flocks in winter, and is hence commonly known as the "Rottnest Snipe." Occurs less frequently on the swamps on the mainland.

55. **Red-necked Avocet.** *Recurvirostra rubricollis* (*R. novæ-hollandiæ*).—Winter visitor. Like its two allies, is met with about the swamps in the winter, and sometimes visits Rottnest.

56. **Australian Curlew.** *Numenius cyanopus*.—Summer visitor. A few are usually to be seen on the shores of the Swan River in summer, also on the ocean beaches and sometimes on swamps.

57. **Common Sandpiper.** *Actitis hypoleucus* (*A. h. auritus*).—Summer visitor. A few may usually be seen about the banks of those portions of the Swan River where there are rocks. They also visit the swamps. They leave for their northern breeding-grounds late in April, and some are back again by September.

58. **Greenshank.** *Glottis nebularius* (*G. n. glottoides*).—Summer visitor. Occasionally met with on the estuaries.

59. **Wood-Sandpiper.** *Rhyacophilus glareola* (*R. g. affinis*). —Occasional summer visitor. A specimen shot on the Canning River at Kelmscott in February, 1900, is the only record for the district (*Emu*, xv., p. 27).

60. **Little Stint.** *Pisobia ruficollis* (*P. minuta ruficollis*).—Summer visitor. Common on the ocean beaches, especially at Rottnest, also sometimes seen on the Swan River and the fresh-water swamps.

61. **Sharp-tailed Stint.** *Pisobia acuminata* (*Limnocinclus acuminatus*). —Summer visitor. Not so common as its smaller relative.

62. **Curlew Sandpiper.** *Ancylochilus subarquatus* (*Erolia ferruginea chinensis*).—Summer visitor. Frequently met with at Rottnest.

63. **Australian Painted Snipe.** *Rhynchæa australis* (*Rostratula australis*). —Occasional visitor. Specimens from Herdsman's Lake and from Pinjarrah are in the W.A. Museum.

64. **Southern Stone-Plover.** *Œdicnemus grallarius* (*Burhinus magnirostris broomei*).—Resident. Still fairly common except in the immediate vicinity of the capital.

65. **Australian Bustard.** *Choriotis australis* (*Austrotis a. australis*). —Resident. A few probably still breed in the district, but most of those now obtained are visitors from further inland.

66. **Straw-necked Ibis.** *Carphibis spinicollis*.—Resident. This species appears to have reached the district from the north only within recent years. It is now fairly common on the swamps and about the Swan River. There is as yet no record of its breeding, and it is possible that some of the birds go north again to breed each

summer, leaving non-breeding birds to represent the species throughout the year.

67. **Glossy Ibis.** *Plegadis falcinellus.*—Occasional visitor. Specimens are in the W.A. Museum which were shot at Herdsman's Lake and at Fremantle.

68. **White Egret.** *Herodias syrmatophorus* (*H. alba syrmatophora*).—Winter visitor. Only an occasional visitor until recently, but is apparently becoming commoner, as some now appear about Perth each winter.

69. **White-fronted Heron.** *Notophoyx novæ-hollandiæ.*—Resident. Very plentiful on all swamps, water-holes, and streams.

70. **White-necked Heron.** *Notophoyx pacifica* (*Myola pacifica*).—Resident. Not so common as the preceding, but especially plentiful in the winter. Probably the majority leave the district to breed.

71. **Reef-Heron.** *Demiegretta sacra* (*Demigretta s. cooktowni*).—Resident. A few occur on the rocky portions of the coast and islands. I know of no record of the occurrence of the white form or species (*D. greyi*).

72. **Nankeen Night-Heron.** *Nycticorax caledonicus* (*N. c. hilli*).—Resident. Common about the rivers and swamps. Formerly a large colony bred in a cave on Bird Island, off Rockingham, but the cave appears to have been deserted in recent years.

73. **Little Bittern.** *Ardetta pusilla* (*Ixobrychus minutus dubius*).—Resident. Probably common amongst the reeds on the larger swamps, though rarely seen.

74. **Black Bittern.** *Dupetor gouldi* (*D. flavicollis gouldi*).—Resident. The same remarks apply to this species as to the preceding.

75. **Australian Bittern.** *Botaurus poiciloptilus* (*B. p. westralensis*).—Resident. Common in reed-beds, but more often heard than seen.

76. **Black Swan.** *Chenopis atrata.*—Resident. Very abundant in early days, and still to be found on all the larger pieces of water in fair numbers. On the Swan River it was at one time exterminated, and was re-introduced some years ago by turning loose individuals, some of which had probably come from the Eastern States.

77. **Wood-Duck.** *Chlamydochen jubata* (*Chenonetta jubata*).—Resident. One of the rarer Ducks of the district, and should possibly be classed as a visitor, as it appears in small numbers on the swamps from time to time.

78. **Whistling-Duck.** *Dendrocygna arcuata* (*D. javanica gouldi*).—Occasional visitor. A bird shot at Wanneroo in 1899 is the only record for the district (*Emu*, xv., p. 27).

79. **Mountain-Duck.** *Casarca tadornoides.*—Resident. Small parties appear on the swamps from time to time, and birds are sometimes seen on the Swan River and fly out to sea, visiting Rottnest and Garden Island.

80. **Black Duck.** *Anas superciliosa* (*A. s. rogersi*).—Resident. Plentiful on all the swamps, and during the winter to be seen in numbers on the Swan River and the various ponds in the parks of Perth.

81. **Chestnut-breasted Teal.** *Nettium castaneum* (*Virago castanea*).—Resident. Occasionally met with on the swamps. Its status is

rather doubtful, owing to the confusion between the two species of Teal, and it should perhaps be classed as a visitor.

82. **Grey Teal.** *Nettium gibberifrons* (*Virago gibberifrons*).—Resident. Probably commoner than the preceding, but it seems impossible to differentiate it satisfactorily.

83. **Australian Shoveller.** *Spatula rhynchotis.* Resident. One of the rarer Ducks, which perhaps ought to be regarded only as a visitor.

84. **Freckled Duck.** *Stictonetta naevosa.*—Resident. The same remark applies as to the preceding.

85. **White-eyed Duck.** *Nyroca australis.*—Resident. A fairly common species, which breeds as near Perth as Monger's Lake.

86. **Blue-billed Duck.** *Erismatura australis* (*Oxyura australis*).—Resident. Apparently less common than formerly, but has been known to breed at Herdsman's Lake.

87. **Musk-Duck.** *Biziura lobata.*—Resident. Very plentiful on all the swamps.

88. **Black Cormorant.** *Phalacrocorax carbo* (*P. c. novæhollandiæ*).—Resident. Common on lakes and the fresh-water stretches of the rivers; less frequent on the salt-water estuaries, and rarely seen on the coast.

89. **Little Black Cormorant.** *Phalacrocorax sulcirostris* (*Mesocarbo ater*).—Resident. Common on the swamps and estuaries, and much more sociable than the preceding. Rarely seen on the coast.

90. **Pied Cormorant.** *Phalacrocorax hypoleucus* (*Hypoleucus varius hypoleucus*).—Resident. This is the common Shag of the sea-coast and salt-water portion of the estuaries. It breeds in large numbers on a number of the rocky islets adjacent to Rottnest and Garden Islands and along the coast farther south.

91. **Little Pied Cormorant.** *Phalacrocorax melanoleucus* (*Microcarbo melanoleucus*).—Resident. The commonest species of Shag on fresh water; also common on the estuaries, and frequently met with on the sea coast.

92. **Australian Darter.** *Plotus novæ-hollandiæ* (*Anhinga novæhollandiæ*).—Resident. Birds of this species are almost always to be seen on the reaches of the Swan River above Perth as well as on the neighbouring swamps.

93. **Australian Gannet.** *Sula australis* (*Morus serrator dyotti*).—Winter visitor. A few appear off the coast in winter, when they may usually be seen in Cockburn Sound.

94. **Greater Frigate-Bird.** *Tachypetes aquila* (*Fregata a. palmerstoni*).—Occasional visitor. A specimen captured alive at Perth in May, 1917, is the only record for this species (*Emu*, xvii., p. 238).

95. **Australian Pelican.** *Pelecanus conspicillatus* (*Catoptropelicanus c. westralis*).—Resident. Common on the Swan River and on the fresh-water swamps of the district, also sometimes seen on the sea about the islands. It is not known to breed in the district, but probably only a proportion of the birds breed each year, going north for the purpose.

96. **Swamp-Hawk.** *Circus gouldi* (*C. approximans*, sub-sp. ?).—Resident. One of the commonest Hawks in the district, to be seen in the neighbourhood of all the swamps.

97. **Australian Goshawk.** *Astur approximans* and *A. cruentus* (*Urospiza fasciata cruenta*).—Resident. Still fairly common in the district, but, owing to their fondness for poultry, many are shot annually.

98. **Collared Sparrow-Hawk.** *Accipiter torquatus* (*A. cirrocephalus broomei*).—Resident. Probably fairly common, but shyer in its habits than most of the other Hawks, and therefore less often seen.

99. **Wedge-tailed Eagle.** *Uroaëtus audax* (*U. a. carteri*).—Resident: A few probably still breed in the more remote parts of the district. The species is now rarely seen in the immediate neighbourhood of Perth.

100. **White-bellied Sea-Eagle.** *Haliaëtus leucogaster* (*Cuncuma leucogaster*).—Visitor. Specimens, usually in immature plumage, appear from time to time on the sea-coast and the estuaries. The species probably does not breed anywhere in the district.

101. **Whistling Eagle.** *Haliastur sphenurus.*—Resident. The common Eagle throughout the district, usually to be seen soaring over any considerable sheet of water.

102. **Square-tailed Kite.** *Lophoictinia isura.*—Visitor. Several specimens have been shot near Perth.

103. **Black-shouldered Kite.** *Elanus axillaris* (*E. a. parryi*).—Occasional visitor. A specimen shot at Burswood, near Perth, is in the W.A. Museum.

104. **Little Falcon.** *Falco lunulatus* (*F. longipennis murchisonianus*).—Resident. A common species.

105. **Brown Hawk.** *Hieracidea berigora* and *H. occidentalis* (*Heracidea b. occidentalis*).—Resident. Plentiful. Both forms of this species occur, but the dark-breasted type is probably the commoner.

106. **Nankeen Kestrel.** *Cerchneis cenchroides* (*C. c. unicolor*).—Resident. Very common, especially on the coastal hills. It occurs also on Rottnest, Garden, and Penguin Islands.

107. **Osprey.** *Pandion leucocephalus* (*P. haliaëtus cristatus*).—Resident. A few pairs still breed on rocky islets off Rottnest, and individuals are sometimes seen on the coast of the mainland and the estuary of the Swan River.

108. **Boobook Owl.** *Ninox ocellata* (*Spiloglaux boobook ocellata*).—Resident. The common Owl of the district.

109. **Winking Owl.** *Ninox connivens* (*Hieracoglaux c. addenda*).—Resident. A rare species, which may be only a visitor to the district; but little is known as to these nocturnal birds.

110. **Delicate Owl.** *Strix delicatula* (*Tyto alba delicatula*).—Resident. Not often seen, but perhaps not really rare.

111. **Masked Owl.** *Strix novæ-hollandiæ* (*Tyto n. perplexa*).—Resident. Status about the same as that of the Delicate Owl.

112. **Purple-crowned Lorikeet.** *Glossopsitta porphyrocephala* (*G. p. whitlocki*).—Resident. This species is generally seen in large flocks wherever the eucalypts are in flower, and often passes screaming overhead when travelling from one place to another. It should perhaps be classed as a visitor rather than a resident, as it is doubtful whether it breeds in the district, but the birds are probably present in one or other part of the district at almost all times of the year.

113. **Red-tailed Black Cockatoo.** *Calyptorhynchus naso* (*C. banksii stellatus*).—Visitor. Only occasionally seen in the district, being a bird of the inland regions of the State. The reasons for the occasional visits of this species to the coastal districts are unknown.

114. **White-tailed Black Cockatoo.** *Calyptorhynchus baudini* (*Zanda baudinii*, sub-sp. ?). Resident. A common bird, conspicuous owing to its noisy habits. Small flocks travel about from place to place, and there appears to be a regular passage of individuals southward after the breeding season, but the movements of this species are not properly understood.

115. **Long-billed Cockatoo.** *Licmetis pastinator* (*L. tenuirostris pastinator*).—Former visitor. This species visited the district in large flocks in the early days of the Swan River settlement, retiring inland during the breeding season. It is now entirely extinct in this district, though still found further north.

116. **Western Rosella.** *Platycercus icterotis* (*P. i.*, sub-sp. ?).—Resident. Fairly common throughout the district, especially in the lower parts of the valleys near the foot of the hills.

117. **Twenty-eight Parrot.** *Barnardius semitorquatus* (*B. zonarius semitorquatus*).—Resident. Much the commonest species of Parrot. The birds found about Perth are as large as the typical *semitorquatus* from Albany, but approach *zonarius* in having the breast much yellower than in the typical form.

118. **Western King-Parrot.** *Purpureicephalus pileatus* (*P. spurius*).—Resident. Fairly common, especially in the tuart forest country near the coast.

119. **Rock-Parrot.** *Euphema petrophila* (*Neonanodes p. petrophilus*).—Resident. Common on Rottnest Island, where it still breeds in considerable numbers in holes in the cliffs. Not recorded from the mainland in this district.

120. **Ground-Parrot.** *Pezoporus flaviventris* (*P. terrestris flaviventris*).—Former resident. Gould ("Handbook," vol. ii., p. 86) gives a name for this species used by the aborigines around Perth, but it appears to be quite extinct in the district.

121. **Tawny Frogmouth.** *Podargus brachypterus* (*P. strigoides brachypterus*).—Resident. A common species, which, owing to its protective coloration and habits, is constantly overlooked.

122. **Owlet-Nightjar.** *Ægotheles novæ-hollandiæ* (*A. c. cristata*).—Resident. This little nocturnal bird is probably resident, but may be only a visitor. It would seem to be very uncommon in the district.

123. **Laughing Jackass.** *Dacelo gigas* (*D. g. gigas*).—Acclimatized resident. This species was introduced about 1896, and is now fairly common throughout the district.

124. **Sacred Kingfisher.** *Halcyon sanctus* (*Sauropatis sancta westralasiana*).—Resident. Common throughout the district, chiefly in the neighbourhood of water.

125. **Australian Bee-eater.** *Merops ornatus* (*Cosmærops o. shortridgei*).—Summer visitor. During the summer months breeding colonies of this species are found in various parts of the district, but the bird is somewhat local.

126. **Spotted Nightjar.** *Eurostopodus guttatus* (*E. argus harterti*).—Visitor. The status of this species is doubtful. Like other birds of nocturnal habits, it may be commoner than is usually supposed, and perhaps a resident in the district. I know of only two records of its occurrence.

127. **White-rumped Swift.** *Cypselus pacificus* (*Micropus p. pacificus*).—Summer visitor. A specimen in the W.A. Museum obtained at Pinjarrah is evidence that this species occasionally visits the district.

128. **Pallid Cuckoo.** *Cuculus pallidus* (*Heteroscenes p. occidentalis*).—Visitor. This species is very much in evidence from the end of June to the beginning of November, when it is constantly to be heard calling. Whether the birds remain longer in the district but cease to call, or whether they are altogether absent for the remainder of the year, requires to be solved by further observation. They visit Rottnest Island.

129. **Fan-tailed Cuckoo.** *Cacomantis flabelliformis* (*C. rubricatus albani*).—Visitor. Less numerous than the preceding species on the mainland, but apparently commoner on Rottnest. Its times of arrival and departure are unknown.

130. **Black-eared Cuckoo.** *Mesocalius osculans* (*Owenavis o. rogersi*).—Occasional visitor. A specimen obtained at Perth is in the W.A. Museum.

131. **Narrow-billed Bronze-Cuckoo.** *Chalcococcyx basalis* (*Neochalcites b. wyndhami*).—Visitor. A regular visitor in the nesting season, but its movements are still little known.

132. **Bronze-Cuckoo.** *Chalcococcyx plagosus* (*Lamprococcyx p. carteri*).—Visitor. Status similar to that of the preceding.

133. **Welcome Swallow.** *Hirundo neoxena* (*H. n. carteri*).—Resident. Swallows are numerous throughout the year, and breed during the winter and spring months. They are especially plentiful about the islands off the coast, where they breed in holes in the limestone cliffs. There is no evidence of any migration taking place.

134. **White-backed Swallow.** *Cheramoeca leucosternum* (*C. l. leucosternum*).—Visitor. There is a specimen in the W.A. Museum obtained at Lake Yanchep, and the species is possibly resident in the north of the district. It is more probably a visitor from the districts to the north and east, where it is known to breed.

135. **Tree-Martin.** *Petrochelidon nigricans* (*Hylochelidon n. distinguenda*).—Resident. The most plentiful member of the Swallow family, breeding in spouts of trees throughout the district.

136. **Scarlet-breasted Robin.** *Petroica campbelli* (*P. multicolor campbelli*).—Resident. Common throughout the district, but not found on the islands off the coast.

137. **Red-capped Robin.** *Petroica goodenovii* (*Whiteornis g. ruficapillus*).—Resident. Plentiful on Rottnest Island, where it breeds, but very rare on the mainland in the Perth district. Milligan has stated that it does not occur in the coastal regions of Western Australia, but there are two specimens in the W.A. Museum obtained respectively at Claremont and near Herdsman's Lake.

138. **Hooded Robin.** *Melanodryas bicolor* (*M. cucullata westralensis*).—Resident. A rare species occasionally met with in open stretches of country. Its true home is the sand-plain regions further inland.

130. **Short-billed Tree-Tit.** *Smicrornis brevirostris* (*S. b. occidentalis*). —Resident. Common, especially in the tuart country near the coast.

140. **Southern Fly-eater.** *Gerygone culicivora* (*Ethelornis c. culicivorus*.—Resident. Perhaps the commonest small bird of the district, universally distributed.

141. **White-breasted Robin.** *Amaurodryas leucogaster* (*Quoyornis georgianus*.—Resident. A rare species, but probably often overlooked owing to its very shy habits. It is apparently only found in dense thickets.

142. **Yellow-breasted Thickhead.** *Pachycephala occidentalis* (*P. pectoralis occidentalis*.—Resident. Fairly common throughout the district, and found also on Rottnest.

143. **Rufous-breasted Thickhead.** *Pachycephala rufiventris* *Lewinornis r. inornatus*.—Resident. A plentiful species, found also on Rottnest.

144. **Red-throated Thickhead.** *Pachycephala gilberti* (*Gilbertornis rufogularis gilberti*.—Resident. A rare species, probably usually overlooked or mistaken for the preceding.

145. **Grey-breasted Yellow Robin.** *Eopsaltria griseogularis* (*E. australis gularis*.—Resident. A common species throughout the district.

146. **White-shafted Fantail.** *Rhipidura preissi* (*R. flabellifera preissi*.—Resident. Universally distributed throughout the district, but not very common.

147. **Black-and-White Fantail.** *Rhipidura motacilloides* *Leucocirca t. tricolor*.—Resident. Very plentiful throughout the district, including Garden Island and the smaller islands further south, where it sometimes nests on the cliffs. The species often sings at night, especially on moonlight nights.

148. **Restless Flycatcher.** *Seisura inquieta* (*S. i. westralensis*).—Resident. This species is decidedly uncommon in the district.

149. **Ground Cuckoo-Shrike.** *Pteropodocys phasianella* (*P. maxima neglecta*.—Visitor. A specimen obtained at Greenmount is in the W.A. Museum. I know of no other record for the district.

150. **Black-faced Cuckoo-Shrike.** *Graucalus melanops* (*Coracina novæhollandiæ westralensis*.—Resident. A plentiful species.

151. **White-shouldered Caterpillar-eater.** *Campephaga humeralis* (*Lalage t. tricolor*.—Summer visitor. Not very common. Breeds in the district. The dates of its arrival and departure are not known.

152. **Brown Song-Lark.** *Cinclorhamphus cruralis* (*C. c. clelandi*).—Visitor. Milligan records seeing this species at Lake Yanchep. It may be resident in the district, but is certainly uncommon.

153. **Rufous Song-Lark.** *Cinclorhamphus rufescens* (*Pteneadus mathewsi*, sub-sp. ?.—Visitor. A specimen in the W.A. Museum was obtained at Maddington, near Kelmscott.

154. **White-fronted Chat.** *Ephthianura albifrons* *E. a. westralensis*. Resident. Very plentiful among the coastal hills in the summer, and found also on Garden Island and Rottnest. The species moves about in small flocks, but is probably not really migratory.

155. **Tricoloured Chat.** *Ephthianura tricolor* (*Parephthianura t. assimilis*).—Visitor. Birds of this species sometimes occur on the coastal hills associating with the flocks of the preceding.

156. **Australian Reed-Warbler.** *Acrocephalus gouldi* (*Conopoderas australis gouldi*).—Resident. Common in the reed-beds throughout the district wherever these occur. It is presumably resident, but is much more often heard than seen, so that it is difficult to detect its presence except in the season when its beautiful song is heard. This season extends from about May to October.

157. **Grass-Bird.** *Megalurus striatus* (*Poodytes gramineus striatus*).—Resident. Common about all the swamps, but not very often seen, owing to its secretive habits.

158. **Broad-tailed Tit.** *Acanthiza apicalis* (*A. pusilla apicalis*).—Resident. An abundant species throughout the district. [The late H. E. Hill recorded *A. pyrrhopygia* as occurring at Guildford (*Emu*, vol. iii., p. 227), but presumably the record should refer to this species.]

159. **Plain-coloured Tit.** *Acanthiza inornata* (*A. i. inornata*).—Resident. A fairly common species in wooded parts of the district. [E. Ashby informs me that his record of *A. tenuirostris* at Guildford (*Trans. Roy. Soc. S.A.*, 1901, p. 133) applies to this species.]

160. **Yellow-rumped Tit.** *Acanthiza chrysorrhoa* (*Geobasileus c. multi*).—Resident. Very common everywhere.

161. **Spotted Scrub-Wren.** *Sericornis maculata* (*S. m.*, sub-sp. ?).—Resident. Not uncommon amongst the bushes on the coastal hills. Found also on Rottnest.

162. **Banded Blue Wren.** *Malurus splendens* (*M. s. splendens*).—Resident. Found throughout the district, but not nearly so common as it is on the Darling Range, to the eastward.

163. **Red-winged Blue Wren.** *Malurus elegans* (*Leggeornis elegans*).—Resident. Formerly occurred and nested near Herdsman's Lake, but does not now appear to be found in the immediate neighbourhood of Perth. It is doubtless still found on the borders of some of the remoter swamps; it occurs at Gingin, in the north of the district.

164. **Black-faced Wood-Swallow.** *Artamus cinereus* (*Austrartamus melanops tregellasi*).—Winter visitor. Small parties are met with in the neighbourhood of Perth, especially on the open coastal limestone hills. Gilbert met with them over 80 years ago in the neighbourhood of Fremantle, as recorded in Gould's "Handbook." I have seen this species on a number of occasions in July, August, September, and October.

165. **Wood-Swallow.** *Artamus sordidus* (*Pseudartamus cyanopterus*).—Resident. A common bird throughout the district.

166. **Buff-bellied Shrike-Thrush.** *Colluricincla rufiventris* (*C. r. rufiventris*).—Resident. Widely distributed, but not very common.

167. **Magpie-Lark.** *Grallina picata* (*G. c. cyanoleuca*).—Resident. Not common in the district, and very local in its habits. I only know of two small areas in the neighbourhood of Perth itself where these birds may be seen, but they occur at many other places in the district.

168. **White-backed Magpie.** *Gymnorhina dorsalis* (*G. hypoleuca dorsalis*).—Resident. A very plentiful species throughout the district.

169. **Butcher-Bird.** *Cracticus leucopterus Bulestes torquatus leucopterus*.—Resident. A common species.

170. **White-bellied Shrike-Tit.** *Falcunculus leucogaster*. Visitor. There is a specimen of this species in the W.A. Museum which was obtained at Wanneroo. This is the only record for the district.

[A specimen of the Crested Bell-Bird *Oreoica cristata* in the British Museum, from the Gould Collection, is labelled Perth, but was no doubt obtained inland or further north.]

171. **Black-capped Tree-runner.** *Neositta pileata (N. p. pileata)*.—Resident. Common. Usually met with in small parties.

172. **Rufous Tree-creeper.** *Climacteris rufa (Whitlocka r.*, sub-sp. ?).—Resident. Uncommon in the district, though frequent in the Darling Ranges to the eastward.

173. **Green-backed White-eye.** *Zosterops gouldi*.—Resident. Very plentiful, especially near the coast, and found also on Rottnest and Garden Islands and some of the smaller islands further south.

174. **Mistletoe-Bird.** *Dicæum hirundinaceum (Austrodicæum h.)* sub-sp. ?.—Resident. Not common, but probably often overlooked owing to its habit of keeping high in the trees.

175. **Spotted Pardalote.** *Pardalotus punctatus (P. p. whitlocki)*.—Resident. Not common, but sometimes the numbers are greatly increased by arrivals of birds, presumably from further inland.

176. **Striated Pardalote.** *Pardalotus striatus (Pardalotinus s. westralicnsis)*.—Resident. A plentiful species throughout the district.

177. **White-naped Honey-eater.** *Melithreptus chloropsis (M. lunatus chloropsis)*.—Resident. Common in the tuart country near the coast.

178. **Brown-headed Honey-eater.** *Melithreptus leucogenys (M. atricapillus*, sub-sp. ?).—Resident. Uncommon, but met with among the bushes in the more open country in the district.

179. **White-browed Spinebill.** *Acanthorhynchus superciliosus (A. s. superciliosus)*.—Resident. Very common, especially in the open parts amongst the flowering bushes.

180. **Tawny-crowned Honey-eater.** *Glyciphila fulvifrons (Gliciphila melanops westernensis)*.—Resident. Uncommon, but met with at times in fairly open country.

181. **Brown Honey-eater.** *Stigmatops ocularis (S. i. indistincta)*.—Resident. Common throughout the district, especially in open country.

182. **Singing Honey-eater.** *Ptilotis sonora* and *P. insularis (Meliphaga sonora broomei* and *M. s. insularis)*.—Resident. The most abundant member of the family in the district, being specially plentiful on the coastal hills and the islands off the coast. Birds from Rottnest constitute a distinct sub-species, originally named by Milligan.

183. **Yellow-plumed Honey-eater.** *Ptilotis ornata (Lichenostomus o. ornatus)*.—Resident. Plentiful in the tuart belt, chiefly frequenting the tops of the tall tuart trees.

184. **Gold-winged Honey-eater.** *Meliornis longirostris (M. novæhollandiæ longirostris)*.—Resident. Common, especially amongst the bushes on the coastal hills.

185. **Moustached Honey-eater.** *Meliornis mystacalis (M. niger*,

sub-sp. ? .—Resident. Not nearly so plentiful as the preceding, but found in various localities about Perth and Fremantle.

186. **Dusky Miner.** *Myzantha obscura* (*M. flavigula obscura*).—Resident. Fairly common. In small parties in wooded parts.

187. **Red Wattle-Bird.** *Anthochæra carunculata* (*Coleia c. woodwardi*).—Resident. During the winter these birds assemble in great numbers in those parts of the district where flowering banksias are.

188. **Little Wattle-Bird.** *Anellobia lunulata* (*Anthochæra chrysoptera lunulata*).—Resident. Common, especially in the coastal districts.

189. **Australian Pipit.** *Anthus australis* (*A. a. bilbali*).—Resident. Not very common, as there is little arable or grass land in the district. The coastal limestone hills, where they are covered with grass, are perhaps the only natural habitat of the species, which is found in such places on the mainland and on Rottnest Island.

190. **Australian Crow.** *Corvus coronoides* (*C. c. perplexus*).—Resident. Common in the district, and on Rottnest and Garden Islands.

191. **Leaden Crow-Shrike.** *Strepera plumbea* (*Neostrepera versicolor plumbea*).—Resident. Rather scarce in the district, and decidedly local in its habits, almost confined to places in the tuart forest.

NOTES ON DIRK HARTOG ISLAND AND PERON PENINSULA, SHARK BAY, WESTERN AUSTRALIA.

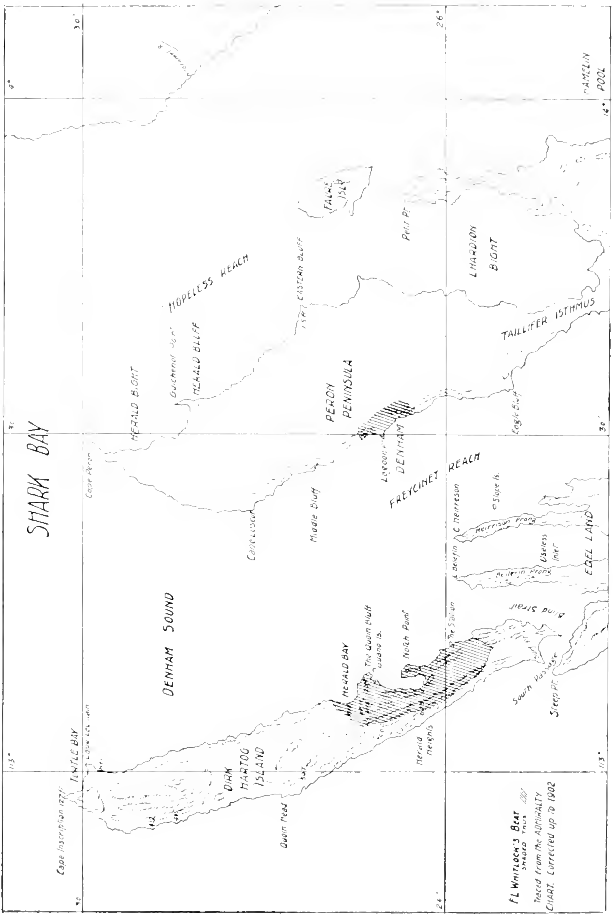
By F. Lawson Whitlock, R.A.O.U., Chiltern, Tudor, *via* Albany, W.A.

Introduction.

Dirk Hartog Island is separated from the mainland of Australia by a channel less than two miles wide, Steep Point, on the south side of the channel, forming the most westerly portion of the mainland. Peron Peninsula is separated from the island by Denham Sound, and lies to the east about 21 miles. Both the island and the peninsula run in a north by north-westerly direction. The 26th parallel S. latitude runs through both, and the 113th degree E. longitude passes through the northern half of Dirk Hartog. Denham Sound forms part of Shark Bay.

The climate is somewhat remarkable, the temperature being about 10 degrees cooler than the mainland in the vicinity of Hamelin Port, which lies at the most southern portion of the bay. This is due to the general prevalence, during the warm weather, of strong southerly winds, locally termed "southerly busters." These winds begin early in the day, increasing in strength till midnight, then slowly subside towards daybreak, by which time practically a calm prevails. The rainfall on Dirk Hartog averages about 12 inches, on Peron rather less. This is probably due to the absence of any elevated land on the peninsula, in contrast to the high ridges running almost the whole length of the western side of Dirk Hartog, an elevation of 600 feet being attained at Herald Heights. This high ridge appears to intercept and condense showers travelling in an easterly direction from the Indian Ocean. The greater part

PLATE XVI.


SHARK BAY
DENHAM SOUND
HOPELESS REACH
HERALD BIGHT
HERALD BLUFF
EASTERN BLUFF
FAURE ISLE
PERON PENINSULA
L'HARDION BIGHT
TAILLIFER ISTHMUS
HAMELIN POOL
Eagle Bluff
DENHAM
FREYCINET REACH
Cape Peron
Middle Bluff
Heirrison Prong
Useless Inlet
Bellefin Prong
EDEL LAND
Slope Is.
HERALD BAY
The Quoin Bluff
Notch Point
South Passage
Steep Pt.
DIRK HARTOG ISLAND
TURTLE BAY
Cape Inscription
Quoin Head
Herald Heights
F.L. WHITLOCK'S BEAT
SHADED THUS
Traced from the ADMIRALTY CHART. Corrected up to 1902

of the rain falls during winter. In the present season (1920) a rainfall of 12½ inches was registered at the homestead up to the middle of October.

