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# The Emu

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

VOL. XXI. 1921-22.



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*Official Organ of the*  
**ROYAL AUSTRALASIAN ORNITHOLOGISTS' UNION**  
2 Temple Court, Melbourne

MELBOURNE:  
W. A. HAMER, PRINTER, 21 JONES LANE (Off 118 Lensdale Street)

EUROPEAN AGENTS:  
H. F. & G. WITHERBY, 326 HIGH HOLBORN, LONDON

1922

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Male

THE PALLID PARDALOTE  
(*Pardalotus pallidus*)

Female

# The Emu

Official Organ of the Royal Australasian Ornithologists' Union

"Birds of a feather."

VOL. XXI.]

1ST JULY, 1921.

[PART 1.

## The Pallid Pardalote (*Pardalotus pallidus*)

By A. J. CAMPBELL, C.M.B.O.U., "Bulgaroo," Box Hill, Vic.

In deference to the special desire of the Editor, Dr. Leach, I write this note on the accompanying coloured plate.

It is difficult in our present state of knowledge to say which are species and which are sub-species. If *P. pallidus* be not a species, it at least appears to be a distinct variety or sub-species of *P. rubricatus* of Eastern Australia, the two forms being separated by a great space of arid interior and the "natural fence" of the conjoined Great Sandy, Gibson's and Victoria Deserts. The habitat of the Pallid Pardalote or Pallid Diamond-Bird appears to be North-West Australia proper, from the region of the De Grey River in the north, to the Gascoyne River in the south.

In addition to my description of, and remarks on, the Pallid Pardalote in *The Emu*, vol. viii., p. 142, Mr. Tom Carter, M.B.O.U., gives the following more recent note in *The Ibis*, 1921, p. 70:—"Pale Red-browed Pardalotes were, as usual, fairly plentiful about the beds of the Gascoyne and Minilya rivers, and occasionally seen far from water-courses. On 10th September, 1916, I shot a female on the latter river. On 18th September I noted a pair of these birds feeding young, which were being reared inside a perpendicular iron pipe about two inches in diameter and seven feet in height. This was set upright in the ground just outside a large shearing shed, where shearing was in full progress. The nest was apparently some distance down the pipe."

The specimens herewith figured are from a series of five in the "H. L. White Collection," National Museum, Melbourne (through the courtesy of the Curator, Mr. J. A. Kershaw, F.E.S.), all of which consistently differ from typical *P. rubricatus*, and from Gould's figure of same in *Birds of Australia*, vol. ii., pl. 36.

## Notes on Two New Birds\*

By A. H. CHISHOLM, R.A.O.U., State Secretary, Queensland.

### 1. Adventures among *Atrichornis*

As Mr. S. W. Jackson (N.S.W.) and myself are, presumably, the only members of the R.A.O.U. who have had field acquaintance with *Atrichornis rufescens jacksoni* and *Pachycephala olivacea macphersonianus*, it may be worth while to reinforce the collector's notes† on these fine birds. The securing of two new and good sub-species of birds on one trip is in itself a noteworthy thing, but it rises to the impressive when the discoveries are birds of the remarkable nature of the Rufous Scrub-Bird, and, in a lesser degree, the Olive Whistler of the Macpherson Range.

#### DISCOVERY OF THE SCRUB-BIRD.

My first acquaintance with *Atrichornis*, and, incidentally, the first record of the species for Queensland,‡ date back to the closing days of 1918. A dozen or so members of the Brisbane Field Naturalists' Club were spending a week in the Macpherson Range then, and as two of us wandered along a jungle track towards the border, we were brought to a halt by a strange bird-voice—just one ringing note, repeated at short intervals. Essentially melodious, the voice was almost human in its imperious quality, recalling W. H. Hudson's description of his bird-girl in the "Green Mansions" of South America. "What's that?" said my companion. I did not know, but was sufficiently interested to determine to find out. Presently the notes changed to a brisk "Chit-chit-chit-chit," and, after a brief interval, the voice came from another quarter in a polyglot chatter. Throughout the whole performance the melodist kept to the thickest tangle on the ground. It was a long and difficult job to trace it, and only after much snake-like manoeuvring and squeaking and twittering did I manage to catch a glimpse of the tantalising creature—a reddish-brown, stocky bird, marked with white on the throat, which shot along under debris with surprising rapidity, barely pausing now and then to peer out at its visitors.

I scribbled a rough description of the colour and call of the bird on the spot, adding to it on meeting another (?) member of the species when returning from the border ridge a few days later. But even then I was "scratching" at the identity of the unexpected find, and it was not until we were back in Brisbane

\*These notes were in hand before the publication of Mr. Jackson's paper (Emu, vol. xx., April, 1921).—Eds.

†Emu, vol. 19, pp. 258-272.

‡Ibid, Vol. 19, p. 212.



Jungle Tangle, Macpherson Range. Haunt of the Rufous Scrub-Bird.



that doubts were dissolved. Reference to the writings of the late Dr. Ramsay and of Mr. Jackson (apparently the only ornithologists who had met *Atrichornis* afield), made it quite certain that this was indeed the Scrub-Bird (pitifully-inadequate name!)—that Queensland had been, almost literally, entertaining angels unawares. The full-throated call which I had written as "Chit-chit-chit-chit" was syllabilised by Dr. Ramsay (for the Dorrigo bird) as "Chip," and by Mr. Jackson as "Chirp"; for the rest, we were in agreement, particularly regarding the habitat and extraordinary elusiveness of the bird.

It was this knowledge, the extension of the range of *Atrichornis* (supposedly *rufescens*), from the Richmond and Clarence River region to Queensland, that induced Mr. H. L. White to send his collector to the Macpherson Range in the spring of 1919. The results of that trip, with the discovery of the long-sought female of the species as the outstanding feature, are already well known; and in a later issue of *The Emu* details were given of the further success which attended Jackson's renewed researches in the Spring of 1920. It was my pleasure to follow in his footsteps on the latter occasion. He came down from the range to Brisbane just a day or two before Dr. Jeffris Turner (the well-known entomologist), Mr. J. C. Smith (secretary of the Field Naturalists' Club), and myself re-visited the locality. That was between Christmas and New Year. We had only a week in camp in the settler's hut, but what we lacked in time, compared with Jackson, we gained in weather, which was fine almost throughout.

That camping-spot had an ornithological distinction all its own. Where else in the world, it may be asked, could one sit on a door-step at dawn, day after day, and be sure of hearing, almost simultaneously, the voices of such gifted creatures as the Rufous Scrub-Bird, Lyre-Bird, Rifle-Bird, Whip-Bird, and Bower-Bird? Jackson had observed that an *Atrichornis* frequented a corner of jungle immediately adjoining the clearing; and, sure enough, the loud, imperative note of this bird greeted us early on the day following our night-arrival.

#### ATRICHORNIS AT CLOSE RANGE.

It did not take long to locate this distinguished neighbour. Going quietly to the spot about which the swelling "chit-chits" were centering, I knelt beside a moss-covered log and commenced to make moderately inviting noises.

Presently the faintest rustle became audible; a mouse-like figure could be seen moving forward with cautious rapidity; and a few moments later it had bounced upon the very log that accommodated its seeker. This was excellent fortune, enabling, as it did, the securing of almost as good a view of the bird as can

ever be gained in those gloomy places. Indeed, the bird looked so dark that I almost doubted its identity; but there was no mistaking the long, *Orthonyx*-like tail. And presently I got a glimpse of the barred, rufous colouring; for, acting upon a few more twitters of persuasion, the wondering avine recluse half-circled me and hopped upon the *other* end of the old log. For quite a while the little beauty—it is a beautiful bird, for all its protective coloration, so wonderfully like that of the scrub-snails (*Helix*) among which it dwells—kept about the spot, pausing in its perambulations between whiles and chattering vigorously—raising the head and opening wide the bill as it did so. There was a curious scolding note, not unlike a bar used by the Large-headed Shrike Robin (*Pacilodryas*); there was also a single rich whistle (akin to that which caused the bird's discovery two years before); but nothing seemed quite so characteristic of the species as the vigorous "Chit-chit," which occasionally was very loud and strong. Once a pair of White-shafted Fantails (*Rhipidura flabellifera*) nearby emitted excited trills, and immediately *Atrichornis* mimicked them. A great little bird, to be sure!

That afternoon Mr. Smith came along to be introduced to the Scrub-Bird, but this time there was a change of attitude; all the coaxing we could utter would not bring the capricious creature into view, though at times he was probably not more than ten yards away. Again the rich "Chips" and whistles were varied by the scolding note—that adjective is used in its human sense, of course, and probably does not express the feelings of the bird—but always there was a strength in the calls which set them above those of other small birds about, and gave them an affinity with the rich-voiced Lyre-Birds that were rollicking in the next gully.

Adventures with *Atrichornis* came again on the following day, when we went further afield. The second member of the species—our original acquaintance had been again voiceful that morning—was heard calling at a spot about a mile from the hut, towards the border mount bearing the pleasant name of Bithongabel. *Atrichornis* number 3 appeared of his own volition. We were hunching on a little spring-fed creeklet on Bithongabel—a quiet, lonely spot—and were expecting nothing more than familiar bird-acquaintances. Suddenly there was a rustle on the opposite side of a small pool, and the bare outline of a mouse-like bird appeared. Again a twitter proved effective: it brought an *Atrichornis*, springing with the energy of a tennis-ball, upon an old log hard by. But the bird was away again in an instant, and we saw it no more. (This specimen we took to be identical with one we had heard calling, ten minutes previously, about 100 yards down the gully.)

An hour or so later, half a mile up towards the crest of the mount, the commanding, ventriloquial call of a Scrub-Bird

sounded again, this time beside the jungle-hemmed track we were negotiating. As I twittered, his notes changed to the scolding "Churr-churr-churr!" and presently a pair of bright eyes peered from out the debris. But the bird was off again at once, and we only got a bare glimpse of him later. Our fifth *Atrichornis* was "flushed" as we walked along a path two miles from the spot last referred to. The first fleeting impression was that the bird was the Coach-Whip (*Psophodes olivacea*); one needs a quick eye to get accustomed to the Scrub-Bird, which moves with the speed and stealth reputed to belong to fairies. This last specimen did not call; it may, indeed, have been the quiet female. The sixth member of the species listened to that day was "Chipping" in a gully as we neared "home," and our original acquaintance (No. 1) could be heard in full voice as we reached the clearing. Synchronously, Lyre-Birds were rioting a few hundred yards away, and a moment later the old male Rifle-Bird (*Ptiloris paradisea*) "whirred" from his tree-top perch at the other side of the clearing.

We did not positively see any additional *male* Scrub-Birds after that day, but three more were heard—sufficient, in all, to indicate that there is a cheering wealth of the birds in the locality. And every day our friend of the clearing corner kept up his powerful, prideful declamations. His calling throughout the day was irregular, but at dawn and dusk he could always be depended on. It was noted casually that on no occasion did he commence so early as, for instance, the Whip-Birds and Shrike-Robins; the obvious explanation being that the light does not penetrate the Scrub-Bird's ground resorts so soon as it does the more open ones of those other species. Incidentally, I was struck with the remarkably narrow ambit of this particular bird; he did not appear to move out of an area measuring, roughly, 50 yards square during the whole time we knew him.

### CAN THE SCRUB-BIRD FLY?

Our most interesting experience with *Atrichornis*, and certainly the adventure that gave us most excitement, was reserved until near the end of our stay—the first day of the present year. Mr. Smith and I had been to the pretty Canungra Creek Falls, and he was photographing on the way back when I, walking on, was halted by the calling of a male Scrub-Bird, apparently about 40 yards down the ridge. He answered an experimental squeak with the half-inquiring, half-scolding note. Sauntering a dozen yards along the track, I "ran into" another *Atrichornis* call. ("It always seems to me," runs a note made that night, "that there is a very distinctive quality in the voice of this species, though the impression may be partly due to the novelty of hearing a strange bird-voice.")

This latest call was a suggestive one, not sweet, nor yet hard, but rather plaintive and anxious—perhaps sounding as does a child's toy balloon when descending. Standing still, I did my best with an imitation of a distressed young bird; and immediately there was commotion. A female *Atrichornis* appeared on the ground a dozen yards away, seeming almost black in the half-light, and continually uttered the squeaking note. This was excellent! Here was the bird which had been sought for, at intervals, during 54 years, and which had been so elusive—had set such a "stay-at-home" example to wives generally—that it was only recently a specimen had been secured! There was romance in the find, romance in the surroundings, added to which was a prospect of adding new observations to our scanty knowledge of a very restricted and remarkable genus.

To begin with, I was particularly anxious to prove whether the species could fly or not. Jackson had stated flatly that it could not do so,\* and I had been inclined to agree with him, basing the belief on the small size of the bird's wings and on the closeness with which the few I had seen hugged the ground. (In the event of this supposition proving correct, would not the species be the only small non-flying bird in the world?) But definite proof on the point was soon forthcoming. As the deluding squeak was continued, the now frantic little bird kept rushing hither and thither at express speed. So rapid were her movements that it was impossible, in the bad light—the time was late afternoon—to determine whether she was running or hopping. Once or twice she bounced on to logs, but always was off again without an instant of rest. Presently, awaiting a favourable opportunity, I sprang at the bird as she came almost within arm's reach. The test worked: she *flew* about three yards. Resolutely, however, she refused to leave the spot. Something potent, it was clear, was holding the bird; accordingly, we commenced a close search for a nest.

Finding nothing in the clump of grass, I watched the energetic little bundle as she scampered along a log and jumped to the ground. Then was revealed a young *Atrichornis*, apparently very like its parents in colour, but minus the curious tail-point. The little creature watched keenly as I crept along towards it, and then went off briskly, partly flying and partly running. Following up, I dived at the youngster, missed, and started it towards the spot where Smith was waiting. That action settled the flight question. The young Scrub-Bird flew, quite cleanly, a couple of feet above the ground, for a distance of fully ten yards! It was a revelation. Bird babies born on the ground are usually able to fly soon after birth, but this little feat was hardly to be expected in the case of the anomalous *Atrichornis*, bird of rudimentary wings.

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\* "This small, non-flying bird."—Jackson.

Action continued. Smith drove the young one back whence it started, and the mother, racing along the log, half-flew and half-galloped over the path in an effort to lead her charge out of assumed danger. The babe, following, hesitated on the end of the moss-clad log, what time I balanced a cap with intent to effect a capture. The young bird started—down came the cap—and like a flash it wheeled and returned to the friendly debris! Meanwhile, the mother waxed more excited than ever. She was never still for a moment, though now and again she snapped up an insect and swiftly passed it to the baby. At this point it began to seem that two young ones were on hand, but the movements were so rapid, and the birds so hard to see in the tangle, that one could not be sure. The same factors applied in respect of the presence of the male bird. I do not think he appeared at all—certainly there was none of his decisive calls—but it was impossible to make certain in the semi-darkness.

#### TRAITS AND VOICE OF THE FEMALE.

The mother bird, however, was worth going far to see. Especially was she spectacular when travelling over open patches, with tail held *erect over the back*, exactly after the manner of a Wren-Warbler (*Malurus*). The young one (perhaps two) did exactly the same thing, but all moved faster than even the fastest of Wrens. When the mother approached a babe with food, she used a soft, sweet little conversational chatter. The response was a soft "Pipe-pipe-pipe!" Between whiles, the female used also a "Tick! tick! tick!" This is evidently the note which Jackson refers to as "resembling the sound produced by pressing your tongue hard against the roof of the mouth, and drawing it away suddenly." It is a good illustration. Obviously, however, Jackson under-estimated the powers of the bird—as also on the flight question—when he added that "this is probably the only note she makes." In our case the "ticking" sound was used much less freely than the anxious squeaking note.

One other little trait on the part of the female Scrub-Bird that interested me immensely was an ability to cling to trees. Often in her rapid travels our worried little study perched, momentarily, from one to two feet up in bushes and on top of debris. Again, once she bounced on to the side of a rough-barked tree, and clung there, about two feet from the ground, for the space of several seconds, meanwhile gazing keenly at us, the strange-looking disturbers of her primeval peace. Her action then was after the sidelong manner of a Shrike-Robin (*Eopsaltria*), rather than the vertical position of a Tree-Creeper (*Climacteris*). In view of this observation, it is scarcely necessary to add that I was interested to read, in Mr. Edwin Ashby's notes on supposed

extinct birds of West Australia,\* a statement to the effect that *Atrichornis clamosa* (sole relative of the species under review) had been known by a settler to fly (jump) up a few feet and cling to rough bark near the base of tree-trunks. That bushman made no mistake in the identity of his bird.

There is little to add regarding our particular female Scrub-Bird. As darkness gathered we left her to the peace of the jungle. Neither of us would have shot the bird had we been armed, but we had ideas of catching the young one, holding it overnight, and returning to the spot with cameras on the following morning. This mild project failed, but the loss of a photograph worried us very little; it was sufficient to have associated with this fascinating species, one of the most remarkable and least-known of the world's birds, and to have brought away fresh knowledge of its curious ways. I am only sorry that the call of jungle-attractions generally—the spring of 1920 was wonderfully bountiful to the lush heights of the Macpherson Range—prevented the paying of further attention to the male birds. We heard little of their clever mimicry, and saw only a suggestion of the proud, *Menura*-like "strutting" described by Dr. Ramsay.

Since the initial discovery in 1918, and resultant discussions in Brisbane natural history circles, a good deal of interest has been manifested in *Atrichornis*, both by reason of the distinctive nature of the genus and the mixture of romance and mystery long surrounding both species. As a corollary, I have been asked whether the Queensland bird may be expected to hold its own. Possibly the answer rests with the scrub-tick. Bird and tick are diametrically opposed, but the fact is that the little flesh-burrowing tick is the only factor likely to keep down the introduced fox in the haunts of *Atrichornis*. The devastating animal is there now, but I doubt whether it will stay. All things considered, I see reason to believe that, even if settlement ends the days of the Scrub-Bird in N.S.W., the marvellous little creature will continue to "sing out and be happy" in the border range, 47,000 acres of which constitute Queensland's chief National Park.

## 2. The "Mystery-Bird" †

It was on the trip of 1918 also that information was first gleaned of the presence of the Olive Whistler on the Macpherson Range. When trudging along the crest of the Roberts Plateau on that occasion one of the settlers (Mr. H. O'Reilly) inquired as to the identity of a bird which none of them had ever seen, but several had often heard. Its note, he said, was very sweet

\*Emu, vol. xx., p. 124.

†*Pachycephala olivacea macphersonianus*, H. L. White.

and soft, and it was so elusive that, after repeated attempts to see the author, the settlers had christened it "The Mystery-Bird." Twice Mr. O'Reilly took me to the spot, on Mount Bithongabel, where the bird was wont to call, but disappointment met us on each occasion. Not a fragment of the haunting music was heard.

Evidently the weather was against us. Conditions that year were dry. There is no mistaking the melodious voice of a *Pachycephala*, but, although we camped on Bithongabel for several days in 1918, I heard only the familiar call of the Yellow-breasted Whistler (*P. pectoralis*); whereas in the bountiful season of 1920-21 there was no difficulty at all in hearing the new Whistler.

Candidly, it must be said that on O'Reilly's description I entertained no idea of the bird being a Whistler. He denied it to be the Golden-breast, and it would have been a rash guess to suggest that one of the southern members of the genus had found its way to the wild, jungle-crowned, 3800ft. high crest of the Macpherson Range. The best I could do was to assume the "Mystery-Bird" to be our other elusive friend, *Atrichornis*. This belief held until the end of 1919, when Jackson came down with refuting evidence—one forlorn specimen of an Olive Whistler.

The success attending the same collector's renewed visit to the Macpherson Range in 1920 rendered our "Mystery-Bird" a problem no longer. Nevertheless, I was eager to hear the melodious voice and to gaze upon the bird in life. This time, as previously mentioned, there was no trouble in gratifying the ear; but to *see* the caller was quite another matter. Jackson—an accomplished mimic—had told me that the call of the species expressed the words "Pee-po," uttered slowly and drawn out. This "phrase," however, was not the one we first heard. It was on December 30. We had just entered the beech country on Bithongabel—the magnificent old Antarctic beeches (*Neofagus moorei*) are almost restricted to the lush, dew-dampened heights, from about 3500ft. upwards—when we heard a new Whistler. The call was a plaintive, essentially-sweet, short bar, and recalled vividly the melody of the Gilbert Whistler (*P. gilberti*), bird of the drier northern parts of Victoria. A hard hunt followed. A pair of the birds was calling, but they kept moving on ahead, well out of sight, as I advanced through the tangle. Those were the voices of sirens, and by the time they had faded in the distance I was nearly bushed.

A mile or so further along the track a second pair of Whistlers called. This time the expression was not a four-note but a two-note call, the sweet "Peeeee-pooooo!" Stealing quietly into the tangle, I got close enough to call one of these birds. It re-

sponded promptly by flying quickly past and alighting out of sight. Another call brought it into view, and afforded a fair view of the plump form, brown plumage, and whitish throat. Only for a moment the bird perched there; then, catching sight of me, it dashed off through the jungle. Yet a third pair was heard something over a mile further along, on a track leading from Bithongabel to Mt. Mermo. In this case the call first heard was the beautifully-melodious "Peee-pooooo." Later came the persuasive notes used by the original pair—the "ta-ta-ta-tooooo!" Much hunting and calling failed to bring either of the birds latest heard into view; nor did we see or hear any more of the species during our short stay.

I agree that these birds are probably rare and certainly extremely shy.\* They are, indeed, regular will-o'-the-wisps, and seem to possess an uncanny knowledge of the movements of "foreign bodies" — which, of course, adds zest to the study of the species. The voice is alluring in the extreme, and much sweeter than that of *Pachycephala pectoralis*; a Golden-breast which was calling close by one of the "new" birds sounded reedy in comparison. I would not like to say that the melody of our "Mystery-Bird" is superior to that of the Gilbert Whistler† (the sweet voices have much in common), but the Olive Whistler carries a stronger appeal by reason of its romantic surroundings—the festooned beech-trees, the pretty tree-ferns, and the generally mazy vegetation of the higher portions of the Macpherson Range. These conditions, by the way, struck Dr. Turner as being much in accord with what he had met on the Ebor heights, northern N.S.W. Moreover, he found the Lepidoptera of the two places to tally closely; and so it is reasonable to suggest that the Olive Whistler may yet be found in certain elevations of northern New South Wales. At present the species provides a pretty problem in distribution.

It is necessary to add that I regard Jackson's bird as undeniably the first record of the Olive Whistler for the northern part of Australia. Mr. N. V. Agnew reported in *The Emu* some five years ago that he saw the species on Peel Island; but, knowing the circumstances, I say quite definitely (and in no critical spirit, of course) that a mistake was made. Probably Mr. Agnew's confusion arose through a scanty acquaintance with the drab-coloured female of the Golden-breasted Whistler.

Two interesting photographs obtained on this trip depict the nests of the Large-billed Scrub-Wren and of the Yellow-throated Scrub-Wren.

\*Jackson, *Emu*, vol. 20, p. 267.

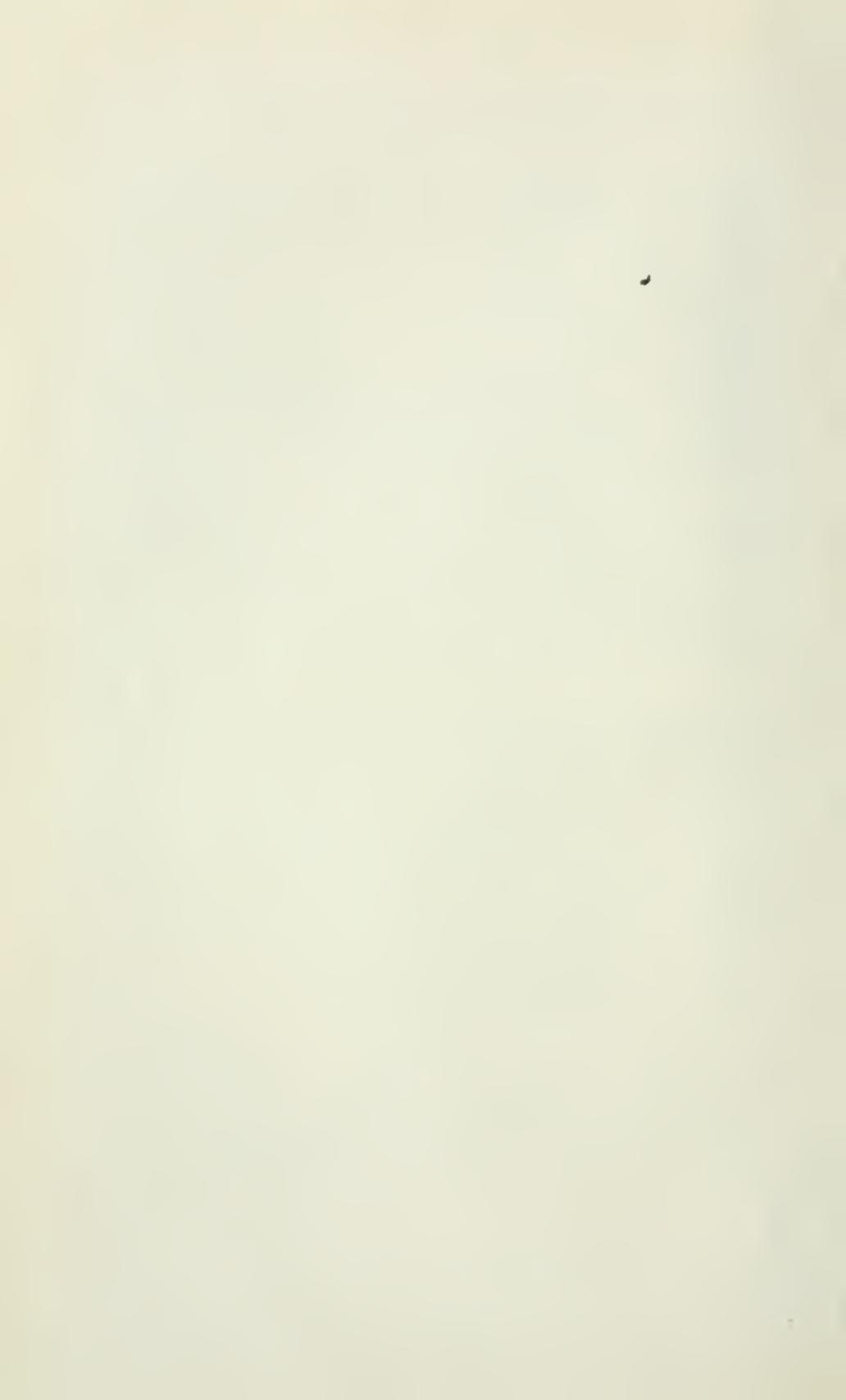
†See *Emu*, vol. 16, pp. 37-41.



Nest of the Large-billed Scrub-Wren  
(*Sericornis magnirostris*), Macpherson Range.



Nest of the Yellow-throated Scrub-Wren  
(*Sericornis lathami*), Macpherson Range.







No. 1 Bower of Satin Bower-Bird (*Ptilonorhynchus violaceus*).

Photo. by J. Potter, R.A.O.U.

## The Satin Bower Bird — Some Observations

By E. NUBLING, R.A.O.U., Sydney.

In October, 1920, in the National Park, south of Sydney, I heard the notes of Lyre-birds, and, from a sheltered place, for half an hour observed some five or six Lyre-Birds, amongst them a young one, and two males that were engaged in an impassioned fight. When about to leave, I heard something dropping in the thick creeper-festooned foliage of a tree opposite. Looking up I recognised a green Satin Bower-Bird (*Ptilonorhynchus violaceus*), which had let itself fall a foot or two in the vines; it flew on to the branch of a neighbouring tree, where it showed itself clearly, and finally disappeared in the brush. I was pleased to meet the Satin Bower-Bird in its natural haunts, which had long been my wish. I had gone only a short distance when I saw several more of these birds, uttering a peculiar "chrrā, chrrā, chrīt" (the ch throaty, as in the Scotch word "loch"), sometimes accompanied by a hissing sound, or followed by the imitation of some other bird's notes.

On the following day, with Mr. J. Potter, R.A.O.U., two or three green Satins were encountered on Waterfall Creek, and several more at two or three places, among them a blue-black male, with a twig in his bill, apparently intended for bower-building.

On the 10th of October, we saw a blue-black Satin fly over the road. It alighted first in a tree, and then dropped to the ground in a small patch of bracken ferns, near the water's edge. When the bird flew we found the bower (No. 1). It was built at the edge of the bracken, some of the fronds bending over it. The platform on which it stood was 3ft. 3in. in diameter, and constructed neatly of long, dry she-oak (*Casuarina*) needles, with a few thin sticks between them, looking almost like a carpet. On the platform, more on the sides than in front, we found many dry leaves of *Banksia serrata*, and also a few, kindly identified by Mr. H. J. Maiden, F.R.S., Director of the Botanical Gardens in Sydney, as *Schizomeria ovata*. Besides these were snail shells of two kinds, a piece of string, pieces of blue paper, two small bags of washing blue, and some blue glass. The measurements of the bower were: length of the walls, 12 and 9½ inches respectively; average height, 12 inches; external width, 11½ inches; internal width, at the ends 3-3½ inches, in the centre 5 inches, the latter slightly concave at the bottom. The walls were but little arched on the top, and the passage wider at the top than at the bottom, where the sticks curved in towards the centre. Looking at the walls sideways many sticks were laid diagonally towards the centre from near the bottom ends of the wall, so that they overlapped in the

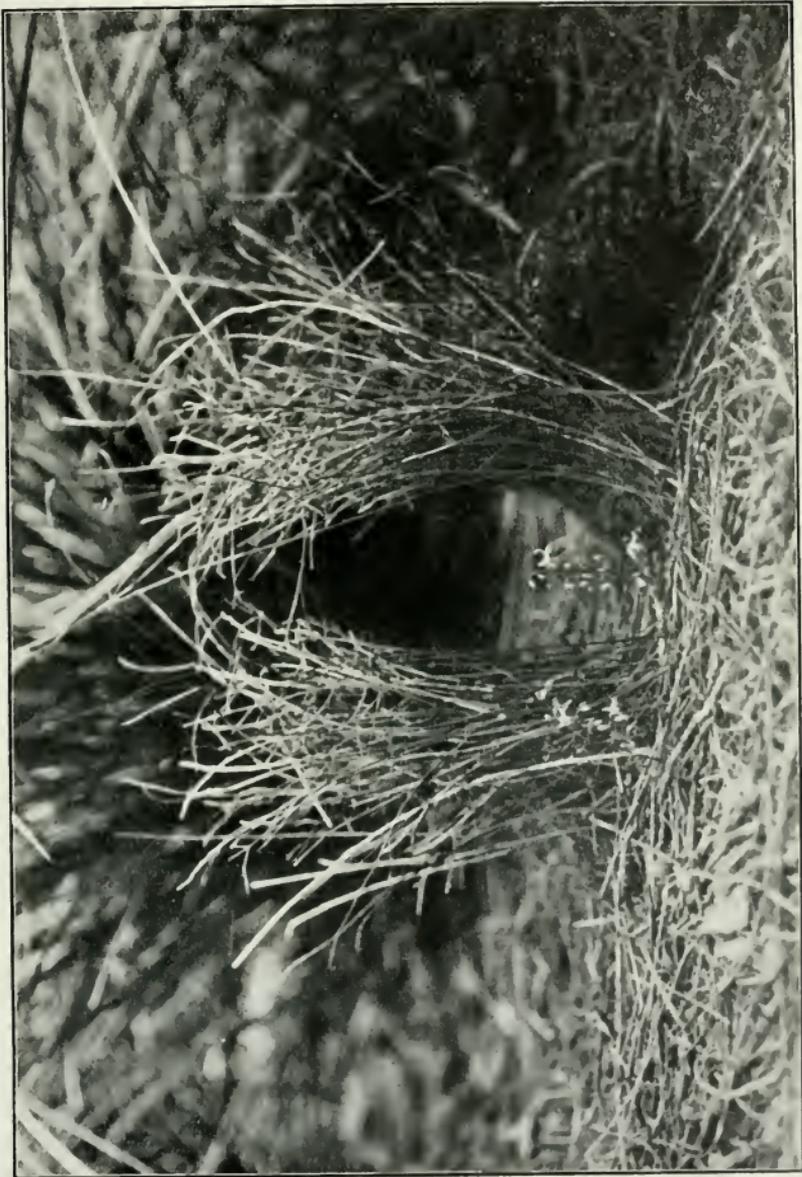
middle, where no sticks were planted for about 3 inches, otherwise the sticks were all upright. The bower was not in the centre of the platform, but had its back entrance within a few inches of the periphery.

After waiting a while, seated about 10 feet distant, we saw the bird in a tree overhead, with a stick in its bill. It flew first down to the stump, and then to the platform, where it hopped about, emitting repeatedly a buzzing sound, and uttering short cries, whilst its wings were slightly raised. Other visits gave Mr. Potter an opportunity to take two photographs.

Continuing our journey, we noticed another blue-black Satin-Bird, and, after a three mile walk, arrived at the place where we had previously seen an old male-bird, with a stick in its bill. Mr. Potter then discovered bower No. 2, situated amongst some tussocks near a small lillipilly tree (*Eugenia Smithii*); a slender six-foot-high pine tree stood still closer to the platform; two turpentine trees (*Syncarpia laurifolia*) were not far off, and behind the tussocks was scrub, with yellow-flowering shrubs.

The platform measured roughly 3 by 2 feet, and was loosely made of sticks, and not so neat in appearance as the first. The collection on it included dry leaves of *Banksia* and *Schizomeria*; two different snail shells, kindly named by Mr. Hedley, Curator of the Australian Museum, Sydney, as *Thersites jervaisensis*, and *Rhytiola capillacea* (a carnivorous snail), as at bower No. 1; the blue drawer of a match box; several blue feathers of the Crimson Parrot; two large tail feathers of the White Cockatoo; two puff-ball fungi; the empty shell of a Cicada larva; a piece of blue glass, and a piece of porcelain with blue stripe, evidently picked up at some camping place. The measurements of the bower, which had its back entrance almost on the periphery of the platform close to a tussock, with just enough space to allow the bird to pass between them, were as follows:—Length of walls, 12 inches; average height, 12 inches, some fine twigs being up to 21 inches long; greatest external width, 12 inches; internal width, in centre 5 inches, narrower at the ends; the bottom slightly hollowed in the centre part. The sticks of the walls were all set straight upright, but arched neatly over on the top. It was a beautifully-made bower.

We took up a position some 6 feet away, lying on the ground, and awaiting developments. We were delighted to see the bird approaching, with a little hesitation at first, and during our stay pay five or six visits to the playground. To our presence he had evidently no objection, as long as we kept quiet. His approaches to the bower were made from varying directions. Generally he alighted in a smaller tree, or bush, then flew down to the ground, hopping to the bower through the tussocks, bringing a stick, a leaf, some flowers, or other article, but we never heard him utter a sound whilst thus occupied, nor when he attended to



Bower No. 2 where the owner, for months, was seen at work and play. Fresh flowers had recently been placed in the front of the bower.



the walls, ramming in a new stick, removing another, and setting it down in a different place. Again he might be seen standing in a meditative attitude, or nibbling at some brownish substance attached to his bill. When away from his bower he often kept quiet for a long time, preening himself, and occasionally uttering his long-drawn characteristic "chërrū" call. The flowers brought by him were those of *Dampiera stricta*, light blue, and quickly shrivelling up, and of *Billardiera scandens*, yellowish-green.

It was interesting to note that, when he espied a green leaf on the platform, he picked it up and threw it out, the colour evidently not fitting in his decorative scheme.

On the 17th October we observed the blue-black Satin fly down to bower No. 1, and found there, apart from articles previously mentioned, the following additions:—2 blue drawers of match boxes, some fresh *Billardiera* blossoms, also one or two of *Dampiera*, blue glass, puff balls, and a larval shell. A little distance off a green Satin-Bird was picking at an orange peel.

About 3 o'clock we reached bower No. 2, seeing our friend moving about in various trees. The platform contained many freshly-added snail shells. During the four visits he paid to the bower, he behaved much as before; among things brought by him being a stalk with blue *Dianella* blossoms, which grows near by. Whilst he was absent I put two snail houses inside the bower, to see what he would do. On his return, he promptly took them out, and put them in their rightful place, on the platform. In one instance he flew into the small pine tree close to the bower, and not more than three feet from me, and fearlessly looked at me inquiringly with his beautiful lilac-blue, pink-ringed eyes. An extraordinary bird!

On the 24th October, bower No. 1 was somewhat reduced, and I wondered if the bird was pulling it down to erect it elsewhere, as on each visit we had found people camping near by. A green Satin in a tree was apparently feeding on insects picked from underneath the bark. The blue-black Satin stopped for a time in a flowering turpentine tree, from which he suddenly dived down, passing my head at arm's length, and flew after the green female. During a following thunderstorm, with some rain, I could see him visit the playground several times, but he did not allow me to get close.

I then continued my journey. Near the Upper Peach Trees two green and a blue-black Satin were up on the hillside. The two green ones came down; one landed in a tree above me, the other, in a long, planing sweep downward, went about a hundred yards distant on the river. This seems a favourite mode of flying with Satin Bower-Birds. One rarely sees them making wing strokes during flight, except when flying upwards, which they seem to avoid as much as possible. If they want to get to a

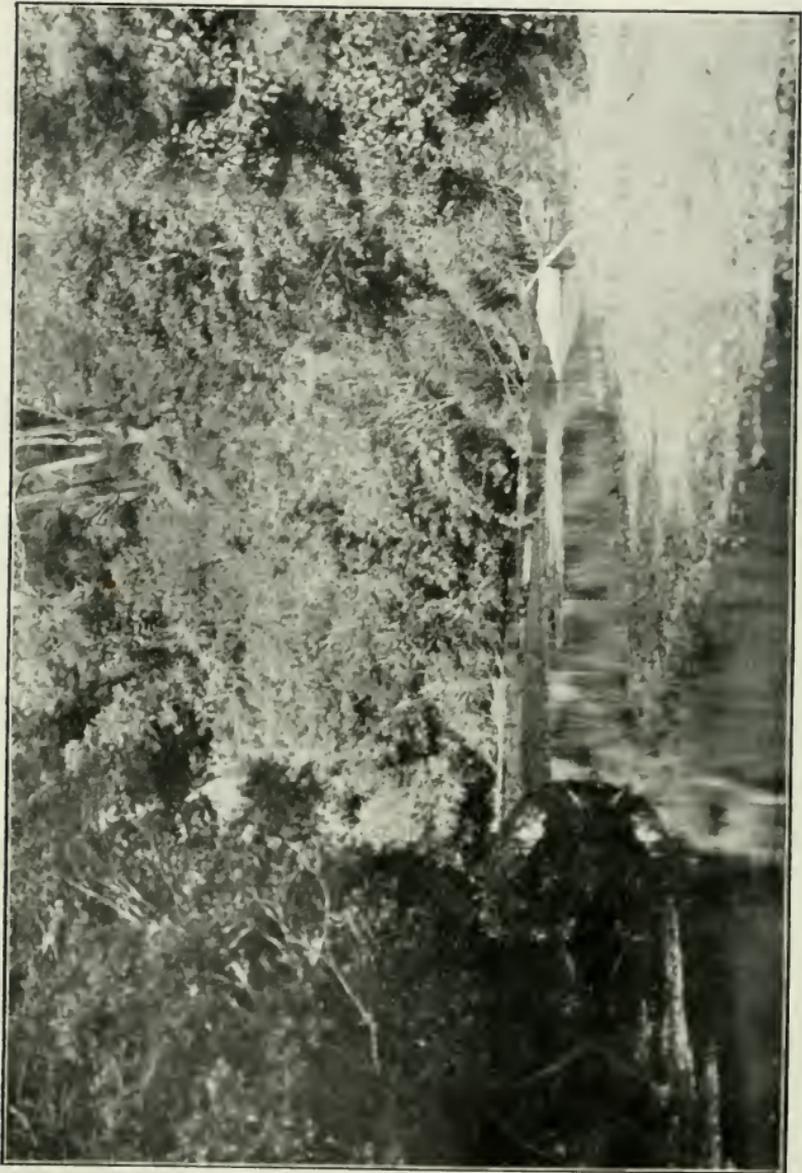
more distant place their method seems to be to ascend a more or less high tree, according to the distance they want to cover, and then to plane down. They mostly ascend a tree by hopping from branch to branch.

At 3 o'clock I was at bower No. 2, and met Mr. Potter there, with a younger brother, who had come by the first morning train, and reported three visits of the Satin to the bower. The bird did not return to the bower until after 4 o'clock, when he arrived with some blue flowers. Repeatedly green Satins were heard calling. It was already 5, when the Satin appeared again with some half-dozen *Billardiera* blossoms in his bill. On hearing the click of the camera he slipped into the tussocks, with the blossoms still in his bill, and, having deposited them somewhere in the scrub, flew into the black wattle without them. When first coming down to the ground to hop to the bower, a fine Cat-Bird alighted simultaneously with him. The Cat-Bird hopped then on to a tree-stump, and, flying up into a turpentine, ascended it in a similar hopping fashion to that of the Satin-Birds. The attitude of the Satin in the bower, or about it, is to have his legs and feet set well apart and spread outward, thus securing the body a strong support. It is interesting to see him working at the walls, lifting a stick out at the end of a wall, turn his head round, raise it and give it a twist, and then with his bill ram the stick down in another place, if necessary hopping along a few inches. All this is done in a thoughtful manner without haste.

Before leaving, four green Satin-Birds were flying about the high eucalyptus tops, calling; others were heard, and a blue-black and a green one were noted on the return trip.

On Saturday, 30th October, bower No. 1 was as before, but for an extra supply of many pieces of blue glass and fresh *Billardiera* blossoms. We also saw the owner, but did not stop there. At bower No. 2 our winged friend was soon heard and detected. A piece of blue velvet was the only novelty in his collection. The night was spent under a rockshelf on the hillside. At 4.15 next morning I was up listening to the manifold voices of the birds in the gully from early dawn to sunrise, starting one after the other with their song. About an hour later we could, from above, see the Satin about his bower. Slipping to the bower during our early breakfast, I noticed the Satin nip off a stalk of blue *Dianella* blossoms and deposit it on the platform. Something on the platform had evidently roused his anger. It was thrown out, and in doing so, he emitted for the first time on the playground a note, a buzzing "churr." When climbing a tree-trunk, he did so somewhat in the manner of a Tree-creeper. After 7 he brought two puff balls, some flowers having previously been deposited. His last morning visit was after 9, when the bower was becoming sunny. Once he removed two puff-balls, put there by us, from the front entrance, uttering again a buzzing sound. He was also seen hopping





The River and Jungle, National Park, Port Hacking, near Sydney. Haunt of Satin Bower-Bird, Lyre-Bird, and others.

about, with wings slightly raised. When in a tree he continued repeating a rather nasal "hwa." In another instance he sat on a log, four feet away, absorbed in meditation, giving only an occasional unconcerned glance, when I could once more at close quarters admire his beautiful eyes and glossy plumage, as smooth and sleek as the skin of a seal; or, in a certain light, the plumage would appear of a dull, lustreless dark blue, with some still darker stripes. His beak is of a rather light yellowish or whitish-green, not unlike that of the blossoms he is so fond of. One of the male's notes sounds exactly like the tone produced by holding a leaf between the lips, and blowing air through.

The birds of both bowers show a decided preference for blue and yellowish-green, as regards their decorations, the only exceptions being perhaps the brownish snail shells, yellowish-brown Cicada larval shells, and the more olive green puff-balls. A thing of another colour is, as a rule, rejected. I do not intend to generalise from this, but, whereas in nearly all descriptions I have read of playgrounds, it is implied that anything bright is regarded by the Satin Bower-Bird as a fit object for collection, my observations so far do not bear out this contention. As an instance, I may mention the prompt rejection of a piece of shining tinfoil placed on the platform, and that with signs of disapproval. I may here also draw attention to the two Satins' partiality to two kinds of leaves. I have not found any bones on the playgrounds. A female Satin was also noticed, and some quaint sounds were heard, when the blue-black and the green were together. After 10 a.m. we moved into the jungle, with its towering trees, with straight, smooth or slightly rough-barked trunks. Whether they are in bloom or fruit one cannot make out from below. They form a shady canopy, an upper world of their own, in which grow birds-nest, elkhorn, and staghorn ferns, sometimes of enormous size. One single, fallen, rotting clump of the first-named measured over 6 feet across. Undergrowth is practically absent, except where some trunk has fallen, and a small clearing has been formed, in which many kinds of ferns are found, and the slender stems of young trees and vines shoot up.

Everywhere vines and creepers grow on the trunks and hang down in long ropes, up to 4 inches and more in thickness. Seen from across the river, this jungle, or brush, forms only a narrow belt, practically confined to the eastern side of the river, and looking like a huge green screen or cliff wall, standing in front of the steep hillside. Here and there a bangalow palm stands out from this background, or a slender, straight stemmed, graceful, palm like tree, whose name Mr. J. H. Maiden gave me as *Tieghemopanax Murrayi*, and in one place a picturesque tree, the native name of which I believe is Merring-arra. Several of the *Tieghemopanax* grow near the bower, and the Satins are occasionally in them. An *Arundo*, belonging to the grasses,

grows to a great height, and may be seen putting its blades through the thick foliage near the tops even of the large trees. This brush is the favourite home of the Satin Bower-Bird and Catbird, the trees there offering them a varied supply of fruits, as, for instance, the plum-like fruit of *Achras* (*Sideroxylon*) *australis*, occasionally found on the ground.

Behind the jungle the sandstone hills rise steeply, and plant life almost at once begins to change its character. This applies also to the eastern side of the river. Along the river and creeks lillipilly trees, *Sassafras*, *Elæocarpus*, *Callicoma*, and many others grow in profusion, wattles only on the other side in the more open places. The description of bird-life in the jungle may be left for another occasion.

About 3 o'clock we returned to bower No. 2, where we noticed the blue-black Satin chasing off another dark male that had apparently trespassed on the former's property. Fresh blue *Dianella* flowers and new Cicada larval shells were on the platform.

On Saturday, 6th November, coming from Waterfall Station, I first heard the Satinbirds at the Causeway. I searched in vain for a bower; nor did I come across anything on the so-called forest path, which deviates from the road, keeping close to the river. But after having passed Palona Creek I saw green Satins repeatedly, in one instance four, and with them a blue-black male; also heard their peculiar wheezing notes, not unlike the spitting of a cat, only less sharp. One of the green Satins was picking on the road. It was almost night, when I arrived at bower No. 2.

Four o'clock next morning found me up. About half-an-hour later, before sunrise, the blue-black, as well as green, Satins could be heard calling. At 5.45 I noticed him at the bower, but, of course, he had been there long ere this. Shortly after that, near our fire-place close to the road, I observed the blue-black and a green female above me in the leafage of a tree, where they talked away in their peculiar language, uttering frequently a wheezing, nasal "ffae ffae." Whether this was produced by both or only by one I could not ascertain, but as in some instances it was followed by the male's "chërru," I am inclined to think that it came from the female. I certainly did not hear it on later occasions among the many notes of the male. Going to the bower I saw the Satin flying from it and found four newly deposited empty larval shells there. A little later he again disappeared into the tussocks, only to return to do some adjusting at the walls. When flying low over the more open scrub, his back, struck by the light at a certain angle, looked as brilliantly blue as that of the Azure Kingfisher skimming the water, just as on another occasion his colour appeared in hue like the breast of the Peacock. After two more visits he did not



leaves, which would curl up very much quicker, when put upside up, instead of *vice versa*, as is done by the Tooth-bill.

Leaving some pieces of blue paper (from a blueprint) in the vicinity of the bower at 6.15 p.m., I walked through the scrub towards the creek. About 10 or 12 yards from the bower I discovered a beautiful Coachwhip's nest, about four feet from the ground, in a large tussock. It contained two lovely eggs, with a pronounced blue ground colour. Returning to the bower about 15 minutes later I found three pieces of blue paper on the platform. I removed them. Having been occupied for a short while some 18 feet away in scraping out my billy, I casually glanced towards the bower, when I noticed seven pieces of blue paper which the bird must have put there whilst I was scraping my billy. Later, Mr. Potter arrived, and we spent the night under the rocks.

Passing near by at 4.30 next morning I saw the Satin fly up from the bower, to which during the next three-quarters of an hour he repaired four times, bringing new decorations, or sticks, comporting himself in the usual quiet way, and enjoying his treasures new and old. During his absence I repeatedly heard beside his usual call a note sounding like "chēaf." We also observed him near our fire-place with a green female. At 7.15 we found new empty shells of Cicada larvae and fifteen pieces of blue paper.

So far we had not seen the green female on the playground. He now uttered, whilst in a eucalyptus, a number of short calls, like "chra" and "chrāé." Three-quarters of an hour after that he approached along the fringe of the scrub, hopping over the ground, closely followed by a female. His wings were slightly raised and his tail was up. He uttered continually the last-mentioned two notes, and we prepared ourselves for an event of some kind. Both birds passed over the platform into the tussocks. Presently they returned, the female being chased round and through the bower by the male. She then slipped into the bower, whilst the male stood in front of it, a little to the side, facing her, and beginning at once with his strange antics, and uttering various notes. On the click of Mr. Potter's camera both went off, but soon reappeared, when the performance was repeated. When the camera clicked a second time, they again left. The female stopped some 8 feet away, wherefrom she watched her partner, who returned alone, picking up and dropping some of his treasures, and uttering his strange calls. The female, who seemed indifferent to the whole thing, flew into a tree, preened herself, and finally departed. The male repaired to a log nearby, where he remained in view for a while, absorbed in his own thoughts, and evidently not minding our presence. To our regret the plates were under-exposed, the light not being too favourable.

Later in the jungle we saw two Catbirds, evidently a mated pair, chasing and then perching in different trees at the foot of the hillside. One of them would call "ffit," the other answer with "ffae," the latter note exactly almost as heard from the Satins. The bill, when the bird called, was slightly opened, and the tail vibrated. I followed one up the steep hillside, when it plained down in one fine long, swooping curve, wings spread and motionless, similar to the Satin, and disappeared in a creeper-festooned tree.

Before 3 o'clock I put an apple core on the platform. Suddenly the Satin emerged from the tussocks, and began to eat the core, then carried it behind a tussock. Till 4 o'clock he paid three more visits to the playground, bringing *Billardiera* blossoms, of which he seems very fond. A green Satin was also seen in a eucalyptus over the road. At 4, Mr. Potter changed position with me, whilst I went a little up the creek.

Shortly after I left the owner of the bower was observed by Mr. Potter sitting some yards away on a fallen tree, when to Mr. Potter's surprise a second, slightly smaller, blue-black Satin approached the bower in a sneaking, cautious fashion, and began to pull viciously at the walls, creating some disorder. He disappeared then in the same stealthy manner.

On 20th November, saw the blue-black Satin in a tree close to bower No. 1 with something in his bill, but, observing me, he went off immediately, and, hearing a few minutes later his call from the hillside, I moved on. At bower No. 2 I left two small strings of light blue beads, and noticed the Satin near by. I may mention here that I never found any article inside the bower, and if anything was put there, he promptly removed it. As I had noticed on several occasions the female flying up the creek gully after her meetings with the male, I thought it possible that she might have her nest up there. I searched carefully, but found no nest.

At half-past six I saw the Satin leaving the bower, and heard the wheezing "ffae" notes, which seemed to originate from two green Satins. In my absence several fresh *Billardiera* blossoms, a piece of dark green glass (an exception to the colour rule), a puffball, and a Cicada larval shell had been deposited on the playground, so he must have been busy. It looked like a preparation for some special occasion. Not long after 4 next morning the male was observed at the bower, lifting up one of the strings of blue beads, and dropping it again, as he is wont to do with his treasures. The beads had apparently found favour with him. When it had become fairly light, three green Bower-Birds were detected high in a eucalypt, two sitting motionless, the third feeding on some insects in the bark at which it picked. Suddenly three more birds flew away from another high tree top, and the whole company of six went off together. Presumably they had roosted in the gums.

Before 5 the Satin was at the bower again, eating some cherries I had thrown there for him. At the same time a second, slightly smaller blue-back male with darker beak was approaching from the creek under cover of the scrub. Suddenly my friend at the bower grew alert, dived into the scrub, and a few seconds later was pursuing the other, who retreated in hot haste. The owner of the bower then returned to continue the interrupted feast. The second male was no doubt the same which had previously been observed about the bower with mischievous intentions.

Having flown off, he was back at 5, eating cherries, lifting up beads and leaves, and making a general tidying up of the playground. Without doubt, the early hours, from dawn till the sun shines into the bower, are the best to study his habits.

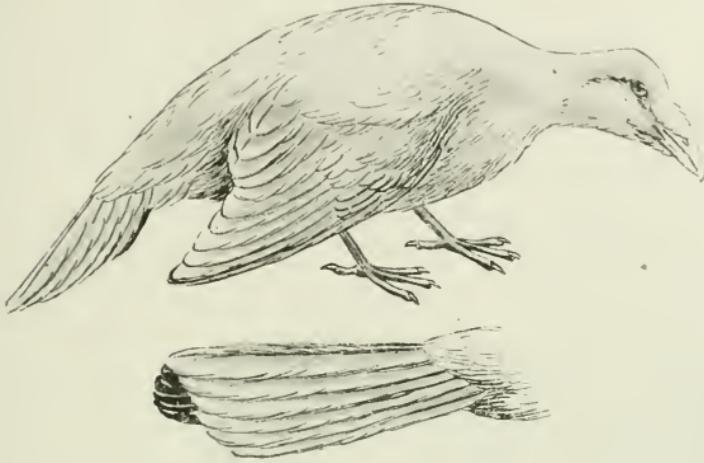
At our fireplace a Catbird (*Ailuradus crassirostris*) was noticed with the blue-black Satin not far off. Another Catbird was observed, feeding on something whitish, presumably grubs. It was in fine plumage, and quite unconcerned about my presence. It came close to the fire-place, picked up a small crust of cheese, and made off with it.

Before 7 fresh *Billardiera* blossoms, more shells of Cicada larvæ, a small piece of string, and a young, curled up, bracken fern leaf had been added to the rather crowded playground. At 7 o'clock, hearing the wheezing notes of Bower-Birds, I crept up to a stump, wherefrom I could overlook the playground. To my delight I found male and female there together.

They would run round the bower and through it, then disappear in the tussocks. Presently the female slipped into the bower, and the male took up a position in front of it, slightly to the side of the wall, and facing the female. Immediately a short vocal and mimic performance followed. He then hopped round the bower, calling, and with peculiar antics, while the female remained quietly inside. These items were repeated several times, the female after each number of the programme slipping off into the tussocks, while the male either followed, or stopped on the platform. After these overtures the play proper began, lasting for close on 25 minutes, during which time the female never left the bower, only occasionally shifting her position a little forwards or backwards, now and then turning her head from one side to the other, picking perhaps at the wall, but generally keeping quite still. Only in one instance did she move for half a minute, or so, to the back, just outside the avenue of the bower. Her attitude in the bower was the same as that of the male, resting on her legs and feet, planted well apart. Consenting to be the central figure of the programme, she probably did not perceive what all the fuss was about.

The attitudes of the male were peculiar. His head was bent downward, the neck long stretched out, the wings were slightly

raised off the sides of the body, the tips pointing to the ground, similarly as I have seen it done by Song Thrushes, when watching for insects on a lawn. The tail was pointed downwards, too, almost at a right angle to the back, the legs were set apart as



Characteristic pose of Satin-Bird when in Bower; tail curved, wings slightly raised, feet wide apart.

From a drawing by Neville Cayley, R.A.O.U.

usual. Sketch A, which Mr. Neville Cayley has made for me, may give an approximate idea of this attitude. Again, head and tail would be raised, but instead of the feathers of the latter lying in one plane, the tail was curved in half-moon fashion, as sketch B shows. From time to time he would raise both his wings high up, erecting his whole body at the same time, but whether the tips of the wings touched above or not, I cannot say. He did this generally when, after performing on one side of the platform, he hopped over to the other, to begin there anew, the wings being raised whilst he hopped over. Now and then he would hop away in a peculiar limping fashion, stopping for a while behind a tussock out of view, as it appeared, of the female, uttering when drawing away a peevish note like "ee-ee-aé aé aé aé aé aé aé." It was just as if an actor retired for a few moments from the stage behind the scene to recuperate.

Each act of the play would be started by the male with a sequence of notes, that reminded me of the sound produced by a wooden rattle, used years ago in Europe by small boys, though not as loud, like "fur-r-r-r-r-r-r- rae rae rae rae rae rae," etc. Other notes that followed were "châit châit châit"; "cheet cheet cheet"; "chraé chraé chraé"; "heerere chāé chāé chāé"; "aé aé aé"; "hwēé hweé"; "hwāe-aé chēé chēé," etc.; "chrē āéé chreaé"; the ch always guttural, as in the Scotch word loch.

These notes, repeated again and again, were taken down on the spot, and are reproduced as best I can.

Now and then during the performance he would lift a leaf, a flower, a feather, or the string of blue beads, as if to show the female the treasures and finery he had, and was singing their praise. Finally, the female hopped into the tussock, flew into a tree, preened herself, and departed, the male remaining for a short while uttering short cries, with down-bent head.

It was a remarkable performance, and I was fortunate in being able to watch the proceedings at such a short distance. The whole programme extended over 35 minutes.

After that I took up my usual position near the bower, lying on the ground and filling in my short notes, when I became aware of the bird's presence, and saw him behind me with a bill full of *Billardiera* blossoms. Perhaps he was curious to find out whether I put down correctly everything as I had seen and heard it. He did not, however, go to the bower, but deposited his flowers somewhere, and flew off, not returning until a quarter to nine. I had thrown down a few more cherries for him, which he began to eat. It was then that I got a snapshot of him at only 4 feet distance. He then brought the blossoms previously left among the tussocks, and departed. The sun was now shining fully into the bower, and he did not return. But about 9 o'clock I listened to a similar performance, enacted a little distance away in the shade of the scrub.

Calls of green Bower-Birds were heard now nearer, now farther away; also the rattling notes of the blue-black. Once more then, after a little silence, came from the same place in the scrub the "ffae ffae" of the female, followed by the ordinary drawn-out call ("chērrū") of the male, and again by "ffae ffae." Then the male uttered his ordinary call, which was accompanied by the imitation of various birds' notes, among which I recognised those of the Crimson Parrot, Butcherbird (*Cracticus torquatus*), and others; this lasted till nearly 10 o'clock, when Mr. Potter arrived.

In the jungle afterwards two or three Catbirds were observed, also a Pilotbird (*Pycnoptilus floccosus*), on the hillside behind it. At a quarter to 4, Mr. Potter secured, as it turned out afterwards, a fine photograph of the Satin standing in front of bower No. 2 in characteristic attitude. It was destined to be the last at this bower. Meanwhile I found four Lyre-Bird mounds at the fringe of the trees. On my return I noticed two nests in mistletoe clumps, growing on two *Casuarinas* on the hillside. These were reserved for later investigation, as we had to depart on our return journey.

27th November, passing bower No. 1, I found the length of the walls, which were very thin, reduced to 9 and 9½ inches, respectively, the whole structure looking rather shabby. Did not



The owner of Bower No. 2.



see the blue-black Satin there, but a green one, a Catbird, and two Lyre-Birds. Observed later at a new place a blue-black and a green Satin-Bird together. Scoured the adjoining hillside for a bower, but found only a Rockwarbler (*Origina rubricata*) feeding a well-grown young. At the Upper Peach Trees, I noticed a Catbird picking a green peach from a small tree, and flying off with it. It was a hot day, and I was glad, at the old fireplace, near the creek, to throw off my pack. My gladness was, however, soon turned into dismay, when I found that a bush fire, coming down from Palona Creek, had devastated the whole scrub on the upper side of the road to the very hilltops, and in parts also the scrub below, down to the river, only the higher trees, and the trees fringing the creeks and the river, being saved. Needless to say, the bower had gone with the rest. Saw the blue-black Satin near the river.

About 6 I noticed a Catbird near our old fireplace, with a Black-faced Flycatcher (*Monarcha melanopsis*) in pursuit, this in turn being followed by a second Catbird.

At 20 minutes to 7 I went down to the river to have tea. My surprise may be imagined when I found a new bower, No. 3, of our old friend. The platform was small, at one end only, the room being rather limited, and no decoration on it. The sticks of the walls were upright, on one side firmly interlaced with diagonally-laid sticks, protruding several inches outwards at the bottom over the uprights, curving in then towards the centre. The sticks were coarse, some up to  $\frac{1}{4}$  inch thick, with the consequence that the avenue was wide open at the top, as these sticks could, of course, not be bent over. Evidently this was only the strong foundation of the unfinished bower. It afforded an interesting insight into the working methods of this clever bird-architect, who seemed to possess a remarkable knowledge of static principles, and to apply them to his structure. The measurements were—length of walls,  $15\frac{1}{2}$  inches; greatest width,  $15\frac{1}{2}$  inches; thickness of walls,  $4\frac{1}{2}$ -5 inches; internal width, at bottom 5 inches, on top 6 inches, the avenue in centre slightly concave. This bower is much larger than the others, and was surrounded by low tussocks. On the roadside a fallen tree trunk lay about two feet from the bower. After seeing his old bower destroyed, the Satin must have set to work, to build a new one, and a fine job he made of it, even as it stands unfinished. It is situated at the edge of the trees flanking the creek, whilst taller trees are found at various distances on the other sides. If a line is drawn along the long axis of this bower it points N.W. and S.E. *exactly*. The same applies to bower No. 1 and 2, which fact seems rather remarkable.

I was sitting on the trunk at the bower when I noticed the Satin alight some 15 feet away. I remained still, and the bird hopped along to the bower, which, after a moment's hesitation, it entered, so that I looked down on it. Something pressing

against my throat, I had to swallow, and, faint as the sound can only have been, he heard it, hopped out, and went off.

Spent the night under the open sky on the hillside. Watched a fine Lyre-Bird performance at close range on two mounds before 5 o'clock next morning.

About 6, the blue-black and a green Satin were seen high up in a tree near the old fireplace. At 7 I found the first decoration on the new bower's platform; five *Billardiera* blossoms, to which later a blue paper label was added; also saw the Satin about the bower. I left a few bits of blue paper, two small strings of blue beads, and some single ones, near the bower, which were later found on the platform, another addition being a dry *Schizomeria* leaf. Saw him then fixing sticks in the walls, and later watched a short performance with the female in the bower, as previously described, confirming my former observations. New notes were heard: "chjua hwoa" and "hoa chooroo."

After 3 o'clock I saw the Satin flying from the bower, and found there a dry *Banksia* leaf. Sitting at the foot of a turpentine tree I saw him hopping along from the bower towards me. On a piece of log, about 7 or 8 feet away, he stopped, craned his neck, looked at me for a few seconds, and then flew away, apparently satisfied that there was nothing to worry about. A thunder-storm coming up about 4 o'clock, I left noticing a blue-black and a green Bower-Bird together in a new locality on the way.

On the 4th December, Dr. E. A. D'Ombraïn and myself visited the Park together. We found bower No. 1 in the same, not very impressive condition. Later a Rufous-fronted Fantail (*Rhipidura rufifrons*), whose mate had evidently a nest not far away, was observed chasing off a big Catbird, which latter, then with another member of its species, was feeding in a cabbage-palm on the ripe black berries. At the same spot, where last Saturday I had made a fruitless search for a bower, we saw again a blue-black and a green Satin together. This time we searched in vain below the road.

Arriving at Bower No. 3, we found that it had been completed during the week, and looked very fine indeed. Many finer sticks and stalks had been inserted between the coarser sticks, which formed the main structure of the walls, practically hiding them from view, and forming an arch above. Several of the finer sticks were 24 inches in length. On the platform the collection included blossoms of *Billardiera*, two snail shells, part of a Cicada larval shell, one or two small feathers of the Crimson Parrot, some of the blue paper bits, one string of the blue beads, and several single ones. We saw the Satin in a tree not far off, but although we stayed some time, he did not visit the bower. Later Mr. Potter arrived, and we spent the night in the open on the hillside, some 100 yards from the bower.



Bower No. 3. Left, building; right, completed.



Next morning we rose about 4 o'clock. Two green Satin-Birds were close by in bushy trees, and in the scrub along another creek were two Catbirds. About 9 a.m. we repaired to bower No. 3.

I climbed up to examine the lower of the two nests discovered a fortnight ago, as most likely to be that of a Satin Bower-Bird. It was placed between the upright twigs of a clump of mistletoe, growing on a thin branch standing sideways from the trunk, at a height of about 40 feet, and was about 6 feet out from the trunk. It was a Bower-Bird's nest, saucer-shaped, constructed of thin twigs, and rather well made, lined inside with dry eucalyptus leaves. It measured approximately 8 inches in external diameter, and about 4 inches deep externally, 2 inches or so internally. There were no eggs, but a young bird, comfortably snuggled up, with closed eyes. It made no sound, nor showed any concern whatever. No parents were seen about. The body was of a dark brown colour, with young feather sheaths, about half an inch long, and of greyish colour, bill very dark, almost blackish-brown, with a small notch close to the tip of the upper mandible. In the jungle we saw Catbirds repeatedly, and Mr. Potter, watching a pair of them closely, discovered their nest, containing 2 beautiful biscuit-coloured eggs. It was placed at a height of about 22 feet close in the fork formed by the trunk and a broken-off branch, and was oval-bowl-shaped, of 9 by  $7\frac{1}{2}$  inches external width,  $6\frac{1}{2}$  inches deep outside, made of twigs and creeper stems, into which on the outside large dry leaves were woven.

No bird was seen about bower No. 3 in the afternoon, though we were about for some time; only once the male's call was heard. Nothing had been added since yesterday, not even a single blossom, but an *Achras* plum, left there for him, had been eaten, and he had thrown out several red articles Dr. D'Ombraïn had placed on the playground. Evidently he does not fancy this colour. Probably his indifference to the bower may be explained by the arrival of the young bird, presuming the mother of the latter to be his mate, as the nest is no great distance from the bower.

I should like here to lay emphasis on the remarkable tolerance of our presence by the Satin at bower No. 2, which alone enabled us to study his habits at such close range, the usual experience being, I believe, rather to the contrary.

18th December, proceeded from Waterfall to Garie, or Gera, in the extreme south-east corner of the National Park, and 8 miles distant from Waterfall. The rich brush gullies of the Illawarra district find here their northernmost limit. On descending from the uplands to Garie in the evening, I observed several Catbirds and heard the call of a male Satin-Bird. I spent the night at the creek mouth close to the beach, and next morning went to the gully, where I had heard the Satin the pre-

vious evening. Observed the Catbirds again, and then heard the call of the male Satin, now here, now there; but had to move forwards and backwards a good deal, much hampered by the dense, heavy scrub and fallen timber, before I caught sight of him, and a green female. He constantly repeated the same note, "chē-āé," occasionally throwing in the well-known "cheerrū"; the female was also heard. Finally they disappeared in a narrow side gully, steep and rocky, with several ledges covered with heavy scrub. After much climbing I got within close range of them and listened to a performance as previously described, but could not see the birds themselves, owing to the dense undergrowth. Some of the male's notes, like "cheerrū-roo-roo-roo" and "ee-urr fūi fūi," I had not previously heard. I noticed then 3 green ones and a dark-blue male in an Achras-tree above, where they were jumping repeatedly at something in the foliage I could not discern, and tearing it off, perhaps some leaf shoots or young leaves, which I have seen them eating before. After a while they departed, and I examined the spot, where the performance had taken place, but found no bower—in fact, there was hardly any room for one. I remained there for a time, during which I observed Satins and Catbirds constantly flying up and down the gully, feeding on the berries of the cabbage palms and the three-lobed red fruit of a bushy tree, which I believe is the bastard rosewood (*Synoum glandulosum*). Some of the green Satins were repeatedly observed dislodging some fibrous material as it seemed from near the base of the leaf-stalks of the palms, and then flying up the gully, returning again and again.

On the return trip to Audley I visited bower No. 3, which was greatly reduced in size: the length, width and height respectively were now only 13 inches, 13 inches, and 12 inches. The platform on the contrary had been extended to both sides. New items among the varied collection were wild violets and single *Helichrysums*, a blue pompon of wool, the small blue berries of *Dianella*, and blue feathers of the Crimson Parrot. Call of the male heard, but bird not seen. Passed later bower No. 1, and found it destroyed by a flood that had swept the low flat during the heavy December rains: the greater part of the platform was the only thing remaining.

22nd December, went up the river in the afternoon in a rowing boat, stopping off Upper Peach Trees, thence proceeding on foot up the river on its western side. Opposite the Peach Trees, I observed a dark-blue Satin fly from the ground, and after a short search found bower No. 4 at the foot of a Sassafras-tree. The platform was rather primitive, and the collection on it composed only of a few dry *Banksia* and *Schizomeria* leaves, some small snail shells, and several pieces of blue-and-white china. Close by was a single small tussock of grass and a few bracken ferns and low shrubs; a large turpentine tree stood not far off. The bower was rather small, and of like construction to No. 1.

Length of walls, 10 inches; external width, 12 inches; height, 11 inches average. The spot was well shaded. I may add that the bower showed very little arching.

Returning to the bower later, I found several bits of blue paper, left in the neighbourhood, deposited on the platform.

Two green and a dark blue Satin had flown from the bower up into the trees. Presently they came down again to a place in the scrub some 12 yards or so away, a short performance following there. On examining the spot, I found a little playground between tussocks and ferns, looking much like the platform of a bower, constructed of short sticks and twigs, and measuring about 2 feet 6 inches by 2 feet. Its single piece of decoration consisted of a bit of dark green glass. This is apparently one of the places they repair to for playing when the bower gets too sunny, and there may have been a similar one near bower No. 2.

25th December, noted blue and green Satin on Waterfall Creek, above the falls, a new locality. Saw several green Satins and Catbirds on the western side of the river, opposite the so-called island, feeding on cabbage palm berries, and also on the wild raspberry. Two Catbirds, dark-blue and green Satin about bower No. 3. Stopped night at Burunda Brook. Left early next morning *via* the uplands for Garie, where I saw two Catbirds in the gully previously mentioned, and a little below the road a dark-blue Satin in the scrub. Examined the narrow rock shelf, but instead of a bower it revealed not less than six fresh and several disused Lyre-bird mounds.

9th January, left Audley, 8 a.m. Green Satin seen at Mullion Brook, near fruit garden. Near bower No. 1, I watched a company of green and blue-black Satins for a considerable time, following their movements along the hillside. They were mostly feeding at the large flower cones of the Banksias, probably on insects thereon, as I found later in the day a number of small ants on various of these cones. For a time two Orioles (*Oriolus sagittatus*) were noticed feeding in company with the Satins, and also some Catbirds. As many as 7 green and 2 blue Satins were seen together, presumably young birds among them. New calls noted were "choorroo-oo" and "choorr." Found another little playground against some rocks, with one dry Banksia leaf on it.

At the Upper Peach Trees a large figtree stands above the road. In this a large assembly of Satins was seen, together with Catbirds and Pied Crow-Shrikes. The Satins were continually flying to and from this tree, and there must have been 10 of them at least, among them two or three blue ones. The males were busy performing in the top of the tree, their calls and strange notes being constantly heard. Crossed the river to bower No. 4, which looked rather flimsy, and showed no arch on the top. The platform collection contained no less than 14 pieces of blue

and white china, some as large as  $2\frac{1}{2}$  by 2 inches. Several green and a blue Satin were on and about the bower, and also in the very rough gully behind the bower. Returning to the bower I found two small sprigs of wattle blossoms (black wattle) deposited there, and also three soft-fleshed, elongated, light-brown fruits, with a very thin skin and two rows of small seeds inside, previously noted in the jungle, but which I cannot identify.

In the jungle further up the river Catbirds were noticed feeding on fallen plums of Achras. Wild violets noted on platform of bower No. 3. Satins later observed in various places.

16th January, at Audley, about 8 a.m., some half-dozen Satins were feeding in low bushy trees bearing small green berries, and three more were noted on the river flat in front of the accommodation-house, apparently young among them, judging by their size. Seen flying across Kangaroo Creek. Towards bower No. 1 three green Satins were bending down leafy twigs of eucalypts and picking off insects. At Upper Peach Trees not a bird in the fig-tree. Bower No. 4 looked neglected; a broken marine shell was on the platform, and a small blackish feather.

26th January, up western side of river to Upper Peach Trees. Windy day. Only young Catbird seen. Searched on several river flats for bowers, but without result.

30th January, several Satins in neighbourhood of bower No. 1. Noticed near little playground two green males in plumage change. The new dark-blue feathers showed on the rump, neck, and probably back; a large patch was in the centre of the wing, and over the under surface a number of dark-blue spots was dispersed, each about the size of a sixpence.

5th February, was told of a bower on Kangaroo Creek. Went a short distance up the creek, and after a little search found the bower on a flat, close to the foot of a rocky hill slope, among high brackenferns, at the back of a black wattle grove, some fifteen yards from the water's edge. Bower at end of oval platform, close to stone, and tiny pinetree sapling. Length of the walls,  $8\frac{1}{2}$  inches; external width, 12 inches; internal at bottom  $4\frac{1}{2}$  inches, in centre, and about  $3\frac{1}{2}$  to 4 inches at ends; height, 10 inches; thickness of the unequal walls, 3 and  $4\frac{1}{2}$  inches respectively. Decorations were only of three kinds, namely, four pieces of dark-blue glass, a bit of blue paper, and four little bags of washing blue. 6th February, visited bower again with Mr. Potter. A few green Satins and Catbirds observed later. 12th February, young Catbird seen in the afternoon about bower No. 1, showing a good deal of greyish-brown in tail feathers and primaries; no white spot yet on neck; white spots on wings not very distinct yet; side of face much lighter than in adult.

Two male Satins were also there, apparently the same as previously observed in change of plumage, in which the dark-blue was now very predominant. The still golden-brown outer wing feathers showed in sharp contrast to the dark-blue. The under

surface appeared speckled blue-black and creamy-white when seen from underneath, the under tail coverts whitish brown. 13th February, visited Garie. Satins neither seen nor heard.

26th February, at Audley, several Satins, among them a dark-blue one, noticed close to the water's edge, in tree covered with a red fruit about the size of a cherry, on which they appeared to feed. The "cheerrü" call was heard, and also the "fur-r-r-r-r." At bower No. 1 the new plumage of the two Satins seemed now almost complete, but the golden-brown of the outer wings still persisted. Without the aid of glasses the birds looked exactly like full dark-blue ones. About 4 birds were noted together, and they were not the least concerned about my presence underneath, singing and performing away for all they were worth. One would sit on a thin branch with lowered head and tail, and wings lifted slightly, uttering the various familiar notes, then hopping a few inches to the side, starting afresh, and so on. It made almost the impression of a rehearsal. More Satins and Catbirds observed in several places further up the river. Visited next morning early again the brush gully at Garie, but once more without result as regards Bower-Birds or their bowers, although the ground seemed suitable enough.

Found bower No. 3 much neglected and deserted. No birds about there either. Presumably there is no fruit available just now in the adjoining jungle parts.

6th March, went up western side of river to flat opposite the hut at end of fig-tree flat. Searched the flat, which is thickly covered with high bracken fern, and finally discovered bower No. 6, or, rather, its sorry remains, since, being situated little above river level, it had evidently had the same fate as bower No. 1—that is, was swept off by the flood. The water-logged platform, 3 feet in diameter, was, however, fairly intact. It was close to a huge fallen tree trunk among low bushy trees, not far from the water. A fig-tree, a large turpentine, and some cabbage palms were also near by. Behind one of the two fig-trees on the flat, on the foot of the hillside, I found a neat, but very small, playground among some rocks, measuring only 15 by 12 inches, its only decoration consisting of a piece of blue glass. Another playground there was situated under a Christmas bush. All the time I was on the flat about six or more Satins, including a dark-blue male, or probably a bird in plumage change, were seen and heard in the trees overhead, in company with a few Catbirds old and young.

It will be noticed that bowers No. 1, 4 and 5 were all of small size and alike and simple in construction, whilst bowers No. 2 and 3, both built by the same bird, were larger and most carefully and expertly put together. From this it may be concluded that the two latter were built by an old male and expert at the game, whilst the others belonged to younger and less experienced members of the tribe.

The absence of the Bower-Birds during the latter months from the Dumbal Grove jungle, the brush gullies at Garie, and a patch of jungle a few miles south of Garie visited on the 25th March, may be accounted for by the relative absence or scarcity of suitable native fruits. Elsewhere, outside the jungle, many birds are, however, still found in the old places, particularly about the former bower No. 1. Apparently they select for the breeding



Unfinished Bower No. 7.

Photo. by E. Nubling, R.A.O.U.

-eason such localities as provide them with a continuous supply of food for several months, till the hatching and partly the rearing of the young are completed.

24th April, blue and green Satins still about bower No. 1. Found at Gundamain, on the saltwater portion of the river, about two miles down from Audley, bower No. 7, on a narrow rock-ledge, some 30 feet above the water. There was practically no platform at all, the bower being erected on a two-inch thick bed of tightly-interlaced strong sticks, the outline of which coincided exactly with the groundline of the bower. Two branches had fallen on top of the bower, but it had stood the pressure well, and only a few sticks were slightly dislocated. There were no decorations. The measurements of the bower were—length, 12 inches; width, external 13 inches, internal at ends 5 inches, in the centre 7 inches; thickness of walls,  $3\frac{1}{2}$  inches and 5 inches respectively, which peculiarity has been previously noted; the aver-

age height was 12 inches, some sticks longer. No arching was shown at the top of the walls, the opening there being fully 5 inches. The bower was situated under a bushy tree (*Tarictia* ?), and near a bit of tussock and some ferns.

5th June. Found bower No. 3 levelled to the ground. Noted dark-blue Satin at Burunda Creek, and found neat, small playground among low ferns in jungle opposite. Visited bower No. 4. To my surprise I found it reconstructed, the platform newly laid with long, dry grass-stalks, and a fresh blue flower and about a dozen *Banksia* leaves, besides other decorations, on it. The bird itself appeared close by in a bush, but departed again on seeing me.

6th June. Visited Palm Creek on the southern border of the Park; an ideal haunt of Lyre-Birds and Satin-Birds, both of which were seen. Four or five of the calls of the latter were imitated by the Lyre-Birds.

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## Descriptions of Australian Eggs new to Science

By H. L. WHITE, C.F.A.O.U., Belltrees, Scone, N.S.W.

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### Prince Edward's Lyre Bird (*Menura superba edwardi*)

Egg rather a lengthened oval in shape, surface of shell, coarse granulated, and slightly glossy.

Ground colour of a light greyish-olive, over which are very sparingly scattered, spots and hair lines of dark-brown and blackish-brown; the smaller or pointed section of the egg being almost devoid of markings. It measures in inches 2.28 x 1.62, and is smaller than eggs of any other of the *Menuridæ* in my collection.

It was collected in the Stanthorpe district, Queensland, in perfectly open country, during 1919; the large-domed nest being placed up from the ground on the side of a large granite boulder.

The specimen was kindly forwarded to me by Mr. A. H. Chisholm, of Brisbane, having been collected by Dr. Spencer Roberts of Stanthorpe.

See Mr. Chisholm's article on this new bird in *The Emu*, Vol. XX., pp. 221-23.

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### The Dusky Flyeater (*Pseudogerygone tenebrosa*)

In *The Emu*, Vol. XV., p. 250, I described eggs of what I thought to be *Pseudogerygone magnirostris whitlocki*, Mathews, but which are now found, after a further examination of skins, to be *Pseudogerygone tenebrosa*, Hall.

The note in *The Emu* referred to describes, therefore, the type clutch of *Pseudogerygone tenebrosa*, Hall.

## The Genus *Climacteris* (Tree-creepers)

By F. E. HOWE, C.M.Z.S., R.A.O.U., Canterbury, Victoria.

Tree-creepers of the interesting genus *Climacteris* are distributed throughout Australia, and are related to the Creepers of Europe. They are about six inches in length, and have powerful feet, a short square tail, a slightly down-curved bill, and a fawn-coloured band across the wing. In the dry inland portions of Victoria two species, the White-browed and Brown, may be found, while in south-east Victoria the White-throated, the Red-browed and Brown species may occur.

Mr. Gregory M. Mathews splits these Tree-creepers into three genera, *Climacteris* (two species) *Neoclima* (one species), and *Whitlocka* (three species), and in the *Austral Avian Record*, vol. i., part 5, gives his reasons, which, to me, appear slender indeed. In *Whitlocka*, both *melanura* and *melanota* are black, while *rufa* is a rich chestnut-red, as the name indicates. If these "smaller groups" receive generic distinction because they are compassed by colour, he should have gone further and created another genus, with *C. rufa* as type. If, on the other hand, Mr. Mathews means colour-pattern, surely the broad band on the wings, to say nothing of the strange gular patches of most or all the females, and the structure generally—particularly the tarsus—is sufficient to denote affinity. Again, ornithologists who have observed it in the open agree that *C. rufa* is more closely allied to *C. picumna*, and, indeed, is its western representative. When more intensive studies are made, I am of opinion that structural differences will prove slight. As a field ornithologist, I prefer keeping these small groups under the old generic name—*Climacteris*. I also prefer to record sub-species with a trinomial name.

I here take the opportunity of thanking Mr. J. A. Kershaw, F.E.S., Curator of the National Museum, Melbourne, for placing the skins of *Climacteris* belonging to that institution at my disposal. Also to Messrs. J. A. Ross and Edwin Ashby for the loan of skins.

For technical descriptions, with the exception of that of *C. melanota*, see "Nests and Eggs of Birds," by A. J. North. It is remarkable that Mr. North omitted this well-defined species from his monumental work; the description should be seen in Gould's Handbook. For forms more recently discovered, and for field-notes, the pages of *The Emu* and other journals have been well scanned.

***Climacteris leucophæa*.** White-throated Tree-Creeper.—range.—Queensland, New South Wales, Victoria, and South Australia. Type locality, New South Wales. Frequents forest

country, especially mountainous localities, but is occasionally seen in the box timber at Parwan, Victoria. The nest is made of bark, hair and fur in a hollow of a tree, generally twenty or thirty feet up.

Eggs—clutch, two or three; roundish in form; texture fine; surface slightly glossy; colour white, sparingly blotched about the apex with reddish-brown and purplish-brown; other specimens more finely speckled, chiefly about the same region, with rich or dark brown, also dull purple (Campbell). Dimensions in inches are: (1) .67 x .44, (2) .66 x .44, (3) .68 x .44. Another set: (a) .66 x .44, (b) .67 x .44, (c) .67 x .44. These dimensions are remarkably uniform, only varying a little in length.

Mr. C. F. Belcher in "The Birds of the District of Geelong, Australia," described the call-notes as a "succession of perhaps twenty or thirty staccato notes in quick succession usually preceded by a somewhat higher one." The call is somewhat hard to locate and the bird is, too, difficult to find as it harmonises well with the bark of the forest trees. It is more slender and creeper-like than any of its congeners. It is practically totally arboreal and the only occasions I have noted of its alighting on the ground were at Selby during August, 1914, and again there in August, 1920. In the first case, a male was eating a saturated bread crust. The food consists of beetles and ants, chiefly the latter. At Selby, a log was covered with dark red brown ants and a bird in company with two Red-browed Tree-creepers practically cleaned up the lot. My first nest was at Ringwood in September, 1907, when two eggs were found on a matting of bark and fur about a foot down a hollow twelve feet up. A full set of three eggs was discovered thirty feet up, and about one hundred paces away another nest was found on October 26th. Another nest contained young birds. On September 6th, 1920, nearly seven years later, Mr. J. A. Ross found three fresh eggs in the hollow of our first find. At Selby on October 17th, 1915, a nest contained two fresh eggs. All these nests were close to creeks.

Both parents feed the young. The visits to the nest are frequent, fifteen being noted in as many minutes. Often a bird returned before the other had left and the bird inside would take the food from the waiting bird and return with it to the young. The birds brought out any excreta as did the Red-browed species. When building they approached the nest in the same manner—alighting a short distance below the hollow, remaining stationary a few seconds with the head back, and then creeping quickly up and disappearing rapidly within. The lowest nest found was fifteen inches from the ground and the highest seventy feet up. From this nest a young bird, nearly fully fledged, flew. It showed the rich chestnut rump of the immature which Gould wrongly described as a separate species—*C. pyrrhonota*. In referring to this red rump patch, Capt. S. A. White, in *The Emu*,

vol. xiv., p. 142, says, "It seems certain that the immature of this (female) sex alone develop the bright rufous colouring on the rump and upper tail coverts." On October 31st, 1920, a nest contained two young birds about ten days old. One had the orange cheek-patch and bright red rump. The other was minus the cheek-patch and the grey rump was slightly washed with rufous. Traces of the rufous rump and upper tail-coverts may be found more or less in birds otherwise in adult plumage. In the "H. L. White Collection" is a young male with the rump grey, head blackish, legs slate and the bill dark horn; the throat is fawn, getting gradually darker until it is grey on the breast and slightly rufous on the abdomen. Three breast feathers show the white central stripe and only a trace of the markings on the crown is discernible. This bird, collected at Selby on December 28th, 1917, was probably two or three months old. At Bayswater on December 11th, 1920, a nest contained four young birds about a fortnight old, and all had a bright rufous rump. Some good notes on the immature bird by Mr. J. W. Mellor appear in *The Emu*, vol. xiv., p. 158. Mr. A. C. Smart observed the female fed on the nest by her mate ("Nests and Eggs," Campbell). The breeding season in Victoria extends from August to January, and two broods are reared. This species is a foster parent of the Pallid Cuckoo.

After examining many skins, I see no reason for retaining Mr. Mathews' South Australian form, *C. l. grisescens*. It is identical with skins from the Dandenong Ranges, Victoria. One is struck by the smaller size and slender appearance, the greyish throat, and the beautiful freckled chest and abdomen of the northern form (*C. minor*). A skin in the collection of Mr. Edwin Ashby is undoubtedly referable to *C. minor*, but it was collected at Bulli, New South Wales. Unless the specimen was wrongly labelled, this is very far south for the bird, as its habitat is towards Cape York, North Queensland, the type being collected near Cardwell.

**Climacteris erythroptis.** The Red-browed Tree-creeper.—Range.—New South Wales and Victoria. Type locality, Liverpool Range, New South Wales. This species frequents the big timber of hilly districts. The nest is a layer of reddish-coloured bark, covered by another of fur, and placed in a hollow from 20 to 100 feet up. Eggs—clutch two; delicate pinkish-white thickly spotted all over with fine red and purplish-red markings, sometimes forming a zone. Texture of shell fine and somewhat glossy. Dimensions in inches: (a) .74 x .46, (b) .68 x .47; another set was: (1) .68 x .46, (2) .64 x .45. Gould "obtained this interesting species while camped on the low, grassy hills under the Liverpool Range in New South Wales." He remarked: The female alone is "adorned with the beautiful radiated markings on the throat, the male having this part quite plain."

Mr. L. G. Chandler first observed a Red-browed Tree-creeper\* at Olinda in 1909. I also met this agile and beautiful form in the Dandenongs, from Ferntree Gully towards Gembrook, and have little doubt that it extends through the eastern and north-eastern portion of Victoria. It is far from rare, and half-a-dozen birds may be seen together, generally in the non-breeding months. In Victoria, the habitat is the hilly country where messmate, blackwood, mountain-ash and white gums abound. When half creeping and fluttering up the long hanging strips of bark of the two latter trees, the bird is seen to advantage while it examines a tree very thoroughly, often working each limb to the extremity. It rests in an upright position on the side of a tree, and I believe these Tree-creeper roost in a like position in the burnt-out hollows at the base of large trees. The call-notes are a harsh, high-pitched medley, not unlike those of the Striated Grass-Wren (*Diaphorillas striata*) when disturbed from a bunch of porcupine grass; other notes are silvery and tremulous, and it also utters the familiar high-pitched staccato notes of the White throated Tree-creeper, but sweeter and not so sustained.

The bird is arboreal, and may feed on ants on fallen dead trees in company with its White-throated cousin. The flight, rapid and undulating, also resembles that of the White-throated bird. The birds are silent at times, and hours may be spent in their feeding grounds without catching a note. The first intimation that they are about is, perhaps, a few high-pitched, harsh notes, often difficult to locate, or else, after a lightning-like streak, a bird alights on a tree trunk, and, as its back is turned towards one, it has then to be ascertained whether it is *C. erythrops* or not. In this country of dense undergrowth, it is difficult to follow the birds. However, they are strictly local. Two pairs I know can always be located in about twenty acres of dense scrub and big timber. On September 13th, 1914, at Selby, where I had located a few of the elusive "Red-brows," I at length caught the familiar high-pitched call. To observe more conveniently, I leaned against a small dead messmate, and immediately a female joined her mate and was fed by him. This was encouraging, and I followed the birds until I lost them up the hillside. Returning to the tree, I was surprised to see a bird leave it. She alighted on the side of a tree, and preened her feathers. Close examination showed a small crack about twenty feet up. The nest contained two eggs, and was a pad of stringy-bark, warmly lined with the fur of rabbit, hare and possum. On October 10th, 1915, a female alighted on the side of a big messmate with a bill full of fur from a dead flying squirrel. A week later the nest contained two well-marked eggs. Close by a bird was flushed from another hollow containing two eggs of the White-throated. The discovery of the eggs of two species of Tree-creeper on one day is a rare occurrence.

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\* "The Emu" Vol. IX., pp. 28 and 84.

On October 31st, 1915, another nest of the White-throated contained a young bird nearly fully fledged, and from this nest two Red-browed birds were busily removing the lining to a spout about ninety feet up in a tall white gum. This hollow, well out of reach, was used for at least three successive seasons. On November 10th, 1918, a nesting hole, about fifty feet up contained two eggs, quite unlike those observed previously, being smaller, more glossy, and not unlike a certain type of the eggs of the Yellow-faced Honey-eater (*Meliphaga chrysops*). The markings were brighter and coalesced on the larger end. These birds again nested in a hollow spout about one hundred yards away, and on December 10th the nest contained two incubated eggs. Three weeks later, the same birds had another pair of eggs. The breeding season extends from August to January, and two broods are reared. The superciliary stripe is never white in either sex, as in the male of the White-browed Tree-creeper (*C. superciliosa*). The Red-browed bird is also more robust in form.

**Climacteris superciliosa.** The White-browed Tree-creeper.—Range.—Central Australia. Type locality, Ilara Creek, Central Australia. Embracing the inland and drier tracts of all the States, particularly those localities favouring a growth of pine, belar (*Casuarina*), and mulga (*Acacia*). The bird is practically totally arboreal. The nesting site is a hollow generally fairly close to the ground. The nest is a pad of grass and bark, lined with fur and vegetable down. The eggs are roundish, texture of shell fine, surface glossy, colour pinkish-white mottled with pinkish-red and purplish-red. Dimensions in inches: (1) .78 x .65, (2) .74 x .64 (Campbell).

I shall not readily forget my first glimpse of this fine bird at Walpeup, in the Mallee of North-Western Victoria, during September, 1910. The timber was mostly belar, sandalwood, myall, needlewood, with here and there large mallee. Whilst watching a Red-capped Robin feeding his mate, a bird with a lightning-like flight alighted on the trunk of a fallen pine. It was a Tree-creeper new to me. The conspicuously white eye-brow hinted its identity. We sought the nest after losing sight of the bird, but, being unfamiliar with the calls, we could not again find it. My next meeting with this bird was at Linga, 25 miles farther west. During September, 1916, a male White-browed Tree-creeper alighted on a Murray pine. In September, 1917, the birds were located at Boinka, a few miles west of Linga. They were feeding with the Little Tit-Warbler (*Acanthiza nana*) and the Brown Tree-creeper (*Climacteris picumna*), the latter appearing to differ slightly from the form found near Melbourne. The White-browed Tree-creeper reminded me of its Red-browed cousin, but was less rapid in its movements. The call-notes resembled those of the White-throated species, both in the loud staccato call and in the sweet, low, tremulous notes. Mr. Mathews, in his "List of the Birds of Australia," included

*C. e. neositta* from West Australia. I consider skins from Central Australia and Western Australia cannot be separated from the dominant form. Mr. Edwin Ashby\* collected two birds at Pungonda, South Australia, and Mr. J. W. Mellor secured specimens in the Hundred of Bookpurnong, South Australia. These he named *C. e. parsoni*.† Pungonda and Bookpurnong are near the Victorian border, and the bird is identical with that of North-west Victoria. *C. e. parsoni* being a larger and more robust bird, is easily separated from *C. e. superciliosa*. The superciliary stripe is snowy-white in *C. e. parsoni*, and so are the white shaft-lines of the breast and abdomen feathers, which are bordered by black. *C. e. superciliosa* is a more dingy-brown on throat and abdomen, and the shaft-lines of breast and abdomen are bordered by brown. Altogether the southern bird has a much finer appearance. The females of the White-browed Tree-creeper show a trace of the red radiated markings that adorn the breast of the females of the Red-browed bird. Mr. Mathews lists *C. superciliosa* as a sub-species of *C. erythrops*. Possibly he is correct, but, in the field, the birds are very distinct, and I prefer keeping them apart. Dr. Chenery found a nest containing a fresh egg on August 4th, 1900, and another single egg incubating on the 12th at Mount Gunson, South Australia. On March 1st, 1895, Mr. C. E. Cowle, in Central Australia, found a nest containing a single egg. Probably August to December or January would be the general breeding months, and no doubt two broods are reared. Interesting field-notes regarding its nidification appear in *The Emu*, vol. ix., p. 208, and vol. x., pp. 95-96.

**Climacteris picumna.** The Brown Tree-creeper.—Range.—Queensland, New South Wales, Victoria, and South Australia. Type locality, South Queensland. Frequents the more open parts, particularly box trees plains. The nesting site is a hollow lined with grasses, feathers and fur, fairly close to the ground. Eggs.—A fine set of four from Pine Plains, North-west Victoria measure, in inches: (a) .74 x .5, (b) .72 x .49, (c) .71 x .5, (d) .69 x .5. They are close-grained, smooth and lustrous, and of a reddish-white ground colour, almost obscured with markings of different shades of red and purplish-red. The spots are larger and more numerous on the thicker end, and with underlying spots of dull violet-grey forming confluent patches. Another set measure: (1) .66 x .5, (2) .68 x .51, (3) .64 x .5.

The loud "pink-pink-pink" familiar on the box plains at Parwan, thirty miles west of Melbourne, is pleasing to the ear. On an autumn evening there is a touch of sadness in the cry. Broadbent records this species from the Cardwell scrubs of Northern Queensland; but this is probably an error, and the bird would be referable to *C. melanura*, the under parts being

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\* "The Emu" Vol. XVII., p. 219.

† South Australian Ornithologist, p. 5, 1919.

not unlike those of *C. picumna*. The Brown Tree-creeper is named from its brownish plumage. Its flight is of a more "rolling" character than that of other Tree-creepers, and often the bird, after a few fairly rapid wing-beats, sails along after the fashion of a Babbler (*Pomatostomus*). When the wing is expanded the broad buff band is conspicuous. This species spends much time on the ground. It is seen to advantage when ascending the trunk spirally and prying into every hole and crack, both on the upper and under surface of the limbs; if it misses a likely-looking spot, it shuffles backward and downward. I have seen the bird break up the decaying wood in short spouts with its powerful bill. At Parwan, birds hopping about the ground turn over leaves and bark. I have seen a bird capture a large spider (*I'oconia*), take moths on the wing, and feed at the edge of a water-hole. When the bird alights on a tree-trunk, the head is usually back, and the feathers of the crown are slightly erected, giving it a grotesque appearance. The familiar notes are then uttered, but, when flying or on the ground it utters harsh, grating, chattering notes. I have observed nests at Stawell, Linga, and Kow Plains. Breeding season in Victoria is from August to January, and the bird is double-brooded. In a series of skins from Queensland to South Australia, the only difference detected is that the dark lines bordering the chest and abdomen feathers are narrower on inland birds. The birds inhabiting coastal regions are perhaps a little more robust in form. The type came from Queensland, and Mr. Mathews named the Victorian and South Australian birds *Neoclima picumna victoriæ* and *N. p. australis* respectively.

**Climacteris melanura.** The Black-tailed Tree-creeper.—Type locality, Derby, North-west Australia. Range.—North-west and Mid-west Australia, Northern Territory, and North Queensland (Gulf Country). Generally found in open forest country and numerous on the "river flats" of the Leichardt.\* Nest—Built of grasses, feathers, etc., in a hollow. Eggs—Clutch, two to three; round in form; texture of shell fine; surface slightly glossy; colour, pinkish-white, marked all over, but thickest in the form of a patch round the apex, with rich purplish-red and purple. Dimensions in inches: (A) .92 x .7. (B) .88 x .74 (Campbell).

This is the largest and finest of the genus, differing from all and particularly from its nearest ally the Black Tree-creeper (*C. melanota*) in having lanceolated markings on the throat. Mathews says: "These birds feed on small ants, catching them on the trees," and Mr. Harry Barnard found the stomach to contain small black beetles, bark moths, and other small insects. Dr. MacGillivray says: "The bird is a spring-breeder," and both Messrs. H. Barnard and W. McLennan found the birds breeding in the Gulf Country. The nests were in hollows from 12 feet

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\* MacGillivray "The Emu" Vol. XIII, p. 175.

to 30 feet up. Mr. Barnard found the birds generally in pairs on the coastal rivers of Northern Territory, where the nests each contained two eggs. Grant\* described a bird from Clifton Downs, West Australia, as a new species, *Climacteris wellsi*; it seems to be referable to Mathew's *Whitlocka melanura wellsi*, a good sub-species. The skins in the H. L. White Collection are much smaller than the dominant form, and are more rufous on the breast and abdomen in both sexes. A juvenile skin is without the radiated breast-markings, merely showing a trace of the gular striations at the base of the bill. Mr. Mathews has named a bird from Northern Territory and North Queensland (Gulf of Carpentaria), *W. m. alexandrae*. The male differs from the dominant form in having the radiated breast markings extending practically right down the abdomen, but the greatest difference is in the females. The gular patch of *W. m. melanura* is snowy-white, as are also the centres of the breast feathers with their bright red edges, but in *W. m. alexandrae* the throat and upper breast are a dingy or greyish-white, as are also the centres of the breast feathers. The ear coverts of *W. m. alexandrae* are brownish-black with white shaft stripes, but in *W. m. melanura* the ear-covert striations are of buff.

***Climacteris melanota*.** The Black Tree-Creeper.—Range.—Queensland. Type locality.—Nassau River (Gulf of Carpentaria). Frequents open forest country, particularly near water-courses. Nest and Eggs.—Undescribed. The Black Tree-creeper was procured in Latitude 15° 57' south, on the eastern side of the Gulf of Carpentaria, during Dr. Leichardt's expedition from Moreton Bay to Port Essington. It was one of the birds procured by poor Gilbert on the day of his death, June 28th, 1845. Practically nothing has been added to its life history since Gilbert discovered it, and of its nidification we are ignorant.

Mr. F. L. Berney, of the Richmond district of North Queensland, remarked that "The loud 'spink-spink' of the *Climacteris* is to be heard fairly frequently among the river timber . . ." "This species has a peculiar cheesy or mouse-trap smell; it is most curious, and strikes one as soon as the bird is handled." Messrs. A. J. Campbell and H. G. Barnard observed specimens on the Kirrama tableland.

Dr. MacGillivray saw the birds "in scattered pairs in the forest on the Archer River." Mr. Gregory Mathews† recorded a sub-species as *Whitlocka melanotus barroni*. "It differs from *W. m. melanotus* in its larger size, wing 96 m.m.: birds from Normanton have a wing-measurement of 85-90 m.m." The female differs from the dominant form in being greyer on the under-surface. In the "H. L. White Collection," there are skins

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\* "Ibis" 1909, p. 664.

† Austral Avian Record, Vol. II., p. 131.

of three males. Two of these, collected on the Kirrama Tableland, near Cardwell, are much lighter on the back than the bird from the Watson River, North Queensland.

**Climacteris rufa.** The Rufous Tree-creeper.—Range.—Southern portions of West and South Australia. Type locality, Swan River, West Australia. Frequenting country overgrown with Acacia, Salmon-barked and York Gum, Jarrah and Mallee. Nest.—Very warm, of soft grasses, the down of flowers and feathers; placed low down in a hollow, generally close to the ground. Eggs.—Clutch, three; roundish in form; texture of shell fine; surface slightly grossy; colour, light purplish-buff, clouded chiefly with dull or light purple and a few heavier spots and blotches of reddish brown; in some examples the reddish-brown markings predominate (Campbell). Dimensions in inches: (a) .78 x .51, (b) .68 x .51. As Gould pointed out, this is the western representative of the Brown Tree-creeper (*C. picumna*). Gilbert procured the bird on the Swan River, where it was abundant in gum trees abounding with white ants (*Termites*). Mr. Milligan saw the birds on the Margaret River, harmonising with the rufous-coloured bark of the jarrah trees, and also with the iron-stone gravel country. He also observed them secure their food by "digging or probing with their bills," as already stated under the Brown Tree-creeper. Mr. Milligan also found the Rufous Tree-creeper plentiful in the Stirling Range and Wongan Hills. Mr. Gerald Hill found the birds common at Brookton, hunting among the dead logs as well as in the trees. He adds: "Has a peculiar cry, which reminded me of that of the Rufous Bristle-Bird (*Sphenura broadbenti*)." When exploring the Gawler Ranges of South Australia, Captain S. A. White\* discovered the eggs of a bird which Mr. Mathews described as a sub-species—*Whitlocka rufa orientalis*. Captain White described the eggs in the *Austral Avian Record*, vol. i., p. 196. In this eastern race the markings on the fore-neck and chest are much darker and of greater extent than in the western forms, but I cannot find any variation in *W. r. obscura* from the dominant species.

**Climacteris waitei.** The Cooper's Creek Tree-creeper.—Range.—"As far as is yet known, the bird is confined to Cooper's Creek, from above Innamincka in the east to Cuttapiirie Corner in the west."

I would refer readers to Captain White's description and notes\*, and also to the same journal for further notes accompanied by a beautiful plate.† I was glad to examine the skin figured in *The Emu*, which, unfortunately was unsexed. The colour scheme points to it as being the closest ally of the Brown Tree-Creeper (*C. picumna*).

\* "The Emu" Vol. XIII., pp. 30 and 31.

† "The Emu," Vol. XVII., frontispiece.

A subsequent examination of the skin of *Climacteris waitei* leads me to believe that it is an immature male of *C. picumna*. I hope to deal more fully with this later on.

The study of this interesting genus has been a pleasurable task, and if such small groups of birds (a genus) or even an individual are similarly dealt with, the result and information obtained would certainly help to eliminate the straw-splitting to which Australian ornithology has recently been subjected. As already remarked, the most perplexing form is *Climacteris leucophæa minor*, a miniature of the southern White-throated Tree-creeper (*C. leucophæa*). Mr. A. J. Campbell‡ remarks "that the difference appears more specific than sub-specific," and states the differences and measurements of both.

After an exhaustive examination of the available material, I append a list of the species and sub-species I would admit.

#### GENUS CLIMACTERIS, TEMMINCK 1820.

##### **The White-throated Tree-creeper.**

*Climacteris leucophæa leucophæa*. Latham, 1801.

" " *minor*. Ramsay, 1891.

##### **The Red-browed Tree-creeper.**

*Climacteris erythroptis*. Gould, 1841.

##### **The White-browed Tree-creeper.**

*Climacteris superciliosa superciliosa*. North, 1895.

" " *parsoni*. Mellor.

##### **The Brown Tree-creeper.**

*Climacteris picumna*. Temminck and Laugier, 1824.

##### **The Cooper's Creek Tree-creeper.**

*Climacteris waitei*. S. A. White, 1917.

##### **The Black-tailed Tree-creeper.**

*Climacteris melanura melanura*. Gould, 1842.

" " *wellsi*. Grant, 1909.

" " *alexandrae*. Mathews, 1912.

##### **The Black Tree-creeper.**

*Climacteris melanota melanota*. Gould, 1846.

" " *barroni*. Mathews.

##### **The Rufous Tree-creeper.**

*Climacteris rufa rufa*. Gould, 1840.

" " *orientalis*. Mathews, 1912.

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‡ "The Emu" Vol. XVII., p. 29.

## A South-Coastal Selborne

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

Australia is so rich in birds that it is often possible to observe a fairly large number of different species in a very limited area, which in this instance is a tract of country about four miles square in extent, and lies on the far South Coast of New South Wales, between Bermagui and Tathra. It is known generally as Bunga, which in the aboriginal tongue is said to mean the "Fighting Ground." The country comprises grassy hills, lightly timbered, and levels flanked by dense scrubs, deep gullies, and thickly-wooded mountain ranges. The only fresh water lies in creeks, swamps, and dams, all of limited extent. There is also a salt lake known as Eurungonia (or Bunga) Lake, and an estuary known as Murrah. The soil is in part of volcanic formation and part slate. During a residence of about six years in this quarter I observed all the birds mentioned below—the bustard excepted, and also several others, of nomadic species chiefly, which I could not with certainty identify. Only a comparatively few miles further inland other species, rarely occurring on this part of the coast, are either common or fairly so, but I have made no attempt to add to my list from elsewhere. While it is remarkable that so many different birds should occur in so limited an area, it may be well to remember that Gilbert White says that the district which is most examined yields the largest number of species, though he was not referring to birds alone.

The following is my list:—

*Coturnix pectoralis*, Stubble Quail, and Brown Quail (*Synoicus australis*).—Fairly numerous at times on grassy flats and among bracken on the hill sides. The monitor lizard and fox must often prey on this strong-scented bird and its offspring.

*Lopholaimus antarcticus*. Topknot Pigeon.—Rare; also the introduced Indian Turtle Dove.

*Leucosarcia melanoleuca*, Wonga Wonga Pigeon, and Bronzewing Pigeon (*Phaps chalcoptera*).—Fairly common. Peaceful Dove (*Geopelia placida*).—Very numerous near the jungles and fed with domestic fowls.

*Hypotaenidia philippensis*. Pectoral Rail.—Seen occasionally about swamps. Also saw a female in a tussock-covered gully with a downy brood shuffling at her heels.

*Porphyrio melanotus*. Bald Coot.—Occurred sparsely about dams. Australian Coot (*Fulica australis*).—Common. Sometimes flocked in considerable numbers on the back waters of Bunga Lake.

*Podiceps ruficollis* and *P. poliocephalus*. Black-throated and Hoary-headed Grebes.—Appeared on Bunga Lake and also on dams.

*Eudyptula minor*. Little Penguin.—Fairly common. Often washed up dead on the beaches, but sometimes cast ashore alive but stupefied. The strange barking cry of this bird, sounding suddenly from the pinnacle of some lonely rock, is apt to startle the uninitiated.

*Puffinus tenuirostris*. Short-tailed Petrel, Mutton-Bird.—Passed by in an apparently never-ending stream about October, journeying south. Also common at times on the sea.

*Bruchigavia novæ-hollandiæ*. Silver Gull.—Very common. Caspian Tern (*Hydroprogne caspia*) and White-fronted Tern (*Sterna striata*).—Fairly common about shores, also other sea fowl which I could not with certainty identify.

*Hæmatopus ostralegus*. Pied Oyster-catcher.—Occurred in odd couples only. This bird is harassed a good deal by gunners. Was at one time common about the sea and lake shores.

*Lobibyx novæ-hollandiæ*. Spurwing Plover.—Small companies or odd couples appeared at times on swampy flats, and occasionally bred there. I discovered one nest by chancing to observe the plovers keeping off vagrant pigs with fierce wing-buffetings.

*Charadrius ruficapillus*. Red-capped Dottrel.—Hooded (*C. cucullatus*), and Black-fronted (*C. melanops*) were common. Latter nested much under sage brush, the other two varieties more on the open sands. But sometimes the Black-fronted Dottrel nested on grassy plots or among debris left by high tides, when the nest was not easily found.

*Numenius cyanopus*. Australian Curlew.—Fairly common in summer on the shores of Murrah Estuary. As these sombre-plumaged birds stood with backs bent and long sickle bills probing in the damp mud and sand, they always struck me as presenting an appearance of intense dejection.

*Pisobia acuminata*. Sharp-tailed Sandpiper.—Small companies appeared one season about October, feeding about surface pools near the salt lake. Eastern Little Stint (*P. ruficollis*).—One seen feeding in a swamp. Greenshank (*Glottis nebularius*).—One example seen.

*Gallinago australis*. Australian Snipe.—Occurred singly in swamps about October.

*Burhinus grallarius*. Southern Stone-plover.—Once ran in the open country in considerable flocks, but now occurs only in odd couples. The advent and great increase, in this quarter, of foxes has been fatal to this bird.

*Eupodotis australis*. Australian Bustard.—Many years ago, when this fine bird flocked each summer to the Monaro plains to breed, odd pairs and single birds sometimes penetrated as far as Bunga, and were seen on open grassy hills. In the Bega district, about 12 miles (crow-flight) further inland, the bustard was also at that time fairly common.

*Notophox novæ-hollandiæ*. White-fronted Heron.—Common about the salt lake and estuary.

*Demiegretta matook*. Reef Heron.—Usually occurred singly along the coast or about the salt-lake and estuary.

*Nycticorax caledonicus*. Nankeen Night-heron.—Appeared occasionally about Murrah Estuary, where a pair nested in a river oak of moderate height.

*Botaurus poeciloptilus*. Australian Bittern.—Flushed occasionally from reed and rush beds about the lake and estuary. Little Bittern (*Ixobrychus minutus*).—Very rare. Saw one example standing in the shallows of the estuary. For fully a minute the bird uttered a peculiar call. It then flew off. I did not see one of these birds again.

*Chenopsis atrata*. Black Swan.—Nested twice in Eurungonia (Bunga) Lake. One nest, found on 10th June, 1920, had seven eggs, even then fairly well incubated. They varied a good deal in size and shape.

The second nest was swept away by a tremendous inrush from the sea. Black Swans also at times swam to and fro on the open sea, just outside the surf-line. This bird is wonderfully alert. On appearing among timber on a hill about a quarter of a mile away, I have been almost immediately observed by the Swan sitting on its nest in the lake below. The bird instantly dropped its head and crouched low, or sometimes slunk quietly off the nest, being careful not to swim erect until it was at least thirty yards away. The nest examined was built on a sand-spit in the middle of the lake.

*Anas superciliosa.* Black Duck.—Flocked occasionally on Bunga Lake and on Murrah Estuary; also occurred sparsely on dams.

*Virago castanea.* Chestnut-breasted Teal.—Occasionally bred on the margins of creeks running into Bunga Lake. Grey Teal (*V. gibberifrons*) sometimes came in numbers during wet seasons, and fed in swamps formed by the lake spreading out into tea-tree scrub; it also occasionally appeared on the sea, in sheltered coves.

*Phalacrocorax carbo.* Big Black Cormorant and Little (*P. ater*) both common; also White-breasted Cormorant (*P. gouldi*). These birds flew inland at dusk and roosted in dead trees at the head of Bunga Lake, white-washing them with excrement. Dead trees about Murrah Estuary were often seen lined with well-fed Cormorants, which at times broke almost simultaneously into a burst of hoarse demoniacal laughter.

*Sula serrator.* Gannet.—Common off the coast.

*Pelecanus conspicillatus.* Australian Pelican.—Appeared occasionally about Murrah Estuary.

*Uroaetus audax.* Wedge-tailed Eagle.—Odd pairs seen. Sometimes chased hares and rabbits in open country, the quarry being usually too agile and escaping. Observed a Crow Shrike ("Black Magpie") and a Black and White Fantail vigorously driving away an Eagle from the vicinity of their nests. The Eagle treated its small foes with supreme indifference.

*Haliaeetus leucogaster.* White-bellied Sea Eagle.—Often flew along the coast or circled over the tidal lakes. Some of these fine birds assisted gulls, foxes, and monitor lizards in disposing of the flesh of a porpoise (dolphin) cast up on Bunga beach. Nested in the ranges. Have seen them flying inland with fish in their talons.

*Haliastur spheurnus.* Whistling Eagle, and Australian Goshawk (*Astur fasciata*) fairly common. Grey Goshawk (*A. clarus*) seen twice only, in dense scrub. One dashed suddenly at Crimson Parrots feeding on wattle seeds, but, observing the writer, the Hawk swerved in its course and the Parrots escaped.

*Falco peregrinus.* Black-cheeked Falcon.—Seen once only, on the margin of Murrah Estuary.

Brown Hawk.—Fairly numerous. Parties of these birds often hunted rabbits on sandy flats. I think both species (*Ieracidea bericola* and *I. occidentalis*) were present.

*Cerchneis cenchroides.* Nankeen Kestrel.—Common. Saw one seize a Tit-Warbler (*Acanthiza*), and another dash at Wood Swallows. Nested in the few tree spouts not already pre-empted by starlings; the hollow was lined with dry grass.

*Pandion haliaetus.* White-headed Osprey.—Seen occasionally sailing leisurely along the coast.

*Spiloglaux boobook.* Boobook Owl.—Common about ranges and in open timber, the Barn Owl (*Tyto alba*) much less so. Powerful Owl

(*Rhabdoglaux strenua*).—Rare, but I discovered the bird occasionally in dense gullies, bunched up on a bough and apparently meditating evil.

*Trichoglossus novæ-hollandiæ*, *Glossopsitta concinna*, and *G. pusilla*. Blue Mountain, Musk, and Little Lorikeets.—Very common at times, usually in summer, when the honeysuckles and gums were in full blossom.

*Calyptorhynchus funereus*. Black Cockatoo.—Usually seen in odd pairs or small companies, but on one occasion I observed a flock of about thirty drifting lazily across open country between two forests.

*Callocephalon fimbriatus*. Gang-Gang Cockatoo.—Fairly common in thick timber. Fed much on the seeds of the jungle tree known as "wild willow," the scarlet-crested birds reclining on the soft feathery foliage while obtaining this food.

*Cacatua galerita*. White Cockatoo.—Seen twice only.

*Polytelis swainsoni*. Barraband Parrot ("Green Leek").—Rare. Saw a flock of about a dozen birds on one occasion in open timber.

*Alisterus scapularis*. King Parrot.—Uncommon. Odd couples seen in dense timber. This bird, being destructive to maize crops, has been shot off to a considerable extent.

*Platycercus elegans* and *P. eximius*. Crimson and Rosella Parrots.—Common.

*Lathamus discolor*. Swift Parrot.—Have observed these brightly-coloured birds clinging in festoons to the yellow cup-blossoms of the grass-tree (*Xanthorrhœa*), the seeds of which they also eat when brown ripe. The grass-tree flowers yield a good deal of nectar.

*Podargus strigoides*. Tawny Frogmouth.—Fairly common. A cat killed an Owlet Nightjar (*Egotheles cristata*), but this bird, from its retiring habit, is rarely seen by day, and it may, in fact, be common in this quarter. Saw no examples alive.

*Eurystomus orientalis*. Australian Roller.—Fairly common in open timber.

*Decalo gigas*. Great Brown (Laughing) Kingfisher. — Common. Sacred (*Halcyon sanctus*) and Blue (*Alcyone azurea*) Kingfishers, fairly so. Latter nested in tunnels in the banks of Bunga Lake, penetrating about 18 inches, and lining the nesting-hollow with fish-scales. Sacred Kingfishers' nesting hollows were often emptied by tree or monitor lizards.

*Eurostopodus mystacalis*. Nightjars.—White-throated variety bred each summer on saddles and slopes of the ranges. Spotted Nightjar (*E. guttatus*) seen once only, when a prowling cat brought one in.

*Chætura caudacuta*. Spine-tailed Swift.—Often seen hawking insects—sometimes high in the air, at others skimming over water, drinking (if the water were fresh) while on the wing.

*Cacomantis flabelliformis* and *Cuculus pallidus*. Fan-tailed Cuckoo and Pallid Cuckoo.—Common, the latter appearing in spring.

*Lamprocyx plagosus* and *Chalcites basalis*. Bronze Cuckoo and Narrow-billed Bronze Cuckoo.—Though very similar in plumage these birds have (in addition to the narrow bill of the latter) another distinction: the former lays a yellow-bronze egg, the latter one a white egg spotted with reddish-brown.

*Menura superba*. Lyre-Bird.—Apparently numerous in the scrubs and ranges. This bird covers such a wide stretch of country in

scratching for insects that the same birds may easily be counted twice over. Seen picking up sticks, moss, etc., about the middle of May. Nests found upon cliff ledges, rocks, stumps and logs, canopies of wild vines; at the butts of tree-ferns and trees, and once in the fork of a tree at about 12 feet from the ground. One chick which I had under observation for nearly three weeks had a white larva, or maggot, probably of some carnivorous fly, attached to the base of its beak. This appendage disappeared before the young Lyre-Bird left the nest. I found a nest in October with one egg very much incubated. In spite of the amount of labour which its large size necessitates, I think Lyre-Birds rarely renovate an old nest, but build afresh season after season.

*Hirundo neoxena.* Welcome Swallow.—Common.

*Hylochelidon nigricans.* Tree Martin.—Common.

*Lagenoplastes ariel.* Fairy Martin.—Bred about Murrah Estuary, plastering its spouted nest in colonies upon the face of steep banks overhanging the water.

*Microeca fascians.* Brown Flycatcher ("Jacky Winter").—Very common. Almost invariably nested in dead trees, the neutral tints of which closely match its slender nesting material.

*Petroica multicolor.* Scarlet-breasted Robins.—Fairly common. Nested among the stringy barks. Flame-breasted (*P. phœnicea*) rarer, and the Rose-breasted Robin (*Erythrodryas rodinogaster*), only seen occasionally in dense gullies or scrubs. A pair of Hooded Robins (*Melanodryas cucullata*) nested season after season on a certain hill, in dead timber, but rarely succeeded in rearing more than one chick. The young are brought to the ground early, and until they can fly strongly remain among bracken and undergrowth, where they are at the mercy of monitor lizards and foxes.

*Gerygone fusca.* Brown Fly-eater.—Common. Many of its beautiful nests found.

*Eopsaltria australis.* Yellow-breasted Shrike-robin.—Very common. A pair were fed on bread and cheese crumbs thrown out for them in a deserted garden. They grow quite fond of cheese, although at first when it stung their palates they seemed a bit doubtful as to its edibility from a Robin's point of view.

*Falcunculus frontatus.* Yellow-breasted Shrike-tit.—Several pairs seen in open timber. This bird has one curious note, something between the mewling and spitting of a cat.

*Pachycephala pectoralis* and *P. rufiventris.* Golden and Rufous-breasted Whistlers.—Common in open timber and scrub. One pair seem to have destroyed their eggs after the nest was examined, as I found them tumbled out on to the ground below.

*Rhipidura rufifrons.* Rufous Fantail.—Appeared in late summer, in dense gullies chiefly. I could never discover a nest.

*Leucocircia tricolor.* Black and White Fantail.—Very common. Sometimes nested in open mortices of standing posts and on rafters of barns; very often on dry tree-roots. When near swamps, black snakes (confirmed egg and nestling eaters) sometimes, I think, robbed the nests. Have found them emptied without a hair of the lining being disturbed. This is usually the neat work of a snake.

*Seisura inquieta.* Restless Flycatcher.—Fairly common. Two nests found, but the proprietors were driven away by Black and White Fantails, which commonly nested in the trees chosen by the less pugnacious Flycatchers. One of these birds reproduced very accurately. I thought, a peculiar whistle habitually given by a farmer to his wife to intimate that he had finished milking and was ready for breakfast.

*Myiagra rubecula*. Leaden Flycatcher.—One example only, in sassafras scrub on the banks of a secluded creek.

*Monarcha melanopsis*. Black-faced Flycatcher.—Very rare. Saw one example only, in scrub, on the margin of the salt-lake.

*Graucalus novæ-hollandiæ*. Black-faced Cuckoo-Shrike.—Fairly common. In the Bega district this bird often feeds on unripe olives.

*Campephaga tricolor*. White-shouldered Caterpillar-eater.—Occurred in open timber, but much more common further inland.

*Cincosoma punctatum*. Spotted Ground-Bird.—Fairly common about scrubby hills. While burning off scrub and tussock grass on one occasion a pair of this bird's nestlings were driven from home. A watchful Laughing Kingfisher (*Dacelo gigas*) swooped down upon these and swallowed them one after the other, much to the distress of their parents.

*Pycnoptilus floccosus*. Pilot Bird.—Seen occasionally in dense scrub.

*Psophodes olivaceus*. Coach-whip Bird.—Common. Nested much in burrawangs and clumps of reed grass.

*Oreocincla lunulata*. Australian Mountain Thrush.—Occurred in secluded gullies and dense scrubs, usually near water. Very tame and trustful. Nest, an ornate mossy structure shaped like a shallow finger-bowl, found in wild vines.

*Ephthianura albifrons*. White-fronted Bush-Chat.—Very common. Nested much in wild sage-brush.

*Acrocephalus australis*. Australian Reed-Warbler.—Appeared annually in reed-beds, about dams, creeks, and the lake and estuary. Came about October, bred, and departed in late summer.

*Origma rubricata*. Rock Warbler.—One pair seen on wooded cliffs abutting on a sea-beach.

*Acanthiza lineata*, *A. chrysorrhoa* and *A. reguloides*. Striated, Yellow-tailed and Buff-tailed Tit-Warblers.—Common. Golden-headed Fantail-Warbler (*Cisticola exilis*).—Seen once only. Have found this bird nesting on Monaro in Californian thistles.

*Sericornis frontalis*. White-browed Scrub-Wren.—Common; Yellow-throated (*S. lathamii*), less so, but nested regularly in certain secluded mountain gullies. The pendulous nests, renovated season after season, sometimes measured nearly 18 inches in length. In one instance some birds (of the Tit-Warbler genus, I think) calmly appropriated a newly-built nest of the Yellow-throated Scrub-Wren and laid three pointed white eggs, spotted with red, in it. The Scrub-Wrens suffered this trespass quietly. I have found the nest of this Scrub-Wren with three fresh eggs so late (or so early) as the middle of May.

*Malurus cyaneus*. Superb Warbler.—Very common. It hopped into open rooms for crumbs occasionally.

*Artamus tenebrosus*. Wood Swallows.—Common. White-browed (*A. superciliosus*) and Masked (*A. personatus*) varieties, occasional visitors, latter rare. First mentioned species sometimes preyed on bees, but not the other two.

*Colluricincla harmonica*. Grey Shrike-Thrush.—Common and very tame. Often entered open doors in winter to pick up breadcrumbs and scraps.

*Grallina cyanoleuca*. Magpie-Lark.—Common, but not nearly so numerous as in Bega district. Pairs nested season after season in trees near the dams, usually with a Black and White Fantail's nest not far from their mud-bowl structures.

*Neositta chrysoptera*. Orange-winged Nuthatch.—Several companies of about half-a-dozen birds seen, and also in the breeding season odd couples.

*Climacteris leucophaea*. White-throated Tree-creeper.—Common. Brown rare. Nests of former found in tree-hollows and logs, usually lined with thistle down. Egg resembles that of the Noisy Miner in miniature.

*Zosterops lateralis*. Silver-eye.—Came in numbers in early summer. Watched a pair feeding their two young ones, as alike as two peas. It is wonderful how unerringly the youngster whose turn it is to be fed is picked out by the parents.

*Dicaeum hirundinaceum*. Mistletoe Bird.—Observed several times in sage-brush covering steep slopes and cliffs abutting on the sea, usually when the sage had broken into white, scented blossom. Against the dark green sage foliage, and the crimson breast of the male was thrown out in strong relief. Also seen in open timber.

*Pardalotus*. Orange-, Red-, Yellow-tipped and Spotted Diamond-Birds.—Common. Nested in creek and lake banks, steep hill sides, and road cuttings, but the yellow-tipped variety in tree-hollows.

*Anthochaera carunculata*. Wattled Honeyeater; New Holland (*Meliornis novæ-hollandiæ*); White- (*Meliphaga leucotis*), and Yellow-eared (*Meliphaga lewini*) and Fuscous (*Meliphaga fusca*) Honeyeaters. Common; also Brush Wattle Bird (*Anellobia chrysoptera*), Regent (*Zanthomiza phrygia*), and Blue-faced Honeyeaters (*Entomyzon cyanotis*) seen once only. Black-chinned Honeyeater (*Melithreptus gularis*) rare. Marked a flock on one occasion passing over the yellow cones of some large honeysuckles, singing as they fed on the nectar. Noisy Miner (*Myzantha garrula*) seen twice only. Very common a few miles further inland. Bell Miner (*Manorhina melanophrys*) numerous in some secluded mountain gullies, where their tinkling notes sounded from daylight to dark. Spine-billed Honeyeater (*Acantharhynchus tenuirostris*) common.

*Anthus australis*. Australian Pipit.—Very common, even on the margins of sea beaches, and often on the sands. Monitor lizards ("Goannas") sometimes surprised these birds on their nests and devoured them.

*Stagonopleura guttata*, Spotted-sided Finch, and Red-browed Finch (*Egintha temporalis*).—Common. Chestnut-breasted Finch (*Donacola castaneothorax*).—A few pairs seen, usually in company with Red-browed Finches. The "Spotted-sided Finch" is more exclusive in habit.

*Oriolus sagittatus*. Olive-backed Oriole.—Appeared in early summer, but was not numerous.

*Ptilonorhynchus violaceus*. Satin Bower-Bird.—Many companies seen, and some bowers found. Purple-black males also seen alone.

*Ailurædus crassirostris*. Cat Bird.—A few pairs seen and nests found.

*Corvus australis*. Australian Raven.—Fairly common. Nest found in a tall gum in gully, with the birds in attendance.

*Strepera graculina*. Pied Bell-Magpie.—Very common. Fed much on fruit of native fig, also on maize. Grey Bell-Magpie (*S. versicolor*) occurred in odd pairs only.

*Gymnorhina tibicen* and *G. leuconota*. Black-backed and White-backed Magpies.—Common. Australian Butcher Bird (*Cracticus torquatus*), fairly so.

This completes my list of one hundred and sixty-two species.

## The Black-banded Whiteface

By J. NEIL MCGILP, R.A.O.U., King's Park, Adelaide.

My first introduction to the Black-banded Whiteface (*Aphelocephala nigricincta*) was in April, 1920, when, by reason of drought, I was compelled to remove our sheep from Moolawatana Station out on to Sandhill Country, towards the N.S.W. border. This belt of sandhills extends from Lake Frome to the N.S.W. border, and for hundreds of miles northwards from the southern end of Lake Frome.

It was in this locality that I found this little banded bird in fair numbers, its very sweet note first calling my attention to "a new bird." I have lived for many years on the western side of Lake Frome, but had not identified this bird, so evidently the sandhill country is its habitat. Lake Frome is only a salt basin, having water on it only after rainfall. It cuts off the sandhill country from open grassy plains extending westerly to the Flinders Range.

During May, 1920, I was fortunate enough to find this bird breeding, although at that time the country was in the grip of the drought, which eventually broke on May 31st, with a good general rain. It was noticed that few of these birds had hatched out young before the rain came, still practically all were nesting. Have some birds the power to forecast rain?

The nest is rather a bulky, domed-shaped structure, and is invariably placed in a prickly bush or shrub. I noted nests only in the "Deadfinish" (*Acacia ulicina*) and "Roley Poley," or Russian Thistle (*Salsola kali*), both bushes being of a prickly nature. The outside of the nest is usually composed of dark-coloured twigs, making it rather conspicuous. Inside these dark-coloured twigs is placed a lining of flower stems and flower pods, with a final lining of soft feathers. The entrance to the nest is a long narrow funnel about 1 inch in diameter, and 6 to 9 inches in length. This funnel is lined with feathers for a third of the distance from the egg cavity. To inspect the contents of these nests, it is necessary to break open the funnels, but I was surprised to find that the bird did not resent this interference.

In all I inspected nine nests, containing eggs, and though all were in various stages of incubation, I found only one set of three eggs, the set being otherwise of two eggs. I also found several nests with young, but only two were in the nest on every occasion. As the season was far from a normal one, I thought that Nature had provided that short sets should be laid.

In April, 1921, my brother visited this locality, and, though he told me he had inspected a number of nests, he failed to find more than two eggs to the clutch. Now, this season is the best on record, and most birds are laying full sets, many even having ab-

normally large clutches. I mention this, as A. J. North, in "Nest and Eggs," gives the clutch as 3 or 4. In May of this year I went into this sandhill country principally at the request of Captain S. A. White, who asked me to secure a specimen of the young from the nest. Whilst out there I found five nests of the Black-banded Whiteface, but in every instance only two young were in the nests. Two young birds I have presented to the South Australian Museum; both show the adult plumage, and also have down-like feathers on the head.

In the building of its nest, both birds share in the carrying, but only one, the female, I presume, does the building. I noted that both birds left the nest together after material. Only one carried material on returning to the nest, which it worked into place, whilst the mate sat on a bush whistling sweetly until the builder was finished; then the whistler flew off alone, and returned with a piece of material, which the builder took and worked into the nest. When this was done, both birds flew off together, but only one carried stuff back to the nest, and the above system of building was continued. One would think that the presumably male bird considered it impossible for its mate to build correctly unless he was whistling on the bush above the nest. I watched one pair on several occasions, and two or three other pairs once, but each pair worked on the same lines, each bird carrying in its turn, never together, and undoubtedly only one bird built the nest.

When I took the young birds in May this year, I noted that in each nest the long funnel had been broken out, evidently to allow the parent birds more easily to feed the young, which were all nearly ready to leave the nest.

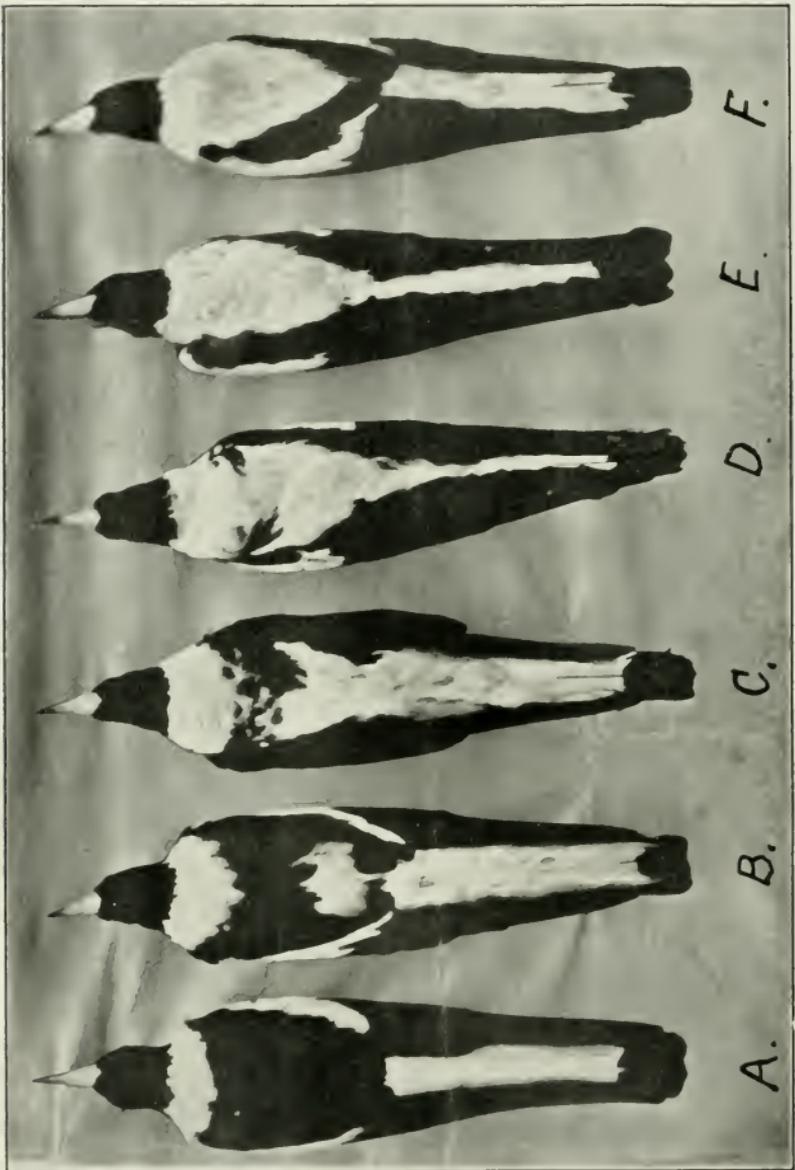
Though two Bore Streams ran through the part I visited, I failed to note one of these birds at water. I camped for three months in 1920 on the water, and these birds, although numerous close to the water, were never actually seen along the Bore Stream. Most birds were watering during that dry period.

The Black-banded Whiteface spends a great deal of its time on the ground after insects, which are its principal food. It has an unusually loud sweet whistling note, and when not breeding is to be found in small flocks.

The eggs of this bird are very different from those of its congener, the common Whiteface (*Aphelocephala leucopsis*). The texture of the shell is finer, the egg is narrower and more pointed, while it is lighter in coloration, with the blotches and markings more diffused.

Though there were plenty of dry hollow stumps and small hollows in trees close to where these birds were breeding, I did not find that they had used any of them. The common Whiteface was nesting in some of the hollows.





A. Typical Black-backed Magpie (*Gymnorhina tibicen*).  
B-E. Variation phases of Black-backed Magpie.  
F. White-backed Magpie (*Gymnorhina leucinota*).

## Variations in the Black-backed Magpie (*Gymnorhina tibicen*)

By C. F. COLE, R.A.O.U., Wangaratta, Victoria.

Probably there is no other species belonging to the avifauna of Australia that varies so much in the adult plumage as does *Gymnorhina tibicen*, and in so conspicuous a type of marking, as that upon the back, from which it derives its vernacular name "Black-backed Magpie," thus separating, at a cursory glance, this bird from its allied species, the White-backed Magpie (*G. leuconota*). Both species are to be met with in the north-east of Victoria, *tibicen* being common, whilst *leuconota* is rather rare. It is no uncommon sight to see from 50 to 100 of the *tibicen* species, in the late autumn, feeding upon freshly-fallowed land.

It was owing to seeing odd "white-backed" birds associated with the "black-backed" birds, and others having this black marking splashed with white, that my suspicions were aroused. The variations in the markings upon the back of many birds dissimilar from that of the birds with the typical marking were many and interesting. These variations were features peculiar to this species, *G. tibicen*, and that this variation in colour upon the back of individual birds, from a uniform black to white, was strong evidence that many of the "white-backed" birds associated with the other types already referred to, were really variations of *G. tibicen*.

If the *tibicen* and *leuconota* species had, and were still mating, this would account for this variation in the colour of the back. Probably, at times, this mating does occur where the two species inhabit the same locality, but the writer has failed to prove that this is so. If this mating should take place, it would be a natural sequence that many of the progeny would have this conspicuous marking upon the back, varying from black to white, as depicted in Figures A, B, C, D, E, and the progeny would perpetuate this variation. My object in compiling this article upon this species is to prove, after years of close observation, that this variation is perpetuated, and that a "white-backed" Magpie seen in the north-east of Victoria is not necessarily a *G. leuconota*, but it may be a variation of *G. tibicen*. There is a probability of this variation increasing to such an extent in numbers as to exceed the parent-typed species—the "Black-backed" Magpie. Roughly speaking, in Wangaratta and adjacent districts the percentage of birds classed under "variation" is very noticeable, at times five out of six birds seen being variations, and it may be safely stated that approximately 30 per cent. to 35 per cent. are variations.