The whole of Dirk Hartog Island appears to be of limestone formation, and, where the rock is exposed, fossil shells, closely allied to species now living in the adjacent seas, are numerous. The surface soil is, as a rule, white sand; but in places this becomes ferruginous, without, however, showing any appreciable differences in the local vegetation. Of true trees there are none, and the great family of eucalypts is very sparingly represented by occasional small patches of mallee. A species of mulga (*Acacia*), however, occurs in thickets, and attains a size sufficient for supplying fence-posts, the wood being very durable, but not remarkable for straightness. These tree-like bushes are locally known as "wanyu," and grow, as a rule, near or upon limestone outcrops. Other bushes are extremely numerous and of many varieties, and the majority are edible by stock. Herbaceous plants, too, are fairly plentiful, but more in evidence during the winter and early spring. Not a few introduced European plants are present, but the most conspicuous native species include several of the *Hibisci*, everlastings, *Trichenium*, soft spinifex (*Triodia*), and *Spinifex longifolius*. Dirk Hartog has been a sheep station for over 40 years, but, as burning-off has not been much resorted to, vegetation on the island probably presents much the same appearance as when the early Dutch navigators first viewed it.

In general appearance the surface growth on Peron Peninsula resembles that on Dirk Hartog, but the soil is much more highly coloured, and in the neighbourhood of Denham red sand prevails; outcrops of rock, too, are infrequent. Peron, however, has an advantage over Dirk Hartog in possessing salt-water creeks, one of which, known as the "Big Lagoon," runs some distance inland, and on its shores are extensive tracts of mangrove and samphire.

Dirk Hartog takes its name from the Dutch navigator Irek Hatighs, who arrived there in the ship *Eendraght* (360 tons) in 1616. Some doubt has recently been cast on the authenticity of his voyage, which has been alluded to as mythical. Be that as it may, a plate, erected (at Cape Inscription) and inscribed with the date, 25th October, 1616, and the name of the ship, *Eendraght*, of Amsterdam, was found and removed to Batavia by Van Vlaming, captain of the *Geelvink*, in 1697. Van Vlaming replaced this plate with a new one, on which he copied the inscription of Irek Hatighs' original plate, and, in addition, the record of his own landing on the island. In the "Encyclopædia of Western Australia" (ed. J. S. Battye) is given a photographic reproduction of the plate removed by Van Vlaming, which was subsequently re-discovered in 1902 at the State Museum of Amsterdam, Holland. In 1801, Capt. Hamelin, in the *Naturaliste*, saw Vlaming's plate, which had fallen down. He replaced it and erected a new plate, recording his own landing. The posts which

held these plates are now in the Perth Museum, the original site being now fenced off and marked by fresh posts and plates.

The ornithological history of Shark Bay, however, does not commence until the arrival of the French corvette *Uranie*, commanded by M. de Freycinet, which sighted Edel's Land (to the south) on 11th September, 1818, after a voyage of 45 days from the Isle de Bourbon. This French scientific expedition left Toulon on 17th September, 1817, but the *Uranie*, before reaching home again, unfortunately struck a rock whilst attempting to enter "French Bay," in the Falkland Islands on 13th February, 1820. She appears to have been beached, however, in time to prevent absolute foundering, but much material of scientific value was either totally lost or badly damaged by water. One can readily sympathize with Mons. Arago, who wrote an account of the voyage, and who was draughtsman to the expedition, when he states:—"She was run ashore in a sinking condition. . . She fell over on the starboard side, and my cabin was under water . . . rare birds and curious reptiles . . . ten portfolios of sketches and finished drawings . . . all, all were engulphed." Captain Freycinet appears to have visited Shark Bay previously with an expedition under Captain Baudin. This navigator visited the west and north-west coasts of Australia about the year 1809. There was no professed naturalist on board the *Uranie*. Messrs. Quoy and Gaimard were the surgeons to the expedition—"neither being naturalists by profession." On arrival the vessel was anchored "two leagues from the shore, off Cape Levillain (north-east point of Dirk Hartog), in eleven fathoms. Prodigious numbers of whales sporting about. . . Before we weighed anchor again, a boat under the command of M. Fabré, in which were Messrs. Quoy, Ferrand, and young Taunay . . . leaving us to pursue our way to the peninsula of Péron, where it was to join us, made for the island of Irck Hatighs to begin their observations. . . At six o'clock we anchored in Dampier's Bay* . . . near Cape Le Sueur" (Péron).

It will thus be seen that it is to Quoy alone that we owe the first information as to the birds found on Dirk Hartog Island. Gaimard landed on Peron the following day, and with a companion caused much anxiety through getting bushed and only turning up at the camp on shore two days later, in a very exhausted state. The expedition remained in Shark Bay a fortnight. The *Uranie* sailed again 26th September.

Dirk Hartog was not visited again by a naturalist until one hundred years later, when Mr. Thos. Carter landed on the island, 25th April, 1916. He did not remain there, however, during the breeding season, being absent during June, July, August, and the greater part of September. He returned at the end of the latter month and remained during November. An interesting account of his visit will be found in *The Ibis* for October, 1917.

* Dampier landed in Shark Bay 5th August, 1699, and gave it its name.

On my return from the Dampier Archipelago, in October, 1918 (see *Emu*, vol. xviii., part 4), I called at Dirk Hartog and spent three weeks there, landing about the middle of October. The breeding season was over; only one or two species of birds were nesting. Nearly two years afterwards I arrived in Denham, Shark Bay, 11th June, and crossed over to the island four days later, where I remained until 18th September following.

In 1918 I worked on Peron, around the township of Denham, during the month of November; but in 1920 I examined a larger area in the same locality during the latter half of September and the earlier part of October, but on each occasion the breeding season was practically over.

The year 1920 will be remembered in Western Australia for its exceptionally cold and stormy winter—heavy falls of snow on the Stirling Ranges and surrounding country and also in the Porongorup district, about 40 miles from the south coast. The influence of this exceptional weather was felt as far north as Shark Bay. On 5th August a fall of 112 points of rain was recorded on Dirk Hartog, and for several days I waded through water to reach my camp. On another occasion the vegetation at daybreak was crisp with crystals of frost—almost an unprecedented occurrence in these latitudes near the sea.

If we eliminate casual visiting birds, neither Dirk Hartog nor Peron is inhabited by a large number of species, but this is compensated for by the abundance of individuals. Mr. Carter remarks on the high percentage of Wrens inhabiting the island. If he includes in the comprehensive term of "Wrens" Wren-Warblers (*Malurus*), Field-Wrens (*Calamanthus*), Scrub-Wrens (*Sericornis*), and Emu-Wrens (*Stipiturus*), I agree with him; but if he confines the term to *Malurus* alone I think he over-estimates their numbers. It must be remembered, however, that during his last visit to the island the season's young birds were on the wing. The breeding season must commence very early. By the middle of June the Pipit (*Anthus*), Field-Wren (*Calamanthus*), and White-eye (*Zosterops*) had newly-fledged young on the wing. When the local Scrub-Wren (*Sericornis*) breeds is still a puzzle.

The special objects of the trip were to secure type nests and eggs of the Black-and-White Wren-Warbler (*Malurus leucopterus*), Textile Grass-Wren (*Amytornis textilis*), Emu-Wren (*Stipiturus malachurus hartogi*), and several other local forms, and also to learn all I could of their habits in the field, and to obtain photographs of nests *in situ*. Mr. H. L. White, of Belltrees, N.S.W., again financed the expedition in the interests of ornithological research.

My best thanks are due to Mr. J. Nicholas, the owner of Dirk Hartog sheep station, and also of Peron, for permission to collect and camp on both runs; also to Mr. and Mrs. G. C. Lloyd, of Dirk Hartog, for hospitality and aid in transport from point to point; to Mr. Len. Bryant, for obtaining for me a type-clutch of Wedge-tailed Eagle's eggs, and to Mr. Berteux for advice and

assistance during Mr. Lloyd's absence. The Western Australian Government again kindly granted me a permit to collect birds for scientific purposes, Dirk Hartog being a faunal reserve. To complete my account I have made frequent reference to Mr. T. Carter's notes. Possibly not all readers of *The Emu* have had the opportunity of studying them. I shall frequently refer in the ensuing notes to Mons. J. Arago's account of the voyage of the *Uranie*. I am indebted to Lieut.-Col. Battye, of the Perth Free Library, for hunting up this old work.*

Species and Observations.†

Dromaius novæ-hollandiæ. Emu.—A few pairs breed on Peron Peninsula. Mons. Arago, when he was searching for his lost shipmates, saw two large birds. "I was fainting with fatigue," he writes, "when at half-past one I saw two birds that I took for Cassowaries, to which I gave chase, but to my regret I could not come up with them." This encounter must have been near what is now called the "Big Lagoon." The *Uranie* was at anchor off Cape Lesueur, and a party had landed to make researches, and also to run the ship's condensing outfit, as a search for fresh water had proved fruitless. Digging above high water mark for water does not seem to have been tried.

Leipoa ocellata. Mallee-Fowl.—According to Mr. T. Carter, this species still lingers on Peron Peninsula. I saw no old mounds suggestive of its presence.

? Turnix velox. Swift Quail.—On my first visit to Dirk Hartog I flushed one or two small Quail, but did not obtain one. I caught a glimpse of a small bird just disappearing behind a mass of spinifex, near the West well, in August last. This bird looked very much like *Turnix velox*.

Puffinus sphenurus. Wedge-tailed Petrel.—I only saw this species in Shark Bay when sailing over to Dirk Hartog on 13th October. Mr. Carter gives an interesting account of a visit to Slope Island—a small, rocky islet adjacent to the Heirrison Peninsula. The birds were breeding in November under a mass of dense bushes, there being no earth on the islet in which to make their burrows.

Sylochelidon caspia. Caspian Tern.—Pairs of this fine Tern were seen on almost all parts of the coast-line. I believe they breed on Bird Island, a small, sandy islet near the Quoin Bluff, on the east side of Dirk Hartog.

Sterna cristata. Crested Tern.—Not so common as the foregoing species, and I did not hear of any breeding colony. However, Terns are all grouped together as "Divers" by the pearlers and others around Shark Bay.

* "Narration of a Voyage Round the World in the *Uranie* and *Physicienne* Corvettes, commanded by Captain Freycinet, during the years 1817 to 1820, on a Scientific Expedition undertaken by order of the French Government, in a Series of Letters to a Friend," by J. Arago, Draughtsman to the Expedition. To which is prefixed the Report made to the Academy of Sciences on the General Results of the Expedition. London: Trentel and Wurtz, 1823.

† Except in recently discovered birds, nomenclature is in accordance with R.A.O.U. Check-list.

Sternula nereis horni (Mathews). White-fronted Ternlet.—This was a fairly common species on the shores of both Dirk Hartog and Peron. On 24th September I found a small colony breeding about two miles from Denham. The eggs, as usual, were laid in slight hollows scratched in the sand just clear of high-water mark. About a week later several eggs were sent me from Dirk Hartog; they had been taken on the beach within a mile of the homestead.

Onychoprion anæsthetus novæ-hollandiæ (Mathews).—The beautiful Bridled Tern was frequently seen in pairs. Mr. Carter obtained an egg on Slope Island, but I saw no nests myself. In November, 1918, I met a Malay, near Denham, who was carrying a specimen he had just shot. I noted that the iris was white.

Larus novæ-hollandiæ. Silver Gull.—Common and very familiar. There was usually an assembly around the station gallows, both at Dirk Hartog homestead and at Peron. A colony breeds amongst a host of Pied Cormorants at the Quoin Bluff, but the eggs are in much request by the coloured crews of the pearling boats. I saw only two nests with eggs and a few young in down, hiding amongst the *débris* on the headland face.

Arenaria interpres. Turnstone.—Small flocks of this species were seen both on Dirk Hartog and Peron.

Hæmatopus longirostris. Pied Oyster-catcher.—More common on Dirk Hartog than on Peron. Several pairs behaved as though they were nesting on the beach to the north of the homestead.

Hæmatopus fuliginosus. Black Oyster-catcher.—A few pairs were seen on Dirk Hartog and Peron, but no evidence of their breeding.

Zonifer tricolor. Black-breasted Plover.—This beautiful but aggressive bird is a comparatively recent colonist on Dirk Hartog. A few years ago several pairs arrived and nested. Since then the species has gradually spread over the island, and is now found in many suitable spots. At the West well, where I camped for some weeks, were nine pairs inhabiting an extensive limestone flat. I put in a day or two at this well on my first visit to Dirk Hartog, October, 1918. I found the species represented by a flock, and I secured a pair of specimens. In general behaviour this Plover reminds me very much of the familiar European Lapwing (*Vanellus cristatus*), but it is more noisy than the latter, and also more pugnacious. I was unmercifully mobbed whenever I left or returned to my camp. It was very amusing the way the birds flew straight at my face, then quickly swerved off when within six feet of me, keeping up an incessant screaming during the performance. Eagles, Crows, Herons, and even peaceful Terns were impartially attacked and driven away by the Plovers. I was engaged with camp work when my attention was attracted by a pair of Plovers rising from the flat about a quarter of a mile away. They attacked and drove off a pair of Crows, and then returned to the spot from which they had risen. This was repeated when a second pair of Crows arrived. I marked the spot and walked over to it. In a few minutes I found the four beautiful green pyriform eggs. They were laid in a very slight hollow lined with sheep droppings, and surrounded by a few fragments of limestone. I photographed the eggs *in situ*. During the operation both birds were perfectly quiescent, watching me from a distance of 200 yards or more. Probably other pairs were breeding on the flat

about the same time, but the area was very extensive to search, and the birds extremely wary. I found this nest on 15th July. The breeding season is evidently early.

Squatarola helvetica. Grey Plover.—I saw a few Grey Plovers at various times on the shores of Dirk Hartog. After the heavy rainstorm of 5th August, which flooded the flat at the West well, a small party was feeding near my camp. On Peron Peninsula I saw a pair or two near the Little Lagoon.

Ægialitis ruficapilla. Red-capped Dottrel.—Moderately common both on Peron and Dirk Hartog Island. Not infrequently I saw pairs feeding on the big limestone flat on the island, where I was for a time camped. I was told this species nested in some numbers at Cape Peron.

Limosa uropygialis. Barred-rumped Godwit.—I watched small parties of this species feeding at low water, not far from the homestead on Dirk Hartog.

Numenius cyanopus. Curlew.—A few pairs were seen, and often heard calling both on Dirk Hartog and Peron Peninsula.

Numenius uropygialis. Whimbrel.—Seen occasionally, but not so common as the last-named species.

Actitis hypoleucus. Common Sandpiper.—One or two seen to the south of Denham, and again around the shores of the Little Lagoon.

Glottis nebularius. Greenshank.—A small party seen on Dirk Hartog Island.

Pisobia ruficollis. Little Stint.—The commonest wader on the shores of Shark Bay.

Pisobia acuminata. Sharp-tailed Stint.—A few seen in company with Little Stints at low water.

Ancylochilus subarquatus. Curlew Sandpiper.—Mr. T. Carter includes this species in his list. I think I saw it at the Little Lagoon on Peron Peninsula.

Burhinus grallarius. Stone-Curlew.—I encountered this species on Dirk Hartog only, where pairs appeared to occupy all suitable haunts. Had I camped on Peron no doubt I should have heard it there too. At the West well camp a pair haunted a hillside about half a mile away during the day time. More than once I saw them quietly stealing away amongst the innumerable bushes. I think they originally intended to nest on a limestone ridge out of sight of my camp; but a pair of Crows built a nest in a clump of eucalypts growing there. This appeared to drive them to another limestone outcrop within sight of my camp. They were often very near, after sunset, when feeding on the flat. 4th August was persistently wet, and I had to remain at home. In the afternoon my attention was attracted by a fine Harrier beating the hillside opposite. When hovering over the limestone ridge it made a swoop at something on the ground. This was followed by angry cries, and presently a male and female Stone-Curlew rose up. The male soon settled again, and the Harrier cleared off; but the female flew in a wide circle for several minutes around my camp. The rain became heavier, and it was not till late next morning I was able to wade out. I immediately made for the scene of the disturbance. Both of the Curlews were there, and, on my coming near, quietly disappeared amongst large *Acacia* bushes.

After a search of a few minutes I found a beautiful pair of boldly blotched eggs with a rather dark background. There was no nest, the eggs being laid amongst some blocks of limestone.

At the Ten-mile well were several pairs. I was camped in a boundary-rider's hut, and at night Stone-Curlews came within a few yards of the door. I think one pair bred about a quarter of a mile away on a limestone outcrop, but I fear the Crows got their eggs. I observed a party of the latter mobbing one of the parent birds In walking out to the Quoin Bluff, where the Pied Cormorants bred, I twice nearly walked over a Stone-Curlew. I searched in vain for another nest.

Eupodotis australis. Bustard or Wild Turkey.—Frequently seen on Dirk Hartog, and occasionally near the Little Lagoon on Peron Peninsula. On the island I seldom walked from my camp to the homestead without seeing a young male bird. By cautious tracking I often got within a few yards of this individual. At the Ten-mile I met with a party of three—male, female, and a nearly full grown young bird. The male was a very fine bird, and exhibited much pale grey in the flight feathers. At the hotel in Denham I was shown several locally-procured eggs.

Demiegretta sacra. Reef-Heron.—A few pairs found around rocky points on Dirk Hartog Island. Near Notch Point a portion of the cliff had been undermined and had fallen forward. Between the fallen mass, weighing many tons, and the cliff was a fissure wide enough to pass easily through. In various cavities were three nests of the Reef-Heron, but only one was occupied at the time of my visit; this contained two incubated eggs (7th August). The sitting bird nearly flew in my face. I had walked silently along the sandy floor of the fissure and surprised her on the nest.

Phalacrocorax hypoleucus. Pied Cormorant.—Two large breeding colonies exist on Dirk Hartog Island—viz., at the Quoin Bluff and at another headland to the north, generally known as "Shag Mia." The Pied Cormorant is one of the most conspicuous birds in Shark Bay, and, if interesting, is generally regarded as a nuisance. One reason for its unpopularity is its habit of perching on the pearling luggers, which are polluted by its limy excreta. Some owners have gone to the trouble of erecting perches in the water in the hope that the birds would prefer them to the jib-booms or gunwales of the luggers; but the birds are so numerous that the nuisance was not much abated by this device. Others, again, resorted to having a cat on board; but this, too, had its disadvantages. Owing to the shallow water the fleet has to anchor nearly half a mile from the shore.

When camped at the Ten-mile well I several times walked out to visit the colony on the Quoin Bluff. The upper part of this prominent headland consists of perpendicular limestone cliff, the haunt of a few pairs of Kestrels. The lower portion of the cliff is a slope at an angle of about 35°. Walking about this slope is not difficult, owing to the earth being soft and ensuring an easy foothold. The Cormorants were nesting here in great numbers, occupying an extent of nearly a quarter of a mile of the face of the headland. The nests, as a rule, were in groups of greater or lesser numbers, and I found and photographed a group of nests actually on the summit of the cliff. The vast majority of nests contained well-grown young, many on

the verge of flying. Down on the rocks at the water's edge were large parties of young and birds of the previous year. A rocky islet near the homestead was much frequented by non-breeding birds. At the colony old birds sat on their nests quite undisturbed by my presence, and right in the midst a pair of Sea-Eagles (*Haliaëtus leucogaster*) had hatched two young ones. The rock on which the Eagles had built was thickly surrounded by Cormorants' nests. I found one small group of nests, all of which contained eggs. Three was the maximum number.

The breeding season must commence early in June. I was informed when I landed that the birds on Shag Mia were already hatching their eggs.

Mons. Arago has the following note, which undoubtedly refers to Cormorants. He and a companion were searching for Mons. Gaimard and another of the party, who were missing. He writes :— "We proceeded toward the lake (*i.e.*, the Big Lagoon), along which we marched for two hours. . . During the search guns were fired off, the report of which disturbed . . . prodigious numbers of birds, in plumage resembling our Ducks and in voice our Ravens." The search proved fruitless, the only result being the discovery of a "half-buried pair of trousers that we knew belonged to Mons. Gaimard."

Some controversy has recently taken place in *The Emu* with regard to the food of Cormorants. As far as Shark Bay is concerned, when the breeding season is on the staple diet is fish. No doubt species of indifferent quality, as far as human food goes, are eaten with other valuable kinds. Twice, on sailing across the sound from Denham, a Cormorant was observed at close quarters struggling to get down a large flounder.

At the Quoin Bluff is a good schnapper ground, and I found it took up far less time to walk from camp to the headland and catch a few schnapper than to go right in to the homestead for meat. A convenient method of getting a fish bait was to fire off a gun near a group of well-grown young Cormorants, which, in their fright, promptly disgorged, in a very sound condition, their morning's meal. Once, when I adopted this stratagem, a fine young bird rolled over and over down about ten feet of the cliff face ; before he pulled up he disgorged four parrot-fish, each about five inches in length. These Parrot-fish all came up *abreast*. Amongst other species of fish I obtained in like manner I identified a garfish to inches in length, young schnapper and mullet up to six inches. I estimated the number of nests at over 2,500. The majority contained three young birds. I was informed the colony at Shag Mia had an equally abundant population. The consumption of fish must be enormous. I do not know what enemies the Shags have to keep down their numbers, but I saw evidence that the Sea-Eagles occasionally preyed on the young birds. The Silver Gulls, too, were not above devouring their eggs when they got the chance. Despite the vast numbers of Shags in Shark Bay, the fishing grounds there are considered amongst the most prolific in Western Australia.

Pelecanus conspicillatus. Pelican.—I occasionally saw small parties of Pelicans on the shores of Dirk Hartog, and also on Peron. Mr. T. Carter writes that an island near the eastern coast of Shark Bay had, in bygone times, a large breeding colony established there, and he thinks the species may nest there at the present day. Mons.

Arago writes: "At length we returned by the Bay of Seals, where we saw prodigious numbers of these animals, which contended, no doubt, with clouds of Pelicans assembled at the south point of the cove for the sovereignty of the place, which I yield to them with all my heart."

Circus assimilis. Allied Harrier.—Pairs seen in various parts of Dirk Hartog Island, and once or twice on Peron Peninsula. I tried in vain to locate the nest of a pair which haunted the neighbourhood of the West well.

Astur cruentus. Lesser Goshawk.—A pair occasionally seen near the Ten-mile well.

Accipiter torquatus. Sparrow-Hawk.—I often saw a male, and occasionally a female, of this species near the hut I was occupying at the Ten-mile well. I hoped they would breed in an adjacent wanyu thicket, but I failed to find their nest.

Uroaetus audax. Wedge-tailed Eagle. Though much persecuted, this species holds its own on Dirk Hartog. It is more abundant at the north end than in other parts. During my recent visit several nests were found. Mr. Len. Bryant very kindly procured me a fine pair of eggs taken from a large nest of sticks newly lined with green leaves. This nest was placed on a spur of rock that had broken away from the cliff on the west side of the island, and was reached with some difficulty. The site was about 150 feet from the waves below. Nests have often been found placed on large bushes or wanyu trees, and I was told of an old one built on the spur of a ridge at the foot of the main range of hills traversing the island. On Peron Peninsula the Wedge-tailed Eagle is much less common; I saw only one bird myself.

Haliaëtus leucogaster. Sea-Eagle. Not so common as the Wedge-tailed Eagle, but pairs breed around the coasts of Dirk Hartog Island, and to a lesser extent around the Peron Peninsula. The only nest I examined was the one before mentioned, amongst the Cormorants at the Quoin Bluff. It was a poor structure—a few sticks arranged in a rough circular form with a very scant lining of seaweed. It contained two Eaglets about a month old. A pair of eggs was taken in August from another headland near Herald Bay. These were secured by an aborigine, who boiled them with a view to making a meal of them. They proved too strong even for his taste. At the West well Sea-Eagles several times perched on the vane of the windmill close to my camp.

Hieracidea berigora. Brown Hawk.—Sparingly distributed throughout Dirk Hartog and the Peron Peninsula. At the former locality I was shown a pair of fresh eggs taken about the end of August. A pair near my Ten-mile camp drove away the lawful owners of a Crow's nest. I left the locality before the eggs were laid.

Cerchneis cenchroides. Kestrel.—Fairly common around Shark Bay, breeding in cliffs, and also on Peron, in old Crows' nests in the mangroves. Another pair had selected an unusual place, the nest being actually on the ground. A hole had been excavated in a corner formed by a galvanized iron fence erected around an open water-hole. I was told four eggs were subsequently laid. Another nest was a natural cavity in a huge rock; this was partly filled with sand, on which the four eggs were laid

Pandion leucocephalus. Osprey.—Ospreys breed in several places on Dirk Hartog, notably near Notch Point and at the South Passage. Some of the nests, from being used year after year, have attained a considerable size. I photographed one nest *in situ*, but this was robbed during my absence at the Ten-mile well. I could not trace who had taken the eggs. I fear they were only destroyed. Other pairs breed around Peron Peninsula. I often saw Ospreys perched on the masts of the luggers at anchor at Denham.

Ninox ocellata. Marbled Owl.—A non-breeding bird was shot at the West well. It appeared to be a stray. It was observed, at intervals, for some weeks perching on the top rail of a fence.

Euphema petrophila. Rock-Parrakeet.—According to Mr. T. Carter, this species occurs on Dirk Hartog and also on Slope Island. He gives an interesting account of a visit to the latter locality in the Government cutter *Shark*. Rock-Parrakeets were seen, but no nests found. I searched the whole of the Quoin Bluff and also Notch Point for this species, but absolutely without success. Mr. Carter states that it is found on Peron Peninsula too.

Eurostopodus guttatus. Spotted Nightjar.—I saw nothing of this Nightjar during either visit to Shark Bay, but Mr. G. C. Lloyd found an undoubted egg on one occasion. I am inclined to regard it as a casual visitor to Dirk Hartog Island.

Cypselus pacificus. White-rumped Swift.—Mr. Carter observed this species at Denham, 13th January, 1917.

Cuculus pallidus. Pallid Cuckoo.—Mr. Carter includes the Pallid Cuckoo in his list of birds seen on Dirk Hartog; but only a single example was met with. I, too, found it very uncommon. One individual was heard calling in the early mornings for several weeks at the West well.

Chalcococcyx basalis. Narrow-billed Bronze-Cuckoo.—Not very much in evidence at Shark Bay; but at Dirk Hartog I found its egg in Black-and-White Wren-Warblers' (*Malurus leucopterus*) nests on two occasions. I also procured a fully-fledged young bird in September at the Ten-mile well.

Hirundo neoxena. Welcome Swallow.—Common at Shark Bay. On Dirk Hartog breeding at the homestead, and also in the boundary-riders' huts, and even on the sides of the rocky water-holes. Many haunt the faces of cliffs.

Petrochelidon nigricans. Tree-Martin.—Seen on Dirk Hartog, probably migrating.

Cheramœca leucosternum. White-backed Swallow.—A pair or two breed in the sandy cliffs near Denham. A nest I examined second week in October contained four young birds, which flew out as I enlarged the tunnel.

Melanodryas picata. Hooded Robin.—A few pairs on Dirk Hartog and also on Peron were breeding.

Petroica goodenovii. Red-capped Robin.—A male, in full plumage, and a second one, not fully adult, were seen perched on bushes and uttering the familiar call near the Ten-mile well; probably only casual visitors.

Rhipidura preissi. Western Fantail.—Seen by Mr. T. Carter in the mangroves on Peron Peninsula.

PLATE XVII.

Nest of the Field-Wren (*Calamanthus campestris hartogi*).

PHOTO. BY F. L. WHITLOCK, B.A.O.U.

Rhipidura motacilloides. Black-and-White Fantail. — Common around Shark Bay; breeding on Dirk Hartog, October, 1918. A pair bred at a pearlers' camp on Peron Peninsula, the nest being actually placed in the building.

Graucalus melanops. Black-faced Cuckoo-Shrike. Mr. Carter records a single pair on Dirk Hartog. It is evidently only a casual visitor.

Pomatostomus superciliosus. White-browed Babbler. Absent from Dirk Hartog, but found sparingly on Peron. Saw the remains of old nests.

Calamanthus campestris hartogi and **C. c. peroni.** Field-Wrens. The Field-Wren of Dirk Hartog is said by Mr. Carter to differ from that on the Peron Peninsula sufficiently to constitute a sub-species. The Dirk Hartog variety is widely distributed over the island, being a common bird, and one of the few that there breaks the silence of the bush with its cheerful little notes. It inhabits the steep slopes of the main ridge and also the valleys or headlands covered with low scrub near the coast. It is by no means shy, and is usually observed singing from the topmost spray of some dead bush.

It must be a very early breeder. By the middle of June fledged young were on the wing. Possibly pairs may breed twice in the season, as I found young in the nest in September. I took a nest with three eggs, 28th June. These eggs were somewhat incubated. The female sat closely, only leaving the nest when I was a few feet away. The site chosen was a little mound of earth, with a small heath-like plant growing on the summit. The nest was well concealed. Two other nests were in similar situations, but a fourth was not so carefully hidden. I was too late for nests on Peron Peninsula, but saw a fair number of birds. Young were on the wing when I landed in the middle of September. There would be nothing remarkable in the Shark Bay Field-Wrens differing from birds inhabiting the hot interior—say around Lake Austin—where the average rainfall is barely seven inches and the general elevation of the country about 1,300 feet; but it requires a fine discrimination to detect differences in plumage in local clans of a species separated from one another by a strait only about 20 miles wide. (For further remarks see Campbell, *Emu*, xviii., p. 257.)

Cinclorhamphus cruralis. Black-breasted Song-Lark. — A single male watched for several weeks at the West well. It had no mate, and was taken as a type. A pair was evidently about to breed early in July in a locality three miles to the north. Probably only casual visitors.

Ephthianura albifrons. White-fronted Bush-Chat. This species was seen around the West well on my first visit to Dirk Hartog, and again in the months of June and July, 1920. Out of about fifteen or twenty birds, however, in the latter instance, I could see only one adult pair. The other individuals were probably last year's young, or some of them may have been hatched very early in the season. Not observed on Peron, but probably lives there on the samphire flats.

Ephthianura tricolor. Tricoloured Bush-Chat. — Mr. Carter observed three on Dirk Hartog, where it is no doubt an occasional visitor.

Acanthiza whitlocki. Whitlock Tit-Warbler.—Seen on Peron only, where specimens were obtained in November, 1918, and several more were seen amongst big acacia bushes in September and October of the present season.

Acanthiza tenuirostris (morgani). Small-billed Tit-Warbler.—Several specimens obtained in November, 1918, near Denham. This record is a farthest west for the species. No *Acanthiza* appears to inhabit Dirk Hartog. Considering the amount of cover, this is remarkable.

Sericornis maculata hartogi (Carter). Spotted Scrub-Wren.—Very common on Dirk Hartog, haunting the larger bushes, especially where there are dead ones by preference. It often happened, when I found a *Malurus* or other small nest, that the owners were invisible. Whenever I attempted to call them up, a pair, or more often three individuals, of this Scrub-Wren invariably put in an appearance. It is common on Peron Peninsula too, but hardly so numerous as on Dirk Hartog. I spent a lot of time watching this species in the hopes of finding a nest, but was completely baffled. I saw one pair only, accompanied by a brood of three young ones; I am therefore inclined to think it breeds at the end of summer—March or April. On the Peron Peninsula an old nest was found which, I think, was that of a *Sericornis*. It was of the semi-domed type, and was resting very low down in a large dead bush. For this supposed new subspecies see Campbell's critical remarks, *Emu*, xviii., p. 259.

Malurus cyanotus. White-winged Wren-Warbler.—Without being considered common, this species may be always found in suitable haunts on the Peron Peninsula. It is absent from Dirk Hartog, where its place is taken by the Black-and-White Wren-Warbler (*M. leucopterus*).

In Mr. Carter's account of his visit to Shark Bay, in *The Ibis* (1917), this species is figured in colour (plate x. for a special purpose. Gould described, from a stuffed specimen, a blue white-winged Wren having a tract of white feathers extending right across the back. The plate accompanying Mr. Carter's article shows a bird answering to this description. Personally, I have never met with a White-winged Wren showing this characteristic so perfectly; but I could easily make up a skin to do so. All the White-winged Wrens I have examined show a parting, like that of the human hair, down the centre of the white feathers. This widens out towards the rump. Careful observations have convinced me that, if the wings were cut off at their insertion, all the white feathers would come away with them, none being actually attached to the back.

Malurus leucopterus. Pied Wren.—Black-and-White Wren-Warbler.—We owe the discovery of this remarkable little Wren to Mons. Quoy, one of the surgeons of the *Uranie*, in the year 1820. We owe its re-discovery to Mr. Thos. Carter nearly a hundred years later—that is, as far as Dirk Hartog Island is concerned. In the meantime, another closely related Pied Wren had been found on Barrow Island, some 400 miles further north. This has been described by Mr. A. J. Campbell and named *Malurus edouardi*. It has fallen to my lot to take the type nests and eggs of both varieties. I have already related my experiences with regard to the Barrow Island form (*Emu*, xviii., April, 1919), and now record my observations on the Pied Wren of Dirk Hartog.

It is a common bird. I am glad to say, and, despite the numbers of cats living a bush life on the island, it is holding its own. Its numbers in relation to those of its congeners *Malurus assimilis*- I estimate at twenty to one, even allowing for the more silent and secretive habits of the latter. Though it has its preferences, I visited no part of Dirk Hartog where it was not present. When I state that I frequently saw a male sitting on a fence just outside the wool-shed door, and that I photographed a nest which had contained a brood of young within a very short distance of the homestead, and found another nest containing eggs not a quarter of a mile away, its familiarity will be at once apparent. Again, I climbed nearly to the highest point of the ridge traversing the island, known as Herald Heights (600 feet), and found pairs or parties of Pied Wrens right up to the summit. Further, I found two nests, one with young and one with eggs, close to the seashore at Notch Point. But the favourite haunts are undoubtedly big, fairly open flats, where salt-bushes of various species are abundant, and the scrub generally is of a more dwarfed character. During the breeding season the male, in nuptial dress, is not difficult of approach, and on numerous occasions I have watched him at a distance of a few feet. The females and immature birds will almost come to one's feet if called up and the observer stands quite motionless. The nuptial male, however, is more silent than males in brown plumage, and it was seldom I heard him uttering the familiar reeling notes. I found an interesting series of nests. The first I discovered (6th July) was in a small, half-dead bush growing in a little gully at a height of about 400 feet in the foothills. I had observed several birds about some five or six days previously, and at length found the nest, after a close search; it contained three eggs. I surmise birds were breeding in the foothills earlier than on the lower ground, through the situation being sheltered from the heavy westerly gales and rain-storms, and having the benefit of the early morning sun—being generally warmer, in fact. Other nests were in low, heath-like scrub, almost resting on the ground; also in salt-bushes, and, around the Ten-mile well, large, very prickly *Hakea* bushes were chosen. I seldom discovered a nest through flushing the sitting bird. In only one or two cases did this happen. The majority of the nests were well concealed. One, placed inside a dense but small prickly bush with a white flower, was so carefully hidden that, had the female remained quiet, I should have passed it by; another nest, however, placed in a dead bush, was visible 20 yards away. I was examining a nest in course of construction, and situated in a small salt-bush, where the female remained motionless within a few inches of the nest. In going to and from camp to the Ten-mile well for water, I passed very frequently a large *Hakea* bush. Walking nearer one day, I saw a Pied Wren's nest, and cautiously inserted a finger. I touched what I thought was a young bird. I left it undisturbed for nearly a week, and then thought I would see how the young were growing. To my surprise there were three fresh eggs. I had actually, in the first place, touched the female bird in the nest without causing her to leave her charge.

The majority of nests contained three eggs, some only two, and, again, several as many as four. Twice I found Cuckoos' eggs viz., those of the Narrow-billed Bronze (*C. basalis*). But in the first case the Cuckoo's egg was on the ground, just underneath the Wren's nest, which contained two incubated eggs. When I find a small bird's nest

with incubated eggs, but not a full complement, I generally examine the ground below, and have more than once found a Cuckoo's egg in this manner.

The greater number of nests were very low down—a height of one foot would be the average; but two nests were placed in the topmost branches of *Hakea* bushes, the highest being about three and a half feet from the ground. Mr. H. L. White is describing the eggs and nests. One fact relating to the latter rather surprised me. Vegetable down—*i.e.*, small plumed seeds—was invariably used in the lining in preference to sheep's wool, which might have been easily procured close at hand. When the stems of *Triodia* had matured seed, and were drying off, this Wren often gave its nest a finishing touch by weaving the feathery heads around the entrance. It was often necessary to spend an hour waiting for a Wren to appear and own a nest where the full complement of eggs had not been laid. In one case the first arrivals were a party of Purple-backed Wren-Warblers (*M. assimilis*), comprising two nuptial males and three or four brown males or females. I was not to be taken in, and at length two brown-plumaged Pied Wrens (*M. leucopterus*) put in an appearance, one of which came up to the nest. I once or twice flushed the female from a nest containing young only a few hours old. I waited about for a long time, wishing to learn if the male helped in feeding the offspring; but neither male nor female came to the nest whilst I remained near. I am inclined to the opinion that newly-hatched young require no food for the first 24 hours. I had the same experience with the local Emu-Wren (*Stipiturus*).

It is very easy to distinguish the brown-plumaged birds of *M. leucopterus* from those of *M. assimilis*. The latter possess hazel-brown beaks and are much more robust generally, apart from the wings and flanks being of a different tint. Call note and alarm note, too, are distinct.

The breeding season, in an average year, extends from June to the end of September. Many pairs rear two broods.

Malurus assimilis. Purple-backed Wren-Warbler.—Mr. Carter calls this the Western *Blue-breasted* Wren. Certainly, the feathers of the breast, if held in certain lights, are *black shot with blue*, but the true Western Blue-breasted Wrens are *Malurus pulcherrimus* and *Malurus elegans*. Viewed from any angle, the breast feathers of these two Wrens show a deep indigo tint. This Wren is found on Dirk Hartog, and more commonly on Peron Peninsula. It haunts very large *Acacia* or other well-grown bushes rather than the salt-bush country. Mr. Carter states that he has never heard this species uttering any song. It has a few brief rattling notes and a high-pitched alarm note, like that of the Grass-Wren (*Amytornis textilis*); but I agree with him that it is generally a very silent and unobtrusive bird, though this is not due to timidity. I found it nesting on Dirk Hartog Island.

Stipiturus malachurus hartogi. Dirk Hartog Emu-Wren.—I did not find this Emu-Wren so common as I expected after reading Mr. Carter's notes. Possibly I did not search far enough north. On my first visit to Dirk Hartog, October, 1918, I met with but one pair, and secured the female. I was naturally anxious to become acquainted with the male, as the local race seems to exhibit well-marked differences from the coastal birds in the extreme south of Western Australia.

I found a nest containing two incubated eggs on 11th July, 1920,

Nest of the Emu-Wren (*Stipiturus malachurus hartogi*).

PHOTO. BY F. L. WHITLOCK, R.A.O.U.

and spent hours trying to get a view of the male. I could see both male and female hopping about in a large *Acacia* bush a few feet away; but, though I took up a position at a distance, and used a field-glass, neither would come out of cover. On another occasion I waited a long time near a nest containing young a day or two old, but my patience gave out, aided by the immediate presence of eight young camels, and I did not get a clear view of either parent. I found several nests with full clutches of eggs. The favourite haunt was a tract of scrub about 18 inches high, interspersed with a few dead bushes, around and through which various grasses were growing. The prevailing bush bore a small, bright blue "forget-me-not-like" flower, with short leaves of a vivid green. Compared with nests of *Maluri*, those of this Emu-Wren were poor affairs. They were smaller, more globular, and only half-lined. It was quite easy to see right through them. The eggs were larger than some of those of the Pied Wren, but were more profusely spotted—I might even say blotched.

Amytornis textilis carteri. Dirk Hartog Grass-Wren; and **Amytornis textilis.** Grass-Wren (Peron Peninsula).—I am at present treating the above as one and the same. I believe the type was obtained by the *Uranie* expedition in 1818 on the Peron Peninsula.

It is hard to conceive that the Dirk Hartog birds should show any but the slightest differences from the type obtained a few miles away, the climatic conditions being practically similar and the isolation on Peron Peninsula being only in a smaller degree less effective. It must be remembered that only two specimens have, until my latest visit to Peron, been recently obtained there. Mr. Carter obtained a male, and I a female. The material for comparison is therefore of the scantiest; but that the Dirk Hartog birds, and also those on Peron, should differ from specimens obtained by myself some twelve or more years ago at Lake Austin, in a hot, dry climate, and at an elevation of 1,200 feet, is not surprising. I regret that, owing to the ravages of cats on Dirk Hartog, I did not see a single example during a persistent search of three months' duration. I had my experiences with the interior form at Lake Austin and Lake Way to guide me, so I do not think I was personally at fault. On my first visit, however, in October, 1918, I frequently saw a pair haunting some extra large *Acacia* bushes not half a mile away from the homestead. They were excessively wary, and I failed to secure a specimen.

Mr. G. C. Lloyd, the manager of Dirk Hartog sheep station, knows the species well since it was brought under his notice by Mr. Carter, and he recently told me that for some time back he had not observed an example. The native marsupial animals have nearly disappeared, too, and the swarms of domestic mice Mr. Carter mentions are now reduced to insignificant numbers at the homestead and out-camps. This is all due to cats. I do not think I ever went out without either seeing one or finding recent traces of these pests.

For an account of Mr. Carter's most interesting notes on the discovery of the Grass-Wren (*Amytornis textilis*) on Peron I must refer readers to Mr. A. J. Campbell's paper on "Additions to the H. L. White Collection" (*Emu*, xviii., April, 1919). I should like to have quoted Mr. Carter's experiences* with the Dirk Hartog form, but space will not permit.

* *Ibis*, October, 1917, pp. 504–611.

On crossing over to Peron Peninsula, in September, 1920, I at once commenced a search for the Grass-Wren near the haunt I discovered two years previously. At the second attempt I was successful. I sat down under the lee of a large shady bush growing in a small neighbouring valley to eat my lunch. I had hardly commenced when my attention was arrested by the sound of three peculiar high-pitched notes uttered in a descending scale, very difficult to express on paper. I "chirped" in reply, when out hopped a fine male Grass-Wren at a distance of 10 yards. We watched one another in silence for several minutes. I quickly finished my lunch and commenced a systematic search amongst all the neighbouring salt-bushes or other likely-looking shrubs for a nest. About 50 yards from where I commenced I found a very neat and substantial nest, empty save for a few dried leaves, but it was in excellent preservation. I was at once struck with its resemblance to a nest of the Western Grass-Wren *A. gigantura*, which I found in 1908 on the East Murchison. Like the latter, it was quite open, no dome of any description being noted. I think this nest belonged to the previous season. Further research revealed a new nest from which the young had not long departed. I pulled this to pieces in the hopes of finding fragments of egg-shell, but without success. A third and older nest contained pieces large enough and sufficiently well preserved to enable me to determine that the eggs are very similar to those found in the East Murchison nest twelve years ago.

In a large valley nearer the township of Denham I found a family of Grass-Wrens, but failed to find further nests except a deserted one. I was able, however, to secure an adult female bird and also one well-grown nestling.

The female of the Grass-Wren (*A. textilis*) is distinguished from the male by her slightly smaller size, distinctly shorter tail, and by chestnut feathers on the flanks. In the nestling procured a male the tail was very well developed, and the chestnut flank markings were replaced by light fawn colour. I found the Grass-Wrens on Peron just as wary and difficult to observe as those at Lake Austin and Lake Way. The reason they are still present on Peron appears to be the abundance of rabbits, on which the bush cats prey in preference to birds.

Artamus cinereus melanops? Grey-breasted Wood-Swallow.—This Wood-Swallow, though not rare, was rather local on Dirk Hartog. On 19th August I saw a small flock land near the Quoin Bluff. A pair or two lingered near the Ten-mile well, and I saw one bird carrying grass; but found no nests up to the time of leaving.

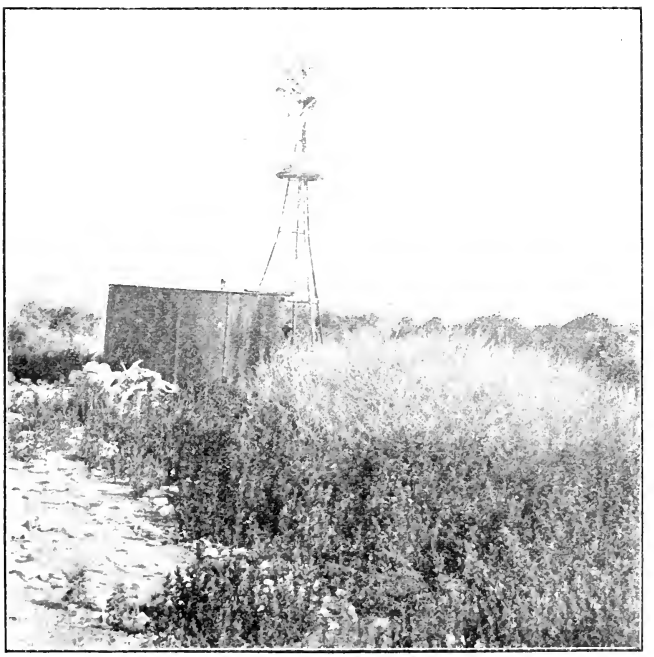
Artamus minor. Little Wood-Swallow.—On 9th September I was returning from the Ten-mile well. Late in the evening I observed a small party of this species hawking about. My gun was packed away and I was cold and stiff with riding on the top of a cartload of camp gear, drawn by five camels. The circumstances were not favourable for securing a specimen. Mr. Carter also records the species from Dirk Hartog Island.

Grallina picata. Magpie-Lark.—A stray bird was recorded by Mr. Carter.

Oreoica cristata lloydi. Dirk Hartog Bell-Bird.—Rather local in its haunts, favouring the very largest bushes, especially wanyu thickets, where it nested. I observed no difference in its well-known

notes or general conduct from mainland birds. I found several nests containing eggs. Both nests and eggs were similar to typical ones; No hairy caterpillars were found in these nests, though a hairy larva resembling that of the European tiger-moth *Chelonia caia* simply abounded at the time. Bell-Birds were frequently noted on Peron Peninsula in similar haunts.

Corvus, sp. ? Crow. Crows were plentiful both on Dirk Hartog and on Peron. On the island a favourite nesting-place was the trellis work on platform or even the head-gear of the various windmills. In one case the pump rod of the mill was actually working up and down through the structure of the nest. Numerous nests are built in wanyu bushes, and as many as six eggs are laid. At the Ten-mile well a flock generally passed the camp at dusk to roost in a neighbouring thicket. These were non-breeding birds. One shot from the



Windmill, showing Crow's Nest on staging.

PHOTO. BY F. L. WHITLOCK, R.A.O.U.

flock had the plumage much like that of the English Blackbird when changing from the mottled blackish-brown to the fully adult glossy black of maturity. Dimensions in millimeters:—Length, 440; wing, 310; culmen, 50; tarsus 53; iris brown. In another adult the iris was white with a tinge of blue around the pupil.

Sphenostoma cristatus. Wedgebill.—Fairly common near Denham, but absent from Dirk Hartog. In September young were on the wing.

Zosterops gouldi. Grey-backed White-eye.—Extremely common on Dirk Hartog, and only less so on Peron. It was nesting in a variety of situations. Young were on the wing in the middle of June, and the species was still breeding at the end of September.

Dicæum hirundinaceum. Mistletoe-Bird.—On my first visit to Dirk Hartog Island I saw one or two birds near the homestead. Mr. Carter records it as well. I saw nothing of it on Peron Peninsula, though mistletoe there was plentiful enough.

Glyciphila albifrons. White-fronted Honey-eater.—Mr. Carter observed a few in the mangroves on Peron.

Stigmatops ocularis. Brown Honey-eater.—A few singing in dwart eucalypts in the ram paddock on Dirk Hartog, and a pair at the Eight-mile well. On Peron only seen near the Little Lagoon.

Ptilotis sonora. Singing Honey-eater.—One of the commonest and certainly the most obtrusive bird both on Dirk Hartog and Peron Peninsula. It was nesting in both localities, large *Acacia* bushes being the favourite haunt. It is stated that the type specimen was obtained by the *Uranie* expedition in 1818.

Acanthogenys flavacanthus. Western Spiny-cheeked Honey-eater. Mr. Carter records two on Peron Peninsula.

Anthus australis. Pipit or Ground-Lark.—Distributed all over Dirk Hartog Island. Young were on the wing when I landed, middle of June. I found nests containing both young and eggs during the season. Two nests near my camp were swamped out by the heavy falls of rain in August (see also Campbell, *Emu*, xviii., p. 264).

Tæniopygia castanotis. Chestnut-eared Finch.—I did not see much of this species either on Dirk Hartog or Peron, perhaps owing to its being the breeding season, when the flocks break up. I found a typical nest, containing four eggs, near the West well.

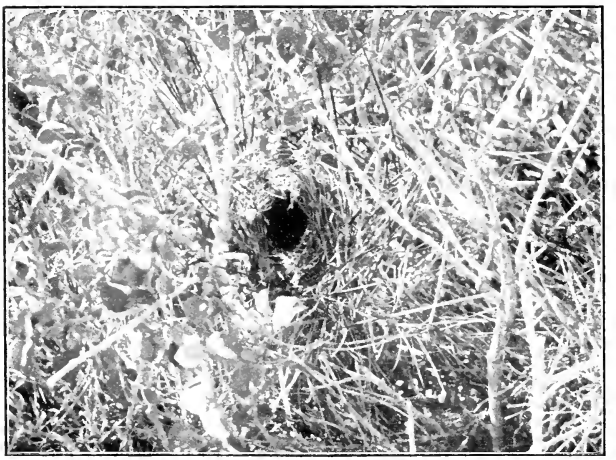
DESCRIPTION OF NEW AUSTRALIAN EGGS COLLECTED BY F. LAWSON WHITLOCK, R.A.O.U., AT DIRK HARTOG ISLAND, WESTERN AUSTRALIA.

By H. L. White, M.B.O.U., R.A.O.U.

Malurus leucopterus, Quoy and Gaimard. Black-and-White Wren-Warbler.

Nest.—Strongly constructed, of the usual *Malurus* shape, domed, with side entrance near top; length about 5 inches, breadth about $2\frac{3}{4}$ inches; entrance hole, $1\frac{3}{4}$ inches in diameter; depth inside, below entrance, $2\frac{1}{2}$ inches; constructed of very fine dried grass matted together with spiders' web, cocoons, and small

Nest of Black-and-White Wren-Warbler (*Lalage leucoptera*).



Nest of the Emu-Wren (*Stipiturus malachurus hartogi*).

PHOTOS. BY F. L. WHITLOCK, B.A.O.U.

pieces of wool, lined with pieces of fine grass, cocoons, and wool. One nest contained, both outside and inside, several coarse pieces of spinifex (*Triodia*) flower-stems.

Eggs.—Usually three, sometimes four, to clutch; shell very fine, with little gloss; ground colour white. In the matter of coloured markings they present remarkable variation, and the selection of a type is difficult. Some clutches (the majority) are marked all over, but more particularly at the larger end, with small dots and splashes of pale reddish-brown; others have a well-defined zone of brighter-coloured markings; a third variety has a cap of markings which run into one another and give a blotched appearance; a fourth variety—and the most beautiful—is boldly marked all over with large spots of bright brownish-red.

The type is more difficult to select than was the case with *Malurus leucopterus edouardi* (Campbell) from Barrow Island, described by me in *The Emu*, xviii., p. 127 (by the way, the page in question is wrongly marked "vol. xvii., 1917"). The Dirk Hartog eggs are more heavily marked, and I have seen no pure white specimens; they are also narrower ovals. I have selected as type a clutch of four eggs marked as first mentioned above—viz., with small dots and splashes.

Dimensions in inches—(*a*) .61 x .44, (*b*) .61 x .42, (*c*) .6 x .41, (*d*) .61 x .41. Taken by F. L. Whitlock, 27th August, 1920. Nest very hard to see and get at, in a prickly *Hakea* bush.

Comparison between Barrow Island and Dirk Hartog nests and eggs:—

Nest	6″ x 3″	5″ x $2\frac{3}{4}$″
Eggs (type set average)	.57 x .45	.61 x .42

It will be noted that the Dirk Hartog Island bird builds a smaller nest, but lays a longer and narrower egg. Two of the Dirk Hartog nests contained each an egg of the Western Narrow-billed Bronze-Cuckoo (*Chalcococcyx basalis wyndhami*), one of them being the most heavily-marked specimen I have seen.

Stipiturus malachurus hartogi, Carter (*Bull. B.O.U.*, xxxvii., p. 6; *Ibis*, 1917, plate 11).

Nest.—Ill-made, dome-shaped, with side entrance near top, constructed of dead grass, shreds of grass, and bark, matted together with spider's web, cocoons, and sheep's wool, with slight lining of cocoons and wool; average size about 4 x $2\frac{1}{2}$ inches; generally placed low down in a bush.

Eggs.—Usually three in number, stout oval in shape, shell slightly glossy; colour white, with light brownish-red splashes all over, but more plentiful at the larger end, where in some cases they form a well-defined cap.

Dimensions in inches of type clutch:—(*a*) .61 x .44, (*b*) .6 x .44, (*c*) .6 x .44; co-type—(*a*) .6 x .46, (*b*) .6 x .46, (*c*) .6 x .46. Taken 10th August, 1920.

There is considerable similarity between eggs of this bird and

some of those of *Malurus leucopterus*; but the smaller size of the nest and stouter shape of the Emu-Wren's eggs enable them to be readily separated by the collector.

Calamanthus campestris hartogi, Carter (*Bull. B.O.C.*, xxxvii., p. 6), or **Calamanthus campestris dorrei**, Mathews.

Nest.—Dome-shaped, with entrance very near the top, size 5 inches by 3 inches, substantially built of pieces of dried grass and herbage: lined with much finer shreds of the same materials; placed on the ground under shelter of a low bush.

Eggs.—Clutch three: shell smooth and glossy: ground colour pale chocolate-brown, with indistinct darker markings of the same colour all over the shell, but forming a cap at the larger end; they approach closely in shade to the eggs of *Calamanthus fuliginosus*. Taken 28th June, 1920.

Dimensions in inches:—(*a*) .78 x .58, (*b*) .76 x .55, (*c*) .77 x .58.

With the exception of those of *Calamanthus isabellinus*, these are the smallest eggs of the genus represented in my collection.

Corvus bennetti bonhoti, Mathews.

Nest.—A substantial structure of sticks lined with bark, and placed low down in a dwarf eucalypt.

Eggs.—Clutch six originally (one found broken in nest), of the light-coloured variety of *Corvus bennetti* eggs of Western New South Wales, the five specimens being fairly uniform in shade.

Dimensions in inches:—(*a*) 1.65 x 1.07, (*b*) 1.71 x 1.11, (*c*) 1.68 x 1.11, (*d*) 1.63 x 1.08, (*e*) 1.64 x 1.08. Taken 5th August, 1920.

Two other clutches of five and four eggs respectively, taken from a nest built on a windmill stand (see illustration), are slightly smaller than those described above, and are extremely irregular in colour, no two eggs resembling one another. Laid by the same bird and from the same nest: the clutches were taken 14th July and 6th August. A third clutch was allowed to hatch out.

The skins accompanying the eggs are evidently those of the Short-billed species. Mr. Carter calls the Dirk Hartog Crow *Corvus coronoides*, while Mr. Whitlock describes it simply as the "common Crow of the island."*

The two following may perhaps be considered doubtful sub-species:—

Oreoica cristata lloydi, Carter (*Ibis*, 1917, p. 608).

Nest. The usual substantial *Oreoica* type, placed low down in a large bush.

Eggs. Clutch four, taken 29th August, 1920; ground colour pale greenish-blue, thickly covered with small (almost circular) spots of brownish-black. Size in inches of an average specimen, 1.06 x .78.

* Recently (*Bull. B.O.C.*, xl., p. 76) Mr. G. M. Mathews has described this Crow as *C. cecilae hartogi*, comparing it with *C. c. marngli*. It would assist students better, perhaps, were new sub-species compared with typical birds, which are often more accessible than later named sub-species.—EDS.

Anthus australis hartogi, Carter (*Ibis*, 1917, p. 610).

Nest. Found 11th August, 1920, well hidden under a spinifex (*Triodia*) bush.

Eggs. Clutch three, lighter in colour than others I have seen, and without gloss. Each measures in inches .84 x .61, and is smaller than typical eggs of the Pipit from Eastern Australia, though more pyriform in shape. They are slightly larger than eggs taken by Mr. Whitlock at Barrow Island, Western Australia.

OTHER SPECIES.

Other interesting eggs taken by Mr. Whitlock at Dirk Hartog Island are as follows:—

Demiegretta sacra. Reef-Heron (dark grey variety).

Two eggs taken 7th August, 1920, from a nest composed of small sticks lined with a little soft material, placed in a cavernous hollow in a limestone cliff.

Burhinus grallarius (*broomei*, Mathews). Western Stone-Plover.

Two eggs taken 5th August, 1920, laid on bare sand between large stones of a limestone outcrop. The ground colour is light stone, with markings more distinct than usual.

Uroaetus audax (*carteri*). Western Wedge-tailed Eagle.

Pair of eggs taken 21st August, 1920, from a nest composed of sticks and lined with green leaves, placed on the spur of a precipitous cliff on the west side of the island, overlooking the Indian Ocean. This is probably the most western set of Australian Eagles' eggs on record; they are of average dimensions. One is heavily blotched with brownish-red at the smaller end; the other has a few markings of the same colour at the larger end only.

Cerchneis cenchroides (*unicolor*). Nankeen Kestrel.

Set of five very richly marked eggs taken 11th September, 1920, lying on bare sand in a cavity in a limestone headland on the west side of the island; probably a farthest west record for the Nankeen Kestrel.

Phalacrocorax hypoleucus, Brandt (*Hypoleucus varius perthi*).

Clutch of three eggs, which present no difference in shape or size from specimens obtained on other coasts of Australia. The birds were found breeding in a great colony on Quoin Bluff. The nests, made of small twigs, were placed on the remains of bushes growing on the slope of the cliffs. Thousands of young, in various stages of growth, were noted. Date, 19th August, 1920.

My collection contains a set of four eggs taken by Mr. Whitlock at Barrow Island, 25th August, 1918.

Sterna nereis, Gould (*Sternula nereis horni*, Mathews).

Clutch of two eggs taken 23rd September, 1920, on Peron Peninsula, laid in slight hollow in bare sand. Dimensions of an average-sized egg, 1.41 x .97.

In size, shape, and colour I notice no difference from typical eggs taken at Kangaroo Island, S.A.

NOTE ON THE GRASS-WREN (*Amytornis textilis*).

By H. L. White, M.B.O.U., R.A.O.U.

Recently I had an opportunity of cursorily examining, with Mr. A. J. Campbell, the series (11 skins) of this species in the "H. L. White Collection," National Museum, Melbourne.

Two pairs (♂ and ♀) from Shark Bay, W.A., and collected by Mr. F. L. Whitlock, appear to agree with three skins from the East Murchison district (also collected by Mr. Whitlock) and with the description of Milligan's *gigantura* (*Vic. Nat.*, xviii., p. 28), except that the Shark Bay birds may be a little lighter underneath, while the tail of one specimen is 110 mm.—fully ¼ of an inch longer than that given, as its chief feature, for *gigantura*. Further east a pair collected by Mr. C. G. Gibson in the region of Kalgoorlie answers Gould's plate of *macrura* (No. 30, iii., "Birds of Australia")—a darker variety of the true *textilis*, while the darkest birds are a pair taken by Capt. S. A. White still further eastward—at the Everard Mountains, which birds are apparently Mathews's *purnelli* from Central Australia (see *A. A. R.*, vol. ii., p. 99).

The interesting question arises, What bird is figured by Gould in his plate (No. 29) as *textilis*, of which he stated "I killed and dissected many examples"? Except for the absence of the dark cheek stripe the picture is suggestive of the eastern form of *A. striata*. However, it is not the typical *textilis*, which has been well represented above the name *Diaphorillas carteri* by G. M. Mathews in the *Austral Avian Record*, vol. iii., pl. 5, with full letterpress description on page 87. The original was collected by Mr. Tom Carter on Dirk Hartog Island, 1916.

It should be mentioned that, as recorded in *The Ibis* (1917), p. 605, Mr. Carter also obtained a single specimen (♂) of *textilis* on the Peron Peninsula (mainland), near the locality where Whitlock secured his two pairs.

Thus, after a lapse of a century, Quoy and Gaimard's species —"*Malurus textilis*"—has seemingly been confirmed.

A NEW SPECIES OF PTILOTIS IN WESTERN AUSTRALIA.

By Edwin Ashby, F.L.S., M.B.O.U., Wittunga, Blackwood, S.A.

Ptilotis geraldtonensis, n. sp. Geraldton White-plumed Honeyeater.

General Appearance.—A yellow form of *P. penicillata* (Gld.), with clearly-defined streaks on throat and breast; face lemon chrome (yellow) (plate iv., Ridgway's "Colour Standards"); eyelids edged with black; ear-plume black tipped with white; forehead and crown washed with bright yellow, streaked; neck, back, and wings similar in tone to specimens of *P. penicillata* from northern parts of South Australia, but outer webbing of wings brighter; tail—outer web primaline yellow, inner web of centre feathers

between yellow ochre and buckthorn brown (Ridgway's "Standards," pl. xvi.); upper tail coverts are mustard yellow (*loc. cit.*), under tail coverts pale yellow; abdomen tinged with yellowish-buff.

Measurements of dried specimen: Total length, 155 mm.; tail, 7 mm.; wing, 78 mm.; culmen, 12 mm.; tarsus, 22 mm.; iris black.

Differs from *P. carteri* (Campbell) in being less yellow on forehead and crown of head and much darker generally, also has a larger proportion of black and less white in the ear-plumes. Differs generally from *P. flava* (Gould) in being less yellow, and *flava* has no white in the ear-plume. Differs widely from *P. keartlandi* (North) in having a yellow face, forehead, and crown, which *keartlandi* has not. Differs from *P. penicillata* (Gould) in having a brighter yellow face, brighter yellowish wash on forehead and crown, pale yellow under tail coverts, and brighter yellow upper tail coverts, has more black and less white in the ear-plumes, and has bright yellow streaks on chin, neck, and chest, these being absent in *penicillata*.

Habitat.—Numerous in the creek beds at Geraldton and Dongara, Western Australia.

There is no difference between the male and female.

The credit of the discovery is quite as much due to Mr. J. W. Mellor as to myself, as we observed several specimens each while we were working together, and I found them later at Dongara.

NOTE. Mr. Mellor suggests that it may be Mr. Mathews's *Ptilotis ladasi*; this is quite possible, but we have had no opportunity to compare the skins.

Stray Feathers.

Clutches of the Bustard in Western Australia.—Referring to Mr. A. H. Chisholm's paper on the breeding of the Australian Bustard, I append notes from my old diaries as to the number of eggs laid in North-West Australia:—

2nd October, 1887.—One egg (Murchison River).
6th August, 1897.—Two nests, each with two eggs.
1st August, 1898.—One nest, with two eggs.
4th June, 1900.—One nest, with one egg.
(8th June, 1900.—Saw young birds that could fly.)
5th August, 1900.—Two nests, each with two eggs.

1897 and 1900 were hurricane years, with heavy rains, the rainfall registered by me at Point Cloates being 23½ inches in 1900 and 11½ in 1897. 1898 was also an exceptionally good year, with 14 inches. The above records of eggs found refer to Point Cloates district, excepting, of course, the first one, and are in favour of two eggs being the usual number. I have seen Bustards, with their wings expanded, driving away sheep from the vicinity

of their eggs, and have been shown a clutch of three eggs from one nest, which, from their uniform colour and markings, were apparently laid by the same bird. Have also been told on good authority of four eggs having been found in one nest. Possibly there were a pair of female birds in this case. – TOM CARTER. "Wensleydale," Mulgrave-road, Sutton, Surrey, England.

* * *

The Bronze-Cuckoo in Western Australia. Referring to my letter of 17th November, 1919 (*Emu*, xix., p. 251), I find that I have a skin of "*Chalcococcyx plagosus*" (the Bronze-Cuckoo) obtained by me at Carnarvon, W.A., on 10th August, 1911, so that it is quite probable that this species does occur on Dirk Hartog Island, although I procured only *Chalcococcyx basalis* (the Narrow-billed Cuckoo) there.– TOM CARTER. "Wensleydale," Mulgrave-road, Sutton, Surrey, England.

Notes and Notices.

OWING to the continued and increasing high costs of paper and publication, funds are much needed. Members who have not yet forwarded their subscription to the hon. treasurer, Mr. Z. Gray, 65 St. Vincent-place, South Melbourne, are requested to assist the R.A.O.U. by doing so at the earliest opportunity.

Our Honour Roll.– The Honour Board of the R.A.O.U. in connection with the Great War was unveiled by Senator Brigadier-General H. E. Elliott, C.B., C.M.G., D.S.O., D.C.M., at the Union's room, Temple Court, Melbourne, on the evening of 6th October, 1920. Mr. A. J. Campbell presided.