Birds of the species under review in the Wangaratta district nest chiefly in the eucalypt trees. After a mated pair has selected a locality for a nesting site, they, at times, pugnaciously defend the right of ownership to the area selected by attacking all and sundry who dare to intrude upon their preserve. Their viciousness is more pronounced from the time their young are hatched until they leave the nest. This species remain mated until one or the other dies. If the female bird happens to be killed, the male will select another mate, and often return to the old locality to breed. I have known one of these birds, whilst nesting, inflict a nasty wound upon the neck of a lad passing by. I had under observation a pair of these birds, that were building, and found the female lying upon the roadside dead, probably shot by a passing gunman, because of her pugnacious habit of darting on one unawares. The male of the deceased female was conspicuously marked upon the back, and readily recognised. Within a month, he had remated, and a nest was built adjacent to the first nest, in the same tree. Another pair of birds built in a red gum sapling upon the bank of a creek for years. The sapling was ring-barked, and became defoliated, eventually dying, but this did not drive the pair away from the old nesting site. They still continue to build in the dead tree, the last nest being built in the spring of 1920. After the breeding season is over, these birds usually move about in numbers.

To carry out my observations, I selected each breeding season, certain birds nesting, and kept them under observation, my chief object being to study the feather markings upon their progeny.

To show that the future adult markings upon the young of this species is readily recognised in the immature stage, I give for those persons not acquainted with this bird the following brief description. The general appearance of the young upon leaving the nest is blackish, each feather margined greyish (becoming glossy black in the adult). Hind neck slate grey; upper, under base tail, patch on wing white (pure white in adult male, and greyish-white in adult female). These markings upon the young male are more pronounced than those of the young female. The male is readily recognised in the nesting stage from the female bird in this, that it is readily seen, that the change from the immature to the adult plumage is purely a matter of the darker markings becoming black, and the lighter markings white, or greyish. Thus if a nestling had a sooty black back, each feather margined with grey, the adult plumage would be a pure black back marking male or female; see Fig. A. If a sooty black back, with patches of slate-grey feathers, the adult plumage would be a pure black back marking, with pure white, or greyish, feathers, as depicted in Figs. B and C. If the back was slate-grey, or mostly so, the adult plumage would be as in Figs. D, E.

After the first moult, the adult plumage is indicated, the third moult bringing the plumage to perfection. The specimens figured are fully plumaged, matured male birds, all having reared young. In some instances, I observed two clutches, and others one from each pair, under observation. Fig. A was mated to a typically marked female. In the spring, and early summer of 1916, this pair of birds reared four young ones, two being typically marked, whilst two were marked as in Figs. B and C. Fig. B was mated to a typically marked female. In the spring of 1919, this pair reared two young ones, one being typically marked, the other as Fig. D.

Fig. C was mated to a female marked as Fig. D. Three young were observed, one typical, one as Fig. C, and one as Fig. E.

Fig. D was mated to a female marked as in Fig. C. Two young were reared, one resembling Fig. B, the other Fig. C.

Fig. E was mated to a female as in Fig. B. They reared four young, one typically marked, one resembling Fig. B, one Fig. C, and one Fig. D.

From these observations, fifteen young birds were reared, five being typically marked = 33.3 per cent.; ten being variations = 66.7 per cent.. One hundred per cent. of the progeny of other pairs typically marked, and mated, under observation, were true to type.

From the observations, it will be found that many pairs breed true to type, whilst others perpetuate variations.

Complete to partial albinism at times occurs in this species. It is significant that black may turn white, whilst white does not turn black. If this were so, variations upon the back markings of the species *G. leuconota* may be as common as in *G. tibicen*.

Fig. F depicts a male specimen of *G. leuconota* from southern Victoria.

I had under observation in captivity a variation of *G. tibicen* that was becoming an albino. The back and the tail were the first parts to become pure white, whilst the remainder of the black feathers upon the body became streaked or mottled with whitish. The irides from a deep red hazel became paler (pink in an albino). This bird before its third moult was accidentally killed. The specimen referred to as a partial albino was also the progeny of a partial albino male, *tibicen*, which was mated to a typical female, *tibicen*, and was a conspicuous bird for several years to travellers and others between Wangaratta and Springhurst. This pair of birds for several years built adjacent to the railway line, their progeny varying from typical colourings to variations, as already depicted in this ar-

vicle. This conspicuousness in colour probably cost the male bird his life, as he suddenly disappeared.

In conclusion, there are two factors that may be the cause of this variation in *G. tibicen*, cross-breeding with *G. leuconota*, and variation under nature.

The writer's opinion is that it is purely a natural variation, whereby in one locality the typical birds when mated perpetuate a greater percentage of their progeny true to type; whilst in other localities, these variations are in evidence, and that a "white-backed" bird seen associated with a "black-backed" or partial "black-backed" bird may be purely a variation of *G. tibicen*, as in Fig. E, and not a *G. leuconota* species, as in Fig. F.

The following measurements are taken from the birds figured:—

A.—Total length, inches—15.3; wing, 11.25; bill, 2.1; tarsus, 2.

B.—Total length, inches—15.8; wing, 10.8; bill, 2.1; tarsus, 2.5.

C.—Total length, inches—15.5; wing, 10.7; bill, 1.9; tarsus, 2.2.

D.—Total length, inches—15.5; wing, 11; bill, 2.5; tarsus, 2.2.

E.—Total length, inches, 15.5; wing, 11; bill, 2; tarsus, 2.3.

F.—Total length, inches—16; wing, 10.75; bill, 2.25; tarsus, 2.2.

## Remarks and Notes on some Western Australian Birds

By TOM CARTER, R.A.O.U., Sutton, England.

On page 123 in *The Emu*, vol. xx., Part 3 (January, 1921), Mr. Ashby states that the Bristle-Bird (*Sphenura littoralis*) was locally known at Ellensbrook as the "Rain-bird." It was the Coachwhip Bird (*Psophodes nigrogularis*) that was so called, as stated by Mr. Milligan in his paper, *The Emu*, vol. ii., p. 72. When I was staying at Ellensbrook in November, 1902 (vide *The Emu*, vol. iii., p. 38-40), Miss Bussell referred to the Black-throated Coachwhip-Bird, in conversation with me, as the Rain-bird, and said how much she missed hearing certain notes uttered by this bird, that invariably foretold rain. Page 123-24, Mr. Ashby expresses surprise at finding that Mallee Fowl (*Leipoa ocellata*) breeds at Cape Naturaliste, and surmises that birds from that locality may prove to be a good sub-species. Mr. G. M. Mathews classes the Western Australian *Leipoas* as one species. These interesting birds have been well known (locally) to breed all along that coast, and past the Cape Leeuwin, to at

least Point D'Entrecasteaux, to my own knowledge, and it is to be hoped they may long continue to do so, but the constant burning off of the coastal scrub, and the increase of grazing stock, must eventually drive them away. They also breed in numbers on the south coast, east of Albany, and in the Ma'lock and other scrub country north of that coast. Accompanying Mr. Milligan's interesting paper in *The Emu*, vol. ii., p. 76, is a photo reproduction of himself standing at a *Leipoda's* nest near Ellensbrook. When I was in that district in 1919 I had proofs of this species still breeding in several localities in the South-West corner of Western Australia. Page 131. Both the Grey-rumped Sandpiper (*Heteractitis brevipes*) and the common Sandpiper (*Actitis hypoleucos*) are regular visitors to the western coasts of Australia, see my notes in *The Emu*, vol. iii., p. 177; *Ibis*, 1920, pp. 697-8; Alexander in *The Emu*, vol. xvi., p. 42, etc.

The Red-winged Wren-Warbler (*Malurus elegans*) occurs, to my knowledge, at Gingin (about 150 miles south of Dongara), and probably further north than that. It is a bird that likes the neighbourhood of swamps.

The Northern Yellow-banded Parrot (*Barnardius occidentalis*) is a good sub-species. It is plentiful about Carnarvon, and from there northwards to where the type was obtained. I fancy Mr. A. J. Campbell had a note in *The Emu* some years ago about the Geraldton form, but cannot trace it at present.\* It is interesting as one works north to find the Yellow-collared Parrot (*B. semitorquatus*) gradually merging into *occidentalis*.

The sub-species, *B. woolundra* (Mathews' Bulletin B.O.C., vol. xl., 1920, p. 44), collected by me in 1919, comes between the above two forms.

If *Ptilotis geraldtonensis*, the Geraldton Honeyeater, proves to be a new species, it is exceedingly interesting. There seems to be some confusion about the forms of *Ptilotis* (*Meliphaga*) found in the Geraldton district. Milligan (*The Emu*, Vol. IV., p. 152) gives the approximate southern range of *Ptilotis carteri* as about Yandanooka, 75 miles south-east of Geraldton, and in the same paper records Yellow-fronted Honeyeater (*Ptilotis plumula*) from near Day Dawn. Mr Milligan also has a note in the same *Emu*, p. 51, on *Ptilotis carteri*. In the *Ibis*, 1902, p. 183, Mr. R. Hall gives details of three specimens of the Pallid Honeyeater (*Ptilotis leilavalensis*) obtained at Geraldton. I have never collected specimens in that district, but when at Mullewa in 1904 I saw many of what appeared to me to be *Ptilotis carteri*.

Page 134. Was the White-browed Babbler (*Pomatostomus superciliosus*) observed at Geraldton, the larger S.W. form,

\* See "Nests and Eggs" (Campbell), p. 643—Eds.

*ashbyi*, or the much smaller sub-species *gwendolenæ* that occurs at Carnarvon?

Page 144. Were the Bush Larks (*Mirafra horsfieldi*) seen in the vicinity of Geraldton, this species, or the more northern form, *woodwardi*, that I have not as yet seen south of the Minglya River? Mathews' List of Birds of Australia, 1913, mentions no Bush Lark occurring in the south-west areas, or south of the Onslow district.

In reply to Mr. Whitlock's query respecting birds of Dirk Hartog Island—"If he (Carter) includes in the comprehensive term of 'Wrens,' Wren-Warblers (*Malurus*), Field-Wrens (*Calamanthus*), Scrub-Wrens (*Sericornis*) and Emu-Wrens (*Stipiturus*)"—I say, yes. I did mean including them. The nomenclature of the joint paper by Mr. Mathews and myself in the *Ibis* for October, 1917, was by Mr. Mathews, as stated in the heading and also on page 571. In his Reference List of 1912, Maluri = "*Wrens*." For the same reason, *Malurus assimilis* (p. 182 of *The Emu*) was called the Western Blue-breasted Wren.

According to Mr. Whitlock's map showing the country that he worked in Shark Bay, his "beat" on the Peron Peninsula did not take him as far east as where the Mallee-fowl (*Leipoa*) used to breed.

Mr. Whitlock surmises that the Scrub-Wren (*Sericornis hartogi*) breeds towards the end of summer. It is certainly remarkable that such a successful nest-finder as he is should fail to find any breeding data. From my own experience on Dirk Hartog, I should say that the *regular* breeding season is in the winter months there, because on my second visit to that island, commencing on September 28, I find recorded in my diary that many small fledged young of this Scrub-Wren (and also Field-Wrens) were observed by me on September 29, and the following days, and one day Mr. Lloyd brought me a young *Sericornis* that he had caught with his hands, as it was too young to fly. Most of the small birds in the north-west and mid-west areas breed after any heavy rainfall, irrespective of the season. Mr. Whitlock experienced heavy rains in the 1920 winter. Were there any earlier heavy rains that season in Shark Bay? In which case the *Sericornis* might have bred then, but the other small birds would also probably have done so. Mr. Whitlock records having seen one brood of young *Sericornis* on his visit.

Mr. Whitlock records seeing several pairs of "*Circus assimilis* Allied Harrier?" on Dirk Hartog Island. According to the R.A.O.U. Check-list of 1913 (which nomenclature he was using), *Circus assimilis* is the Spotted Swamp-Hawk, and the Allied Harrier (Swamp Hawk) is *Circus gouldi*. Personally I

have never seen the latter bird away from the swamps of the South-West, but *Circus assimilis* is a common bird in the Gascoyne and more northern areas, and I certainly saw it on Dirk Hartog Island.

Field-Wrens (*Calamanthus hartogi* and *C. peroni*). In respect to these sub-species, Mr. Whitlock says: "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 twenty miles wide." I shall deal with this point later on in this paper, but may say that when one lays out any series of skins like those of *Calamanthus* collected between the N.W. Cape and Lake Austin (Day Dawn), as I did at the Perth (Western Australian) Museum, with the kind assistance of Messrs. Alexander and Glauert, it is best to ignore the localities at first, and class the birds according to their respective resemblances or differences (as we did) in order to avoid any prejudice, and then compare the labels. *C. hartogi* very much resembled the birds from Dorre Island, but the Peron specimens were quite distinct from the Dirk Hartog birds. As stated by me in the *Ibis*, 1917, p. 587, the Peron birds came nearest to *C. rubiginosus* and *C. zwayensis*, but have differences, which I gave in my paper. On my return to England, a comparison between my specimens of skins from the North West Cape regions and the Peron confirmed these differences. However, we shall probably soon have Mr. A. J. Campbell's opinion about them. As I was not on Dirk Hartog during the breeding season, as Mr. Whitlock was, I did not see the *C. hartogi* in full breeding plumage, which may be a point in his favor.

Mr. Whitlock states that "no *Acanthiza* (Tit-Warbler) appears to inhabit Dirk Hartog," which coincides with my own experience. In the *Ibis*, October, 1917, p. 588, I stated that no *Acanthiza* was observed by me on the island, but in my diary I have an entry made by me on May 1, 1916, when at Cape Inscription Lighthouse, that I there saw a few birds that looked like the Yellow-tailed Tit-Warbler (*Acanthiza chrysorrhoa*), but no specimens were obtained (I think I had not my gun with me at the time); so being doubtful of their identity they were not recorded. It was the same date and place as the Tricoloured Bush-Chat (*Ephthianura tricolor*) were seen. A heavy N.E. gale was blowing at the time, which might account for stragglers of both the above species occurring temporarily on the island.

White-winged Wren-Warbler (*Malurus leuconotus*). Referring to Mr. Whitlock's criticism of the coloured plate of this bird that appeared in *The Ibis*, October, 1917, it was certainly drawn and coloured by the artist from a skin, and not from a specimen in the flesh. The skin was selected by myself from a series then in my collection (mostly collected from the Gas-

coyne and N.W. Cape districts) as being of a typical bird in good plumage, and I can assure Mr. Whitlock that I did *not*, in any way "make up" the skin for the special purpose, but I hope, and think, that the well-executed plate answered the purpose for which it was made. In my paper in *The Ibis*, October, 1917, referring to the above, I stated on page 592—"Much depends, too, on the making of a skin, as to whether these white feathers show or not." *Apteria* occur in practically all birds, to a greater or less extent, but in the ordinary way are concealed by the overlapping feathers, which need displacing, or uplifting, before the *apteria* are visible. Mr. Milligan made some interesting notes on the "white wing-patches" of *M. cyanotus*, v. *leuconotus*, in *The Emu*, Vol. IV., p 52. There is no doubt but that the extent of the white feathers varies considerably, according to variations in the seasonal plumage, moulting, and probably also individually.

Page 183. Referring to the Grass-Wrens (*Amytornis textilis* and *D. carteri*), Mr. Whitlock says: "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."

I admit that one specimen was not much material upon which to work, and form an opinion, but the above statement is a sweeping one, and it is quite evident that those "few miles" of sea water are enough to prevent *Malurus leucopterus* and *leuconotus* and also *Acanthiza* from crossing it; so why not *Amytornis*, which is a bird of (apparently) feeble flight, using its legs more than its wings. As a matter of fact, the narrowest part of the South Passage, between the south end of Dirk Hartog and the mainland (Edel Land) is barely *one mile* wide, yet I found Shrike Thrushes (*Colluricincla*) and Babblers (*Pomatostomus*) in Edel Land, and Wedgebills (*Sphenostoma*) and Babblers on the Peron Peninsula, and none of these three species were found on Dirk Hartog by Mr. Whitlock or myself. Even the Dirk Hartog Crow (*Corvus*) appears to be distinct from the mainland form.

The channel between Bernier and Dorre Islands is also about one mile in width, yet I believe, so far as is yet known, Dorre Island can claim a distinct sub-species in *Calamanthus dorrei* (which is very similar to the Dirk Hartog bird) and Bernier Island has a good sub-species in *Malurus bernieri*, and another in *Sericornis balstoni*. Other similar instances might be quoted if space permitted, including the most remarkable case of the distribution of birds in the Canary Islands, where five well-defined sub-species of *Fringilla* (Blue Chaffinches) occur in the western group of these islands, all five of the islands being within sight of each other (*vide* Mr. D. A. Bannerman's paper, *The Ibis*, July, 1920, with coloured plates).

## A Trip to the "Watercourse," North West N.S.W.

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During a very pleasant holiday at Coocalla, Garah, the residence of Mr. F. C. Morse, 36 miles to the W. of Moree, one of the many interesting outings planned was that to the region that is known as "The Watercourse." Mr. Morse and the writer in one motor car and Mr. A. Mawhinney, with Mr. Reg. Hays (M's. R.A.O.U.) in another, constituted the party, and loaded up with provisions, mosquito nets, tents, etc., and old clothes and boots (for wading), we set out early in October last year for our destination, some 25 miles away.

The Great Western plains, after their two years of excessive drought and subsequent soaking since the drought broke, were simply rolling prairies of growth, in which the Brolgas or Native Companion, Kangaroos, and Emus were easily hidden from view, save for such places where the luxurious growth was not as tall. Thousands of acres of this country rolled away, far as the eye could see, interspersed with trees of many varieties—for the most part not very tall — Coolibahs, Red-gums, tall, tapering Belahs, and many others.

Across huge paddocks, the deep ruts cut by the wool teams in "the black-soil plains," the only track, on and on to the N.W. till we reached that part of the Watercourse we proposed to work, *viz.*, Direlmabindi, and the area around Curragundi Station.

At Direlmabindi, we were met by Mr. S. Freeman, who has a permanent camp home there, and were given a cordial welcome. Here we were to camp, and we were greeted with the news that Mr. Freeman had found the nest of the White-eyed Duck, with nine eggs, in a clump of rushes in the swamp a couple of hundred yards from his tents. The nest was placed just above the water level, and built for the most part of down from the bird, which, of course, definitely decided the species of the owner.

After spending some days here we very reluctantly packed up and made for Curragundi Station home paddocks. From this base another section of the region was worked.

One outstanding fact all over this region is the great amount of damage done to all the aquatic birds breeding on or near the water by both foxes and wild pigs, and of the latter we saw scores, from "suckers" to huge boars and sows. A brief description of what exactly is meant by the Watercourse is now necessary.

## "THE WATERCOURSE."

The Watercourse is that portion of the Gwydir River which ends as a defined river channel, and spreads itself roughly fan-shaped over the surrounding plains. The Gwydir rises in the New England tableland, about 200 miles from the town of Moree, in N.W. New South Wales. At Moree it is a fine stream, but 9 miles below Moree the channel narrows, and practically disappears, and in flood-time huge volumes of water spread all over the surrounding plains through swamps and shallow water-courses. The largest of the latter, which naturally continues running longest, is "The" Watercourse. These flooded areas occupy from 80,000 to 100,000 acres, interspersed by belts or ridges raised only a few feet above the water. The waters eventually drain into the Barwon River, above Collareenabri. The average depth of these waters is 1 foot, and the rate of flow is slow, as the fall is about 8 feet in a mile. The whole area contains many timbers, in addition to huge beds of "sags," a kind of bulrush, and large belts of Wilga. Further on is a list of trees and shrubs compiled by Mr. F. Morse.

As can readily be imagined, all our tramps and excursions were through water all day long, and the going was consequently very often "painful and slow." Sometimes we would find ourselves in a deeper and more swiftly-moving channel, and one had always to be on the look-out for the sunken logs and hidden stumps. As the "bottom" for the most part was muddy and full of widely-gaping cracks, one was constantly slipping or at times sitting down in the water.

Flies and mosquitoes were in millions, but the latter not as bad as they can be, and at such times they become a real plague to man and beast. In the belts of timber were birds in scattered numbers, colonies of Night Herons in one, Spoonbills or White-necked Herons in another. A grassed area would be filled with White-headed Stilt Plovers. A tree-studded swampy area, with sags and rushes, etc., with the floating nests of the Grebes, whilst out of bushes and clumps the Moorhens, Coots, Land-rails, etc., would make their flippy flight, with legs a-draggle. The work was hard, the going laborious, and twilight and dry clothes a goal to strive for.

Coolibah, *Eucalyptus bicolor*; Red gum, *Eucalyptus rostrata*; Eurah, *Eremophila bignoniiflora*; Belah, *Casuarina lepidophloia*; Wilga, *Geigeria parviflora*; Sandalwood, *Eremophila mitchelli*; White Box, Bibble, *Eucalyptus* (sp. ?); White Wood, *Atalaya hemiglanca*; Bumble (Caper-tree), *Capparis mitchelli*; Leopard wood, *Flindersia maculosa*; Pine, *Callitris robusta*; Needle wood, *Hakea leucoptera*; Quinine, *Alstonia constricta*; Boonary, *Heterodendron olecofolium*.

The following is a list of the birds seen, with some notes where it is advisable. Mostly all the birds seen were nesting, but the list is mainly a "locality" one, to show bird distribution:—

LIST OF BIRDS SEEN ON "THE WATERCOURSE."

P = plentiful.

NP = not plentiful.

V = very plentiful.

R = rare.

FP = fairly plentiful.

Emu (*Dromaius novæ-hollandiæ*). Time, May to June.

Stubble Quail (*Coturnix pectoralis*). At times in countless thousands.

Brown Quail (*Synoicus australis*)—P. along watercourses and swamps.

Painted Quail (*Turnix varia*)—FP.

Little Quail (*Turnix velox*)—VP.

Barred-shouldered Dove (*Geopelia humeralis*), Peaceful Dove (*G. placida*), Diamond Dove (*G. cuneata*)—NP.

Crested Pigeon (*Ocyphaps lophotes*)—VP.

Pectoral Rail (*Hypotaenidia philippensis*)—P.

Australian Spotted Crake (*Porzana fluminea*), Spotless Crake (*P. plumbea*)—R.

Little Crake (*P. pusilla*)—P.

Black-tailed Native Hen (*Microtribonyx ventralis*), Black Moor Hen (*Gallinula tenebrosa*)—P. Breeds in lignum bushes and on the ground.

Bald Coot (*Porphyrio melanotus*)—FP.

Australian Coot (*Fulica australis*)—P.

Black-throated Grebe (*Podiceps ruficollis*), Hoary-headed Grebe (*P. poliocephalus*)—P. Nests October-December.

Crested Grebe (*Podiceps cristatus*)—R. Small young seen here, March, 1910.

Marsh Tern (*Chlidonias leucoparcia*)—NP.

Stilt (*Himantopus leucocephalus*)—VP. Breeding.

Red-kneed Dottrel (*Erythrogonys cinctus*)—P.

Spur-winged Plover (*Lobibyx novæ-hollandiæ*)—P.

Black-breasted Plover (*Zonifer tricolor*)—P.

Black-fronted Dottrel (*Charadrius melanops*)—P.

Snipe (*Gallinago australis*)—P.

Australian Painted Snipe (*Rostratula australis*). Occasional small flocks in swamps, where they breed.

Bustard (*Eupodotis australis*). Not numerous now, owing to the fox.

Native Companion (Crane) (*Antigone rubicunda*)—P. During the dry season they retire to the prickly pear country, living on the fruit.

Straw-necked Ibis (*Carphibis spinicollis*). White Ibis (*Threskiornis molucca*). Large rookery on watercourses, nests in the lignums. White on one clump, and the straw-necked on another.

Glossy Ibis (*Plegadis falcinellus*). Flock of about 50 seen.

Black-billed (Royal) Spoonbill (*Platalea regia*)—FP. In company with Ibis, breeding together in October-November.

Yellow-billed Spoonbill (*Platibis flavipes*)—P.

Plumed Egret (*Egretta intermedia*)—NP.

Australian Egret (*E. alba*)—P. One colony breeding October-December.

White-fronted Heron (*Notophox noræ-hollandiæ*)—VP.

White-necked Heron (*N. pacifica*)—P. One colony of about 15 was nesting in tall Redgums in water on September 24; most clutches were incomplete.

Nankeen Night-Heron (*Nycticorax caldonicus*). 200-300 seen in one colony; only one nest found (10.10.1920).

Pied Goose (*Anseranas semipalmata*)—NP. Breeding in October and November.

Maned Goose (*Chenonetta jubata*)—P. Mostly on creeks and bore-drains.

Whistling Duck (*Dendrocygna javanica*)—FP, in November and December, 1920.

Plumed Whistling Duck (*Dendrocygna eytoni*)—VP. Nesting in October. Nests found destroyed by foxes. Most plentiful duck.

Black Duck (*Anas superciliosa*)—P. Apparently rearing 2nd brood.

Grey Teal (*Tringa gibberifrons*)—VP. Nests in every available hollow spout and trunk.

Blue-winged Shoveller Duck (*Spatula rhyncotis*)—NP. Breeding; one authentic clutch found.

White-eyed Duck (*Nyroca australis*)—P. Clutches of 9 eggs. Nests placed in isolated clumps of rushes, close to surface of the water.

Large Black Comorant (*Phalacrocorax carbo*), Small Black Cormorant (*P. ater*), Large Pied Cormorant (*P. hypoleucus*), Small Pied Cormorant (*P. melanoleucus*)—VP. Breeding November-December.

Darter (*Anhinga novæ-hollandiæ*)—R. Breeding in December.

Pelican (*Pelecanus conspicillatus*)—P, where the waters are deeper.

Spotted Harrier (*Circus assimilis*)—P. Where "sags" grow higher up.

Allied Harrier (*Circus approximans*)—R. In spite of swampy nature of country.

Wedgetailed Eagle (*Uroactus audax*)—NP.

Whistling Eagle (*Haliastur sphenurus*)—FP. Lives on cast-up fish and birds' eggs, especially from ibis rookeries.

Little Falcon (*Falco longipennis*)—R.

Brown Hawk (*Heiracidea berigora*)—VP. Seen taking the young out of other birds' nests.

Boobook Owl (*Spiloglaux boobook*)—R.

Delicate Owl (*Tyto alba*)—R., but plentiful when quail or mice are numerous.

Sp. ? Heard hooting; not a boobook.

Sulphur-crested Cockatoo (*Cacatua galerita*)—P.

Galah (*Cacatua roseicapilla*)—VP.

Cockatoo-Parrot (*Calopsitta novæ-hollandiæ*)—P.

Red-winged Parrot (*Aprosmictus erythropterus*)—P.

Pale-headed Rosella (*Platycercus pallidiceps*)—N.P. Large river trees.

Yellow-mantled Parrot (*Platycercus eximius splendidus*). Plenty until summer months. Does not breed here.

Ring-necked Parrot (*Barnardius barnardi*)—P.

Crimson-bellied Parrot (*P. hæmatogaster*)—P.

Red-backed Parrot (*Psephotus hæmatonotus*)—R.

Warbling Grass-Parrakeet (*Melopsittacus undulatus*)—P.

Tawny Frogmouth (*Podargus strigoides*)—P.

Owlet Nightjar (*Ægotheles cristata*)—P.

Great Brown Kingfisher (*Dacelo gigas*)—P.

Red-backed Kingfisher (*Halcyon pyrrhopygius*)—R.

Sacred Kingfisher (*Halcyon sanctus*)—P.

Bee-Eater (*Merops ornatus*)—P. Has arrived the fourth week in September for years past; coming from the north.

Pallid Cuckoo (*Cuculus pallidus*)—P.

Fantailed Cuckoo (*Cacomantis flabelliformis*). Here for a short time in spring, returning for the winter.

Black-eared Cuckoo (*Mesocalius osculans*)—R.

Narrow-billed Bronze Cuckoo (*Chalcites basalis*)—P.

Bronze Cuckoo (*Lamprocoryx plamosus*)—R.

Welcome Swallow (*Hirundo neoxena*)—P.

Fairy Martin (*Lagenoplastes ariel*)—VP.

Tree Martin (*Hylochelidon nigricans*)—VP.

Red-capped Robin (*Petroica goodenovii*)—P.

Hooded Robin (*Melanodryas cucullata*)—P.

Short-billed Tree Tit (*Smicromis brevirostris*)—VP.

White-throated Fly-eater (*Gerygone albogularis*).

Brown Fly-eater (*Gerygone fusca*).

Yellow-rumped Shrike Robin (*Eopsaltria australis chrysorrhoea*). Plentiful in the big Belah scrubs interspersing the Watercourse.

Yellow-bellied Shrike Tit (*Falcunculus frontatus*)—FP. Note entirely different from that of Southern birds; as no specimen was taken, plumage comparison with the latter was missed.

Crested Bell Bird (*Orcoica gutturalis*)—FP.

Yellow-breasted Whistler (*Pachycephala pectoralis*). Found breeding. As far as is known, this is the first record of this species in this district.

Rufous-breasted Whistler (*Pachycephala rufiventris*)—P.

White-shafted Fantail (*Rhipidura flabellifera*)—NP.

Black and White Fantail (*Leucocirca tricolor*)—VP.

Restless Flycatcher (*Seisura inquieta*)—FP.

Leaden Flycatcher (*Myiagra rubecula*)—R.

Cuckoo Shrike, Black-faced (*Graucalus nova-hollandia*)—P. Most numerous on Gwvdir River.

Cuckoo Shrike, Little (*Graucalus mentalis*)—R.

Cuckoo Shrike, Ground (*Pteropodocys phasianella*)—NP.

Caterpillar-eater, White-shouldered (*Campephaga tricolor*)—VP. Nests in profusion.

Australian Babbler (*Pomatostomus temporalis*)—P.

Brown Song Lark (*Cinclorhamphus cruralis*). Usually very common, but scarce at time of our visit.

Rufous Song Lark (*Ptenocedus matheosii*)—FP. Scattered throughout the ringed timber.

Little Grassbird (*Megalurus gramineus*)—P. Nest feathers placed in the usual "hooded" manner.

Yellow Tit-Warbler (*Acanthiza chrysorrhoa*)—P.

Yellow-rumped Tit-Warbler (*Acanthiza chrysorrhoa*)—P.

Red-rumped Tit-Warbler—R, and only few nests seen.

Chestnut-rumped Tit-Warbler (*Acanthiza uropygialis*)—P.

Blue Wren-Warbler (*Malurus cyaneus*)—NP.

White-winged Wren-Warbler (*Malurus leuconotus*) — FP. Breeds in "Roley-poley" bushes on the plains.

Lambert's (Variegated) Wren-Warbler (*Malurus lamberti*)—FP. Noted in the lignum bushes in the swamps, and water-courses, as well as in more usual haunts.

White-browed Wood-Swallow (*Artamus superciliosus*), White-rumped Wood-Swallow (*A. leucorhynchus*), Masked Wood-Swallow (*A. personatus*), Black-faced Wood-Swallow (*A. cinereus*)—P.

Wood-Swallow (*A. tenebrosus*)—NP.

Little Wood-Swallow (*A. minor*)—R.

Grey Shrike Thrush (*Colluricincla harmonica*)—P.

Magpie Lark (*Grallina cyanoleuca*)—VP.

White-face (*Aphelocephala leucopsis*)—VP. Nesting in hollow spouts.

Orange-winged Tree-runner (*Neositta chrysoptera*)—FP.

Brown Tree-creeper (*Climacteris picumna*)—VP. Feeds at the kitchen doors.

White-throated Tree-creeper (*Climacteris leucophæa*). Only in tall Belah scrubs.

Mistletoe Bird (*Dicæum hirundinaceum*)—P.

Pardalotes, both red-tipped (*Pardalotus striatus*) and orange-tipped (*Pardalotus assimilis*) are fairly plentiful. Their notes were exactly alike, but entirely different from the similar species of more Southern latitudes. The note is "chip-chip," not "wit-ee-chu," as uttered by the red-tipped elsewhere. In examining specimens of each, we noticed that the white outer edge and tip was missing in the 2nd primary feather of the orange-tipped, while there was only a faint trace of white towards the final third

of the similar feather in the red-tipped. We do not think this has been recorded before, although Dr. W. Macgillivray (Broken Hill) mentions the unequal amount and distribution of the white margins in the specimens around Coleraine (Vic.) (North, Vol. II., p. 219). These birds, with the same notes, showed (a) red tips, (b) reddish orange tips. Probably they are *assimilis*, showing the range of colour in the tips as described by Hall, in his Handbook. Their nests here are always in trees, and they are never known to breed in tunnels in banks. The writer of this article found the red-tipped breeding both in the trees and banks on the Snowy River, near Jindabyne (N.S.W.).

Black-throated Honey-eater (*Melithreptus gularis*), Brown-headed Honey-eater (*Melithreptus brevirostris*). Thinly dispersed.

Striped Honey-eater (*Plectorhynchus lanceolatus*)—P.

Painted Honey-eater (*Grantiella picta*)—R.

Singing Honey-eater (*Meliphaga sonora*)—R.

White-plumed Honey-eater (*Meliphaga penicillata*)—VP. In Coolibahs and Red Gums.

Noisy Miner (*Myzantha garrula*)—VP.

Yellow-throated Miner (*Myzantha flavigula*)—VP.

Spiny-checked Honey-eater (*Acanthagenys rufigularis*)—P.

Blue-faced Honey-eater (*Entomyza cyanotis*)—FP.

Friar-bird (Leatherhead) (*Tropidorhynchus corniculatus*). Found chiefly on banks of larger streams.

Yellow-throated Friar-Bird (*Philemon citreogularis*)—P.

Pipit (*Anthus australis*)—NP.

Horsfield's Bush Lark (*Mirafra javanica*)—FP.

Spotted-sided Finch (*Stagonopleura guttata*)—P.

Chestnut-eared Finch (*Taniopygia castanotis*)—V.P.

Banded Finch (*Stizoptera bichenovii*)—FP.

Plum-headed Finch (*Aidemosyne modesta*)—P.

Australian Oriole (*Oriolus sagittatus*)—P.

Spotted Bower Bird (*Chlamydera maculata*). Scattered through the district. Playgrounds in dry ridges of sandalwood. Usual assortment of bones, pieces of glass, the latter chiefly lilac or amethyst colour in harmony with the bird's "colour patch." Noted.—The heavier articles, as nails, bolts, etc., are always placed in centre of the bower. Bowers less arched-over than those of the Satin-Bird. These birds are great fruit robbers.

Raven (*Corvus australis*)—VP.

Choughs (*Corcorax melanorhamphus*)—FP.





Mr. Bellchambers at his mound. The male Mallee-Fowl (*Leipoa ocellata*) assists in uncovering the egg and also in covering it again.

Grey Jumper (*Struthidea cinerea*)—VP.

Black-throated Butcher Bird (*Cracticus nigrogularis*)—FP.  
Notes more flute-like than those of the Collared Butcher Bird.

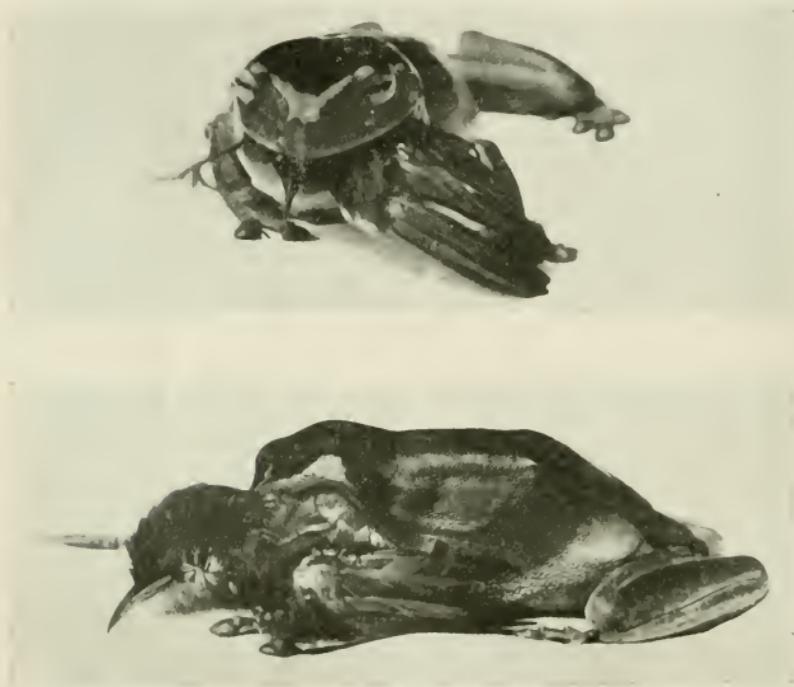
Black-backed Magpie (*Gymnorhina tibicen*)—P.

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## Camera Craft

**Mallee Fowl in Captivity.**—In October a party visited the home of Mr. T. P. Bellchambers, who lives in Humbug Scrub, in the ranges about 25 miles from Adelaide, to see Mallee Fowl (*Leipoa ocellata*) in captivity. Mr. Ernest Whittington, R.A.O.C., supplies the following notes, with two photographs (see plate):—After a delightful lunch, a move was made to the cages where the Mallee Fowl are kept. These unique birds, which retain the reptilian characteristic of hatching their eggs by the heat of the sun and rotting vegetation, have been Mr. Bellchambers's special study, and he has achieved most gratifying results. Mr. Bellchambers entered the cage and began to open the first mound. The male bird was soon on the scene, and started vigorously scratching back the material which was removed. In several minutes a large flesh-tinted egg was exposed to view. It was taken out and shown to the interested visitors, and then returned to the egg chamber. Mr. Bellchambers scraped back some of the earth and decayed vegetation which generates the heat, and the male bird did the rest. Owing to the wet conditions at Humbug Scrub it takes so long for the excessive moisture to dry out of the mound building material that the early eggs have always been lost. This year Mr. Bellchambers has constructed a mound of his own, and he has succeeded in getting a temperature of 76deg. The eggs hatch at between 85 and 96 deg. The naturalist thinks that by removing the early eggs to his own mound he will, if he cannot hatch them, at least be able to keep them fresh until the heat is sufficiently developed in the birds' own mounds. When Mr. Bellchambers was in the mallee country, catching the birds for the various zoos, he made a mound at his camp, and placing the eggs he found in this receptacle, he was able to save himself endless walking and watching, and to catch the chicks as they hatched out. It was explained that the chick when hatched was fully fledged, and that it forced its way from the chamber through the overhead mass, and was at once able to fly and care for itself without any help from the parent birds.

**Frog eating a Bird.**—One wet day my attention was drawn to a sound in the hedge at the rear of my studio. Thinking it was a Snake with a frog, I went in the direction of the sound, and to my surprise saw a frog hanging by the hind legs, as one would say, just like a monkey, with the bird hard and fast in his mouth. How the frog caught the Grass-bird (*Megalurus gramineus*) I do not know. On watching the operation again, to my surprise he was making a meal of the bird, so I thought it was worth a photo. In about five minutes he had the bird so far down (see No. 1), and about two hours later so far (see



An Australian Tree-Frog ingesting a Grass-Bird (*Megalurus gramineus*).

Photos. by A. Friend, R.A.O.U., Ingham.

No. 2). In about three hours' time it was out of sight. Two hours later it evidently began to hurt, and the frog brought the bird up. The frog, still looking sick, I kept him caged up, and next day let him out, when he was bright and happy. I may say that when he disgorged the bird, it was partly digested. I was interested in this performance, and made it known to as many as I could, showing it to the Mayor; he said that had he not seen it, he would have stated that I did not take enough soda with it.—ALFRED FRIEND, Ingham, N.Q.

## Stray Feathers

**The Sunbird in Mackay.**—I am glad to be able to report that the pretty little Sunbird (*Cyrtostomus frenatus*) is again in our district. It was completely wiped out by the cyclone of 1918. There are very few here yet, but I was pleased to find a pair in my paddock a few weeks ago, and I am in hopes that they will breed up again.—E. M. CORNWALL, R.A.O.C., Mackay, Q.

\* \* \*

**Sulphur-crested Cockatoos** (*Cacatua galerita*) are just bringing their fledglings about now. We spent nearly half an hour two evenings ago watching the old bird teaching two young ones to get about from branch to branch in a tall dead tree. The time of nesting of these birds depends a good deal on the season. The bloodwood trees have had an exceptional wealth of blossom in this district this year, and therefore the birds and bees have had a glorious time.—Mrs. A. BLACK, Pajingo Station, Charters Towers, Q 10/4/21.

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**Bird Study by Aeroplane.**—There is one good aspect of bird study which I find is neglected in Australia, and as I had something to do with it in England, I suggest it to you as a field worth exploring. That is the study of migration by aeroplane. The best method of doing this is to get in touch with all Government aerodromes, enlist their sympathy so that every pilot is asked to record what birds he meets by day or night, and at what height they are seen, and their general direction of flight. The pilots soon become keen, and even learn to distinguish different birds beforehand, so as to make their job more useful. In this way was found at home how many great flocks of birds pass by day too high to be visible, and even by night enormous numbers were identified. The points the pilots want to note are as stated, with the addition of speed, for which the air speed of the aeroplane should be noted, whether the birds overtake or are passed by the machine, and by about what speed. It should show I think, that about 16,000 feet is the average height of migration. If the suggestion attracts you, and you take it up, I would dearly like to hear from you the facts. My own experience here is confined to being investigated by a Wedge-tailed Eagle at 1000 feet, it seemed annoyed at our presence, and willing to fight; but was able to glide past us without a single wing beat, and we were making 82 miles an hour at the time. But this is not migration, and merely an incident. On the same flight I noticed how we scared the Magpies whenever we came low, making them scurry away with much noise (heard by those on the ground).—

A. H. R. WILSON, Raywood, Vic.

**Cuckoo's Eggs.**—Some interesting notes made on a Cuckoo during the deposition of its eggs appear in *British Birds* for March. The author, Mr. Edgar Chance, kept a single female under observation throughout the whole of this time, which lasted until no fewer than twenty-one eggs had been laid. All were dropped, at intervals of forty-eight hours, into the nests of Meadow Pipits, save in the case of the fifteenth egg, for which the nest of a Tree-Pipit was selected, there being no Meadow-Pipit's nest available. Deposition always took place in the afternoon, and an egg was never left in a nest until after the first egg of the foster-parents had been laid. On each occasion, after dropping her egg into the nest, she removed one of her dupe's eggs, and this was either swallowed at the nest-side or borne away and disposed of. Apparently only when forced by dire necessity will she leave an egg in a nest in which incubation has commenced.—From *Nature*, No. 2685, Vol. 107.

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## State Secretaries' Reports

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### QUEENSLAND.

As was forecast in last report, the handsome Native Companion (*Antigone*) has been transferred from the list of partially protected birds, and given sanctuary for the whole year throughout Queensland. This action was taken by the Government chiefly on the initiative of the Central Queensland Native Birds' Protection Association, a body whose activities could be emulated with advantage in country centres throughout Australia.

It is a custom of this Rockhampton association to conduct an essay competition on birds in the schools of the district each year. This will be repeated during the present year, but the association has gone one better by offering a prize of five guineas for the best essay on "The Value of Birds to the Man on the Land," the competition to be open to "all-comers" throughout the State. Another very useful custom of the association is the periodical advertising in the press of information relating to close and open seasons for birds. They have done this for the past five or six years, and so weakened the excuse of poachers, who say they "didn't know it was close season." The last successful prosecution conducted by the association (through Mr. P. V. Maloney, hon. secretary) was against a man who shot two Bustards (Plain Turkeys) two days before the season opened. The Police Magistrate, in inflicting a fine of £3, said it was quite common knowledge that the association had been making great efforts for years past to protect birds.

Meanwhile, the Queensland Gould League of Birdlovers is endeavouring to keep a sharp eye on the birds of the State generally. The most notable success of the League recently was the prosecution of a city bird-dealer, who had 36 Gouldian Finches (now totally protected in Queensland) and 17 other Finches. The chief point in the defence was that the birds had come from Sydney, and were not, therefore, native birds within the meaning of the Queensland Act. This point, which involved an important principle, was not sustained by the Police Magistrate, who convicted defendant on both charges. On the first a fine of £18 (10/- a bird) was inflicted, and on the second count (which amounted to a second offence) the maximum fine of £1 a bird was imposed for each of the 17 birds. In all, defendant was ordered to pay fines and costs amounting to over £40, in default two months' imprisonment.

Activity continues to be displayed also by the Queensland Field Naturalists' Club, whose operations are closely associated with those of the Gould League and Queensland section of the R.A.O.U. One of the biggest gatherings of its kind held in Brisbane was a meeting which the Club promoted during May for the purpose of furthering the interests of the National Parks of the State. Professor H. C. Richards spoke of the geology of these reservations; Mr. C. T. White (Government Botanist) of their botany; Mr. A. H. Clisholm, R.A.O.U. (president Gould League of Birdlovers), of the birds; and Mr. H. A. Longman, R.A.O.U. (Director, Queensland Museum), of the mammals. His Excellency the Governor (Sir Matthew Nathan) was present, together with Sir Thomas and Lady Robinson.

Two members of the R.A.O.U. from other States have been welcomed on visits to Brisbane. Capt. S. A. White came to inquire into the food of birds frequenting our State forests; and Mr. E. A. Le Souef came on business connected with the Perth Zoological Gardens.

A. H. CHISHOLM, R.A.O.U., State Secretary,

"Daily Mail," Brisbane.

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## SOUTH AUSTRALIA.

As representative of the Union in S.A., I have the honor to report that much progress has been made with protection work in South Australia since the last report was furnished.

First of all, it is necessary to record the great support and sympathy shown by the Hon. the Premier, the Minister controlling the Act, and the Department administering it. The Premier

(Hon. H. N. Barwell) is a great friend to our Fauna and Flora, and, being a University man, can well understand the scientific importance of our bird life. The Hon. the Minister for Industry (Mr. Hague) is ever sympathetic, and being a son of a pioneer upon the land, can realize the alarming decrease in our Fauna during late years, and, lastly, the officers of the department are closely on the watch for law-breakers. Your representative had the honour to introduce a deputation to the Minister, drawing his attention to the violation of a sanctuary, namely, Pierson's Island, where a number of seals were slaughtered. Seeing that it was difficult to detect seal skins coming from protected or un-protected areas, it was asked that all seals be protected in South Australian waters. The Minister viewed this suggestion with favour.

Several convictions have been obtained of late in reference to shooting protected birds. Last season the greater part of the Coorong Lake, near the mouth of the Murray, was closed to shooting. This came about after a visit made by the Premier and your representative. The past season, unfortunately, through a misunderstanding, part of the closed area was opened up to the shooter. A court case followed this, and three men were charged with shooting protected birds to the value of £60. Two local J.P.'s tried the case at Meningie, and dismissed it. A fresh charge was made out, and the magistrate was sent to try the case. He immediately gave it against the shooters. In another case a man I sent out to investigate was badly handled by a poacher. The same J.P.'s that tried the former case sat upon this one, and gave it against us; but we are not finished here. The nesting islands in the Coorong, to supervise which I have kept a man, at my own expense for some years past, has been taken in hand by the Department, insomuch that they have appointed a ranger, and will now relieve me of this expense.

Your representative has made several trips along the East-west Railway in an honorary capacity, to endeavour to keep sparrows from reaching the Western State.

Under the auspices of the Advisory Board of Agriculture (of which your representative is a member), many lectures have been given throughout the country upon the economic value of bird life, and the necessity of protecting them. Your representative has repeated these lectures both in the city and suburbs to large audiences. My services have been again requested outside the State, and, complying with a request from the Queensland Government, a bird survey has been made in reference to Forests and Agriculture. It is hoped the work will be beneficial to the forests and a means of further protection to the native birds of that State. A more complete report upon this very interesting work will appear, it is hoped, later on. Flinders Chase, the national sanctuary on Kangaroo Island, has been a great source

of worry. The Government, having taken a very strange attitude towards the Board, was the means of our chairman (the Hon. John Lewis, M.L.C.), resigning. Your representative has been acting as chairman for some time, but it is to be hoped a reconciliation will be effected soon, and that our chairman will be again with us, so that we can speed up with a great national undertaking. It is very gratifying to see how public opinion in this State is leaning towards more and more protection for our native birds, and this is entirely due to propaganda work in the press and by lectures. Much thanks is due to the *South Australian Register* for the splendid way that paper has championed the cause of our native birds.

S. A. WHITE,  
State Secretary for South Australia.  
"Wetunga," Fulham.

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#### NEW SOUTH WALES.

By proclamation dated the 7th January, the Chief Secretary declares an open season for the undermentioned birds, from the 1st February to the 30th June, viz.:—Corella, King Parrot, Cockatoo Parrot, Mallee Parrot, Musk Lorikeet, and Red-winged Lory. These birds have been reported as destructive to fruit and crops in various localities.

The State Birds and Animals Protection Act dated 12th September, 1918, has been rendered largely inoperative by reason of a test action brought against the Government in connection with the seizure of a number of Budgerigars.

Under the heading Exemptions clause 17 states—

"Nothing in this Act shall extend or be construed to extend to prevent any person who is the owner of any bird or animal from keeping the same in confinement or in a domesticated state, or from offering for sale or selling or taking or killing same."

This has been construed literally, and apparently once a bird is caught, the owner is exempted under this clause.

The wonderful season that the drier areas of Australia is experiencing is continuing, and we can look for a general increase in the numbers of "Out back" bird life.

15/6/21

—A. S. LE SOUEF.  
Taronga Park, Sydney.

## Correspondence

To the Editors of "The Emu."

Sirs,—I am somewhat surprised that nothing I believe has so far appeared in *The Emu* about an Indian Bulbul that seems to have established itself about Sydney. I can speak myself of two localities only—Hunter's Hill, where I first saw the birds in 1919, and in 1920, October, found a nest containing four young birds, and the birds seemed fairly common in that suburb. I now see and hear them here in Wahroonga, 8 or 10 miles from Hunter's Hill, in direct line—in fact, a pair calling in my garden at this moment induced me to write this letter.

The bird appears to be identical with a specimen in the Sydney Museum, marked "Red-eyed Bulbul" (*Atocompsa jocosa*). Hab., N. India, Burmah, etc.—Yours, etc.,

H. WOLSTENHOLME.

"Maybanke," Wahroonga, 21st May, 1921.

To the Editors of "The Emu."

Sirs,—Having read much of late regarding the notes of Coachwhip Bird (*Psophodes olivaceus*), alleging that the well-known "whip crack" call is the combined notes of two birds, i.e., one bird giving vent to the soft first note and the mate supplying the ventriloquial whip-like "crack," I would like to record my observations.

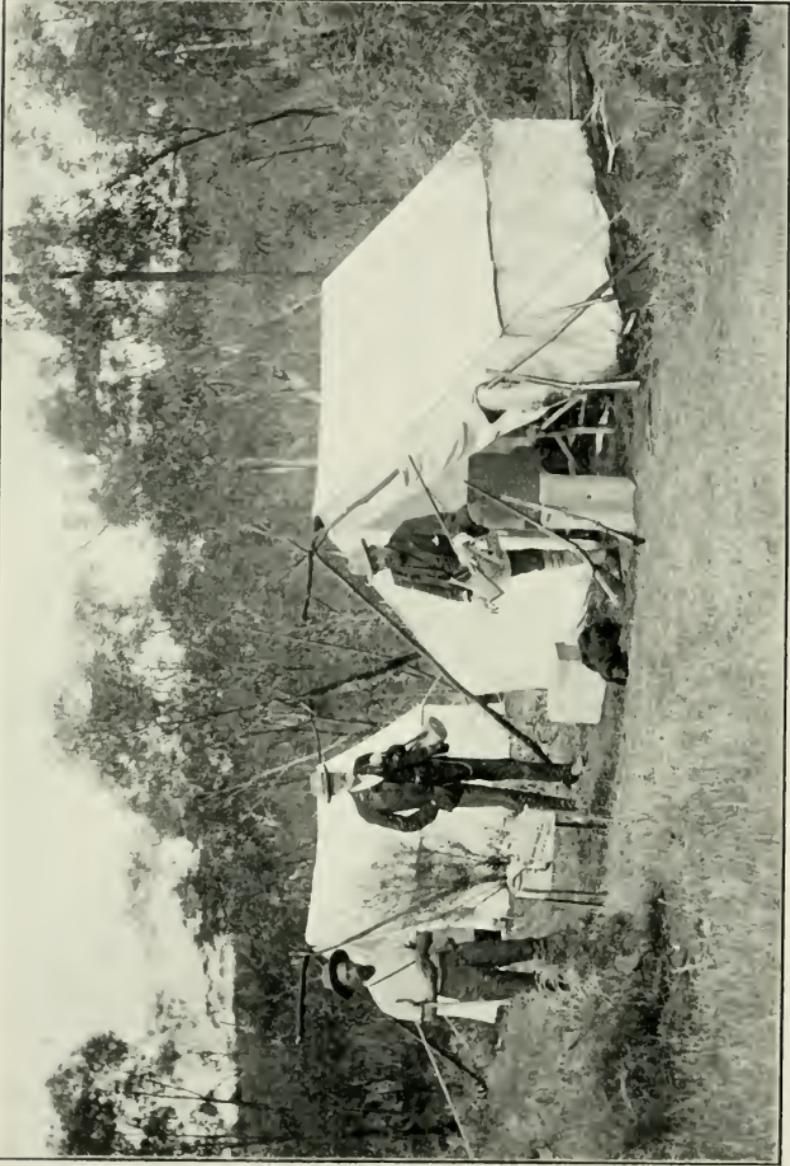
Recently, in the Dandenongs, I had the opportunity of keeping a male Coachwhip under observation for about an hour, during which time the bird called repeatedly, and I am sure that in this case the one bird was responsible for the complete double call.—Yours, etc.,

N. A. RUE ARNOLD.

Langridge St., Middle Park, 10/5/21.

[The point of discussion is neither the long indrawn note nor the explosive crack of the male, but the two, rarely three, chuck, chucking notes uttered, mostly, if not wholly, by the female in reply to the male's double note. If the female is on the nest she usually does not reply to the male's call. According to some observers, the male may rarely add the "chuck, chuck" to his usual double call.—Eds.]





Mr. Lawson Whitlock, R.A.O.U. Mr. Alan Morrison, late Gov. Botanist, W.A The late A. W. Milligan.

The Camp of the late Mr. A. W. Milligan, Hon. M.R.A.O.U., Wongan Hills, W.A.

## Obituary

MILLIGAN.—On the 30th March, 1921, at private hospital, St. Kilda, Alexander William, dearly beloved husband of Rebecca Milligan, of 56 Kooyong-road, Caulfield; aged 63 years. (By request, no flowers.)

The late Mr. A. W. Milligan was an original and honorary member of the R.A.O.U. Not only was he a born Nature-lover, but in every sense of the word he was an ornithologist, both in the field and at cabinet work. His first contributions to the science appeared in early numbers of *The Victorian Naturalist*, and latterly in *The Emu*.

In addition to an excursion to Queensland and many outings in Victoria, the late Mr. Milligan's more important expeditions were in Western Australia, notably "South-Western Australia" (*The Emu*, ii., p. 68); "The Stirling Range" (*The Emu*, iii., p. 9), and "The Wongan Hills" (*The Emu*, iii., p. 217, and iv., p. 2). Herewith is given, in connection with the last-mentioned trip, a hitherto unpublished photo. of a camp-scene, which depicts the author, gun in hand, at the tent door, the central figure being Dr. Alan Morrison, late Government Botanist, W.A.

The following new species were described by our deceased member:—*Acanthiza robustirostris* (*The Emu*, iii., p. 71); *Amytornis housei*, *Aphelocephala castaneiventris* and *Mirafra woodwardi* (see pl. 13, *The Emu*, iv.); *Gymnorhina longirostris* (*The Emu*, iii., p. 96). There are besides three good Western varieties—*Sphenura littoralis*, *Amytornis gigantura* and *Ptilotis novæ-norceiæ*. When residing at Perth, where he was for 11 years, he was Honorary Consulting Ornithologist to the Western Australian Museum. Some beneficial fruits of that office members were well pleased to notice during the last (Perth) Session of the R.A.O.U. On his return to Victoria he was, until compelled to resign by ill-health, a painstaking successful Honorary Secretary of the R.A.O.U.

As one of the members of the committee that prepared the Union's Official Check-list, Mr. Milligan was chiefly responsible for the proper representation of the technical matter. He was against (for the time being at least) encumbering the list with trinomials, and was in favour of the principle of priority, so long as it did not confuse or clash with the best interests of ornithology.

The late Mr. A. W. Milligan, who was born at Sulky Gully, near Ballarat, in 1858, was the eldest son of the late Mr. James Milligan, and was educated at Guildford, near Castlemaine. He followed a legal profession, his last appointment being with Messrs. Hedderwick, Fookes and Alston, Melbourne. Mr. Milligan, as a friend or servant, had an unimpeachable character for the strictest integrity. His ripe and valued, but unobtrusive, advice, frequently given in connection with the Union's affairs, will be much missed. On behalf of every member of the R.A.O.U., we tender our sincere condolence to Mrs. Milligan and to the other relations of the late Mr. A. W. Milligan.

## Monthly *Conversazione*

This monthly meeting of members of the R.A.O.U. was held at the National Museum, Wednesday evening, 1st June; Mr. F. Keep in the chair. Mr. F. E. Howe read an instructive paper on the genus *Climacteris*, and gave interesting field notes of the breeding habits of many species. The paper will be published at length in *The Emu*. An interesting discussion followed.

The principal business of the evening was the inspection of the "Tom Carter Collection" of bird-skins, which Mr. H. L. White, with his usual far-seeing and patriotic policy, has acquired for the National collection. The Carter Collection is extremely valuable and useful, seeing that it was the labour of so careful an observer and explorer as Mr. Carter. Mr. Carter spent 30 years in Western Australia, and his explorations extend from the region of the North-West Cape to Albany—distance apart nearly 1000 miles. The collection contains 800 skins of over 300 species and sub-species of birds, chiefly western kinds. The specimens are carefully labelled, with full data.

Mr. A. J. Campbell explained some of the exhibits, and read from *The Ibis* interesting notes concerning them, by Mr. Carter. (See *Ibis*, 1920, pp. 679-719, and 1921, pp. 48-81.) These notes are of importance to Australian ornithologists. A pair of Emu-skins were contrasted—the dark south-western bird with the sandy-coloured creature of the dry north-west. A Wood-Sandpiper (*Rhyacophilus glareola*) caused much interest. It appeared with two others of the same kind at an artesian-bore swamp, near Mand's Landing (North-West), September, 1911. The scapulars were curiously scalloped on the outer edges—either worn away or bitten out by the bird. The first-recorded instance of Wood Sandpiper in Australia was from Victoria. There were many other Waders, the North-West Cape being a good "dumping ground," especially for far-northern migrants. A Babbler caused comment. It is smaller than *Pomatostomus superciliosus*, and has been named by Mr. G. M. Mathews *gwendolena*, in honour of Mr. Carter's daughter. Among the small fry *Acanthiza inornata* was found as far north as Carnarvon, in some Melaleuca scrub and the *Maluri*, notably *assimilis* or *occidentalis*, were plentiful, while Mr. Carter's diligence brought more than one new variety of Emu-Wren (*Stipiturus*) to scientific light. *Pardalotus pallidus* was deemed a good and decided variety of *rubricatus*. Much interest centred round two pairs of Tree-creepers (*Climacteris*), provisionally labelled "*C. melanura wellsi*," but evidently are not referable to Ogilvie-Grant's dark variety, but are near relations of the more eastern and central species *C. superciliosa*. During Mr. Carter's long residence in the North-West Cape district, he had never seen a Tree-creeper. But during September, 1915, he obtained the four

specimens in some Jam (Acacia) wood, near the Minilya River. Honey-eaters, as one would naturally expect, are well represented, there being no less than 42 kinds, including *Meliphaga carteri*, probably a distinctive species, not a sub-species of *penicillata*. A pair of fine Bower-Birds (*Chlamydera guttata*) grace the collection. As far back as 1892, Mr. Carter procured the first recorded specimen of this species for W.A., and forwarded it to the National Museum, Melbourne, where it arrived a bundle of dust and feathers. Fortunately in the same locality (North-West region) several more specimens of the same species were collected which the finder and Mr. Mathews have called *C. g. nova*. (See *Ibis*, 1920, p. 499, pl. 14.)

The meeting, which included two English visitors, Mr. and Miss Wilson, was enthusiastic over Mr. H. L. White's last ornithological donation to the Nation, and closed with a vote of thanks to the chairman.

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## Reviews

### RECENT WORK BY MATHEWS AND IREDALE.

The indefatigable Mathews continues his remarkable output of work of the first importance to Australian ornithologists. The parts of his great "Birds of Australia" have continued to arrive with commendable regularity. The high quality of this important work has been fully maintained. The first and second parts of volume ix., completing Mathews' treatment of the large and difficult group of Australian Flycatchers, are to hand. The quality of the hand-coloured plates continues excellent.

In conjunction with Tom Iredale, a re-grouping of the world's birds is proposed in a valuable article on "Avian Taxonomy" (*Austral Avian Record*, vol. iv., pts. 2 and 3). Some original and daring changes are proposed. Plovers and Gulls are combined into a large order. Frigate Birds (now a small, separate order) and Tropic-Birds (now a sub-order of the Gull-Plover group) have been removed from the Pelican-Cormorant group of Sharpe.

Sharpe, in his *Hand-list of the Birds of the World*, used six families for the Parrots. Mathews uses 16 families, but uses six "super-families."

As this new classification of Birds is stated by the authors to be their "first attempt at providing a workable classification of avine forms," the Check-list Committee did not depart from Sharpe's Classification as used in "The Hand-list of the Birds of the World," the Official Check-list, the last B.O.U. List, in Mathews' various lists and his "Birds of Australia."

Following this reclassification in the *Austral Avian Record*, vol. iv., pts. 2-5, is a Name-List of the Birds of New Zealand.

This is succeeded on similar lines by a Name-List of the Birds of Australia. It proved of great value to the Check-list Committee by enabling them to complete their draft with Mathews' latest position before them. Apart from genera splitting, there is no vital difference in any place between the work of the Check-list Committee and that of Iredale and Mathews. Some of their changes have been made in advance of recognised rules and principles—*e.g.*, "one letterism." These the Check-list Committee are not accepting, but are retaining *Synoicus*, *Oriqma*, *Callocephalon*, *Plectorhynchus*, *Meliphaga*, *Myiagra*, and others altered by Mathews and Iredale.

Articles on Forgotten Bird-Artists and An Old-time Ornithologist (General Davies, who gave the name *superba* to the Lyre-Bird); Snipe and Sandpipers and Sherborn and the Systematist complete four important parts of vol. iv. of the *Austral Avian Record*.

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[“A Manual of the Birds of Australia.” By Mathews and Iredale, with coloured and monochrome plates, volume i. (from the Emu to Pigeons, on Mathews' new arrangement).

It is true that Latham brought out a supplement; that Gould, after the completion of his great work, gave the result of his completed studies in “The Handbook of the Birds of Australia,” and that any author when finishing is in possession of fuller and better information than when he started a great work. Though the Manual is excellently produced, and, indeed, is a necessity to any person interested in Australian birds, still one cannot repress a feeling of regret that Mathews did not delay the publication of this supplementary work until his great work was completed. Of course, the section treated here was completed in the big work years ago, and it is hardly likely there will be much further accession of fresh knowledge of the birds treated. Still Mathews' standards are not yet fixed. It is to be regretted that the Manual appeared while Mathews is still in the phase of excessive splitting of genera, though even now the swing of the pendulum back from his extreme position is plainly indicated in this sentence from the Introduction of the Manual: “When we have studied all the groups with their plumage changes and growth stages, we may suggest genera lumping.” Apart from this phase, the work will receive a warm welcome. It is convenient and compact, a good synonymy is given, a full description of adult, immature, chick, nest and egg, and the breeding season, incubation period, distribution and the recognised geographical races (sub-species) are briefly stated. The paper is good, the printing clear, and the binding strong. The plates are well drawn by Miss Lilian Medland. The colour printing is very good, and there is a complete index. The Manual is indispensable to working ornithologists, and those desirous of up-to-date knowledge of Australian birds.

[“Some Useful Australian Birds.” By Walter W. Froggatt, F.L.S., F.E.S., Government Entomologist N.S.W., etc. Published by the Department of Agriculture, N.S.W., through the Government Printer. Price 10/6].

This modest title introduces a book originated, the Preface says, to serve as the re-publication of a series of notes on birds useful to the man on the land. These were begun in the *Agricultural Gazette* (N.S.W.) by the late A. J. North, C.M.B.O.U.

The birds are treated in three sections:—

1. Birds of the Garden, Orchard and Field.
2. Birds of the Forest and Brushes.
3. Birds of Inland Plains, Swamps, Open Forests and Scrubs.

The author has utilised the opportunity to include many original and valuable field observations made by himself during a life-time of study in natural history.

The fine plates, over 60 in number, are excellent full-page reproductions in colour of the magnificent plates of Gould's great folio work, “The Birds of Australia.”

An interesting section deals with the “Effect of Changing Environment on the Habits of Birds.” Another deals with introduced mammals and birds—foxes, rabbits, domestic cats gone wild, sparrows and starlings—serious pests, one and all.

This handy volume contains much of interest for the bird-man as well as for the man on the land. It is written in a popular, interesting style. References are given to Gould's “Handbook” and to Leach's “Bird Book.”

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## About Members

Mr. A. F. Basset Hull, Sydney, on retiring recently from the Government service, was presented by the fellow-officers of his Department with a valuable pair of field-glasses, and a solid leather suit case. Mr. Hull still retains his position as honorary ornithologist to the Australian Museum. We wish him many years at his labour of love.

From birds to trees is but one remove. Mr. A. J. Campbell is shortly bringing out an artistic production entitled “Our Golden Wattles, or Australia's National Flower,” which will be illustrated by a unique series of full-plate photo-pictures.

Captain S. A. White at present is leading a small exploring party into Central Australia. Hitherto on such trips he had often, at the risk of his life, to scratch for water. This time floods impede his progress.

## Notes

### ANNUAL CONGRESS AND CAMP-OUT.

Arrangements for the Annual Congress in Sydney are now well advanced. A sub-committee, consisting of Dr. D'Ombrain and Messrs. Basset Hull, A. S. I.e Souef, and N. Cayley are arranging details in Sydney. It is proposed that interstate delegates should leave Adelaide on Monday, 3rd October, and Melbourne and Brisbane on 4th October. The Congress begins at 2.30 on 5th October. It will continue for several sessions. Lectures, excursions, and photographic exhibitions are proposed. On Saturday, 8th October, it is proposed to leave for Taree and Ellerslie, near Cape Hawke, for the annual camp-out in the big scrubs. Taree may be left on return on 18th October, or earlier to suit the visitor's convenience. Members intending to take part are requested to communicate with the State Secretary as soon as convenient. Members desiring to have business brought before the congress should communicate also at an early date with the State Secretary. Any notices of motion or nomination of office-bearers should also be sent to their State Secretary as soon as possible.

### SECOND EDITION OF THE CHECK-LIST.

The second edition of the Check-list has now been practically completed, and shortly, it is hoped, through the generosity of Messrs. Angus and Robertson—the publishers of the forthcoming Cayley's "Birds of Australia"—to make available 50 copies of the proposed list. Comments and criticism are invited, and the Check-list will be finalised at the Sydney Congress in October. Some names finally accepted by the Check-list Committee and by Messrs. Mathews and Iredale are used in this issue. Where a difference exists, the name according to the *Official Check-list* has been used.

Principles accepted by the British and American committees will be observed here in the finalisation of the list. B.O.U. and A.O.U. names will be accepted for birds common to the Australian, British and American lists.

### PERMANENT ADDRESS OF THE R.A.O.U.

The Permanent fixed address of the R.A.O.U. is No. 2 Temple Court, Melbourne.

### DATE OF PUBLICATION.

Owing to unavoidable delays, connected mainly with a change of printers due to financial considerations, this issue was published on 19th July, 1921.





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THE NARETHA PARROT

(*Psephotus narethae*) H. L. White

Male—lower figure

Female—upper figure

# The Emu

Official Organ of the Royal Australasian Ornithologists' Union

"Birds of a feather."

VOL. XXI.]

1ST OCTOBER, 1921.

[PART 2.

## The Naretha Parrot (*Psephotus narethae*) sp. nov.

By H. L. WHITE, C.F.A.O.U., M.B.O.U., "Belltrees," Scone,  
N.S.W.

*Adult Male*.—General colour above, including the greater portion of head, the fore-neck and chest pale brown becoming more greyish-olive\* in tone on the back; the rump and upper tail coverts a rich olive yellow (Pyrite yellow); the nape, hind-neck, throat and upper breast mottled with a light buff (Tillcul buff); forehead and lores verditer green; cheeks a rich purplish blue (Violet ultramarine) with an edging of light cream; abdomen (Citron yellow), flanks washed with greyish olive; under tail coverts vermilion; lesser wing coverts cerulean blue outer median wing coverts scarlet vermilion; inner median and greater wing coverts olive yellow (Pyrite yellow); the inner secondaries olive yellow, the inner webs being blackish brown; the outer secondaries, primary coverts a rich blue (Ultramarine); primaries, except the first, which is blackish brown, a rich blue (Ultramarine) extending from their base half way down their outer webs, the other half of their outer webs a pale mauve; the inner webs black; central pair of tail feathers dull olive green, the apical half of their outer webs and tips dull blue; the remainder dull blue at the base, white on their apical portion; all but the lateral feathers with a pale bluish wash on their outer webs extending nearly to their tips. Bill whitish horn colour, bluish at the base; legs and feet dark fleshy grey; iris dark brown. Total length, 285 mm.; wing, 122 mm.; culmen, 19 mm.; tarsus, 19 mm.; tail, 172 mm.

\* Colors in brackets are taken from Ridgway's "Color Standard of Color Nomenclature."

*Adult Female.*—Very similar in plumage to the male, but smaller; with less colour on the wings, cheeks, abdomen and tail. Total length, 260 mm.; wing, 113 mm.; culmen, 18 mm.; tarsus, 20 mm.; tail, 153 mm.

*Immature Male.*—The immature male upon leaving the nest carries plumage very similar to that of the mature female; but with a marked wash of bright yellow over the feathers of body and wings.

The finding of a new parrot is such a notable event in the ornithological world, that a few remarks upon the discovery of *Psephotus narethae* may not be out of place.

Captain S. A. White, having worked up the birds on the eastern edge of the great Nullarbor Plain, it was suggested to me that similar useful data should be obtained on the Western Australian side, some 450 miles distant; the intervening country, about the size of the State of Victoria, being level, treeless and waterless.

Having secured the services of Mr. F. L. Whitlock, who had previously done such wonderfully good work for me, I suggested Zanthus, on the trans-Australian railway line, 130 miles east of Kalgoorlie, as a starting point.

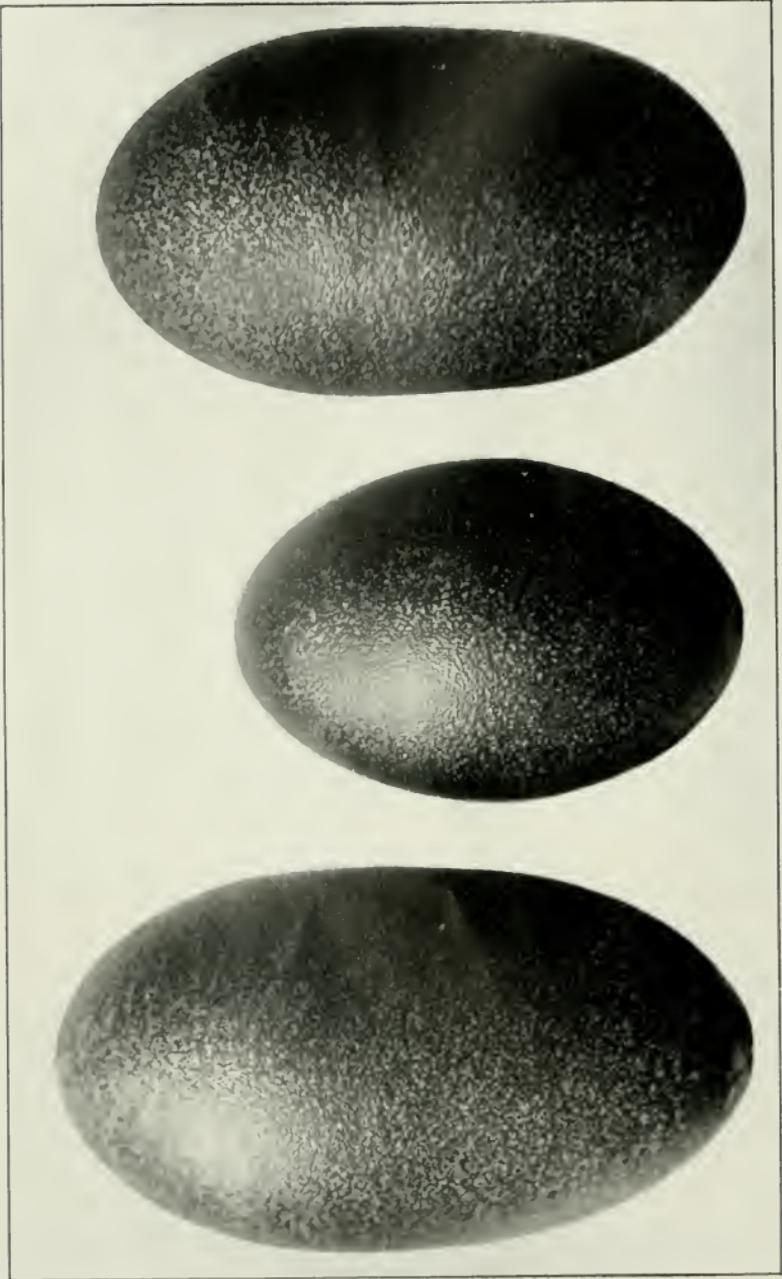
Certain concessions having been kindly granted by the Commonwealth Railway Department, Mr. Whitlock fixed his camp at Zanthus during July, but soon found he was too far to the west; and an important matter coming under his notice, hastened his departure. A railway official had in captivity a parrot, said to have been taken at Naretha, 75 miles further east, near the edge of the great plain, the bird agreeing with no published description.

Business calling me to Perth, I passed Zanthus on the 1st August last, and met Mr. Whitlock there for a quarter-of-an-hour's talk. Upon hearing of the pet parrot, I said: "Get away to Naretha without delay, and report to me there on my return journey." On the 8th, Mr. Whitlock met the train at Naretha, and handed me three (3) skins, saying he thought the bird was new.

Upon arrival at Adelaide, I had a few minutes' conversation with Captain White, who gave an opinion that the parrot was a good species. A careful comparison at the National Museum, Melbourne, settled the matter conclusively.

The discovery of this bird points to the possibility of the Nullarbor plain separating certain eastern and western forms, in a manner similar to that noted in North-West Australia, where a wide stretch of desert country extending south from Broome appears to act as a barrier to certain forms of bird life.





Very large eggs of the Emu (*Dromaius nove-hollandicæ*). The centre egg is the usual size.

## DESCRIPTION OF EGGS OF NARETHA PARROT

*(Psephotus narethae).*

Eight nesting holes were observed, all in Desert Oaks (*Casuarina*). The type clutch was taken from a hole 5 feet from the ground, and at a depth of 18 inches from the entrance.

Clutch, five; rounded oval in shape; shell close in grain, but slightly rough; colour, dead white without gloss.

Measurements in inches—A, .9 x .74; B, .88 x .72; C, .9 x .71; D, .93 x .73; E, .89 x .73.

Another clutch of four is uneven in size, the average being .86 x .7 in.

Both taken by F. L. Whitlock at Naretha, W.A., the first-named clutch on August 31st, and the second on September 6th. The bird appears to be an early breeder, six nests observed by Mr. Whitlock during August containing from four to six young each.—HENRY L. WHITE.

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**Abnormal Eggs of the Emu.**—Copy of data supplied by Mr. C. J. Craig, of the Department of Agriculture, Perth, W.A.:—

“These two large eggs of *Dromaius nova-hollandiae* were found in desert country some 200 miles south of the North-West coast. Condouve Shellborough is marked on the map. Go east on the coast line 40 miles, thence south 200 miles, and you have the locality. Eight eggs, all abnormal, were in the nest. Unfortunately, natives had roasted six (one exceptionally large, judging by the half shell) before my arrival.” I went to a good deal of trouble to test the authenticity of these eggs.

Specimen A measures 173 x 99 mm; specimen B measures 167 x 95 mm. An ordinary-sized egg measures about 130 x 85 mm. A peculiarity about the eggs is their long oval shape.

—H. L. WHITE. 5/9/21.

\* \* \*

**The New British Law** which has for its object the protection of bird life is not the same law as that which was on the eve of enactment when war came, Dr. William T. Hornaday, Campaigning Trustee of the Permanent Wild Life Protection Fund, said yesterday, and he termed it a half victory for the London plumage trade. He predicted that the three representatives of the feather trade on the committee to be appointed would be “hand picked,” and would dominate the committee.—From *The New York Times*.

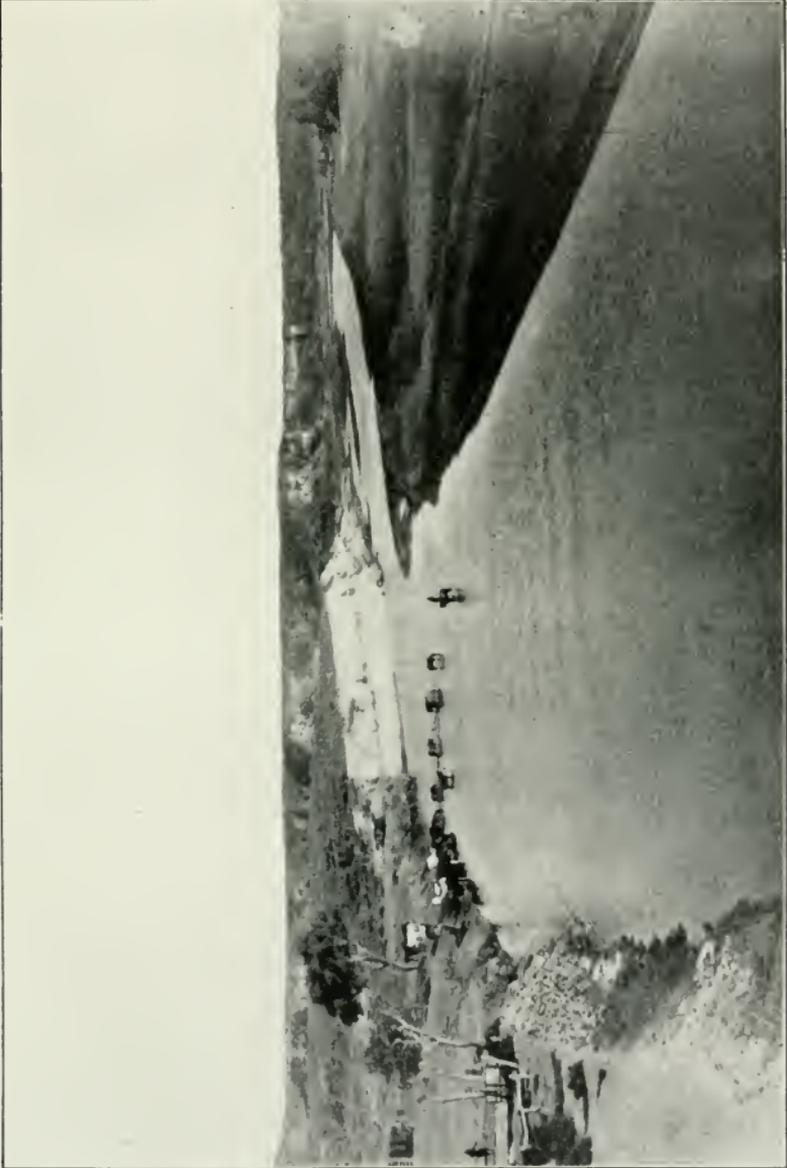
## A Central Australian Expedition

By Captain S. A. WHITE, C.M.B.O.U., C.F.A.O.U.,  
State Secretary R.A.O.U., S.A.

Quite a number of years ago, the Australasian Association for the Advancement of Science discussed the necessity of sending scientists into Central Australia to clear up some doubts centred round a spot called Yellow Cliff on the Finke River. Sir Douglas Mawson proposed that two geologists should carry out this work. Prof. Sir Edgeworth David, D.S.O., F.R.S., F.G.S., etc., of the Sydney University, and Prof. Walter Howchin, F.G.S., of Adelaide, were selected for the investigation.

The author of this paper, having traversed the country in question more than once previous to this trip, was called into consultation with the geologists, the outcome being that all arrangements and organising were left in his hands. The first move was with regard to transport. Upon approaching Sir Sidney Kidman, he, in his characteristic broad-minded and public-spirited way, said, "I will do what I can for you. If you can do the trip by car, you can have the one at Macumba Station; if not, you shall have a waggonette and as many horses as you like." Final arrangements were made by the writer with Sir Edgeworth David in Sydney when on my way up to Brisbane last May. On 17th June, 1921, Sir Edgeworth David arrived in Adelaide, and we should have left on the 22nd by the fortnightly train to the head of the line at Oodnadatta; but, on the 18th, the expedition was postponed owing to the extraordinary reason that there had been *too much rain*. The news of heavy falls of rain reached me late in the evening, and the outcome was that the start was put off till the next train in two weeks' time. The time before starting was taken up by Sir Edgeworth in the examination of most interesting geological centres within a few hundreds of miles of Adelaide.

On July 6th Prof. Sir Edgeworth David, Prof. W. Howchin and the writer left by the Great Northern train. The expedition had a double objective. In the first place there was the examination of some remarkable glacial deposits at Yellow Cliff, on the Finke River, at Crown Point, and, secondly, the investigation of the sandstone strata, an important intake of the Great Artesian Basin. After travelling all day, the train reached the picturesque little town of Quorn in the evening. Starting early next morning, a special car was arranged to trail behind, forming an observation car, and giving the geologists good opportunity of observing the wonderful country through which we passed. Exclamations of wonder came from the great geologist as we wound our way through and along the wonderful peaks of Flinders Range. Leaving Maree in the early morning of the third day, we were travelling still northwards. The effects of the wonderful rains were more and more apparent. Where the writer had experienced miles upon miles of drift sand, and where the



Crossing the Finke River, Central Australia.

Photo. by Capt. S. A. White, C.M.B.O.U.



train had been held up till the sand had been removed from the rails, waving grass, herbage and wild flowers now covered the landscape. A few birds were seen—Bustards, Wedgetailed Eagles, Crows, Brown Hawks, Kites, Rose-breasted Cockatoos (in small flocks), and, on the clay pans and creeks, Ducks of several species, White-fronted and White-necked Herons and Avocets. Many of these birds rose at the approach of the train. That evening we arrived in Oodnadatta, and the following morning were very busy preparing for the trip. At 2 p.m., Mr. E. R. Kempe arriving with a car, we made a start to the North-East, and arrived at Macumba Station, owned by Sir Sidney Kidman, and ably managed by Mr. E. R. Kempe. Mrs. Kempe gave us a hearty welcome. The next day was spent by the geologists in looking round the country near the station, and the writer had his time fully occupied in preparing for a start on the following day.

At an early hour on 11th July, the horses were brought in, and five were harnessed up to a strong four-wheeled conveyance. As soon as the black boys let the horses' heads go, they were away with a bound, and we had made a start on our trip to the North. The itinerary for the trip was made out before leaving, and agreed to, and now it was a matter of keeping to the timetable as closely as possible, because Sir Edgeworth David was due back in Sydney at a stated time.

Macumba Station is situated on Yardaparinna Creek, and we followed this to the northward, with 25 loose horses in charge of two black boys. The chief vegetation along the creek was Stinking Acacia or Gidyea (*Acacia cambajia*), and amongst these low trees were noted the Pallid Cuckoo, Rose-breasted Cockatoos, Crested Bell Birds, the White-face, Crows and other birds. Striking the Macumba Creek, we met with several large waterholes, on which were numbers of Maned Geese or Wood Ducks, also Grey Teal. The water had started to dry up, leaving great masses of Nardoo (*Marsilia quadrifolia*) to fruit before the hot winds set in and scorched it all off. When growing in the water, the leaves of this plant—the "Clover Fern"—resemble four-leaved shamrock, floating on the surface after the manner of the leaves of the water lily. It is a most interesting plant, for it is found to-day living in the same form as that in which ancient rocks of Devonian age contain it in a fossilised state. Crossing the wide sandy bed of the Alberga River, which was now drying up (there being but waterholes here and there along its course), we then crossed the Stevenson Creek, and pulled up for the mid-day meal in the sandy bed near a fine waterhole. All these water courses are lined with fine red gums (*Eucalyptus rostrata*), and the birds were numerous, especially Mrs. Morgan's Parrot (*Barnardius zonarius myrtae*), Yellow-throated Miner, White-fronted Herons or Blue Cranes, Tennant's Maned Geese, Grey Teal, Red-backed Kingfisher, Mudlarks, Whistling and Little Eagles, Kestrels, and Cloncurry Honey-eaters. After the meal, a fresh team of horses was put in, and we were off

again into some heavy sandy country, which took some pulling to get through to reach the Ten-Mile Bore. A short halt was called here to examine the hot water coming up from the Great Artesian Basin. Continuing our journey, we followed the Stevenson Creek, pulling up at Willow Well for the night. In addition to the birds already mentioned as having been seen during the day, the following species can be added:—Pelican, White-necked or Pacific Heron, White-fronted Heron, Pipits, Black-fronted Dotterels and Red-browed Pardalote. This was the first night out in the open, and I was glad it was a mild one for my companions' sake, for they are well advanced in years. The glass fell only to 45, which is quite a mild temperature for the time of year. Boobook Owls and Nightjars were calling during the evening.

Making an early start next day, we reached Hamilton Bore at mid-day, and used up two teams of horses to get there, and with two more teams reached the Dove or Opossum Creek, where we went into camp for the night close to a fine water-hole, on which ducks sported all night long, in spite of our bright camp fire so close to them. Mosquitoes worried us badly all day as well as night, and our horses suffered much from them. Bird life was plentiful in the country around us. Mrs. Morgan's Parrot, Ground Cuckoo-Shrikes, Pallid Cuckoos, Black-throated Butcher Birds, both the Orange and Tricoloured Chats, Grey Teal, Black and White Fantail, White-fronted Herons, Shell Parrots, were noted. Boobook Owls and Nightjars were calling all along this creek. The nights were still keeping mild, for 46 was the lowest reading.

Next morning two horses were missing, and we left one of the black boys to track them down and bring them along. Driving along the creek that morning with the bright sunlight shining upon the gum tops, the latter, as usual, lining the banks of this water course, one could not but be filled with admiration. Owing to the grand rains during the last twelve months, the growth on these tree tops was wonderful, but the coloration of these young succulent leaves was beyond description, and could only be described by the artist's brush, for they shaded from pale greens and yellows to orange, and then from pale brown to pink and all shades of red. Along this timbered creek were observed Tennant's Maned Geese, Black Duck, Grey Teal, Southern Stone Plover, Banded Plover, Mrs. Morgan's Parrot, Ground Cuckoo-Shrikes, Pallid Cuckoos and Pipits.

We reached Blood's Creek for lunch, where the manager of Eringa—another of Sir Sidney Kidman's properties—brought seven more horses. The boy did not catch up with the two stragglers, so on we went after lunch. Reached the Adminga Creek for night camp, and during the evening the boy and two lost horses came along. Each day the writer collected many botanical specimens, for the whole country was a picture of waving grass, herbage, and wild flowers everywhere. The night was a little cooler, 39 deg.



A mid-day halt in Central Australia.

Photo. by Capt. S. A. White, C.M.B.O.U.







Crown Point Mountain, Central Australia.

Professor Howchin

Sir Edgeworth David  
Photo, by Capt. S. A. White, C.M.B.O.C.

Next morning, the 14th, we got an early start, and passed over rough, stony tablelands, but even this country was covered in a wealth of plant life all in full bloom. At 9.15 a.m. we crossed the boundary line into the Northern Territory. Australian Dotterels and Desert Chats were seen amongst the gibbers, on the stony tableland country.

We reached Charlotte Waters telegraph station at 11.30 a.m. Here we picked up a consignment of stores, which the writer had sent on by camels some time before. Letters were posted, and telegrams despatched. After a change of horses, we went on for another seven miles and camped on a box flat for lunch. This flat was covered in high grass, and many botanical specimens were collected here. A fresh team was harnessed up, and we plunged into heavy sand, and by 3 p.m. a fresh team was again in request. Late in the afternoon we came upon a drover's camp. Messrs. A. Ross and Tapp were on their way from Newcastle Waters to the head of the line in charge of 2000 head of cattle. We made Boggy Flat for camp that night, and not long after sunset a male Bustard started his harsh, grinding call, resembling a camel's cry. In the distance this went on for many hours well into the night. The night was mild, 40 degrees, although the day was very hot. Many birds were seen—Crested Pigeons, Red-backed Kingfisher, Pipits and many others. Had a good start the following morning, and with two teams reached Green Waterhole, on the Finke River, at 11.20 a.m. The geologists examined the country here, and we then moved on to Yellow Cliff, which rises out of the Finke. This was one of the objectives of the trip. Sir Edgeworth David described this as "a stupendous glacial phenomenon" on a very grand scale, and said, "Nothing was seen on the South Polar explorations in which I took part on such a magnificent scale as that which presents itself at Yellow Cliff: even the word 'stupendous' seems inadequate."

In 1913 the writer experienced great heat (125 deg. in the shade) at this spot, and the country was in the grim grip of drought, yet millions of years ago this very place was held fast in thick-ribbed ice—a wonderful country indeed. Half a day was spent here, and when the writer had made camp, etc., he busied himself with bird observations within the bend of the river, which was running a good stream.

Cockatoo Parrots were very numerous, mostly young birds, which had congregated in large flocks. Mrs. Morgan's Parrot, Ground Cuckoo-Shrikes, Little Falcons, Kites, Whistling Eagles, Shell Parrots, Cloncurry Honeyeaters, Tricoloured Chats, Yellow-throated Miners, Screech Owls, Boobook Owls, Night Herons, Stone Plovers and Nightjars were also noted. That night in the valley of the Finke was cold, the glass falling to 36 deg. F.

Next morning we made a start for further north, and passed Old Crown Point. We took photographs of the wonderful Crown Point mountain. Crossing the Finke here, we stopped

for lunch on the high ground, and going on in the afternoon again crossed a big bend in the river, and struck it again at Horseshoe Bend at 4 p.m. A large piece of the bank and many trees had been carried away by recent floods; in fact, many of my old landmarks of former trips have disappeared. Sir Edgeworth was greatly interested in this weird place. It was a cold night, the thermometer recording 34 deg. F.

Next morning our horses had gone back, and it was late before they turned up. This was owing to the bad nature of the fodder in this locality. We left on our return journey at 11.40 a.m. Pulled up for lunch at 12.30. Geologists examined many places during the afternoon. We went through Cunningham Gap at 4 p.m., and crossed the Finke and made camp at the foot of Mount Crown Point. Black-throated Butcher Birds were calling loudly here. The night was cold (36 deg. F.) We were still in the valley of the Finke.

Next morning, the geologists worked round the camp for a few hours, and made some geological discoveries. I took my camera and walked on a few miles to a blacks' camp, and was very fortunate to get some good photographs of some wild men who had just come in from the back country. The good season had unfortunately enabled these men to travel over country which in normal times is practically waterless. These natives were making their way to Crown Point Station. It is most regrettable that they were able to leave their own country, for this is the undoing of them.

Prof. Howchin made a good discovery that morning of new glacial indications further up stream.

Getting away late, we made a forced drive to Black Rock, where we had our mid-day meal, and with one change of horses reached our old camp at Boggy Flat that night. We heard the same old Bustard calling in its strange, grinding noise well into the night. There was a very heavy dew through night, and the thermometer fell to 36 deg. F.

Next morning we had a good start, and when crossing the flat drove within twenty yards of a fine male Bustard; no doubt the bird which had made so much noise each time we had camped in the vicinity. We now struck out to the east to go round by New Crown Point Station on the Finke. On our way along the river bank, quite large parties of Red-breasted Babblers were met with, and went off chattering loudly, and following one another in their strange way. Other birds were plentiful, such as Black-faced Wood-Swallow, Kites, Pipits, Crows, and Australian Dotterels, which were breeding.

At mid-day we were delayed bolting up the conveyance. The fearful bumping it received nearly shook it to pieces.

Charlotte Waters telegraph station was reached in the afternoon, and we sent wires down south. The officer in charge kindly entertained us to tea and cake, and seemed glad to see someone he could converse with. This station has the lowest average rainfall in Australia, 3½ inches. This year it has had over 20 inches.

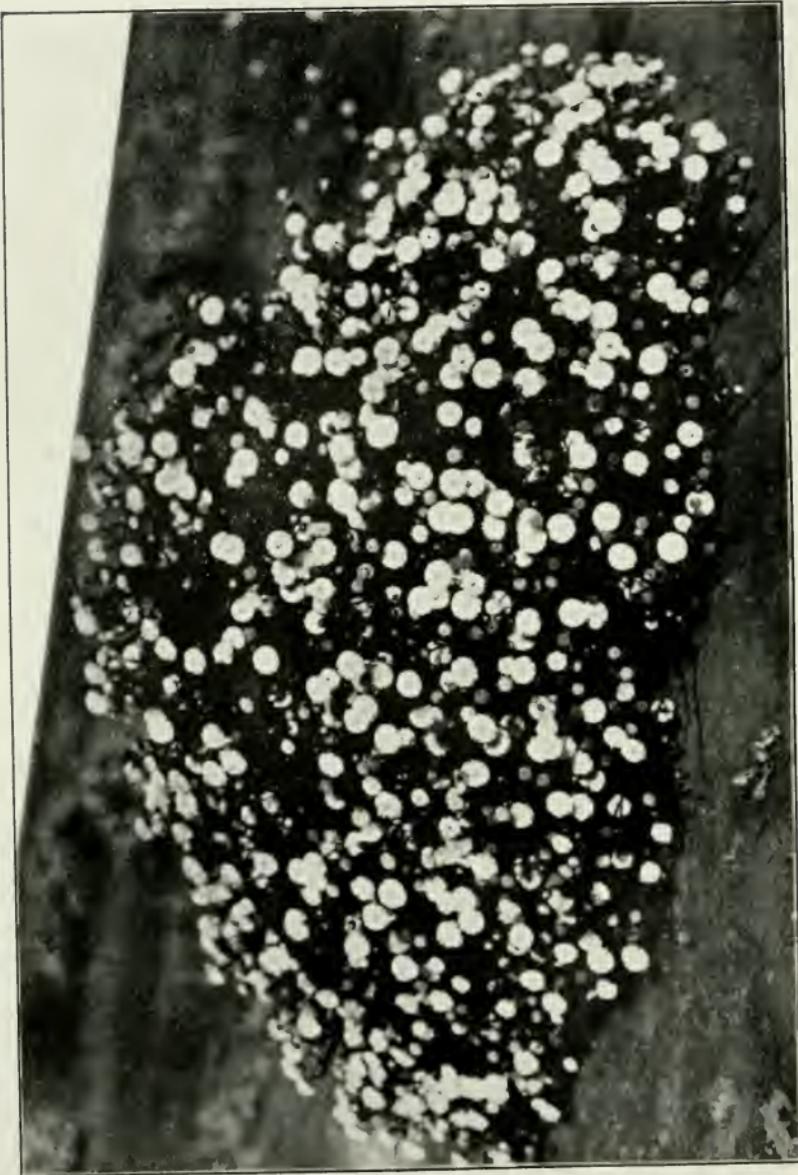


A Central Australian Native and his catch.

Photo. by Capt. S. A. White, C.M.B.O.U.







A Central Australian Blue Aster.

Photo. by Capt S. A. White, C.M.B.O.U.

We continued on our way across the tablelands to Bullocky Creek, where we went into camp amongst the Gidyea trees. The Desert Chat, Australian Dotterel, and Black-faced Wood Swallow were seen during the afternoon.

Our route next day led us over very rocky country. The geologists examined many outcrops, and discovered fossils in the rocks. Acres and acres of a beautiful daisy plant were met with, and photographs were taken. Descending from the high tablelands, Blood's Creek was reached at lunch time, and we pushed on after that to Opossum Creek (the head waters; not the lower end where we camped on our outward journey). We had a very snug camp here amidst thick Gidyea trees on the bank of a fine waterhole. Saw Little Falcons, Australian Dotterels, Pied Honey-eaters, Tricoloured Chats, Pipits, Tennant's Maned Geese and Grey Teal. There were some beautiful flowering shrubs in full bloom, notably *Erimophilas* and *Cassias*. The night temperature here was mild (44 deg. F.). All the next morning was spent traversing stony country. We reached Dalhousie at mid-day. After lunch we drove up to the Mound Springs, five miles distant, and the geologists spent the afternoon amidst the wonders of that mound-spring area, which comprises a hundred or more springs (some now inactive). The water temperatures vary very much from tepid to almost boiling point. The waterfowl have a great liking for these warm waters. Ducks of several species were found in hundreds upon the springs, and when alarmed flew up, but soon returned. My old camps in 1913 and later were easily picked out, for there is little change in this country from when I first saw it. The Purple-backed Wren was seen in the rushes round some of the springs, and Spiny-cheeked Honey-eaters were very plentiful. Black Moor Hens as well as Tennant's Maned Geese, Mountain Duck, Black Duck, Grey Teal, and Pink-eared Ducks were observed on the waters. As evening approached we made our way out of one of the greatest wonderlands of the North. On our way back, the writer made a valuable geological discovery—a large ice-marked boulder. This glacial evidence at Dalhousie is new to geological science. This night at Dalhousie was still milder, for the temperature did not fall below 50 deg.

Next morning, Sir Edgeworth David left camp at daylight to examine some cliffs a few miles to the west, and came back after sunrise with some wonderful fossils, of which he was very proud. That morning the sunrise was wonderful—one that can only be seen in a semi-desert country. Making a late start, we pushed on with speed, and with table-topped hills all round us. Later we rose on to tablelands, with numerous clay pans full of water, on which were great numbers of Avocets, accompanied by their young in grey plumage. We halted for the mid-day meal in the sand hills, which were covered with wild flowers and flowering shrubs. Again we passed on to stony tablelands, where Australian Dotterels were numerous. Around some of the clay pans a beautiful blue *Aster* was growing and blossoming in profusion.

We reached the Ten-Mile Bore at 4.30 p.m., and went into camp, for our conveyance had to be repaired again. Brown Hawks, Orange-fronted Chats, Yellow-rumped Tits, Black-breasted Larks, Crows and Black-throated Butcher Birds were seen during the day. The temperature fell that night to 36 deg.

We were on the move before daylight next day, and the steam produced by the hot water escaping from the bore rose in a thick cloud all around. We made good progress next day, and found the sandhill country as well as the tablelands ablaze with wild flowers and bright green grasses and herbage. Many of these plants, which were not even budding at the time of our outward journey, were now in full bloom or going off. The great masses of many-coloured Swainsonias or Pea plants were very lovely. Birds were numerous, and included Caterpillar-eaters, Black-faced Wood-Swallows, Tricoloured Chats, Yellow-throated Miners, Mrs. Morgan's Parrots, Pipits, Red-browed Pardalotes, Herons, and Ducks of several species. After lunch, a fresh team was harnessed up, and we were in at Macumba Station at 4 p.m., and received a warm and hospitable welcome from Mrs. Kempe and her sister.

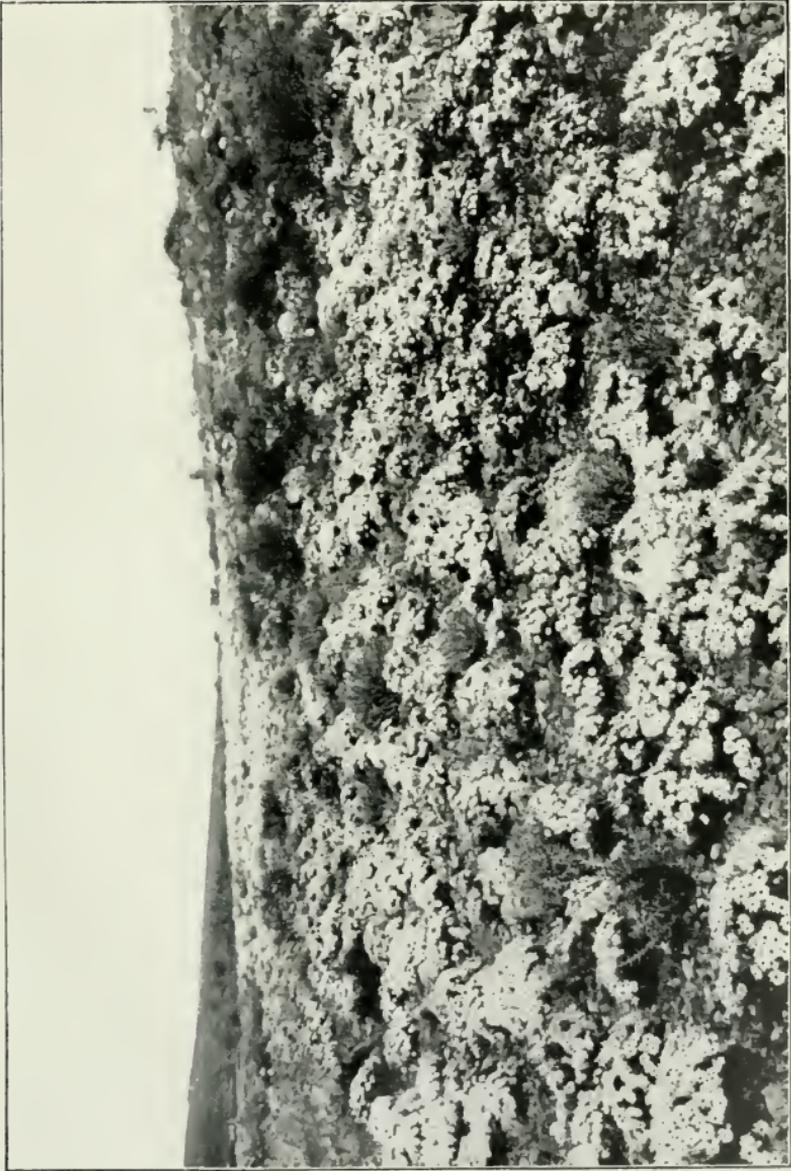
We rested on Sunday, 24th, and the next day Mr. Kempe motored us in to Oodnadatta to catch the fortnightly train for Adelaide and home.

Our special rail car being ready for us at the head of the line, we went to bed on board, and at an early hour next morning the train moved off from Oodnadatta. The three days' rail trip came to an end at Adelaide, and so did a very wonderful trip. To travel with Sir Edgeworth David was a treat in itself, for never have I met such a lovable nature or more courteous English gentleman, and to see the central regions at that time was to see them as they have never been seen before. Unfortunately this will not last long for hot winds and dust-storms have already (at the time of writing) set in, and it is only the matter of a few weeks when all the annuals will have become dried up and blown away, and a condition of mild drought will prevail, perhaps for a considerable time.

An appendix follows this in the shape of a list of the birds identified on the expedition. The nomenclature is that of the practically agreed on second edition of the Official Check-list:—

NOTES CONCERNING THE BIRDS IDENTIFIED BY  
THE SIR EDGEWORTH DAVID, PROF. HOWCHIN AND  
S. A. WHITE EXPEDITION INTO CENTRAL AUS-  
TRALIA, JULY, 1921.

1. *Dramaius novæ-hollandiæ*. Emu.—Only one seen during the trip. Seeing the large tract of country covered, this is remarkable.
2. *Turnix velox*. Little Quail.—Numerous in many districts.
3. *Geopelia cuneata*. Diamond Dove.—Numerous along all the creeks.
4. *Phaps chalcoptera*. Bronze-winged Pigeon.—Only an occasional bird seen.



Daisies in a good season in Central Australia.

Photo. by Capt. S. A. White, C.M.B.O.U.



5. *Ocyphaps lophotes*. Crested Pigeon.—Very numerous over all the country traversed. We often flushed these birds, and they flew to the first branch. Raising their tails, they looked as if they would over-balance. They depressed their tails to regain their balance, and raised their crests.

6. *Microtribonyx ventralis*. Black-tailed Native-Hen.—A small party or two of these birds was seen. No doubt, owing to the good season they are widely distributed.

7. *Gallinula tenebrosa*. Black Moor-Hen.—These birds were seen at Dalhousie Springs, and when disturbed took to the water to escape to the other side, and disappear in the reeds and rushes. Not common.

8. *Fulica australis*. Australian Coot.—Observed on the springs at Dalhousie.

9. *Podiceps ruficollis*. Black-throated Grebe. Seen on many of the waterholes both in South Australia and Northern Territory.

10. *Lobibyx novæ-hollandiæ*. Spur-winged Plover. Not a plentiful bird. A few pairs seen out on the plains.

11. *Zonifer tricolor*. Black-breasted Plover.—More numerous than the preceding species; still not plentiful. A pair was seen here and there on the trip, and by their actions in chasing crows and other birds, one could safely say that they were breeding.

12. *Charadrius melanops*. Black-fronted Dotterels.—A plentiful bird throughout the country. It is found along the margins of all waterholes and clay pans, and its sharp and distinctive call was heard throughout the night. This bird should not be placed in the same genus as the Red-capped Dotterel (*C. ruficapillus*), for it is a distinctive bird in every way.

13. *Recurvirostra novæ-hollandiæ*. Red-necked Avocet.—These birds were in numbers on the Tableland claypans, where they had rested this year; nearly every pair had three young ones with them. The young were feathered, and all the upper surface was of a light mottled grey, and the under surface was white. At first glance one would think that many Sharp-tailed Stints were dodging about amongst the Avocets. The young birds kept up a low but continuous call as they followed the parent birds about in the shallow water; they seemed to be calling all the time except when a parent bird was placing food in their mouths, and then smothered calls would be heard.

14. *Burhinus grillarius*. Southern Stone Plover.—These birds were widely distributed through the central regions, and there was hardly a night that they were not heard.

15. *Eupodotis australis*. Australian Bustard.—Not plentiful by any means; only an odd bird was seen here and there. A party of five was seen from the railway train just before we reached William Creek. A fine old male bird kept up his strange, harsh, grinding cry for the greater part of two nights during our outward camp and return journey at Bogy Flat—an indication that they were breeding.

16. *Notophox novæ-hollandiæ*. White-fronted Heron.—A common bird all through the country wherever there was water. It seemed to be getting much food from the rapidly drying claypans.

17. *Notophox pacifica*. White-necked Heron.—This bird was found all over the country visited, in ones and twos along the creeks; often it perched on the trees overhanging the waterholes.

18. *Nycticorax caledonicus*. Australian Night-Heron.—Often met with roosting in the big gum trees near the river banks, and heard at night when in search of food.

19. *Chenonetta jubata*. Tennant's Maned Goose.—Very plentiful. There was not a single waterhole of any size that did not have these

birds upon it, and at night their strange calls came from every point as they were passing from one water to another. We did not see any signs of breeding, but they may have started early in the year, when good rains fell.

20. *Casarca tadornoides*. Mountain Duck.—A few of these birds were seen at the Dalhousie Mound Springs.

21. *Anas superciliosa*. Black Duck.—Fairly numerous, and there were many young birds.

22. *Virago gibberifrons*. Grey Teal.—This bird was very plentiful both on the creeks and out on large claypans.

23. *Malacorhynchus membranaceus*. Pink-eared Duck.—Not very numerous. One bird observed at a crab hole must have had a nest in the grass close by, which it stuck to while the spare horses were round, and when they dispersed feeding, it slipped into the water and swam unconcernedly about within a few feet of the writer.

24. *Phalacrocorax carbo*. Large Black Cormorant.—A few of these birds were seen near the large waterholes along the creeks.

25. *Pelecanus conspicillatus*. Pelican.—Several small lots of these fine birds were seen at different waters.

26. *Uroaetus audax*. Wedge-tailed Eagle.—This bird is without doubt becoming fewer in numbers as time goes on. Poison baits are, no doubt, responsible, and it is to be greatly regretted, for they play a great part in the balance of nature. The blow-fly pest shows this.

27. *Hieractus pennatus*. Little Eagle.—Very few of these charming birds were seen. It may be that they are widely distributed this good season.

28. *Haliastur sphenurus*. Whistling Eagle.—A common bird, breeding in the large gums all along the creeks.

29. *Milvus migrans*. Allied Kite.—Plentiful along the creeks, where they were breeding.

30. *Falco hypoleucus*. Grey Falcon.—A few pairs were met with during the trip.

31. *Falco longipennis*. Little Falcon.—Quite a common bird, paying a good deal of attention to young Shell Parrots.

32. *Ieracidea berigora*. Brown Hawk.—A common bird, but not nearly so much so as I have seen it upon former trips. The bird's harsh note draws one's attention to it. Many nests were seen along the creeks.

33. *Cerchneis cenchroides*. Kestrel.—Very plentiful all through the country, nesting in the big grass along the creeks. One pair was mating in a discarded eagle's nest.

34. *Spiloglaux boobook*. Boobook Owl.—Often met with both in hollows and in the leafy branches of the gums along the creeks. They were often heard calling at night. This is a good sub-species, the coloration being very distinctive.

35. *Tyto alba*. Screech Owl.—These birds were often heard at night, and not having seen *T. novae-hollandiae* upon former expeditions, I believe *alba* to be the only species found there.

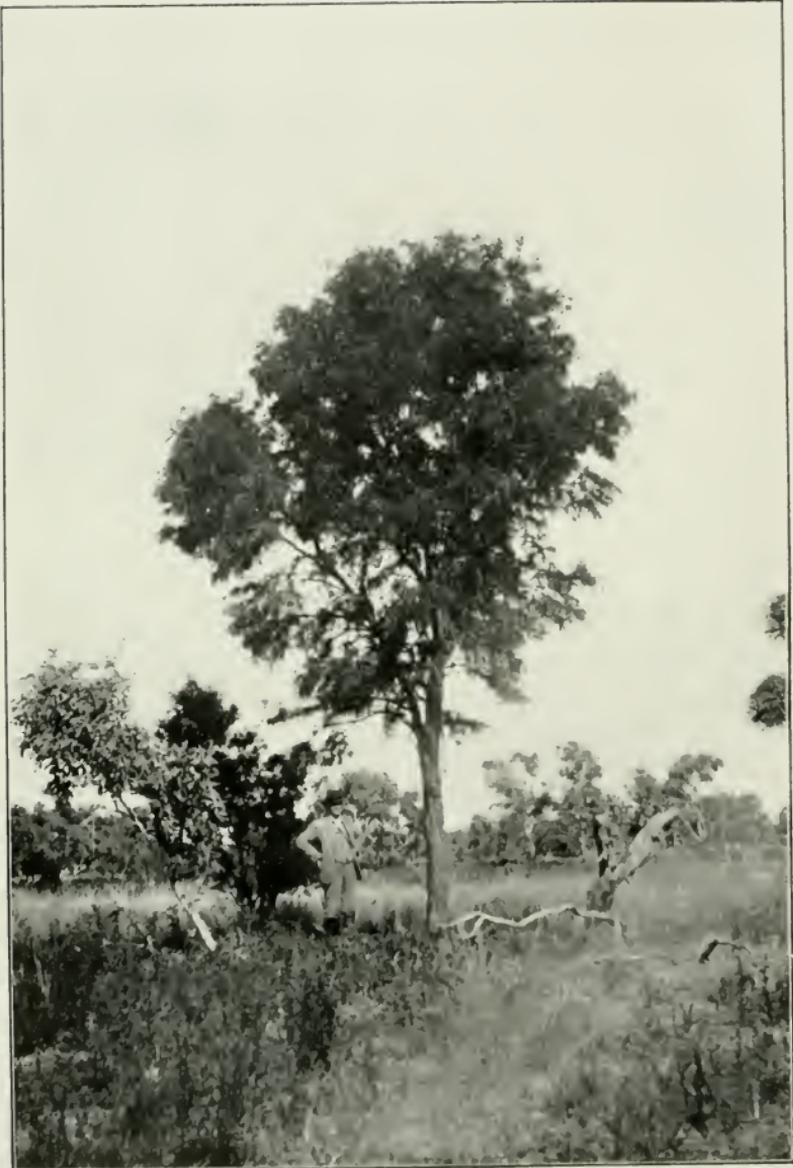
36. *Cacatua leadbeateri*. Pink Cockatoo.—A flock of these beautiful birds was seen at Crown Point, the only place they were observed.

37. *Cacatua roseicapilla*. Rose-breasted Cockatoo.—These birds were numerous, and were seen in large parties feeding upon the ground; they had evidently nested earlier in the season.

38. *Barnardius zonarius myrtae*. Mrs. Morgan's Parrot.—This is a very handsome bird, and the writer described it as new to science after his 1914 expedition. The bird is found in numbers all along the timbered creeks, and is very noisy; chattering away to one another so like the other members of the genus.

39. *Psephotus varius*. Many-coloured Parrot.—Often seen in the





Nesting site of the Red-breasted Babbler (*Pomatostomus rubeculus*),  
Central Australia.

Photo. by Capt. S. A. White, C.M.B.O.U.

mulga scrub, but not nearly so numerous as on former visits to this country. They feed a lot on the seed of the mulga (*Acacia anura*).

40. *Melopsittacus undulatus*. Warbling Grass Parrot.—These lovely little birds were often seen in large flocks both in South Australia and the Northern Territory.

41. *Podargus strigoides*. Tawny Frogmouth.—An odd bird or two seen in the mulga; not numerous.

42. *Halcyon pyrrhopygius*. Red-backed Kingfisher.—These birds were very numerous, and their quaint call could be heard in several places at the one time. It is the only Kingfisher found in this country.

43. *Merops ornatus*. Rainbow Bird.—This bird, so wrongly called the Bee-eater, was often seen along our route; its beautiful plumage and elegant flight attracted much attention.

44. *Cuculus pallidus*. Pallid Cuckoo.—These birds were very numerous all through the country; their strange, scale-like call was heard all day long, and they were often seen being mobbed by small birds. It was not uncommon to hear the birds call at night.

45. *Chalcites basalis*. Narrow-billed Bronze Cuckoo.—Only one specimen came under observation, but there is little doubt that the birds are widely distributed, but are silent at times.

46. *Hirundo neoxena*. Welcome Swallow.—Many birds were seen round stations.

47. *Lagenoplastes ariel*. Fairy Martin.—Found throughout the country; their strange retort-shaped nests were seen attached to the sides of cliffs and overhanging rocks.

48. *Petroica goodenovii*. Red-capped Robin.—This beautiful little bird is distributed all over the Central country, and is found along the watercourses as well as out in the sombre mulga scrubs. Often one would not be aware of its presence were it not for the flash of colour as the bird darts to the ground to pick up an insect.

49. *Melanodryas cucullata*. Hooded Robin.—These birds were not numerous; a pair or two were seen in the mulga scrub.

50. *Smicronis brevirostris mathewsi*. Central Australian Tree-Tit.—The writer described this little bird after the 1914 expedition. It was found to be quite numerous all along the gum creeks.

51. *Oreoica gutturalis*. Bell Bird.—A common bird all through this country, and their wonderful ventriloquial note was often heard.

52. *Pachycephala rufiventris maudeae*. Central Australian Rufous-breasted Thickhead.—The writer described this bird as new to science after the 1914 expedition. It is a very consistent variety all through the centre of the continent. We did not find it numerous upon this visit.

53. *Leucocirca tricolor*. Black-and-White Fantail.—This wonderful little bird is found everywhere, and is as confident as in a country town.

54. *Pteropodocys maxima*. Ground Cuckoo-Shrike.—Very plentiful all along our route, and parties of ten or twelve could often be seen hopping about on the ground in search of grubs.

55. *Graucalus novæ-hollandiæ*. Black-faced Cuckoo-Shrike.—A fair number seen, but not nearly so numerous as the preceding species.

56. *Campephaga tricolor*. White-shouldered Caterpillar-eater.—These birds were numerous, and had nested but a short time before.

57. *Cinclosoma cinnamomeum*. Cinnamon Ground-Bird.—An occasional pair was seen, but they were not numerous.

58. *Pomatostomus superciliosus*. White-browed Babbler.—During the first part of the journey they were numerous, but after we got well into the Territory they were seldom seen.

59. *Pomatostomus rubeculus*. Red-breasted Babbler.—This bird

takes the place of the White-browed Babbler on the Finke, where large parties were at times seen moving along in "follow the leader" fashion, mobbing together and chattering in a wonderful way.

60. *Cincloramphus cruralis*. Brown Song Lark.—Very plentiful all through the country, and we flushed them from the herbage many times during the day to go soaring up aloft and singing their quaint refrain.

61. *Ptenoedus mathewsi*. Rufous Song-Lark.—The lovely song of this bird was often heard.

62. *Ephthianura tricolor*. Tricoloured Chat.—Very numerous in places, mostly in the open scrub country.

63. *Ephthianura aurifrons*. Orange-fronted Chat.—This bird was plentiful, but had not the range of the tricoloured bird. It was in large flocks.

64. *Ashbyia lovensis*. Desert-Chat.—Met with in many places on the stony tablelands, but not very numerous.

65. *Acanthiza uropygialis*. Chestnut-rumped Tit-Warbler.—A small party met with south of Charlotte Waters.

66. *Malurus leuconotus*. White-winged Wren.—Met with on the saltbush and cotton-bush country.

67. *Malurus assimilis*. Purple-backed Wren.—Around the Mound Springs at Dalhousie was the only locality where this bird was found.

68. *Artamus cinereus*. Black-faced Wood-Swallow.—Found all through the country from the start to the finish of the journey.

69. *Colluricincla rufiventris*. Buff-bellied Shrike-Thrush.—A fairly common bird along the watercourses.

70. *Grallina cyanoleuca*. Magpie-Lark.—Observed in many places near creeks, and some old mud nests were seen.

71. *Aphelocephala leucopsis whitei*. Central Australian White-face.—Numbers of these birds were seen along our route. They have a very much more consistent rufous coloration on upper surface and flanks in comparison with *A. leucopsis*.

72. *Dicaeum hirundinaceum*. Mistletoe Bird.—Several of these little birds were seen in the mistletoe (*Loranthus*) bushes.

73. *Pardalotus rubricatus*. Red-browed Pardalote.—Fairly plentiful, but always found in the red gums on the watercourses.

74. *Certhionyx variegatus*. Pied Honey-eater.—A few birds seen in the *Erimophila* bushes east of Blood's Creek.

75. *Meliphaga sonora*. Singing Honey-eater.—This bird is found all over the Central regions, and shows little variation in plumage.

76. *Myzantha flavigula*. Yellow-throated Miner.—A common bird all along the timbered creeks.

77. *Acanthagenys rufogularis*. Spiny-cheeked Honey-eater.—One of the most widely distributed birds of that country, and its strange gurgling note is often heard through the hottest hours of the day. It darts in and out amongst the flowering *Erimophila* bushes in a most erratic manner.

78. *Anthus australis*. Pipit.—Found all along our route on the tableland country as well as the creek flats, but they were not at all plentiful anywhere.

79. *Mirafrja javanica*. Bush-Lark.—One or two birds were flushed from the herbage while we were driving through it.

80. *Taniopygia castanotis*. Chestnut-eared Finch.—A very numerous bird; some flocks seen must have contained thousands of birds.

81. *Corvus coronoides*. Australian Crow.—Plentiful all through the country.

82. *Cracticus nigrogularis*. Black-throated Butcher-Bird.—Plentiful all through the interior. This bird has a most charming song.

83. *Cracticus torquatus*. Collared Butcher-Bird.—Not a common bird; a few seen in the mulga scrub.





Haunt of Lyre-Bird.

Photo. by Tom Tregellas, R.A.O.U.

## Further Notes on the Lyre-Bird (*Menura superba*)

By TOM TREGELLAS, R.A.O.U., "Cosmos," Camberwell,  
Vic.

With the idea of adding to our limited knowledge of the home life of the Lyre-Bird (*Menura superba*), I started out at Easter, 1920, on a series of investigation. This series lasted, with but few intervals, right through the winter and spring months, terminating in October with the desertion of the nests by the young.

In early April the male began to prepare the mounds for his display. Often fresh mounds were made, but sometimes the old ones were refurbished up and made usable. Nearly all were connected, one with the other, by a path or runaway. The mounds averaging 3 ft. 6 in. in diameter, and 6 in. in height, were generally placed in the midst of dense scrub or bracken, and were kept in a state of tilth. In no instance was a mound discovered in open country. All were incapable of approach from any direction without the presence of the intruder becoming known, and I soon found that to see the male at all required much patient stalking. One object of this persistent stalking was to discover on which mound the male called, as I wished to photograph him at his devotions. I had a fair idea of the task ahead, as I had previously seen the birds on the mounds, and had watched them for a quarter of an hour at a time, but without a camera.

When locating the mounds in April, I made the startling discovery that one male bird used no less than eight different mounds during the day, stopping a short time on each. The possibility of picturing him on any particular mound was, therefore, exceedingly remote. The first day I focussed upon a mound well used. After covering up the camera and leading the long tube to a log, I lay hidden, and waited a matter of five hours, but the bird did not come near. He went down the gully, and up the opposite range, where he had other mounds in the bracken. Rain then came on, and I hid the camera in a hollow log, where it remained for a night and a day. This was but a prelude to many weeks of anxious waiting, and, though I often worked "from dewy morn to dusky eve," and the birds called most tantalisingly from their mounds, it was always from some mound other than the one where I was waiting.

Till the end of August (when the love-making was over, and no inducement offered to further parade), I worked unceasingly. Then the bracken began to show through the mounds, and the season for dancing was over. I had failed in one purpose, but was not disheartened.

On June 26th, the first Sassafras flower was seen, and, as this plant flowers only when the Lyre-Birds nest, the sight to us was

welcome. This day was also remarkable because we found a dead male Lyre-Bird in the gully. This was the first time in all my wanderings that I had come across a dead bird. He had evidently not been killed by a fox or other carnivorous animal, as he lay where he had fallen, on a wombat or wallaby pad, with his legs and tail out behind him, and not a bone broken. Close at hand a tall mountain ash had fallen, and I surmised that the tree in falling had caused his death. This made things unequal in the gully, as there was now an odd female. It set me wondering how Nature would preserve her balance. Once before we saw the same thing when a companion and I watched a male and two females; one female endeavouring to drive away the other. The male appeared quite indifferent as to how it ended. He knew that the victor would be his mate.

After finding the dead bird, we heard a male calling up the hill, and search revealed a nest partly built. It was raised slightly above the creek, in a fine position for photographing. On July 16th I found that the nest contained an egg, its coldness showing that as yet it had not been sat upon. The male was calling splendidly, not far away, in an effort to entice me away from the nest. Another nest was also found, half built, close to the water on the edge of the creek. I had a most interesting quarter of an hour's interview with a splendid male perched on a fallen limb about six feet from the ground. He never once elevated his tail during the interview, but allowed it to hang down in the manner of a pheasant. I took out a whistle, and mocked his calling, but he did not acknowledge it. Then he jumped down, and fed past where I was hidden, *with his tail partly erect*, and started at my call as he passed. Three males, within a space of 200 yards, were calling here at the same time. This was courting disaster, as overlapping of territory is not permitted in these mountain gullies.

I narrowly missed witnessing, some years ago, a terrible fight between rival males on a mound in one of these lonely places. Hearing sounds betokening battle, I hurried across to a well-used mound previously located, but as I neared the spot the turmoil ceased. In spite of my care, the birds must have heard me through the din and arranged an armistice for the day. The soil of the mound was torn up and scattered, the surrounding bracken was broken and covered with feather fragments, and the whole locality showed that a battle royal had been fought.

On the morning of July 17th, I awoke to find a white world outside. The Whip-Birds were calling vociferously, and so were the Lyre-Birds, but a search failed to reveal anything new in the way of nests. About mid-day, however, I had an interview with a male bird. He called continuously, and, as in the previous case, did not once elevate his tail while calling. It hung straight down all the time, the feathers even clinging together. Again I whistled, to no purpose, and it was only when I called and shouted loudly that he deigned to notice. He then jumped from his perch.



Dancing-mound of Lyre-Bird.

Photo. by Tom Tregellas, R.A.O.U



An hour later I had a splendid view of a male on his mound. He was not 10 yards from me, and for a quarter of an hour regaled me with an assortment of mimicry which I have never heard equalled; *nor did he once elevate his tail.* Not till he moved off did he alter its position, and then it was spread fan-wise behind, straight out, parallel with the ground; the wide feathers at the outside. Many new mounds were built in this locality, one of them nearly 10 feet in diameter, and several inches in height.

On August 1st, I took two visitors to the nest containing the egg. We found the egg cold, and apparently deserted. The mounds in the vicinity had a neglected look, but whilst searching round about we had the good fortune to find a nest we had passed close by on two previous visits. This nest was close to where we picked up the dead bird previously. When we almost stumbled over the nest, the hen flew out with a piercing scream, which told us that the nest contained a well-incubated egg. Investigation proved the truth of our theory, as the egg was shiny, hot and dry. The nest was away from the creek in a position which no one but a Lyre-Bird would have chosen. This particular nest was destined to be much in our thoughts during the next few weeks, as the hen bird was the most docile and tractable of all we interviewed, the nest was in a good position in regard to light and surroundings, and the young one of a most lovable and trusting disposition.

At dawn on August 8th we were out, as it was a day of great expectations. The Lyre-Birds were calling well down the gully, and when we neared the site of the first nest we received a pleasant surprise when, stalking a calling male, we walked right on to another nest containing a cold egg, making the third in the gully. This nest was a hundred yards from the creek, well up the hill, in a position where we had previously searched.

The morning of August 22nd broke with a howling gale, but we shouldered our cameras. At No. 1 nest we found a chick about a week old and the mother close at hand. The baby was a fluffy mass of soft grey down, soft and smooth and warm. Taking his photo, we moved on to nest No. 2. Nearing this, the hen flew out with a rush, and we found the egg very hot. This was luck, as we thought the nest deserted on account of our frequent visits. Then on to No. 3 nest, in which the egg was cold. Photographing the nest, we conducted a strenuous search in the upper reaches of the gully, and were delighted when, passing the nest on our return, the hen flew out, showing that she intended to sit.

We went back to the nest that contained the downy chick. The little fellow on being touched emitted a shriek that brought his mother post haste, and she gave us a most interesting half-hour. We took several snaps of the birds, and had a most

enjoyable time. This was a memorable day in our annals of Lyre-Birding, and will remain with us through the coming years.

August 29th found us again in company, and the birds by now were beginning to know us at sight. At nest No. 1 the young one was doing well. After exposing all our plates and films, we spent two hours adding to our knowledge of the lives and habits of this charming bird of the solitudes, and left regretfully at the end of the programme. At the second nest, we found the egg hatched and a dear little chick of three days. We regretted that we had no plates remaining. The third nest still held a warm egg, which was hopeful, as on more than one occasion we had found it cold.

I might here mention that *it appears unnecessary for the hen bird to sit continuously.* We have found the egg intermittently hot and cold, yet the young bird has safely emerged. Another item worth mentioning is that, after the egg is laid, the hen bird often leaves it for a week or two before beginning the duties of incubation. This, I feel sure, has led many observers to say that the period of incubation covers eight weeks. We have found 40 days to be the average time of sitting.

On September 5th the first nest (with the three weeks' old chick) was worked for a while. We took many photographs, but the old bird gave much trouble. At No. 2 nest (10 days' chick) we photographed the chick, but the adult, in spite of the clamour of the young, refrained from coming near. No. 3 nest contained a bird about three days old. It was very quiet, emitting at times a faint whistle, and no amount of calling would bring the mother in sight.

On September 12th, with the weather very bad, we took 16 snaps of the young and old birds at No. 1 nest. This young bird was then one month old, and getting his quills well out. The light was bad, rain fell steadily, and leeches were very troublesome. At No. 2 nest (3 weeks' chick) the mother was flying and jumping from log and fern in a disconcerting manner, cannoning from fern trunk to fern trunk at all conceivable angles, even alighting for a moment on the camera. As it rained hard no pictures were taken. At No. 3 nest (10 days' young) everything was quiet. The young one scarcely spoke, but the mother walked about the nest, saying what she thought of us.

A quiet night and steady soaking rain made the going bad on September 19. We found the five weeks' chick tame and docile, allowing us to handle him, and preening his feathers whilst being caressed. He had long wing feathers, but only a stump of a tail, which he kept elevating and depressing for practice. Mud on his feet showed that he had already been out of the nest. On taking him from the nest he seemed well pleased, and ran around to show his paces. He always came





Female Lyre-Bird approaching nest.

back and sat amongst us as if he liked company, and his mother was just as companionable. We took 24 photos between us. At No. 2 nest (four weeks' young) the mother, as usual, was most active, and the chick almost unapproachable. At No. 3 nest (2½ weeks' young) the mother scratched around us, and demonstrated how food is obtained, and the method in which it is conveyed to the young. The throat of the female is soft and pliant, as is the throat of a cormorant. *After collecting beetles, worms, crustaceans and other materials until her gular pouch was full, she put her head in the nest and fed the young. Sometimes she collected so much that she was unable to articulate properly and emitted only a gurgling note.* Her scratching for food was a revelation. In these mountain gullies much foraging and turning over of rubbish is necessary in the daily quest for food. In doing this both legs are used. Standing on one leg, she would scratch all around right and left, using each foot as occasion demanded. Anything dainty was at once snapped up and conveyed to the gular pouch, which when fully distended hung down like that of the musk duck.

An amusing instance of why the Pilot-Bird is so called was seen. While we were watching her she was accompanied by a Pilot-Bird, which snapped up unconsidered trifles unearthed in the scratching. At times the Lyre-Bird scolded her in no measured terms. Several times the Pilot-Bird had to dodge the vigorous peck from the Lyre-Bird. I had previously seen the Pilot-Bird in the company of the Lyre-Bird, but never in such close attendance.

The legs and feet of the Lyre-Bird are tremendously strong. As if to demonstrate their power one day, she easily cast behind her a water-soddened and moss-covered piece of wood three feet long and as thick as my arm. She frequently clutched masses of bark and sticks in her strong claws and put them aside without effort. She stripped sections of moss and debris from fallen logs, cleaned out crevices with the long central claw (which has a nail 1½ inches in length and as sharp as a needle), and showed us how wonderfully adapted it is for the life she leads. The young in the nest also uses its feet in defence, striking out vigorously when a hand is inserted, and on more than one occasion sinking its claws into the flesh.

On September 26th, at No. 1 nest, we found, as we expected, that the young one, five weeks old, had left. At No. 2 nest, however, the young bird, also five weeks old, was still in possession. The mother of this chick was as restless as ever, and we could do nothing with her. When we attempted to remove the young bird from the nest, he fought like a demon. At No. 3 nest, the young bird of 3½ weeks was as quiet as ever, and the mother exceedingly so. Here we took many snaps, as we knew our time was now brief.

When sitting on a wet log near the nest changing plates, the mother stood alongside, and from a distance of three feet used

most endearing expressions, the while gazing earnestly with those lovely large brown eyes, and we told her we were friends and intended no harm to her or hers. This assurance seemed to comfort her, as she resumed her scratching. What impressed us forcibly was the fact that we were holding converse with and taking photos of one of the shyest of God's creatures, and yet she trusted us implicitly.

On October 3rd I got a surprise when taking a short cut to the nests. In a tree-fern fifteen feet up was what appeared to be an old nest; a "Wattle Day" button pinned on the trunk signified that I had climbed it earlier in the season. The nest showed signs of renovation, and a squeak told me that it was occupied. Judge of my surprise when I drew out a baby Lyre about four days old. This was indeed something new, as I had never before found a young one of that age so late in the season. There being no sign of the hen bird about, I took a picture of the nest. At No. 2 nest the mother was as noisy and restless as before, and we took only one snap of her. The young one, now six weeks old, was also imbued with the same spirit, striking out when a hand was placed near the nest and screeching loudly.

This nest was about 3 feet above a blackwood butt, and not easy of access to a young bird. I think for that reason his mother had delayed his debut. Although he had not been out of the nest, he seemed glad enough when we placed him on the ground. He began calling out whilst running, and could fly fairly well, having short rounded wings. After photographing him we caught him to replace him in the nest. To this he strenuously objected. His taste of liberty had whetted his appetite for more, and, by the time we had him safely in, there was not much resemblance to a nest left. On account of his belligerent tendencies, his lordly mien, and greater size, we felt sure that this young bird was a male.

No. 3 nest still contained the young bird. He was now 4½ weeks old, but was just as quiet as the last one was rowdy. The mother also was just as friendly, watching our operations with an absorbing interest. As if to repay us for the honor conferred on her, she treated us to a unique performance. Looking straight in our faces she carolled like a magpie, laughed like a Kookaburra, barked like a fox terrier, yelped like a fox, cackled like a hen, "tu-whoood" like a young Podargus, whistled like a Pilot-Bird, shrieked like a Bell-Magpie (*Strepera*), and wailed like a Chough. We were enraptured, enthralled, and there she stood till tears came into our eyes with very joy. She was majestic, sublime, and proved that it is not only the male that mocks.

October 17th, 1920, I shall never forget, as it was the last occasion on which we called at the nests. It was "Good-bye" to the Lyre-Birds and all that it meant to us. The morning came in cool, fragrant, and bracing, and we were early astir. Reaching the last nest discovered, I found that the little one

was dead in the nest, and a new growth of fronds hemmed it in. Had the little one been alive, no fronds would have shown through the nest, as the birds keep them bitten back as long as the nest is inhabited. No. 2 was also untenanted, as we expected. From No. 3 the young one bounded as we approached and ran into the forest with his mother. He was  $5\frac{1}{2}$  weeks old when he left home. We searched for an hour and found the young one hidden under a log, though the mother lied glibly in telling us he had gone up the hill. After placing him in the nest we took photographs of him there and in the hand. As it was the last opportunity we would have, we placed a ring on his leg by way of remembrance.

#### NOTES ON THE ROOSTING HABITS.

Although we had seen the birds on more than one occasion preparing to go to roost, and had heard a good deal about their habits when so doing, it was not until the evening of March 26th, 1921, that we had a practical demonstration of the manner in which they ascend to their roosting places in the trees.

Coming down the track through the Sherbrooke forest late that evening, and waiting about the Falls to see the birds feeding around the tables at the picnic grounds, we were granted a most wonderful experience. We saw no birds feeding, but just as we were leaving the locality a slight noise to our left betokened something moving, and we were delighted to see three or four birds in the act of ascending. Using both legs and wings, they jumped from the ground to the dogwood scrub, and when they could get no higher in that they crossed to the blackwoods and repeated the operation, jumping and flapping from limb to limb and from side to side, as occasion demanded, till they were amongst the topmost branches. Here one or two of them stayed, and the others flew across to a big mountain ash and ascended still higher, till they were fully as high again as those left in the blackwood. These latter were about 60 feet from the ground.

It was an easy matter for them to ascend in this manner, and a young man selling fruit at the picnic ground told me he often saw them at the same spot, and one night counted seventeen. They were not at all perturbed at our presence, and showed not the least alarm. From many of the big gums in the vicinity others called, using a call resembling the first two bars of the Kookaburra chorus, and these calls and replies were repeated till darkness fell.

The next morning (March 27th, 1921) I went up alone, and a short distance along the track saw a fine male scratching for his breakfast. I approached carefully and secreted myself. A most profitable quarter of an hour was then spent in watching his movements. Later I saw a chance, and flung over a small stone, which caused him to dart away instantly, and use language unprintable. After spending the day in the forest, I returned

to the Falls in the evening, and, in company of two ladies from the Lodge, watched two more Lyre-Birds going to roost in the blackwoods.

On May 1st, 1921, I took (by request) a small party of ladies and gentlemen from Belgrave, and in the evening had a fine view of a pair of the birds scratching and feeding around us. As darkness came on we saw several going to roost; and, as one of the ladies truly remarked, "It was worth going miles to see." My diary reports this as "the end of a perfect day."