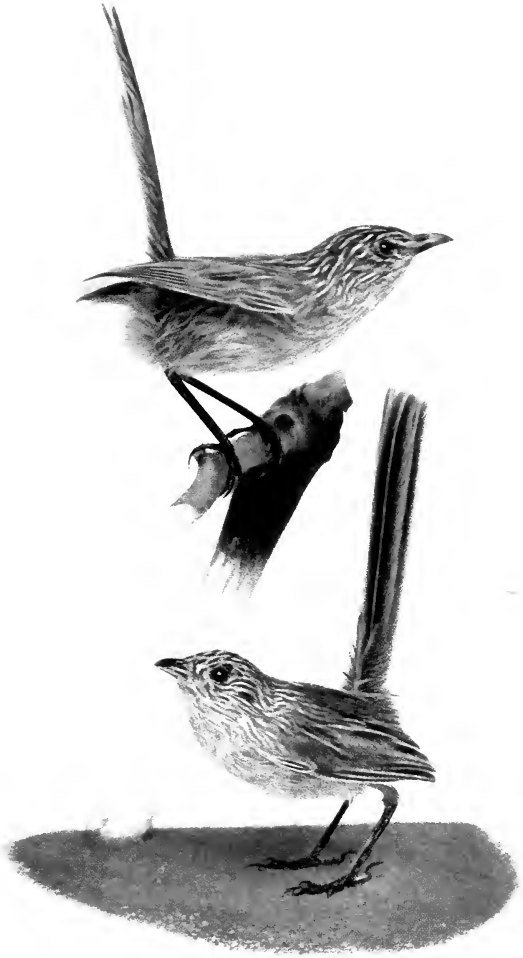
The board, which was made of wattle-wood, polished and lettered in gold, was suitably draped with flags and wreaths of flowering wattle, and contains the names of 50 members (see *Emu*, xix., p. 253) who dared to "put their lives in jeopardy" at their country's call, and, alas! of that number nine have fallen.

> "Their gallant lives they sacrificed to rescue the oppressed;
> The flowers of dear Australia—the men in khaki dressed."

Mr. J. A. Ross, on behalf of the Union, thanked General Elliott for his attendance and interest in our Honour Board. The General narrated an incident of the war, where he was instrumental in saving a room full of natural history specimens from destruction. A valuable collection of butterflies was under "bombardment" by the enemy, but it was safely removed to the Paris Museum with the loss of one insect only.

MUCH matter has had to be held over from this, a Western Australian number.

ON account of unavoidable delay, the date of publication of this number was 13th January.



GRASS WREN (*Amytornis textilis*).

Male, lower figure; female, upper figure. From the "H. L. White Collection," National Museum, Melbourne.

For remarks, see EMU, *ante*, page 190.

The Emu

Official Organ of the Royal Australasian Ornithologists' Union.

"Birds of a feather."

VOL. XX.] 1ST APRIL, 1921. [PART 4.

Nests and Eggs Not Previously Described.

BY H. L. WHITE, C.F.A.O.U., BELLTREES, N.S.W.

Atrichornis rufescens jacksoni (H. L. White).

Nest.—A dome-shaped structure, placed amongst ferns on the almost perpendicular bank of a creek; composed of dead leaves, small pieces of tree-fern, and well-bleached flat rush or scrub-grass (*Xerotes*), all very loosely put together. Outside diameter, 6 inches; height about the same; entrance at side very neat, roundish, and 1¼ inches in diameter. Lined with a peculiar composition resembling very coarse cardboard, made apparently of soft decayed wood worked up when very wet and plastered over the inside of the nest; no other lining used.

Egg (infertile, found with newly-hatched chick) resembles closely those found by S. W. Jackson in the Dorrigo scrubs of New South Wales during 1898 and 1910, but rather more elongated, and may be described as a swollen oval, measuring, in inches, .97 x .68, as against .88 x .7, an average of the Dorrigo clutches. Ground colour pale pinkish-white, well marked with specks and irregular spots of brownish-red, the markings confined chiefly to the larger end, where they form a large, irregular zone. Surface of shell fine and slightly glossy.

Taken by S. W. Jackson, 27th October, 1920, on the Macpherson Range, S.E. Queensland, at an elevation of 3,000 feet above sea-level.

Pachycephala olivacea macphersonianus (H. L. White).

Nest.—A comparatively large cup-shaped structure (resembling that of the Harmonious Shrike-Thrush, *Collyriocincla harmonica*, and the Crested Bell-Bird, *Oreoica cristata*), compactly and neatly made of long, thin twigs, large and small dead leaves, green moss, and strips from decayed palm leaves; lined with soft yellowish fern-stems and dried roots of orchids. Breadth over all, 6½ inches; egg cavity, 3⅛ inches x 2 inches. Placed 3 feet up in a spice-bush (*Helicia Youngiana*) overgrown with wire vines (*Rhipogonum Fawcettianum*).

Eggs.—Clutch, three, giving the following measurements in inches:—(*a*) 1.15 x .81, (*b*) 1.13 x .79, (*c*) 1.09 x .78. Ground colour pale yellowish-white, much darker about the larger end.

Very sparingly marked with rounded spots and blotches of different shades of umber and dark purplish-grey; markings confined, with few exceptions, to the larger end, where they form an irregular cap. Oval in shape, and much pointed at the smaller ends. Shell very fine, smooth, and glossy.

Taken by S. W. Jackson, 6th November, 1920, on the Macpherson Range, S.E. Queensland, at an elevation of 3,800 feet above sea-level.

Pachycephala rufiventris maudeæ (S. A. White).

Nest.—That of a typical Thickhead or Whistler (*Pachycephala*); measures externally 3¼ by 2¼ inches in depth; fragile structure, composed of dried rootlets and tendrils, with no lining other than fine rootlets; placed 12 feet up from the ground, in the fork of a tea-tree on large gum creek; female on nest; eggs visible from ground through bottom of nest.

Eggs.—Clutch, three eggs, swollen oval in shape; surface of shell rather fine and very glossy. Ground colour yellowish-brown, with small spots and blotches of darker brown and pale purplish-grey, chiefly confined to the larger end of each egg; they closely approach some very dark specimens of the Rufous-breasted Whistler (*Pachycephala rufiventris*). They measure, in inches—(*a*) .87 x .64, (*b*) .83 x .63, (*c*) .87 x .63. Mr. M'Gilp states this clutch is of usual coloration, and two eggs appear to be the usual clutch, but three are now and again found.

Locality.—Collected by Mr. J. Neil M'Gilp at Moolawatana, near Lake Frome, South Australia, on 11th December, 1920. Female sat closely, and did not leave nest until the branch was shaken. The tea-tree is their favourite nesting-tree, and sometimes the nest is placed in a mistletoe in these trees; height from ground varies from 5 up to 20 feet. Male frequently feeds the female on the nest.

Further Notes on Rufous Scrub-Bird and Olive Thickhead in Queensland.

BY H. L. WHITE, C.F.A.O.U., BELLTREES, N.S.W.

LAST season Mr. S. W. Jackson succeeded in securing additional specimens of both birds. Referring to my previous remarks on the Scrub-Bird (*Atrichornis r. jacksoni*) (*Emu*, xix., pp. 257, 258 and plate xlvii.), another female is similar to that figured except that the throat is slightly whiter, thus resembling more that of the male. Two immature birds accompanied her, which Mr. Jackson judged were about four weeks old. They were darker (dark shade of chestnut-brown) on the upper surface than the parent, while the under surface was more Verona brown or warm sepia, with a trace of rufous showing on the breast.

Another young specimen, about three weeks old, is similar in coloration to the four weeks birds, but has a shorter tail and no

PLATE XXI.

Nest of Northern Olive Thickhead (*Pachycephala o. macphersoniana*).

PHOTO. BY S. W. JACKSON, R.A.O.U.

Nest, *in situ*. Northern Olive Thickhead.

Nest of *Atrichornis* (Scrub-Bird) on bank of creek.

PHOTOS. BY S. W. JACKSON, R.A.O.U.

trace of the rufous under-colouring; while another immature bird (male), about eight weeks old, has almost adult plumage except that the outer webs or edgings to the wings are dark chestnut-brown and not cross-barred, as in the full adult. As Mr. Jackson, in this issue, has furnished the dimensions, details, flesh parts, &c., there is no need to recapitulate same here.

Regarding the Olive Thickhead (*Pachycephala olivacea macphersonianus*), mentioned in the same *Emu*, p. 273, and described from a single specimen, a mated pair obtained by Mr. Jackson confirms this northern sub-species, and that the type skin was a male.

Male.—Lighter-coloured generally, and more greyish (slate-grey) about the head than southern form; a distinct mottled white throat is succeeded by a greyish band on the breast, which breaks into a tawny olive or buckhorn-brown under surface. Eyes reddish-brown; feet silvery-grey; legs brownish; bill blackish-horn. Dimensions in mm.:—Length 209, wing 100, tail 95, tarsus 26, culmen 22.

Female.—Differs from male in the absence of the greyish head and breast band, but has the mottled white throat. Eyes coffee brown; legs and feet silver-grey; bill—upper mandible blackish-horn, lower mandible much lighter coloured. Dimensions:—Length 213, wing 102, tail 98, tarsus 30, culmen 22.

Second Trip to Macpherson Range, South-East Queensland.

By SIDNEY WILLIAM JACKSON, R.A.O.U., BELLTREES, SCONE, N.S.W.

SEPTEMBER 20th, 1920, found me engaged putting up camp again in the luxuriant and wonderful jungles on top of the Macpherson Range, in south-east Queensland, where success had favoured me when collecting the first known female specimen of the Rufous Scrub-Bird (*Atrichornis rufescens*) in 1919, as recorded in *The Emu* (vol. xix., part 4).

The camp was situated at an altitude of nearly 3,500 feet above sea-level—several hundred feet higher than the previous camp. At this elevation, and within less than 30 miles of the ocean, the camp was frequently enveloped in clouds and mist, especially after a warm day. Often it would rain all day about the camp, yet not much over 1,500 feet below often not a drop fell. The days were mostly warm, but pleasant, and the nights rather cold, except early in December, when they were sometimes warm and sultry. Many severe cyclonic storms, accompanied by heavy rain and hail, occurred during October and November, doing much damage in the great tall scrub or jungle, as well as smashing and destroying rare nests and eggs of birds which were under observation. However, perfect specimens were found later.

During 24th October five storms passed over the camp, and extensive damage was done here and as far north as Brisbane. The continual heavy rains and gales came chiefly from the south-east, and during our time on the range (from 20th September to 12th December) nearly 30 inches of rain were registered at our camp, named "The Ark," and situated in a small clearing in the jungle. Cooking food was at times difficult—indeed, impossible. A local resident stated that it was the wettest season for years. Fortunately, two good assistants — Messrs. E. H. Page and Bernard A. O'Reilly—did well in the wet and gales, and helped me through my difficulties. During my former visit, in 1919, the season was very dry.

On arriving in the scrub we were struck with the numbers of birds of many species that were calling and flying about. It was a superb and unforgettable picture to see these birds of various plumage on the moss-clad vines and trees. The curious fire-flies (*Malacodermidæ*) were often noticed at night, but were more plentiful at the lower parts of the range.

Rufous Scrub-Bird.

The first morning, daylight saw us busy, and by 6 a.m. we had located and seen our first male Rufous Scrub-Bird; he was calling in an extensive heap of vines and scrub *débris*. After careful watching a fine view of the bird was obtained as he sat on a stick and took an inquisitive peep at me; then he vanished suddenly, mouse-like, under the *débris*. As usual, his movements were wonderfully active, and his tail was kept well "cocked," especially when he moved quickly and fussed about. It is not easy to get these birds in a suitable light to examine their tails, as they live in dark places, and their colouring harmonizes closely with the surroundings. We, later, sat on a moss-covered log within 30 feet of the bird calling loudly under an immense heap of fallen trees and vines, overgrown with a thick mass of two species of scrub-weeds (*Pollia crispata* and *Elatostemma reticulatum*) which grow in or near water. For half an hour we listened to the bird calling loudly as he moved about under the *débris*, but we could not see him. At times the shrill notes vibrated loudly in our ears. As the bird called we moved on, its shrill note smothering, to a great extent, the sound made by us. Our patience was rewarded by getting a splendid view of the bird. We stood up suddenly, and the bird ran along, mouse-like, in a partly open space. He had his breast feathers puffed out, tail "cocked," and head rather thrown back in a peculiar and unusual manner. He vanished in the *débris* and passed along in front of us, keeping under the rubbish. Each glimpse we got of him showed his tail well "cocked" when he was not creeping, cramped low down, under objects. When he saw us he uttered a loud scolding note and ran down into a gully where tall stinging nettles were growing upon a heap of decayed *débris*, and where we had previously seen black snakes. Here he called and carried on his wonderful

PLATE XXIV.

Nest of Spine-tailed Log-Runner (*Orthonyx spinicauda*).

PHOTO. BY S. W. JACKSON, R.A.O.U.

PLATE XXIII.

Site on Bank of Creek of Deserted Nest of *Atrichornis*

PHOTO. BY S. W. JACKSON, R.A.O.U.

mimicry of other birds. It is wonderful how these birds localize themselves. The other male Scrub-Birds located by us last year were all found calling at exactly the same old places during this visit.

On 28th September we got within 20 feet of an *Atrichornis* calling loudly and carrying on his clever mimicry of the notes of the Goshawk (*Astur novæ-hollandiæ*), Lewin's Honey-eater (*Ptilotis lewinii*), Yellow-rumped Robin (*Eopsaltria chrysorrhoa*), and the peculiar fussy squawk or scolding note of the Coachwhip-Bird (*Psophodes crepitans*), as well as the loud notes of the Spine-tailed Log-runner (*Orthonyx spinicauda*).

Within 70 feet of where an Albert Lyre-Bird (*Menura alberti*) was giving a concert of mimicry we located an *Atrichornis* mimicking various scrub-birds, including the Coachwhip-Bird's "scolding" note. We later heard one make several efforts to reproduce the loud "whip-crack" note. The *Atrichornis* was the only bird heard calling during the heavy gales, and it was surprising how wonderfully loud and shrill the notes were for such a small bird. When about 15 feet or so from an *Atrichornis* calling loudly the great vibration fairly rang in our ears—"Ziz-ziz-ziz."

One day we observed one up off the ground 2 feet, sitting on a vine in dense undergrowth, and calling loudly; this did not often occur. At times the bird renders a note resembling that made by a rat when caught in a trap or by a dog. The loud and continual "Chit" or ordinary note of the male sounds like tapping a thin sheet of metal on a solid block of iron rapidly with a small hammer. This effect we noticed particularly with the bird opposite our camp, where he rendered his loud "Chit" in a most indefatigable manner, usually uttering it 9 or 12 times in rapid succession.

Early in October we had an interesting experience when surrounding a male *Atrichornis* in an isolated heap on a sloping creek-bank. He made several attempts to escape, but by keen watching we kept him in for some time. The more agitated the bird became the more the tail was cocked and the small wings drooped. John Gould figured this bird correctly in his great work on "The Birds of Australia," and this is the only correct figure I have seen. The bird now repeatedly called, and we worked closer to the heap, while he peeped at us from various points of vantage. He moved each time like magic, and on seeing we were surrounding his retreat he ran across a fairly open space, and then actually *flew* or fluttered at least 10 feet in a most awkward manner, keeping about one foot above the ground. This is the first time, to my knowledge, that this small-winged bird has been seen flying. Apparently it will do so for short distances only, when hard pressed. Hunting this bird previously by myself, its chances of escaping were greater, and there was no necessity for it to fly. We met the birds up to 3,000 feet elevation. They became silent again in November, as in 1919. By

that month the young birds are out of the nests and getting the parents' attention; hence the silence. The adult male keeps silent when he is with or near the female and young.

The food consists of beetles, including various species of the weevil family (*Curculionidæ*), also smaller insects and grubs collected from damp and rotten wood and rubbish. I also found in the bird portions of fairly large longicorn beetles and pieces of the bright green elytra or wing cover of a species known as *Rhiphidocerus australasiæ*, which belongs to the family *Prionidæ*. One of their chief foods is the numerous small crustaceans (*Talitrus australis*) that hop about like enormous fleas when anything is moved from the ground in these damp jungles. They form food for many ground-birds in such places. Scrub-snails' eggs and small, tender-shelled snails such as *Vitrina*, have also come under my notice as being on their "menu." The palate is yellowish, and closely covered with minute spines of the same colour, all pointing towards the throat.

Nest of Rufous Scrub-Bird.

It was not until the 27th October that, after much hunting, we succeeded in finding a nest containing an egg. Over the moss-covered rocks in a small stream known as Tom's Creek, and with a steep, fern-clad bank on the east side, a small brown bird moved rapidly, dodging in and out much after the manner of a Rock-Warbler (*Origma rubricata*), and uttered a little ticking note, "Tit-tit-tit-tit," with from one to six seconds or more between each "Tit." The note exactly resembled that of the female Scrub-Bird, as described in *The Emu* for April, 1920. The bird ran over a large rock and down into a cave through which the cool water of the creek was running rather rapidly. Then she got on top of the east bank, and after much exertion we chased her back into the creek among the rocks again. She came towards me, over the large rocks and vegetation, all the time uttering her feeble "ticking" note every few seconds. She was now much agitated. She was seldom seen as she moved about, and was often hidden from us, her presence being known only by her note. This rocky locality seemed more suitable for Rock-Warblers than for a Rufous Scrub-Bird. Then suddenly she made one rather long and peculiar plaintive call, hard to describe, and full of fear and distress. She then became silent, and we had great difficulty in locating her. At last we saw her, and she ran into a fairly large root-hole on the steep western bank of the creek. We rushed to the place, and, covering the hole with hats and coats, made her a prisoner. After carefully cutting down all growth surrounding the spot, we set to work to dig out the hole, and at last the bird was found at the end of the hole, over 3 feet in from the entrance. It was a female *Atrichornis*, and, although alive, was panting heavily; it died in my hand a few moments later. This rare specimen (the second female skin extant) has

PLATE XXV.

Bank of Creek, showing Nest of *Atrichornis*.

PHOTO. BY S. W. JACKSON, R.A.O.U.

been presented to the Queensland Museum, Brisbane, by Mr. H. L. White.

A close examination was then made, and at the place where we first heard the bird call we found the nest, built on the almost perpendicular bank, and placed on projecting roots amongst ferns. The rocks in the creek at this spot were covered with masses of beautiful orchids (*Sarcochilus falcata*) in full flower. The blossom is a frosted white, and about one inch across, the bottom portions of the petals being mottled with pink. The nest was situated up 2 feet 6 inches from the level of the creek bed—4 feet from where the water was running. It contained one addled egg in perfect condition, and one chick, only a few days hatched. The chick was preserved in formalin solution, as it was something new to science; it had only a little blackish down on the head and down the middle of the back, the other portions being naked and whitish in colour.

The domed nest is a typical and perfect specimen, composed of dead leaves, small pieces of dead tree-fern leaves, and flat rush or scrub-grass (*Xerotes longifolia*, var. *montana*), all loosely put together. The inside is lined neatly with the same peculiar wood-pulp material, resembling thick cardboard of coarse quality, as were all the other nests previously found. Notwithstanding all the rain, the nest was warm and dry inside. We had to strike a match and use a reflector in order to see into the dark nest, the neat round opening of which faced due west, and measured about an inch and a quarter across. The egg closely resembles those found in the Dorrigo scrubs, N.S.W., in 1898 and 1910, except that it is a little more elongated and the markings are more liberally distributed. Nest, egg, and the little chick are now in the collection at Belltrees.

The female belonging to the nest gave, in the flesh, the following descriptions and measurements (in millimetres):—Total length, 162; wing, 56; tarsus, 18; bill to base of gape, 18; tail, 60. Upper mandible dark horn colour; lower mandible light horn, very pale underneath; eyes coffee-brown; legs brownish-horn; feet light brownish-horn; circumference of body around wings folded in natural position, 95 mm.

The body, showing ovaries intact, was preserved in formalin. This female had wonderfully strong thighs and legs. No wonder the birds could get over the ground with such magic and active movements! All the under surface was a rusty colour, similar to the female secured in 1919.

Three other nests were discovered during the present trip, two of which appeared a few seasons old, but were nevertheless collected; they contained the unmistakable wood-pulp lining. They were both built in small tree-ferns on the steep bank of a creek, one being placed 9 inches from the ground and the other 12 inches up—new situations in which to be found. One nest was found within 20 inches of an old nest of the Albert Lyre-Bird. The third nest was a new one, and placed 9 inches up from the

ground in the more usual position—in a clump of the long, flat-leaved rush or scrub-grass, on the crest of the range, and a long way from any creek. We were very disappointed over this nest, because, instead of containing two eggs when visited on 29th October, it was pulled to pieces and the wood-pulp lining was lying in pieces before it, together with several feathers of the parent bird. All pointed to a tragedy. Some nest-robbing marauder (such as a native cat) had undoubtedly been at work. Probably many nests are treated in this manner. I took a photograph showing the nest thus destroyed *in situ*. This damaged nest, together with the clump of scrub-grass and feathers from the destroyed bird, was collected.

Four species of snakes were frequently met with—namely, Black, Tiger, Copperhead, and Carpet—the first two being the most plentiful. We killed about 30 of these venomous reptiles. No doubt Scrub-Birds and other ground-feeding birds are frequently devoured by them.

On this visit to the Macpherson Range we located upwards of 30 male Rufous Scrub-Birds during many extensive tramps through the jungle, backwards and forwards over the range and gorges for many miles. The continual rain brought many scrub-snails or land-shells out of their hiding places, including the large species known as *Panda falconari*, which forms food for the Lyre-Birds. Strange to relate, the smaller markings on this pretty scrub-shell closely resemble those on the tail feathers of *Atrichornis*; this is a curious coincidence, as I have always found the *Atrichornis* frequenting the same scrubs wherein this particular species of snail has come under my notice. Altogether, six nests of the *Atrichornis* composed of, and built in, the flat-leaved scrub-grass have been discovered, and three that were placed in different situations: these are the only nests so far recorded.

Not far south-west of the camp, on the Queensland side of the range, is a great valley known as the Albert River Gorge; this reminded me of the Barron River Gorge, near Cairns, North Queensland. One day, from the top of a great precipice overlooking this magnificent chasm, we heard Scrub-Birds and many others calling about 2,500 feet below us, in the dense jungle. It is wonderful how sound travels up from such a depth! Flocks of 20 to 40 large Topknot Pigeons (*Lopholaimus antarcticus*) flying over the Albert River looked more like Sparrows, but the field-glasses settled the identity. A White Goshawk (*Astur novæ-hollandiæ*) flew over the trees below as a white speck, and travelled so fast at times that it was difficult to see it with the glasses. The noise from the running water in the river, about 3,000 feet below, could be heard plainly. A few days later we ventured below into this great gorge. The descent was steep, and progress was hampered by the loose earth and stones, on which it was almost impossible to get a footing. Saplings, limbs of trees, vines, and roots proved invaluable as hand-grips. After descending about 1,000 feet we heard our first *Atrichornis*, but

PLATE XXVI.

Butt of Giant Beech-Tree (*Fagus Muelleri*).

PHOTO. BY S. W. JACKSON, R.A.O.U.

it ceased calling when we were about 100 yards away. Going in his direction we heard the note of a female, and presently saw her among a mass of fallen palm fronds. She was close to us, and we had a good sight of her rusty breast; we did not disturb her. The locality resembled that where we obtained the nest, egg, and female at Tom's Creek. There were many ledges of dripping rock covered with large-leaved reeds, birds'-nest ferns, &c. Piccabeen or Bangalow palms (*Archontophœnix cunninghami*) were in rich profusion, and their fallen fronds covered the ground to a depth of fully 2 feet, and were difficult to get over without noise. Here the humid heat was severe, and the perspiration simply ran off us. Not hearing the male *Atrichornis* call again, we made our way towards another bird calling below us. We found it in a gully, which was the "real home of rolling stones." The trees were scarred with blows from boulders coming down this steep place. It was devoid of much undergrowth, and dislodged rocks were everywhere, showing what a dangerous place it was to explore. The bird was calling loudly about 30 yards away, and as we approached we stood on a flat rock. From a cavity under this rock came the unmistakable faint "ticking" note of a female, accompanied by excited fluttering, which lasted several seconds. Then she suddenly hopped into view and disappeared among some tall, wide-leaved rushes. When fussing about, her tail was rather well cocked, and wings drooped. After she called, the male ceased calling, came down within several yards of us, called once, and finally disappeared down the gully. As at the Tom's Creek nest, this locality of rock cavities seemed more suited to Rock-Warblers (*Origma rubricata*) than to *Atrichornis*. In the scrubs of the Dorrigo and Richmond Rivers, in New South Wales, I have never known Scrub-Birds to frequent rocky places; probably here rock-cavities are retreats for them in times of danger.

On the steep side of the Albert River Gorge we found some mounds of the Scrub-Turkey (*Catheturus lathami*). It amazed me to find them in such a place. Portion of one of these mounds had slipped down the steep side fully 50 yards. The climb back up the steep side of this gorge was a heavy one, and took us nearly three hours. At each step the loose earth and stones gave way under our feet as we struggled on and grasped at anything for support. During the climb thousands of large broken scrub-snail shells (*Helix falconari*, *H. dupuyana*, and *H. muhlfeldtiana*), which Lyre-Birds and others had smashed, were seen. Lyre-Birds frequently scratch for their food on sloping ground, as it renders the work much easier for them.

A few miles to the south-east of the camp stand Mount Bithongabel and Mount Wanungara, from which a splendid view is obtained of the Tweed River district and the dense scrub thousands of feet below in New South Wales. While standing on the great precipice forming the eastern face of the latter mountain we heard several *Atrichornis* calling straight down below us, exactly at the same places as we heard them in 1919.

Red-bodied blow-flies were common, and deposited their eggs on clothes, blankets, food, and anything; they loved the coolest parts of the range. March-flies of several species frequently stung us severely; specimens were collected for identification. They form food for many of the birds.

The three young Scrub-Birds obtained on this trip make a unique series, as they are of different ages—about three, five, and eight weeks old respectively. In the bodies of the two oldest the male organs are discernible, but the youngest bird shows nothing. Judging from my experience, one would assume that the young of this species grow and develop very fast, and don their adult plumage very early.

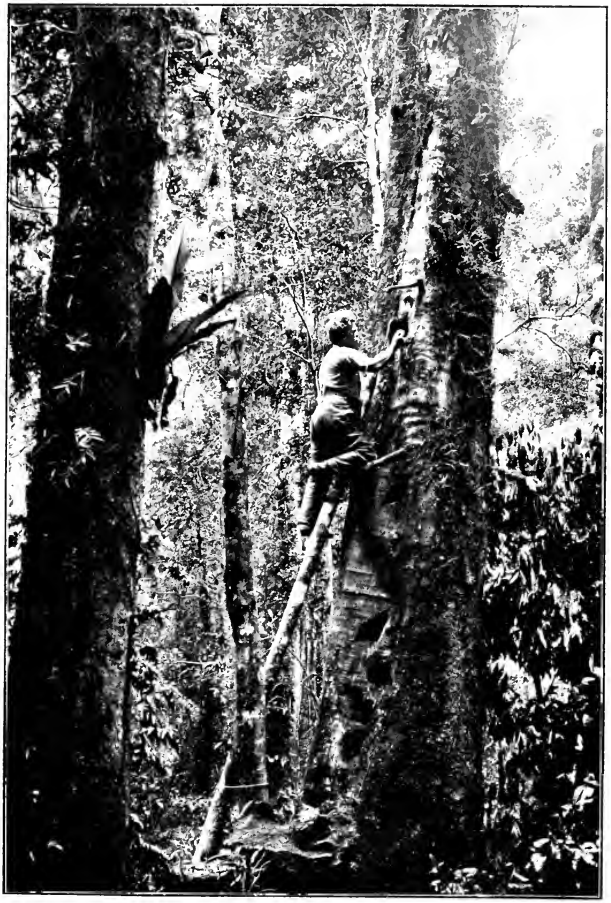
The bird lays an enormous egg in comparison with the size of its body, and consequently, when hatched, the young one is well advanced, and grows fast. This is possibly the reason why the sexual organs develop so early compared with the young of much larger species. The note of the young bird is different from that of the adults; it resembles the sound produced by suddenly drawing the finger-nail across a rough or rusty lid on a small *empty* tin 3 or 4 inches high.

The three young birds were collected on the following dates:—(*a*) No. 1 (male), about 8 weeks old, collected 2nd November, 1920; (*b*) No. 2 (no sex), about 3 weeks old, collected 4th November, 1920; (*c*) No. 3 (male), about 5 weeks old, collected 29th October, 1920. These three specimens, in the flesh, gave the following descriptions and measurements (millimetres):—

(*a*) (Young male)—total length, 178; wing, 64½; tarsus, 20; bill to base of gape, 20; tail, 69; upper mandible dark horn, lower mandible yellow; eyes dark slaty brown (not coffee-colour like adults); gape of mouth yellow; inside mouth whitish; legs brownish-horn; feet pale brownish-horn; under feet pale yellow; edges of wing feathers and wing coverts of a darker chestnut or reddish-brown than in adult birds; no black patch showing on breast; patch of rufous on abdomen much larger than in adult male; throat whitish. Two young ones were noticed at an altitude of nearly 3,900 feet with the mother; they were shy and wary. We secured one young one, and did not interfere with the other or the mother. Once we were within 8 feet of her, and she excitedly rendered the usual "ticking" note. The young one on several occasions made an attempt at mimicking, and caused us much amusement, especially when he tried the notes of the Olive Thickhead, which was calling close by. His attempt, however, was not altogether a failure. Scrub-Birds apparently start their mimicking antics early.

(*b*) (Juvenile, no sex)—total length, 129; wing, 54; tarsus, 17½; bill to base of gape, 16; tail, 38; upper mandible dark horn, lower mandible yellow; eyes dark slaty-brown; gape of mouth rich yellow; inside mouth yellow; legs, feet, and claws very pale horn; under feet pale yellow. This is the smallest and youngest speci-

PLATE XXVII



Nest of King Parrot (*Aprosmictus scapulatus*).

PHOTO. BY S. W. JACKSON, R.A.O.U.

men of the three young birds secured. The colour throughout is a pale reddish-brown.

We saw two young birds together; they uttered a peculiar rasping or squeaking note, as described, became very excited, and kept their short tails well cocked up. They hid for nearly an hour in the dense weeds known as *Pollia crispata* and *Elatostemma reticulatum* growing in the creek and on the adjoining parts. We succeeded in disturbing the birds by throwing stones into the weeds and ferns. They were very active, and, although the mother was with them, she kept well hidden; we frequently heard her call in the weeds and *débris*. Eventually these two young birds got on a small rotten log lying across the creek, and almost covered with the weeds; they ran along this rapidly, and then, like "feathered mice," went up the almost perpendicular bank. When up about 4 feet they flew, or rather fluttered, down into the weeds in the creek, and joined the mother, who was still hiding. This fluttering down surprised me much, considering the birds were so young. No doubt our presence and persistent hunting caused them to do so. We at last captured one young one in a hole under the foot of a tree standing on a steep bank, at an altitude of about 3,000 feet. When captured it died in my hand almost immediately. It is a fine specimen, and in colour and size a big contrast to specimen (*a*).

(*c*) (Juvenile male)—total length, 168; wing, 63; tarsus, 19; bill to base of gape, 19; tail, 69; upper mandible blackish-horn and pale brown horn at tip, lower mandible all yellow; eyes pale brownish-slate; gape of mouth very rich yellow; inside mouth yellow; legs and feet pale brownish-horn, with yellowish tinge; claws pale brown; under feet yellow. The plumage is more advanced than in specimen (*b*), but not nearly so much developed as in specimen (*a*). Underneath, on the *left side* of the breast, the feathers have started to become rufous, and the bird is different in colouring compared with the adult male. It was the curious note of this young bird that attracted my attention, this being the first young one found. Great difficulty was experienced in securing it, on the crest of the range, at an altitude of about 3,400 feet.

Early in December a female was making her "ticking" note at an altitude of about 3,200 feet, and, in order to see her, a tree was climbed. We plainly saw her below, some 30 feet away, with two young ones. They were busy feeding and picking from ferns and old rotten logs. They remained only a few seconds in one place. They were active, and their movements remarkably rapid. The mother moved on quickly through the dense undergrowth, rendering her little note now and then until she was beyond hearing. While this was going on the male was calling loudly some 100 yards away to the west; they travelled in his direction.