On June 25th, 1921, I took an American visitor and Mr. G. Dyer with me, and this proved to be the most eventful and wonderful of all the trips. Reaching the Falls at 4.30, we had lunch and waited. About dusk a male and two females came along, and fed past us; and, best of all, we saw fifteen of the birds going to roost in the trees. It was awe-inspiring, and we could scarce believe our eyes. Not one of them roosted less than 100 feet from the ground, and several of them were every inch of 150 feet.

We counted fifteen birds, and there were many more calling that we could not see. Taking into consideration those we saw and those we heard calling all up and down the gully, we calculated that there are at present fully 40 birds in the Sherbrooke forest area, and the most remarkable thing about the visit was that, with one exception, all the birds seen were females.

#### NOTES ON THE NESTING OF THE BIRDS—UP TO DATE IN 1921.

On June 6th I found the mounds being used, but no sign of anything new in the way of nests until the 19th, when I found a beautifully constructed nest on a broken tree-fern in the creek. This nest was all complete and ready for the egg, and must have been started at least three weeks before the date of my find. This was No. 1 nest.

On the 26th a nest was started on the top of a stump some yards from the creek, just a ring of rough sticks. No. 2 nest.—On July 2nd I found this nest very much advanced, being nearly covered by the dome and having a platform erected in front. About a mile further up the creek I found another nest nearly ready in the heart of a tree-fern 15 feet high. This was No. 3 nest. Then a quarter of a mile further on I came across the foundation of another nest resting on the mud about a foot from the water. The males this day were calling splendidly, and a fine view of one of them on a log was obtained. He elevated his tail once only, and that for a second or two.

My diary for the 10th reports "No eggs yet." There was much rain on the hills, and I was forced to leave my camera in a hollow log "to be called for." On July 17th I called at No. 1 nest and saw feathers showing which I knew meant an egg inside. This egg was a very pale one, larger than usual, and mottled with few brownish and blackish spots. *This pair of*



Nest of Lyre-Bird.

Photo. by Tom Tregellas, R.A.O.U.



*birds always have the light-coloured egg.* No. 2 nest was complete, but still empty. No. 3 nest was finished, and now contained feathers and a small egg of dark purple with almost imperceptible blackish spots and blotches. No. 4 nest was greatly enlarged from my previous visit, and beginning to assume rotundity.

On the 20th I examined another gully, and though a female was giving that peculiar "Call-oh, call-oh," which denotes proximity to a nest, I was unsuccessful. On the 22nd I called at No. 1 nest, and saw the hen's head protruding, so stole quietly away. The male warned her of my approach, but she stayed in the nest. I worked most of the day clearing the track for the expected visit of the Earl and Countess of Stradbroke, and the next day heard that they were coming for the week-end.

The 24th was a memorable day in the annals of Selby, as His Excellency the Governor and his lady arrived, and were conducted to the haunts of the Lyre-Bird in the mountain ranges.

It was a beautiful day for the trip, as the sun shone brightly and there was an absence of rain and wind. Everything turned out exactly as I promised them. Not only did they see the dancing-mounds, nests, and eggs, but the males were calling beautifully in the vicinity. A female most obligingly perched on an overhead limb and regaled them with a remarkable series of calls. After picking a lovely bunch of Sassafras the visitors left for home, highly delighted with the result of the outing.

On the 27th the egg in No. 1 nest was cold, and evidently had not been sat on that day. I called at the nest again on the 31st, and found the egg lukewarm, the hen bird probably being out feeding. August 5th saw me again on the rounds. At No. 1 and 2 nests the eggs were warm, but that at No. 3 cold and wet. No. 4 was still unfinished and looked as if deserted. On the hillside on my return journey I flushed three feeding females. I brought down the camera, which had been for over a month in the hollow log.

At No. 1 nest on the 10th the bird was sitting, and I didn't disturb her. At No. 2 nest the egg had been sat on, but was nearly cold. On the 11th I searched another gully where I knew a pair of birds was nesting, and found the nest (No. 5) in a tree-fern 15 feet up. It was finished, but contained no egg.

On the 12th I was again in the gully, and saw the hen fly out of No. 1 nest, and the eggs were also warm in No. 2 and No. 3 nests. On the 13th we watched the male of No. 5 nest calling in a big blackwood. On the 14th the egg was warm in No. 1, also in No. 2 and in No. 3, but none of the hens was seen. Then nest No. 6 was located, about 25 feet up on the side of a big mountain-ash, but on account of inaccessibility was not examined. This is a very large nest, and was found after much searching.

## Notes on some Australian Tubinares—Petrels and Albatrosses

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The question of what are Australian Petrels is one that has attracted considerable attention of late years, and the recent papers by Mathews, Macgillivray, and Alexander have done much to consolidate our knowledge of the species that occur in Australian seas. The present notes, giving the observations made on two recent trips to Europe and back, and on shorter trips on the coast, may be worth recording, if only to supplement the experiences of other travellers. Mr. Alexander, in his able article, has well summed up the list of species according to our present knowledge. In some particulars he does not appear to be in complete agreement with Mr. Mathews. I do not profess to speak with authority on these questions, but possibly some of my observations may have some bearing on problems requiring elucidation.

I propose to give first some brief notes of one or two voyages, and later to discuss individual species in the light of observations made at different times.

In January, 1916, I travelled from Durban to Sydney across the Southern Indian Ocean, on a route approximating to that of Dr. Macgillivray. The observations made on the Albatrosses encountered have already been published; unfortunately, I cannot reproduce the records of other species of Petrels seen on this voyage, as the note-book was subsequently lost in transit from England. I regret this the more as it would have been of distinct advantage to have been able to compare my daily list with that of Dr. Macgillivray, particularly as the voyages were made at opposite times of the year. One bird, the Brown Petrel (*Pterodroma cinereus*), seen commonly by Dr. Macgillivray, I failed to identify, though a close look-out was kept. Practically from leaving South Africa the boat was followed by Cape Petrels (*P. quinotialis*), until the level of the Leeuwin was reached and passed. During the following night the course was altered to return to Fremantle, and next morning none was to be seen. About halfway across large numbers were seen of a Petrel that I am fairly confident was the Soft-plumaged Petrel (*Pterodroma mollis*). These were common for two or three days, and then were replaced by the White-headed Petrel (*P. lessoni*), which became equally abundant.

The explanation of the differences in the two records probably lies in the fact that the voyages were made at opposite seasons of the year.

About a month previous to the time (May, 1919) of Dr. Macgillivray's voyage, I was travelling between Colombo and Fre-

mantle, over a course previously traversed on two occasions (September, 1915, March, 1916), without seeing hardly a single Petrel. On this occasion, Petrels became numerous when nearing the Australian coast, and their record may have some bearing on the question of seasonal distribution. We left Colombo on the night of the 14th May, and from thence until the 25th May few birds were seen beyond a few Gannets and Tropic-birds, and near Ceylon a black Shearwater, presumably the Wedge-tailed Shearwater (*Puffinus pacificus*). On the 25th May, we were at noon 2,425 miles from Colombo, and 700 from Fremantle. Petrels were first observed, the species seen was provisionally identified as the Soft-plumaged Petrel (*Pterodroma mollis*). On the 26th similar birds were numerous. The description given in my notes is as follows:—Petrel, brownish grey above, darker on wings, underwings dark, dark bill, white under-surface, dark patch on neck, white cheeks and lores. ?—*P. mollis*. Among these was a bird resembling the general description given above, but the wings had darker markings, much as in a Prion, and the tip of the tail was definitely white; this bird suggested *Halobæna cerulea*—the Blue Petrel. Prions were also seen, as well as one White-headed Petrel (*P. lessoni*), and a black Petrel. 27th May: One White-headed Petrel was seen, and several Petrels resembling those seen yesterday; in one a white tip to the tail was made out; in others no white tip could be seen. An immature specimen of the Wandering Albatross (*Diomedea exulans*) was seen for the first time, as well as two species of Mollyhawks, probably the Black-browed (*D. melanophrys*) and the Yellow-nosed (*D. chlororhynchus*). During the afternoon numerous birds were seen, including (1) Prions, (2) a Petrel resembling those seen previously, but darker on wings, body above dark grey, no white seen on tail, forehead apparently whitish; (3) a small Petrel, black above, white beneath, flies close to water, sometimes sailing, at others with quick fluttering flight. This was provisionally identified as the Allied Petrel (*Puffinus assimilis*). 28th May: Birds seen included Yellow-nosed Albatross, Prions, a black Shearwater (? *P. pacificus*), and a moderately large Petrel, resembling the one seen the previous day. My notes give dark grey back, darker on wings, underwings whitish in some lights, greyish in others, white under-surface with dark patch on the neck, forehead whitish. This bird was not identified. I reproduce the notes to show how much detail can be distinguished without an identification being arrived at. Rottneest Island was sighted that afternoon.

A recent trip in a small steamer from Port Macquarie to Sydney (September 16th, 1920) afforded me an opportunity of studying the species, particularly of Albatrosses that occur on the New South Wales coast during that season of the year. The stretch of coast between Port Macquarie and Seal Rocks was traversed in daylight, and the following species were seen there:—

Black-browed Albatross (*D. melanophrys*)—Common, less numerous south of Crowdy Head; several immature birds seen.

Yellow-nosed Albatross (*D. chlororhynchus*)—Several seen mostly north of Crowdy Head; shy, not approaching very close. Several, apparently this species, appeared to have all black bills; one of these was seen fairly closely.

Grey-headed, or Flat-billed Albatross (*D. chrystoma*)—One seen when opposite Camden Haven Heads. Dark grey head, black bill, with yellow culmen, and lower edge.

Shy, or White-capped Albatross (*D. cautus*)—Two or three specimens seen, mostly immature, with dusky head, discoloured beak, darker at tip. Noted off Camden Haven Heads, and further south. On trip north a fortnight previously, this species was noted off Port Macquarie.

Wandering Albatross (*Diomedea exulans*)—Numerous, especially south of Crowdy Head; several immature, some with black cap only; one or two with very white wings, and only specks of black on tail, the mantle with few markings. Generally about 6 were following the vessel at any one time. As a rule, on this stretch of coast, one Wandering Albatross will be seen during the course of the day.

Wedge-tailed Petrel (*Puffinus pacificus*)—Numerous, especially in the vicinity of Cape Hawke, and Seal Rocks. The identification is presumptive, as no specimens of this bird were obtained.

Fluttering Petrel (*Puffinus garvia*) (*Reinholdia reinholdi byroni*)—Fairly numerous, mostly in company with the last species. Readily distinguished by the white under-surface, and mode of flight.

The records of the above three voyages support the contention that while the range of a species is to a certain extent limited, such range may alter according to the season of the year. Furthermore, it is to be remembered that individual birds may straggle far from their accustomed beat.

I now wish to touch on the species that frequent our Australian seas, in so far as my observations concern them. I do not claim to have identified every species recorded as Australian, nor has it been by any means possible to identify every bird seen. No one is more fully aware from personal experience of the immense difficulties attendant on the identification of Petrels at sea, and I am in accord with Mr. Mathews in his contention that species should not be admitted to the Australian list until specimens are actually procured. At the same time, there is a distinct advantage to be gained in recording observations. If only interest in the subject is stimulated sufficiently, a more careful watch will be kept for specimens, and the occurrence of debatable species ultimately settled. As Mr. Alexander has pointed out, certain species cannot well be mistaken, though sub-species cannot be identified.

Perhaps not unnaturally, as my acquaintance has been most intimate with these birds, I start with the Albatrosses. *Diomedea*

*exulans*, the Wandering Albatross, should be familiar to any one who has voyaged between Sydney and Perth. On the eastern coast my records for this species go as far north as Port Macquarie. I have spent considerable time in studying the variations in plumage, especially of wings and tail. Every gradation has been noted between the brown immature bird with white face, and the white-winged form, in which the markings on the mantle are indistinguishable with a glass at short range, and in which the tail spots are reduced to one or two, or are even quite absent. I cannot say that I have ever been able to distinguish the Snowy (*D. chionopectera*) or the Royal (*D. regia*) from the Wandering (*D. exulans*), though I have been through the range of both the two former species. Nor have I ever noted brown-winged birds, with pure white tails, such as Macgillivray recorded as having been seen south of King George's Sound. I have seen fully as white-winged birds off the New South Wales coast, and in the Bight, as in the Southern Indian Ocean. Much more has yet to be learnt about the plumage changes of these three species, if they are not, as Loomis contends, to be regarded as one. Finality will not be reached by observations at sea, nor even by the examination of casual specimens. Much of the information required can only be obtained at the breeding grounds. Attention might be drawn to the well-known example of the Albatross breeding at the Antipodes. The photos taken in the Sub-Antarctic Islands of New Zealand portray breeding birds still retaining their black cap, and others mating while still brown or mottled. Does this occur in other breeding colonies of *D. exulans*? I must confess to a large amount of ignorance concerning the early plumage change in *D. exulans*. Nestling birds are white, but become brown within the first year. Mr. Barrett's photograph, given on page 245 of *The Emu*, Vol. XV., is interesting as the distribution of the colours of this young Albatross is practically that of an adult *D. exulans*. The name of the species is, however, not given.

Next to the Wanderer, the Black-browed Mollymawk, or Mollyhawk, (*D. melanophrys*), has perhaps the widest range in our seas. The distribution is mainly southern, but on the east coast extends further north in winter; at any rate, I met it fairly commonly in September, as far north as Port Macquarie. In the immature stage, the head, or, at any rate, a mark on the side of the neck, is brown, and the underwings are darker, while the bill is of an indeterminate colour, dirty yellow, with darker tip. I mention these details as it seems possible that specimens in this stage have been mistaken for the Grey-headed Mollymawk (*D. chrysestoma*).

The Shy, or White-capped, Albatross (*D. cauta*) well deserves its name—shy. It seldom approaches a vessel closely, preferring to range wide. The species hardly extends beyond Victorian waters, but I have seen it as far west as the western end of Kangaroo Island, and in the winter as far north as Port Macquarie on the eastern coast. Some seen on this last occasion

were apparently not in full adult plumage; the head was dusky, and the bill discoloured and darker at the tip. It may be that Mathews would refer these birds to *wallaca*, but I see no justification for forming a separate sub-species for New South Wales birds, which, as the evidence available goes to show, only come north from Victoria in the winter.

The Yellow-nosed Albatross (*D. chlororhynchus*) is the commonest species on the east, as on the west coasts. I have frequently seen this species in Sydney Harbour, once opposite the entrance to the Quay. The Wanderer (*D. exulans*) also occurs in the harbour, but more rarely. I recently (27th November, 1920) saw a pair near Fort Denison. On my return trip from Port Macquarie, in September, several specimens of the Yellow-nosed (*D. chlororhynchus*) were noted, and amongst them birds with apparently all black bills. I could not be absolutely positive on this point, though we passed one bird fairly closely. If my observations were correct, the distinction between *D.c. bassi* and *D.c. carteri* fails. The breeding grounds of the Australian and New Zealand birds are unknown, and if the western coast form is distinct from the eastern it is necessary to premise two unknown breeding areas.

The claim of the Grey-headed or Flat-billed Albatross (*D. chrystoma*) to a place on our Australian list is acknowledged by all. But much difference of opinion exists as to whether the sub-species *culminata* Gould is Australian. Mathews thinks that Gould's type of *Diomedea culminata* was not procured in Australian seas. Alexander, on the other hand, accepts Gould's record as authentic. Macgillivray records having seen this species on many occasions on his voyage, but Mathews has pointed out that there are discrepancies in his notes, and after carefully reading his paper it seems to me that Dr. Macgillivray may have been mistaken in his identifications on some of the occasions. The species, however, undoubtedly does occur on the eastern coast, as I saw a specimen recently off the Camden Haven Heads. The bird was unmistakable, and I was able to get a good view of the grey head and black bill, with upper and lower yellow margins. We were about 8 miles off the land at the time. The two Sooty Albatrosses are generally readily distinguished, the Sooty (*Phæbtria fusca*) being much commoner than the Light-mantled Sooty (*P. palpebrata*). I should like, however, to have more knowledge of the plumage changes in these two species, and in this connection would like to quote two observations made in the Australian Bight on June 1st and 2nd, 1910.

June 1st.—Sooty Albatross (*Phæbtria fusca*)—Numerous, at least 15-20 about dusk. Among them was one with whitish nape, as in the Light-mantled Sooty (*P. palpebrata*), but it had the yellow streak on bill, and white round the eye. The latter character also occurs in *palpebrata*, though in the specimens I have seen of this species I have been unable to distinguish it. Another showed traces of grey on nape and crown.

June 2nd.—Sooty Albatross (*P. fusca*)—Numerous. Noted one with slight grey on nape. Another with conspicuous white mark on sides of neck, and back slightly dappled; couldn't distinguish any yellow on lower mandible, nor any white ring round eye. It is to be noted that Loomis lists only one species of Sooty Albatross, *Phaebetria palpebrata*.

To turn to the smaller Petrels, I find in my notes a record of having once identified the Diving Petrel (*Pelecanoides urinatrix*) in Bass Strait. Its small size and mode of flight render it fairly easily distinguishable. Crossing from Hobart to the Bluff in December, 1911, our vessel was followed by several white-bellied storm petrels, with light underwing coverts and white rump. These were provisionally identified as the White-bellied Storm Petrel (*Fregatta grallaria*), but this identification is by no means certain. Similar birds were also seen in January, 1914, between Wellington and Sydney. The Black-bellied Storm Petrel (*Fregatta tropica*) I have seen in the South Indian Ocean, but owing to the loss of my notes cannot give the dates of observation. Wilson, or Yellow-webbed, Storm Petrel (*Oceanites oceanicus*) I have observed in the Bight (March, 1916), and the White-faced Storm Petrel (*Pelagodroma marina*) on the eastern coast, but I have never met with the Grey-backed Storm Petrel (*Garrodia nereis*) unless several grey-backed storm Petrels seen, not too distinctly, in the Bight (March, 1916) belonged to this species.

The Shearwaters are almost impossible to identify at sea, unless when passing the breeding place of a known species. In this way, I am certain of having seen the Wedge-tailed (*Puffinus pacificus*), on the east coast of New South Wales, and off Rott-nest Island; the Fleishy-footed (*P. carneipes*), near King George Sound; the Short-tailed or Mutton-bird (*P. tenuirostris*), in Victoria; and the Sombre (*P. griseus*), in New Zealand. The latter is fairly readily recognised by the grey underwing coverts, and the Fleishy-footed (*P. carneipes*) by its light-coloured bill, but isolated specimens of any of these species would be impossible of identification.

The Fluttering Shearwater (*Puffinus gavia*) is common on the New South Wales coast, and may be recognised by its fluttering flight, quite unlike that of the Wedge-tailed (*P. pacificus*), with which it occurs. I have seen it as far north as Cape Hawke.

The Allied Petrel (*P. assimilis*) I have doubtfully identified on one or two occasions, but not close to the Australian coast, unless birds seen off the south-west corner of the continent belonged to this species. I find in my notes queried identifications of this species for birds seen between Sydney and Auckland, and also two days out from Fremantle, in the Indian Ocean.

Much discussion has taken place over the species of *Procellaria* (*Majaqueus*) found in Australian seas, and over the question of the identity of the Spectacled Petrel (*P. conspicillata*), with the

Cape Hen (*P. aequinoctialis*). While Mathews contends that Gould's type of *conspicillata* probably did not come from Australia, Alexander admits Gould's species to the Australian list, but discards *P. aequinoctialis*. Other authors have regarded both as one species. I must confess that my slight experience is rather in support of Mathews' contention. The only specimen of the Speckled Petrel (*P. conspicillata*) that I have seen was off the South African coast, but I daily watched the Cape Hens (*P. aequinoctialis*) on the run across from Durban along the 41deg. S. parallel, and never saw one with any white, apart from the chin spot. These birds accompanied us until well to the south of Australia, when we lost them on retracing our track to Fremantle. The Black Petrel (*P. parkinsoni*) I have seen only in New Zealand waters.

Members of the genus *Pterodroma* (*Æstrelata*, of the older nomenclature) are generally a puzzle at sea. Though most of the species have distinctive coloration about some part of the body, it is not always easy to pick these up. I have found, however, that, where Petrels are numerous, most of the birds seen will prove to belong to one species, and with close and patient observation one can obtain the clue to the bird's identity. Where single specimens are seen, the observer has generally to content himself with the record of a Petrel of unknown species.

In company with most observers, I have recorded having seen the Great-winged Petrel (*P. macroptera*), both off South-West Australia and between Australia and New Zealand. It is a solitary bird, and fairly readily recognised. The White-headed Petrel (*P. lessoni*) is perhaps, from its colour, the most easily recognised of the genus, and I have seen it on many occasions: in the South Indian Ocean (January, 1916), farther north on the Fremantle-Colombo route (May, 1919); in the Bight (May, 1919, and March, 1916); and between Hobart and New Zealand (December, 1911). The Soft-plumaged Petrel (*P. mollis*) has been finally admitted to the Australian list on the strength of a specimen picked up on the beach at Cottesloe, but I believe that it will be found to be not uncommon in Australian seas: at any rate, at some season of the year. I met with what I took to be this bird in the South Indian Ocean some days' steam from the Australian coast, and later, in 1919, birds agreeing fairly well with this species were seen on the Colombo-Fremantle route. I have also seen similar birds in the western part of the Bight (May, 1919), this observation agreeing with Alexander's record of 24th March, 1919. The Giant Petrel, or Nelly (*Macronectes giganteus*), has been seen on several occasions on the New South Wales coast, both north and south of Sydney, but I have not found it universally present, and am inclined to agree with Alexander that it is a winter visitor. I have also seen it in summer between Hobart and the Bluff (December, 1911).

The Cape Pigeon (*Daption capensis*) cannot well be mistaken at sea if seen at all closely. On one occasion, in the western

end of the Bight, our ship passed through flocks of these birds. I have not met with them again in such numbers, but have seen isolated specimens in the South Indian Ocean, and between Tasmania and the Bluff.

The Prions are quite hopeless of identification at sea. One sees them on every voyage, often in considerable numbers, but it is impossible to distinguish the different species. The Blue Petrel (*Halobana carulea*) I have queried as identified by me between Colombo and Fremantle, as recorded earlier in this paper.

The above list traverses practically all the Australian species of Petrels with which I am familiar. My notes contain references to birds seen to which a name could be attached only with a considerable amount of uncertainty.

Some additions may perhaps be made in time to the lists given by Alexander. Birds breeding in Lord Howe and Norfolk Islands, or even the Kermadecs, may perhaps occur at long intervals, as in the instance of the \*Brown-headed Petrel (*Pterodroma melanopus*). I have noted species between Sydney and Auckland that were tentatively identified with *P. melanopus* and *P. cervicalis*, and it is quite possible that with easterly gales these may be brought to our shores. The Cape Hen (*Procellaria equinoctialis*) will, I feel certain, be found to occur in Tasmanian waters, and be thus restored to our list. The occurrence of the Spectacled Petrel (*P. conspicillata*) is a question that will require careful investigation, and will be settled only by procuring specimens.

Alexander quotes 11 species of which Australian breeding grounds are known, and 26 that are visitors. Is it likely that others not known to breed in Australia will ultimately be found to do so? The case of the Forster, or Fluttering, Petrel (*Puffinus gavia*) requires investigation; from the large numbers in which this bird occurs along the New South Wales coast, I think it is almost certain that it does breed somewhere along the coast. Breeding grounds may readily be overlooked, and comparatively few of the islands that skirt the southern shores of the continent have been systematically searched. There is room here for a well-organised expedition to examine in detail the islands in Bass Strait, off the Tasmanian coast, and in the Australian Bight.

In the following table I have arranged the species of which no breeding areas are recorded in Australia, according to their nearest-known breeding place. The table was originally drawn up on the species as contained in Alexander's list, subsequently altered to conform with the list given by Mathews, in *The Birds of Australia, Supplement 1*, and was finally redrafted according to the species given in the recent *Manual of the Birds of Australia* by Mathews and Iredale. Twenty-nine species are listed, of which six are of doubtful occurrence, or of which no specimens are available for sub-specific determination. Of the remaining twenty-three species, nine are known to breed in New

Zealand, or on the New Zealand sub-Antarctic Islands, and two probably do so also, though these last might have better been placed under the heading of species breeding in the South Indian Ocean. One species is listed as breeding on Lord Howe Island, two as breeding within the Antarctic Circle, six on islands in the South Indian Ocean, and of three the breeding place is unknown. Of the six species of which the records are unsatisfactory, four breed on one or other of the sub-Antarctic Islands, one on Lord Howe Island, while of one the breeding place is unknown. Comparison of the sub-species shows that in eight cases the Australian sub-species differs from that of the nearest known breeding sub-species; in three of these cases two Australian sub-species are described. In three other instances, where the breeding sub-species is recorded, one or two additional sub-species are described from Australia.

It is not my purpose here to discuss the validity of these sub-specific distinctions, some of which have been made on single specimens. If these sub-species are, however, recognisable, it means that a good many breeding grounds yet remain to be discovered, not necessarily in Australia, nor likely to be so in cases where only a single occurrence is recorded. Much more work requires to be done before even the names of our Australian Petrels can be regarded as settled, while the investigation of their breeding habits remains to a great extent untouched.

Table showing nearest known breeding areas of visiting Australian Petrels:—

A. Breeding in New Zealand, or on Sub-Antarctic Islands—

Species.	Sub-species Breeding.	Australian Sub-species.
<i>Garrodia nereis</i>	<i>nereis</i>	<i>nereis</i>
<i>Procellaria parkinsoni</i>	—	—
<i>Reinholdia reinholdi</i>	[ <i>reinholdi</i> ]	<i>byroni</i>
( <i>Puffinus gavia</i> )	[ <i>huttoni</i> ] (Snares)	—
<i>Pterodroma inexpectata</i>	[ <i>inexpectata</i> ]	<i>thompsoni</i>
<i>Pterodroma lessoni</i>	? <i>australis</i>	<i>australis</i>
<i>Macronectes giganteus</i>	[ <i>albus</i> ] [ <i>wilsoni</i> ] (Macquarie Is.)	<i>docei</i>
<i>Prion vittata</i>	<i>vittata</i>	<i>vittata</i> <i>gouldi</i> <i>missa</i>
<i>Diomedea exulans</i>	<i>rothschildi</i>	<i>rothschildi</i> <i>westralis</i>
<i>Diomedea melanophrys</i>	<i>impatida</i>	<i>impatida</i>

B. Probably breeding in New Zealand, or on sub-Antarctic Islands.

<i>Fregatta tropica</i>	<i>australis</i>	<i>australis</i>
<i>Priocella antarctica</i>	<i>addenda</i>	<i>addenda</i>

C. Breeding on Lord Howe Island—

<i>Pterodroma melanopus</i>	—	—
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D. Breeding within Antarctic Circle—

<i>Oceanites oceanicus</i>	<i>exasperatus</i>	<i>exasperatus</i>
<i>Daption capensis</i>	? <i>australis</i>	<i>australis</i>

E. Breeding on islands in South Indian Ocean—

<i>Pterodroma mollis</i>	—	—
<i>Halobæna carulea</i>	[ <i>carulea</i> ]	<i>victoria</i>
<i>Prion desolatus</i>	[ <i>desolatus</i> ]	<i>mattingleyi</i>
		<i>alexanderi</i>
<i>Diomedea chionopectera</i>	<i>chionopectera</i>	<i>chionopectera</i>
		<i>rohui</i>
<i>Diomedea chrysostoma</i>	<i>chrysostoma</i>	<i>culminata</i>
		<i>alexanderi</i>
<i>Phæbetria fusca</i>	[ <i>fusca</i> ]	<i>campbelli</i>

F. Breeding places unknown—

<i>Fregatta tubulata</i>	—	—
<i>Prion belcheri</i>	—	—
<i>Diomedea chlorohynchus</i>	--	<i>carteri</i>
		<i>bassi.</i>

G. Of uncertain occurrence in Australia, or no specimens available or sight records—

- Procellaria aquinoctialis*—Breeding in New Zealand seas.  
*Procellaria conspicillata*—? Cape seas.  
*Priofinus cinereus*—Breeding on Macquarie Island.  
*Fregatta grallaria innominata*—Breeding Lord Howe Island.  
*Phæbetria palpebrata*—Breeding on N.Z. Sub-Antarctic Islands.  
*Diomedea epomophora*—Breeding on N.Z. Sub-Antarctic Islands.

#### NOTES ON TABLE.

The White-headed Petrel (*Pterodroma lessoni*).—The sub-species *leucocephalus* previously recorded as applying to Australian birds, appears to have been dropped in the Manual, as only two sub-species are noted for this bird.

The Giant Petrel (*Macronectes giganteus*).—The sub-species *M.g. dovei* does not appear among the six sub-species proposed, though the name is mentioned incidentally as having been named as being smaller than *M. g. albus*.

The Silver-grey Petrel (*Priocella antarctica*).—No sub-species recognised in the Manual.

Fairy Dove Petrel (*Prion desolatus*).—Might be better included in list of species breeding in sub-Antarctic Islands of New Zealand, from which two sub-species are recognised in the Manual.

Yellow-nosed Albatross (*Diomedea chlororhynchus*).—Nesting, eggs, and nesting-place stated in the Manual to be unknown, though Dr. Macgillivray, in his article, mentions breeding colonies found on Tristan d'Acunha by Mr. Keytel.

*Fregetta tubulata*, *Prion belcheri*.—These two species were described on Australian specimens, but breeding grounds are unknown.

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## The "Times" on John Gould\*

True zoological science is the creation of the present era. In a wide sense, this science includes the organic structure of the animal creation, the arrangement according to their natural affinities of the great groups composing it, and also of the members of those groups from families to *genera*. From the time of Ray and Linnæus to that of Cuvier, artificial systems, founded upon assumed principles, prevailed. But Cuvier brought anatomy to bear upon zoology, and zoology became elevated into its true position. Linnæus was an avowed formalist; but before we condemn, we must take into consideration the time in which he wrote, the limitation of the materials at his command, the confusion in which he found science, and the necessity in which he was placed of reducing the *disjecta membra* around him into something like order. His bold idea of a general system of

\*The Public Library of Brisbane is fortunate in possessing a set of eight volumes of John Gould's *Birds of Australia*, which are not only in excellent order, but have their value added to by the inclusion of interesting relics. These comprise an autograph letter from Gould, written in 1851; a newspaper clipping giving over three columns of critical appreciation of the general work of the great ornithologist, taken from the London *Times* of September 3, 1851; and a full-page impression of the author, inscribed by the artist, "T. H. Maguire, 1849." This date being a year later than that of the issue of the *Birds of Australia*, it follows that the page bearing the portrait is inset. The insertion, however, has been executed so neatly as to be hardly noticeable, though attention is directed to the fact by stains that have developed on the particular page. Beneath the portrait is the inscription, "John Gould, F.R.S., F.L.S., etc., Fellow of the Ipswich Museum."

The *Times* review has for caption, "The Ornithological Publications of John Gould, F.R.S.," to which is added a footnote giving the following list of the author's works at date:—

*A Century of Birds from the Himalaya Mountains; A Monograph of the Rhamphastidae, or Family of Toucans; A Monograph of the Trogonidae, or Family of Trogons; Zoology of the Beagle—Part Birds; A Synopsis of the Birds of Australia; The Birds of Australia; Introduction to the Birds of Australia; A Monograph of the Macropodidae, or the Family of Kangaroos; The Quadrupeds of Australia; A Monograph of the Odontophorinae, or Part-ridges of America; Icones Avium; The Birds of Asia; The Humming Birds, or Trochilidae.* (The two latter in course of publication.)



John Gould, the greatest of all bird-men.



Nature, and his precise binary nomenclature, defining in two words genus and species, are at once proofs of his intellectual strength and acumen.

Many thanks, my dear Sir,  
for your kind note: the  
australian plants are all  
from nature and their  
names are given wherever  
they could be ascertained  
with certainty. Mr.

McGillivray is I believe  
in town and residing  
at 37 Gloucester Street  
Queen Square, Bloomsbury

Ever my dear Sir

Yours truly & obliged

W. Drummond  
London 20 Broad St.  
Goldsmiths, 1874/57

J. M. Gould  
over

Letter, portrait, and article, as reproduced herewith, are of particular interest at the present time, and thanks are due to various Queensland Government officials for facilitating the making of copies, namely, Messrs. P. J. McDermott (Under Chief Secretary), E. G. Scriven (Under Secretary for Agriculture), J. Brown (Chief Librarian), and H. W. Mobsby and J. W. Sanderson (photographers). Mr. McDermott supplies the information that the relics were in the books when the set was purchased by the Queensland Government in London.—A. H. Chisholm, State Secretary, Queensland.

After Linnæus came other labourers into the field, and among them, as a star of the first order, the immortal Cuvier. The progress of zoology began now to receive a new impulse. Throughout every branch of this science the impetus was communicated, and in that of ornithology more particularly rapid advancement was made. At the close of the 18th and beginning of the 19th century the stores of ornithology, so scanty in the time of Linnæus, were almost daily increased by new accessions from various parts of the world, for now islands and continents began to be more ardently explored, and vessels of research returned from their surveys with specimens of the *fauna* and *flora* of the regions visited. The acquisition of treasures excited the thirst for fresh novelties. The plains of India were open—the chains of the Ghauts attracted the sportsman. The Nepal and Himalaya Ranges were accessible—vast tracts of Australia were receiving a tide of European colonisation. The Oceanic clusters of palm-clothed isles were becoming familiar. South America was penetrated, its forests trodden, its mountains scaled, and its Pampas traversed by men keen in the course of science. As geognosy became more extensive, so zoological knowledge increased in a like ratio, and in the department of ornithology more particularly, the most interesting discoveries were made. The continental naturalists were all on the alert; the zoology of voyagers was published, and valued works from the pens of Temminck, Vieillot, De Blainville, L'Herminier, and a host of philosophic ornithologists and general zoologists, were given to the world with, till then, unexampled rapidity; nor was England in the background. Between the years 1821 and 1824 appeared Latham's useful, if not brilliant, *General History of Birds*—a work of reference—and *Selby's British Ornithology*, a costly publication, was welcomed by the public. But in this brief survey it is almost invidious to mention some names to the exclusion of others; yet we cannot pass over Wilson, the eloquent author of the *Birds of America*, for we claim him as a British naturalist.

At this crisis, under the auspices of Mr. Vigors, Sir H. Davy, Sir Stamford Raffles, and others, the Zoological Society of London was established. This institution became the depository of the noble Rafflesian collection, to which, in the ornithological department, the late Mr. Vigors added largely. The museum of the Linnæan Society had already received a valuable series of birds from Australia; the museum of the Hon. East India Company became enriched by collections from India, Malay, and the great Malayan Islands. The British Museum brought her stores to light, and adding to these, through the zeal of her talented officers, now presents us with an ornithological series that may vie with the finest which Paris or Leyden or Frankfort can produce. When once public feeling is directed to the furtherance of a good object, how much may be effected! A spirit for the maintenance of our national character in a scientific point of view had gone forth. Private collections of ornithology were made. A nobleman, alike exalted by his rank and by his

private virtues, not only exerted himself in the cause of science by giving the weight of his influence with the leading societies or institutions of this nature which grace our island, but by himself establishing, at no trifling cost, an aviary for the study of rare species of birds "after the life," and the introduction of some as adopted species, and still more by the establishment of a museum of extraordinary ornithological richness, and a collection of original drawings perhaps unequalled in Europe.

It was at this juncture, under circumstances the most favourable, with a peculiar predisposition for the study of ornithology, to which he had for years devoted himself, and with an artistic feeling for the delineation of the feathered tribes, that Mr. Gould, whose works constitute the special objects of our notice, began a career which has conducted him to well-merited renown—a career, we rejoice to say, calling him to renewed labours, with fresh laurels in full view. The works of Mr. Gould constitute a new epoch in the history of ornithology. We may look at them in several points. The boldness of the plan on which they were executed, involving a fearful amount of outlay, and depending on their merit alone as a guarantee from heavy pecuniary loss; the number of new species added to science, and of doubtful species cleared away from previous obscurity; the unadorned fidelity of the descriptions; the exquisite accuracy of the plates, in which the utmost adherence to Nature is united with that felicitous effect which stamps the artist, and proves (unlike what we tolerate in Latham and ridicule in Catesby—*viz.*, false drawing, hardness, and inelegance, unredeemed by precision) that grace and truthfulness may meet together. Again, Mr. Gould's works form in themselves an ornithological museum, pictorial we grant, but of such a character as to obviate the necessity of a collection of mounted specimens obtained at no trifling cost, and preserved, even where room can be afforded for them, not without the greatest trouble. Of course, we say this with reference more particularly to his *Birds of Europe*, to his *Monographs of the Toucans*, of the *Trogon*, to the *Birds of Australia*, to the *Partridges and Quails of America*, and to the *Humming Birds* and *Birds of Asia*, now in the course of publication.

We have said that the works of Mr. Gould constitute a new epoch in the history of ornithology, and we say so advisedly. Let it not be supposed that we deny great credit to others—to writers on certain departments of ornithology who have admirably illustrated their subject. Nor can praise be denied to many well-written works of a popular nature, which in themselves suffice to prove the vast advance which zoological science has made, and its impress on the public mind. But from all these Mr. Gould's works stand out in bold relief—that are "themselves alone." We do not here forget Audubon's *Birds of America*, with his *Biography*; but, without undervaluing the labours of that energetic zoologist, the hardness of whose often well-drawn illustrations, and the inflated style of whose imaginative descrip-

tions, might bear a passing censure, we repeat our assertion. This assertion, however, we ought to prove, or at least attempt to justify.

Let us give a rapid sketch of Mr. Gould's labours. In a position which brought under the notice of Mr. Gould a collection of birds from the Himalaya Mountains most of the species new to science, and described either by himself or his friend Mr. Vigors in the proceedings of the Zoological Society, he selected a hundred of peculiarly interesting species, many of them pheasants (properly speaking) of gorgeous plumage, and conceived the idea of publishing a work entitled *A Century of Birds from the Himalaya Mountains*. In his artistic figures he was ably seconded by one now no more—one whose hand filled up his sketches even after his return from Australia, and was not idle in delineating native flowers or fruits, insects, and birds, for future use during a sojourn in that distant country. The *Century* (in imperial folio) may be regarded as the type, in its style, its size, and mode of illustration, of all his subsequent publications albe it at every stage of future progress decided improvement has been marked in clear characters.

This work was well received; it deserved to be so. It was a new idea; it demonstrated how birds might be drawn and coloured; and, besides, was intrinsically valuable to the professed ornithologist, whether British or continental.

To attempt more when something has been achieved is surely a laudable ambition. That Mr. Gould should have determined upon the execution of a far more elaborate and extensive work, encouraged by success, and gratified by the expressed approbation of the scientific world, is less to be wondered at than the boldness of his first attempt, the felicitous issue of which he could not have promised himself, whatever might have been his hopes. In the very month of the same year (June, 1832) in which the *Century* was completed, he commenced his *Birds of Europe*. Such a work was a *desideratum*. Nothing like it had been attempted, for his plan was not only to give a clear description of the habits, manners, and locality of every species, with the details of colouring, and the changes of plumage to which so many are subject—in fact a succinct history of each—but to figure every species, male and female, of the size of life, and, where necessary, also the young, and individuals clothed in the plumage of summer and winter, whenever such figures would clear up points of doubt, and conduce to the recognition of the same species under its varied aspects. But though such a work was a *desideratum*, it could not be overlooked that far less expensive works on British birds had been published in our own island, and that some of these—as Bewick's—were graphically illustrated (Mr. Yarrell's admirable work had not then appeared); and it was to be feared that the cost of such a publication, although embracing the Birds of Europe, would, taking the foregoing points into consideration, render a remunerative

sale somewhat problematical. Mr. Gould pursued his onerous task with an intensity of purpose which resulted in complete success. *The Birds of Europe* was brought to a close in August, 1837. Notwithstanding the costly nature of such a publication, which necessarily limited its sale to the more wealthy promoters and lovers of ornithological science, and to the great scientific institutions of our own country and the continent, its reception equalled his most sanguine hopes, and its spirited and able author had the happiness to find his labours not unrewarded. It must be borne in mind that at least in some countries the splendid publications of science which have appeared are due to the liberality of Government. Here, on the contrary, we are presented with a magnificent work, unequalled in beauty, fidelity, and completeness, resulting from the enterprise of an ornithologist looking to himself and depending on his unassisted exertions. "Detous les ouvrages de luxe," says M. Temminck.

"Avec planches coloriées d'oiseaux, il n'en est aucun qui puisse rivaliser avec l'immense et brillante entreprise d'une iconographie complète des oiseaux d'Europe dont s'occupe en ce moment M. Gould à Londres. *The Birds of Europe* sont d'un fini si parfait, tant pour le dessin, la pose et l'exacte vérité de l'enluminure, qu'on pourrait, avec de si beaux portraits, se passer des originaux montés; le plus grand nombre des figures sont dessinées sur le vivant; on y voit réunis les deux sexes, souvent le jeune, et toujours les différens états de muë périodique. Le texte est une compilation faite avec critique et discernement."

Mr. Gould's well-merited fame as a scientific ornithologist, in whose hands the pencil mimicked life, was by common consent established, and he might without blame have closed his arduous labours with the close of his *Birds of Europe*; but undeterred by risk, his energetic mind urged him still onward to other and even more formidable attempts. While yet the *Birds of Europe* was in progress of publication, in 1833, he commenced a *Monograph of the Ramphastidae, or Family of Toucans and Aracaris*, a group of birds peculiar to South America, remarkable for the size of their painted beaks and the richness and contrast of the colours which adorn their plumage. This *Monograph* comprised 33 species of this singular race of birds, most of which were new to science, and originally described by Mr. Gould in the *Proceedings of the Zoological Society*. Within the last few years further accessions of new species have been received, and upon these Mr. Gould is at work, preparing additional plates and descriptive letterpress, by way of an addition to, or completion of, the work. The deep black abruptly cut up by bands or patches of scarlet and yellow, which characterises the plumage of the Toucans, and the olive green tints which prevail in their allies, the Aracaris, are most artistically managed, while the attitudes of the birds themselves are as spirited as truthful. The scientific importance of this *Monograph* is greatly enhanced by a beautiful and delicately executed lithograph rendering manifest the cellular texture of the inside of the large yet light beak, the course of the olfactory nerves, etc., from a dissection by Professor Owen. The long feathery tongue is well displayed,

and also the nerves running through the cellular structure of the upper mandible.

Another work entitled *Monograph of the Trogonidae, or Family of Trogons*, birds of surpassing splendour, was commenced by Mr. Gould in 1835, and finished in 1838. Independently of their extraordinary beauty, these birds are peculiarly interesting to the ornithologist from their geographical distribution. They are respectively distributed between inter-tropical America, some portions of the continent of India, with the islands of the Indian Archipelago, and Africa, one species only being as far as we know, indigenous in the latter continent. Previous to the commencement of Mr. Gould's *Monograph*, 22 species had been described; to this number Mr. Gould added 12 others new to science; and he states in his preface that he has reasons for believing that many others have yet to be discovered, both in the Old and New World, in remoter districts which the civilised man seldom visits. A supplement to his attractive *Monograph* of these birds will be welcomed by the lovers of art and science throughout Europe. Of all the known species the *Trogon resplendens*, clad in golden iridescent green, with long lax flowing plumes, is the most surpassing in brilliancy. Fine specimens are contained in the collection of the British Museum. Mr. Gould's figures of the male and female attest his success in ornithological painting. Before the *Monograph* of the beautiful and interesting family of Trogons (*Trogonidae*) was concluded, two parts of a work termed *A Synopsis of the Birds of Australia* made their appearance. This *Synopsis* in its design is purely scientific; yet it is elegantly illustrated with those essential parts of a bird which fix on the mind generic characteristics, as presented by two, three, or more typical forms. The size of this work adapts it to the ordinary library, and it is one of those publications which the practical ornithologist must possess.

We must not omit to notice that, in the midst of his many labours (1837-8), Mr. Gould prepared the ornithological portion of *The Zoology of the Beagle*, edited by Mr. Charles Darwin. This portion of the work was illustrated by 50 exquisite plates of rare and new birds from Patagonia and other parts of South America, and also from the Galapagos Archipelago. Among these is a new Rhea or South American Ostrich (*Rhea Darwinii*), the habits of which are admirably described by Mr. Darwin in his journal.

At this period, as the *Synopsis* and his papers in the *Zoological Proceedings* prove, Mr. Gould had a grander work in prospect—no less than a great work on the *Birds of Australia*. Yet, while meditating upon it, he gave to the world, in 1837, his *Icones Avium*; and thus, as it were, freed his hands for strenuous and undivided labour. It was in the same year that, taking a glance at what his fellow ornithologists were doing, he issued a prospectus, at the close of which he intimated his intention of visiting Australia; for he felt that although he had access to

the collections of Europe, there was a new world open for exploration. The commencement of the prospectus is as remarkable for personal modesty as for liberality. A short quotation must suffice:—

"The science of ornithology has now become so popular that it has attracted within its influence the talents of many scientific men in all parts of the world, and we find several of these highly gifted individuals engaged in illustrating particular portions of this interesting branch of study. Thus, independently of his work on general science, Mr. Swainson is engaged on the birds of Brazil and Western Africa; Mr. Audubon on the birds of the United States of America; Dr. Ruppell, of Frankfort, on those of Abyssinia; while the deservedly celebrated M. Temminck is occupied upon the Birds of Japan, besides adding yearly to the stores of science by recording new species in his *Planches Colories*, and M. Natterer, after a residence of 16 years in the Brazils, has just returned to Vienna with an exceedingly rich collection of the zoological productions of that vast country, the novelties comprised in which will in all probability be immediately known. Thus, while we find the ornithology of almost every other portion of the globe occupying the attention of various talented individuals, that of Australia and its islands, although not forgotten, remains almost unheeded."

To the *Birds of Australia* Mr. Gould now devoted all his energies, and, after putting his plan into a tangible form, set sail in May, 1838, for Australia. During his voyage he found means of sending over to the Zoological Society many valuable observations on the various sea birds, and their latitudinal range respectively, which appeared in the *Proceedings of the Zoological Society*. His notice of the Stormy Petrels (*Thalassidroma*) is more peculiarly interesting, and will be found in Part VII., 1839, page 139. But here Mr. Gould must speak for himself:—

"After exploring Van Diemen's Land, the islands in Bass's Straits, South Australia, and New South Wales, into the interior of which country I penetrated to the distance of nearly 400 miles from the coastline, I despatched my able assistant, Mr. Gilbert, to explore the Western and Northern portions of the country, and returned to England in 1840. I immediately commenced the work *de novo*, and the result of my labours is now before the public."

With respect to Mr. Gilbert, he adds:—

"After spending two years in Northern and Western Australia, Mr. Gilbert returned to England in 1841, bringing with him the result of his labours, which proved of sufficient value and importance to induce me to believe that much remained to be discovered in those countries, and to direct him to return thither, which he accordingly did in the ensuing spring, and after again visiting Swan River, and sedulously exploring the interior as far as practicable, he proceeded to Sydney, and, unfortunately for himself, allowed his love of science, in the advancement of which no one was more ardent, to induce him to join Dr. Leichhardt in his overland journey to Port Essington."

During the expedition his party was treacherously attacked by the natives, and he himself fell a victim. The specimens he had collected, together with his notes and memoranda, were afterwards recovered by Mr. Gould.

Thus furnished with an unrivalled collection of subjects, to which every day added fresh stores, and with a rich fund of knowledge, the result of personal experience, Mr. Gould was

prepared for the labour before him. In 1848 the work was brought to a close, but the acquisition of several new species, some of extraordinary beauty, will render it necessary to add several supplementary plates and sheets of descriptive letter-press. Of these we may here notice a new *Menura* (*Menura Albertii*), a new and most gorgeous species of Rifle Bird (*Ptiloris Victoriae*), and a new *Tanyptera*, as being among the most interesting.

An idea of the importance of Mr. Gould's *Birds of Australia* may be gained from the fact that 636 species, in various stages of colouring, are described and figured, and their food, habits, nidification, migration, and extent of geographical range, detailed from his own observation, with the assistance he derived from zealous friends and the natives.

Of these 636 species, about 340 (including those more recently obtained, and of which the figures are now in progress for laying before the world) are either new or were so vaguely known as to render their extrication from a maze of confusion no easy task, and one not to be accomplished without the possession of a *vast series of actual specimens*. When we consider that Dr. Shaw, in his *Zoology of New Holland*, had devoted only a few plates to the subject, from specimens collected by Sir Joseph Banks during the first voyage of Captain Cook, that Lewin's *Birds of New Holland* comprise not more than 26 plates, and that but a few figures and descriptions were given in the earlier voyages of Phillip, White and Collins, and the more recent one of King, we may judge how little aid Mr. Gould could receive from the earlier describers. It is true that more recently the late Mr. Vigors and Dr. Horsfield commenced a memoir on the collection of Australian birds in the Linnæan Society, but they did not proceed far in their labours. To the works of Latham, Cuvier, and Vieillot, as well as to several of the recent voyages of discovery, reference may be made for figures and descriptions of isolated species more or less definite. Still, this is only to glean where the harvest awaits the sickle—only to obtain such a glimpse as proves the necessity of entering personally into the field of exploration. Had not Mr. Gould acted on this conviction, how much relative to the *Zoology of Australia* would remain a sealed-up book—how much that is strange, interesting, and surprising would be unknown!

We cannot here enter into a disquisition on the habits of particular species, or the indulgence of a feeling to body forth a picture of the bower birds, which construct arbours of courtship decorated with shells and the brilliant feathers of parrots, might lead us to follow Mr. Gould's admirable but unadorned narrative till we found ourselves in the realms of poesy. So, also, are we tempted to enter upon the history of the mound makers, or, as we should rather say, constructors of hotbeds for incubation. But, as we have said, we must generalise; for when selection is difficult and space limited, a *resume* must content us. And this *resume* of the birds of Australia is given by Mr. Gould in a

small work which he modestly terms *An Introduction to the Birds of Australia*—in fact, an appendix to his great work, in which he condenses into a small compass a general outline of Australian ornithology, adding to it some details relative to his own journeyings, and an æsthetic survey of nature as presented by forests, flowers, watercourses, droughts, inundations, temperature and climate, interspersed by groupings of birds, insects, and quadrupeds—a picture so simple, and yet so graphic, as to lead us to regret that a full work on the "Impressions of Australia on the Senses" has not issued from the pen of this philosophical ornithologist.

The following passage we quote from the "Introduction":—

"Upon taking a general view of the Australian ornithology, we find no species of vulture, only one typical eagle, and, indeed, a remarkable deficiency in the number of the species of its birds of prey, with the exception of the nocturnal owls, among which the species belonging to the restricted genus *Strix* are more numerous than in any other part of the world—a circumstance which is probably attributable to the great abundance of small quadrupeds, most of which are nocturnal in their habits. Among the perching birds there is a great excess in the *insectivorae*, of the *graniivorae*, and of the *psittacidae* (parrot tribe). The latter tribe of birds is more numerous in Australia than in any other part of the world, and forms four great groups, amounting to nearly 60 species. Of the rasorial forms, while the pigeons and hemipodes are numerous, the larger and typical *gallinaceae* are entirely wanting, their only representatives being a few species of *coturnix* and *synoicus* (partridges). The grallatorial birds are about equal in number to those of other countries; and among the water birds the true ducks are but few, while the *procellaridae* (albatrosses, puffins, petrels, etc.) which visit the coast are in much greater abundance than in any other part of the world. On a retrospect of the whole, we find a greater number of nocturnal birds than is comprised in the ornithology of any other section of the globe. I must not omit to mention, too, the extraordinary fecundity which prevails in Australia, many of its smaller birds breeding three or four times in a season, but laying fewer eggs in the early spring, when insect life is less developed, and a greater number later in the season, when the supply of insect food has become more abundant. I have also some reason to believe that the young of many species breed during the first season. . . . Another peculiar feature connected with Australian ornithology is that of its comprising several forms endowed with the power of sustaining and enjoying life without a supply of water—for instance, the *halcyons* (Kingfishers), which I found sustaining life and breeding on the parched plains of the interior during the severe drought of 1838-9, far removed from any water, the food of these birds being insects and lizards."

We may add that there are no woodpeckers in Australia and Polynesia.

Returning from Australia, loaded with specimens, not only of birds, but also of mammalia, struck down by his own gun, Mr. Gould naturally bent his mind to the delineation and description of some of the most important species of the latter. Hence in 1841 he announced his *Monograph of the Kangaroos*; but, on a revision of his collection, he determined to give to the scientific world a history of the *Quadrupeds of Australia*, as a companion to that of the birds. In this work, now in the course of publi-

cation, the animals themselves are not only figured, but portraits of them from life are delineated, of which we cannot but notice one of Landseerian vigour—the physiognomy of the Tasmanian wolf. In the publication of such a work Mr. Gould confesses that he has departed from his original purpose of confining himself solely to ornithology, and owns that, with such profusion of materials at his command, he was tempted to overstep his self-assigned limits. The scientific world ought to be grateful to him for having yielded to a temptation which, contrary to the normal rule, is productive of good.

With the execution of these great works, Mr. Gould's labours have not yet ended. He has just completed a *Monograph of the Odontophorinac, or Partridges of America*—a group of chastely coloured, elegant birds, as attractive to the sportsman of the Far West as are the partridges, pheasants, and grouse to the sportsman of the Old Country.

The completion of one work with Mr. Gould is *not* the period of the commencement of others; he commences a series of new labours the moment he sees his way clear in the midst of his then pressing engagements. At the invitation of the scientific world he has commenced a grand work on the *Birds of Asia*. Is Asia the terminal *terrain* of Mr. Gould's ornithological labours? No. He has already invaded America, and is making an invasion still more formidable. While at work upon the *Birds of Asia* (1850), he is at work also upon the *Humming Birds*, the winged gems of the New World; and were he not to bring out such a *monograph* we should at once condemn him. His collection of humming birds is the finest in Europe; and almost every week he is adding, at no trifling cost, to its perfection. Here, indeed, he is regardless of expense and risk, and can justly claim the patronage of the wealthy and the noble of Europe. The humming birds, divided into many groups or genera, are extremely numerous. Lesson describes about 110 species. The collection of the late Mr. George Loddiges contains about 200 species; that of Mr. Gould upwards of 300, of which many are unique. We may here observe that the bulk of Mr. Gould's collection is mounted, and arranged in revolving cases, in a style befitting the value and overwhelming splendour of their quivering inmates, for the specimens are set upon almost invisible wires, and are tremulous as when during life they hovered over the blossoms of a Mexican wilderness.

But, then, how are the resplendent glories of gems, of metallic gold, green, purple and bronze, to be depicted? Can this triumph of art be achieved? Even so; not indeed by common colouring, but by a peculiar mode attained, after many and most expensive trials, and requiring each figure to be worked up by the hand of the ornithological artist and his able assistant, every plate being in fact an original painting. *Hic labor, hoc opus!* More than adequate repayment of the necessary expenditure Mr. Gould cannot expect—unless, indeed, he receives a full measure of encouragement; and that his noble exertions in such an illustration,

before which every previous attempt falls into the background, should not meet with most liberal support, would be a reflection upon those patrons of ornithological science to whom "les ouvrages de luxe" are welcome as additions of intrinsic value to a noble library. It may be justly observed that these works have already extended a taste for ornithology, not less by their merits in a scientific point of view, than by the truthfulness, beauty, and spirit of illustrations—every plate serving as a first-rate copy for those artistic branches of a family who wish to paint birds as they *should be* painted, and not, as we usually see them in albums, portfolios, and drawing books, vile caricatures of nature. To draw a bird *well* is a task of some difficulty; there are, in fact, not many professed artists who can accomplish this, and herein Mr. Gould's plates may serve as a *study*, or at least afford assistance to those who would wish to do justice by their pencil to these lovely forms of organic being. It is *something* to have extended a taste for ornithology, and a feeling for a pure and artistic style of delineating the varied contour and plumage of the feathered tribes, *more* to have contributed to science.

We think it will be conceded that we have made good our assertion as to the great importance, not in a purely scientific point of view *only*, but as a means of defusing and elevating taste, of Mr. Gould's publications, including those which are still in progress. No one can be blind to the boldness of the scheme in its totality, the consummate style of illustration, the clearness of description, and the splendour of the volumes which have appeared. Nor can we overlook the interest produced by the introduction to the world of so many new species, by the complete illustration of the ornithology of Europe, Asia, and Australasia, and by *monographs* of some of the most attractive groups—Toucans, Trogons, American Partridges, and Humming-birds, to which the attention of the lover of nature can be directed.

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## Notes on Birds Observed at Ebor and the Nullarbor Plain

By A. S. Le SOUEF, C.M.Z.S., R.A.O.U., State Secretary for New South Wales.

When crossing the great Nullarbor Plain last October, the members of the Union who journeyed to the Perth Conference were interested in seeing a number of Wedge-tailed Eagles, Brown Hawks and Kites flying over the plain, and some speculation was caused as to their food supply, for nothing was visible from the train. On returning early in November, I stayed for two days at Ooldea in order to investigate this question. The preliminary inquiries indicated that numbers of native animals would be found, and that rabbits were also in evidence. In order to get further information, and also some notes on the life history of such animals as were to be found, I spent last July

two days at Fisher, a siding well out on the plain, and seven days at Ooldea, a station in the sandhill country at the eastern edge of the plain. As the trip was undertaken specially to investigate the mammalian life, little time was given to bird observation, and the notes appended referring principally to the birds of the plain are not as full as they might be.

The plain at Fisher was found to be covered with the prevailing Salt-bush and Blue-bush, and several species of dwarf herbaceous plants. These were covered with millions of caterpillars, which provided food for the bird population. Birds were not very numerous, nor were many species observed. Indeed, with the sparse cover available, few birds could escape the hawks, which along the railway line, at any rate, were fairly numerous. Although it was mid-winter, many species were found breeding.

Two birds which I took to be Australian Pratincoles (*Siltia isabella*) were noted. Mr. Harry Taylor, the foreman ganger for this section, stated that they were always present. They were rather shy, were not easily flushed, and then did not fly more than a few feet above the ground.

When the last of the bushes had been left behind, and the train was well out on the plain, the Wedge-tailed Eagle (*Uroaetus audax*) was observed. One bird was seen flying slowly over the surface, when it suddenly seemed to spring upwards and dive to the earth, evidently alighting on some animal. Mr. Harry Taylor states that the Eagles are numerous when rabbits are abundant, and scarce when there are few rabbits.

Brown Hawks (*Ieracidea berigora*) were numerous, and were often seen hunting over the plain while uttering their shrill cry. They were very tame.

A large flock of Pink Cockatoos (*Cacatua leadbeateri*) lived near the Soak at Ooldea, and left every morning for the plain, where they seemed to be feeding on the Casuarinas. They flew in a very compact flock, and kept well together when feeding. It was a beautiful sight to see dozens of birds clustering on to a large Casuarina like so many pink flowers.

The well-known scale note of the Pallid Cuckoo (*Cuculus pallidus*) was heard very often at Ooldea. I was surprised to find it so far south in July.

Last October White-backed Swallows (*Cheramocca leucosternum*) were noted flying in flocks over the sandhills. This July they had parted, and were out on the edge of the plain, but still not beyond the tree line. From their actions I think that they were nesting.

Red-capped Robin (*Petroica goodenovii*).—When I first arrived at Ooldea, only uncoloured birds of this robin were seen, but soon afterwards the scarlet, black and white males were in evidence. Uncoloured birds ventured into the open scrub country on the edge of the plain.

One Hooded Robin (*Melanodryas cucullata*) was noted near the Soak.

Tiny Short-billed Tree-Tits (*Smicronis brevirostris*) were numerous in the belts of Mallee and Eucalyptus pyriformis; they were constantly searching the tops of the trees for insects.

Black and White Fantail (*Leucocirca tricolor*).—Mr. Taylor stated that the Wagtail occasionally visited his house at Fisher, but did not stay long.

White-fronted, Golden-fronted and Tricoloured Bush-Chats (*Ephthianura albifrons*, *E. aurifrons* and *E. tricolor*) were numerous out on the big plain from Fisher, though *tricolor* was



Nest of Orange-fronted Chat (*Ephthianura aurifrons*)

Photo. by A. S. Le Souef, C.M.Z.S.

more plentiful in the open scrub country closer to Ooldea. *E. aurifrons* was breeding, and several nests with both eggs and young were noted in the Blue-bushes.

What I took to be Chestnut-backed Ground-Birds (*Cin-closoma castanotum*) were fairly numerous on the edge of the plain out from Ooldea; they have a habit of dodging round the base of bushes, and are rather reluctant to leave the cover. Five miles out from Ooldea on a thickly grown clay pan, where the ground was a very light clay colour, I observed a very light-coloured Ground-Bird coloured exactly like the clay on which it lived. It allowed a close approach, and when flushed flew under a small bush and remained very still and trusted to its protective coloration to escape observation. This was, I think, the Cinnamon Ground-Bird (*C. cinnamomeum*).

The Field Wren (*Calamanthus campestris*) was one of the commonest birds on the big plain, and was only in evidence well

away from the open scrub country. In the early morning at Fisher their sweet notes could be heard from all directions, and the birds themselves would come close to the house. They lived on the ground, and ran from bush to bush with tail well cocked.

Brown Song-larks (*Cinclorhamphus cruralis*) were very numerous on the edge of the plain, in the open and scattered scrub country. They had paired, were in full song, and were probably breeding. They must have come south much earlier this year.

The Speckled Warbler (*Chthonicola sagittata*) was noted on the open scrub-country at the edge of the plain. Two nests were found, each containing dark chocolate eggs. The nests were built of dry grass, placed at the base of a bush on the ground.

Turquoise Wren-warbler (*Malurus callainus*).—These most beautiful wrens were quite numerous round the Soak, keeping strictly to the sandhills, and keeping principally to the Casuarinas. They were very tame, and came to within a few feet of me as I sat quietly under a bush to observe them. Twice the hen birds of the Purple-backed Wren Warbler mixed with them, but as soon as the male Purple-backed tried to join them, he was promptly driven off by the female *callainus*.

Purple-backed Wren-Warblers (*Malurus assimilis*) were not plentiful, and were noted only round the Soak.

Whiteface (*Pheloccephala leucopsis*).—These cheery little birds were numerous out on the plain, and I think were nesting.

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## Further Notes on the Birds of Shark Bay, W.A.

F. LAWSON WHITLOCK, R.A.O.U., Tudor, via Albany,  
W.A.

Mr. Carter's comments\* on my recent paper on Shark Bay birds appear to call for some further information on my part. In the first place, let me state that none of my references to Mr. Carter's notes in *The Ibis* were made in a critical spirit. Being a resident in Western Australia, no one reads his notes with greater interest and pleasure than I do.

With regard to the rainfall on Dirk Hartog in the year 1920, prior to my landing in June there had been fully six inches. Young of the local Field-Wren (*Calamanthus*) and Pipit (*Anthus*) were then strong on the wing. Compared with Scrub-Wrens (*Sericornis*), my experience points to the fact that the young of *Calamanthus* keep with their parents for a much longer period than do the young of the former. This may account for my not seeing family parties of *Sericornis*, if my surmise was correct that the species bred at the end of summer. Having already made a collection of the birds found on the island, I

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\* "Emu" Vol. XXI., p. 56, *et seq.*

did little collecting during my second visit. I had a permit to do so, but Dirk Hartog being a faunal reserve, I naturally refrained as much as possible.

My only reason for alluding to the name "Blue-breasted Wren" was that I considered it a misnomer when applied to *Malurus assimilis*. I didn't in any sense hold Mr. Carter responsible for it.

With regard to the differences in plumage between the Field-Wrens (*Calamanthus*) found on Dirk Hartog, Peron Peninsula, and Bernier Island, all depends on what value is to be set on such slight differences, which I still contend require a fine discrimination to detect, when age of birds and age of specimens are taken into consideration. Mr. Carter's method of shuffling a number of skins together, and then picking out those resembling one another most, at the same time ignoring the labels, is an excellent one, and if the result shows consistent differences between specimens from the three adjacent localities, then it is a very interesting fact. But whether the differences merit sub-specific rank is still a matter for debate. I am content to abide by the result of Mr. Campbell's examination.

In the case of the coloured plate of the White-winged Wren-Warbler (*Malurus cyanotus*),\* I seem to have drawn a wrong inference. Gould doubtfully described this species (?) from a mounted specimen brought to his notice in England. That he had not much confidence in its validity is shown by his recommendation that if it did not stand, the name was to be transferred to its closely allied congener. I thought that the white feathers on the back, as shown in the plate, had been purposely so drawn to show how easily Gould could have been misled. Certainly the extent of white on the wings varies in the individual, perhaps usually due to age; but never in my experience does it extend across the interscapular region. In drawing attention to this, I thought I was confirming Mr. Carter's own observations.

With regard to the Grass Wren, when I referred to the "few miles of water" separating the localities where Mr. Carter and I obtained our specimens, I had in mind the distance of Dirk Hartog from Peron Peninsula; roughly, about twenty miles, and not the South Passage. I hope my statement as to the reputed differences in plumage is not a more "sweeping one" than Mr. Carter's assertion that the South Passage, with a width of about a mile at its narrowest, *prevents* the interchange of species between Edel Land and Dirk Hartog. The present-day absence of the Shrike Thrush and Babbler from the latter locality is no evidence that they did not exist there prior to the advent and increase of bush cats. It must not be forgotten that no ornithologist had visited Dirk Hartog for a hundred years until Mr. Carter arrived there. But it has been a sheep station for quite forty years. No doubt cats were introduced with the sheep. Mr. Lloyd, the present manager, told me that formerly small

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\* *Malurus cyanotus* is now regarded as a synonym of *M. leuconotus*.

marsupials were plentiful, but were now seldom seen. The Grass-Wren, I fear, has gone, or nearly so. The Crested Bell-Bird will be the next to go. Under such circumstances, ground feeders like the Shrike Thrush or Babbler have small chance of re-establishing themselves. It is just this class of bird cats seem to prefer. In our south coastal district, the Rufous Tree-creeper (*Climacteris rufa*) has nearly gone from the same cause. Smaller birds like the Black and White Wren-Warbler (*Malurus leucopterus*) and Emu-Wren (*Stipiturus*) seem to hold their own much better. Certainly the absence of the Tit-Warblers (*Acanthiza*) is remarkable. I found them comparatively rare on Peron, and they may be so in Edel Land.

It is very difficult to account for a Black and White Wren being confined to the islands of Dirk Hartog, and Barrow, so much further north. On further consideration, I am inclined to regard this as the survival of a species once inhabiting a continuous region, but now isolated by geological changes. But I think it quite probable that individuals or parties of *M. leuconotus* do occasionally cross the South Passage, either voluntarily or *nolens volens*. It would have been interesting to have visited both sides of the strait after the hurricane of last March to see if any interchange of species had taken place. The wind started blowing from the south-east, afterwards veering to north-east. May not the traces of the feathers found by Mr. Carter and myself in the plumage of *Malurus leucopterus* point to an occasional interbreeding with immigrant *M. leuconotus*?

Finally, I must thank Mr. Carter for pointing out the slip I made in the trivial name of *Circus assimilis*. I simply translated the Latin word *assimilis* = *allied*, which is a permissible interpretation. I know the Allied or Swamp Hawk, *Circus gouldi* to my cost in half-grown chickens. It breeds near my home.

My notes were written at the Denham Hotel, whilst the facts were fresh in my memory, and without reference to Check-list or other authority. In these days of Bolshevistic nomenclature, this may have been a rash thing to do. I use the term in its literal meaning of "extreme," but with its attendant atmosphere of confusion. After being out of touch with European ornithology for more than twenty years, I was quite at a loss on reading Mr. D. A. Bannerman's interesting paper in *The Ibis* on the birds of the Canary Islands, to identify the various species mentioned, so chopped about and interchanged have the names become. It was only the trivial names that saved the situation.

In the same journal, another writer, to make his meaning clear, has had to reinforce the trinomial with a fourth name, accompanied by a mathematical sign. We are getting on.

I have written the foregoing notes in my tent over one thousand miles from home. If I have unwittingly misquoted Mr. Carter this must be my excuse. I had no note-book or *Emu* to refer to.

## Further Notes from Peel Island, Moreton Bay, Queensland

By NOEL V. I. AGNEW, R.A.O.U., Queensland.

Although it is some years since my Bird-list was published (vide *Emu*, Oct., 1913), I find it necessary to forward the following notes regarding 91 birds, which makes the total 161 species to date. Some migrants arrive as early as February, others depart not later than in August; stray birds are blown here by heavy winds, and others stay a short period. A few species hitherto recorded have nested on the island.

I may mention, although Peel Island lies two miles from Stradbroke Island, some birds noted on the latter island are not found here—for instance, the Grey Shrike-Thrush (*Colluricincla harmonica*), and the Red-browed Finch (*Egintha temporalis*). It is strange that these birds do not visit this island, which is well supplied with food and fresh water.

**Synoicus australis.** Brown Quail.—Rare; the same habitat as the Stubble Quail (*Coturnix pectoralis*), and the nesting period is in late autumn.

**Ptilinopus regina.** Red-crowned Fruit Pigeon.—The first note taken on 24/10/15. A solitary bird was observed feeding in a fruit-bearing Moreton Bay fig; this bird frequented the tree till December, when it was shot. In the same period of 1916 a pair was noted.

**Hypotaenidia philippensis.** Pectoral Rail.—Observed on 15/3/16; is rare, being noted singly or in pairs. This bird probably breeds here, but I have been unsuccessful in locating nests.

**Porzana fluminea.** Australian Spotted Crake.—Common. Generally seen in pairs; they are supposed to relish fowl eggs. Nests here, young being noted in the third week of October.

**Fulica australis.** Australian Coot.—A doubtful visitor. A resident informed me he had seen a pair of these birds near the seashore.

**Sterna striata.** White-fronted Tern.—Visits us during winter months. The rapid and easy flight of these birds is worth watching as they sail and flutter in the air a good height above the waves, and then rapidly dive to secure a fish.

**Arenaria interpres.** Turnstone.—While observing the habits of sea birds in 1914, I was attracted by the presence of a pair of these birds feeding a short distance away. I think their name is appropriate, as the birds were busily engaged turning over small stones and shells in search of molluscs.

**Haematopus ostralegus.** Pier Oyster-catcher.—8/10/14. One of the birds observed feeding on the reef.

**Lobibyx novæ-hollandiæ.** Spur-wing Plover.—Occasionally noted.

**Squatarola squatarola.** Grey Plover.—Doubtful species. A small flock of sea birds answering to the description of this Plover was observed in 1914.

**Pluvialis dominicus.** Lesser Golden Plover.—First noted during mid-winter, 1914. Visits the island every season.

**Peltohyas australis.** Australian Dotterel.—Observed during winter; they frequent the mud flats in pairs.

*Charadrius cucullata*. Hooded Dotterel.—During April, 1917, a flock of birds seen feeding on the mud flats.

*Gallinago australis*. Australian Snipe.—Very common one time; now sadly reduced in number. Observed in pairs.

*Antigone rubicunda*. Australian Crane.—Oct., 1913. A few birds seen flying toward Stradbroke Island.

*Notophox pacifica*. White-necked Heron.—Winters here; noted singly or in pairs.

*Nycticorax caledonicus*. Nankeen Night-Heron.—A pair of these birds is generally to be observed in the mangroves, or feeding near the edges, where they can soon disappear under the trees if alarmed. Although regarded as nocturnal, I have often seen them feeding in the middle of the day.

*Dupetor flavicollis*. Yellow-necked Mangrove Bittern.—A pair of these birds was once flushed from a swamp near the mangroves.

*Chenopsis atrata*. Black Swan.—Seldom seen, although common in other parts of the bay.

*Dendrocygna javanica*. Whistling Duck.—A flock numbering a dozen were seen flying towards Stradbroke Island June, 1914.

*Virago castanea*. Chestnut-breasted Teal.—Common in winter, when they frequent the lagoon; not seen this year.

*Circus assimilis*. Spotted Swamp Hawk.—A resident shot one of these birds, 28/6/13, and brought him to me for identification; one pair noted.

*Haliastur sphenurus*. Whistling Eagle.—A pair of these birds nested here in October, 1913-14, using an old eagle's nest for the purpose.

*Elanus axillaris*. Australian Black-shouldered Kite.—Wintered here and nested in October, 1915.

*Ieracidea berigora*. Brown Hawk.—Visits the island in winter, and probably nests on Stradbroke Island.

*Cacatua roseicapilla*. Rose-breasted Cockatoo.—A bird visited here one winter and was trapped.

*Polytelis swainsoni*. Barraband Parrot.—Inhabits the topmost branches of gums, and nests during early spring.

*Podargus*. Frogmouth.—Heard calling at night, but has not yet been identified.

*Halycon macleayi*. Forest Kingfisher.—I forgot to mention this bird in my previous list—a forest-loving species; generally noted in pairs, nesting in September. The nest is drilled in a tree Termite's home. One has been used two or three years in succession.

*Halycon chloris*. Mangrove Kingfisher.—This species came under my notice on the first mangrove exploration during 1914. The birds are seen in pairs and nest in October.

*Chaetura caudacuta*. Spine-tail Swift.—Observed in January, 1914-15. A small company of these birds.

*Micropus pacificus*. White-rumped Swift.—A number of these birds visited the island January 21st, 1915, and as they flew low the white rump was distinctly seen.

*Cuculus pallidus* (Pallid Cuckoo).—Migrant; seldom seen. First noted, 6/9/13. 1917: May, arrived; departed end of month. 1918: December, one bird visited us. 2/8/19, a bird observed in vicinity of beach.

*Cacomantis flabelliformis*. Fan-tailed Cuckoo.—Local, 7/6/14. "A single bird noted in honeysuckles." 1918, October to December, visited, seen every day. 1919, August to December, no foster parents found.

*Mesocalius osculans*. Black-eared Cuckoo.—Stray migrant. 1915, May: A pair of birds frequented the fruit trees, particularly figs, where they fed daily on herbaceous beetles (a pest of fig trees). On 30/12/18 a dead bird was picked up.

*Chalcites basalus*. Narrow-billed Bronze Cuckoo.—Migrant; wintered here 1915-16. 2/8/19 to 7/8/19, a bird noted.

*Lamprococcyx plagosus*. Bronze Cuckoo.—Local. 1915, October: A resident reported having found a young bird in White-bearded Honey-eater's nest. Subsequent to this (September), I saw a pair of these birds in open bushlands. 1918, October, first week: Five Cuckoos noted. 24/9/19: A single bird noted. 25/9/19: A Bronze-Cuckoo seen in company with *Meliphaga chrysops* (Yellow-faced Honey-eater).

*Eudynamys orientalis*. Koel.—Migrant. 26/11/17: "A pair noted to-day feeding in fig tree." 1919, February: Still resident. April 10th: Birds disappeared. 30/10/19: A female noted in wattles, where Friar Birds chased it. Departed 14/1/1920.

*Scythrops novæ-hollandiæ*. Channelbill.—"A pair of birds arrived 23/2/16; after wintering here, departed in July."

*Centropus phasianinus*. Pheasant Coucal.—Local. Nests in swamplands in early spring, August or September. Noted singly or in pairs.

*Pitta versicolor*. Noisy Pitta.—Stray migrant. 25/6/15: A resident reported having seen a bird in the mangroves. 26th: The bird in flesh brought for identification.

*Hirundo neoxena*. Welcome Swallow.—Local. Common in winter; nests, earliest date, 26/7/18; first week of August, 1919! young flying about, 31/8/19. Second brood, earliest, December; latest, January.

*Hylochelidon nigricans*. Tree-Martin.—Local. A common bird, generally seen in small companies; nests in hollow spouts of gums at same time as Welcome Swallow. 7/8/19: Start nesting; second brood, January, 1920, second week.

*Petroica phœnicea*. Flame-breasted Robin.—Migrant. 23/4/15: A female of sombre hue noted. 1916: Noted at end of May. 1917-18: Arrive in May, depart August. 1919: Arrived in May, departed 7/8/19.

*Petroica goodenovii*. Red-capped Robin.—Migrant. One bird (male), May, 1912, visited island.

*Erythrodryas rosea*. Rose-breasted Robin.—Migrant. Several birds frequented forest during winter, 1911.

*Melanodryas cucullata*. Hooded Robin.—Migrant. Females observed during winter, 1914-15-16; departed first week of August.

*Gerygone albogularis*. White-throated Fly-eater.—Migrant; rare. Visits the island early winter; arrival, 26/5/15; both sexes noted.

*Gerygone fusca*. Brown Fly-eater.—Local. Fairly numerous. Habitat generally bushland; seen in pairs. October 29th, 1919: A nest similar to that of *G. cautator* with stem practically lacking found suspended from oak branch about 15 feet from ground.

*Gerygone cantator*. Singing Fly-eater.—Local; common; generally seen in pairs. These birds build their oblong, suspended nest in the low branches of mangroves. Material used in construction: Tea-tree bark, sun-dried seaweed, and sometimes a little cobweb-like lining down plucked from honeysuckle cones. Eggs: Three in number, warm white in colour, sparsely spotted with reddish-brown. Generally breed in early September; noted on 24th, 1919. Incubation, 12 to 14 days. Young learn to fly at ten days old. Measurement of nest: Length, 7 in.; stem, 5 in.; at 1 in. from top a hood protrudes half an inch; entrance,  $\frac{1}{2}$  in. in diameter. The female builds the nest; the male either accompanies her on journeys to and fro, or perches on a neighbouring tree watching.

*Oreoica gutturalis*. Crested Bell-Bird.—Migrant; winters here; generally seen in pairs, and hard to stalk, being restless birds. Dates: Arrive, 9/4/17; April, 1918 and 1919. They depart during July.

*Pachycephala pectoralis*. Yellow-breasted Whistler.—Migrant; males seldom seen; females fairly numerous; winters here. Records: 1914, 1915, 2/6/18; 31/7/19; departs at end of July.

*Pachycephala rufiventris*. Rufous-breasted Whistler.—Local. Common in winter; hitherto regarded as migratory, but observations led to a female being seen carrying food to young; and 31/7/17, a female noted gathering nesting materials. Arrive, March; depart, July.

*Pachycephala olivacea*. Olive Whistler.—Stray migrant. For notes on "Extension of locality," vide "Emu," July 1915, vol. xv., p. 51.

*Rhipidura flabellifera*. White-shafted Fantail.—Local. Hitherto placed on migratory list; observations during late years prove it to be local. In winter, become numerous in all parts of island. Arrive, March; depart, August. Nest in October in the dense stunted-mangroves.

*Rhipidura rufifrons*. Rufous-fronted Fantail.—Migrant. Arrival, Feb., 1915, when a pair was seen. 1916: Arrival, last week Feb. 1917: Feb.; must have arrived, being seen in second week March. The following year same. 14/2/1919: Date of arrival at last, when a pair of birds seen in quinine tree on small island. Departure last week July.

*Rhipidura tricolor*. Black and White Fantail.—Local. It is probable this bird nests in the tea-tree swamp, as a single specimen visited gardens during summer months. In April generally common in second week, excepting arrival third week March, 1919. Departure, 1918., first week Sept; 1919, Aug. 31st.

*Seisura inquieta*. Restless Flycatcher.—Migrant. Winters here; noted singly or in pairs. Arrive, 1917, May; depart, 1918, August 16th. Arrive, 1918, April, second week; depart, August 2nd. 1919, depart, September 1st.

*Myiagra rubecula*. Leaden Flycatcher.—Local. A pair generally restricted to a large area; although immature birds noted, nests were not discovered. In winter, numerous. April, 1917: Female observed in first week; second week both sexes noted. Depart, end of July. Record of 24/9/19:—"Heard Flycatchers calling while traversing mangroves; these birds had nest in vicinity, which I was unable to locate, although much time was spent in the search."

*Graucalus novaehollandiae*. Black-faced Cuckoo-Shrike.—Local. Generally seen in pairs in the open and bushland. Bred on island October, 1919. The rough-built stick nest is placed on the branches of gum or swamp-oak. At end of autumn frequently observed, most birds depart late winter; date, 26/8/19.

*Graucalus mentalis*. Little Cuckoo-Shrike.—Migrant. Visits island in small flocks. Arrive, 19/3/19; depart, 31/7/19. Inhabits bushland.

*Graucalus lineatus*. Barred Cuckoo-Shrike.—Stray migrant. A small flock visited us, winter, 1912.

*Campephaga tricolor*. White-shouldered Caterpillar-eater.—Partially local. Male generally seen; female on one occasion flew up near me with nesting material. Arrive, 1918, March; depart, June, 1919. September 11th, male noted; December 31st., last seen.

*Campephaga leucomela*. Pied Caterpillar-eater.—Local. Common in winter; rarer in summer. Nests in tea-tree swamp, September.

*Oreocincla lunulata*. Australian Ground-Thrush.—Migrant; pair wintered here, 1912.

*Ephthianura albifrons*. White-fronted Bush-Chat.—Stray migrant, 30/10/15. A female noted at edge of mangroves.

*Cisticola exilis*. Grass-Warbler.—Local. A bird of mouse-like habits; frequent the grass and swamp lands in pairs; always heard singing. The song is better when birds are on the wing. Nests, built in a shrub near the ground; consists of two leaves sewn together with cobweb, lined with thistledown, and is dome-shaped. Eggs, 3 or 4 sky-blue, marked on larger end with reddish-brown. Nest, January, 1917-18-19.

*Malurus cyaneus*. Silvery Blue Wren-Warbler.—Stray migrant; a pair of birds noted January, 1914.

*Artamus leucorhynchus*. White-rumped Wood-Swallow.—Local. Generally in pairs or small companies resorting to open lands. Nest built in horizontal spout of mangrove, or gum; a few feathers used for lining. Eggs, two or three of a neutral ground colour, dashed, speckled and blotched with shades of brown. September 10th, 1918: Nesting; second brood, January, 1919.

*Artamus personatus*. Masked Wood-Swallow.—Local. Seen in small companies in winter; pair off August; nest September and January. March, congregate.

*Artamus cyanopterus*. Wood Swallow.—Migrant. May, 1912: One bird seen, which appeared to be sick.

*Grallina cyanoleuca*. Magpie-Lark.—Local. Common; a pair generally seen. Nests in August or September, according to seasons.

*Neositta chrysoptera*. Orange-winged Tree-runner.—Stray migrant. 1/7/17: "An interesting note today, when a small company of these birds were seen in the tea-trees."

*Climacteris leucophæa*. White-throated Tree-creeper.—Stray migrant. One bird noted during the winter of 1912.

*Zosterops lateralis*. White-eye.—Migrant. Common in winter, when they generally fly in small flocks; seen in mangroves and bushlands. 1915: Arrived, May; depart, August. 1917: May; departed last week July. 1918: Arrived last week May; departed September. 1919, March: a few birds noted this month. April: Large flocks here. Departed September 1st. December, 1919: A small flock seen in garden and again in January, 1920.

*Dicaeum hirundinaceum*. Mistletoe-Bird.—Local. Noted in pairs and generally inhabits topmost branches of trees. Common in April. Begin to nest September 1st, 1919, and October. December finished nesting.

*Pardalotus striatus*. Red-tipped Pardalote.—Local. Generally seen in pairs. Nests drilled in base of fallen trees. Earliest record, 14/7/18.

*Pardalotus punctatus*. Spotted Pardalote.—Local. Generally inhabits tall gums and are rare; nests in hollow horizontal spouts, August or September.

*Melithreptus lunulatus*. White-naped Honey-eater.—Local. An interesting bird, noted in pairs; frequents tall trees. 9/8/18: Saw a bird gathering nesting material amongst the wattles.

*Myzomela sanguinolenta*. Sanguineous Honey-eater.—Migrant. A regular winter migrant; daily seen or heard calling. Arrive, 1917, May 18th; depart, August. Arrive, 1919, May; depart, August 28th.

*Myzomela erythrocephala*. Red-headed Honey-eater.—Migrant. 14/8/18: First noted. Winters here, arriving with *M. sanguinolenta*. Depart, August.

*Acanthorhynchus tenuirostris*. Spinebill.—Stray migrant. A single bird noted during May, 1914.

*Meliphaga chrysops*. Yellow-faced Honey-eater.—Local. Common. Breeds here. 3/8/19: Nest suspended from oak branch 3 feet from ground; built of tea tree bark shreds, dead leaves and cobwebs outside; lining was the down from honeysuckle cones. 9th: Nest contained two young, whose down had started to disappear, and feathers on wing coverts; gape, yellow. 17th: Feathers covering birds brownish with white edgings mostly on nape and crown. 20th: Feathers cover body, being light olive-brown. 22nd: Watched parents busily engaged feeding young with putella moths. 24th: Visited nest and found young beginning to fly. It will be noted that the young take 17 days till they leave the nest; 7 days elapsed before the first appearance of feathers, then ten days before being fully fledged. Earliest record of nesting, 23/7/19. Eggs buff coloured. Measurements of nest No. 1: Diameter,  $1\frac{3}{4}$  in.; depth outside,  $2\frac{3}{4}$  in.; depth inside,  $1\frac{3}{4}$  in. Nest No. 2: Diameter,  $1\frac{1}{2}$  in.; depth outside, 3 in.; depth inside,  $1\frac{1}{2}$  in. Nests discovered either in mangroves or bushlands. *P. chrysops* is a foster-parent for the Bronze-Cuckoo (*Lamprococyx plagosus*).

*Meliornis novæ-hollandiæ*. White-bearded Honey-eater.—Local. Common; breeds here. 21/10/19: A pair of birds building nest in peach tree near window. 22nd, 23rd, 24th: Birds busy adding to nest; finishing task about 5 p.m. on 24th. 25th: Late in afternoon one pinky-white egg laid. 26th: This morning another egg was laid. 27/10/19 to 12/11/19: Female sat till today, when young naked birds were hatched; colour, dark brown with white down  $\frac{1}{2}$  in. long all over body. 16th: No change in appearance; culmen light brown above, nostril raised  $\frac{1}{2}$  in.; inside and above along gape to chin light yellow white. 19th: Rapid development in growth of feathers, which take the place of down on wing-coverts, mantle, rump, crown and neck; the basal half of outer webs of wings white; ear coverts light yellow, other points greyish-brown. 20th: Watched parents feed young on insects, of which there was a supply handy. 21st: Examination of young; found down quickly disappearing; scattered hairs on lower back, around ear coverts and nape; wing feathers a little darker. Since this date young left nest, and being soon able to fly were gone in a week. Food: These birds partake liberally of *Aphis* infesting garden plants; also the skin-like substance lining cup moth cocoon.

*Tropidorhynchus corniculatus*. Friar-Bird.—Local. A common bird, nesting on island. In winter small flocks seen everywhere; otherwise observed in pairs. Nests, in tea-trees and gums, suspended and cup-shaped; material used in construction, tea-tree, shreds of bark, dead leaves, also gum lined with supple grass, etc. April: Numbers arrive from highlands. July departure, when local birds pair off. August: Nesting commences, which proceeds till January.

*Anthus australis*. Pipit.—Local. Once noted on northern point; now resident on grassy flats on S.E.; noted in pairs. Nest built at base of tufty grass; well concealed, and is made of fine grass with rootlets for lining; sometimes feathers are used. Eggs: Three. Last noted on north end, January, 1915. They nest in August.

*Mirafrja javanica*. Bush-Lark.—Stray migrant. 30/5/19: "A pair of these birds seen early this morning." 10/6/19: Disappeared.

*Stagonopleura guttata*. Spotted-sided Finch.—Stray migrant. First noted 20/5/15; departed, 27/5/15; again, 26/2/20, a solitary bird.

*Zonæginthus bellus*. Fire-tailed Finch.—Migrant. May, 1917: A flock numbering about 20 frequented the garden and paddock trees. Departed second week July.

*Stizoptera bichenovii*. Banded Finch.—Migrant. These birds visited the island for winter, 1915.





A Western District plantation on previously treeless country.

**Oriolus viridis.** Australian Oriole.—Migrant. Arrival, during February, 1914 and 1915; winters here. 1919: Arrival, February; departed, end of March.

**Ptilonorhynchus violaceus.** Satin Bower-Bird.—Migrant. A pair visited us, 1916.

**Corvus coronoides.** Australian Crow.—Local. Common. In reference to this and the following species, I have not ascertained which is more numerous. They nest here; similar habits; and move about either in pairs or small flocks. They build stick nests in the high branches of gums. In winter fairly numerous, April to June; nest from September to December.

**Corvus australis.** Australian Raven.—Local. Same notes as preceding species.

**Strepera graculina.** Pied Bell-Magpie.—Migrant. 21/6/19: "A pair was seen feeding in a Moreton Bay fig tree." Departed 9/7/19.

**Strepera versicolor.** Grey Bell-Magpie.—Stray migrant. May, 1915: A solitary bird noted this month.

**Gymnorhina tibicen.** Black-backed Magpie.—Stray migrant. 28/6/14: A single bird noted. 3/7/14: Departure. 5/3/19: A bird resided here till last week of month.

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## Birds of Barunah Plains and District

JAMES RUSSELL, R.A.O.U., Barunah Plains, Victoria.

Before listing the birds of this district and recording their local habits, it may be as well to describe, for the benefit of the many readers of *The Emu*, the nature of the country and the locality.

Barunah Plains is on the well-known volcanic area which stretches for many miles in the west of Victoria, approximately, 30 miles west of Geelong, 40 miles south of Ballarat, and 120 miles east of Hamilton, and as the crow flies, within 30 miles of the Otway Ranges.

The country was originally devoid of any timber, with the exception of perhaps a few Banksia (Honeysuckle) trees, now long since gone. However, for many years past, plantations have been extensively planted, and around the homestead in particular trees at the present time are fairly numerous. The country is more or less flat, intercepted with "stone rises" of rough, angular lava blocks, and swamps. Two creeks having numerous permanent waterholes run through the property.

Considering the seemingly small attraction for bird life, it is surprising to note that I have recorded about 60 species, of which about 50 per cent. are permanent and nest here each season.

**Coturnix pectoralis.** Stubble Quail.—Not altogether a resident species, but an odd bird may generally be seen at all times of the year. During certain seasons the birds appear in great numbers. Notes on nests I have observed contained eleven, six and eight eggs; nesting months from September to January.

**Pedionomus torquatus.** Plain Wanderer.—Although never plentiful, odd birds are flushed right through the year. These birds seem to be very poor fliers, and I think depend mostly on their ability to hide rather than take to the wing. After heavy rain, I have, on several occasions, caught the birds with a hat. I have never observed a nest, but have no doubt that they do nest on these plains.

**Phaps chalcoptera.** Bronze-winged Pigeon.—This year, for the first time, I came across a pair of these fine birds in a fine plantation, and again a single bird flushed right out on the plains near a swamp.

**Podiceps ruficollis.** Black-throated Grebe.—Nearly all through the year there is a fair number of these little birds about. More often at the water holes than on the creek. I have never noticed them breeding here, but possibly they do so.

**Lobibyx novæ-hollandiæ.** Spur-winged Plover.—Very plentiful all through the year. Pairing off early in August to nest, and assembling into large flocks towards the end of April. I counted one flock of over fifty. These birds, I fancy, rear two or even three broods in a season, and very often nest in the same situation year after year.

**Zonifer tricolor.** Black-breasted Plover.—Also very plentiful, and resembling very much the habits of Spur-winged Plover, except that they are more often found out in the "stoney rises" and hard plains. This little bird becomes an easy prey of the well-known sport who chances to lay in wait at a water hole on any hot summer day. Last season I noticed a number of nests, mostly containing four eggs.

**Charadrius ruficapilla.** Red-capped Dotterel.—Seen at odd times right through the year, but more plentiful in the summer months. These pretty little birds are very quick runners, and are always seen beside the water holes. My brother noticed two eggs of this bird here last September placed close to the water's edge between some small stones. He also found a nest at Lake Corangamite during February.

**Pisobia acuminata.** Sharp-tailed Stint.—Although it is some years since I have handled a species, I am almost certain it is *acuminata*, which at times appears in large flocks, mostly on the sandy and lighter country.

**Eupodotis australis.** Australian Bustard.—Full notes on the local habits of this bird appeared in "The Emu," vol xx., part 4. Owing probably to the exceptionally dry autumn just past, these birds are at present very few and far between. But now rain has fallen, I expect a fair number will commence to show up again.

**Antigone rubicunda.** Australian Crane.—These fine birds rarely make an appearance now, although a few years ago they were fairly numerous, and nested regularly in some of the swamps. I once had one for a pet. All day long he wandered round the horse paddock with one of the hacks which he made a friend of, returning to the yard with the mob at night to feed. It was queer how a bird and a horse should become such mates, but they were never apart. Eventually "Jacko" came to grief, being kicked by a young horse in the yard.

**Notophoxyx novæ-hollandiæ.** White-fronted Heron.—Although never plentiful, odd birds can be seen all through the year, usually along the creek, or perched on a post near one of the water holes. I have on several occasions noticed nests of this bird, usually placed on a forked horizontal bough of a blue gunt tree, nearly always a very roughly built platform without any lining.

**Chenopsis atrata.** Black Swan.—Fairly numerous at certain times of the year, and more especially after a wet winter when the

swamps are full. Odd pairs nest. One nest I discovered in a swamp contained five eggs. August 10th, 1918.

*Chenonetta jubata*. Maned Goose (Wood-duck).—Seen only at odd times. Have never noticed a nest of this species on the plains.

*Casarca tadornoides*. Mountain Duck.—Nearly at all times of the year an odd pair is met with on some of the water holes, but they are never plentiful.

*Anas superciliosa*. Australian Black Duck.—Plentiful in a wet season, and usually an odd pair can be seen at all times. A nest I found in a tussock contained nine eggs (November 1st, 1918). I fancy a few pairs nest on these plains.

*Virago gibberifrons*. Grey Teal.—These birds are more numerous than any other of the duck family, and at times large flocks can be seen on the dams and creeks. I have noticed young teal just hatched, on the water's edge, but have never noticed a nest.

*Malacorhynchus membranaceus*. Pink-eared Duck.—Seen only during wet seasons, when at times they are fairly plentiful, but I doubt whether they nest in these parts.

*Phalacrocorax carbo*. Black Cormorant.—I have seen a pair of these birds a few times lately on one of the larger water supply dams, but probably they are only temporary visitors. I rather hope they are.

*Phalacrocorax melanoleucus*. Little Pied Cormorant.—Seen only at odd times through the year. They follow along the creeks during the day, and make into the trees at the homestead every night to roost. Never more than three or four appear together. I fancy they must find it rather difficult to secure enough food.

*Circus approximans*. Allied Swamp Hawk.—This bird is one of our most common birds of prey, and although not seen so much during the winter months, towards the beginning of spring they make their appearance in fair numbers. I have often come across their nests among the reeds in the creeks, and one nest contained four eggs. November 15th, 1918.

*Astur approximans*. Australian Goshawk.—Odd birds are seen occasionally mostly when there are dead lambs about on which they feed.

*Uroaetus audax*. Wedge-tailed Eagle.—Seen only at odd times during the year, more especially in April and May, when the young lambs are about. I know of the many opinions in regard to these birds killing lambs, but personally I have never seen them attack a live lamb. I have seen them attack a ewe when cast, and mutilate it to such an extent as to necessitate its being destroyed. These birds do not nest here, but most likely return to the Otways or the ranges towards Ballarat to breed.

*Ieracidea berigora*. Brown Hawk.—Plentiful at all times of the year. I fancy these birds take a fair number of chickens where opportunity offers, but no doubt they do a lot of good to make up for this. I have often come across them nesting, but have never seen them actually building a nest. They usually commence nesting in August, rather earlier than most birds, and I do not remember a nest with more than three eggs.

*Cerchneis cenchroides*. Nankeen Kestrel.—Seen only at odd times through the year. I fancy there is not sufficient timber for this species to remain permanently with us. I have never observed them nesting in the district.

*Spiloglaux boobook*. Boobook Owl.—I have seen this bird several times during the day time. I think there are probably a fair number about.

**Tyto alba.** Barn Owl.—This bird is fairly numerous about here, although not often seen. During the last winter I noticed a lot of them lying dead about the garden. The majority of them seemed to be in good condition.

**Glossopsitta concinna.** Musk Lorikeet.—Small flocks of these birds appear when the gums are in flower.

**Callocephalon fimbriatus.** Gang Gang Cockatoo.—I have noticed only one bird here, and this solitary individual has been here now for some months; probably it has become lost from some passing flock.

**Platycercus elegans.** Red Lory.—Only on odd occasions do these birds appear here, and then only in small numbers. During the last few weeks, I have noticed five birds about, all in their green or immature plumage. They seem to feed principally on the box-thorn berries.

**Platycercus eximius.** Rosella Parrot.—Only seen occasionally; perhaps three or four will appear for a few weeks, but soon depart again.

**Neophema chrysogaster.** Orange-bellied Parrot.—Some months ago I came across several flocks of parrots feeding among the tussocks, and although I have not actually handled a specimen, I am certain they are Orange-bellied Parrots.

**Podargus strigoides.** Tawny Frogmouth.—Only naturally, this bird is more often heard than seen. I don't fancy there is a great number here. I have on two occasions noticed their nests, one on the top of an old stump containing two partly fledged young.

**Cuculus pallidus.** Pallid Cuckoo.—Never appear in great numbers. The first ones seem to arrive here in October. I have noticed the egg of this bird in a nest of the Goldfinch.

**Chalcites basalis.** Narrow-billed Bronze-Cuckoo.—This bird is certainly the most plentiful of the Cuckoo family, and I have discovered its egg in the nests of the Goldfinch, Yellow-rumped Tit and White-lored Field-Wren.

**Lamprocoeryx plagosus.** Bronze Cuckoo.—I have seen this bird only on rare occasions, and it soon moves on to more suitable surroundings. I once observed a nest of the Yellow-rumped Tit containing an egg of this species as well as an egg of *L. basalis*.

**Hirundo neoxena.** Welcome Swallow.—This bird is plentiful during the spring and summer months, but the majority disappear before winter. A few birds remain right through the year.

**Lagenoplastes ariel.** Fairy Martin.—Seen only at odd times through the year, when they appear in considerable numbers. I have never known them to nest in this locality.

**Petroica multicolor.** Scarlet-breasted Robin.—This is the only representative of the Robin family which seems to visit this district. Nearly every day now I notice these pretty little birds about. They seem to disappear before the nesting season commences, and probably go on to the Otway Ranges to breed.

**Pachycephala rufiventris.** Rufous-breasted Whistler.—During the last few seasons a few pairs of these birds have been seen, but so far I have not noticed them nesting.

**Rhipidura flabellifera.** White-shafted Fantail.—This little chap shows up in fair numbers, usually towards the end of April, probably on his way further north; by the beginning of June few, if any, are left. I have noticed odd birds about in the spring and early summer, but I fancy they do not remain for any length of time.

**Seisura inquieta.** Restless Flycatcher.—This bird during the last three years has been quite plentiful; but, before that, I had only

noticed it on odd occasions. They now seem to remain right through the year, and I have noticed several of their nests in the plantations. One containing two eggs November 22nd, 1919; another containing three October 17th, 1919.

**Graucalus novae-hollandiae.** Black-faced Cuckoo-Shrike.—Appear usually in spring time, but do not remain for any length of time.

**Campophaga tricolor.** White-shouldered Caterpillar-eater.—I have only noticed this bird here on two occasions, once during last November, and the other many years ago.

**Calamanthus fuliginosus.** White-lored Field Wren—Plentiful all through the year. Although as a rule more often heard than seen, except in the early morning, when often one can be seen perched on the top of a stone or small tussock pouring out its rather quaint little song. I have on several occasions come across their nests, usually well hidden in the middle of a tussock or a patch of thick grass. I once found the egg of the Narrow-billed Bronze Cuckoo in the nest of this bird, or rather was present when it was noticed. They usually commence nesting early in August, and I fancy finish early in October.

**Ephthianura albifrons.** White-fronted Bush Chat.—Fairly plentiful at most times of the year, but more so during the spring and summer months. Towards the end of April the majority of these birds form into flocks, and from then onward seem to disappear, although a fair number can be seen right through the year. I have often noticed their nests, usually placed in a large tussock. The bird if flushed from the nest always flutters along the ground, evidently to attract you from the nest.

**Acrocephalus australis.** Australian Reed Warbler.—Always numerous during spring and summer, and their rather quaint little song can be heard anywhere among the reed-beds along the creek. Until recently I was under the impression that these birds migrate during the winter, but at present (July) there are still plenty to be seen, if not to be heard. Many nests can be seen hanging among the reeds during November and December.

**Acanthiza chrysorrhoa.** Yellow-rumped Tit-Warbler.—This is one of our most common birds, and can be seen at any time through the year. Nests can be observed hanging from the branches of many pine trees around the homestead. I have on several occasions noticed as many as five eggs in the one nest.

**Artamus superciliosus.** White-browed Wood-Swallow.—Only at certain times do these birds visit here. During the spring and summer of 1918 there were literally hundreds nesting and in many funny places: on the tops of fencing posts, coils of wire netting, and, in fact, any place that a nest would rest. The nests mostly contained two eggs, but sometimes three. I do not remember seeing a single bird during the last summer.

**Artamus cyanopterus.** Sordid Wood-Swallow.—Always appear in early spring-time, and every season fair numbers are here. They usually nest among the blue gums in a small fork or behind a piece of bark.

**Grallina cyanoleuca.** Magpie Lark.—This is a very common species on the plains, and is one of my most favoured birds. I have often seen their mud nests, usually placed on a horizontal pine bough at a considerable height from the ground.

**Zosterops lateralis.** White-eye.—These little birds appear only at certain times through the year. During May and June there is, as a rule, a fair number about, and again in spring time they reappear. I have never noticed them nesting in the district, and presumably they make towards the coast. In the vicinity of Barwon Heads, I have noticed them in considerable numbers feeding in the teatree.

**Meliphaga sonora.** Singing Honey-eater.—Among the plantations where there are a fair number of the blue gums and different varieties of Wattle, this bird is sometimes seen. It is never plentiful away from this one favoured place.

**Meliphaga penicillata.** White-plumed Honey-eater.—Plentiful all through the year in any of the plantations, more especially those containing blue gums. These birds seem to nest over a long period. On last Christmas day I noticed one of their frail nests containing three eggs hanging from a fine limb close to the ground. This nest was quite close to the house, and I am afraid before the young birds were ready to fly they made a meal for one of the cats.

**Anthus australis.** Australian Pipit.—Anywhere on the Plains this little bird can be seen in numbers. During last year's drought many of these birds came right into the station yard, probably securing food amongst the horse yards and hay stacks.

**Mirafrja javanica.** Horsfield's Bush Lark.—Whether this is a bush lark or not, it certainly inhabits the plains in considerable numbers, especially where there is any cultivation. I have never noticed the nest of this bird, but I am certain they breed on the plains, probable amongst the crops.

**Corvus coronoides.** Australian Crow.—Plentiful all through the year, and at certain times there are flocks of many hundreds to be seen. These birds seem to be among the earliest to breed, and I have noticed eggs as early as July, but the majority breed in August and September.

**Strepera versicolor.** Grey Bell Magpie.—Last year during September a pair of these birds were here for a few weeks; only on odd occasions have I noticed them here, and they remain only a very short time.

**Gymnorhina leuconota.** White-backed Magpie.—This is one of the most plentiful birds in the district, but I am afraid it is being thinned out to a great extent by farmers poisoning them on newly sown ground. We always have a few pairs around the garden, and many hundreds return each night to roost in the old trees about the homestead. Some of the old birds are very savage at nesting time, and on more than one occasion I have known them to pick right through a thick felt hat.

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## Camera Craft

**Tree-creeper and Silver-eye.**—While at Greensborough in October last with Mr. L. G. Chandler, we discovered the nest of a pair of White-throated Tree-creepers (*Climacteris leucophaea*) in a hollow tree-trunk about six feet from the ground. About three years before, we had found a nest in the same hollow, but had been unable to obtain pictures. On this occasion the birds appeared fairly trustful, but the tree was in the shade, and the position little suited to photography. The camera was focussed on the entrance of the nest, and a considerable length of thread used to release the shutter. The bird invariably approached the nest in the same manner, and the pictures show little variation. Flying to the base of the tree on the side hidden from the camera, she proceeded as close to the nest entrance as was possible without coming into view. Then head and shoulders would appear. If dissatisfied with the appearance of the camera, she backed out of sight again. I was



White-throated Tree-creeper (*Climacteris leucophaea*).

Photo. by R. T. Littlejohns, R.A.O.U.



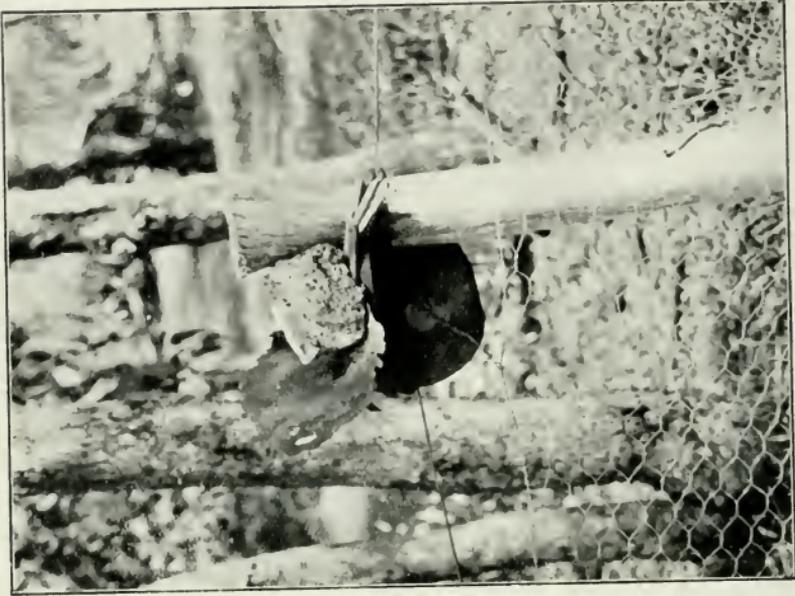




The Silver-eye (*Zosterops lateralis*).

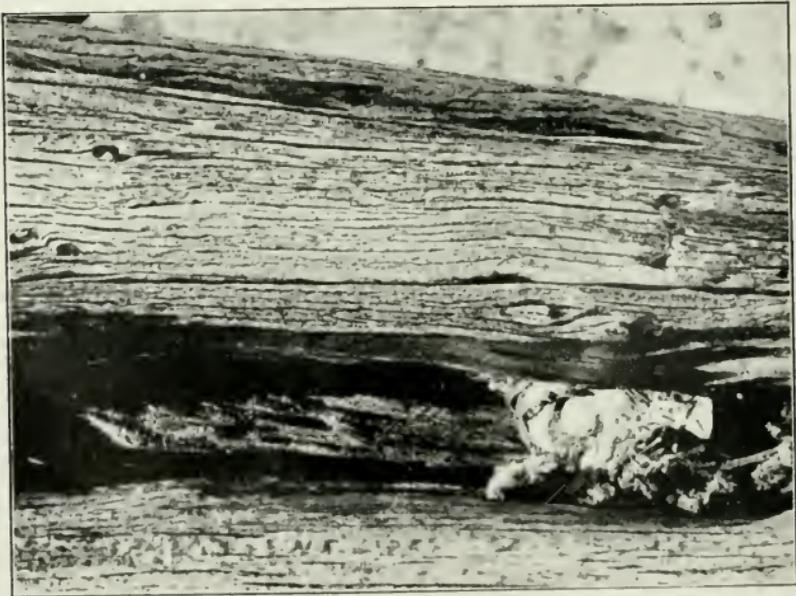
Photo. by R. T. Littlejohns, R.A.O.U.





Nest of White-throated Tree-creeper in an old kettle. Note the cover of sheet iron kept in place by a stone.

Photo. by A. H. Chisholm, R.A.O.U.



Nest of White-throated Tree-creeper *in situ*; a piece of the outer covering has been removed.

Photo. by D. W. Gaukrodgers, R.A.O.U.

struck with this backing movement. Whenever the Tree-creeper wished, for any reason, to proceed down a limb or tree-trunk, it steadfastly refused to turn about and move head downward. It hopped backward instead, and appeared equally as agile as when hopping upward.

The Silver-eye (*Zosterops dorsalis*) I have not found at any time a satisfactory subject for photography, and three or four attempts had left me with the impression that the greedy little bird showed rather a heartless unconcern for eggs or young. But a pair found nesting at Oakleigh in November last were more trustful than the average. Even these birds were pictured only after a three-hour wait. A thirty-foot thread was stretched from the shutter release through a furze hedge near by. Behind this hedge I sat. In a quarter of an hour one bird had approached quite close to the nest, but perched in such a position as to be hidden by the nest from the stare of the lens. Every few minutes she elevated her head ever so slowly, regarded the camera most comically over the top of the nest, then disappeared again just as slowly. This went on for three-quarters of an hour, after which I left the spot for quite thirty minutes. I crept back fully expecting the bird to have become accustomed to the apparatus. Considerably to my amusement and much to my disgust, I found the hide-and-seek business still going on. Later in the day, however, several plates were exposed.—R. T. LITTLEJOHNS, R.A.O.U., Melbourne, August 25th, 1921.

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**Nesting of Tree-creepers.**—This has been an extraordinary year for nesting birds, both in the South and North of Eastern Australia. It is not unusual to find birds breeding in Queensland during the autumn or winter months, as many species have been doing this year, but it is an event out of the common to find, as some of us did a few months ago, such birds as Yellow-tufted Honeyeaters and Yellow-tailed Tits tending babes in Victoria during April and May. Now comes word from the same State that Brown Tree-creepers have made an unusually early start with their *menage*.

July had not gone when a particular pair of these birds brought fresh material to an old kettle, stuck upon a post, in which they have been wont to nest for many years. On August 5th, there were two eggs in the novel nest, and two more were expected. Last year two broods were reared in that situation; with the early start this year, it is suggested by the "official" owners of the kettle that four broods may be produced during the current spring.

It is not the early breeding that interests, however, so much as the remarkable tenacity of the Tree-creepers for the particular nesting-site. As the photograph indicates, the kettle was merely hung carelessly on a fence-post. The site was not twenty yards from a house, a bush home in an orchard. Yet in this precarious situation the Tree-creepers have nested during eight consecutive years! That it is the same pair of birds

that have occupied the kettle all along, the owners of the orchard are convinced, partly by reason of the fact that other birds are driven away when they approach the nest. Further, it is believed that the two original Tree-creepers "camp" in the kettle during the winter. Certainly they appear to be always about the neighbourhood.

By reason of the fact that Tree-creepers usually select a hollow post or limb of a tree for breeding purposes, the nesting-site is seldom adaptable to photography. A rough idea of situation in the instance under notice, however, can be gained from the illustration of the kettle site—made more cosy with a brick and bit of tin on top. But a better indication is offered by Mr. D. W. Gaukrodger's picture of a nest (same species), in a dried boree tree in Central Queensland. In this case the eggs were exposed through the removal of a narrow strip of bark for photographic purposes.—A. H. CHRISTOLM, Brisbane, 25/8/21.

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**Nesting of Emu.**—This pair of Emus are nesting this season in a small enclosure by the home of my sister, Mrs. Wyatt de Little, Temora, N.S.W. They are a very quiet pair. The hen started to nest early in the season, and laid two or more eggs after she became broody. The eggs took about fifty-two days to incubate; the male bird took very little notice of the young ones. This pair hatched all the seven eggs laid, but one young one died before the hen left the nest; the others are doing well.

The male bird is easily distinguished from his mate; he has a fuller breast, which he can inflate while making the drumming noise. The hen bird has a totally different note, more like a soft grunt, which she uses to call, and also to warn her young ones in case of danger.—SHEILA M. ROBERTSON, R.A.O.U., Mordialloc.

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**Good Camera Subjects.**—The accompanying photograph of a pair of Yellow Robins (*Eopsaltria australis*) was one of a series taken by us last season on the Scotchman's Creek, Oakleigh (Vic.). This pair of birds was remarkably tame. The male repeatedly fed the female on the nest while we had the cameras focussed at a distance of eighteen inches only.

At another time, when the young had hatched out, we placed a piece of brown paper over the nest to shield them from the hot sun. The female, on arriving at the nest, and finding she could not reach the nestlings, proceeded to brood them through the paper. It was an amusing sight to see the bird anxiously trying to fathom the altered conditions.

We succeeded in securing some pictures also, showing the bird sitting on her nest, with one of us touching her breast with the hand. She took little notice of this liberty beyond occasionally pecking at the offending finger.—S. A. LAWRENCE, R.A.O.U., and R. T. LITTLEJOHNS, R.A.O.U., Melbourne.



Nesting Emus. Note the two young birds by the head of the sitting bird.

Photo. by Miss Sheila M. Robertson, R.A.O.U.





Male Yellow-breasted Robin feeding his mate on the well-camouflaged nest.



## Stray Feathers

**Effects of a Mild Winter.**—The winter having been so mild in Victoria, birds have been nesting unusually early. I saw a fully fledged White-plumed Honey-eater (*Ptilotis pencillata*) in July, as one case in point. Then again at Koowecup, where the country is rough and mostly lightly timbered, except for patches of swamp ti-tree, I found very early this season three nests of the Yellow-breasted Shrike-Robin (*Eopsaltria australis*); one had three eggs in, but one of these was taken, and the birds promptly disturbed the nest. I have noticed the same thing occur before. Magpie-Larks (*Grallina cyanoluca*) nested freely in the pines. They seem to prefer these trees to the eucalyptus; possibly their mud nest has a better hold. Many Magpies (*Gymnorhina leuconota*) were nesting, but usually in eucalypts or blackwood trees, and I noticed one nest of the Butcher-Bird (*Cracticus torquatus*) with three eggs in, and also not far off a pair of Kestrels (*Cerchneis cenchroides*) built their nest in a eucalyptus tree, but the other birds did not seem to be very scared of them. Their food is, I think, largely insectivorous. Possibly other members have also noticed early nesting this season, and probably many birds will rear two or three clutches this year. We saw a Wedge-tailed Eagle (*Uroaetus audax*) catch and kill a rabbit. It caught it by the head with its talons and carried it off.—J. CECIL LE SOUEF R.A.O.U., Parkville.

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**The Red-Eyed Bul-Bul.**—Mr. Wolstenholme's note on this bird (*Otocompsa jocosa*—Linn.) in the July issue of *The Emu*, following that by Mr. W. H. D. Le Souef in the issue of April, 1918, have prompted me to make some observations on the occurrence of this bird about Sydney. Its natural habitat is Northern India, Burma, South China, Andaman Islands, and the Malay Peninsula. In size it is somewhat smaller than our Crested Bell-Bird, for which I mistook it on the first fleeting glimpses, before the conspicuous red markings were noticed. The beak, forehead, crown, crest, nape and sides of chest are black, and a black line occurs below the cheek. The chin, throat, cheek and centre of the chest are white, as are the tips of the tail feathers beneath. A white feather also appears at the position of the bastard wing. The under tail coverts are bright red, and a patch of similar colour appears below the eye. The rest of the plumage is, roughly, brown above and grey beneath. The crest is a conspicuous feature, standing well up from the forehead and crown, the centre feathers being erect, while the anterior contour is concave. Often the crest appears bifid. I first noticed this bird in my garden at Double Bay, Sydney, in October, 1917, and observed it there constantly until my de-

parture in July, 1918. On one occasion I asked Messrs. W. D. H. and A. S. Le Souef to come out and observe it, but, unfortunately the day was windy and the birds were not visible. I regularly saw and heard this bird about Double Day, Edgecliffe and Darling Point, and have subsequently heard it at Rushcutters' Bay. Mr. A. S. Le Souef informed me that it frequented the Sydney Botanic Gardens, and I have heard but not seen it there. It has since been added to the collection at Taronga Zoological Park. In habit the bird is very restless, constantly moving or flying rapidly from place to place. At the same time it was not very shy or timid, and disported itself on the shrubs and trees close to the roadside, in full view of the passers-by. Building operations in an adjacent garden did not frighten it away. The birds were often seen on telephone wires or on the tops of tall trees, but also on the roses feeding on Aphides. They frequently drank from and bathed in a large earthenware saucer placed on my lawn for the use of birds. The posture adopted on perching is very erect. I mostly saw or heard this bird about daybreak or from 9 to 10 a.m., or in the late afternoon. The flight is rapid and straight, or somewhat undulating. The voice is clear, ringing and musical or softer and lower, as if the bird were chattering plaintively to itself. When uttered only a few yards away it often sounded far distant. Sometimes the direction of the sound could not be located, and the bird seemed to possess "ventriloquial" powers. The loud notes might be roughly likened to "Pretty creatures" or "Sweet creatures." I found no nests. How many individuals there were I could not state. I have seen two at the one time on a Robinia tree in our garden.

(Dr.) JOHN MACPIERSON, Sydney.

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**Lyre-Birds and Lyra.**—When writing in *The Emu* (vol. xx., p. 222 concerning Prince Edward's Lyre-Bird (*Menura edwardi*), I remarked that the first intimation of the presence of a *Menura* in the granite belt of Queensland-New South Wales came from a lad living at the small township of Lyra, and that he had remarked that the place received its name from the bird. This was an erroneous assumption, but its appearance in print has served the useful purpose of discovering the real origin of the name in question. The information came from Mr. R. Hoggan, a veteran resident of Lyra, who stated that Lyre-Birds are still to be found in the locality, but they had nothing to do with the name of the town. The place, he says, was formerly known as Accommodation Creek. This mouth-filling name did not strike him as being fair to bushmen; accordingly, early in the nineties, he called on the then Commissioner of Railways (Mr. Gray) to seek a change. Together they looked through a small dictionary of aboriginal words, and discovered that the native name for creek was "lira." "Well," said Mr. Hoggan, with a sense of poetic fitness, "why not spell it 'lyra'?" The

Commissioner agreed, and so Lyra is on the map of Queensland to-day. That Lyre-Birds should be in the district is apparently merely a pretty coincidence. — A. H. CHISHOLM, R.A.O.U., Brisbane. 1/8/21.

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**Stray Feathers from The Steppes (Tas.).**—This district is situated some 3000 feet high in our Central Highlands, being on the road to the Great Lake from Bothwell. In common with the rest of Tasmania, this winter is notable for the heavy fall of snow which occurred during the first week of August. Here, at the Steppes, the snow kept on falling, day after day, till all the fences were covered. Icicles, five feet long, hung from the eaves of the dwellings, whilst a cold wind moaned through the trees.

In circumstances like these, one wonders how the birds fare, so these few notes from my correspondent at the Highlands may prove of interest. She says: "Such numbers of birds come to us to be fed. The Black Magpies (*Strepera fuliginosa*) have been coming for food for some years, but this winter we have had a flock of seventy (counted). Besides these, there are five ordinary magpies (*Gymnorhina leuconota*), and one Black Jay (*S. arguta*), the only one of its kind that ever makes friends with us. These will all eat almost anything. We generally give them meat, apple peelings and bread. They are fond of milk too.

Between twenty and thirty Noisy Miners (*Myzantha garrula*) make this their home, and are regaled with sugar and crumbs. Seven Rosellas (*Platycercus eximius*), and a number of the Green Parrots (*P. caledonicus*) pick up oats and walk round the cows' feed boxes on the look out for dropped grain. They spend much of their time in the willows, whose tiny buds they eat.

Numbers of Wrens (*Malurus longicaudus*) and Tits (*Acanthiza diemenensis*) haunt the verandah and enjoy their meal of crumbs. The above birds come regularly for their meals. The Black Magpies are very quick at catching anything thrown to them. I saw one the other day fly away with a whole apple held by both its claws. Six Spurwing Plovers do not come for meals, but they spend their time with the fowls, and are not in the least afraid of us. It is strange to see them trotting about with the hens. I had almost forgotten the Grey Butcher-Birds (*Cracticus cinereus*). They prefer meat.

This fall of snow has taken a heavy toll of the birds, and many of all sorts have been picked up dead in the snow. We generally have a great many Bald Coots (*Porphyrio melanotus*), but they left when the lagoon dried in the drought last summer, and have not come back. I hope they do. The lagoon is very lake-like now, and many ducks are about it.

Later on in the year, I hope to spend a few weeks with my friends at The Steppes, and look forward to making some interesting observations. — (Miss) J. A. FLETCHER, R.A.O.U., Woodbridge, S. Tasmania.

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**Old Sydney Bird Notes.**—The following items of interest to ornithologists were forwarded to me by Mr. H. Selkirk, of the Department of Lands, Sydney, and are very old "stray feathers":—

"A neat aviary is building by the Surveyor-General, Major Mitchell, at his new residence on the Woolloomooloo Hill for the purpose of domesticating a number of Australian birds. This is the first erection of the kind in the colony."—*The Sydney Herald*, 18th April, 1831.

The "major" was doubtless he from whom the cockatoo derived his vernacular name.

Another item:—

"The species of owl peculiar to this island, vulgarly known by the name "Mope-hawk," is held in high veneration by the blacks. When it is heard near their encampments at night, they put various questions to it, and interpret the notes which it utters in reply as a sort of augury of their future fate."—(Extract from the *Sydney Gazette*, 9th April, 1829; reprinted from the *Hobart Town Courier*).—E. A. D'OMBRAIN, Sydney. 7/9/21.

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**The John Burroughs Memorial Association** is making the first appeal for contributions for the fund with which to purchase Riverby, the Bark Study, Woodchuck Lodge and Memorial Field, and to provide for their maintenance and that of Slab-sides, the plan for which is set forth in an accompanying circular. It is not believed there is any need of urging the value of this plan to acquire and preserve the homes and haunts and the final resting place of the poet-naturalist. Indeed, we should do him scant honour were we to urge contributions.

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**Black-breasted Plover and Young.**—A few days ago I had occasion to be in one of my back paddocks shortly after sunrise, the scene being an open grassy flat devoid of timber. In the middle of this I suddenly noticed a Black-breasted Plover to all appearances attacking four young Plovers not yet able to fly. This bird, uttering the usual Plover warlike cry, would swoop first at one youngster and then at another. These would duck, and sometimes squat for two or three seconds before moving on. The old bird seemed very cross, and kept them travelling in one direction all the time. A hundred yards away from where I had seen them first were some very thick rushes.

As soon as the young birds reached this spot the old rover flew away, and did not chase them again. Evidently it was one of the parents driving the young to a place where they could hide from enemies.—BRUCE W. LEAKE, R.A.O.U., Cardonia, Woolundra, W.A. 5/9/21.

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A "South-coastal Selborne."—*The Emu*, July, 1921. In my list of birds found in a very limited area on the far South Coast of New South Wales, I inadvertently omitted the White-naped Honeyeater, or "Blackcap" (*Melithreptus atricapillus*), and the White-shafted Fantail (*Rhipidura albiscapa*), both very common, also the Friar Bird (*Tropidorhynchus corniculatus*), seen occasionally, but commoner further inland. The White-shafted Fantail, by the way, occasionally lays again in the same nest after being robbed of its first clutch of eggs, which few birds do. The addition of these three birds brings the total number of species observed in the above-mentioned quarter to 165.—H. V. EDWARDS, Bega, N.S.W.

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**New Zealand Birds in Captivity.**—I lately obtained from New Zealand two Paradise drakes and one duck and four wekas, which soon made themselves at home in my three-acre zoo, as I call it. The Paradise Ducks are evidently a Sheldrake, and very like our Mountain Duck in shape, colouring and note, except the female, which has a white head. One of the wekas, has made a nest, and I am hoping that she will lay. My pair of Black Swans (I hope they are a pair) have made a nest, and so far laid four eggs in five days. I am hoping they will be fertile, and that she will hatch them out safely.

ERNEST G. AUSTIN, R.A.O.U., "Borriyalloak," Skipton.

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## Library Notes

By F. ERASMUS WILSON, R.A.O.U., Hon. Librarian.

Owing to lack of space, library notes were not published in the last two or three issues of *The Emu*. Since the last notes were given, the following publications have been received:—

*The Victorian Naturalist*, vol. xxxvii., parts 4 to 12; vol. xxxviii., parts 1, 3-5.

*Science and Industry*, vol. ii., parts 1 to 12.

*The Australian Naturalist*, vol. iv., part 11.

*The Ibis*, vol. ii., 11th series, parts 3, 4; Vol. iii., 11th series, parts 1-3.

*Bird Lore*, vol. xxii., parts 2-6, vol. xxiii., parts 1-3.

*The Avicultural Magazine*, vol. xi., parts 3, 5-12; vol. xii., parts 1-6.

*British Birds*, vol. xiii., parts 11, 12; vol. xiv., parts 1 to 12; vol. xv., parts 1, 2.

*Le Gerfaut*, 1920, Fas 2, 3, 4; 1921, Fas 1, 2.

*Proceedings of the Royal Society of Tasmania*, 1920.

*Proceedings of the Linnean Society of N.S.W.*, vol. xlv., parts 1, 2.

*Revue Francaise d'Ornithologie*, Nos. 132-5, 138-143, 145-147.

*The Condor*, vol. xxii., parts 3-6; vol. xxiii., 1-4.

*The Auk*, vol. xxxvii (new series), parts 2, 3, 4; vol. xxxviii., parts 1, 2, 3.

*The South Australian Ornithologist*, vol. iv., part 4; vol. v., parts 1, 2, 3; vol. vi., parts 1, 2.

*A Geographical Bibliography of British Ornithology*, by W. H. Mullens, H. Kirke Swann and Rev. F. C. R. Jourdain. Parts 4, 5, 6. (Witherby & Co., London.)

*Fauna of British India. Birds*, vol. 1 and 2, by Eugene W. Oates, 1889. Presented by Mr. F. Keep, R.A.O.U.

*Essays on Early Ornithology and Kindred Subjects*, by James R. McClymont. [Bernard Quaritch Ltd., London.] From the author.

A delightfully written and beautifully got up little brochure. Three chapters of special interest to members are these under the following headings:—

“The Etymology of the name Emu.”

“Australian Birds in 1697.”

“New Zealand Birds in 1772.”

*Proceedings of the Royal Society of Queensland*, vol. xxxi.

*Journal and Proceedings of the Royal Society of Western Australia*, vol. vi., part ii.

*Proceedings of the Royal Society of Victoria*, vol. xxxiii. (new series).

*The Queensland Naturalist*, vol. ii., No. 6; vol. iii., No. 1.

*The Austral Avian Record*, vol. iv., Nos. 4, 5.

*The University of California Publications in Zoology*, vol. 19, Nos. 1-4, 8-11; vol. 20, Nos. 1-6; vol. 21, Nos. 3, 5; vol. 22, pp. 1-292.

*A Practical Handbook of British Birds*. Witherby & Co., London. Part x.

*Early Annals of Ornithology*, by J. H. Gurney, F.Z.S. H. F. and G. Witherby, London.

The following articles of special interest to members are noted in the preceding list of journals:—

*The Ibis*, vol. ii., No. 4.

"A Contribution to the Study of Nestling Birds," by Collingwood Ingram, M.B.O.U. A splendid paper on this somewhat neglected phase of ornithology.

*Agricultural Magazine*, xi. (5).

"Cockatoo Catching in Victoria," by Thornton Skinner. An article describing the methods adopted by the professional bird catcher.

xi. (6). Contains an article on "Birds of Paradise in Captivity" by Mr. A. S. Le Souef.

He states that these birds do not make good Zoo exhibits, as they are of a very retiring disposition. Some species are very pugnacious, and will kill and eat smaller birds.

xi. (7). "The Nesting of the Pilot Bird (*Pycnoptilus floccosus*)", by S. A. Lawrence and R. T. Littlejohns. This paper is accompanied by two excellent photographs.

xi. (12). "The Australian Cat-Bird," by Hubert D. Astley.

xii. (2). "The Mallee Fowl of Australia," by R. T. Belchambers. Contains much information of value on the habits of *Leipoa ocellata*.

*Condor*, xxiii. (1).

"Suggestions regarding the Systema avium," by R. C. McGregor.

An article calling attention to the need of, and suggestions for an up-to-date Check-list of the Birds of the World.

*Auk*, xxxviii. (2).

"The History and Purposes of Bird Banding," by Frederick C. Lincoln.

An informative paper dealing with the interesting subject of bird ringing.

*South Australian Ornithologist*, vol. iv., 4.

"The Weights of Some Australian Birds," by A. M. Morgan, M.B., B.Ch.

Vol. v. (2). "*Eudromias australis* (Australian Dot-trel)," by J. Neil McGilp.

Some useful and interesting notes on this bird of the interior. Mr. McGilp considers it to be of great value as an insect destroyer.

Vol. vi. (1). "Description of a New Wren," by J. W. Mellor, R.A.O.U.

Mr. Mellor describes a new sub-species, *Legycornis lamberti eyrei*, and suggests for it the very lengthy vernacular of Eyre Peninsula Chestnut-shouldered Wren.

## Economic Section

THE STARLING: IS IT INJURIOUS TO  
AGRICULTURE?

WALTER E. COLLINGE, D.Sc. F.L.S., The University of St. Andrews.

Reprinted from the Journal of the Ministry of Agriculture, Vol. XXVII.,  
No. 12, March, 1921.

For many years past there has been taking place a sure but gradual change of opinion with reference to the economic status of the starling, for from one of our most useful wild birds it has become one of the most injurious. Its alarming increase throughout the country threatens our cereal and fruit crops, and the magnitude of the plague is now fully realised.

Writing in April, 1919,\* we stated: "At the present time the starling offers a most serious menace to the production of home-grown food, and any further increase in its numbers can only be fraught with the most serious consequences." In the intervening two years the starling has undoubtedly increased to such an extent, and as a result of the great damage done to crops, farmers and fruit growers in all parts of the country realise the seriousness of this bird plague. The causes which have brought about the change in the food habits of one of our commonest wild birds are not at first sight apparent, but a closer study of its habits readily explains the deflection.

The starling is distributed generally throughout the British Isles, and, with the exception of one or two counties in Ireland, is abundant now in all districts. Its remarkable increase during the latter part of the nineteenth century attracted considerable attention, and many theories were advanced as to the cause. Some attributed it to the destruction of birds of prey, others to greater facilities for nesting places, while a growing abundance of food was cited by others. In the writer's opinion, however, it is due, *firstly*, to the security of its nesting site; *secondly*, to the change in its food habits; and *thirdly*, to the autumnal immigration. The increase has steadily continued, and at the present time it is almost as numerous as the house-sparrow. The usual nesting place was in the holes in trees, quarries, cliffs, etc. and these are probably its natural habitation. More recently, however, it has availed itself of the greater security afforded by houses, farm buildings, churches, ruins, etc., and occasionally it builds in the foundations of larger birds' nests. The actual nest is a loose untidy structure, consisting of straw or dried grass, leaves, wool or moss, lined with feathers. Both sexes assist in nest building. Five to seven pale bluish eggs are laid early in April, and sometimes there is a second brood. Incubation is shared by both sexes, and extends over a period of from 12 to 14 days; the fledgelings are ready to leave the nest about three weeks later.

As has frequently been pointed out, this bird is most variable in its movements, even from the time of leaving the nest. Its habit of moving about in flocks during the spring and summer months constitutes a grave danger; while later the habit of collecting at special roosts frequently causes much damage to young fir plantations, shrubberies and reed-beds.

It is exceedingly difficult even approximately to estimate the actual number of pairs of breeding birds in this country, but for the purpose of illustrating the rate of increase, we will presume that in 1917 there were 100,000 pairs of starlings breeding in Great Britain (which is

\*National Review, 1919, pp. 252-257.

considerably under the actual figure), and that each pair reared three pairs of young, half of each sex, and that all lived together with their offspring. The progeny and parents in a single year would total 800,000. At the end of 1918 this number would have increased to 3,200,000, the addition in 1919 would make the total 12,800,000, while at the end of 1920 there would be over 51,000,000 birds.

These figures are calculated on the basis of a single brood per year, though in many parts of the country there are two broods. Even allowing for a very high rate of mortality, it is clear that the annual increase is enormous, and supplemented as it is by immigrants, the number of these birds at present is far greater than the country can naturally support.

As the number of starlings has increased annually, a gradual change in the nature of the food consumed by these birds has taken place. There is fairly reasonable evidence to show that in the past the bulk of the food consisted of insects and insect larvæ, slugs, snails, earthworms, millipedes, weed seeds, and wild fruits; in more recent years this has been supplemented by cereals and cultivated fruits and roots. Some writers have affirmed that once the fruit-eating habit is acquired, they refuse the other available food.

As a winter visitor large numbers come to the British Isles from Northern and Central Europe, and others pay a passing visit when *en route* between Continental summer and winter quarters. From observation on the east coast of Scotland the writer can attest to the arrival daily during September, 1915, of flocks of starlings from one to five thousand. In 1916 the numbers were much smaller, but increased again in 1917. During 1918 they outnumbered anything seen previously. Small flocks were observed on 7th September, and larger ones on the 8th. On the latter date one flock alone must have contained something between 150,000 and 200,000 birds, and on the 9th September a still larger flock was observed. This immigration of course occurs all along the eastern coast of England and Scotland, so that the actual number of arrivals must total many millions. The Continental visitors are darker in colour than our residents, and many of them remain here.

The depredations of this bird are known only too well, and require little further description. During the past two years the writer has visited many farms investigating the damage caused to newly-sown cereals. In some cases as much as 30 per cent. of the seed was eaten. The loss due to re-sowing, where possible, is very great if the high cost of labour is taken into consideration, but where this is not possible it is a direct and enormous loss to the cultivator and to the nation. Again, in fruit growing districts the depredations of this bird become more marked annually, cherries, strawberries, currants, plums of all kinds, and more recently, apples and pears suffer. One grower states: "Only one bird is dangerous to my crops—that is, the starling. He threatens the utter destruction of our strawberry, raspberry, cherry, gooseberry, currant, and some other crops. These birds are said to come here from the marshes as soon as the young are hatched, and they come in millions—in flocks that darken the sky." Another grower writes: "During recent years this bird has increased to such an alarming extent as to be a plague. They come in flocks of tens of thousands, and whilst here commit an enormous amount of damage which must far outweigh any benefits they confer. Each year they seem to grow more plentiful. I am in favour of a very drastic reduction for some time to come."

In order to appreciate clearly the true economic position of the starling, it is necessary that the stomach contents of a large series of individuals should be examined, from various districts, and during each month of the year. Such an examination has been made, and as a result we find that of the total bulk of food consumed in a year 51 per cent. consists of animal matter and 49 per cent. of vegetable matter (see Fig. 1). Examined in further detail we find

ANIMAL MATTER	51%
VEGETABLE MATTER.	49%

FIG. 1.

INJURIES	41%
BENEFITS.	36.5%
NEUTRAL.	22.5%

FIG. 4.

INJURIOUS INSECTS.	26.5	BENEFICIAL.	34.5
SLUGS & SNAILS	6.5		
MILLIPEDES.	1.5	INJURIOUS.	2.5
BENEFICIAL INSECTS	2.5		
NEUTRAL INSECTS	3.5		
EARTHWORMS	8.5	NEUTRAL.	14.0
MICROANIMAL MATTER	2.0		

FIG. 2.

CEREALS.	20.5	INJURIOUS.	38.5
CULTIVATED ROOTS.	2.5		
CULTIVATED FRUITS.	15.5		
WILD FRUITS & SEEDS.	7.0	NEUTRAL	10.5
MULL. VEG. MATTER.	3.5		

FIG. 3.

FOOD OF STARLINGS CLASSIFIED AND CALCULATED.

that the animal matter contains 26.5 per cent. of injurious insects and their larvæ, 3.5 per cent. of neutral insects, 2.5 per cent. of beneficial insects, 8.5 per cent. of earthworms, 6.5 per cent. of slugs and snails, 1.5 per cent. of millipedes, and 2 per cent. of miscellaneous animal matter. The percentages of the different items are expressed diagrammatically in Fig. 2. Further inquiry into the nature of the vegetable matter shows it to consist of 20.5 per cent. of cereals, 2.5 per cent. of cultivated roots and leaves, 15.5 per cent. of cultivated fruits, 7 per cent. of wild fruits and seeds of weeds, and 3.5 per cent. of miscellaneous vegetable matter of a neutral nature (see Fig. 3).