It seems remarkable that it has taken 55 years to bring the young of the shy and interesting Scrub-Bird to light.

OLIVE THICKHEAD (*Pachycephala olivacea macphersonianus*).

The first recorded specimen of this shy bird was collected by me near Mount Bithongabel, in 1919, and was described in *The Emu* for April, 1920, by Mr. H. L. White. We discovered on this trip that these birds did not come below the 3,800 feet level. Above that level the trees and vines are festooned with luxuriant and wonderful shawls of long hanging moss, usually glistening with moisture, supplied by clouds and mountain mists which frequently envelop these higher portions. The various mosses must run into dozens of different species. It is a fascinating paradise of moss.

During our twelve weeks' rambling through these jungles we located only seven pairs of birds, usually a good distance apart. The food chiefly consists of beetles, small insects, grubs, and caterpillars, as well as small seeds.

When leaving a tree the bird often appears to fall or fly almost straight down; it then travels or swoops along rather close to the ground, usually amongst the dense undergrowth, and is lost until it calls again. It lives where the undergrowth is extremely dense and the ground steep. The birds move so quickly and unobtrusively that it becomes tantalizing and disheartening to a person who, after wriggling and crawling on hands and knees through dripping wet moss-covered logs and rocks, as well as prickly and treacherous vines and bushes, finds on each occasion that the bird has vanished, and the whole work has to be repeated. The most troublesome vines to get through are the wire-vines (*Rhipogonum Fawcettianum*), the lawyer-vines (*Calamus australis*), and the barrister-vines (*Mezoneuron Scortechinii*). A person cannot cut his way through with a brush-hook, as too much noise is created, and using a knife is slow.

This Thickhead is the most active and restless of the genus that has come under my notice. We obtained one pair of the birds, a male and a female—the only specimens extant, except the single specimen secured in December, 1919. The birds gave the following descriptions and measurements (millimetres):—(*a*) Adult male, collected on 12th October, 1920, altitude about 3,860 feet; (*b*) adult female, collected on 9th October, 1920, altitude about 3,860 feet. Both birds were obtained at the same locality, and represent a mated pair; this was done in order to avoid breaking up two different pairs. (*a*)—Total length, 209; wing, 100; tarsus, 26; bill, 22; tail, 95; upper and lower mandibles blackish-horn; eyes reddish-brown; legs brownish-horn; feet silver-grey; feet pale yellowish underneath. Gizzard preserved, and contained chiefly the remains of beetles. Palate covered with many pale flesh-coloured spines, pointing towards the throat. (*b*) Total length, 213; wing, 101½; tarsus, 30; bill, 22; tail, 98; upper mandible blackish-horn, lower mandible much paler; eyes coffee-colour; legs and feet silver-grey; under side of feet pale yellow; numerous small seeds and remains of beetles in gizzard.

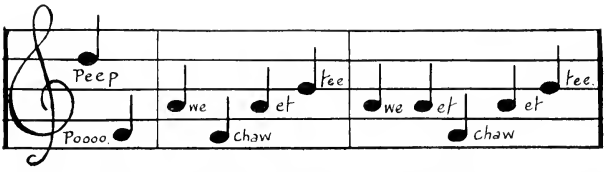
The bird had a variety of notes. One very sweet one was a slow, soft, and long-drawn-out call resembling "P-e-e-p—p-o-o-o-o."

PLATE XXVIII.

Spice-Bush (*Hedycia Youngiana*), where Northern Olive Thickheads build.

PHOTO. BY S. W. JACKSON, R.A.O.U.

These notes were rendered slowly, and the "P-e-e-p" was rather high pitched, while the "P-o-o-o-o" was a low note, as shown :—



The "P-o-o-o-o" somewhat resembled the sound produced by running a wet finger around the top of a thin champagne glass and removing it quickly. The notes were difficult to locate, the sound appearing to be coming from any direction in which you turned an ear. While thus calling the bird often ventriloquized, and the sound appeared about a quarter of a mile away instead of, perhaps, 15 or 20 feet. Only that we had many times observed its throat moving as the sound was produced, we would have concluded that the call was made by another bird some distance away. The bill was *closed* when this distant sound was being produced. The notes rendered most frequently by these birds resembled "We-chaw-et-tee" and also "We-et-chaw-et-tee." There was a longer pause on "Chaw," the lowest-pitched note of the series, and the note "Tee" was the highest. The notes were drawn out slowly and sadly, and were indeed extraordinary and difficult to describe. The bird also ventriloquized with this last lot of notes. Both birds seemed to have the same calls. Another call often resembled "O'wheat," repeated from four to nine times or more, rapidly, each one getting faster and faster and louder and louder, the last few notes being very loud, while the first few were exceedingly soft and low. Sometimes the note was given without the "O" in front, thus sounding "Wheat," and in some instances it was rendered as "Too-wheat." The birds seldom called more than about 150 yards apart, and were local in their habits, each pair keeping to a particular section of the jungle. As a rule they kept up in the moss-clad trees about 20 to 40 feet, though we have observed them as high as 80 or 90 feet.

The first nest found was an old one, 4 feet up on a horizontal branch of a yellow-wood tree (*Daphnandra micrantha*). The first new nest was found on 14th October, and we enjoyed watching the birds with field-glasses. They called all the time while collecting material and bringing it to the nest, which was placed about 3 feet up in the middle of a flowering spice-bush (*Helicia Youngiana*) entwined and overgrown with wire-vines. This carefully hidden nest was discovered through our observing the female carrying a curved twig fully 10 inches long. Sitting on a moss-covered log, she ran this through her bill, and we could distinctly hear the cracking as she did so, no doubt to give it a greater curve; then she flew up into the bush, and the nest was

at once located. She soon departed, and both birds came back with material, whistling to one another all the time, the male frequently carrying out the distant ventriloquizing calls. They made several visits to the nest with twigs, then sat side by side on the nest and combed each other's plumage with their bills in a loving manner. The male then departed, while the female fluttered and turned in the nest and spread out the twigs with her bill. The male returned again and again, bringing a twig each time. When both birds departed, and were calling to one another some 80 yards away, we made a hurried inspection of the nest, which apparently had only been started that day, and then left the place. The nest and locality were strictly tabooed for ten days, none of us going within hundreds of yards of the spot. A visit was made on the 25th October, the morning after a great cyclonic storm accompanied by severe hail. My expectations and fears were only too well founded. There was the nest—a large, completely built, and beautiful structure, containing one fresh egg—smashed beyond repair. In it also were fresh green leaves, which the hail had beaten in after driving the bird from the nest. Not a sign of the Thickheads could be detected, though we watched and listened for over an hour. The storm had ruined and upset everything. The broken egg and green leaves were carefully removed with a pair of forceps, the nest being left for the time being. During our wanderings we found another new nest containing one fresh egg, badly smashed. The day before another hailstorm had passed over the locality and played havoc with the scrub. This damaged egg was also secured. The nests resemble some of those built by the Harmonious Thrush (*Collyriocincla harmonica*) and Crested Bell-Bird (*Oreoica cristata*).

However, perseverance and hard work won us success at last, and on 28th October we found the same birds building about 200 yards from the first nest. Now and then the male on the ground immediately under the nest would carry on his far-off ventriloquizing notes. We kept well behind a great clump of large beech trees (*Fagus Moorei*), on which were many large orchids (*Dendrobium fagicola*) with a mass of creamy-white blossoms. The nest was built 3 feet up in a spice-bush covered with beautiful blossoms, over which were large-leaved wire-vines. It resembled the other three nests in every detail.

On 6th November we disturbed the female, and found a lovely clutch of three eggs, comparatively large and fresh—the only clutch extant. A description by Mr. H. L. White of the nest and eggs appears in another part of this issue of *The Emu*. The female was tame, and allowed me to get within a few feet before she flew off. When I was removing the eggs she flew at me several times. While we were at the nest the light in the jungle was very bad, owing to the heavy mist, and everything was wet. An hour later a heavy hailstorm passed over the place, and, had the eggs been there, all would have been smashed again.

PLATE XXIX.

Nest (*in situ*) of White-throated Thickhead (*Pachycephala pectoralis*).

PHOTO. BY S. W. JACKSON, R.A.O.U.

Nest of Cat-Bird (*Galeoscoptes carolinensis*).

PHOTO. BY S. W. JACKSON, R.A.O.U.

PLATE XXX.

VARIOUS OTHER SPECIES.

The beautiful Rose-breasted Robins (*Petroica rosea*) were plentiful, and their feeble, sweet notes were heard daily. The male uttered a call resembling "E-tun-t-nud-i-dee—tee-tee-joey"; while the notes of the female were "E-tun-t-nud-i-dee—tee-tee-tee." We found one of their small and handsome nests at an elevation of nearly 3,900 feet—the first nest observed in Queensland, as far as can be ascertained. It was fully 60 feet up, near the end of a horizontal branch of a tall tree parasitical on tree-ferns, and known to science as *Quintinia Sieberi*. It starts its growth, as a rule, on a tree-fern. The tiny nest was found by watching the female, who made several trips to it within a few moments, and was busy putting cobwebs over the outside of the structure. She was very rapid with her work, and with the field-glasses we got a splendid view of her. The lovely male bird did not go near the nest or assist in building it. Unfortunately, the great cyclonic storm of 24th October smashed this nest to pieces; it was completely cut off the limb by the heavy hail and wind.

Satin Bower-Birds (*Ptilonorhynchus violaceus*) and Regent Bower-Birds (*Sericulus chrysocephalus*) were fairly common, and we found a new nest of the latter in the suckers on a damaged rosewood-tree (*Dysoxylon fraserianum*) on top of a range at an elevation of 3,900 feet: but, owing to our passing frequently near the tree while watching a young *Atrichornis*, the bird deserted the nest. It was very unfortunate, as I hoped to photograph the eggs *in situ*. The bird was seen busily building the nest on two occasions. Several play-grounds of Satin Bower-Birds were discovered, and the variety of ornaments of decoration therein was interesting; among these were dead scrub-snail shells (*Helix confusa, H. porteri*, and young of *Panda falconari*), blue Parrot feathers, blue star-shaped flowers of a scrub bush known as the kangaroo apple (*Solanum aviculare*), fungi of different species, blue berries, flowers from the spice-bush, empty pupa skins of the *Cicada*, and cast-off snakeskin. In a play-ground near our camp were displayed, among other things, the hard brown outside skin of onions, pieces of blue paper, and twine. Two nests were found in the tops of tree-ferns, but these belonged to a previous season.

Cat-Birds (*Ailuradus viridis*) were plentiful, and did not call much until about the end of October. The cry resembles that of a domestic cat, and at times reminds one of the delicate little cry of a young baby. The bird makes a comparatively large and deep cup-shaped nest, composed of sticks and twigs, and then layers of large dead leaves, many placed around the nest perpendicularly on their edge, probably to permit moisture to drain away easily. On examining a deserted nest we were surprised to find, about 1 inch below the thin stick lining, a layer of wet, decayed wood, some pieces measuring over 2 inches long by a half inch thick. This wet wood filled two 2-lb. jam tins, and, after

drying in the sun thoroughly, was with difficulty pressed into one of these tins. Probably this wet layer is instrumental in promoting heat when the female is sitting on the nest. Under the wet wood were large dead leaves, some measuring 9 by 3 inches, and belonging to a scrub-tree known as "Maiden's Blush" (*Echinocarpus australis*). Many nests were found, mostly in the top of a tree-fern. One was carefully situated in a satinwood-tree (*Zanthoxylum brachyacanthus*), which is very prickly and impossible to climb in the ordinary way, owing to the numerous sharp thorns covering the trunk and limbs. I have known Regent-Birds to build in these trees in the Richmond River scrubs of New South Wales.

One morning, early, a Large-headed Robin (*Pœcilodryas capito*) came into our camp while we were having our early breakfast. It appeared a rare bird here. One nest was found, and it contained many small pieces of skin or scales, proving the young ones had gone.

Yellow-rumped Robins (*Eopsaltria chrysorrhoa*) were plentiful, and their notes were usually the first to be heard in the morning and the last in the evening. They flew about until almost dark. Their beautiful nests were sometimes neatly built in between the fronds on the top of tree-ferns.

The Albert Lyre-Bird (*Menura alberti*) was daily seen, and a few old nests discovered. Once we saw three birds together; this is unusual. They made a great noise, and scattered quickly when they saw us. One day a pair was carrying on mimicry near a gigantic scrub box tree (*Tristania conferta*), which I photographed; it measured over 50 feet in circumference 6 feet up from the ground. Lyre-Birds had been scratching and feeding among the dead leaves around this jungle giant.

When suddenly disturbed this Lyre-Bird makes a peculiar whistle, "loud and sudden," and then usually resorts to a tree as a means of escape; it hops from limb to limb until it is often 50 feet up. Then there are times when it will run away through the jungle. Its early morning note resembles "Ch-eek—ch-ack—ch-ook—ch-ock—ch-ook—wit." These notes vary from about five to seven generally, and each one, as *slowly* rendered, gradually goes down the scale until the note "Wit" is reached, which is a sudden contrast, as it is suddenly sounded in quite a high-pitched whistle. The birds are great mimics, and can mock almost any bird or sound they hear in their haunts.

Rifle Birds-of-Paradise (*Ptilorhis paradisea*) were frequently seen, but were seldom recorded above the 3,800 feet level. On 28th November an adult male and a female were observed in company with two young ones. Except that they were paler in colour, the young resembled the adult female. Their call was rather different, and more "rasping," than that of the adult birds. The handsome male birds appear more plentiful than the females. One day we saw two of the latter hopping up the trunk of a large scrub tree known as bolly gum (*Litsea reticulata*)

PLATE XXXI.

The × denotes position of Rifle-Bird's Nest.

PHOTO. BY S. W. JACKSON, R.A.O.U.

PLATE XXXII.

The × denotes bathing place of Rifle-Birds.
The vine above is where they preened their feathers after each wash.

PHOTO. BY S. W. JACKSON, R.A.O.U.

and collecting insects from underneath the scaly bark thereon. This tree contains very light and useful timber, and is not connected with the eucalyptus or gum trees of our forests. During this trip I photographed the lower portion of a large marara tree (*Ackama Muelleri*), showing the "water-pocket" in its trunk, in which the handsome male bird was seen bathing. One's attention is often directed to these birds when they are feeding, as they make a great noise at times while scratching amongst the *débris* inside the large cup-shaped hollows of the birds'-nest ferns (*Asplenium nidus*) and elk-horn ferns (*Platycerium alcicorne*) up in the large trees. The large staghorn ferns (*Platycerium grande*) keep more to the lower elevations of the range.

Spine-tailed Log-runners (*Orthonyx spinicauda*) were plentiful, and some plundering creatures—probably dingoes, foxes, or native cats—destroyed many nests and contents. I am sorry to record that the fox has at last found his way into this scrub, and am afraid the Albert Lyre-Birds and other ground species will suffer greatly. This bird usually builds its domed nest on the ground, or close to it, though we found one placed 4 feet up in a thick bush. In one nest we found a young bird, partly covered with black down. The sides of the mouth, up to within a quarter of an inch of the tip of the bill, were covered with a thick, *white*, and projecting skin, giving the mouth a swollen appearance. The inside of the mouth and tongue were yellow. Probably this white inflation around the mouth is Nature's method in assisting the parent birds while feeding their young in the dark covered nest. After examining the young one it was replaced in the nest.

Many more species were met with, but space does not permit mention of them.

In conclusion, I may state that the photographic work was carried out under great difficulties, owing to the continual rains and gales, and in some instances I was reluctantly compelled to photograph various subjects when they were "wet." The nest of *Atrichornis* shown here, on the bank of a creek, and from which an egg was obtained, is an example of a wet subject, and rain had not long ceased when the photograph was taken; and, further, the light in the dense jungle was very poor.

Colour Change in the White-bellied Sea-Eagle.—At the end of 1910 the Sydney Zoo received what we took to be a pair of Sea-Eagles from Mackay, for one was uncoloured and was taken for a female; but last year (1920) this bird partially coloured out, and now has the grey back and the white under parts of the fully plumaged male. It thus remained for ten years in the brown immature dress.—A. S. LE SOUËF. Taronga Park, Sydney (N.S.W.), 10/3/21.

The Nature of the New Zealand Avifauna.

BY GREGORY M. MATHEWS, F.R.S.E., &c., AND TOM IREDALE, M.B.O.U.

As we regard ourselves as specialists in connection with the New Zealand avifauna, and are now preparing a Handbook, we are naturally much interested in literature relating to this country. Consequently, we noted in *The Emu*, vol. xix., p. 275 (1st April = 29th May, 1920), a paper entitled "The Tasmanian and New Zealand Groups," by Robert Hall. It is well known that Mr. Hall was familiar with the Tasmanian *Ornis*, so that the essay demanded attention.

We have published a "Name-list" in the *Austral Avian Record* (vol. iv., pp. 49 *et seq.*, July, 1920), and we will here give details in connection with that list. We had not intended to do this at the present stage, as Hutton's account, published within the last twenty years, was comparatively good. This paper will only deal with the birds as we have studied them, giving the relationships as accurately as possible and their hypothetical method of arrival. It will be observed that many of the relationships are regarded as unknown by us; this is better than stating an alliance which is purely conjectural.

As the limits of the Maorian Region are debatable, we must preface these remarks with our ideas of the territory and its subdivisions. As we here include the Kermadec Islands, we must note that these constitute a Polynesian outlier with a basic Neozelanic affinity, and consequently species become admitted to the New Zealand avifauna which, if this were not emphasized, would show a peculiar aspect in some connections. Then it must be remembered that the Chatham Islands, which are an integral portion of the region, have been separated for a period quite inestimable with the present data; consequently we have, as endemic, forms which are missing from the mainland, and, *vice versa*, have no record of well-established mainland specialities. The next item is the Subantarctic series of islands, covering the Bounty Islands, Campbell, Auckland, and Macquarie Groups. All these are situated in different latitudes, and are more or less barren islets and islands inhabited by sea-birds, with a few land residents. These, again, give to the New Zealand avifauna a strange countenance, which would be different and might be differently interpreted in their absence.

To begin with, we credit New Zealand with nine species of Penguins, only four of which breed on the mainland, and these are the best known and, except one, the least significant of the Order. We admit two species of *Eudyptula* (the Little Penguin), with a strange distribution, the facts regarding which are not yet well known. One species, the earliest to be described by Forster—the *Eudyptula minor*—is so closely allied to the bird breeding in Australia that it is considered only sub-specifically

separable. No sub-species are recognized in New Zealand, though it is known to breed as far north as Auckland and south to Otago, while recently Nicholls and Alexander * concluded that no sub-species could be determined in Australia with a breeding range from the South Solitaries, New South Wales, through Bass Strait along the south coast to Western Australia. It is extraordinary and at present inexplicable that a second very distinct species should live at Banks Peninsula, about the middle of the east coast of the South Island, called, from its beautiful pale coloration, the Silver Penguin (*Eudyptula albosignata*). Of the genus *Eudyptes* we admit four species, of which one occurs on the mainland as a breeding species—*Eudyptes pachyrhynchus*—known as the Victoria Penguin when breeding at The Snares, but also having the name of the Big-billed Penguin, which is not so distinctive, as other species of *Eudyptes* have as big or even bigger bills. *Eudyptes serresianus* (the Tufted Penguin) also breeds at The Snares, and is peculiarly distinct in breeding plumage, but not so easily distinguishable in a worn state. These two appear to have been recorded from Australia as wanderers, but a complication has just recently been recognized in the description of one specimen, which determines it, as far as it goes, as *Eudyptes schlegeli*, the species which breeds on the Macquarie Group, and which is characterized by the presence of yellow feathering on the forehead, which is present but sometimes obscured in some stages. The fourth species is *Eudyptes sclateri*, the Auckland Island breeding bird, which appears to be separable by the culmen formation as regards the dead specimens, but which may show vivid features in life, as it appears to be easily differentiated by field observers. The Yellow Penguin (*Megadyptes antipodes*) breeds both on the mainland and outlying islands, and is remarkable as suggesting a higher place in the scheme of evolution of the Penguins, as derived from the *Eudyptula* series. This series seems to be more closely allied to the *Spheniscus* group, which occurs in South Africa, South America, and the Galapagos, and to the Emperor Penguins, and which include the famous Adelie Penguin. To the latter group two New Zealand species are allotted, both of them confined as breeding birds to the Macquarie Group—the Rock Hopper and the King Penguin. The former, also known as the Royal Penguin (*Pygoscelis papua*), is even more famous as the Gentoo of the Falkland Islands. Only sub-specific differences are ascertainable between the representatives on the two far distant groups, and this is confirmed by a similar distinction between the King Penguin (*Aptenodytes patagonica*), also with a similar distribution, but more southward at the Falkland Islands locality, only occurring as far north as a visitor even as in New Zealand and as once recorded from Tasmania. Before leaving these families we might note that latitude does not govern the range of these species, but apparently cold currents have more significance. It is a remarkable fact that while *Eudyptes*,

* *The Emu*, vol. xviii., p. 50.

Pygoscelis, and *Aptenodytes* have a world-wide Subantarctic range, *Eudyptula* is confined to Australia and New Zealand, and *Megadyptes* is purely Neozelanic. No other country can boast of an endemic genus of Penguins, and none other can show five breeding genera of Penguins with nine distinct species.

Australia, the nearest country, has only one breeding species, and that the least in size, though perhaps not the most insignificant in scientific interest.

If New Zealand can claim to be the present stronghold of Penguins, how can we express its relationship to Petrels? Out of a total of a little over 200 species of birds, one-fifth are Petrels. No proportion anything like this can be elsewhere seen, and no other country can show so many species, whatever its extent. Australia can nearly enumerate as many, but these are mainly stragglers, whereas in the case of New Zealand the majority are breeders. This is again due to the Subantarctic and Subtropical groups of islands, which are the breeding homes of many species. Of little value as regards the inter-relationships of avifaunas, we can dismiss them easily. They, however, characterize the New Zealand *Ornis*, and occupy, with the Penguins, the most prominent place in the study of the avifauna.

Frigate-Birds have occurred as stragglers only from the north, but New Zealand Shags are famous. Owing to the splitting methods of the last generation of ornithologists, many more species were credited to the Dominion than really exist. A large number of "White-bellied" species were named on account of indeterminate and variable differences seen in single specimens from different islands. A very careful examination has reduced the number of "species" to nine, but still this is more than any other locality harbours. Moreover, eight out of the nine do breed on the mainland, while varied forms of two of them inhabiting the subantarctic islands have been the ones to receive "specific" recognition without deserving it. Four species of the "White-bellied" series *par excellence* are allowed, one of which has not a "white belly." Such a paradox could not be achieved except in New Zealand, but it is one of Nature's ways in that peculiar country absolutely to contradict itself. This species is a melanistic evolution which has separated itself and at present lives along with its parent form. In another Shag we have the reverse procedure present—viz., the acquisition of a "white belly" from a Black-bellied form. Then two Shags only subspecifically different from two Australian Shags occur, and two others, generically endemic, complete the tale, one of which represents the other on the Chatham Islands.

To indicate the facts with usage of technical names, we will note that the genus *Hypoleucus* has four species—*varius*, *carunculatus*, *campbelli*, and *chalconotus*—the last-named being the fixed melanistic representative of the preceding one. This genus is Subantarctic in distribution, occurring in Australia with two species, *perthi* and *fuscescens*. The latter is purely an Australian

form well distinguished; but the former, though quite distinct, was until very recently confused with the Neozelanic *varius*. The two species *carunculatus* and *campbelli* are scarcely specifically separable from the South American, Falkland Islands, &c., forms known as *atriceps, magellanicus*, &c. The two species of *Stictocarbo* constitute a peculiar group—one on the mainland, a very common and well-distributed Shag, *punctatus*; the other a rare and very beautiful Chatham Island representative, *featherstoni*. The genus is endemic and well defined.

Mesocarbo ater is an Australian species ranging from Sharks' Bay, Western Australia, eastward to northern New Zealand, only sub-specific differences being discernible. *Microcarbo brevirostris* we allow to be specifically distinct from the Australian *melanoleucus*, but the genus, like the succeeding *Phalacrocorax*, ranges from Europe, but with a more southern distribution. The last-named has only sub-specifically varied all over the Old World, and hence we get only a sub-specific difference between the Australian and Neozelanic forms. The Shags of New Zealand can therefore be seen to have two distinct sources—from the north *via* Australia, and from the south from the Antarctic. We have refrained from going into great detail and providing much speculation, as Hutton did in *The Emu* some years ago, and unfortunately the acquisition of much material has shown the majority of his premises to be framed upon insecure bases. Thus it might be noted that a species has been named on account of lack of a certain character, and this was thoroughly discussed by Hutton; since then specimens have been received showing the "species" to possess the character alleged as lost.

Two Gannets are included in the fauna as breeding species—the one from the Kermadecs, a tropical form also occurring as a breeder in Northern Australia; the other breeding on the mainland, and sub-specifically representing a Gannet breeding in Southern Australia and specifically representing a South African species and a North European species—a peculiar group.

With the Gannet at the Kermadecs live a Tropic-Bird, the Sooty Tern, Little Grey Noddy, White-capped Noddy, and White Tern. These are all tropical species, the first, second, and fourth breeding in tropical Australia, the other two being absent. These can scarcely be considered as affecting the New Zealand avifauna in the connection in which we are discussing it. Otherwise, as to Gulls, Terns, and Skuas, we find four Terns and three Gulls breeding on the mainland, and a Tern and Skua confined to the Subarctic groups. While the former are more or less represented (as hereafter noted) in Australia, the latter are absent, save that the Skua straggles northward to that locality. As to the Terns, the same species, White-fronted Tern, Fairy Tern, and Caspian Tern, breed, with only a sub-specific distinction, whereas the New Zealand Black-fronted Tern we consider a peculiar modification of the Australian Marsh Tern (*Chlidonias hybrida*); but this affinity has not yet been determined absolutely. The species,

however, shows more affinity to the Marsh Terns than to the normal Sea Terns. The three Gulls, again, show a peculiar state of endemism, the Red-billed Gull being only sub-specifically separable from the Australian Gull, while the Black-billed Gull is a distinct evolution, quite peculiar to New Zealand, and unrepresented in Australia. The common Black-billed is a Subantarctic species, very different from the Australian Pacific Gull, yet scarcely distinguishable from the South American Gull. In the Subantarctic group of islands two other Subantarctic forms breed—the Subantarctic Tern and the Great Skua. The range of these Subantarctic species is very peculiar, breeding at the Falkland Islands or to the south thereof, Subantarctic New Zealand islands, then altogether absent from Australia, recurring at the Kerguelen Group and thereabouts as breeding species, the variation during the extent of this range being only sub-specific.

Among the Snipe, Sandpipers, and Plovers we find even more of interest than we have yet treated of. Twenty-nine species are admitted, of which fourteen have as yet occurred orly once or twice; these were stragglers from Australia or wanderers from the north, arriving through association with the migrating Godwits, which are regular winter visitors. As well-established visitors also are included the Knot, Sharp-tailed Stint, Curlew, Turnstone, and Lesser Golden Plover—all well-known Australian migrants. Two of the rarest stragglers, the American Godwit and the Grey Phalarope, have not as yet been noted in Australia. It is when we deal with the residents that we get excited, as, though we have two Snipe visiting Australia, we have no resident species; yet from the Subantarctic group of New Zealand islands we find a semi-Woodcock (*Cœnocorypha aucklandica*), with nó near relation save a huge South American bird, and which has been well described as a "living fossil," and approaching the most primitive idea of the Snipe and Woodcock series of birds. Next we find two Stilts—the one only sub-specifically distinct from the Australian Stilt, the other a fixed melanistic form, apparently like the Shag (*Hypoleucus chalconotus*) previously referred to. Of course, we have both a Pied and Black Oyster-catcher, which we also get in Australia and elsewhere. Then we have only four Plovers, but the quality quite suffices for lack of quantity. Probably the Wrybill alone would answer that query, but the New Zealand Dottrel is a big development of the Sand-Plover species elsewhere met with at only about half its size. The Double-banded Dottrel also occurs in Australia, with a problem hanging to it. It is a common breeder throughout New Zealand, and is resident, yet its nest has not been found in Australia, though recorded in the far West. It has been suggested that its presence in Australia can be accounted for by regarding it as a migrant from New Zealand, but we cannot see that we are justified in considering the wandering of a New Zealand bird to North-West Australia. To complete the quartet is the Shore-Plover, a peculiar long-billed form, which has apparently evolved

from the same form as the Common Ringed Plover of Europe, which is represented in Australia by the Hooded Dottrel, and which has not generically changed, while the generic distinction of the New Zealand bird has been unchallenged for nearly eighty years. In Australia we have Stone-Plovers, Painted Snipe, a peculiar generic type of Stilt, four peculiar Wattled Plovers, Jacanas, Pratincoles, and Coursers (to say nothing of such delights as Bustards and Cranes), all of which are missing from New Zealand. We again get recompense when we come to the Rails, as once more we are upon historic ground, Australia being unable to counter the Wood-Hens and Takahe with anything better than *Tribonyx*. Notwithstanding the incitation to exaggerate the wonders of these Rails, we can scientifically do nothing except depreciate them. Judging the series seriously, we are compelled to realize that they are simply degradational products through lack of energetic stresses allowing disuse of means of flight. Moreover, we can see the progress of the stages living in other generic types, as from the Auckland Islands has been described a *Rallus muelleri* which is a semi-flightless but otherwise little differentiated species, while *Hypotænidia philippensis*, *Zapornia pusilla*, and *Porzanoidea plumbea* are represented by sub-species, the most noticeable differential feature being the prominence of the secondaries at the expense of the primaries. At the Chatham Islands two well-marked generic types were found, whose origin could be recognized from a study of superficial characters, and which accurate estimation was confirmed by study of the osteological remains. These are *Cabalus modestus* and *Nesolimnas dieffenbachii*, the ancestry of the former being a species of *Rallus* alliance, while the latter's predecessors belonged to the *Hypotænidia* branch. *Gallirallus*, the Wood-Hens or Wekas, have, however, become so large through flightlessness, and their ancestors apparently also become extinct, so that their origin is at present obscure. It has never been emphasized sufficiently that flightlessness is accompanied (with scarcely an exception) with increase in bulk; this is easily seen in connection with the Takahe and Kakapo. Thus the forerunners of the Wekas must have been small Rails, and the increase, possibly within comparatively recent times in the case of the Takahe, is noteworthy. Thus the Takahe is only a flightless *Gallinule*, and we can suggest two colonizations of New Zealand by the same kind of bird. Thus, at an early date, a *Porphyrio*-like bird must have reached New Zealand, and, finding no enemies, degenerated into a large flightless bird, well known as the *Notornis*. Probably man, in the guise of the Maori, was the unexpected new enemy, and the *Notornis*, having lost its means of escape, soon suffered extinction. In the wildness of the South Island it lingered longer, still developing new useless features, and, as *Mantellornis hochstetteri*, may still exist. It is even possible that its own relation, *Porphyrio melanotus*, assisted in its extermination by its arrival at a later date with more energy and capabilities as to

flight, as *Porphyrio* reached the Chatham Islands, where it still lives, and is common throughout New Zealand. It is as yet only sub-specifically changed from the Australian bird, and it may be noted that probably two entrances into Australia also took place, as *Porphyrio bellus*, the Western Australian form, is quite specifically distinct, and the whole family shows little distinction over wide areas. Thus the true Gallinules and Coots have colonized the whole of Australia and Tasmania without showing much individuality, but failed to reach New Zealand as settlers, because the Coot has been noted in New Zealand as a rare straggler. The Wood-Hens in New Zealand show local variation, as yet not at all well understood, three species being at present admitted.

On each point yet dealt with in a few lines a long essay could have been easily prepared, and this sentence applies well to the Grebes. Two species are residents—one, the great Crested Grebe of British authors, with a world-wide distribution, showing only sub-specific characters, yet peculiarly a sedentary form; the other, the Dabchick (*Poliocephalus rufopectus*), specifically separable from the Australian species of *Poliocephalus*, only the two species being contained in the genus. Also, in Australia is resident the European Dabchick referred to the genus *Tachybaptus*, and if all are lumped in the one genus *Poliocephalus* must be used as the genus name. It is a curious feature that the European Dabchick should have colonized Australia while the species did not alter specifically, and that a different species of the same or an allied group should co-exist with differences in the near-by countries of Australia and New Zealand.

We now come to the Kiwis (*Apteryx*), the New Zealand *piece de resistance*—probably the best written-out birds we have, but our knowledge is still meagre. They are certainly no close relations of the Ratite birds as commonly understood, but we consider them more nearly related to the Rails. As to the Moas, their relationships are so obscure, notwithstanding the immense quantity of osteological material available, as to suggest the impracticability of laying much stress upon "deep-seated" features. It has been suggested that they are allied to the Kiwi, but this seems a very debatable matter. It is the presence of these two groups which have made the New Zealand *Ornis* so well investigated and so much argued, but the results do not seem comparable to the premises and surmises.

A Quail (*Coturnix novæ-zealandiæ*) has recently become extinct, and it was very closely related to the Australian form, very little difference even as to coloration being noted. It is suggested that it was a comparatively recent immigrant, and had scarcely established itself as a factor in the avifauna when the new conditions arose which decided its extermination.

Two species of Pigeon are admitted—*Hemiphaga novæ-seelandiæ* and *chathamensi*, the latter belonging to the Chatham Islands. It is peculiar that the only other species referable to the genus

Hemiphaga was a native of Norfolk Island, where it is now extinct. These are Fruit-Pigeons whose relations are all northward, and it is remarkable that the Chatham Island form has become more different from the New Zealand bird than the Norfolk Island form was. This fact has been adduced in favour of a Norfolk Island–New Zealand connection, but is valueless in that connection.

Neozelanic Ducks, again, show some remarkable items, as, out of twelve species admitted, four are wanderers from Australia, two are species common to Australia, while the other six are endemic and four belong to endemic genera. Such localization is quite as notable in this group as some of the better-known peculiarities of the *Ornis*. Thus, the Brown Duck (*Elasmonetta chlorotis*) appears to be the mainland representative of the Auckland Islands Duck (*Nesonetta aucklandica*), which is well known as being a flightless Duck, which is the true *Anas* group. The Mountain Duck (*Hymenolaimus malacorhynchus*) is peculiar, inasmuch as superficially it shows some features commonly regarded as peculiar to the Diving Ducks, whereas it is a modified surface-feeding Duck. Moreover, in New Zealand lives a Diving Duck referable to the typical genus *Fuligula*—*F. novæ-seelandiæ*—which is unrepresented in Australia; and then at the Auckland Islands lives a Merganser, *Promergus australis*, whose nearest relative lives north of the equator. This constitutes an extraordinary anomaly, of which no reasonable explanation has yet been provided. The Paradise Duck (*Casarca variegata*), though referable to the same genus as the Mountain Duck of Australia (*Casarca tadornoides*), shows very different specific character, the sexual variation in coloration being very marked and well known.

As regards Herons and Bitterns, all the breeding species, five in number, are regarded as only sub-species of Australian (and extra-limital) species.

The Harrier and the Morepork (Owl) of New Zealand are well spread all over Australia, and only a sub-specific difference is allowed, but there is also the Quail-Hawk and the Laughing Owl, which constitute endemic genera, *Nesierax* and *Sceloglaux*. The former genus may contain two species, but at present this is not really established, while its nearest relative is supposed to be the Australian genus *Ieracidea*. As to the relationships of *Sceloglaux*, little is known, the species being almost extinct and always rare.

There are not many Parrots, but there is lots of interest in those. There is, for instance, the Owl-Parrot, or Kakapo. This is another almost flightless New Zealand form about which a lot has been written, and in this case it seems to have been concluded that the novel features were purely due to disuse, but that the ancestors must have been somewhat primitive Parrots. Our own view is that it is a not very distant relative of the Australian *Pezoporus*, and that the forefathers of both came from the same stock. One genus of Broad-tailed Parrakeets is represented by four distinct species, all of the same group, and different

from anything referable to the family in Australia, which is its stronghold. Three of the species—*Cyanorhamphus novæ-zelandiæ*, *auriceps*, and *malherby*—live on the mainland, more or less together, while the first two are represented by sub-species on the Chatham Islands and on some of the Subantarctic islands. On Antipodes Island—one of the latter—lives a very distinct species of large size, and from which, indicating the tenor of the evolution through isolation, probably a flightless form would have been produced. As representatives of a distinct family of Parrots, the Kaka and the Kea (*Nestor meridionalis* and *notabilis*) have become famous through the activities of the latter in search of a new diet. As a matter of fact, it is certain these would have become flightless had not man intervened and, through persecution, compelled them to utilize their flying limbs before disuse had totally disabled them. No Parrot of Australia, the home of Parrots, is classed near to these at the present, but their morphology is not well understood in view of recent scientific work.

Two Cuckoos are natives of New Zealand—the Shining Cuckoo, with its mythological journey of thousands of miles each year, and the Long-tailed Cuckoo, with a known distribution of less extent, but still its migrations are not tracked. We have written "mythological journey" because no facts have yet been provided to account for the myth. Shining Cuckoos are heard and then their whistles cease, and from these facts a journey of thousands of miles is premised and a settling place selected, but, so far, no birds have been secured at the suggested locality. Here lies *the* puzzle of Neozelanic ornithology. An Australian and Polynesian Kingfisher has established itself, so that a sub-specific distinction may be accepted.

Then we arrive at the Passeriform birds, which we enumerate as thirty-two species. Such a total is insignificant, and it is at once lessened by the removal of three very rare visitors from Australia. Of the twenty-nine left, one is the well-known recent Australian immigrant, *Zosterops lateralis*, about which much has been written as regards its introduction.

The genera which these twenty-eight are included in number twenty-one, and nearly every one of these is endemic. Rarely an Australian representative can be determined, but more often no near relation can be cited, and more than half a dozen constitute endemic families, but their exact situation in the phylogenetic classification is at present indeterminate.

The whole series can be dismissed with very little notice, as the speculation is not supported by facts, but merely fancies. Thus, the allotment of the four small birds—the Rifleman (*Acanthisitta chloris*), the Stephens Island Wren (*Traversia lyalli*), the Bush-Wren (*Xenicus longipes*), and the Rock-Wren (*Xenicus gilviventris*)—to two distinct families is based upon facts, but the inclusion of these in the Super-family *Pittoidea*, and thereby classing them with Pittas, has not such a sure foundation. The basis of this alliance is more probably due to convergence in the anatomical

items used for comparison. They are certainly not *nearly* related to the Pittas.

The birds locally known as Tomtits and Robins are relations of the Australian *Petroica*-like birds, and appear to have arrived in New Zealand probably about the same time as the antecedents of the *Petroica* series invaded Australia. Isolation caused their evolution in different directions, and thus we get the Robin (*Miro australis*) as a large form, while the Tomtits (*Myiomoira macrocephala* and *toitoi*), perhaps through competition, as degenerate species. An interesting item are the two Black Robins (*Nesomiro traversi* and *dannefærdi*), which appear to have evolved independently on similar lines in achieving an entire black plumage on far distant isolated islands. We here suggest that they have developed from a form of *Myiomoira*, and not from *Miro*, with which they were associated until we separated them.

Another Australian form, the Fly-eater, is represented by a species which is a little different in structure as well as in habits. In order to emphasize these differences we have called the mainland New Zealand form *Maorigerygone*, while the Chatham Islands species had been distinguished previously as *Hapolorhynchus*, on account of its extraordinary large size and peculiar bill—a beautiful example of evolution by isolation on islands. A noteworthy item is the retention of aboriginal coloration, while structural changes are manifest and of great import.

The New Zealand Fantails, *Rhipidura flabellifera* and *fuliginosa*, are as interesting as any birds could be, as it is obvious they are only recently immigrants from the mainland, and, while the species was spreading throughout Australia without a great deal of variation, a melanistic "sport" was produced in the south of New Zealand, and this melanism is now spreading over the islands and probably displacing the original form. We do not know of any similar case of melanistic displacement in progress, but these forms show how such may occur. At the present time the two birds breed together without producing hybrids, each form appearing quite distinct from the egg upwards.

The Thrushes of New Zealand constitute an endemic family whose exact relations are unknown, and the name "Thrush" is only used as they are superficially large Thrush-sized birds with an obscurely spotted breast.

The Fern-Birds (*Bowdleria*) are, again, endemic and of family rank, their allies certainly *not* being the South African *Sphenœacus*, with which they were confused many years ago. They are island modifications of some such form as that from which the Australian *Atrichornis* was derived.

To the family *Paridæ* three very different species are allotted simply because a new family for each seems too much to admit at present; but they have as little real affinity with the Palæarctic Tits as the Australian Whitefaces (*Aphelocephala*) have.

The Yellow-head (*Mohoua ochrocephala*) may be distantly related to the White-head (*Certhiparus albicilla*), but whether

either of these is related to the Creeper (*Finschia novæ-seelandiæ*) is a very doubtful point. We hope to adjust these items at a later period, but lack of material is the difficult item to overcome.

Again, the family *Meliphagidæ*, the keynote to the Australian *Ornis*, is credited with three species—the Bell-Bird (*Anthornis melanura*), the Stitch-Bird (*Notiomystis cincta*), and the Tui (*Prosthemadera novæ-seelandiæ*)—but none of these can be directly ascribed to an Australian ancestry, the Bell-Bird having the most superficial likeness. The Stitch-Bird is very probably not a member of this family at all, while the Tui is a remarkable evolution, with no very marked affinity to any existing Australian species. The Ground-Lark is a Pipit (*Austranthus novæ-seelandiæ*), very closely allied to the Australian one, and certainly quite a recent immigrant to New Zealand, and here again it shows how quickly evolution works in that country. Thus, a Pipit from one of the Subantarctic islands shows degeneration towards flightlessness in the reduction of the sternum.

The Huia (*Heteralocha acutirostris*) was referred to the family *Sturnidæ* along with the Saddle-back (*Creadion carunculatus*), because the investigators were unable to interpret the features they observed. They have little to do with each other, and still less with the *Sturnidæ*, and we allow each as an endemic family until we know more about the anatomy of birds and are better able to determine exact relationships. Similarly, the so-called Crows were placed with the true Crows, but they are not related in any sense, but contribute a distinct family, whose affinities we hope later to trace.

This short essay has been prepared simply with the idea of placing on record facts, and we have not loaded the paper with a lot of detail, but we can produce full confirmation of all the statements here made. It is unfortunate that the New Zealand avifauna should have been so ill-treated in the past that a mass of misstatements surrounds almost every bird. The superficial critic then grasps these misstatements, ignorant of the truth, and makes more confusion, and then the confusion is transferred into other books by writers attempting to cover wide fields, and they become historic. No word in this essay has been written second-hand, and we have not controverted the statements on record, as that would have more than doubled this space; but we ask anyone interested to contrast this article with any others they may have read.

We may conclude with a general survey in a few words. The New Zealand avifauna is very peculiar, and this is due to long isolation. This isolation has been once or twice interrupted, and later invasions have taken place. Even since the apparent latest, time has elapsed sufficient to allow (with the rapidity with which evolution has worked in this country) variation in many marked directions.

While the invasions may have been mainly from the north, there appear to be good reasons for allowing an Antarctic element

still persisting. The northern invasions are not easily traceable, but we cannot dogmatize by stating that they were through New Caledonia or Norfolk Island, and it is possible that a way existed of which we have no trace. It is possible that some of the earlier invasions took place simultaneously with an Australian invasion, which would account for some of the peculiarities, but we do not think that any direct colonization of New Zealand from Australia has taken place except in the undoubted case of *Zosterops*; consequently there can be no comparison of the Neozelanic avifauna with that of Tasmania, as the latter simply shows, with scarcely an intrusive element, the northern forms which travelled down Australia from the north before the separation of Tasmania from the mainland. It is also admitted that Tasmania may have been connected with Antarctica even as New Zealand was, but this connection was at a later date, when most of the peculiar forms had been dissipated. The Tasmanian endemic genus *Tribonyx* is only an island form of *Microtribonyx*, of larger bulk and less flight. Much confusion has been caused through the misunderstanding by palæontologists of the convergence in flightlessness in the Ralline birds, but when Andrews described a fossil *Tribonyx* from Madagascar he drew attention to this fact, pointing out that there was little reason to suggest that this was really a *Tribonyx*.

We might note that in *The Ibis* for 1913 we published a reference-list of the birds of New Zealand, which contains much of interest, a majority of the points in Hall's paper (1920) being discussed in that place seven years before.

A New Menura: Prince Edward's Lyre-Bird.

By A. H. CHISHOLM, R.A.O.U., BRISBANE.

INASMUCH as the Australian Lyre-tails are among the most remarkable and fascinating of the world's birds, and by reason of the fact that their habitat and range are restricted, importance attaches to the discovery of any variant from the type, and even to the recording of any extension of locality. The type-bird of the genus, *Menura superba* (Davies), ranks as one of the earliest of important "finds" in Australian ornithology; a markedly different species, *M. alberti*, was named by John Gould in 1850; and a third species, *M. victoriæ*, was separated from the type species by the same great ornithologist in 1862.

Nearly 60 years having elapsed since the latter date (and over 100 years since the discovery of the type species), it is somewhat extraordinary that it is now possible to put forward, with a considerable degree of confidence, what is apparently a better variant from the type of the genus than is Gould's *victoriæ*. Moreover, it has to be said at once that the new bird hails from Queensland—a State which was previously supposed to harbour

only the Albert Lyre-Bird; that the class of country which it inhabits is totally different from that favoured by other species of the genus; and that the type-locality is on the *western* watershed of the Great Dividing Range.

Early in 1919 I had a note relating to this subject from a lad who lives at Lyra, a small township on the Sydney to Brisbane railway line, and not far from the border of New South Wales. In this letter it was remarked that Lyre-Birds were once abundant in the locality, that some were still to be seen and heard, and that the township itself had taken its name from the birds. While not overlooking the fact that Shaw had used the specific title *lyra* for the *M. superba*, it seemed to me hardly possible that any member of this restricted genus should be found 100 miles inland, and particularly in a locality carrying none of the jungle vegetation so beloved of Lyre-Birds generally. Confirmation came later in the year, however, when Dr. Spencer Roberts, R.A.O.U., wrote me regarding the Lyre-Birds of the contiguous district of Stanthorpe. He related that the birds dwelt upon the lonely granite-strewn hills of the locality, and that their nests were usually placed in the clefts of giant boulders.

This was an invitation in itself. Accordingly, in the following month (August), following the departure of the Royal train, I took advantage of the occasion to drop off at Stanthorpe—which town, by the way, is 198 miles by rail from Brisbane and 25 miles by rail from the border of New South Wales. Three interesting days among the birds of the locality were distinguished by close acquaintance with the Lyre-Birds. We examined seven nests in one afternoon, including two which each contained an egg; and in one case a female bird was flushed from the nest. In every instance the nest was built on the side or sloping top of a huge boulder, *in perfectly open forest country.*

We did not see a male bird at any time, nor had we any desire to secure one in the breeding season. Early in the present year, however, I asked Dr. Roberts to take a specimen, at the same time furnishing him with a special permit from the Queensland Government. Dr. Roberts responded promptly, though, as a sound bird-lover, the work "nearly broke his heart." The specimen was examined in Brisbane, after which it was sent on to Mr. A. J. Campbell for critical comparison with skins in the "H. L. White Collection" in the Melbourne Museum. To this national collection it was subsequently donated.

Gould admitted that the grounds upon which he separated *M. victoriæ* from the type-bird were slender; nevertheless, he allowed the species to stand, and it has held good as a variety to this day. In the latest variant, as earlier suggested, the case for separation is stronger. Nor do I think that additional material (from such a "novel" locality) will tend to disprove this view. The upper surface is fuscous, as against brownish (bay brown) in the type of the genus and auburn in *M. victoriæ*. The under surface is mouse-grey, compared with light fuscous (hair brown) in both

superba and *victoriæ*. The colour of the two large tail feathers is tawny or russet, as against hazel in the type-bird and chestnut in *victoriæ*—*i.e.*, the new bird is of a lighter colour than the type, while the Victorian bird is darker. Total length, 35 inches; wing, 11½ inches; bill, 1½ inches; tarsus, 5 inches. These figures are slightly larger than those of the typical *superba*.

Further material must be obtained before the precise relation of this bird to the type species can be definitely established. Provisionally, I suggest for this "Queensland *superba*" the name of *Menura edwardi*, in honour of His Royal Highness the Prince of Wales. The use of proper names for birds can be overdone; but in this case the precedents are extraordinary. The names of the Prince's great grandparents were used in respect of two of the three previous species of these "royal" Australian birds; and what more fitting than that to Queen Victoria's * and Prince Albert's Lyre-Birds should be added Prince Edward's Lyre-Bird? † Moreover, it was on the fringe of the type locality (*i.e.*, at the Amiens soldiers' settlement) that our persuasive ambassador-Prince first disembarked in Queensland; it was in the same locality that he took his farewell of the State; and it was his tour that indirectly led to the obtaining of the bird.

How far the Lyre-Bird of the rock country extends (into New South Wales and Queensland respectively) cannot at present be stated. Stanthorpe itself, though almost exactly 100 miles in a direct line from the coast, is very little to the north of the Richmond River country—previously supposed to be the most northerly record for the *superba* group of Lyre-tails. It may be that there is a link somewhere. Indeed, I am beginning to suspect that *M. alberti* is not the only species of *Menura* in the Macpherson and other coastal ranges of Southern Queensland: we have, I think, been inclined to take too much for granted on this point. Should connection be established, the semi-anomalous bird of the granite belt will probably take sub-specific rank as *M. superba edwardi*.

THE strike having been settled, the monthly conversazione of the R.A.O.U. will be held on the first Wednesday of each month, at 8 p.m. 4th May, R.A.O.U. Room, "Gully Birds," Mr. T. Tregellas; 1st June, National Museum, "Recent Additions to the 'H. L. White Collection,'" Mr. A. J. Campbell, and "Tree-creepers," Mr. F. Howe; 6th July, R.A.O.U. Room, "Nests of Birds," Mr. J. A. Ross.

* A general impression has gained ground that the name *victoriæ* implies the locality of the species. Gould made his object impulse clear, however, when he wrote, *apropos* of this bird:—"It will be seen that I consider the *Menura* from this part of the country to be different from the bird inhabiting New South Wales, and that, under this impression, I have named it *M. victoriæ* in honour of our gracious Sovereign."

† A capital suggestion, especially in these days when so much disloyalty is in the air. Moreover, the royal parents of Prince Edward are the co-patrons of the R.A.O.U., and have taken an especial interest in the Union since its inception 20 years ago.—EDS.

The Tubinares (Petrels and Albatrosses) in the Gould Collection at Philadelphia.

BY W. B. ALEXANDER, M.A., R.A.O.U.

DURING a brief visit to Philadelphia in September, 1920, I was enabled, through the kindness of Dr. Witmer Stone, to see the famous Gould collection of Australian birds which, as is well known to Australian ornithologists, is the property of the Academy of Natural Sciences of Philadelphia.

Dr. Stone and Mr. Mathews have published a list of the type specimens in the collection,* but no complete list of all the specimens has ever been published, though a copy of the original list made by Verreaux, the French taxidermist who mounted the birds, is preserved in the Academy. The list gives in five columns a reference number, generic name, specific name, sex, and locality. Precisely similar details are written on the under surface of the wooden stands of each of the specimens, where, however, in every case the word "type" also appears. Those which Messrs. Stone and Mathews have determined as actual types have been dismounted and relaxed. The remainder are mostly still on exhibition in the Museum of the Academy.

I was a good deal surprised to find in what an excellent state of preservation the majority of the specimens are. Dr. Witmer Stone informed me that he would like Australian ornithologists in general to know that he would be willing at any time to compare any skins they might send him with Gould's types, though, of course, he could not risk sending such valuable specimens away for examination in Australia.

I was particularly interested in the specimens of *Tubinares*, especially as, in a good many cases, there is some doubt as to whether a species is entitled to a place on the Australian list. The following is a list of the birds of this order contained in the collection, copied with the permission of Dr. Stone from Verreaux's list. Notes on the specimens marked with an asterisk (*) will be found at the end of the list; those marked with a dagger (†) are types. I regret that I had not time to examine all the birds in detail.

Number.	Genus.	Species.	Sex.	Locality.
†1169.	*Thalassidroma*	*leucogaster*	♂	—
1170.	,,	,,	♀	—
1171.	,,	*marina*	♂	W. Australia
1172.	,,	,,	♀	,,
1173.	,,	,,	juv.	,,
†1174.	,,	*nereis*	♀	Bass St.
*1175.	,,	,,	juv.	,,
†1176.	,,	*melanogaster*	♂	—
1177.	,,	,,	♀	—
1178.	,,	*wilsonii*	♂	Bass St.

* *Austral Avian Record*, vol i., p. 129, 1913.

Number.	Genus.	Species.	Sex.	Locality.
1179.	*Thalassidroma*	*wilsonii*	♀	Bass St.
1342.	*Diomedea*	*exulans*	♂	Aust. Seas.
1343.	,,	,,	♀	,,
1344.	,,	,,	juv.	,,
1406.	*Daption*	*capensis*	♂	N.S. Wales.
1407.	,,	,,	♀	,,
1408.	,,	,,	♀	Off C. Howe.
†1409.	*Puffinus*	*brevicaudatus*	♂	Bass Strait.
1410.	,,	,,	♀	,,
*1411.	,,	,,	♀	W. Australia.
1412.	,,	*sphenurus*	♂	,,
1413.	,,	,,	♂	Raine's Isl.
†1414.	,,	,,	♂	W. Australia.
1415.	,,	,,	♀	Raine's Isl.
†1416.	,,	*carneipes*	♀	W. Australia.
1417.	,,	*sphenurus*	juv.	Raine's Isl.
†1418.	,,	*assimilis*	sexe ?	E. coast of Aust.
1419.	,,	*urinatrix*	♂	V.D. Land.
1420.	,,	,,	♀	,,
1421.	*Prion*	*vittatus*	♂	Aust. Seas.
1422.	,,	,,	♀	,,
1423.	,,	*banksii*	sexe ?	,,
1424.	,,	*turtur*	♂	,,
1636.	*Diomedea*	*melanophrys*	♂	Australian Seas.
1637.	,,	,,	♀	,,
†1638.	,,	*cauta*	♀	V.D. Land.
1639.	,,	*chlororhynchos*	♂	Australian Seas.
†*1640.	,,	*culminata*	♂	Aust. Seas.
*1641.	,,	*fuliginosa*	♂	V.D. Land.
1644.	*Procellaria*	*gigantea*	juv. ♂	V.D. Land.
1645.	,,	,,	♀	,,
*1651.	*Diomedea*	*culminata*	♀	Aust. Seas.
†1666.	*Procellaria*	*conspicillata*	♂	,,
1667.	,,	,,	juv. ♂	,,
1668.	,,	*equinoctialis*	♂	Cap B. Esp.
1669.	,,	*atlantica*	♀	Atlantic Seas.
*1670.	,,	*antarctica*	sexe ?	,,
*1671.	,,	,,	sexe ?	,,
*1672.	,,	*hasitata*	♂	Aust. Seas.
*1673.	,,	,,	♀	,,
1674.	,,	*glacialoides*	♂	,,
1675.	,,	,,	♀	Nlle. Zélande.
1676.	,,	*lessoni*	♂	Aust. Seas.
1677.	,,	*mollis*	juv.	,,
†1678.	,,	,,	♂	Atlantic.
1679.	,,	,,	♀	,,
*†1680.	,,	*cookii*	♂ (?)	P. Stevens.
1681.	,,	,,	♀	,,
1682.	,,	*cærulea*	♂	Aust. Seas.

NOTES ON SOME OF THE ABOVE SPECIMENS.

1175. Though marked juvenile, this specimen of *Garrodia nereis* is fully fledged, and cannot be taken to indicate that the species breeds in Bass Strait.

1411. The specimen labelled *Puffinus brevicaudus*, from Western Australia, is an example of *P. carneipes*. I have already stated in *The Emu* that Gould appears originally not to have distinguished these two species, and suggested that his record of *P. brevicaudus* from Western Australia was made before he separated *P. carneipes*. It is satisfactory to find that the specimen confirms my suggestion. Western Australia can now be finally struck off the list of States in which *P. tenuirostris* (*brevicaudus*) has been obtained.

1640 and 1651. These two specimens of *Diomedea culminata* are labelled "Australian Seas." It is evident that Gould used this term rather loosely, and probably any bird obtained between the Cape of Good Hope and the coast of South America might have been so labelled. But in the case of this species Gould specially remarks that he found it commoner in Australian seas than anywhere else. He met with "numbers during a voyage from Launceston to Adelaide, particularly off Capes Jervis and Northumberland," and again observed them between Sydney and New Zealand (Gould, "Handbook," vol. ii., p. 436). In view of these statements we are, I think, justified in assuming that the two specimens in his collection, one of which is the type of *Diomedea culminata*, were obtained in Australian waters.

Mathews's latest pronouncement on the subject is difficult to reconcile with the foregoing facts. He writes (Mathews, "Birds of Australia," Supplement, i., p. 109):—"This is another bird that Gould said he saw in Australian waters: but *no specimens are in his collection*. Perhaps he made a mistake in his locality. If so, I designate as type-locality of *Diomedea culminata*, Gould, 1843, the Cape Seas. If this be correct, Gould's name becomes a synonym of Forster's bird. There are only two authentic records, both from West Australia."

As there are, in his opinion, only these two authentic records, Mathews consigns the bird to the Appendix, and does not give it a place in his latest Australian list.

1641. The specimen of *Diomedea fuliginosa*, from Van Diemen's Land, is an example of the entirely dark race which Mathews calls *Phœbetria fusca campbelli*, and which, according to many observers, is quite common on our southern coasts in winter. This species, like the preceding, is consigned to the Appendix of Mathews's latest list (Mathews, "Birds of Australia," Supplement, i., p. 113), as he only knew of "one specimen from Hobson's Bay, preserved in Melbourne Museum."

1670 and 1671. These specimens of *Thalassoica antarctica* are labelled Antarctic Seas on the stand, not Atlantic Seas, as in Verreaux's list.

1672. This bird is an example of *Priofinus cinereus*, and is almost certainly one of the specimens which Gould states he

obtained on his passage from Hobart Town to Sydney ("Handbook," vol. ii., p. 446).

Mathews writes (Supplement, i., p. 109) :—"I do not know of any authentic skins of this species that were taken in Australian waters. Although Gould said he killed specimens, *none are in his collection*, and we must wait till others are caught." The species is therefore entirely omitted from his latest list.

1673. This bird is very obviously different from the preceding, though, like it, labelled *Procellaria hasitata*. It is an example of one of the forms of *Puffinus kuhli*, and, as Dr. Stone has noted on the stand of the specimen, is not improbably Gould's *Procellaria flavirostris*—perhaps actually the type—which was procured by Sir George Grey off the Cape of Good Hope on one of his voyages to Australia.

1680. This is the type of Gould's *P. leucoptera*.

In conclusion, I would like to express my thanks to Dr. Stone for his courtesy, and to point out, in case of any misapprehension, that in referring to mistakes of labelling I am referring to the old Gould–Verreaux names written on the stands, not to those which they now bear in the Academy Museum : these are, of course, the correct modern scientific names.

Birds Visiting Cape York Peninsula and New Guinea.

By H. G. Vidgen, Paira, Cape York.

Birds which make a regular annual migration from New Guinea to Cape York, and *vice versa* :—The Bee-eater (*Merops ornatus*), the Spangled Drongo (*Chibia bracteata*), the White-tailed Kingfisher (*Tanysiptera sylvia*), the Koel or Flinders Cuckoo (*Eudynamis cyanocephala*), the Nutmeg-Pigeon (*Myristicivora spilorrhoa*), the Blue-breasted Pitta (*Pitta mackloti*), and the Shining Starling (*Aplonis metallica*).

A few odd birds of both *M. ornatus* and *C. bracteata* are here right through the year. I am inclined to the idea that the Lesser Pitta (*P. simillima*) is also migratory. Some birds are certainly to be seen and heard all through the year, but the same logic also applies to the Bee-eater and Drongo. The Pitta, being purely a scrub-dweller and a ground-bird, is difficult of observation ; in my opinion these facts alone have won for it the name of being non-migratory. From personal observation I am sure that they are much decreased in numbers after March. These remarks are applicable only as regards the locality of Paira, Cape York.

Birds which make irregular migrations from New Guinea to Cape York :—The Little Topknot-Pigeon (*Lopholaimus antarcticus minor*), the White Ibis (*Threskiornis molucca*), the Spoonbill, and the Channelbill Cuckoo (*Scythrops novæ-hollandiæ*).

When pearl-shelling on the ocean beds to the north-west of Thursday Island I have seen large flocks of Spoonbills and Ibises making their flights to and from New Guinea. I did not notice them every year. As far as memory serves, these migrations were generally at the latter end of the year—during September, October, and November. The Channelbill (*Scythrops*) is rather a difficult bird to place; a few may be seen almost the whole year through. Some years they are plentiful during June, July, and August, but not regularly. In two different years I saw them in flocks of up to a dozen on Mulgrave Island; on both occasions this was in the latter end of April and early May. They were feeding on the wild figs when seen. The direction of their flight I could not ascertain, but they are not permanent on Mulgrave Island. We do not see many of these birds at or near Paira. If there are any about they are sure to be found in the vicinity of Somerset, three miles from here. Just why they favour that particular locality it is difficult to say; food is certainly not the factor, as the wild figs on which they chiefly feed are widely and plentifully distributed.

Birds which make an annual appearance at Cape York. They come and go with regularity as regards the time of the year, but, unlike the migratory birds, they are seen but once. Whence they come and where they go is a matter of conjecture:—The Australian Roller or Dollar-Bird (*Eurystomus pacificus*), the Chestnut-breasted Finch (*Munia castaneothorax*), a Swift, a Swiftlet, the Pied Grallina or Magpie-Lark (*Grallina picata*), Sea-Curlew (*Numenius cyanopus*), the Whimbrel (*N. phæopus*), and two varieties of Quail.

Of these birds only the Finch and Quail are definitely known to breed during their sojourn in this locality. At different times I have seen *Munia castaneothorax* on Banks and Mulgrave Islands—the last islands of importance in the chain stretching from Queensland towards New Guinea on the western boundary of Torres Strait.

Notes on the Domestic Habits of the Spotted-sided Finch (Stagonopleura guttata).

By (Mrs.) S. T. W. Norton, R.A.O.U., Boree, Walcha, N.S.W.

When we first settled in the New England district, ten years ago (1910), I do not remember seeing any of these little birds about near the homestead; but so soon as our newly-planted trees and shrubs began to attain some growth and thickness of foliage the Finches (known locally as "Diamond-Sparrows" or "Red-tails") began to come into the garden through the summer months. The first pair I observed here arrived about March, 1916, and began at once building a nest in a rose arch near the house. They did not lay any eggs or rear any young ones that autumn, but used

their half-finished nest as a roosting and sleeping place till about midwinter, when the rigours of the winter in such an exposed place, or the shortage of food, sent them away. They reappeared in the spring, finished their old, half-built nest, and reared a family of four. I noticed that the four young ones went on using the old nest for a resting and sleeping place long after the parents had beaten them off, and had begun a fresh nest, which they built right against the old one, and raised a second brood of three. During the cold months (which are very cold here) they all retire, I think, to the more sheltered bush. At any rate, they all leave the garden, but I can always find isolated pairs out in the bush all through the winter.

In 1917–18 quite a flock of Finches took up their residence in the garden. We have a belt of cypress and *Pinus insignis* trees planted as a breakwind all along one side of the place, and I think there was a Finch's nest in every tree. At any rate, I knew of twelve nests, each in a separate tree, besides two or three odd ones in fruit trees and rose bushes. In the pines they always built right in so deep among the boughs that I could never observe the method of their building. They were very shy, too, and would never allow me to get within spying distance of their operations; but at last one day I was delighted, whilst sitting at an open window, sewing, to see a pair of "Diamondies" busily exploring the mixed wistaria and rose creepers just outside. One —which, I presumed, was the female—did all the investigating, rustling about among the branches, twisting leaves and stems here and there, and evidently seeking for a suitable site for her nest. The male bird hopped about after her, evidently admiring her efforts immensely, but doing nothing to assist; putting his little head on one side and watching her, and occasionally giving vent to the long-drawn, plaintive little note which seems common to both sexes. For a long time the little hen bustled about among the wistaria leaves, pulling them about and bouncing up and down among them, but at last she seemed to decide they were not an ideal place, for she left them and bustled off to the rose branches near, the little male obediently and admiringly following her as though she said, "Come on, my dear; let's try somewhere else. This place is no good." After some more twistings and turnings among the rose branches—all in full view of my delighted eyes—she came out and joined her mate on a wire just above. They had a consultation about things—sitting close side by side and saying things in small twitters. Evidently she conveyed to him that she had found the ideal spot at last. After a few moments he flew away with a definite purpose in his eye, whilst she returned to her chosen site and began busily twisting leaves and twigs and bouncing up and down in the same energetic way as before. Presently back came little master with a long trailing piece of seedy grass, and perched on a twig near her, holding it in his little bill till she was ready to take it. When she was ready she popped out of her arranged site, took the piece of grass with

scant ceremony, and pulled it backwards into her retreat and began to weave it into the branches with a great deal of energetic jumping up and down.