If the monthly averages are examined we find that the percentage of animal matter is greatest in April, May and June, the respective percentages being 65, 92 and 87. The highest percentage of fruit is found in July, August and September, and the highest percentage of cereals in September, October and March. In some districts the total percentage of injuries during the months July to October is nearly 100, in other words, cereals and cultivated fruits form the main items of food during this period of the year.

Summarising the above figures, we find that 36.5 per cent. of the starlings' food constitutes a benefit to the agriculturist, 41 per cent. an injury, and 22.5 per cent. is of a neutral nature. These percentages are expressed diagrammatically in Fig. 4. The difficulty is how to balance these figures. This can be accomplished only by interpreting the economic value of the different items in the light of experience gained in such work.

Let us first examine the nature of the benefits. Amongst the insect food we find large numbers of click-beetles and weevils, a few June bugs, wireworms and many beetle larvæ. (The starling does not consume anything like the number of wireworms that the rook does.) Surface larvæ such as those of the Garden Swift Moth, the Heart and Dart Moth, the Great Yellow Underwing Moth, and the caterpillars of the Winter Moth form a considerable item, also leather-jackets and the larvæ of other Dipterous flies. Slugs and snails constitute the next most important item. Millipedes are occasionally taken, but are not a large item.

All the above-mentioned insects are exceedingly injurious to agricultural and fruit crops, and the number of individual forms destroyed must be very great. It is necessary to bear in mind, however, that the bulk of this kind of food is consumed in April, May and June, that is to say, for a period of about three months the starling is wholly beneficial, for another three months it is partly so, and for the remaining six months it is harmful.

A point in the starling's favour, is the nature of the food brought to the nest by the parent birds during the nesting season, which covers a period of about three weeks. A volumetric analysis of the stomach contents of 40 nestlings shows that injurious insects constitute 89 per cent. of the total bulk of food, neutral insects 1.5 per cent., earth-worms and slugs 6.5 per cent., and miscellaneous matter 3 per cent. Amongst the insects we find the larvæ of the Great Yellow Underwing Moth, various Noctuid and Geometrid larvæ, wireworms, leather-jackets, and many Dipterous larvæ, weevils and numerous small beetles. In addition to feeding the growing and rapacious nestlings upon this diet, there is every reason to suppose that during this period the parent birds also partake of a similar one. It is, however, important to bear in mind that this period is confined to three weeks only, or six where there are two broods, and as we have previously shown, while the animal diet of the adults during April, May and June is remarkably high, it is almost negligible during July, August, September, October and March.

Almost every farmer is aware of the damage done by these birds to autumn and spring sown cereals: large areas of newly sown land

are laid waste. In many cases great loss is occasioned by the rooting up of seeds which are not consumed. In a like manner the fruit grower can recount serious damage to strawberry, raspberry, gooseberry, currant, cherry, plum, pear, and apple crops, and here again a large tonnage of fruit is damaged apart from that actually eaten.

The above figures were obtained from investigations on the starling up to the end of 1918, but we are convinced that a new inquiry at the present time would show that the injuries had become greater, and the benefits less, owing to the further increase in the number of individuals. Moreover, if we examine the food of starlings from limited areas we find that in spite of the large number of injurious insects they eat in agricultural districts, the percentage of cereals and cultivated roots is so high that the species must be condemned. In a like manner, in fruit growing districts the injuries far outweigh the benefits conferred. Examined from almost any standpoint the unprejudiced mind can come to one conclusion only, viz., that the starling has long since risen above the "high water mark of abundance," and in consequence is doing more harm than good. In other words, we have too many specimens of one species requiring the same kind of food within a limited area, and as the late Professor Beal pointed out, this is the cause in nearly all cases where a bird becomes injurious.

If further evidence were needed against the starling it is supplied by its activities in other countries. When first introduced into Australia it was generally regarded as one of the most beneficial birds to the agriculturist and fruit grower, but with its rapid increase a marked change took place in its food habits to such an extent that in 1905 Mr. C. French, the Victorian Government entomologist, wrote: "There can be no doubt about the starling being a most pernicious enemy to the fruit grower and viticulturist in this State. The starlings are increasing a thousand times faster than their natural food, hence they must avail themselves of such as is obtainable. Once driven to this, an appetite is acquired, and fruit diet being easily obtained, they will not seek any other, even if available. It is pleasing to note that the Shire Councils are offering a bonus for starlings' heads and eggs . . . . Valuable insect-eating birds such as Kingfishers, diamond-birds, tree creepers, and tree swallows are being driven out of their nesting places in tree-hollows by swarms of starlings, and before long these insectivorous birds, useful to the farmer and orchardist, will be driven out of the State."

As yet the charge of usurping the nesting places and the destruction of insectivorous birds in this country is not proved, but it is only natural that this should take place as the starling family becomes the preponderating bird-factor in a district. The question naturally arises: "How are we going to attack this problem?" It is by no means an easy one, for any reckless or indiscriminate method of general destruction will only do harm. The object to be sought is not how to exterminate the starling, but how to reduce its numbers and to keep it within reasonable limits so far as the immediate future is concerned. To bring about the desirable end we would suggest the following course of action:—

- (1) In all fruit growing and agricultural districts, the systematic collection of the eggs and the destruction of autumn immigrants.
- (2) So far as possible, the making of all dwelling houses, farm and out-buildings starling proof, *i.e.* blocking up all openings or facilities wherein the bird may nest.
- (3) More stringent regulations for the protection of birds of prey, such as the Kestrel, Merlin, Hobby, the Tawny or Brown Owl, and the Little Owl.
- (4) International co-operation with those countries from which we receive autumn immigrants.

(5) A new inquiry as the starling becomes reduced in numbers, in order to gauge accurately its food habits under new conditions.

Failing some such action as indicated above, the agriculturist and fruit grower will be left faced with a growing enemy which is devastating their crops, and inimical to their interests, and the country with a portentous factor which is adding to the scarcity of home-grown food. In short, the starling has become a plague in the land and a source of great national loss.

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## Reviews

[“Results of Dr. E. Mjöberg’s Swedish Expeditions to Australia, 1910-1913,” xviii. Studies of the Birds in North-West Australia, by Rudolf Soderberg, with 5 plates and 25 text figures. Stockholm, 1918.]

After many delays, due, at least partly, to the Great War, the interesting and valuable report of the detailed painstaking investigations of Dr. Rudolf Soderberg in the fascinating North-West has reached us.

In a brief preface, Dr. Soderberg acknowledges assistance rendered by the Perth Museum, and gives the welcome information that the birds collected by the expedition are now in that museum. Unfortunately, this wise procedure was not followed by other authors of works on Australian birds, and comparatively few Australian types are now available to Australian ornithologists. Reference to the work of Messrs. A. J. Campbell, Tom Carter, Bowyer-Boyer, Rogers, E. T. Hill, R. Hall and J. S. Timmey is also made, and a bibliography of works containing reference to the avifauna of the North-West is given.

A good map of Western Australia shows the faunal regions, and the localities where the expedition worked in the far N.W., near Broome and Derby.

The geographical conditions, including climate, the Savanna landscape and the rains and their effects on animal life are intelligently discussed. The presence of many tree-climbing lizards is shown to be responsible for the placing of nests well out on the periphery of the trees, where, although apparently conspicuous to enemies “from without,” they are really well protected from the greater enemies “from within” the tree. The camouflage of the beautifully-constructed nests of the Tree Runner, the Scarlet-breasted and Yellow-breasted Robins, is well shown in photographs. The remarkable mimicry by a young Stone Plover of a lizard is illustrated.

The birds of each order are treated in the arrangement of Sharpe’s Hand-list of Birds, as shown in Mathews’ Hand-list Supplement of *The Emu*, 1908. It is explained that as the species were identified in 1912 according to that list, before the issue of Mathews’ later lists, the nomenclature of the 1908 Hand-list has, for the most part, been adopted. Notes on the

adult, young, and variants, the moulting and the ecological conditions are given for the different birds. Special attention is devoted to the feather and moulting conditions.

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["Golden Wattle: Our National Floral Emblem." By A. J. Campbell, C.M.B.O.U., author of "Nests and Eggs of Australian Birds" and Life Member Wattle Day League of Victoria. Osboldstone & Co., Temple Court Place, Melbourne. 63 pages, quarto, with 28 illustrations, 5 coloured. Price, £1/1/-.]

Though this is a bird journal, yet there is a close connection of birds with trees, rendered closer in this case by the author being for years Hon. Editor of this Journal, and also life member of the Wattle Day League of Victoria.

The author, a pioneer in Australian nature study, particularly in bird and tree study, has, after many years of study and photographing, produced a handsome, well-illustrated volume of our beautiful often heavily scented wattle, a work worthy to be a companion volume of the valuable "Nests and Eggs of Australian Birds."

The dedication reads: "To all who love our National Flower—with its flossy wealth of golden glory and leaves of loveliness—the wattle, this work is humbly dedicated by A Wattle Lover."

The foreword by Sir William J. Sowden, K.C.M.G., Adelaide, President Federal and South Australian Wattle Day Leagues, draws attention to the author's efforts in promoting the cult of the wattle blossom, in developing Australian sentiment for the wattle, and in securing the recognition, already practically Empire-wide, of Wattle Day. Sir William concludes with "an expression of the great gratitude which is due to the author from Australia's sons and daughters in general, and members of the Wattle League in particular for the patriotic and national inspiration which he has imparted."

The letterpress is developed from the interesting lecture given by the author in arousing interest in the Wattle Day movement. It is beautifully and appropriately illustrated by selected pictures by the author—an expert photographer. A symbolic meaning has been added by the inclusion of draped figures in many of the pictures.

Printer, block-maker, and binder have done their parts well, and the book deserves the support of all interested in Wattle Culture, and the development of an Australian national sentiment.

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## State Secretaries' Reports

### TASMANIA.

Considerable progress has been made in Tasmania recently as regards bird protection, and the "Animals and Bird Protection Act," which is controlled by the Police Department, is of great assistance in this direction. Reports were received that the Silver Gulls and other sea birds were being molested in

the estuary of the Derwent, and upon the attention of the Department being drawn to this matter, certain action was taken which should have a good effect.

The question of reservations is a very live one in Tasmania. The National Park of 38,500 acres is an absolute sanctuary for the native fauna, and at the present time we are conducting a campaign in favour of the reservation of some 200 square miles of mountainous country in the Cradle Mt.—Lake St. Clair district as a National Reserve. If proclaimed, it is proposed to manage the reserve more as a tourist resort than a sanctuary, but the animal life will be afforded every reasonable protection. The mountain and lake scenery within this area is magnificent, and, properly managed, the area should become one of the most famous National Reservations in the world. The proposal has been sympathetically received by the Government, and the details are now being considered by Ministers.

The 'Tasmanian Field Naturalists' Club is also moving in the direction of having part of Mount Wellington declared a bird sanctuary.

Attention was drawn to the depredations usually inflicted upon the Black Swans during the nesting season, particularly so as regards the Moulting Lagoon on the East Coast. The Commissioner of Police, who is also Chief Inspector under the Animals and Birds Protection Act, detailed a man for special work in protecting the breeding grounds, and the success of this is amply demonstrated by the following article extracted from the *Hobart Mercury*:—

THE MOULTING LAGOON  
SWANS IN THE NESTING SEASON.  
A VISIT TO THE SANCTUARY.  
(From Our East Coast Correspondent.)

By the courtesy of Trooper Sproule, the police officer in charge of the swan sanctuary in the Moulting Lagoons, a small party, including the writer, was invited to visit the hatchery, where thousands of birds are now nesting. The spot selected by Mr. Sproule for our visit is situated on the northern end of the Lagoons, and to reach the hatchery we had to make our way through half a mile of dense titree scrub, which in this locality fringes the water for some three or four miles. Between the titree and the water there is a narrow strip of tussocky land, intersected by countless mud channels, forming hundreds of islets, and in these islets the swans have built their nests.

The swans had become so used to the presence of the trooper that we were enabled to approach to within quite a short distance before they left their nests, and it was a quaint sight to see their long necks and heads peering at us over the high grass. On our near approach they took to the water, and swam leisurely about, some 50 yards distant, whilst we inspected their nests. On one islet, not more than 60 yards in circumference, we saw over 20 nests. Most of them contained from five to seven (the swans evidently believe in odd numbers), and in one we counted nine eggs. A few cygnets were seen swimming with the old birds, for some are already hatched; but the trooper told us that, although he has seen several nests where they had been hatched, he has not seen them in the nest. He thinks they must take to the water immediately they break the shell. Although

we only stayed a few minutes, as we did not wish to disturb the birds more than we could help, we all thought it well worth the trouble of our long scramble through the scrub, and although some of the ladies of our party on more than one occasion mistook unfathomable mud for dry land, they would not have missed the sight for pounds.

It was a beautiful sunny day, and to see thousands of graceful swans swimming about the blue water of the Lagoon, numbers of them within a stone throw of where we stood; and further out, countless numbers of duck and other water fowl, with here and there the white plumage of a pelican, showing out clearly amongst his darker brethren, was a sight not easily to be forgotten.

This is the first season that the swans have had anything like adequate protection from marauding egg stealers, and, judging by what we saw of the hatchery, there will be thousands upon thousands of young birds this season. Trooper Sproule takes a keen interest in his duties, and is as proud of his "chickens" as he calls them, as any prize poultry keeper in the land. The thanks of East Coast residents and sportsmen throughout the island are due to the Commissioner of Police for sending a trooper immediately his attention was drawn to the subject, and there is not the slightest doubt that when the swan season opens next year there will be more swans than ever on the Moulting Lagoon.—"The Mercury," Hobart, 10/9/1921.

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## Correspondence

*To the Editors of "The Emu."*

Sirs,—Some twenty years ago I contributed a paper on the plumage of Magpies (Roy. Soc. Vic. xiv., 1901), and it is now quite interesting to find Mr. C. F. Cole, in *The Emu*, xxi., pt. 1, page 51, confirming the observations.

The position of Magpies, as I now see it, is:—

*Gymnorhina tibicen*, Latham, The Australian Magpie.

A. B. Dimorphics.

A. Black-backed Magpie.

B. White-backed Magpie.

a<sup>i</sup> Southern Race.

a<sup>ii</sup> Northern Race.

a<sup>iii</sup> Western Race.

b<sup>i</sup> Tasmanian Race.

b<sup>ii</sup> South-eastern Race.

b<sup>iii</sup> Western Race.

Yielding to the law of priority, I put Latham's name, though I should have preferred Gould's *hypoleuca* for the more developed bird.

The matter of races is still an open one.—Yours, etc.,

ROBERT HALL.

Tasmania, 26/7/21.

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Date of publication of this issue, 3rd October, 1921.





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BLACK THROATED GROUND BIRD

*Cinclosoma alisteri* (Mathews)

Male—lower figure

Female—upper figure

# The Emu

Official Organ of the Royal Australasian Ornithologists' Union

"Birds of a feather."

VOL. XXI.]

1ST JANUARY, 1922.

[PART 3.

## *Cinclosoma alisteri* (Mathews) Black-Throated Ground-Bird

By A. J. CAMPBELL, C.M.B.O.U., F.A.O.U.

Mr. H. L. White, C.M.B.O.U., C.F.A.O.U., who again most liberally bears the expense of this beautiful plate by Mr. Neville W. Cayley, R.A.O.U., has requested me to supply the letterpress.

On the "Provisional List" of the R.A.O.U. Official Check-list, p. 103, is the name "*Cinclosoma alisteri*, Mathews. Black-breasted Ground-Bird." The original description ( $\sigma$ ) is found in *Bulletin B.O.U.*, xvii., p. 16 (1910).

For over a decade this description has stood unique until Mr. F. L. Whitlock, collecting for Mr. H. L. White, recently took a fine series of similar skins at the western end of the Nullarbor Plain, Western Australia. Mr. Mathews' description is accurate save the coloration of the upper surface, which is auburn, not chestnut as described by Mr. Mathews, who also does not mention a conspicuous, elongated, white patch on the malar region, or side of the neck, and again, the bird is more black-throated than black-breasted, as the vernacular name describes it in his "1913 List" (p. 198). Should these three marked differences not agree with Mr. Mathews' type, then I venture to suggest the name *nullarborensis* for the bird represented on the present plate, in case it be different. But for the time being, we shall treat the interesting species as *C. alisteri*.

*Adult Male*.\*—Upper surface from forehead to elongated tail coverts, and including ear-coverts, and side of neck auburn; wing-coverts and primary coverts black, tipped with white; secondaries mummy-brown, margined with cinnamon-rufous, some wholly, or on inner webs crimson-rufous; primaries mummy-brown with paler edges, especially third to sixth quills, which are margined with pinkish-buff towards the base; tail feathers clove-brown to blackish-brown, except the central pair,

\* The male figured in plate is another specimen.

tipped with white, broadly on the outer, and diminishing in size towards inner ones, some margined with auburn on outer web; superciliary line and conspicuous patch on malar region, or side of neck, white; lores and line through eye black; throat and fore-neck black with bluish gloss; breast and centre of abdomen light buff, and separated from cinnamon-coloured flanks by tract, more or less defined, of blackish marked feathers; under tail-coverts, feathers dark brown and light buff, the former colour imparting a blackish spotted appearance; under wing coverts white, succeeded by small blackish patch; quills under, lustrous hair-brown with cinnamon drab tinge on inner webs. "Bill black, iris deep brown, feet lead grey" (Whitlock).

Dimensions (in flesh).—Total length 190 mm.; wing 82 mm.; culmen 16 mm.; tarsus 28 mm.

*Habitat*.—Haig, Nullarbor Plain, W.A., 11/10/21.

*Adult Female*.—Forehead, lores, ear-coverts, crown, nape, hind-neck and mantle cinnamon-brown, blending into back, rump, and upper tail-coverts auburn; lesser and greater wing coverts and primary coverts blackish brown (3), tipped with white; the greater coverts being edged with drab; secondaries cinnamon-brown, some striped with clove-brown; primaries blackish (clove) brown, some of outer webs, towards the base, edged with light buff; tail similar to that of male; lores, superciliary stripe, and malar region whitish, like breast and abdomen; chin and throat mottled grey and white; fore-neck mouse grey; flanks wood-brown; under tail-coverts light buff, indistinctly marked with wood-brown; under wing-coverts more mottled than in male; quills under, as in male. "Bill black, iris coffee brown, feet lead grey" (Whitlock).

Dimensions (in flesh).—Total length 185 mm.; wing 85 mm.; culmen 16 mm.; tarsus 24 mm.

*Habitat*.—Naretha, East-West Railway, W.A., 10/8/21.

*Immature birds* more resemble the female, with under surface, especially chin, throat and fore-neck mottled with black. "Bill, peary black; iris, deep brown; feet, lead grey" (Whitlock).

Dimensions (in flesh).—Total length 185 mm.; wing 80 mm.; culmen 15 mm.; tarsus 27 mm.

*Note*.—In the series of skins examined, there is practically no difference in Naretha and Haig specimens, but in a male taken at Loongana (31/10/21), further into the great plain, the upper surface generally is more cinnamon-rufous, perhaps caused by age, as the tail feathers are somewhat abraded. Total length 193 mm.; wing 84 mm.; culmen 14 mm.; tarsus 28 mm.

*Eggs*.—See descriptions by Mr. H. L. White, page 164.

*Field Observations* by Mr. F. L. Whitlock, p. 178.

\* Type of female, the specimen figured in plate being co-type.

## Two New Subspecies of Birds

By H. L. WHITE, M.B.O.U., C.F.A.O.U., "Belltrees," N.S.W.

*Gymnorhina tibicen eylandtensis.* sub sp. n.

*Adult Male.*—Differs from typical Black-backed Magpie (*Gymnorhina tibicen*) by longer bill, more slender tarsi, intensely black (glossy black) and purer white parts, narrower band of black at tip of tail (30 as against 60 mm.), by the mottled tibia (instead of wholly black), and by less black on the tips of white feathers of shoulder patches.

*Adult Female.*—Instead of cloudy greyish patch on neck, as in *G. tibicen*, the nape is a pure white, and blends into patch of dusky feathers, which are edged with white, and broadly centred with black.

*Immature Male.*—Most resembles female, with all the dark portions more or less mottled greyish, blackish-brown, and rust colour, the latter tipping the feathers, particularly on back, breast and face.

*Dimensions in mm.*—

♂ Length ... 370; wing, 224; cul., 57; tail, 145; tar., 58.

♀ Length ... 370; wing, 220; cul., 53; tail, 145; tar., 50.

♂ Imm. length, 365; wing, 222; cul., 57; tail, 140; tar., 55.

♂ Imm. length, 375; wing, 232; cul., 59; tail, 148; tar., 53.

Dimensions typical *G. tibicen*. See *Proc. Roy. Soc., Vic.*, viii., 1895 (Campbell).

♂ L., 400 mm.; W., 257 mm.; cul., 51 mm.; tail, 152 mm.; tar., 51 mm.

♀ L., 400 mm.; W., 247 mm.; cul., 42 mm.; tail, 152 mm.; tar., 51 mm.

Collected by Mr. W. McLennan, on Groote Eylandt, N.T., 8/5/1921.

*Geophaps scripta peninsulae.* Sub sp. n. The southern variety of this bird has apparently become scarce in many of its former strongholds; it is pleasing to note that a northern form is still plentiful, and it has on more than one occasion supplied Mr. McLennan with a very welcome change of diet. It is a quiet confiding bird, and takes little trouble to hide its nest.

*Adult Male.*—Smaller and lighter coloured than typical bird. Colour in general above, light drab to drab, instead of snuff-brown to sepia as in type; wing speculum purple, not green; abdomen patch, dull gull grey (see "Color Standards," Ridgway's).

*Dimensions.*—Length, 286 mm.; wing, 140; tail, 102; tar., 25; cul., 16, as against typical male—*Geophaps scripta*:—Length, 325 mm.; wing, 148; tail, 110; tar., 25; cul., 22.

Collected by Mr. W. McLennan at Coen, Cape York Peninsula, North Queensland, September, 1921.

## Descriptions of New Nests and Eggs

By H. L. WHITE, M.B.O.U., C.F.A.O.U., "Belltrees," N.S.W.

*Cinclosoma alisteri* (Mathews). Black-throated Ground-Bird. —Clutch, 3 eggs; oval in shape; ground colour dull, creamy-white, with the least perceptible trace of greenish tinge, well spotted and blotched all over, chiefly at the larger end, with olive brown and slaty-grey markings; surface of shell very smooth and somewhat glossy. Dimensions—A,  $1.07 \times .78$ ; B,  $1.08 \times .77$ ; C,  $1.07 \times .77$  inches. Nest situated at foot of dead blue-bush, and consisted of hollow scratched in the ground, lined with fine dry grasses, and with a rim of coarse herbage on level with ground.

Collected by Mr. F. Lawson Whitlock, at Haig, Nullarbor Plain, Western Australia, 20th October, 1921.

*Acanthiza pusilla whitlocki*, North. Lake Way Tit-Warbler. —Clutch, 3 eggs; oval in shape, and much pointed towards the smaller end; ground-colour, very delicate pinkish-white, marked with small spots and scratches of reddish-brown, taking the form of blotches on the larger end, where they make rather a well-defined zone. Intermingled here and there are a few purplish-brown markings. Surface of shell, very smooth, and slightly glossy. Dimensions—A,  $.68 \times .48$ ; B,  $.72 \times .49$ ; C,  $.72 \times .47$  inches. Nest of the usual *Acanthiza pusilla* type, taken from a low bush about two feet from ground. Female sitting.

Collected by Mr. F. Lawson Whitlock, at Zanthus, Great Western Railway, Western Australia, on 18th July, 1921.

Note.—I have classed this *Acanthiza* in the *pusilla* series, and it most resembles *apicalis*, of which *whitlocki* appears a lighter phase. The bird of the Nullarbor is still lighter coloured, having the upper surface greyish olive except the coverts, which are wood-brown, while the scales on the forehead are nearly white, thus differing in this respect from all other *Acanthiza* in the "H. L. White Collection."

With the approval of ornithologists, I think this little Nullarbor bird might be known in the vernacular as the "White-scaled Tit," or *Acanthiza pusilla nullarborensis*. There are four skins in the "H. L. White Collection" from Zanthus and Naretha.

*Strepera graculina robinsoni* (Mathews). Northern Pied Bell-Magpie.—Before describing eggs of sub-species, I have usually been most particular in obtaining skins of the bird for comparison; where I consider the variation too slight, I discard the sub-species. In this case I am departing from my usual practice, skins not being to hand. But the difference in the eggs of this northern bird from those of its southern relative is so very marked that I think I am safe in assuming *Strepera graculina robinsoni* to be a good sub-species.

With a series of eggs before me, I note very little individual difference in the colour of the clutch, while those of the southern bird vary to a remarkable extent.

Number of eggs to clutch usually three, four occasionally. Ground-colour invariably a dirty white, or pale brown, with a few darker smudges or blotches about the larger end. They are remarkable eggs, presenting the appearance of having been long exposed to sun and weather, though most of my clutches were fresh when taken; nothing in my series of eggs of the more southern bird approaches them in colour.

Previously my most northern record was the Percy Islands, S.E. of Mackay, North Queensland, where sets of a very bright brick-red were obtained; Coen is 700 miles further north.

*Strepera graculina robinsoni* (Mathews).

*Type Eggs*.—Clutch, 3; lengthened oval in form, ground-colour dirty white, and possessing very pale yellowish tinge, sparingly marked with small spots and blotches of dull olive and slaty grey, which form an irregular cap at the larger end of each egg. Surface of shell finely granulated, dull, without gloss, and having a bleached appearance. Measurements in inches—A, 1.70 × 1.12; B, 1.68 × 1.17; C, 1.67 × 1.11. Nest placed 77 feet from the ground in a paperbark (*Melaleuca*) tree. Collected by Mr. W. McLennan at Coen, Cape York Peninsula, North Queensland, 12th October, 1921.

*Co-Type Eggs*.—Clutch, 3; swollen oval in shape, ground-colour dirty white, and possessing a very pale greenish tinge. Spotted and blotched with comparatively small markings of dull olive and slaty grey, the latter being the most numerous, and the general markings becoming confluent at the larger end. Surface of shell finely granulated, and almost without gloss. A, 1.57 × 1.15; B, 1.57 × 1.14; C, 1.53 × 1.13.

Nest placed 55 feet from the ground in a paperbark tree. Collected by Mr. W. McLennan at Coen, Cape York Peninsula, North Queensland, 23rd October, 1921.

A clutch containing four eggs, taken at Coen, 12th October, 1921. The specimens are rounded ovals in shape, and darker than the two foregoing sets, being brownish in general colouring. Dimensions—A, 1.43 × 1.12; B, 1.39 × 1.08; C, 1.42 × 1.07; D, 1.49 × 1.09.

In his notes on the taking of the last clutch of eggs, Mr. McLennan states:—"Struck a big nest of the vicious little Yellow Hornets in the top of the tree, and got badly stung about the head, hands and back. The *Strepera's* nest contained four eggs; had to use the rod and scoop from a strong limb 9 feet from the nest to secure the eggs. The hornets were giving me gyp all the time. Measured distance of nest from ground, 50 feet."

*Climacteris melanota* (Gould). Black Tree-creeper.

The discovery of this Tree-creeper, followed by the tragedy of Gilbert's death on the 28th June, 1845,\* from aboriginal spear-wounds (see Leichhardt's "Overland Expedition from Moreton Bay to Port Essington" (1847), page 309) has always been of more than ordinary interest to ornithological collectors.

I have tried unsuccessfully for many years to secure eggs, and until Mr. McLennan's visit to Coen (about 200 miles N.W. of Cooktown), North Queensland, my only souvenir of the bird was a skin or two.

*Climacteris melanota* (Gould). Black Tree-creeper.

*Type Eggs.*—Clutch, 2; swollen ovals in shape; ground-colour pinkish-white, well marked all over, and particularly at the larger end, with specks and blotches of pale to rich reddish-brown, and purplish markings, the latter being chiefly confined to the larger end of both eggs. Incubation fresh; surface of shell very fine, and slightly glossy. A, .87 × .66; B, .85 × .67 inches.

Nest placed 24 feet from the ground in a hollow limb of iron-bark tree. Entrance 3 inches in diameter, depth 12 inches, bottom 4 inches diameter. Collected by Mr. W. McLennan at Coen, Cape York Peninsula, North Queensland, 30th October, 1921.

*Co-Type Eggs.*—Clutch, 2; ovals in shape; ground-colour pinkish-buff, marked uniformly all over with specks and blotches of pale to rich reddish-brown, and scattered here and there are dull purplish markings, the latter not nearly so numerous as in the type clutch. The general markings are far more abundant, and closer together than in the type clutch. Surface of shell very fine, and slightly glossy. A, .88 × .67; B, .88 × .67 inches.

Nest placed 15 feet from the ground in a hollow limb of a mountain ash. Entrance 5 inches in diameter, depth 15 inches, bottom diameter 5 inches. Incubation was advanced.

Collected by Mr. W. McLennan, at Coen, Cape York Peninsula, North Queensland, 1st November, 1921. The eggs vary in size, shape and general disposition of markings, and approach nearest to those of the Brown Tree-Creeper (*Climacteris picumna*), but, of course, are much smaller.

Mr. McLennan's notes upon the taking of the eggs read as follows:—"I saw a single *C. melanota*, watched it; after a while I saw its mate. In a few minutes one flew to a hollow 24 feet from ground in an ironbark, with what looked like a piece of charcoal in its bill, and went inside. Waited several minutes, then rode up and rapped the tree with tomahawk, bird flushed and flew off. Climbed up and found a set of two lovely fresh

\* On the Gilbert Memorial Tablet in St. James' Church, Sydney, the date of death is shown as 29th June.—Eds.

eggs, which I could just reach without cutting out the hollow. Did not disturb the nest, as I thought the bird might lay again in same nest. Composed of short grass, cattle-hair, and pieces of bark; could not see any snake scales in it (as was the case with my nest found on 2/9/21); several small pieces of charcoal in with the eggs."

The latter data refers to clutch taken on 30/10/21. In his notes referring to the clutch of two taken on 1st November, 1921, he states:—"Saw likely looking hollow in direction from which the bird came, so went and examined it. Nest there right enough; contained two fine eggs; secured them and also nest. Hollow 15 feet from ground in a mountain ash. Went away about 100 yards and watched what the birds would do. Both returned to nest in a few minutes, one carrying quite a large piece of charcoal in its bill; it went into the hollow, and the other flew off."

*Geophaps scripta peninsulæ* (H. L. White). Northern Partridge-Pigeon or Squatter-Pigeon.

Clutch, 2 eggs; stout ovals in shape, very pale creamy-white, surface of shell rather smooth and glossy. Dimensions—A, 1.16 × .88; B, 1.12 × .85 inches. Nest situated amongst short grass, and consisted of a shallow depression in ground, lined with few leaves, and pieces of grass.

Collected by Mr. W. McLennan, at Coen, Cape York Peninsula, North Queensland, 15th September, 1921.

*Podargus strigoides capensis* (Mathews). Tawny Frogmouth.

Clutch, 2 eggs; pointed ovals in shape; colour, pure white; surface of shell slightly coarse, and almost without gloss, while under the lens numerous small pittings are noticeable. Dimensions—A, 1.52 × 1.08; B, 1.47 × 1.09 inches.

Nest a flat structure of small sticks, placed 18 feet from ground on thick horizontal fork of ironwood tree.

Collected by Mr. W. McLennan at Coen, Cape York Peninsula, North Queensland, 28th September, 1921.

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## Abnormal and Curious Combination Clutches

By H. L. WHITE, M.B.O.U., C.F.A.O.U., "Belltrees," N.S.W.

### Abnormal Clutches of Eggs or Nestlings observed, Season 1921

Probably the good season experienced generally throughout Australia has been the cause of so many clutches, containing an unusually large number of eggs, or young being noted. Mention of a few may be the means of bringing other records from various observers. Following are some records that have come under my personal notice.

*Notophox nova-hollandia*. White-fronted Heron.—Six eggs, noted by Mr. A. B. Bettington, 27th November, 1921, at Brindley Park, Merriwa, N.S.W.

*Gymnorhina tibicen*. Black-backed Magpie.—Six young birds in one nest noted by Mr. E. Page (a thoroughly reliable observer) near Muswellbrook, N.S.W., during August, 1921.

*Eupodotis australis*. Australian Bustard.—“The Daily Mail,” Brisbane, of the 3rd December, 1921, records a clutch of three eggs noted by Mr. Archer of Mount Enniskillen Station, near Blackall, Queensland.

*Dacelo leachii*. Blue-winged Kingfisher.—Five eggs, all fresh, noted by Mr. W. McLennan, on 20th October, 1921, near Coen, Cape York Peninsula, North Queensland.

*Plegadis falcinellus*. Glossy Ibis.—Six eggs, found by Mr. F. C. Morse, at The Watercourse, Moree, N.S.W., during December, 1921.

*Dendrocygna eytoni*. Plumed Whistling Duck.—Sixteen eggs found by Mr. F. C. Morse at Coocalla, Garah, N.S.W., October, 1920.

*Chenonetta jubata*. Maned Goose (Wood Duck).—Sixteen eggs taken by Mr. F. C. Morse, Coocalla, Garah, N.S.W., August, 1920. Mr. Morse reports having noted a clutch of 18 young Wood-Ducks during the late spring; also a clutch of 28, with a pair of old birds, but cannot believe that this great number was the product of one pair of birds.

*Virago gibberifrons*. Grey Teal.—Seventeen eggs found by Mr. F. C. Morse at The Watercourse, Moree, N.S.W., September, 1920.

*Cinlosoma alisteri*. Black-throated Ground-Bird.—Three eggs noted on three occasions during November, 1921, by Mr. F. L. Whitlock near Haig, trans-Australian railway, Western Australia. I have not previously heard of more than two *Cinlosoma* eggs to the clutch.

*Entomyza cyanotis harterti*. Northern Blue-eyed Honey-eater.—Three young, two chipped and one addled egg all in same nest, observed by Mr. W. McLennan near Coen, North Queensland, on 20th September, 1921. Five eggs, fresh, of same species noted by Mr. W. McLennan from one nest near Coen, North Queensland, on 9th October, 1921.

### Curious Combination Clutches

*Entomyza cyanotis harteri*. Northern Blue-eyed Honey-eater.—Two eggs with one of *Pomatorhinus rubeculus* in the nest of last named; noted by Mr. W. McLennan near Coen, Cape York Peninsula, North Queensland, on 1st October, 1921. Contrary to their usual habit, the Honey-eater had not built its nest inside that of the Babbler.

Two eggs of the Blue-winged Kingfisher (*Dacelo leachii*) with two eggs of the Northern Blue Mountain Lorikeet (*Trichoglossus novæ-hollandiæ septentrionalis*) in same nesting hole; noted by Mr. W. McLennan near Coen, Cape York Peninsula, North Queensland, on 25th October, 1921. When first observed (22/10/21) the nest contained one egg of each species.

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## Stray Feathers

**Eggs of Black-ringed Finch** (*Stizoptera annulosa*).—A clutch of 5 eggs in my collection possesses very small specks of black, well distributed over the larger ends of the specimens. Collected by Mr. W. McLennan on Groote Eylandt, Northern Territory, on June 15th, 1921. Another clutch containing 7 eggs was taken by Mr. R. Hislop at Cooktown, North Queensland, November 4th, 1898. These eggs also possess black specks on their larger ends.—HENRY L. WHITE "Belltrees," Scone, N.S.W., 9/12/21.

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**Albino Australian Pipit or Ground Lark** (*Anthus australis*).—A white specimen of this bird was noticed by the overseer (Mr. J. Telfer) with one of his men. The bird was a young one, and was noticed to be weak on the wing, so they immediately gave chase. The bird kept going for about quarter of a mile, reaching a rough gorge, where it took shelter for a time. On being disturbed again, it flew up and down the side of the gorge, until getting into open country. Making off, it flew into a very thick swarm of grasshoppers, which seemed to upset the bird, and Mr. Telfer was able to get his hat over it.—A. B. BETTINGTON, R.A.O.U., "Brindley Park," Merriwa, N.S.W., 30/11/21.

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**Hawk and Dottrels.**—While on the bank of the Merriwa Creek one day lately, I noticed a Collared Sparrow-Hawk (*Accipiter cirrhocephalus*) make a dart at three Black-fronted Dottrels (*Charadrius melanops*) that were running along the edge. To my astonishment the Dottrels dived into the stream, and keeping under the water, made for the opposite shore. On the Hawk turning again, the same thing was repeated, and so on for half an hour, when I left. It is the first time I have ever seen a Dottrel take to water. A most remarkable feature was the direct dive; they went in like stones, sometimes 15 feet from the shore. Some time elapsed between each swoop. After making a miss, the Hawk went direct to an "Oak Tree," and waited until the Dottrels took to the wing. He missed them badly each time, and the Dottrels did not seem more nervous than usual.—A. B. BETTINGTON, R.A.O.U., "Brindley Park," Merriwa, N.S.W. 30/11/21.

## Notes from the Nullarbor Plain

By F. LAWSON WHITLOCK, R.A.O.U., Tudor, *via* Albany,  
W.A.

### INTRODUCTORY.

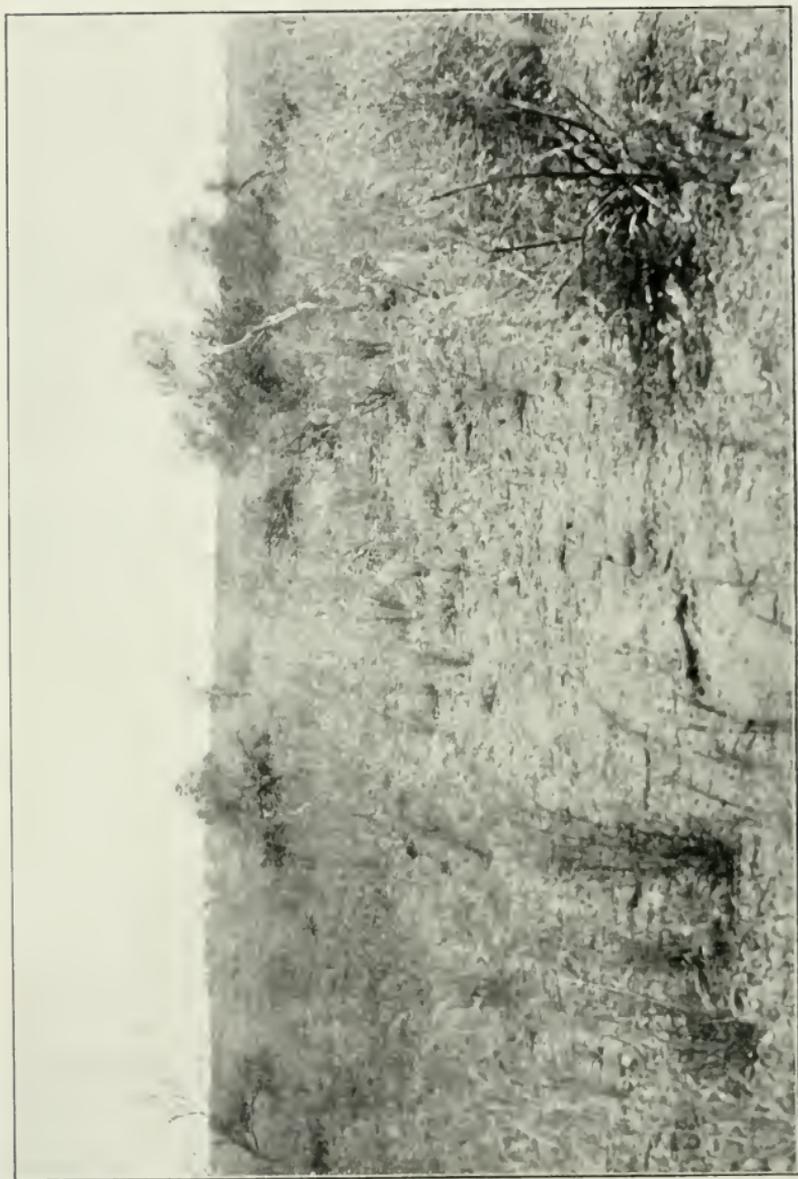
The western side of the Nullarbor Plains is not altogether a *terra incognita*, in an ornithological sense. In the year 1908, Mr. C. G. Gibson, then assistant Government geologist of the State of Western Australia, travelled through the plain right up to the South Australian border. This was at the time the survey for the trans-line was being put through. Mr. Gibson published his observations on the birds he met with in *The Emu*, ix., p. 71 (1909); and Captain S. A. White, of Adelaide, has in the meantime made several trips to the eastern side of the plain, in South Australia.

One object of my trip, which was organised and financed by Mr. H. L. White, of Belltrees, N.S.W., was in a measure to link up with and compare results with those achieved by Captain White, and to make a more minute examination of the avi-fauna than Mr. Gibson was able to do. About some eighteen or nineteen years ago I spent over a year prospecting for gold in the country lying twenty or thirty miles to the south-east of Kalgoorlie, and through which the "trans." line now passes. About that time I got into correspondence with the late Mr. A. W. Milligan, and exchanged many letters with him referring to the local bird life. He did much to aid me in accurately identifying the species met with. In the following notes, I am calling the above locality my Boorara camp.

In his paper Mr. Gibson does not state what his means of transportation were, but I presume he had the services of Government camels. In such a waterless country it is impossible to go far from one's base without their aid. My researches, therefore, were confined to a radius around certain stations along the trans-line, where, owing to the kindness of the Commissioner for Commonwealth Railways, I was allowed to camp, and obtain water and supplies from the bi-weekly train.

It was decided I should commence work at Zanthus, 130 miles east of Kalgoorlie. Zanthus lies in the belt of country referred to in Mr. Gibson's description as "giant mallee and spinifex." Around Zanthus, however, are tracts in which salmon gums, morrel gums, and gimlet wood are to be found in profusion; some of the first-named growing to a considerable height. Not far from the siding, I found a large outcrop of granite, and in its vicinity trees and bushes of the mulga and hakea type predominated; the well-known pituri poison-bush, too, was very plentiful. Amongst the birds, I found nothing of special interest, the species noted being almost identical with those found years ago around my Boorara camp. One rather curious and notable





A "donga" at Naretha, Western Australia.

Photo. by F. Lawson Whitlock, R.A.O.U.

difference occurred, however. At Zanthus the Tree-creeper was the Rufous (*Climacteris rufa*), and at Boorara the White-browed (*C. superciliosa*).

At Boorara I cannot recall seeing or hearing the Yellow-fronted Honey-Eater (*Meliphaga plumula*), and the two Butcher-Birds, the White-winged (*Cracticus leucopterus*), and the Black-throated (*C. nigrogularis*), were far less common than at Zanthus.

On 1st August I met Mr. H. L. White, who was travelling to Perth. On talking things over with him, it was decided that I should at once move on to Naretha, a locality where I was informed the forest country merged into the great Nullarbor Plain. There was a special reason for this move, as will be related further on. I left Zanthus a few days later, travelling by the supply train, in order to have a look at the country passed through. About 35 miles east of Zanthus, the eucalypts cut out somewhat abruptly, probably due to a change from the granite and ironstone formations to the limestone of the plain. With the disappearance of the eucalypts, the country became more open, and spinifex (*Triodia*) gave way to saltbush. The most abundant trees were Casuarinas, Mulgas and other Acacias, with a variety of smaller tree-like bushes; many of them flowering species.

Naretha lies 205 miles to the east of Kalgoorlie, and after the arboreal profusion of Zanthus presents a desolate appearance. This is much aggravated by the numbers of dead and bleached bushes and trees. Not infrequently I came across areas of from 20 to 30 acres, which hardly contained a living specimen. I believe the destruction is due to a wood-boring beetle. Great numbers of these dead bushes were lying prone, having been uprooted by the aboriginals in search of "bardies" amongst the roots.

I remained at Naretha till 30th September, when I moved to Haig, 280 miles east of Kalgoorlie, and a long way into the open plain.

If Naretha looked desolate, Haig, had it not been for the abundance of waving grasses and myriads of everlastings in this fine season, would have appeared a desert. Hardly a bush or tree is to be found in the immediate vicinity, the nearest belts of stunted timber being five miles to the east, and a smaller belt some four miles to the west; the saltbush and bluebush having the most miserable and stunted appearance. In describing the plain, however, mention must be made of the "Dongas." These appeared to me to have at one time been fissures in the limestone floor, subsequently becoming choked up with dead vegetation and alluvial soil washed into them from the surrounding plain during heavy storms. These dongas vary much in extent, but they are always narrow, and may run in any direction. Vegetation in many of them is very profuse. Bushes growing on the edges are generally of large size and prolific of leaf, whilst

grasses and herbaceous plants are up to and above one's knees. They form favourite feeding grounds for a variety of birds.

I paid several visits to the timber belts near Haig, particularly to the one five miles to the east. I worked this chiefly to the north. Roughly it is about a mile in width, and I could not discern its northerly limit, even with the aid of a field-glass. Near the railway, the timber had been much cut during construction times. I found these belts to contain plenty of bird life, but with the exception of the Masked Wood-Swallow (*Artamus personatus*) and the Swift Quail (*Turnix velox*) few species seemed to breed there. One reason for this may be the entire absence of hollow trunks, and the foliage being confined to the umbrella-like tops of the trees.

I left Haig 28th October on a flying trip to Loongana, 116 miles from the South Australian border. My object in visiting Loongana was to inspect a well-known cave there, and to examine a series of blow-holes a few miles to the west in the hopes of meeting with specimens of the Cave, or Barn Owl (*Tyto alba*). The breeding season being practically over, I only remained a few days at Loongana, returning to Haig to pick up my impedimenta, *en route* for Perth, which I reached November 4th.

Before referring in detail to the various species of birds met with during the expedition, I must mention that the season was a good one, the rainfall for the month of May being exceptionally heavy, and extending right across the plain. Even at Haig it amounted to 366 points. June registered 145 points. At Naretha the fall was equally good, and during my stay there further falls of from 20 to 50 points were not infrequent. The most serious drawback to collecting and observing bird life on the plain is the almost incessant wind. Really calm days are quite the exception, and at times the gales are very violent indeed. It is necessary to have one's tent protected by a wind-break of some kind.

I found Mr. Gibson's list of birds reliable. I did not meet with all the species he did, and on the other hand, I found a few that were not noted by him. This is only what might be expected. Mr. Gibson covered a far larger area, but against this, I examined the country around my various centres more closely, and obtained one or two species likely to be overlooked in a more casual search. I shall therefore not repeat his list, but content myself with commenting on those species met with which are of special interest.

#### VARIOUS SPECIES OF BIRDS.

Of the birds of prey recorded by Mr. Gibson, I saw nothing of either the common Kite (*Milvus migrans*) or the Square-tailed Kite (*Lophoictinia isura*). Possibly both species were breeding well away from the railway line. Many of the railway employees are interested in homing Pigeons, and Hawks are not popular around the various stations.

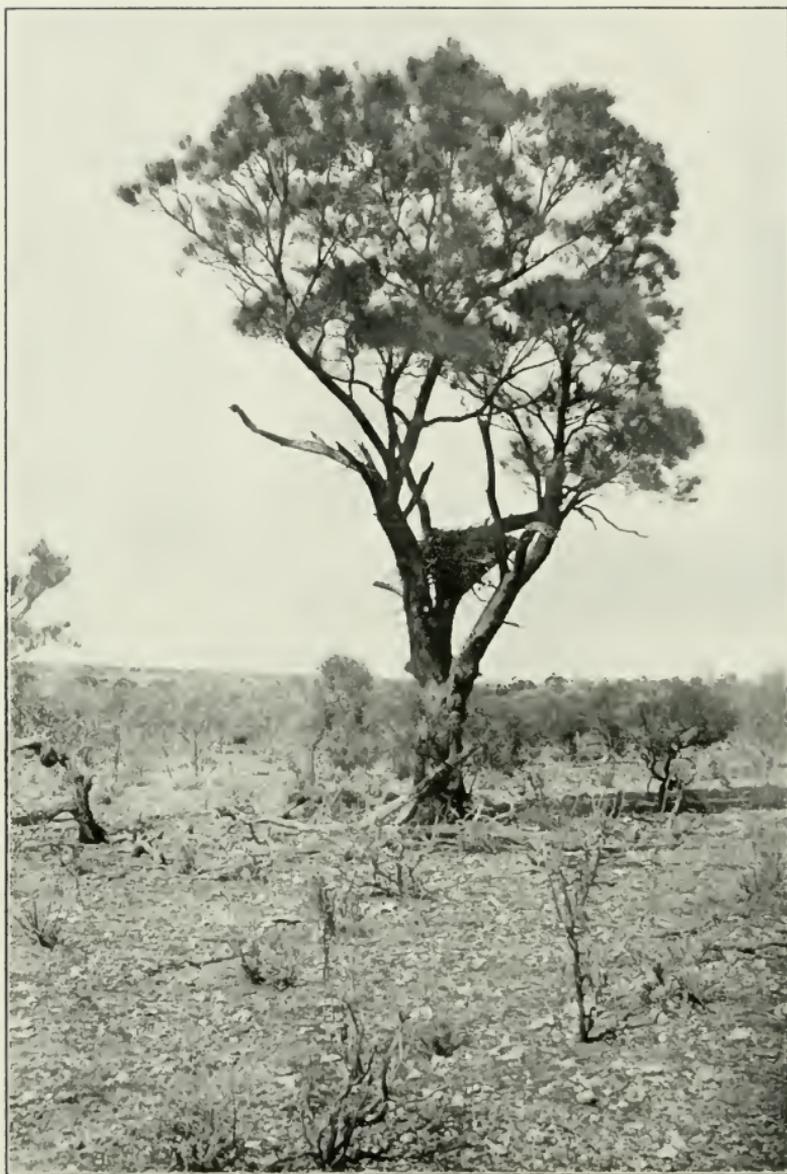


Wild Flowers in a "donga" near Naretha.

Photo. by F. Lawson Whitlock, R.A.O.U.







Wedge-tailed Eagle's nest in a Casuarina, near Naretha, W.A.

Photo. by F. Lawson Whitlock, R.A.O.U.

Near Naretha I found five unoccupied nests of the Wedge-tailed Eagle (*Uroaetus audax*), one of which had broken down the tree on which it was built. All these nests were easily accessible, being built in the strongest branches of such trees as are to be found on the edge of the plain. In two cases I could touch the nest without climbing. I saw one or two pairs of fine adult birds, but could not locate an occupied nest. Many fall victims to baits intended for dingoes, which at times are very abundant.

In a slender tree-like bush near Haig I found a nest of the Little Eagle (*Hieraetus pennatus*). It contained a young bird nearly able to fly. I not infrequently saw pairs beating about the plain. The commonest Hawks were the Kestrel (*Cerchneis cenchroides*) and the Brown Hawk (*Ieracidea berigora*). I agree with Captain White that there is a light form and a dark form of this Hawk. On the plain the light form only is found. Some individuals hardly showed any stripes on the breast. A pair had three eggs in the fire-place of an abandoned fletcher's camp. A hollow had been scratched in the hearth, and the eggs laid on a few pieces of paper and torn sacking. In a donga two nests of this species were in one tree. Kestrels were fairly common, but unless they nested on the ground in rocky situations, I am at a loss to know where they bred. At the big cave at Loongana a pair had brought up a brood in a chamber in the side of the entrance shaft.

At Naretha I found two fine nests of the common Goshawk (*Astur fasciatus*). Both these nests were in casuarina trees at a height of less than 20 feet. They were substantial structures of small sticks, neatly lined with green mistletoe leaves. The eggs in one case were marked with a few large blotches of deep red.

Before I left home I was looking forward with great interest to a meeting with the Cave, or Barn Owl (*Tyto alba*), which, after reading Captain White's notes, I had hopes might be found in equal numbers on the western side of the plain: a hope not realised. Until I got to Haig, I neither saw nor heard anything of the species. My own impression is that it is slowly spreading westward, and that its present distribution on the actual plain is due to the gradual migration of rabbits in the same direction. But rabbits, being vastly more prolific than owls, the latter are colonising the plain at a much slower rate.

At Haig on the few calm nights that occurred during my visit, I could hear the gentle "hoo, hoo" coming from all points of the compass. These notes were more frequent on calm nights when there was a young moon. It was a puzzle where these Owls roosted and bred. There were no caves or blow-holes known anywhere near to Haig, and the trees and bushes afforded no adequate shelter for roosting during daylight. The most likely, or, indeed, the only possible place, is the numerous rabbit earths.

A burrowing Owl exists in North America, *Speotyto cunicularia*, where it has a very wide range. It occupies and breeds in

the burrows of the Prairie Marmot, or Prairie Dog (*Cynomys*). It is a small species, but can hold its own with the marmots, and no one will doubt that the Cave Owl would prove the master in an encounter with a rabbit. I spent many hours sitting on the rabbit earths on favourable nights, but only once saw an Owl. It was cold work, and several times I was driven home by the sudden rising of the wind. Though I cannot be certain, I think the Owl I saw had flown directly from a burrow just behind me. My attention was drawn to the bird by hearing the "swish" of wings close at hand. Looking up, I could dimly see the form of an Owl flying around in a short circle, and its shadow on the ground was plainly visible. On other nights I tried to get within sight of these Owls by following up their cries. Either they were very wary, or very timid, for I never got near a calling bird. The calls varied a little in tone, there being a higher and a lower note, but I am not sure that the lower note was not uttered by a Quail (*Turnix*). I have often heard the Little Quail (*T. velox*) call at night. It was fairly common on the plain.

Not far from Haig was an abandoned water shaft, which had been put down to a depth of 200 feet. This shaft was close-timbered and furnished with a ladder held by staples to the timbers. About 20 feet down, roosting on a rung of the ladder, I discovered a Cave Owl. Its head was twisted right round as it gazed upwards in my direction. I dropped one or two small pellets of clay on its head in the hopes it would fly up the shaft, and I might get a better look at it. It refused to move, so I climbed down the ladder, thinking there might be some cavity, not visible from above, where its mate was nesting. There was nothing, and the Owl simply flew to the other side of the shaft, to which it clung with its claws. On visiting this shaft again a week or so later, I found no Owls there, but two or three bats were hanging from the timber of the walls. Evidently the Owl I had seen had no difficulty in finding another roosting place. Formerly there had been a fettler's camp near this water shaft, and I was informed by several employees who lived there that Owls were often seen and even perched on the ridge poles of the various tents. On one occasion a young bird was found drowned in a water tank. My informant was familiar with the call, and also the snoring noise made by this species.

Since my return home, Mr. A. Rees, the station-master at Haig, has written that three young Owls and their parents had been captured by a railway employee at the bottom of a small shaft only 12 feet deep. This shaft lies some 12 miles or more to the east of Haig. When the Owls were first noted, the female was sitting on three eggs in a corner at the bottom of the shaft.

At Loongana Owls formerly bred in the big cave some two miles E.S.E. of the depot, but the cave has been so much visited of late years that the Owls deserted it. At the depot itself a pair roosted for some time on the steel trestle work supporting a large feed tank. Despite the situation, they were very wary, and all

attempts to catch them failed. Another pair at one time, accompanied by three young ones, was also observed, and it is thought the female nested in the firebox of a derelict portable boiler standing a little distance from the railway. I visited a series of the blow-holes similar to those described by Captain White, which exist some miles to the west of Loongana. The upward current of air in some of them was very strong, and possibly this was the cause of their not being tenanted by any Owls. In one only did I see traces of bird-life. Owls are known at the large railway depot at Rawlinna, and are said to roost in cavernous hollows there. But at Naretha the only evidence of their presence was the record of one being caught by the foot in a trap set for rabbits. Evidently they have not spread so far westward on the plain, up to the present. Barn Owls, for all that, occur in the south-west of this State, as I have seen individuals in a dense tea-tree swamp near my own home.

At Zanthus I shot one or two Crows for identification purposes. In point of size they agreed closely with those obtained by Mr. Sid. W. Jackson, on the Diamantina River, Western Queensland. At Haig a nest in a large bush was pointed out to me as a Crow's nest, and I met with one or two young birds near at hand. But viewed through a field glass they looked more like Ravens. The species was rare out on the plain proper.

Mr. Gibson records a second species of Cuckoo-Shrike, seen but not obtained. I saw only the Black-faced (*Graucalus novaehollandiae*), but both at Zanthus and Naretha small parties of the Ground Cuckoo-Shrike (*Pteropodocys maxima*) were noted; and I obtained a nest of three typical eggs, placed in a half-dead tree, standing in a large area of dead and bleached bushes. The nest was the usual substantial structure of very fine grasses thickly interwoven with fur and spiders' webs.

At Zanthus I noted four species of the genus *Meliphaga*, viz.—*sonora*, *ornata*, *plumula*, and *leucotis*. The last named species was very local. At Naretha, only the Singing Honeyeater (*M. sonora*) was present. It was breeding commonly, and I found a number of nests containing both eggs and young. The eggs varied much in size and shape, and in one case were nearly colourless. This species probably extends right across the plain, as I found pairs in the dongas at Loongana. During August the Spiny-cheeked Honeyeater (*Acanthagenys rufogularis*) was very common at Naretha. Numbers passed on migration, and odd pairs, I think, remained to breed. A nest that had been disturbed by a lizard or other marauder was noticed. Near Haig I noted a few pairs in the dongas, and occasionally in the timber, where they were feeding amongst the large clumps of mistletoe.

The only other Honeyeater observed on the plains were one or two White-fronted Honeyeaters (*Glyciphila albifrons*), possibly blown out of their course by the heavy westerly gales in October.

Referring to the Tits (*Acanthiza*), I saw nothing of the Thick-billed (*A. robustirostris*), which is included in Mr. Gibson's list. At Zanthus the local forms of the Broad-billed (*A. apicalis*) was nesting in July. The nests were of the usual type, placed at a height of from two to three feet from the ground in any suitable bush. The Slender-billed (*A. iredalei*) occurred very sparingly at Naretha, but out on the plains at Haig and Loongana it was not uncommon.

The Red-throat (*Pyrholaemus brunnea*) was observed at Zanthus, but was very local. A nest was found cunningly placed in the inside of a small circular ring of spinifex (*Triodia*). The nest was invisible without parting the spinifex by which it was sheltered. It contained two eggs nearly hatched. At Naretha, a nest was found quite unconcealed and almost on the ground. It had been disturbed and was forsaken. The only eggs it contained was one of the Black-eared Cuckoo (*Mesocallius osculans*). On the plain the Red-throat was rare.

Field Wrens (*Calamanthus campestris*) were rare until I searched well out on the plains. At Haig they were fond of haunting the neighbourhood of rabbit earths. I obtained one nest with three eggs. This nest was placed on the ground in a slight hollow, and was concealed by a tuft of half-dead blue-bush. The female slipped away like a mouse. I chased a young one which had left the nest before it could fly. It tried to escape by darting down a rabbit burrow. The burrow happened to be a very short one, and on thrusting down my arm I caught the fugitive. After an examination I released it again, when it took refuge in another and deeper burrow. Birds seem fully aware of the protection offered by rabbit burrows, and more than once I lost birds through their fluttering inside them. A winged Dotrel (*Peltohyas australis*) was amongst those which escaped in this manner.

The Black-breasted Song-Lark (*Cinchorhamphus cruralis*) was very common out on the plain. The train disturbed numbers, as it travelled along, from the grassy margins at the side of the track. When I reached Haig young were on the wing, but pairs were still nesting. I found several beautifully constructed nests, in excavated hollows, sheltered by tussocks of grass. The linings of these nests were of the finest grasses, and were wonderfully neat. The eggs varied in number from three to four.

Amongst the Chats, the Red-capped (*Epthianura tricolor*) was extremely common around Haig on the plains. Young birds were very numerous around the dongas and amongst the saltbush on the edge of the various belts of timber. Pairs of this species, and also of the Orange Chat (*E. aurifrons*) were still breeding at the end of October. The Nullarbor Plain appears to be the headquarters of the Red-capped in the west. The White-fronted Chat (*E. albifrons*) was comparatively rare, but I found a nest containing exceptionally well marked eggs at Naretha. The only Wren-Warbler (*Malurus*) met with on the expedition was

the White-winged (*M. leuconotus*), and no member of the genus was found around Zanthus, despite the closest search. This agrees with my previous experience at my old Boorara camp. It is somewhat puzzling to account for this, as a Red-winged species occurs to the east of Southern Cross (probably the Blue-breasted, *M. pulcherrimus*) and I procured specimens of *M. pulcherrimus* at Norseman (Lake Dundas), which is in the longitude of Coolgardie. It is not likely that Lake Dundas marks the eastern limit of this species. Captain White procured the Turquoise Wren-Warbler (*M. callainus*) at Ooldea. It will be interesting in the future to learn how far east and west the ranges of these two species extend.

*M. leuconotus* was nesting at Naretha, and I met with empty nests at Haig. The males in nuptial plumage of this species are pretty wary, but during the heavy gales on the plains they preferred to risk my presence within a few feet of their shelter rather than to face the heavy wind.

The only Diamond-Bird or Pardalote I saw was *Pardalotus striatus*. I watched a female carrying strips of bark into a hole in a salmon gum at Zanthus. It was a very small hole at the entrance, and there was much manoeuvring to get extra large strips of bark into the hole, when held crosswise in the bill. I was surprised to see individuals amongst the mistletoe right out on the plains at Haig.

The Short-billed Tree-Tit (*Smicrornis brevirostris*) was very common in the mallee at Zanthus. Nesting operations were just commencing when I left. I watched two pairs building. Commencement seems to be made at what is to be the back part of the nest; this is added to, on all sides, the final material being used to finish off the entrance. One of these nests was in a drooping branch of a small eucalypt at a height of barely five feet.

Two species of Wood-Swallows were met with, *viz.*, Masked (*Artamus personatus*), and Black-faced (*Artamus cinereus*). The latter was far from common. I found a nest with young at Naretha in a small tree, at a height of about 12 feet from the ground. *Artamus personatus* was breeding at Naretha, but more commonly in the belts of timber near Haig. Some nests were in the stunted trees, others on large salt or blue bushes.

The Allied Flycatcher (*Microeca assimilis*) was fairly common around Zanthus, but not seen on the plain. A favourite perching place was the telegraph wires. The White-face I saw was *Aphelocephala leucopsis*, and that not till I got to Naretha. It was nesting in a variety of situations, and showed its usual fearlessness of man. At Haig it was nesting in thick blue-bushes for the most part. Four eggs seems to be a full clutch. The nests, though very bulky, are far from neat, and have a spout-like entrance. At Naretha some were placed in the lowest forks of dead bushes and without the slightest concealment. The eggs were often imbedded in rabbit fur.

I saw nothing of the Chestnut-backed Ground-Bird (*Cinclosoma castanotum*) at Zanthus, though some parts of the country looked favourable to its requirements. At my old Boorara camp, I occasionally saw pairs. Mr. Gibson remarks, "None seen 70 miles east of Kalgoorlie." No doubt this is about the limit of the species' eastern range.

I met with the Black-throated Ground-Bird (*C. alisteri*) at Naretha, but I found it local and far from common. Its range probably does not extend much further west. This is the third species of Ground-Bird I am personally acquainted with, and of the three it is much the shyest and most difficult of observation. Like its congeners it lives in pairs, and the full-grown nestlings for a brief period keep with their parents. Only at feeding time does it venture far from the shelter of bushes, behind which it will hide, occasionally taking a short run to peep at an intruder. When disturbed, the male clears right out, often flying quite out of sight. The female is not quite so cautious, but unless there are young, she soon follows the male, either nimbly running or flying after him. Once or twice I watched her at a distance of a few feet, only to find subsequently that she had young "planted" near by. In one instance I came to the conclusion the young were down a rabbit hole, as she frequently went to the entrance as though to be assured of their safety. In the meantime there was great pretence of feeding, and every few seconds one of the feet was lifted to the tip of the bill, for what purpose I cannot say.

Full-grown nestlings were with their parents when I arrived at Naretha in early August. Nesting operations must have commenced after the heavy rains of May. I found three or four empty nests. These were all excavations under recumbent bushes, lined with dried grass.

On the plain proper the Black-throated Ground-Bird is in its true haunt, and scattered pairs were found all around Haig and Loongana. On my arrival at Haig the females were about to lay their second clutches. I found several nests with fresh eggs. With one exception, these nests were at the foot of dead and bleached blue bushes, and in one case very well concealed. The excavations were deep, and very neatly lined with dried grasses, the rim being finished off with a thick edging of coarser herbage. A full clutch of eggs seems to be three. One very pretty set showed a faint creamy ground-colour, being much less profusely marked than usual. The female sits closely, and then flies right off the nest, unless a heavy wind is blowing, when she escapes by running away.

At Naretha, in the early morning, I occasionally heard the male bird uttering his call, which consists of a very feeble "i-i-i-i-i," rapidly uttered, but not sustained. Altogether, this is the least intrusive of the three species of Ground-Birds with which I am acquainted.



Nest and eggs of Black-throated Ground-Bird (*Cinclosoma alisteri*).

Photo. by F. Lawson Whitlock, R.A.O.U.



Captain White does not record this species from the South Australian side of the plain. Apparently its range does not extend so far east in these latitudes.

The Crested Bell-Bird (*Oreoica gutturalis*) was found throughout the country examined, but on the plains it was naturally confined to the dongas. At Naretha I observed a number of nests. Some contained eggs of a decided bluish tinge. I saw no hairy caterpillars in any nest, but moths and butterflies (*Lepidoptera*), as regards species, are poorly represented on the plain.

The Wedgebill (*Sphenostoma cristatum*) was far less common than the Bell-bird, and seldom found away from the dongas. I observed a nest at Naretha in a small acacia, the sitting bird being visible some distance away. A family party in a donga at Haig were inquisitively watching me eat an orange, as I sat during a heavy squall under the lee of a large blue bush. A strong gale was blowing at the time. When on the ground under a bush, the Wedgebill is not unlike a Grass-Wren (*Diaphorillas*), a species I did not meet with during the trip.

Two species of Robin were met with, *viz.*, the Hooded (*Melanodryas cucullata*) and Red-capped (*Petroica goodenovii*). The latter was comparatively rare, but the Hooded Robin was especially common around Naretha. It was also very frequent on the plain wherever tree or bush was growing. I saw a few nests from which the young had flown.

Captain White records the Buff-bellied Shrike-Thrush (*Colluricincla rufiventris*) from the eastern side of the plain. I did not meet with this species anywhere on the plain proper, so, if its range is continuous, it must be found along the coast line of the Great Bight. It was breeding at Naretha. I found nests in the clumps of Casuarinas. One containing three pretty eggs was about twelve feet from the ground, and instead of being built of strips of soft bark, was constructed of dried grasses. The cup was very deep, only the tail of the sitting bird being visible from below.

In the interior the female of this species has no buff eyebrow, and the loreal spot of the male is not so distinct as in our south coastal birds. I have often wondered if it is generally known that both sexes sing. I am not able to distinguish the song of the male from that of the female.

Whistlers (*Pachycephala*) were very rare throughout the country examined. Mr. Gibson records the Western Whistler (*P. occidentalis*), but I did not meet with the latter. At Naretha a bird was singing in a donga with a voice like that of a Shrike-Thrush, but there was sufficient difference in the song to attract my attention.