I was able to watch the whole building of that nest. At first I had to observe them only through the closed glass window. If I appeared at the open window they would at once fly away and perhaps not come back for hours; but after a while they seemed to get used to my presence, and would go on happily with their building whilst I sat in full view in the open window. One little bird—I presume the female—did all the building, whilst the other—presumably the male—did all the carrying of materials. He was most energetic and indefatigable. He would arrive with a long trailing piece of stuff and perch on the same twig every time, where he would patiently sit holding it dangling from his bill till the little lady deigned to come and take it. Sometimes he got very tired of waiting, and would open his little bill to give voice to a long protesting quaver. Of course, the piece of grass would at once fall to the ground, but I never once saw him pick it up again. He would put his little head on one side and observe the fallen piece with a contemplative air as though wondering if it were worth while bothering any more about it, and would then fly away and bring a fresh piece. After a while there was quite a pile of dropped and despised pieces littering the verandah beneath the nest. The little hen did all her building from the *inside*. To begin with, she outlined the whole nest, spout and all, with roughly-woven grass and weed stems. She left a round space at one side just opposite where the little male perched with his building materials, through which she drew in the trails of material, always holding them by the extreme end and going in backwards, and hauling the material after her. Once inside she seemed to go round and round and jump up and down and bounce about with much energy. As the whole nest grew and became more and more solid and opaque I could not see her at all excepting when she emerged for more material, but her busy jumpings and bouncings inside the growing structure jerked the whole rose-branch and kept it in agitation. I observed that the male bird brought nothing but *green*, growing material. He would fly out into the orchard, where grass and weeds grew tall, and would select a suitable piece, nipping it off near to the ground with his sharp little bill and tugging at it till he got it free; then, holding it by the extreme end (the bitten-off end), would fly off with it, the long piece of material streaming out behind him as he flew. He was particularly fond of a tall, soft weed with a yellow, dandelion-like flower, which is very plentiful here—in fact, the nest was built almost entirely of it, yellow flowers and all. He also brought long stems of seedy grass (never just grass-blades). I have also observed them using long trails of a little creeping weed with small red berries that trails about over the ploughed ground in the orchard. The small bird nips and tugs at the stem till he gets it cut through, and then often has much

difficulty in getting such a long, unwieldy piece home. If there is any breeze it is very difficult, and I have seen him having a fearful struggle to reach the nesting-site with it. One pair built their nest entirely of asparagus sprays. They built their nest in a fruit tree just beside the asparagus bed, and the lazy little male simply descended into it for all his material.

My especial pair of Finches were very amusing to watch. The male bird would bring a piece of material and would often have to wait a long time before the busy little lady weaving inside the nest was ready to take it from him. He seemed to get very tired of this waiting game. Sometimes, as mentioned above, he would give voice to a protesting note and drop the piece; sometimes he seemed to think he would take a hand—or, rather, "bill"—in building himself, and would attempt to weave his piece into the nest, but he always did his bit of weaving on the *outside*, and the little lady, if she emerged in time to catch him at it, never failed promptly and scornfully to drag it out again and haul it *inside* the nest, bundling him most unceremoniously out of the way, and even trampling over him without the least compunction if he did not move aside quickly enough. I could plainly see by her impatient and scornful attitude that she was saying, "My dear, I wish you would attend to your own department and leave the home-making to me; what do you know about it, anyhow?" and the small male bird would hastily—and, I am sure, apologetically—fly away and bring another piece with obedient despatch. At last a very brilliant idea seemed to occur to him, and if she was not ready for his material when he arrived he took to placing it very carefully in a fork of the rose-branch, just outside the nest, and flying off for another, and so soon had quite a little collection of pieces ready for her ladyship's selection. She seemed to approve of this arrangement, too, and would emerge and seize a piece from the pile and drag it backwards into the nest whenever she needed it. She seemed consumed with a veritable fever of house-building. Sometimes little master, arriving with a specially fine piece of flowering weed and finding the lady of the house safely occupied within, could not resist the temptation of weaving it on to the outside, and if he accomplished this feat without her coming out and demolishing his work, he seemed to consider it with the most comical air of pride and delight, and would sit on a twig and admire it, head on one side, till, her little ladyship coming bustling out, he would fly off hastily to attend to his providing duties again. We used to stand and watch him—my maid and I—with the greatest amusement, and hoped he would get time to finish his bit of house decoration before she came out and caught him.

The main part of the nest grew in bulk and thickness, but the "spout" was left quite sketchy till the very last. Unfortunately, I had to leave home for a few days just before it was finished, and when I returned there was a most complete and compact 'spout" to it, through which they were carrying large feathers.

I think both of them took part in this business, though I could not be sure, as the small bird that arrived with a feather at once entered the nest and disappeared from view. They seemed to have a penchant for *white* feathers—though they used black ones too—and it was most amusing to watch a small bird struggling to reach the nest with a big white fluffy feather (bigger than itself), catching the wind and almost turning it head over heels in the air. Frequently they were blown entirely out of their course, and, after taking a "breather" on an adjacent fence, would try again and again till the feat was accomplished and the goal attained. They did not build straight ahead every day till the nest was finished; on the contrary, the female seemed to have fits of energy—orgies of building. Whilst the fit was on things were kept going at top pressure for an hour or two at any time of day, but mostly in the early morning. Then they would seem to desert the nest altogether for a day or two, and once left it so long that I began to fear that perhaps my spying upon them had disgusted them, and that they had abandoned it; but after nearly a week's neglect, one morning they were back at work, busier than ever. Once, in the midst of a very furious bout of building fever, the boy came round to cut the grass just below them, and frightened them away. Soon after he was gone, one—I am sure it was the female—came back, popped into the nest, and did some energetic jumping about in it; came out and called several times; sat and listened; popped back into the nest and did some more bouncing round; came out again and called several times, but her mate did not respond. She waited a bit; then, evidently saying "Drat that man! Whatever is he about? I must go and find him!" she flew off, and very soon came back accompanied by her mate bearing a long trail of grass, which she took from him and dragged into the nest, whilst he was despatched for more.

They finally finished the nursery, and she laid four eggs in it, and whilst she was sitting he used to come and feed her early in the morning—perhaps oftener—and she would make a noise something like the "buzz" of a big fly caught in a spider's web. When the young were hatched both parents fed them with equal devotion, and long after the little ones could fly they still pursued their unfortunate little parents for food with a fretful, crying noise. The four young used to sit in a row on the fence, and when an old bird flew up they all would rush at it and scramble all over the poor little thing in their greedy desire for the food it had brought, so that the little parent, in its bright dress of black and grey, white and crimson, would almost disappear beneath a fluttering wave of browny-grey, noisy youngsters, each intent on trying to secure the whole titbit for itself. To one who did not understand what was going on, it would seem that a battle-royal was in progress and the bright little bird was fighting for its life against overwhelming odds.

Their greedy, unruly behaviour was a great contrast to that

of four young Swallows sitting very close together near by. They placidly awaited the visits of their busy parents, and each took its just turn of a meal, without protest or fuss from the others. They never tried to rob their little brothers.

Notes on Birds of Prey from Casterton, Victoria.

By C. E. SIMSON, R.A.O.U., CASTERTON, VICTORIA.

ALLIED Swamp-Hawk (*Circus gouldi*).—Swamp-Hawks are fairly plentiful all over the district, preferring the growing crops along the river and the rushes of swamps in the scrub. They do a good deal of hunting for small birds, but do not seem to have enough courage to attack the larger ones; they also feed on young rabbits. They are very harmless, and, apart from killing a few small birds, do no harm. We generally find their nests at harvest time when cutting the crop.

Grey Goshawk (*Astur cinereus*).—I have seen odd birds about which, I feel sure, belong to this species. Their habits seem to be the same as the Australian Goshawk.

White Goshawk (*Astur novæ-hollandiæ*).—I have seen only one specimen of this beautiful Hawk in these parts, but it is said to be more plentiful in the forest country towards the mouth of the Glenelg River.

Australian Goshawk (*Astur approximans*).—This Hawk is very plentiful all over the district, but seems to prefer the more lightly timbered country to the stringybark scrub. They are very fearless about a homestead, and take an odd chicken or two, but do more good than harm by keeping Sparrows and Parrots away. One used to perch on the roof of our hay-shed, and any Sparrows or Parrots that happened to be under the roof when he arrived had to run the gauntlet to some pine-trees a hundred yards away, when the odds were on the Hawk. I was not at all pleased when somebody shot the unfortunate Hawk and incidentally put a charge of shot through the iron roof. These birds will often return to their old nests. One that was used in 1914 was again used last year. I have no record of it during the years 1915 to 1918.

Collared Sparrow-Hawk (*Accipiter torquatus*).—This is a rare bird here, and is only occasionally seen. I knew of two eggs that were taken from a nest last year, and a fortnight later a full set of four eggs was taken from the same nest.

Wedge-tailed Eagle (*Uroaëtus audax*).—These magnificent birds are always to be found about the district, and they nest in the big red gums along the river and the steep gullies leading into it. Most of the nests are in commanding positions on the side of a steep hill or gorge, and, although the nest may be not more than 60 or 80 feet from the butt of the tree, you appear to look straight down from the nest to the bottom of the gully—perhaps

200 or 300 feet below. In ten years' experience with lambing ewes I have never actually seen an Eagle killing a lamb. One of the boundary riders once told me that he had seen five birds hunting a mob of ewes and lambs, and they had killed three or four lambs before he could get to them and hunt them away. This year, when the ewes were low in condition, a pair killed several and maimed others so badly that they had to be destroyed. When a ewe got down lambing they would start at the tail and eat down the back of the legs as far as the hocks. I think the Eagles are like foxes—only certain ones take to killing, and when they do they kill regularly. Nearly every year they kill a few weaners in the autumn and early winter. Now for the credit side of the ledger. When once the young rabbits come about I have never known the Eagles to be any trouble, even though they may be nesting in a lambing paddock. In one nest that we examined last year there was an Eaglet about three weeks old sitting amongst a mass of dead rabbits. We estimated there must have been the remains of over thirty. When all is considered, the good they do more than balances the harm, and if odd birds do get troublesome it is better to destroy the guilty one and leave the innocent to carry on their good work.

Whistling-Eagle (*Haliastur sphenurus*). — Whistling-Eagles, I consider, are amongst the most useful birds we have. I have never known them kill their food, as they live entirely on carrion, and do not appear to mind in what state of decay their food is. They followed the men who were digging out rabbits this year, and between them and the Ravens there would, next morning, be very little left of the day's catch of fifty or sixty rabbits. Last summer I saw a Whistling-Eagle standing up to his knees in water at the edge of the river feeding on a dead fish. It is easily seen that these birds are harmless by the indifference shown towards them by wild birds and fowls. They never appear to notice their presence, whereas if a Falcon or Goshawk is on the wing the bush is full of the alarm calls of Honey-eaters and other birds. If the full value of these birds as scavengers was realized by Australians they would be encouraged and protected, as the Kites are in Egypt. They nest freely along the river and in the red gum country, generally choosing the topmost branches of tall trees near water; the last nest we examined was 80 feet up in a red gum. They love to use the same nest year after year, unless molested, and, although they sometimes build a new nest near the old, they generally end up by being faithful to their old home. One nest I know of has been in use off and on for twenty years.

Black-cheeked Falcon (*Falco melanogenys*).—This dashing bird is the terror of the birds of the bush, and its speed and daring are amazing. When out riding one day I heard a frightened screech from a White Cockatoo, and, looking up, was just in time to see a puff of feathers fly from the Cockatoo as a grey flash shot past it. When I picked the unfortunate bird up it was stone dead,

with a hole as large as a two-shilling piece under its wing. The Falcon merely wheeled round and sat in a tree near by waiting till I left, so that he could commence his meal. I have also known them kill Starlings, Parrots, Finches, Black Duck, and White-fronted Herons. To see a Falcon attacking another bird reminds me of nothing more than a black-nosed German aeroplane attacking one of our observing machines. Falcons nest freely in the district in the hollow spouts of old red gum trees, and are very fierce when they have a nest about.

Brown Hawk (*Hieracidea berigora*).—These are very harmless birds, and like to get their living as easily as possible; consequently, a good many are poisoned from eating rabbits that have been poisoned with strychnine and apple. All the nests I have found have been in red gum trees, and they are very fond of making their nest in a mistletoe.

Nankeen Kestrel (*Cerchneis cenchroides*).—Common all through the district, and nothing but good can be said of them. A favourite spot for them is the ridge of a haystack, where they can swoop down on any mice that may appear. I saw a Kestrel fly from a hole about 25 feet up in a gum-tree last year, and on climbing up was surprised to find three eggs of the Harmonious Shrike-Thrush in their well-built nest instead of (as I had expected to see) the rusty-brown eggs of the Kestrel.

Return of Migrants and Visitors.

BY H. STUART DOVE, WEST DEVONPORT (TAS.)

IN their very interesting paper on "The Birds of Sydney" in current (October) *Emu*, Messrs. Le Souëf and Macpherson remark having noted a Rufous-fronted Fantail (*Rhipidura rufifrons*) in the same spot, at the same time of year, for three years in succession. The same experience has occurred to me with more than one species. A Tree Pardalote (*P. affinis*) returns to the same gum-tree in my enclosure at the beginning of September each year, and utters for several days its sprightly "Pick-it-up" call. About three weeks later its congener, the Spotted Pardalote (*P. punctatus*), utters its double note, "Wit-loo" (second syllable lower and softer than first), from the same tree. Each spring a Bronze-Cuckoo (either *plagosus* or *basalis*) comes to sit on the same electric light wire not far from the beach and Bluff, and calls with great persistence from that perch. There is a peculiarity in the notes by which it may be recognized as the same individual. A still more remarkable instance is quoted in the latest *Bird-Lore* (Audubon Society, U.S.A., vol. xxii., 4), where it is recorded by an Illinois observer that on 25th May, 1919, a male Rose-breasted Grosbeak flew in through the open door of a glass-enclosed porch, where he beat vainly against the panes until exhausted; was picked up and resuscitated, but before

completely recovering was photographed sitting on a boy's hand (a beautiful reproduction is given in the magazine) and banded with No. 49,510. After release he took to himself a mate; they built and raised their family not far away, and then left for warmer climes. On 1st May, 1920, the Grosbeaks returned from their winter quarters, and one was found in the same porch the following day. When caught, it was found to be banded, and the number revealed was 49,510—"We held again in our hands the same bird which had been held and photographed a year before." The editor of the section, Dr. A. A. Allen, remarks on this being a good example of the results obtained by banding birds. The bands have proved not only that the birds come back to the same place to nest each year, but likewise that some, at least, spend each winter in the same place.

A striking little piece of evidence, tending to confirm my idea that our Summer-Bird (*Graucalus parvirostris*) is a migrant, comes from Somerset, about 33 miles west of Devonport. Mr. C. Ross Mackenzie writes:—"Knowing that you are interested in the movements of birds, I am sending an observation made on 15th of this month (September). My farm is on a hill overlooking the sea, and on that day I witnessed the arrival of about 100 'Martins' and about 30 Summer-Birds. The first came at 3 p.m., the latter about half an hour afterwards. The 'Martins' came in a body, and appeared quite fresh; the Summer-Birds—18 first, then the others straggling in twos and threes—seemed somewhat fatigued, and kept 'heading-up' to the wind, which was easterly and fresh. The 'Martins' stayed about near the coast, but the others moved away inland, only one being visible next day."

"Martin" is, of course, the local name for Wood-Swallows (*Artamus sordidus*). That part of the coast, as it trends away to north-west, receives the migrants from the mainland, or King Island, or the Hunters, before we get them. I did not see any Summer-Birds in this district until 21st inst., and then only two pairs. My correspondent mentions the *ground-wind* being easterly, but up aloft it was probably north-west, and the migrants would only drop into the opposing current as they neared the coast.

For the past four months an extraordinary number of Brush Wattle-Birds (*Anellobia mellivora*) has made a home in the township of Devonport and vicinity. In these few months I have seen far more of the species than in all the previous years which I have lived in Tasmania, and its appearance in such profusion seems to point to the long, warm summer of 1919–20 as having been an exceptionally favourable one for nesting and subsequent development. The blue gums which border some of the gardens along the road in which I live are alive with the birds; the same may be said of the flowering lucerne trees, whose white, leguminous blossoms are in great favour for the nectar with which they abound. The calls of the "Mock-Wattles" (as the boys call the *Anellobia*) have been a source of great amusement

during the winter and spring. One, which resides in some blue gums passed by me every day, salutes one with "Come up, oh do! Come up, oh do! Kai, kai, kai!" the latter phrasing reminding us of the Maoris' call to food—"Haeremai, kai, kai." Another of the birds, in a friend's garden, calls out frequently, "Cycles go quick, quick, quick!" There is also a single guttural note, "Kwok," much like the well-known sound made by the Yellow Wattle-Bird (*A. inauris*); this is varied by "Kok, kok, kwee, kwee, kwee," and occasionally by a much softer "Too-tee, too-tee, too-tee," apparently a courting note. There is infinite variety of tone, and some of the phrases, such as the first and second cited above, appear to belong to individuals only. I am in great hopes that some of the Brush Wattle-Birds will nest in the trees about the town, as numbers still remain with us, and are evidently courting; they are most entertaining visitors, owing to being in constant movement and almost constant voice. Numbers of White-bearded Honey-eaters (*Meliornis novæ-hollandiæ*) were with us when the Anellobias arrived, and at first disputed vigorously the right of possession with the larger birds; but after a great deal of scolding and chasing the White-beards were eventually routed, and have betaken themselves to "fresh woods and pastures new."

While spending a few days at Table Cape, North-West Tasmania, in the early summer (November) of last year, I noticed a small party of half a dozen of the Little Cuckoo-Shrike (*Graucalus mentalis*) feeding in the gums which border the River Inglis. They were flying from tree to tree at no great height, searching the foliage for insects. The morning was beautifully fine and sunny, with scarcely any breeze, and remained so during my stay. The trees in which the birds were observed were of the white or "manna" species (*Eucalyptus viminalis*). Numbers of our ordinary Cuckoo-Shrike (*G. parvirostris*) frequent the Table Cape district, but this was the only lot of the smaller species which I saw, and on the single occasion only.

Spine-tailed Swifts have been seen once only this season in the Devonport district, on 2nd January this year, when, at 7.30 p.m., a considerable number passed over at varying heights from N.W. towards S.E., or inland. There had been an electrical disturbance, with heavy rain, on the previous evening.

Native Birds in Captivity.

By EDITH M. JONES, Harris Park.

In the April issue of *The Emu* you mention a case occurring in the Melbourne Zoological Gardens of a Black Duck and a Muscovy Duck producing hybrid offspring. At Umbercollie station, 7 miles out of Goondiwindi (Qld.), there was a deep hole of water just in front of the house, surrounded by sedges and tall grasses, where

the late Mrs. Treweeke kept Rouen Ducks. These often mated with the wild Duck and produced their hybrid offspring. Mrs. Treweeke presented me with a setting of eggs, but only one showed the wild strain.

In my yard (about half an acre) I had running about among the fowls five Wood-Duck that I had hatched—three Ducks and two drakes—one Teal, two Black Duck, one Whistling-Duck, five Spur-wing Plover, one Scrub-Turkey, and one Crimson-winged Parrot. It was funny to watch the Parrot dodging in and out among the fowls, picking up grain. The Scrub-Turkey was a nuisance; I gave him away. Nothing delighted him so much as to come into the house, jump on the table, and scratch everything off—crockery or glass, it was all one to him. The Teal was a great pet. At meal time, directly she heard the bell ring, she would mount the steps—five of them—into the house, and waddle into the dining-room, where there was always a saucer of bread and milk placed on the hearth for her.

We left Goondiwindi and went to St. George. There I had a good-sized wire-netting enclosure built under the shade of some big Cape mulberry trees. In it I had two Bronze-wing Pigeons and two Topknots, different sorts of Parrots, one Dollar-Bird, two "Happy Family" (Babblers), and other birds, besides a Magpie and Jackass running loose. I have heard people say that Bronze-wing Pigeons cannot be tamed. I used to go into my aviary, in which we put a big branch of sandal-wood tree every fortnight, and the Pigeons would roost on my head. They would gather sticks and try to make a nest, but the "Happy Family" never allowed them to finish, for they would always pull the nest to pieces just as it was nearing completion. The Topknot-Pigeons were very gentle little fellows, but they never attempted to make a nest. The Crimson-winged Parrot would perch on my shoulder and gently tweak my ear, and, if he could reach it, my nose, but he never hurt. When we were leaving St. George I gave most of my birds to a friend, but she wouldn't have the "Happy Family," with the result that the Bronze-wings finished their nest in peace and reared their young the next year; since then I have not heard how they got on. During the big mouse plague in St. George the Jackass used to catch and eat as many mice as he could swallow; then he would sit all day long with the last one in his beak, the tail hanging down. The Magpie would catch the tail in his own beak and waltz round and round the protesting Jackass, crowing with delight. Poor Jackie was too full of mouse to do more than utter angry, hoarse growls. The Dollar-Bird did not do well in captivity. I finally let him go. Of course, I could not get him the kind of food he required.

LAST nesting season I noticed a Blue Wren (*Malurus cyaneus*) feeding the female while she was busy building her nest. Is this usual?—A. MACCASKILL, JUN. Coleraine, Vic.

Stray Feathers.

The Rufous Bristle-Bird (*Sphenura broadbenti*).—With regard to this bird in the Otways, what is the extent of its range? From personal observations I find this bird at Anglesea, extending round the coast past Airey's Inlet, from there on to Lorne, and as far as the Jamieson River, 10 miles from Lorne. At the back of Mount Defiance, near the Cumberland River, I have seen and heard numbers of these birds. Again, along the Lorne coach road these birds are plentiful, extending over the top of the range to within a few miles of Dean's Marsh. In nearly every gully along the coast-line mentioned several pairs can be found, and I fancy they are increasing in numbers.—J. K. Russell. Barunah Plains, Hesse.

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Habits of Cockatoos.—Lately, when staying at Tallarook, I noticed that a flock of about 200 Sulphur-crested Cockatoos and Corellas that lived in the neighbourhood always seemed to have their regular beat, which they go over every day, and roost in the same place at night. They also visit other places during the day in search of food. My father, W. H. D. Le Souëf, noticed the same thing with Crows in Queensland, and also that the same individual bird acted as leader every time; as it had two or three white feathers on one wing it was easily identified. It is probable that the Cockatoos and other birds, when flying in companies, have their recognized leader. I know it occurs in mobs of cattle, sheep, &c., and the leader may be either a male or female.—Cecil J. Le Souëf. Melbourne.

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Gang-Gang Cockatoos.—During a few weeks' stay at Lorne I was surprised at the number of Gang-Gang Cockatoos (*Callocephalon galeatum*) close to the township. Every morning numbers of these birds could be heard, and also seen feeding, among the gum-trees along the foreshore. I have been at Lorne for every summer for many years past, but never remember these birds being so plentiful. My brother also mentions seeing a flock along the Barwon River, at Geelong. Another note I have from Whoorel, near Birregurra, saying that the birds were very numerous, feeding among the sugar-gum plantations. The birds had never been in that locality before. While at Inverleigh some days ago I noticed four birds flying over the cricket ground, and I also saw a single bird here on the plains. Has the food supply in the Otway Ranges anything to do with the birds appearing in these unusual places?—J. K. Russell, R.A.O.U. Hesse.

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Osprey Aerie, Cape Mentelle, W.A.—I was interested in this "historic nest" (*vide Emu, ante*, p. 126) and Mr. Hurst's picture on the opposite page (pl. xv.), and, being further inland at the time, I was not with the R.A.O.U. party. Thirty-one years

previously I photographed the same aerie (see "Nests and Eggs," p. 42). The fine figure at the nest represents Mr. A. J. Bussell, brother of the "Australian Grace Darling"—Miss Grace Bussell. Eleven years subsequently Mr. C. P. Conigrave visited the nest (see *Emu*, i., pl. ix.) It is satisfactory to learn that these noble birds are still in possession of that ancient isolated rock, which has been made a permanent reserve by the Lands Department. It is probably the smallest reserve on record, and was made on the representations of Mr. A. W. Milligan and the late Mr. Woodward (see *Emu*, ii., p. 70).—A. J. CAMPBELL, C.M.B.O.U. Box Hill (Vic.)

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Terns at Bunbury.—It was my privilege, during the Union's W.A. trip, to visit the port of Bunbury, and among some of the interesting bird-notes I made there was one on a company of Crested Terns. A very cold and strong wind was blowing in from the sea, and these birds had discovered that the old piles of a one-time bath-house inside the breakwater afforded them a veritable haven of rest. Protected from the wind by the higher land on the sea side, and from human disturbers by the dilapidated state of the structure, these birds had collected in great numbers to take it easy, and thus demonstrates how typically Australian they were. I counted no less than 360 in the lot, and not one was within pecking distance of its neighbour, and every one faced the same direction, head to wind. A noticeable feature was the diversity of marking of the different birds. The crests varied from black to grey, and other dark markings were equally variable; the greys of the backs and wings also ran through many grades, no doubt due to variable ages.—G. H. BARKER, R.A.O.U. Brisbane.

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Cuckoos' Eggs.—Does the Cuckoo lay its egg in a nest only before the foster-parents commence laying? This question has repeatedly occurred to me when I have noted that the Cuckoo egg is further advanced in incubation than the eggs of the foster-parents. In every instance I found that in combination clutches the egg of the Cuckoo was first laid, or the incubation of the Cuckoo's egg was of shorter duration than those of the foster-parents. Even a clutch of one Fantail Cuckoo and one of Blue Wren, taken on Kangaroo Island, bears this out, as, though the Blue Wren's egg was quite fresh, the Cuckoo's was slightly incubated. Mr. J. W. Mellor has records of Bronze-Cuckoo (Narrow-bill) hatching out two days before Blue Wrens' eggs. Has a nest been found containing young of foster-parents and egg of Cuckoo? Two or even more eggs of Cuckoos have been recorded in one nest, but, I understand, only one Cuckoo's egg was with foster-parents' eggs, the others being embedded in lining of nest. Has an authentic record been made of a Cuckoo's egg being added to eggs of foster-parents?—J. NEIL M'GILP, R.A.O.U. "Origma," King's Park, S.A.

Notes from Prairie, N.Q.—The only observation here is Peewits coming to the garden taps with grasshoppers and grubs and dipping them in the water and beating them soft. Repeatedly they will dip them until soft and apparently broken, and then fly away to the nest across the dry creek. The object is to make them easily swallowable by the young birds. Storm-Birds, or Channelbill Cuckoos, have been numerous around the homestead; so also were the Pallid Cuckoos a few weeks ago. I am disposed to the opinion that they make their habitat adjacent to bush dwellings. Some time ago I found a very fine dead specimen of the Jabiru lying dried near a big stock tank at a windmill in dry country. The brilliant bronze-blue plumage of the head was retained in the dried skin. These birds must at times fly high, otherwise this one could not have seen the tank. I first thought some miscreants had shot the bird, but this was not so. It had simply alighted on the water and could not get out, so was drowned and thrown out. Frequently this happens to smaller birds, and I know one place where it was a morning job to clear dead flying foxes from a tank, until sticks were put in so that the wretched bats could get out.—J. R. CHISHOLM. The Plains, Prairie (N.Q.)

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Northern Range of *Geobasileus reguloides*.—Mr. H. G. Barnard has been good enough to send for the "H. L. White Collection" an example of this species from the Dawson River district, Queensland. In my "Nests and Eggs," i., p. 240, I quote Mr. Charles Barnard as having observed the species nesting in the same district. Mathews, in his "Reference-list" (1912), does not indicate Queensland for the species, but more recently (*Bull. B.O.C.*, xl., p. 106) he describes, under the name *G. r. nesa*, a variety from South Queensland, taken at a R.A.O.U. camp-out, and states that it "differs from *G. r. squamata* (De Vis) in being paler generally, the under surface only tinged with yellow, and the rump only being pale buff." Why does Mr. Mathews not compare his supposed new bird with its true type instead of with a more northern sub-species of which there is a doubt? The Dawson skin (♂), compared with typical *reguloides*, has more yellowish upper tail coverts, and is more yellowish than buff on the under surface, notably breast and abdomen. Iris pale yellow; bill and feet dark brown. If this description agrees with Mr. Mathews's skin, his new name, *nesa*, may be acceptable for the variety. Those members interested in sub-species should read "The Last Phase of Sub-Species," by L. M. Loomis, of San Francisco, in *The Ibis*, October, 1920, pp. 964-966.—A. J. CAMPBELL.

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Australian Bustard (*Eupodotis australis*).—During the last few years I have had splendid opportunities of studying the habits of the Australian Bustard, probably better known as the Wild Turkey. Seeing several notes in *The Emu* lately on this fine

bird, I feel sure it will interest many readers to learn that the bird still frequents, as well as breeds in, southern Victoria. The birds usually arrive here about June, leaving again towards the end of the year, although a few pairs seem to stay on right through the year. The largest number I have seen together was in 1919, when I came across a mob of sixteen ; but as a rule they seem to stay in pairs. I have had the good fortune to notice several nests (if such they may be called), all containing one egg only. One egg I found on a large flat stone ; another between two large stones on the top of a stony rise ; and two others alongside small tussocks. The nesting months are from August to December. During the season 1920, although I did not notice any eggs, I know of four different young birds having been seen. The young Bustard has some peculiar calls, and on being surprised it utters two quick barks, which sound like the bark of a young dog. Another call is a long-drawn-out, mournful whistle, which can be heard for a considerable distance. A bird which I have mounted (shot many years ago) stands just over three feet high. Unfortunately, there is no record of weight or measurements.—J. K. RUSSELL, R.A.O.U. Barunah Plains, Hesse, Vic.

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The White Honey-Eater.—One of the most interesting finds of the R.A.O.U. in Western Australia was the White or Alfred Honey-eater (*Lacustroica whitei*), also called the Inconspicuous Honey-eater, owing to its small size and dull mousey-grey colour. Resembling an *Acanthiza*, it is little wonder that the bird has rarely been procured. The first specimen—a male—was obtained in 1909 by Mr. F. Lawson Whitlock at Lake Way, in the East Murchison district. Mr. North described the bird as a new genus and species—*Lacustroica whitei*, after Mr. H. L. White's son Alfred. A full description appeared in the *Victorian Naturalist*, vol. xxvi., p. 138, and a coloured plate of the bird appeared in *The Emu*, vol. ix. ; but this plate is somewhat misleading, as there is a certain amount of yellowish tinge about the upper surface of the birds. This is not in the live bird, there being no "adornment" whatever in its feathers. The species was not included in the list in the last issue of *The Emu* owing to lack of identification until after *The Emu* had gone to press. The bird was shot in low bushes in very dry country, and its habits and actions resemble those of an *Acanthiza*. The taking of the bird near Ajana extends the range of the bird a considerable distance westward on the Murchison, and nearer to the coast-line.—JOHN W. MELLOR. Locksley (S.A.), 27/2/21.

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The Gracemere Bird Reserve.—At the invitation of Mr. R. S. Archer, who has been patron of the Central Queensland Native Birds' Protection Association since its inception, a party of members of the association recently journeyed to Mr. Archer's homestead. After enjoying the hospitality of Mr. Archer and

Mrs. Archer, the members of the party took advantage of the visit to inspect the boundaries of what is known as Archer's Reserve, which, including the mere, has an area of about 1,000 acres, and is one of the first areas to be proclaimed as a sanctuary for bird-life in Queensland. Only those closely associated with the movement can realize what an immense advantage has been the fine sheet of water, known as the "Mere," of long-established permanence even in dry seasons, and the surrounding country also contained in the reserve, in preserving and perpetuating the water-birds of this country, apart from the historic aspect of the locality, where there was ended, in 1853, the overland trip of Messrs. Charles and William Archer, a notable circumstance in the settlement of Central Queensland, and where there still stands, in an excellent state of preservation, the home of the Archers. A place more charmingly situated it would be difficult to imagine. Thousands upon thousands of all kinds of birds, large and small, and of great variety, frequent this delightful neighbourhood in complete safety from the gunmen, some of whom have at times been very strongly tempted to take a shot; but, as a rule, the reserve is respected, and the birds themselves know it well.

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A Hawk Irruption.—Every year, in January or February, we have a wave of Hawks, which, I think, are mostly Collared Sparrow-Hawks. I fancy they are young birds migrating from inland, somewhere where people and guns are not, for they simply rush for and take little chickens, and always try to get the Finches in the aviary on my verandah. Lately one, trying to catch Finches on a lemon-tree, came within a few feet of me. We did not shoot them, but in letters from my neighbours one mentioned shooting nine and others mention a plague of Hawks after the chickens and little Turkeys, that simply had to be shot to stop their carnage. Probably from now on only odd ones will be observed. Talking of birds travelling, last killing morning about 100 Crows stopped to eat the offal, and made a dreadful noise all day. Next morning they were all gone, the only ones remaining being the few old residents who are always about, and who take eggs when they can find them. They show marvellous instinct in disappearing when a man goes out with a gun. Really, I am sure we do not average more than two killed by shooting each year. The Butcher-Birds (Crow-Shrikes) are very numerous and tame here, and come to be fed. One day I killed a small snake, and a Butcher-Bird came and dragged it all over the place, so I cut it into little sections, and he carried it off to his family. They sing gloriously nearly all the year round here.—(Mrs.) A. Black. Pajingo, Charters Towers (Q.)

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Four Eggs in a Clutch of the Desert Chat.—A nest with a clutch of four eggs of the Desert Chat (*Ashbyia lovensis*) was discovered on 14/12/20; locality, Muligan paddock, about 20 miles north

of Moolawatana station. Moolawatana station is approximately 500 miles north from Adelaide and 100 miles west from the New South Wales border. This locality is not unlike that where the type clutch was taken, being not much more than 20 miles to the westward. The country in the vicinity of the nest was in wonderfully good heart, green grass and herbage being plentiful, amongst which a plentiful supply of insect life was to be found. The nest was made of dry twigs of salt-bush and rootlets, lined with rootlets, measuring over all, in diameter, five inches, the egg cavity being 3 inches by $1\frac{3}{4}$ inches in depth. The nest was placed in a depression in the ground, partly under and on east side of a green annual bladder salt-bush, and the eastern side of rim of nest was extended to form a platform projecting out from the nest circle fully $\frac{1}{2}$ inch; this projection was not measured when over-all diameter was obtained. This platform was fully 1 inch above ground surface, and also level with the rim of nest. When the nest was carefully lifted from depression a small quantity of dried flower-pods were noted in bottom of hole, which was $3\frac{1}{4}$ inches in depth by $4\frac{1}{4}$ inches in diameter. The female bird was flushed from the nest by the motor-car passing within 5 feet of nest. The bird pretended injury to draw attention from the nest. The eggs were about one-third incubated, and of even incubation. One of the set of eggs was much lighter in ground colour than the rest of the clutch. This, I believe, is the first record of this bird laying four in a setting. In good seasons three eggs are usually found, but in normal years two eggs are as often found as three. In bad seasons one rarely notes more than two to the clutch.—J. Neil M'Gilp, R.A.O.U. "Origma," King's Park, S.A., 24/2/21.

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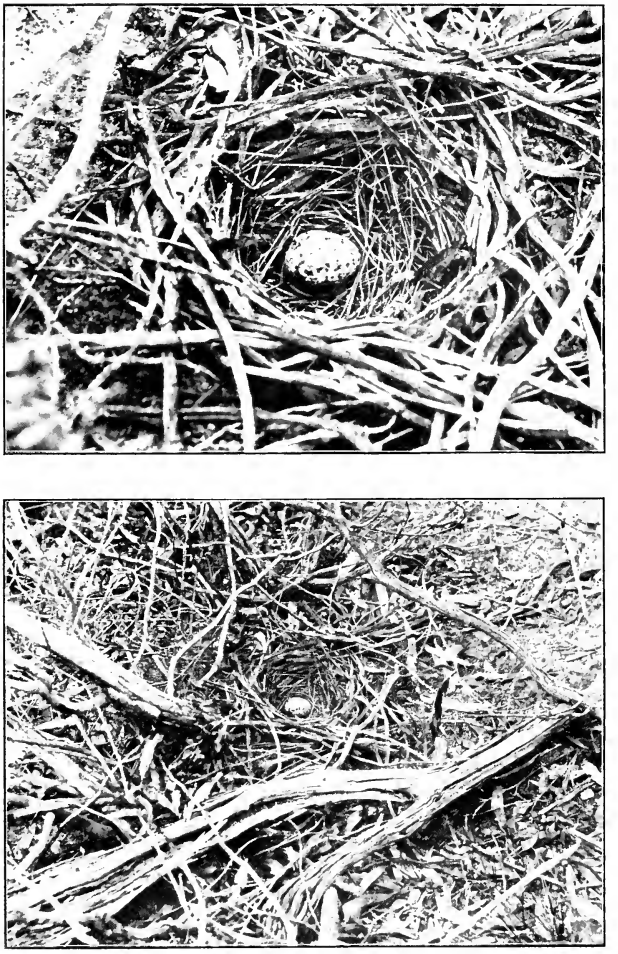
The "Mutton-Bird" Pilgrimage.—Respecting the annual southward pilgrimage of the "Mutton-Bird" (Short-tailed Petrel), I have, on occasion, when schnapper fishing from rocks on the South Coast between Bermagui and Tathra, watched these birds passing all day in an apparently endless stream, about a mile out from the shore. The stream, however, is at times intersected by gaps, which, I think, are eventually filled up. Then, as Mr. Basset Hull says, the dead bodies of derelict Mutton-Birds are found strewn along the shore. These, however, are not always in low bodily condition, and, though most bear no external marks of injury, some are gashed and torn—probably by barracouta, sharks, or other carnivorous fishes. These birds may have died, not from starvation, but from the injuries thus inflicted. I have at times used flesh from the breasts of these derelicts as bait for flathead and mullet, and there was a fair quantity of it on the bones. It may be that some of the pilgrims, feeling the necessity for rest and refreshment, alight for a time on the water, and may then fall victims to ravenous fishes. The injuries which the bodies of some bear need not necessarily have been done after



Nest of the Scrub-Robin (*Drymodes brunneopygius*)
Upper—Nest enlarged.

PHOTOS. BY H. A. PURNELL, R.A.O.U., GEELONG.

the bird collapsed from starvation. Similarly, bodies of the Little Penguin (*Eudyptula minor*) are often cast ashore in the same quarter, apparently uninjured. Some birds, in fact, are found alive, but in a stupefied state. I have also (once only) found the bodies of Gannets (*Sula serrator*) and of Albatrosses. The latter were almost buried in the sand, and decaying, but the wide-sweeping pinions still held their feathers. Other avian derelicts included a pair of Blue Mountain Lorikeets, with their bright plumage all bedraggled through tossing in the waves. Perhaps these birds, which feed much in honeysuckles on the coast, were surprised by a sudden storm, in which they perished. Most pathetic, however, was the discovery of a pair of Stints, which lay dead side by side on a coastal bluff, huddled together as though for warmth.—H. V. Edwards, R.A.O.U. Bega (N.S.W.)

Economic Section.

By A. S. Le Souëf, Taronga Park, Sydney.

Native Birds Eating the Cattle Tick.—In countries where ticks are endemic certain birds have specialized in feeding on them, notably the Ox-Bird (*Textor*), Cattle-pecker (*Buphaga*), and the Cattle Heron (*Bubulcus*). These birds play an important part in keeping the wild animals in Africa and India free from ticks.

Although there are native ticks in Australia, they are chiefly found on nocturnal animals and reptiles, and no birds could feed upon them, and so it is most interesting to note that since the introduction of the cattle tick into Australia two species, in the *Grallina* (Magpie-Lark) and the Ibis, have found them out and developed the habit of feeding upon them.

The *Grallina* in North-West Australia is now known as "the stock inspector," for dozens of them will congregate round the watering-places of the stock, and as the cattle come in to drink they will carefully examine each beast for ticks—an office which the cattle seem to appreciate. The Ibises, on the other hand, congregate on the camping-places of the cattle, and pick up any ticks that have fallen off the animals, and it is stated that the ticks form the principal food of these birds in the district.

Camera Craft Notes.

The Scrub-Robin (*Drymodes brunneopygius*).—The accompanying photograph is one of a series that I took on a trip to Boinka with Messrs. J. A. Ross, F. E. Howe, R. Archer, and J. J. Scarce. During our stay in this Mallee district we located many pairs of birds, and in the finding of the nests (which all contained a single egg, which is the full clutch) we noticed that each pair of birds seemed to have an allotted area to themselves. We

also observed that in nearly all of the areas an old nest or two could be detected on the ground. The old nest was considerably flattened down, but the outline could be plainly seen, and I have often regretted that I did not photograph one of these old vacated nests, for they were interesting finds at the time. Nearly all the nests were found on the ground amongst the short mallee shoots and clumps of acacia. In photographing the nests the birds became very tame, and in one instance, whilst standing over the nest with my stereo. camera, the bird allowed me to get my hand to within a few inches of its body.—HERBERT A. PURNELL, R.A.O.U. Geelong (Vic.)

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The Yellow-breasted Shrike-Robin (*Eopsaltria australis*).—On Monday, 19th January, 1920, whilst roaming through the dense scrubs in the quiet gullies near Sherbrooke, in the Dandenong Ranges, we noticed a young Yellow-breasted Shrike-Robin (*Eopsaltria australis*) which had evidently just left its nest to

Young of Yellow-breasted Shrike-Robin on side of sapling.

PHOTO. BY D. F. F. THOMSON, R.A.O.U.

sally forth into the great world outside its home. The peculiar brownish-spotted plumage of the immature young offers a singular contrast to the beautiful yellow breast of the adult. This youngster was, of course, fully fledged, and was just able to fly sufficiently well to provide, between attempts to photograph

him, exciting chases amongst the thick scrub. Our efforts, however, were eventually rewarded, for, despite the parents' warning cries, the young bird posed for several pictures. One of these is of interest, as it shows the youngster in the "sidelong clinging" attitude so characteristic of this species.—D. F. F. Thomson, R.A.O.U. Canterbury.

State Secretaries' Reports.

New South Wales.

The wonderful season that this State has been experiencing has had a marked effect on the bird-life, and, generally speaking, birds are recovering fast from the effects of the previous dry period. Reports from the country show that birds, especially Waders, are numerous. Ducks are reported to be scarce in many of their regular haunts, but this indicates that they are scattered far and wide on many small lagoons and flooded areas that are not usually available for them. The Royal Agricultural Society of New South Wales has instituted a series of lectures in the show-grounds on popular subjects connected with agriculture, and your local secretary has been asked to take the subject, "How to Get the Best Use from Our Birds This Year." Owing to numerous complaints of destruction of fish, young Ducks, Ibis, &c., by the Pelican, this bird has been removed from the protected list for the breeding season in the western part of New South Wales. This will enable land-holders who find them troublesome to keep them in check when the waters are low and young birds are about. Parrots have been very numerous this season in some of the fruit districts, and have also been reported as destroying maize crops, and certain species have been taken off the protected list, as the farmers had to shoot the birds in order to protect their crops. From reports to hand it seems that the Barraband Parrot is again becoming numerous in western New South Wales. This species has been scarce for many years past, many being probably destroyed by rabbit poison, and that it is now increasing is very likely due to the fact that most of the large stations in the Riverina dig out rabbits instead of using poison.

A. S. Le Souëf.

Queensland.

From a business point of view (as distinct from ornithology itself) the most notable happening since last report—possibly the most important development of the Union in this State—was a meeting of Queensland members, held on 11th February, in connection with the formation of a State branch of the R.A.O.U. Mr. H. A. Longman (member of the Council) was voted to the chair.

Several matters of local importance were first dealt with. These

included a report by the State secretary on measures taken to protect Finches. Action in this direction was taken, firstly, because of the enormous traffic in these birds from the Northern Territory—approximately 18,000, embracing eight species, were inspected on the steamer *Mataram* at Brisbane during December, and were prevented from landing here—and because of the continued activities of trappers. It was reported that bird-lovers had caused several consignments of protected birds to be seized in Brisbane during the last few weeks, and that in one case 60 out of a batch of 90 Chestnut-eared Finches had died for want of attention before being found. The consignor of these birds had been prosecuted by Mr. C. G. Stevenson (secretary of the Gould League of Bird-Lovers and of the Cruelty Prevention Society), and had been fined £5, with over £5 costs. It was added that the police had issued warnings against trapping in several localities, and that the Commissioner of Railways had given instructions against the carriage of protected birds on the railways of the State. The meeting approved of the action taken, and a resolution was carried asking the responsible department, before granting permits of any kind in respect of native birds, to submit applications to the Queensland branch of the R.A.O.U. (This policy had already been followed to some extent.)

Another report concerned the National Park of the Macpherson Range. It was stated that, following a public meeting, representatives of some twelve societies had waited upon the Minister for Lands (Hon. J. H. Coyne) and submitted resolutions making for the protection of the fauna and flora of the reservation and seeking to have its development placed in the hands of a trust. The Minister, in responding to the representations (which were made to him by Professor H. C. Richards, Queensland University, and Mr. A. H. Chisholm), assured the deputation that no destruction of either fauna or flora would be permitted in the "park." This remark, he said, applied particularly to the fauna. Trees could be grown again, but once a valuable bird was destroyed it was gone for ever. It would be nothing short of a criminal act for anyone responsible to allow such a wonderful creature as the Rufous Scrub-Bird to be destroyed, and he did not propose to be responsible for such an act.

Mr. G. H. Barker, the only Brisbane member of the Union to attend the annual meeting of the Union at Perth, reported on the business transacted there, particularly in relation to matters with which he had been entrusted by a meeting of members held prior to his departure. The chief of these subjects were:—Safeguarding of National Parks, co-ordination of Northern Territory bird-protection laws with those of Queensland, restriction of the use of the pea-rifle, the establishment of State branches of the R.A.O.U., and the establishment of a scheme of membership distinctions in the Union. Mr. Barker dealt with these matters as fully as possible. As a corollary, the State secretary was instructed to inquire whether the resolutions of the annual

meeting regarding the three subjects first mentioned had been given effect to, and the Governments concerned approached on the various matters.

Mr. Barker was thanked for his report, and there ensued further general discussion on the question of a State branch, concerning which a message of goodwill had been received from Melbourne members of the Council. After Mr. Henry Tryon had placed on record the opinion that State branches do not conflict with the present constitution of the R.A.O.U., the following resolutions were carried unanimously, on the motion of Messrs. Tryon and Brenan :

(1) " That we, members of the R.A.O.U. in meeting assembled, constitute ourselves the Queensland branch thereof, with power to incorporate in our body all other members resident in Queensland."

(2) " That a circular setting forth the purposes of such branch, and its relation to the central executive, be prepared and sent to all Queensland members of the R.A.O.U., inviting them to enrol in the branch."

Another item of importance dealt with by the meeting was a recommendation from the Central Queensland Bird Protection Association that the Native Companion (*Antigone*) be protected for the whole year instead of portion thereof. The recommendation was forwarded by the Department for opinion, and cordial support of the R.A.O.U. was given the proposal.

Subsequently, the State secretary received a request from residents of Bribie Island (Moreton Bay) to present to the Minister for Agriculture a petition they had drawn up praying that their island be made a sanctuary for native fauna. This was done, and the Minister (Hon. W. N. Gillies) promised sympathetic consideration. Incidentally, the Minister was heartily congratulated on his resolve to protect koalas and possums for the whole of the present year throughout the State. Official figures showed that during the last open season at least 5,000,000 possums and 1,000,000 native bears were killed in Queensland.

A. H. Chisholm, *State Secretary.*

Correspondence.

AUTHENTIC NESTS OF *Mattingleya inornata*.

To the Editors of "The Emu."

Sirs,—In the last part (No. 5, vol. viii.) of his work, " The Birds of Australia," Mr. G. M. Mathews gives an excellent historical exposition of the puzzling Grey Thickhead (*Mattingleya griseiceps inornata*) ; but his picture has been somewhat spoilt, so to speak, by the author drawing his pen heavily charged with ink across it by writing : —" From a further consideration of Campbell's account of the nests found at Cardwell, it is possible that they

were referable to *Pachycephala queenslandica*, and not to this species at all, especially the one with the 'red' young in" (last three lines, p. 268).

The inner history of finding the nests of *Mattingleya inornata* is as follows:—In October, 1916, Mr. H. Greensill Barnard, the well-known Queensland field naturalist, and I were guests of Mr. Tom Butler, J.P., near Cardwell, N.Q. There were several sons in the family, all well versed in bushcraft. Mr. Barnard produced a skin of the Thickhead in question, which we obtained nearer the coast, and intimated he would give a reward to any of the boys who found a similar bird's nest and eggs. At the end of a week there had been no result, except with other species. Therefore, in a jocular manner, I said—"I suppose the old oologist will have to go out and find the nest," or words to that effect.

When examining an old clearing on the edge of some virgin scrub where Topknot Pigeons were feeding on the bright blue fruit of "quandong" trees, a small bird flushed from a bunch of suckers springing from a low stump. The bird perched in a neighbouring tree, where I got a good view of it, and it commenced to preen its feathers. This was none other than the species the nest of which we were seeking. Then, examining the bush, I found it sheltered a nest containing two eggs. As it was late in the afternoon I took the eggs, and on the following morning returned with Mr. Barnard. Fortunately, one of the parents was found still in the vicinity of the nest. Mr. Barnard shot it. This was important for identification purposes, as the sequel has proved. Replacing the eggs, I photographed the nest *in situ*—the picture in *The Emu*, xvi., pl. xxxv. Mr. H. L. White described the eggs on page 163, same volume, while the skin of the bird obtained is in the "H. L. White Collection," National Museum, Melbourne. It was Mr. Barnard who observed the nest with "red" coloured young, and he subsequently took another nest with eggs. Further, regarding the possibility, as Mr. Mathews suggests, of the birds being *Pachycephala queenslandica* (*i.e.*, the common *pectoralis*), that species was not breeding in the coastal country, but up in the ranges and on the table-land beyond.—I am, &c.,

A. J. CAMPBELL.

Box Hill (Vic.), 26/2/21.

Death of Member.—Members of the R.A.O.U. will regret to learn of the death of Mr. A. W. Milligan, an honorary member of the Union, which occurred at a private hospital, St. Kilda, on the 30th March. An extended notice of the late Mr. Milligan's ornithological labours in the field, together with a camp scene of one of his Western Australian expeditions, will appear in the next (July) issue of *The Emu*.

Reviews.

["The Life of Samuel White—Soldier, Naturalist, and Sailor."]

THIS neat *brochure*, which is illustrated by photographic and coloured plates, is written by Capt. S. A. White, C.M.B.O.U., son of the late Samuel White, and is sympathetically handled, especially as Capt. White is himself an intrepid explorer and naturalist. The little work also casts sidelights on the early settlement of South Australia, when Samuel's father, John White, in 1836 arrived from England and settled at "The Reedbeds." Capt. White is to be commended for preserving these old-time memories, not to mention his filial privilege to chronicle the travels of his father. "Honour the pioneers."

When farming operations were well established at "The Reedbeds," Samuel White, with his brother William—then small boys—followed their father to Australia in 1842. The delightsomeness of the new country, especially its fauna and flora, soon captivated the imaginations of the youngsters, and they must needs explore far and wide as opportunity afforded. Their first important trip was up the River Murray, 1863. The same year Samuel undertook a daring trip into Central Australia. The hardships were beyond description, but science benefited by one new Wood-Swallow—Gould's type of *Artamus melanops*. After another excursion up the Murray, in 1865, Samuel essayed the dangerous task of crossing the head of Spencer Gulf in a "flatty," which nearly cost him his life by drowning. But he seemed rewarded by the "great find of a new Blue-Wren," which became another of Gould's types—*Malurus callainus*—for beauty of blues one of the most dazzling of birds. In 1867 the brothers were together again further afield. They landed at Cleveland Bay (before Townsville was), North Queensland, worked inland, then down to Brisbane. After crossing the wild Macpherson Range they overlanded to Melbourne by way of Sydney. This mighty trip was brimful of adventure, not to mention daring, meeting with ferocious natives, &c. Samuel was again "called" to the tropics. In a letter to his wife, under date Somerset (Cape York), 25th September, 1878, he wrote:—"I have just returned from a cruise among the islands of Torres Strait." To crown all, he built a schooner (80 tons), the *Elsea* (named in honour of his wife), and in 1880 equipped and commanded a scientific expedition to New Guinea and the Aru Islands. This was Samuel White's last voyage, and the brief and racy accounts of Birds-of-Paradise, brilliant butterflies, and remarkable reptiles fairly enthral the reader. The end of the expedition came with dramatic suddenness, as is recorded in cold type on page 92. "Samuel White joined his wife in Sydney, and had only been there a few days when, on the very day he arranged to purchase a home on North Shore for his wife and family, while he was away to finish his expedition, he caught a chill; inflammation set in, and on the 17th November, 1880, there passed away one of the greatest field ornithologists

the world has ever seen." The pity is that the field observations of Samuel White have not been all recorded, and the mass of material collected, much new to science in those days, had not been worked out.

["Birds of Our Bush, or Photography for Nature-Lovers." By R. T. Littlejohns and S. A. Lawrence, with an Introduction by J. A. Leach, D.Sc. Illustrated from photographs by the authors. Melbourne, Auckland, Christchurch and Wellington, N.Z., and London: Whitcombe and Tombs Limited.]

"BIRDS of Our Bush" is a good title to a well-written book, and indicates that its youthful authors will rise to great things "in the open field." It is a double-barrelled book, dealing with bird-observing and photography. The field observations are exceedingly good, not to mention some hitherto unrecorded facts in the life-histories of familiar species.

The photography part, as stated, is only for beginners in nature photography. The authors do not pretend to teach one's grandmother to suck eggs. Details and experiences are given in a breezy and attractive style, while obstacles are surmounted—weary waitings for models who never posed and wet camp-outs are mere nothings. Of the many fine pictures, perhaps the best three are the White-browed Wood-Swallow (frontispiece), Swallow (p. 32), Nests of Fairy Martins (p. 87). The flowers that prettily embower the Spinebill and nest (p. 121) might have been named. "In the Haunt of the Lyre-Bird" (p. 193) the soft sylvan scene leaves much to the imagination, and is a true photo.-art picture of a difficult subject. From the nearness of the camera to the chief object, and the rapid exposure necessary, some of the bird pictures are technically under-exposed, but they are nevertheless useful to demonstrate the natural pose of the bird, &c.

There is a well-merited introduction by Dr. J. A. Leach, of the Royal Ornithologists' Union, wherein he draws attention to the importance of the field work of Messrs. Littlejohns and Lawrence, and mentions their connection with the Gould League of Bird-Lovers of Victoria. It is hoped that these youthful authors will keep true to their hero, John Gould.

There are several royal roads to the study of Nature; therefore there are other ways than the one we choose for ourselves. Nature is *one* spirit, but has *many* manifestations—"In diverse forms a common soul we see."

One of the best pictures in "Birds of Our Bush" is the Tomtit near Nest (p. 66), but the hypercritical will say it is unnatural—an Australian bird perched on a plant (furze) introduced from the northern hemisphere! However, the authors are to be congratulated on their bright bird book, while the publishers (Messrs. Whitcombe and Tombs Limited) have left nothing to be desired from a printer's point of view, and typographical "eyesores" are conspicuous by their absence. Copies of "Birds of Our Bush" may be had direct from the publishers, 189–191 Little Collins-street, Melbourne, price 12s. 6d. (postage 3d. extra).

Obituary.

The late Mr. Matthew Symonds Clark.—The late Mr. Clark, who was a member of the R.A.O.U. since its inception, died at Adelaide on the 10th July last, in his 82nd year of age. Although a lover of Nature in general, which kept him young in spirit, he had a bias for birds. Native flora also interested him much, and his garden at Knightsbridge, where he resided since 1882, has become a wilderness of native shrubs and trees.

The late Mr. Clark was particularly fond of the Parrot tribe, many of which he kept as aviary pets, and when they died he turned their skins into mounted specimens, for he was a skilled taxidermist. Mr. Clark was of a modest and retiring disposition; nevertheless, he contributed at least two original papers on Parrots before the Field Naturalists' section of the Royal Society of South Australia. Mr. Clark is the last link with the past of members of the R.A.O.U. who had spoken to the great Gould face to face.

On the occasion of the late Mr. Clark's eightieth birthday—19/1/19—a special representative of the Adelaide *Register* waited upon him, and the following is culled from a pleasantly-written article on "A True Nature-Lover" in that paper:—

"'To do good by stealth' has been his life motto, and when asked this week by a reporter to outline some of his scientific pioneer work in the State he smiled and said, 'But I've really done nothing but attend to my own affairs.' This is true—in a sense—for Mr. Clark has included much philanthropic work in his daily duties. As an ornithologist he has spent a lifetime in pursuit of his hobby, and the earliest Game Bills were drafted under his supervision, although, with characteristic modesty, he disclaims all credit for the fact. The Society for the Prevention of Cruelty to Animals was kept in existence for many years by him also, and then he handed it over to Mrs. Ennis, who brought it into the general prominence it occupies to-day.

"There was one important member of the family that I was specially introduced to—a Bare-eyed Cockatoo. 'I have had him for 30 years,' said Mr. Clark, 'and he was not an infant when he came to us.' Cocky is part of the family circle, and took a keen interest in everything. He loves his master, and his cage is placed beside him every night. As long as the master rests, so, too, does that comprehending bird; but directly there is a movement from Mr. Clark, then the bird, too, is galvanized into life. A fine case of bird specimens further demonstrated this ornithologists's personal study. There were Little Lorikeets, Blue Mountains, Honey-eating Parrots, and that scarce Swift Lorikeet. 'I met the great John Gould, that wonderful bird writer,' said Mr. Clark. 'I went to his place of business in London, in 1865. He was a publisher, and I bought his "Handbook," just published, to the "Birds of Australia." He was a most interesting man, and chatted of the many new birds he had

discovered in my adopted land.' Mr. Clark then briefly recounted his family history, in response to a request to do so. He was born at Hazlewood, near Birmingham, in 1839, and came out to 'the colonies' in June, 1850, in the sailing vessel *Fatima*."

The Library.

British Birds, vol. xiii., part 12; vol. xiv., parts 1 and 2.

Avicultural Magazine, vol. x., part 14; vol. xi., parts 3, 5, 6. Vol. xi., part 5, contains an interesting article entitled "Cockatoo Catching in Victoria," by Thornton Skinner.

University of California Publications in Zoology, vol. xix., part 11; vol. xx., parts 5, 6; vol. xxi., part 5; vol. xxii., part 1.

Hawkesbury Agricultural College Journal, vol. xvi., part 9; vol. xvii., part 6.

Science and Industry, vol. ii., parts 5, 6, 7; also Bulletin No. 18.

Revue Francaise d'Ornithologie, Nos. 132, 133, 134.

The South Australian Ornithologist, vol. 5, parts 2, 3.

Part 2 contains—

"The Birds of Rivers Murray and Darling and District of Wentworth," by A. Chenery, M.R.C.S., L.R.C.P., and A. M. Morgan, M.B., B.Ch. Part I.

"Some Weights and Temperatures of Birds," by A. M. Morgan, M.B., B.Ch.

"*Eudromias australis* (Australian Dottrel)," by J. Neil M'Gilp, R.A.O.U. This is a very valuable contribution to our knowledge of these plain-frequenting Dottrels.

Part 3—

J. Neil M'Gilp records the Red-winged Parrot (*Aprosmictus erythropterus*) from Moolawatana, S.A.

The Wilson Bulletin, vol. xxxii., part 2.

The Journal of the Wild Bird Investigation Society, vol. i., part 2.

The Australian Naturalist, vol. iv., part 2.

The Victorian Naturalist, vol. xxxvii., parts 3, 4, 5.

Index to the Bulletins of the British Ornithologists' Club, vol. xvi.–xxxix., 1906–10, by David Seth Smith, F.Z.S.

Bird-Lore, vol. xxii., parts 2, 3, 5.

Le Gerfaut, 10, Fas ii.

"The Buzzard at Home," by Arthur Brook. Witherby and Co., London.

A very entertaining account of the Buzzard (*Buteo buteo*) in Wales. The photographs accompanying the letterpress are excellent.

" A Practical Handbook of British Birds," parts 7 and 8. Witherby and Co., London.

" Geographical Bibliography of British Birds," parts 4 and 5.

" Report of the Tasmanian Field Naturalists' Club Easter Camp, 1920."

" Notes on the Elegant Tern as a Bird of California," and other reprints, from Joseph Grinnell.

Notes.

The R.A.O.U. Bird-Skin Collection.—This collection, thanks to various donors, is increasing and becoming valuable as a general reference for members. Two useful cabinets were donated by Mr. D. Le Souëf, which are fully taxed. An additional cabinet is necessary. Therefore, members who feel inclined are kindly invited by the Council to subscribe for another, at a cost of about £30. A proper disinfecting chamber is also required. The phenomenal cost of publishing *The Emu* at present absorbs all the Union's funds, and the skins urgently need protection against the inroads of insects, &c.; otherwise there is danger of irreparable damage to the collection. Subscriptions may be sent to the hon. treasurer, Mr. Z. Gray, 65 St. Vincent-place, South Melbourne.

Messrs. Witherby, publishers, announce the early publication of " A Manual of the Birds of Australia," by those indefatigable workers, Gregory M. Mathews and Tom Iredale, who have done so much to advance Australian ornithology. The work will be published in four parts at £3 3s. a part, and will be fully " illustrated with coloured and monochrome plates." Attention is directed to the previous page for details.

Mr. H. L. White, of Belltrees, has been elected a Corresponding Fellow of the American Ornithologists' Union. Members are gratified to note this recognition by the American Union of the fine work and long-continued generosity of Mr. White in the interests of ornithology in general and Australian ornithology in particular.

A good response has been made to appeals for prompt payment. Amongst much-appreciated donations are £50 from " West Australian Well-Wisher " : £10 from Miss Robertson ; £5, " Anonymous," towards library bookcases : and £1 1s. from Mr. W. H. Ford towards a good projecting lantern for the R.A.O.U. room.

On account of various delays, the date of publication was 23rd April, 1921.

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Vol. XX. JULY, 1920. [Part 1.

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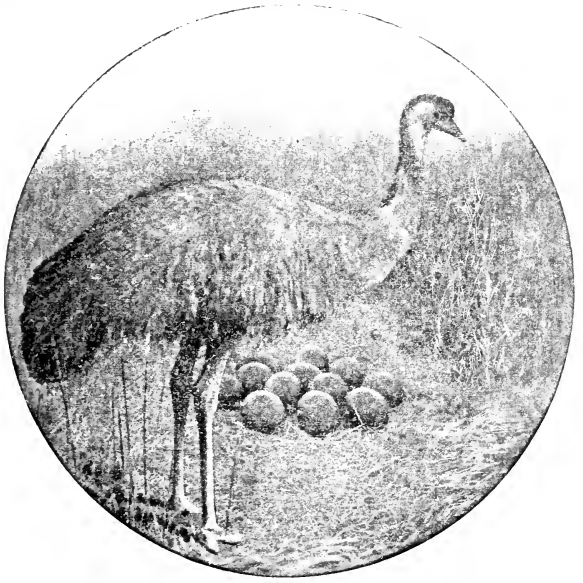

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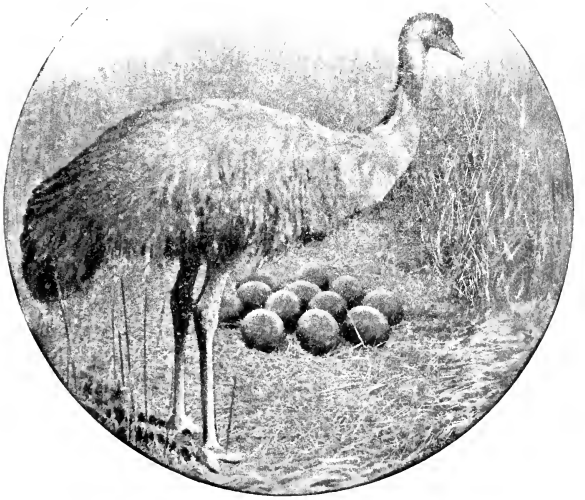

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