I followed the songster from bush to bush, without being able to identify it. There was a strong wind blowing at the time, and eventually I fired at a bird resembling the songster. I picked up a bird new to me, but it did not look mature. I heard the bird I had followed singing again; this time behind me. I re-

turned to the spot, and commenced a search for a nest, as a second bird had joined in the song. After a time I found a nest more like a Shrike-Thrush's than the neat but flimsy structure of a Thickhead. I imitated the notes of the singers, and brought them both to view. I could not recognise them. Hoping eventually to get eggs from the nest discovered, I did not disturb them further. About a mile further on I came across another bird like the specimen I had secured. It had no mate, so I shot it also. These birds were subsequently submitted to Mr. A. J. Campbell, who pronounces them to be immature examples of the Red-throated Whistler (*P. rufogularis*), a species I have not met with before. I made several visits to the nest I had found, and saw the owners at close quarters several times. The male had certainly no red throat. No eggs being laid, I took down the nest, which was in a small, dense clump of mistletoe of a very slender species. The nest had contained young. It was not like the ordinary type of Thickhead's nest. I did not disturb the parent birds in the hope they would nest again, but up to the time of leaving Naretha they had not done so. The identification of Thickheads is complicated by their often breeding before they have assumed fully adult plumage. I must assume, therefore, that this accounts for the absence of the red throat in the male under observation.

About a mile further on from the donga where I first observed the Rufous-throated Thickhead, I heard the song of another bird unfamiliar to me. I followed up the sound until I located the songster in a small tree. His mate was in a neighbouring tree. I watched for some time in the hopes they were nesting, but could see no evidence of this in their behaviour. I decided to shoot them both as I was so puzzled by their appearance and the unfamiliar notes. They were evidently a mated pair. I secured them, and on getting back to camp skinned and dissected both with extra care. The breeding organs of the male were in an advanced state, those of the female less so. With regard to plumage, the sexes are easily distinguishable; both are striped on the under parts, and have throats greyish white. The male has no trace of a black pectoral collar. The upper parts are ashy grey, without signs of immaturity in the shape of brown margins to the flight feathers. These two birds were also submitted to Mr. A. J. Campbell. He identifies them as the Rufous-breasted Whistler (*Pachycephala rufiventris*), the male in immature dress.

I am well acquainted with the latter species, and have found its nest and eggs in various localities further north. I am familiar, too, with its song, and had the male been singing like a male of *P. rufiventris* I think I should have at once recognised the songster. Immature males of the White-bellied Whistler (*P. lanioides*) sing in just the same manner as fully adult birds; the same applies to the Western Whistler (*P. occidentalis*), which nests near my house. The inference is that imma-

ture males of *P. rufiventris* should follow the same rule. Without wishing to cast any doubt on the decision of such an experienced ornithologist as Mr. Campbell, I confess myself a bit puzzled, and if any other ornithologist should visit Naretha I hope he will try to observe the birds further.

The White-browed Babbler (*Pomatostomus superciliosa*) was as far out on the plain as Haig. It was breeding freely both at Zanthus and Naretha. Nests were usually placed in large prickly Hakea bushes. The eggs were embedded in rabbit fur.

Pallid Cuckoos (*Cuculus pallidus*) were very common on my arrival at Naretha, but they appeared to be chiefly migrants. I saw an occasional bird in the timber on the plain. The Black-eared Cuckoo (*Mesocallius osculans*) was distinctly rare. I found one egg in a deserted Red-throat's nest at Naretha.

In no part of the west have I observed the small Bronze Cuckoo (*Chalcites basalis*) so common as on the plain near Haig. It was fairly plentiful around Naretha too, and I found its eggs in the nests of Whiteface (*Aphelocephala leucopsis*) and White-winged Wren-Warbler (*Malurus leuconotus*). One was an especially large and boldly blotched egg; but, though I examined numbers of the local Bronze Cuckoos with the aid of a field-glass, and listened carefully to their notes, I have no reason to think there was another species at Naretha. At Haig the young were on the wing, and haunting the verges of the timber belts. I had over a dozen in view at one time in some small trees growing in an isolated clump. Every day I met with individuals being fed by foster parents—*Malurus leuconotus*, *Aphelocephala leucopsis*, *Epthianura tricolor*, and *E. aurifrons*, *Epthianura* being the most frequent guardians. The female of *E. aurifrons* fluttered on the ground in front of me if a young Cuckoo was about.

The only species of Tree-runner noted was the Black-capped (*Neositta pileata*). I used to see this Tree-runner at my Boorara camp, so no doubt its range extends eastwards to the edge of the plain. I met with a few parties near Naretha, but none on the plain proper.

Two species of Tree-Creepers (*Climacteris*) were noticed. But had I not read Mr. Gibson's list, I should not have been prepared to find the Rufous Tree-Creeper (*C. rufa*) so far east as Zanthus. Years ago, at my Boorara camp, which was situated in a tract of country where the tea-tree of the interior was plentiful, I occasionally saw a pair or two of *Climacteris*. One pair was nearly always around the camp. The birds became very fearless, and I often saw them feeding on ants attracted by the discarded jam tins. This pair was undoubtedly the White-browed (*C. superciliosa*). After leaving Boorara, I went to the Murchison goldfield, in the neighbourhood of Lake Austin. Here I did some collecting for the Perth Museum, and obtained specimens of *C. superciliosa*. My next experience was to find the latter species, with *C. rufa*, in a tract of York gums, 100 miles

east of Geraldton. Some time afterwards I met with *C. superciliosa* about 30 miles to the south of Mulliwa. In the Wongan Hills, much further south, but in the same line of country, I obtained *C. rufa*. But at Southern Cross, further to the east, I met with *C. superciliosa* again. On travelling down to Norseman (Lake Dundas), the same species occurred north of Lake Lefroy. At Norseman, *C. rufa* alone was breeding near my camp. It was therefore puzzling to find *C. rufa* without *C. superciliosa* at Zanthus.

At Naretha, however, the gums having cut out, some forty miles to the west, *C. rufa* had disappeared, and its place was taken by *C. superciliosa*. The latter species was breeding in the hollow stems of dead trees. The first broods were on the wing early in September.

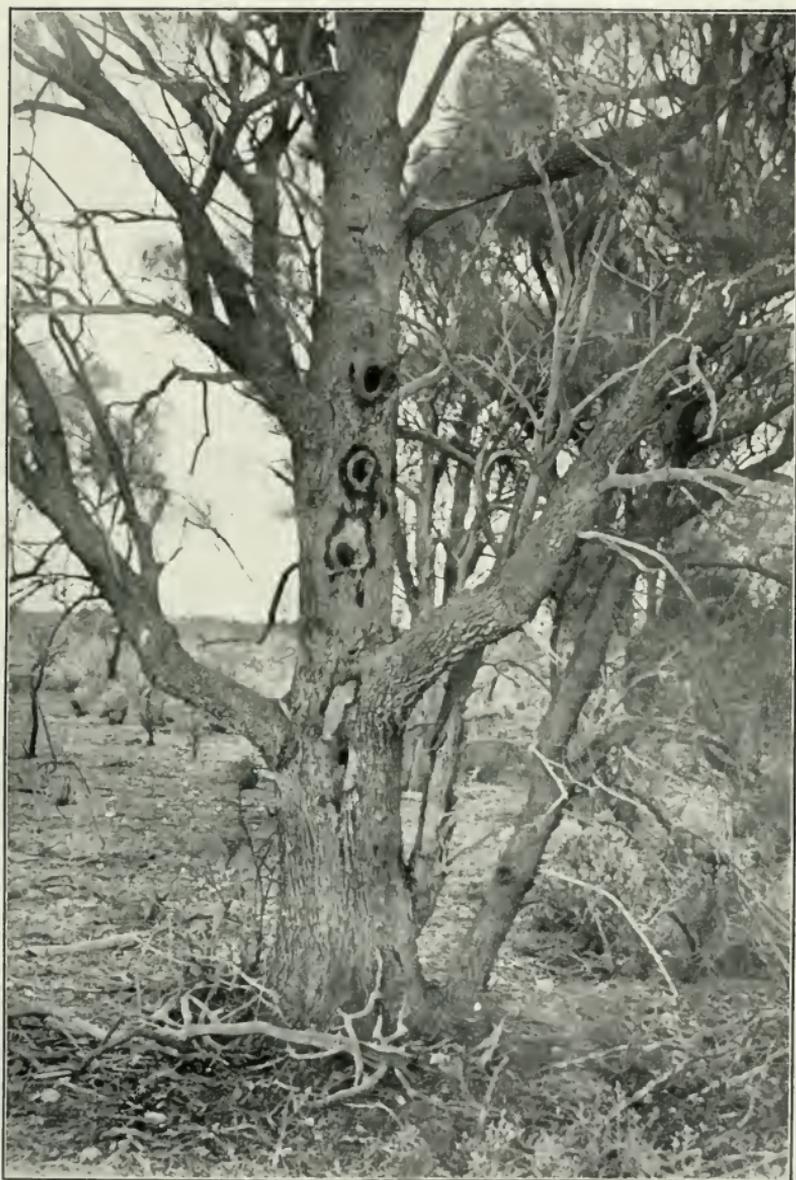
In view of Mr. F. E. Howe's excellent paper on this genus (see *Emu*, vol. xxi., part I), the foregoing notes on the peculiar distribution of two of the western species may be interesting.

The Frogmouth (*Podargus strigoides*) was nesting as far east as Naretha, and I flushed an individual of the Owlet Nightjar (*Ægotheles cristata*) from a hollow tree in the same locality.

#### NEW PARROT.

At Zanthus my attention was attracted by a Parrot in captivity at the house of Mr. de Marcaux, of the loco. department. I could not place it, and on enquiry I was informed it had been taken from a nest in a Casuarina tree about five years previously at Naretha. It was called an "Oak Parrot" from the surroundings of its haunt. It was obviously an adult bird, and beyond classifying it as belonging to the genus *Psephotus*, I could not further identify it. Mr. H. L. White passed through Zanthus on August 1st, and after talking the matter over with him, it was decided I should at once go on to Naretha, and if possible secure specimens, and hand them to him on his return journey a week later. I was able to carry out this arrangement, and soon afterwards received a wire confirming my opinion that the bird was new to science.

My next task was to learn all I could of its habits, and also to procure a clutch of eggs for description. Not much seemed to be known of the bird locally, and what information I gleaned as to its abundance or otherwise, was somewhat contradictory. On one point, however, my informants were unanimous. Its haunts were the clumps of casuarinas growing on the limestone outcrops, on the edge of the plain. I found this correct, with the exception that at feeding time, it was no use to look for it in such haunts. It was a simple matter, however, to go to an isolated clump of casuarinas, where a pair or more might be breeding, and to wait there until the birds came home. As in the case of other species, the male Naretha parrot returns with the female to the nesting tree, and waits until she enters the nest-hole. He then flies away. But as the clumps of casuar-



Nesting site of the Naretha Parrot (*Psophodes narethæ*); top hole.  
The bottom hole was cut just above the nesting chamber.

Photo. by F. Lawson Whitlock, R.A.O.U.



inas occupy only very small areas, as a rule, he is always close at hand. More than once he betrayed the nest through remaining in a tree near at hand. In flying towards, and away from, the nest, both birds utter a soft flute-like "cloote, cloote." This note is modified at times into a sound, impossible to write down on paper. When perched side by side, on the limb of a tree, the usual parrot-like chattering cries are indulged in, and the male at intervals feeds the female with the half-digested food from his crop.

In the breeding season the greater part of the food is procured in the dongas, but the first birds I met with were nipping off pink blooms from a small flowering shrub, the half developed seed vessel being eaten, and the petals falling to the ground. An introduced species of blue Crane's Bill was very plentiful in the dongas, and the crops of birds examined were crammed with the seeds, in a green state. Occasionally pairs may be met with under large bushes, where green herbage is growing, but this is rather exceptional.

The Naretha Parrot appears to be a gregarious species, and even during the breeding season, half a dozen or more birds may be seen feeding together. The largest party I saw was a flock of over thirty. These, when carefully scrutinised with the aid of a field-glass, appeared to be all in the plumage peculiar to a bird a year old. This plumage is much duller than that of a fully-fledged nestling, and the upper parts have rather a streaky grey appearance. The nestling, on the other hand, resembles more the adult. Even the row of spots, on the under side of the flight feathers, which denote immaturity in Parrots, is only slightly developed. The color of the bill, however, is very distinct. Instead of the bluish-white of the adult, it is of a conspicuous light brown. As the nestling gets older this gradually fades to a greenish yellow, and from that to the same as in the adult.

On the eastern goldfields September is the usual breeding month for parrots; and it was a great surprise to me to find young in a nest a fortnight after my arrival at Naretha. On August 24th I was examining a group of casuarinas adjacent to a donga, where Naretha Parrots were feeding. I noticed the edges of a hole in the trunk of a casuarina appeared to be polished by the entry and egress of some living creature. I procured a slender stick, and gently probed the hole. The result was an angry screech, followed by a full "bag-pipe" chorus. A female was inside brooding a family of young. Further search in a neighboring patch of casuarinas revealed a second nest hole, where a similar state of things prevailed. The nest hole in the first instance was very small, and about five feet from the ground, the nest chamber being nearly two feet below the entrance. In the second case the nest hole was about two feet from the foot of the tree, and subsequent examination proved that the eggs had been actually laid on the earth inside

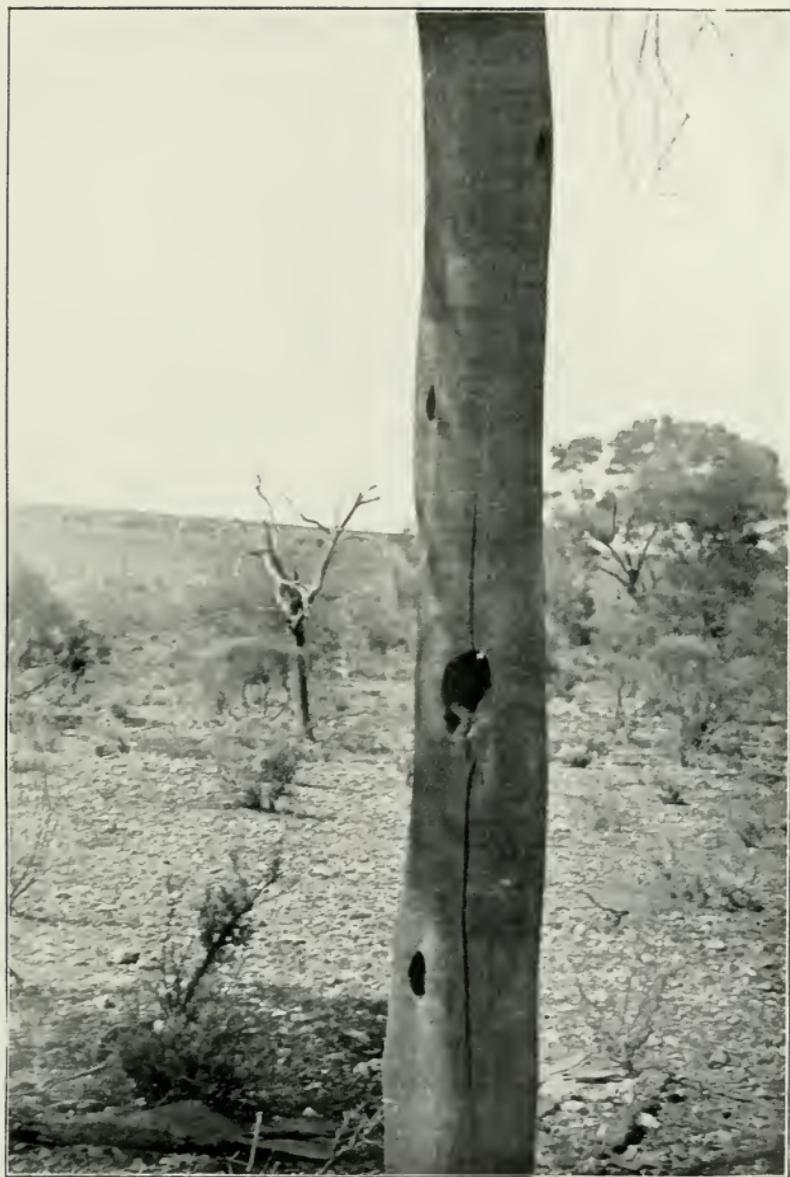
the hollow, and level with the ground. Both these nesting trees, though hollow in the trunk, were in a flourishing state. In view of the foregoing state of things, my anxiety to secure a perfect clutch of eggs increased.

Some days previously I had noticed a pair of birds in a clump of casuarinas not more than two miles from camp. I watched them, but lost sight of the female. I resolved to try again. I was at the spot by eight a.m. After a long wait the male came home *alone*. I immediately commenced a fresh search, and at length in a dead tree found a likely looking hole about two and a half feet from the ground. Inserting a slender stick, I got no response until I rattled it about at the entrance. I was then greeted with the usual angry screech, but no sound of young birds. I decided to chop the nest chamber out. The dead wood was extraordinarily tough, and turned the edge of my tomahawk. It was a good hour's work before I got at the nest. During all this time, the female refused to move. Eventually I had to lift her off. The nest contained two newly hatched young, and two heavily incubated eggs.

On 27th August, whilst watching another pair in a tree containing a nest hole, which the female frequently examined without entering, my attention was drawn to another pair, which flew by uttering the customary note. I followed their flight with the eye, until they disappeared in a neighbouring clump of casuarinas some distance away. I followed them, and found a nest hole in a rather small tree. This was about four feet from the ground. I rattled a stick at the entrance, and was greeted with a screech in reply. Being armed with an axe, I resolved to chop out the nest. After finding the approximate depth of the cavity, I cut deep notches above and below the nest chamber; then with a sharp downward stroke split off the intervening flake of wood and bark. This was set aside in case of need. After stuffing a handkerchief down the hole, further chopping revealed the inside of the nest chamber, with the sitting female. I gently lifted her off, only getting a slight nip in the process. There were three fresh eggs. Realising that three eggs were better than none, I took them, and picking up the before-mentioned slab of bark and wood, I replaced it over the cavity, securing it in its place with string. A few days later I took two more eggs from this nest, the five forming the type clutch described in *The Emu* of last October by Mr. H. L. White (see vol. xxi., p. 83).

This method of examining Parrots' nests, where it is practical, is a very useful one, and by adopting it I was able to watch the progress of several broods of young, without the parents deserting them.

Families vary in number from four to six, the smaller number being found in later nests. It was easy to distinguish the first hatched members of a brood, the difference in size and progress being very marked. A brood of five examined very easily were on the bare ground inside a very rotten tree. I was able to force



Nesting site of the Naretha Parrot (*Psephotus narethæ*) in a dead Casuarina ; the young were nearly on the ground inside.

Photo. by F. Lawson Whitlock, R.A.O.U.



the trunk apart until the interior was fully visible. There were five young clothed in white down, with a few fine feathers showing on the wings of the first-hatched birds. By placing a forked strut against the trunk, I was able to restore things to their former condition. The male bird watched the proceedings from a neighbouring tree. This brood of young eventually got safely away. With one exception all the nests of the Naretha Parrot were in the hollow trunk of a tree, usually a living casuarina. The exception was a nest in a hollow limb of a bigger tree than the average.

Mr. Bert Cottrill, the station master at Naretha, accompanied me several times in my raids on the Parrots. According to his experience, they were more common around Naretha the present year than he had known before. Mr. Cottrill has been stationed in the neighbourhood for three years. My own impression is that the exceptional rains of May had brought down migrants from the north. Little is known how far the casuarinas extend in that direction. In any case, the range of the Naretha Parrot must be a restricted one. At the fettlers' camp between Naretha and Zanthus it was known as an occasional visitor, but nests had seldom been found. To the east, the casuarinas cut out some seven miles away. Naretha is about 95 miles from the shores of the Bight. It is very questionable if the range extends so far to the south. An area therefore roughly 50 miles in width, and the same distance from Naretha to the south, with an unknown length to the north would comprise the probable range. Readers of *The Emu* will be familiar with the appearance of the Naretha Parrot now that it has been honoured with a coloured figure. A full description of the bird and also the eggs, and the circumstances which led to its discovery, contributed by Mr. H. L. White, accompany the plate (*Emu*, October, 1921).

#### OTHER SPECIES.

In the gums at Zanthus the common Ring-necked Parrot was frequent. Mr. Gibson in his list calls this bird *Barnardius semitorquatus*. I made it out to be *B. zonarius*—the interior form. The under parts of the fully adult were lemon yellow, and only a trace of the red forehead-band was perceptible. Younger birds had the under parts boldly blotched with rich orange. Pairs were on the eve of nesting when I left Zanthus.

At my Boorara camp I occasionally saw pairs of the smaller Many-colored Parrakeet (*Psephotus varius*). I met with none at Zanthus, but at Naretha I saw a few pairs in company with the Naretha Parrot. All I saw had the yellow humeral patches. One or two had a peculiar bluish-green shade in the general appearance of their plumage. But this is a variable species. I found no nests, and think it is a much later breeder than the Naretha Parrot.

On the plain at Haig Parrots were naturally of rare occurrence. I met with only a few small parties of the well-known Betcherry-

gar or "Shell Parrot" (*Melopsittacus undulatus*). They may have been passing migrants.

At night I occasionally heard Parrot-like notes that I could not account for. They were uttered by some bird, as it flew around. After sunset I put in some time near telegraph posts in the hopes that whatever bird it was might perch on one of the arms, but without success. It was only on calm nights that these notes were audible, and they had an aggravating way of putting one on the alert after having turned in. On one occasion the fettlers reported a Parrot seen as they were returning from work some two miles from camp. I visited the neighbourhood next morning without meeting with it, so have no idea what it was. After the heavy gales waifs of known species are not unlikely to occur.

On the plain the Australian Dottrel (*Peltohyas australis*) is well known. At times it is said to occur in large flocks. I met with parties nearly every day at Haig, and saw others near Loongana. The breeding season was over. I picked up the wreck of three or four birds killed by striking the telegraph wires. One I found alive with both legs broken. This proved to be an adult female that had bred earlier in the season. Moulting had commenced. The favourite haunt of this species seems to be the gentle stony rises in the plain. Here they fed and rested in small flocks, and were excessively wary. Seldom I got within a hundred yards of a party before they took to flight.

At Naretha I had the luck to find the nest of the only pair I met with. Some two miles from camp, in crossing a small bare flat, I noticed a Dottrel running away. There had been a heavy gale the previous night, and I thought this bird might have been a stray. It was not feeding, however, so I sat down to watch. In ten minutes it ran back towards me, and squatted down, at the same time keeping his head erect to watch me. I walked over to the place, and spotted the three eggs. They were just visible, being laid in a slight hollow, and nearly covered with fluffy seed vessels. I saw nothing of this bird's mate.

Quails of any species were rare at Naretha, but on the plain at Haig the Little Quail (*Turnix velox*) was plentiful. I found this species nesting on the grassy flats or in the long herbage on the edges of the dongas, and occasionally on the margins of the tracts of timber. Usually, the apology for a nest—a little pad of grass—was placed at the foot of a tussock of grass. On this four pretty eggs were laid. Occasionally the eggs were protected by a few fallen sticks. Some nests I found by flushing the sitting bird, others I found without any aid. Both the male and female shepherd the young. I often heard them calling their gentle "tchook-tchook" to lead the young away.

There was a second species of Quail at Haig, much less common than *T. velox*. It was larger, and laid as many as six eggs, somewhat like those of the Painted Quail (*Turnix varia*). I found one deserted nest, and another nest with the empty shells

from which the young had not long emerged. I never got a good view of this Quail, so cannot write with any certainty as to its identity.

At Zanthus I came across several recent nest mounds of the Mallee-Fowl (*Leipoa ocellata*). I was told that the bird still existed near Karonie, 70 miles east of Kalgoorlie. Years ago a nest containing eggs was found near my Boorara camp. On the edge of the plain I saw but one old nest mound. At Haig were a few very old and rather flattened mounds, which from their regular and circular shape I think were the work of bygone Mallee-Fowl.

Bustards (*Eupodotis australis*) occur all along the Western Australian portions of the trans-line. I saw more of them at Haig than anywhere else. The largest number seen together was a party of eight, but I was informed at times flocks of over a 100 had been counted on a single flat. Females with one or two young ones were several times seen. On one occasion one of the fethlers chased a young one not able to fly. This he caught, and then tried for the second bird. But the female was too quick for him. Running up she seized the young one with her feet, and pressing it to her breast flew off with it in safety. It is well known that the Woodcock of Europe conveys its newly hatched young to the feeding grounds in like manner.

Emus do not seem very plentiful on the portion of the plain I visited. I saw a single bird at Naretha, and a fine pair passed close to the camp one evening at Haig.

#### CONCLUSION.

In conclusion I must thank Messrs. Bert Cottrill, A. Rees, and B. Carroll, station-masters at Naretha, Haig, and Loongana, respectively, for the interest they took in my work, and for doing all in their power to make my visit a pleasant one. I am indebted, too, to Mr. Dumford, one of the travelling road-masters, for many items of useful information. I find no mention of the name Nullarbor in the accounts of the early explorers, who travelled along the shores of the Great Bight. I think, with Captain White, that it is of native origin. The consensus of opinion among the railway staff favours this view. I interviewed one native, born on the plain, but the only information I could glean was that "Boora" means wind.

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**Rufous Fantail** (*Rhipidura rufifrons*). Mr. George Hill reports having seen a pair of these Fantails in the orchard of Mr. James Cowan, Bacchus Marsh, last August. As these birds usually appear in Victoria about the beginning of November, it is suggested that possibly this pair remained in the local ranges during the winter.—A. J. CAMPBELL, Box Hill (Vic.). 26/10/21.

## Some Birds of Groote Eylandt, Northern Territory

By A. J. CAMPBELL, C.M.B.O.U., F.A.O.U.

With Observations from the Diary of WM. McLENNAN,  
R.A.O.U.

Notwithstanding the pressing, many-sided demands made on an extremely busy pastoralist's life, Mr. H. L. White, "Bell-trees," N.S.W., has found time for thought to endeavour to link up the avi-fauna of the northern parts of Australia. He is greatly to be commended for his whole-hearted enterprise, not to mention its considerable expense.

He has had in the field at Cape York and the Gulf of Carpentaria country, Mr. H. G. Barnard; in Arnhem Land, Mr. Wm. McLennan; and in the further North-West, or Kimberley Country, Mr. Gerald Hill. This year (1921) he again equipped Mr. McLennan to explore, in search for "missing links," Groote Eylandt (Great, or Big Island), on the western side of the Gulf of Carpentaria. Groote Eylandt is a large square-shaped island (roughly about 40 miles square) and about 30 miles off the mainland (Arnhem Land), with which it is connected by numerous small islets. For plan of locality, see *Emu*, vol. xvi., p. 118.

Mr. McLennan left Thursday Island with assistants and boat on 20th April for a journey of about 290 miles across the great Gulf. After touching at Batavia River and Duyphen Point, the party, after a voyage of five days, eventually sighted Groote Eylandt on the 25th April. On the 4th July, the island was left, and a return commenced to Thursday Island, which was reached after five days of mostly heavy weather. Therefore, two months were occupied in exploring Groote Eylandt and its vicinity. The amount of bird-life was disappointing; yet, not so, if one considers the season of the year—winter time: "dead low water," so far as birds are concerned; too late for autumn migrants, too early for spring visitors. From the description of the country given by Mr. McLennan (see appendix), the island appeared most favourable for numerous birds at the proper season; say, during October, November and December.

However, Mr. McLennan, notwithstanding a vicious sting in the eye by an ant affecting his sight, onslaught of mosquitoes, and evil eyes of crocodiles and cunning natives, did remarkably well in procuring 70 species of birds—all perfect skins, and mostly in perfect plumage, because newly moulted. These Mr. H. L. White has kindly permitted me to examine before he handed the consignment over to the National Museum, Melbourne, to be incorporated in the ever-increasing and valuable

"H. L. White Collection." Hence the few following critical remarks.

Having dealt with the "Birds from the Gouldian-Gilbert Type-Locality" (Arnhem Land) (see *Emu*, xviii., part 3), I was particularly anxious to see birds from the adjacent large island—Grooto Eylandt.

In connection with type localities of several of the "Gouldian-Gilbert" birds, I fell partly into a trap. In turning up Gould's original localities in the *P.Z.S.* (London), I found records, "North-West Australia," and did not recollect that Gould, in his "Handbook," had corrected some of them, or the inference to "Port Essington" (Arnhem Land) until Mr. Gregory Mathews drew attention to the matter as reflecting on his researches. I cannot say more than "I am sorry," and thank him for the correction. No one values more than I the amount of research work Mr. Mathews has done in discovering and correcting references. The species referred to are five, namely:—*Podargus phalenooides*, *Piezorhynchus nitidus*, *Neositta leucoptera*, *Pardalotus uropygialis*, and *Myzomela erythrocephala*.\*

However, Mr. Mathews has not satisfactorily shown that "North-West Australia" is not the type-locality for six of Gould's species, namely—*Turnix castanota*, *Rhipidura isura*, *Myiagra concinna*, *Malurus cruenatus*, *Cracticus argenteus*, and *Tropidorhynchus argenteiceps*. In the last-mentioned, we have the interesting record by Gould (see "Handbook," i., page 548): "For the first knowledge of this species of *Tropidorhynchus*, science is indebted to the late Mr Bynoe, surgeon of Her Majesty's surveying ship, 'Beagle,' who, on my visiting Sydney, placed his specimens at my disposal; after my return to England, other examples were sent to me by Sir George Grey.

"Bynoe's specimens were obtained during the survey of the *North-West coast*, a portion of Australia the natural productions of which are but little known, and Sir George Grey's during his expedition into the interior, from the same coast."

That does not appear like "Port Essington, Northern Territory!" Then regarding *Cracticus argenteus*, reference to the "Brit. Mus. Cat. Birds," viii., pp. 99-100, indicate that the type came from North-West Australia. Page 100 bears the following record:—

"(a) Juv. sk. N.W. Australia. J. Gould, Esq. (Type of species.)"

Perhaps it matters little ornithologically, because reference to Mr. Gerald Hill's fine photographs in *The Emu*, x., pls. 29 to 34, and to his observations of the country in both the further North-West and Arnhem Land—the physical features are similar, and doubtless their respective avi-fauna varies little.

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\* Students and others, if sufficiently interested, will accordingly please correct their copies of the above mentioned article.—A.J.C.

*Megapodius reinwardt tumulus.* Scrub-Fowl.

♂ See former remarks, *Emu*, xviii., p. 176.

*Synoicus australis cervinus.* Northern Brown Quail.

♂ ♀ The male is redder above and more finely freckled and barred than the female, as is usually indicated in this species.

*Ptilinopus ewingi.* Rose-crowned Fruit-Pigeon.

♂♂ When in Arnhem Land, 1915, Mr. McLennan saw this beautiful Pigeon but did not procure a specimen. This time he was more fortunate. An examination of a long series in the National Museum, Melbourne indicates that it should be a separate species and not merely a sub-species of *P. regina (swainsoni)*. It is smaller and the distinctly yellow throat and more yellowish under surface are striking and constant. The great Gould had a good eye for species, and was unlikely to blunder here, much less figure the bird as distinct (see "Birds of Australia," folio v., pl. 55).

*Chalcophaps chrysochlora longirostris.* Long-billed Green-Pigeon.

♂♂♀ See former remarks, *Emu*, xviii., p. 177.

*Phaps chalcoptera consobrina.* Northern Bronze-winged Pigeon.

♀ There appears to be a good northern race of the common Bronzewing, which Mr. Gregory Mathews has characterised as *P. c. consobrina*. See "Birds of Australia" (Mathews), i., pl. 35. This specimen agrees with the plate.

*Eulabeornis castaneoventris.* Chestnut-bellied Rail.

♀ See former remarks, *Emu*, xviii., p. 177.

*Butorides stagnatilis.* Little Mangrove-Bittern.

♀ See former remarks, *Emu*, xviii., p. 178.

*Tadorna radjah rufitergum.* White-headed Sheldrake.

♂ See former remarks, *Emu*, xviii., p. 178.

*Phaethon rubricauda.* Red-tailed Tropic-Bird.

♂ ♀ ♀ ♂ ? The unsexed specimen appears to be mature; the others are in more or less immature plumage.

*Phaethon lepturus.* White-tailed Tropic-Bird.

♀ Almost in mature plumage. This species is the smaller of the two Tropic-Birds.

Mr. McLennan did not actually obtain these birds at Groote Eylandt, but on his return across the Gulf of Carpentaria, when nearing Cape York. The following is from his diary:—

"6/7/21.—Daylight breeze chops round to northward, and we are able to lay on our course again E.N.E. Mid-day a single Red-tailed Tropic-Bird seen. During afternoon wind chops to eastward again, still blowing very strong. This boat is half a submarine—travels more under the water than over it. 6 p.m., wind chops to S.E. and blows stronger than ever. Impossible to sleep.

"7/7/21.—3 a.m., wind takes off a good bit and chops round to east; 8 a.m., wind very light and further round to the E. Shake out the reefs in all sails. 10 a.m. Four Red-tailed Tropic-Birds seen. Half an hour later five more appeared. 1 p.m., another Tropic-Bird





(Right) Nest and eggs of Tawny Frogmouth  
(*Podargus strigoides*)



(Left) Nest of Partridge-Pigeon (*Geophaps scripta*)

Photos, by W. McLennan, R.A.O.U.

observed. All immature specimens. Small Petrel seen.\* Little later another Tropic-Bird circled round, much smaller than the others, and with a very long tail; a fine specimen of the White-tailed. 4 p.m., saw another Petrel, Brown Gannet (*Sula sula*), Crested Tern (*Sterna bergi*); also another Red-tailed Tropic-Bird. Breeze freshens at sunset, and sea very rough again."

*Circus assimilis*. Spotted Harrier.

♂ A handsome example showing the rich chestnut shoulder patches. It has not been definitely recorded previously for the Gulf of Carpentaria region, although Mr. McLennan believed he saw the species in Torres Strait last year (vide *Emu*, xx., p. 66).

*Spiloglaux boobook mixta*. Boobook Owl.

♂ ♀ Slightly redder in general colour and whiter about the face than a pair from King River, N.T. Gould states: "I have seen individuals of this Owl from every one of the Australian Colonies, all presenting similar characters, with the exception of those from Port Essington (N.T.), which differ from the others in being a trifle smaller in size and paler in colour." This meets Mathews's *mixta* (*Nov. Zool.*, xviii., p. 255).

*Trichoglossus rubritorquis*. Red-collared Lorikeet.

♂ The farthest east this Lorikeet has been collected (H. G. Barnard) was at the McArthur River. It would be interesting to learn where it meets *T. septentrionalis*, the northern race of the "Blue Mountain" Parrot (*T. nova-hollandiae*).

*Cacatua galerita queenslandica*. Little White Cockatoo.

♀ Very much smaller than typical birds. Wing 307 mm., as against wing measurement 356 mm. of a female taken at "Bell-trees," New South Wales.

*Cacatua sanguinea*. Blood-stained Cockatoo.

♂ Typical.

*Aprosictus erythropterus coccineopterus*. Crimson-winged Parrot.

♂ See former note, *Emu*, xviii., p. 179.

*Podargus phalaenoides*. Freckled Frogmouth.

♀ ♀ The species of *Podargus* are very puzzling; there appear to be two northern races, a large and a small. These examples are very small for females. We now understand "Port Essington" to be the type locality of *phalaenoides*, which bird Gould states "may be readily distinguished from every other Australian species of *Podargus* by its small size, by the beautiful, delicate and moth-like painting of its plumage, etc." This is the Freckled Frogmouth (*P. phalaenoides*) of Northern Territory. And whoever omits it, as a full species, from any Australian list of birds will have to reckon with future ornithologists.

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\*The following day, when nearing land, the same species of Petrel was observed in "great numbers." Mr. McLennan suggests it may be the Storm Petrel (*Oceanites oceanicus*). Considering the latitude, I think this is doubtful. It would have been extremely interesting and important to have settled the identification.—A.J.C.

*Alcyone azurea pulchra.* Purple Kingfisher.

♂ ♀ Both blackish above, some feathers only tipped with blue; flanks also blackish, not abundantly bluish, as is usual in the species; may be a phase of plumage.

*Alycone pusilla.* Little Kingfisher.

♀ This is another Gilbertian type-locality bird, which Mr. McLennan did not procure when in Arnhem Land, fortune favouring him on this occasion. The specimen is typical.

*Dacelo leachii cervina.* Fawn-breasted Kingfisher.

♀ See former remarks, *Emu*, xviii., p. 180.

*Halcyon macleayi.* Forest Kingfisher.

♂ Similar to both N.T. and Cape York examples except for the feathers of the wing coverts, which are tipped with silvery colour of pretty appearance against the blue.

*Halcyon sanctus.* Sacred Kingfisher.

♂ Immature and slightly smaller than same from New South Wales (type locality).

*Halcyon chloris.* Mangrove Kingfisher.

♂ ♂ Fine skins, apparently typical.

*Merops ornatus.* Bee-Eater.

♂ In good plumage. Skin dated 3/7/21. Many of these birds were seen on that date, denoting possibly that all Bee-eaters do not migrate beyond Australia.

*Eurostopodus guttatus.* Spotted Nightjar.

♂ ♀ Handsome pair; male more spotted on breast, not finely freckled like female. Can hardly distinguish between a bird from Victorian Mallee country and those from Northern Territory. The "H. L. White Collection" possesses a very reddish example from Narromine, N.S.W.

*Cacomantis pyrrhophanus dumetorum.* Northern Square-tailed Cuckoo.

♂ Typical.

*Chalcites basalis.* Narrow-billed Bronze Cuckoo. ♀

*Lamprococcyx minutillus.* Little Bronze Cuckoo. ♂

*Pitta iris.* Rainbow Pitta.

♂ ♀ Examination of a good series in the National Museum shows no difference in this insular pair.

*Hylochelidon nigricans.* Tree Martin.

♀ Smaller and paler coloured than typical. See *rogersi*, Mathews, *Austral Avian Record*, i., p. 38.

*Microeca flavigaster.* Yellow-breasted Flycatcher.

♂ Similar to bird from the type locality (N.T.), which has a buffy olive upper surface, as against brighter coloration (Citrine) of the North Queensland birds. The examination of a larger series has caused me to modify the views expressed in *Emu*, xviii., p. 181.



Nesting site of Fawn-breasted Kingfisher.  
(*Dacelo leachii*)



Black-throated Butcher-Bird on nest, Grootte Eylandt.

Photos. by W. McLennan, R.A.O.U.



*Gerygone magnirostris*. Large-billed Fly-eater.

♂ ♀ Typical. See former remarks, *Emu*, xviii., p. 181.

*Gerygone chloronota*. Green-backed Fly-eater.

♂ ♂ ♂ Rare and good examples. See former remarks, *Emu*, xviii., p. 182.

*Pachycephala melanura*. Black-tailed Whistler.

♂ ♀ Same as Northern Territory specimens. The female possesses under parts nearly as bright yellow as in the male. Both sexes are exceedingly handsome.

*Pachycephala rufiventris falcata*. Northern Whistler. ♂

*Pachycephala simplex*. Brown Whistler. ♂

*Rhipidura dryas*. Wood Fantail.

♂ Typical, a good species, and I am of opinion should be separated from *R. rufifrons*, a migratory bird.

*Rhipidura setosa isura*. Northern Fantail.

♂ See former remarks, *Emu*, xviii., p. 183.

*Myiagra rubecula concinna*. Blue Flycatcher.

♂ ♀ See former remarks, *Emu*, xviii., p. 183.

*Myiagra ruficollis*. Broad-billed Flycatcher. ♀

*Piezorhynchus alecto nitidus*. Shining Flycatcher. ♂

*Graucalus novæ-hollandiæ*. Black-faced Cuckoo-Shrike.

♀ Trifle lighter coloured above than typical.

*Graucalus hypoleucus*. White-bellied Cuckoo-Shrike.

♀ See former remarks, *Emu*, xviii., p. 183.

*Campephaga tricolor*. White-shouldered Caterpillar-eater. ♀

*Campephaga leucomela*. Pied Caterpillar-eater. ♂

*Pomatostomus rubeculus*. Red-breasted Babbler.

♂ Typical of northern species.

*Cisticola exilis lineocapilla*. Grass-Warbler.

♀ See former remarks, *Emu*, xviii., p. 183.

*Megalurus galactotes*. Tawny Grass-bird.

♂ Typical.

*Malurus melanocephalus cruentatus*. Red-backed Wren-Warbler.

♂ ♂ See former remarks, *Emu*, xviii., p. 184.

*Artamus leucorhynchus*. White-rumped Wood-Swallow.

♀ Slightly smaller than typical.

*Artamus minor*. Little Wood-Swallow.

♀ ? Slightly lighter coloured than typical.

*Colluricincla brunnea*. Brown Shrike-Thrush.

♂ ♂ Typical. See further remarks, *Emu*, xviii., p. 184.

*Zosterops lutea*. Yellow White-eye.

♀ Same as N.T. birds. My former note (*Emu*, xviii., p. 185) may be considered somewhat ambiguous. The thought I intended to convey was that *hecla*, from Kimberley District, and

probably *tribulationis*, because from the same district as *hecla*, were both synonymous with Gould's *lutea*.

*Dicaeum hirundinaceum*. Mistletoe-Bird.

♂ Slightly smaller than typical.

*Pardalotus rubricatus uropygialis*. Chestnut-rumped Diamond-Bird.

♂ ♀ ♀ These specimens possess the golden (cadmium yellow) upper tail coverts typical of N.T. birds. For further remarks, see *Emu*, xviii., p. 185.

*Myzomela erythrocephala*. Red-headed Honey-eater. ♂ ♂

*Conopophila albogularis*. White-throated Honey-eater. ♀

*Stigmatops indistincta*. Brown Honey-eater.

♂ Small in size for male of this species.

*Stomiopera unicolor*. White-gaped Honey-eater.

♀ Typical.

*Tropidorhynchus argenticeps*. Silvery-crowned Friar-Bird. ♂

*Philemon citreogularis sordidus*. Little Friar-Bird. ♀

*Taniopygia castanotis*. Chestnut-eared Finch.

♂ ♀ Almost typical.

*Stizoptera annulosa*. Black-ringed Finch.

♂ ♀ Typical with *black* rump, not *white* as in *bichenovii*.

*Donacola castaneothorax*. Chestnut-breasted Finch.

♀ Very pale (pinkish-buff) breast.

*Oriolus sagittatus affinis*. Northern Oriole.

♀ ♀ Typical of northern race.

*Oriolus flavocinctus*. Yellow Oriole.

♂ See former remarks, *Emu* xviii., p. 188.

*Sphocotheres flaviventris*. Yellow-bellied Fig-Bird.

♂ Typical.

*Corvus cecila*. Crow.

♂ It seems a very far cry from Nullarbor Plains, Southern Australia, to Grootte Eylandt, in the Northern Territory. Yet Crows respectively collected at these localities by Messrs. F. L. Whitlock and W. McLennan are visually apparently similar.

*Cracticus nigrogularis picatus*. Pied Butcher-Bird.

♂ ♂ Imm. The immature specimen shows brownish instead of the black portions of plumage, especially on the throat and chest (date when taken, 5/5/21).

*Gymnorhina tibicen eylandtensis* (H. L. White)\*.

♂ ♀ and ♂ ♂ Imm. The old pair is exceedingly handsome and distinctive in their newly moulted plumage. There is a bluish-black sheen about the blacks, especially on the mantle of the male, while the whites are the purest. The two immature males are in mottled brown and blackish plumage, except the white upper tail coverts and white portions of tail.

\* Mr. H. L. White has more fully described these specimens on a former page of this issue, p. 163

## FIELD NOTES from Diary of W. McLENNAN, R.A.O.U.

1st May, 1921.—Turn out at daylight; breakfast, and go ashore. Pick out a place to camp and get Eric and the boys to rig up old tent and fly. Go inland eastward along edge of swampy country for about a mile to small mangrove-fringed creek. Bird life scarce. Brown Honey-eater, Ground Doves (*Geopelia humeralis* and *placida*), and a White-bellied Cuckoo-Shrike (*Graucalus hypoleucus*) noted. Follow creek up short distance, then cross it and continue along edge of swampy country for another mile. A single Native Companion (*Antigone rubicunda*) the only bird seen about the swampy country. Head north along a sandy rise, heavily timbered with messmate and bloodwood (*Eucalypts*) and Wattle (*Acacia*), undergrowth of saplings, shrubs and coarse grass—very thick. A pair of Bronzewing Pigeons (*Phaps chalcoptera*) flush from the ground and away out of sight. Continue along this rise for a couple of miles. Bee-eaters numerous, and a single Drongo (*Chibia bractcata*) and a Forest Kingfisher seen. Northern Thickhead (*Pachycephala falcata*), Honey-eaters (*Stigmatops indistincta* and *Conopophila abogularis*), Chestnut-rumped Pardalote also seen occasionally. Head to west through similar country and strike belt of scrub behind the mangrove along the passage into Nor'-west Bay. Several big tamarind trees in this belt. Bower-Bird (*Chlamydera nuchalis*) noted. Search through the scrub. Brown Thickhead fairly numerous. A pair of Rainbow Pittas only other birds seen; found two of their old nests. Return to camp through the strip of fairly open country in from beach; spear-grass very thick here. Few White-gaped Honey-eaters seen in large-leafed bushes near beach. Flock of Blood-stained "Cockies" and a pair of White "Cockies" seen flying past. Reach camp 3.30; clothes a mass of spear-grass seeds. Go on board, have a cup of tea; bring gear ashore and fix up camp for the night.

2/5/21.—Daylight, rain squalls for a couple of hours. Breakfast, and go out S.W. along foot of the Bluff for about 1½ miles. All messmate forest here; very thick undergrowth, mostly *Zamias* and rank grass. Birds fairly numerous. Bower-Bird, Oriole, Drongo, Pied Butcher Bird, Silvery-crowned Friar-Bird, Honey-eaters, Flycatchers (*Rhipidura setosa* and *Myiagra concinna*), Red-backed Wren, Red-Collared Lorikeet, Chestnut-rumped Pardalote noted. Go up spur of Bluff, heavily timbered with messmate, bloodwood, Moreton Bay ash (*Eucalypts*), pine, wattles (*Acacia*), and other trees and shrubs, and to S.E. for about two miles; pretty rough going most of the way. Fewer birds observed. Brown Shrike-Thrush, Pardalote, Northern Thickhead, Barred-shouldered Dove (*Geopelia humeralis*), Brown Honey-eater, Silvery-crowned Friar-Bird, Pied Butcher-Bird, White Cockatoo seen. Reach to edge of the Bluff; it drops away abruptly to a great forest-clad valley, 200 feet below, which stretches away for miles to the east and south to a series of lower forest-clad bluffs and ridges. No open grass, or open swampy country to be seen. Go down into the valley and through for a couple of miles; no bird-life of any kind here; very poor class of country. Head back to the Bluff, and cross a spur. Can get better view of the country about head of Nor'-west Bay. It appears to be worse than this. No hope of getting into the big central Bluff from there; it appears to be about ten miles inland from the head of the bay. Go down into the forest along the north side of Bluff and head through to the camp. Crow, Crimson-winged Parrot, and Peaceful Ground Doves noted. Saw a single Magpie (*Gymnorhina*) flying ahead and set out after it, but it eventually flew over the Bluff. Old nests of Friar-Birds, Finches, and Pigeons were seen in this stretch of forest. Got back to camp about 2.30 p.m. pretty tired; it is heavy work ploughing through the rank grass and undergrowth. Lunch, and spent rest of the afternoon hunting through the mangroves near camp. Broad-billed and Shining

Flycatchers and a few Barred-shouldered Doves observed. Just at dark a big crocodile swam along and floated on the surface of the water, 20 yards from the beach in front of the camp. Too dark for a sure shot with rifle, so did not disturb it. Twenty minutes later it swam away along the beach.

3/5/21.—Boobook Owl heard calling before daylight and Brown Quail before sunrise. Breakfast, and go up along beach for about a mile and then inland to the swampy country, and work along the edge to north. Bird life fairly plentiful. Silvery-crowned and Little Friar-Birds, Peaceful and Barred-shouldered Doves, Red-winged Parrots, White Cockatoo, Northern Thickheads, Honey-eaters (*S. indistincta* and *C. albugularis*), a Coucal (*Centropus phasianinus*), Yellow Oriole, small flock of Black-ringed Finches and a large flock of Chestnut-breasted Finches (mostly immature specimens), and Red-backed Wrens noted. Spotted Harrier flying past over head; pair of Forest Kingfishers seen. Nearly all cabbage gums growing in and around the swamp here. Circle round through forest country; no bird-life of any kind in it. Go along to belt of scrub noted on the 1st, and work through it thoroughly. Wood Fantails and Flycatcher seen, also Rainbow Pittas; found more old nests of this bird. Brown Thickhead and Pied Caterpillar-eater only other birds seen in the scrub. Go back to swamp and saw only three Finches—the Black-banded and the Chestnut-breasted. Return to camp about 1 p.m. Youngfellow and a dozen more natives were at the camp; they were after tobacco. Gave them enough to make a couple of cigarettes. Have lunch and set to work on the birds. Swarms of flies here now; must have come along with the natives. Took me nearly all the afternoon to fix up specimens. Natives continually pestering me for more tobacco, but wouldn't give them any. Tried to make Youngfellow understand that they were all to keep away from the camp, but it was no go. Just before sunset a couple of them brought a few plates of turtle-shell, and I gave them some tobacco for it; then they all left and camped about half a mile away on the beach. A Whistling Eagle (*Haliastur sphenurus*) was seen circling high over camp during the afternoon. A Little Falcon (*Falco longipennis*), flew swiftly past at sunset. Very hot to-day.

4/5/21.—Take Kasia with me to carry rifle, and go S.W. along the beach and behind the mangroves for a mile and a half. Strike a fairly big stretch of marshy country thickly grown with giant Paperbarks (*Melaleuca*), palms, ferns, and vines, and with a fringe of good scrub (jungle) along the edge. Work through the scrub fringe for half a mile. A single Green-backed Fly-eater seen; Brown Thickheads and Brown Honey-eaters only other birds seen. Old nesting mound of Scrub-Fowl seen. Leave the scrub and go through a big stretch of white sandy country covered with fairly dense growth of low, tangled thicket. A single Fawn-breasted Kingfisher seen here. Strike a stretch of water-logged country half a mile across, covered with small paperbarks. No bird-life seen. Strike a fairly big tidal creek fringed with mangroves and follow this up some distance. A Red-winged Parrot flushed from a hollow 15 feet from the ground in a bloodwood. Start to climb, and a fairly fledged young one flew from the hollow; nothing else in it. A little further on a rock-bar crosses the creek. This is the limit of tidal waters; good stream of fresh water comes in here. Continue along the creek for about a mile; fine large fresh water holes in it. Good forest country on both sides, but no bird-life of any kind to be seen or heard. Head through the forest to the Bluffs, and back to camp along the base of them. Single Little Wood-Swallow procured, and a Brown Thrush. Several old nests of Babbler noted; did not see any of the birds. Party of Red-backed Wrens seen with one bright male. Nearing camp saw a Chestnut-rumped Pardalote. Reach camp about 2 p.m. Afterwards went to see if I could find the Magpie noted on the 2nd; no luck. Saw

a Sacred Kingfisher and a White-gaped Honey-eater. Two more natives came along during the afternoon bringing a pack of mangy dogs. The natives shifted camp to within 100 yards of the tent, so consider it advisable to sleep on board the boat.

5/4/21.—Uneventful.

6/4/21.—Get Eric to take down tent and fly and rig the latter as an awning over the stern of the boat. Will have to do all my work on board: natives and flies too much of a nuisance on shore. Take Kosia and Malaki and go inland N.E. for couple of miles, circle round to S.E. across a stretch of ironstone country heavily timbered. An occasional Northern Thickhead and Brown Honey-eater the only birds seen since leaving the beach. Strike a stretch of poorer country lighter timber with stunted cabbage gums and shrubs. A Black-ringed Finch flushed from a nest containing half-fledged young. A pair of Red-collared Lorikeets the only other birds observed. Strike another stretch of ironstone. A party of Red-breasted Babblers was seen. Magpies were flushed from ground some distance ahead; set out after them, but could not get near enough them. A Goshawk (*Astur approximans*) seen soaring over the tree-tops. Another lot of Magpies heard calling. Send the boys well round to drive the birds towards me, which they did, but the birds were flying high. Strike N.E. end of the Bluff. Heard some more Magpies calling; got within 70 yards of one. Others calling on the top of the Bluff. Set out after them; saw them several times, but could not get near them. Head back to camp; reach there 3.30 p.m., tired out. More natives came along to-day. This lot brought some spears. Thirty nine natives now in camp.

7/5/21.—Uneventful.

8/5/21.—Eric and I got out after the Magpies. Separate on the off chance of driving birds to each other. Saw one. Boobook Owl flushed from bushy top of tall messmate. Disturbed four Magpies, which flew off in Eric's direction. Have a good search for Owl, but cannot locate it again. Heard Magpies calling in towards Bluff. Go along foot of Bluff; four Magpies flush from the ground and fly into trees on the Bluff. Sit and watch them for about an hour; then they flew down into the timber about 200 yards away. Get down on my hands and knees and crawl through the undergrowth to within 50 yards of one of them. Brought it down. It was only slightly wounded. Use it as a decoy, and in about two hours I secured three more birds, two of them immature specimens. Get back to the boat, 2 p.m. Eric came along half an hour afterwards; he had been chasing the Magpies all over the top of the Bluff, but could not get near them.

[The history of the Magpies is interesting because attached to type-specimens. See Mr. H. L. White's descriptions.—A.J.C.]

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**Eagle and Cockatoo**—Two Sulphur-crested Cockatoos were feeding on the seeds of a small vine, when an Eagle swooped down and grabbed one poor "Cockie," flying with it to a large tree, where the Eagle sat on one leg, holding the Cockie in the other, and quietly began pulling it to pieces with its beak, the Cockie shrieking all the time. The lads rode under the tree and threw sticks, and the Eagle flew away, and again perched on a tree, and the last the lads saw of it the Eagle was again holding it in one foot while eating it.—J. BLACK, Mrs. Adam Black, Payingo Station, Charters Towers, Queensland.

## Types of the Australasian Genera of Penguins

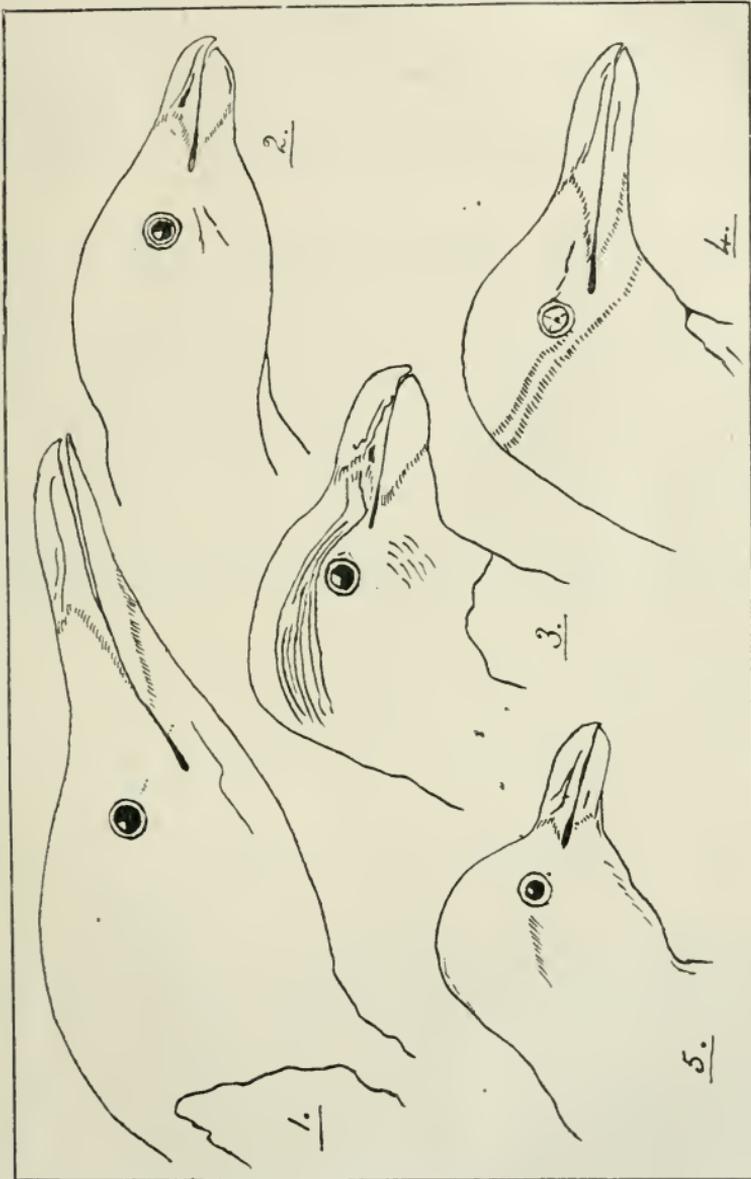
R. STUART-SUTHERLAND, R.A.O.U.,  
Puysegur Point, N.Z.

The Penguins here dealt with are those of the Australasian region, or more properly all the genera of Penguins with the exception of *Spheniscus*. In allowing for five genera, I pass over that classification which is based on geographical distribution, where the family is divided into three genera, the first containing *Aptenodytes* and *Pygoscelis*, with a distribution from the Antarctic Regions up to 50 deg. S. The second combines the genera *Megadyptes* and *Eudyptes*, which are found between 55 deg. S. and 38 deg. S. *Eudyptula* and *Spheniscus* form the third, which ranges from 50deg. S up to the northern limits of the order. It can be readily shown by records, and is shown by the given figures, that the genera cross each other's limits, and so render such a geographical classification entirely futile.

Professor Newton, following Dr. Coues, admits only three genera, but neither of these authors takes any account of *Eudyptula*. Their scheme is: Genus 1, *Aptenodytes* (five species—*Aptenodytes* two and *Pygoscelis* three); genus 2, *Eudyptes* (five species—*Megadyptes* one and *Eudyptes* or *Catarrhactes* four); and genus 3, *Spheniscus* (four species), thus giving fourteen species in three genera with no mention of *Eudyptula*. Sir W. L. Buller (*Manual of the Birds of N.Z.*, 1882), treats the single species of *Megadyptes* with the various species of *Eudyptes* in one genus *Eudyptes*, and gives seven species and a melanistic form. Later (*Supplement to the Birds of N.Z.*, 1905), he treats *Megadyptes* separately, and refers the remainder of *Eudyptes* to *Catarrhactes*, and gives five species. Hutton and Drummond (*Animals of N.Z.*, 1904) also give the name as *Catarrhactes* instead of *Eudyptes*, and allow four species.

The order *Sphenisci* has been divided into two families: *Aptenodytidae*, the Thin-billed Penguins, and *Spheniscidae*, the Thick-billed Penguins. *Megadyptes* is then included in the latter. This peculiar species, forming a distinct genus, should, I consider, be placed, if this system be allowed, in a separate family midway between the other two.

*Aptenodytes* differs from *Pygoscelis* greatly in size, slightly in shape of skull, shape and structure of the feet, length of tail and curvature of flippers, as well as in colour of plumage and mode of nidification—differences which I consider are ample to separate the two genera. The stoutness of the bill and the presence of a crest or tuft and the shape of the skull effectively part *Eudyptes* from *Aptenodytes* and *Pygoscelis*. *Megadyptes* might possibly be classed with *Eudyptes*, if due notice is taken of the bill, which is swollen at the base of the latericorn more



HEADS OF AUSTRALASIAN PENGUINS.

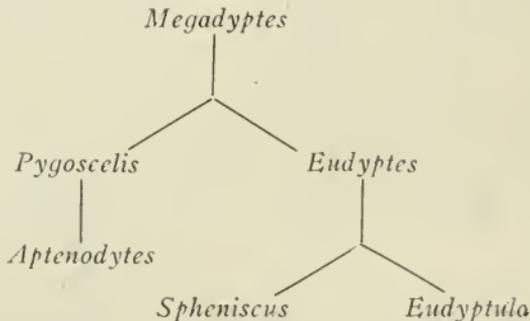
1. *Aptenodytes*,
2. *Pygoscelis*,
3. *Eudyptes*,
4. *Megadyptes*,
5. *Eudyptula*.

From Sketch by Stuart-Sutherland, R.A.O.U.

or less in both these forms, and so, were it not for the flatness of the top of the skull and the presence of twenty feathers in the tail, connects them. It may be said that the occasional grey feathers which occur in the white breast of *Megadyptes* are a primitive characteristic, but this would connect this form with two of the four species of *Spheniscus*, whereas it has been shown that *Spheniscus* is hardly divisible from *Eudyptula*, save in that the bill of the former is grooved longitudinally at the base of the mandibles. In the last-mentioned genera, however, due allowance must be made for the differences in colour and marking of the plumage.

The classification at present in vogue places the largest variety at the head of the family and the smallest at the foot (I am allowing that *Spheniscus* comes after *Megadyptes*), a convenient but hardly scientific method. Mr. W. P. Pycraft says in his opinion *Eudyptula* is the nearest approach to the ancestral stock; but, even on a superficial measurement and comparison of wing to body length of some fossil forms, *Megadyptes* lies nearest the ancestral form. Further, I should add that *Megadyptes* is a peculiar genus of one species only, and that this species shows traces of characters common to all the other five genera.

A reasonable geneological tree, then, would show that *Pygoscelis* connects *Megadyptes* with *Aptenodytes*, and that *Eudyptes* connects *Megadyptes* with *Spheniscus* and *Eudyptula*. Thus we have—



However, for the sake of convenience, as being in conformity with the illustration, I will deal with the types under the old order. The sketches are drawn to careful measurement, and are reduced to one-half natural size. The following dimensions are in millimetres:—(1) Head of the Emperor Penguin (*Aptenodytes forsteri*); drawn from a skin with the following measurements: Length, 1294 mm.; wing, 343 mm.; tail, 73 mm.; bill, 68 mm.

The head and throat are black, whilst on each side of the neck is a patch of bright orange yellow; the rest of the upper surface of the body is dark bluish-grey and the lower surface is creamy white; the bill is bluish-black and the feet black.

(2) Head of the Adelle Penguin (*Pygoscelis adelle*); drawn from a skin with the following measurements: Length, 770 m.m.; wing, 188 m.m.; tail, 122 m.m.; bill, 37 m.m.

Around the eyelids white; the upper part of the head, neck and throat bluish black, with the remainder of the upper surface just a shade lighter. Breast and abdomen pure white; bill reddish brown with black at the tip of the upper mandible and black along the cutting edges; feet flesh colour with black plantar surfaces.

(3) Head of the Yellow-crested Penguin (*Eudyptes chrysolome*); drawn from a mounted specimen. Length, 603 m.m.; wing, 170 m.m.; tail, 72 m.m.; bill, 43 m.m.

The upper surface bluish-black, darker on the crown and sides of the head; breast and abdomen 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 in a crest of fine filamentous feathers. The crest feathers in the specimen shown are shorter than in the majority of individuals I have seen. Bill brownish red; feet pale flesh colour above, black beneath.

(4) Head of the Yellow-eyed Penguin (*Megadyptes antipodum*); drawn from a skin with the following dimensions: Length, 654 m.m.; wing, 189 m.m.; tail, 66 m.m.; bill, 56 m.m.

The crown of the head light yellow, very finely streaked with black and 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. Upper plumage dark slaty grey; under surface white with two isolated grey feathers; feet pinkish flesh, and the bill light reddish horn colour.

(5) Head of the Blue Penguin (*Eudyptula minor*). From a mounted specimen. Length, 390 m.m.; wing, 115 m.m.; tail, 23 m.m.; bill, 34 m.m.

Upper surface light dull greyish blue; the flippers darker and edged posteriorly with white; under surface pure white; the upper breast and neck inclining to greyish; feet dull white flesh colour, and the bill dark bluish horn.

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Members will be pleased to learn that, at the last Annual Congress of the A.O.U., our veteran ex-President, ex-Editor, and ardent field and cabinet ornithologist, Mr. A. J. Campbell, C.M.B.O.U., was elected an Honorary Fellow of the American Ornithologists' Union—a signal honour held by no other Australian. The recipient is congratulated on his well-merited recognition as the leading Australian ornithologist.

## An Impression of the Birds of Australia

By A. H. WILSON, Visiting Ornithologist from Great Britain.

I suppose that a lover of birds coming to Australia first when a grown man, and, for the second time, after an interval of ten years, must needs get an entirely different impression of Australian birds from one who has been brought up among them. Let us see if that is so. It is a curious fact that while people in Europe know really dangerously little about Australia, it is on the whole the birds which are the most familiar, even among schoolboys. Any English boy can tell you of Black Swans, Galahs (known as Rose and Grey Cockatoos), Emus, Lyre-Birds, and the Bird which laughs at you. But the more interesting Bower-Bird is not so much heard of, which is strange. The only other things equally household words are boomerangs, Victor Trumper (still an idol), the Kangaroo, and the Platypus: so the birds hold pride of place. The saying, here supposed to be popular in England, that Australian birds have no song, is pure imagination among Australians. It was once said years ago, but I had never heard it, nor have I ever met anyone at home who has heard it said. Let me assure you that your birds need no defence in this way, nor do your trees; it was an Australian who told me that gum trees have no shade.

A visitor's first impression on landing in Victoria for the first time, as far as birds are concerned, will be his worst. He will be expecting something new, but the first thing he sees is a Sparrow, the next a flock of Starlings, and presently Thrushes or Blackbirds. I do not fear the two latter, because the climate does not suit them; they die of heat in the summer, when the thermometer flirts with the century mark. I found three dying in Melbourne streets on one day this year; two young Thrushes and a Blackbird: but the Sparrow and Starling will thrive anywhere. The economic argument may rage about these birds as to their agricultural value, but their driving away of native species from where man lives and likes to see them is a crime.

After ten years' absence I have come back, and found them increasing in numbers and spreading wider afield, ever following man and his railway lines. Why should a garden be full of Sparrows, when Honey-eaters in all colors, brilliant Finches, and others might be there instead? While it is yet time, keep out the pretty Bull-finch. When he is adult he is almost 100 per cent. bad, being then entirely a fruit eater. He will probably do more harm if introduced. His importation should be specially prohibited by law.

Turning to the brighter side, Australian birds are intensely interesting to a visitor, both in habits and variety. There is nothing more original than the families of Bower Birds, or the Mound-Builders (*Megapodidae*), nor more primitive than the Emu, nor more perfect in flight than the Wood Swallows.

Watch one day the wonderful control of the Masked variety, and see if you do not agree.

I am also struck by the unrivalled opportunity for original research and discovery given by Australian birds, where the humblest seeker can still find something new. My own observations during the past year have been mostly concentrated on migration. A study of books would lead one to think that a very large proportion of birds in this country is non-migratory: a state of things so greatly at variance with conditions in Europe and America, that I could not believe it. Are we sure that the last word on migration has been said? Because a bird like the Magpie is always with us, have we any reason to believe that those we see in winter and summer are the same birds? Now where I live we have all noticed, and that almost daily, a grey and white Magpie, with no black feather on it; this bird we know in summer and early autumn: but in winter and spring it never appears, and yet other Magpies remain with us all the year round. Let any keen observer count the Magpies he sees every day in January and June or July, and he will notice how many more there are in January. I therefore regard the Magpie as a limited migrant: that is, limited in the distance travelled.

The Crested Bell Bird is another accepted non-migrant. Now this species happens to be very common here, just north of the coastal ranges, north of Bendigo, where its southern limit is reached. In summer there is a road where I expect to see between 30 and 40 of these birds running along the wheel ruts after insects, and it is always so. In winter I look in vain, and the scrub near by is empty of their bells. But in Central New South Wales, where they can be seen all the year round, one would say casually that the same birds remain there stationary. I wonder if it is so. I could multiply instances, and so could anyone interested, especially by watching albinos, birds with some peculiarity such as one-legged specimens, or extra tame friends.

Another matter open to investigation is, "Why do some birds sing?" Many people will at once say there can be no practical reason; it's just because they are happy or something. And yet are we sure there is no reason? Surely it is proved that Owls hoot to frighten into a shiver some startled mouse or small bird asleep, so as to force it to give its presence away. Now if you study Dr. Leach's valuable book, you will notice that insect-eating birds almost all sing at their work; but you will look in vain for a fish- or yabbie-eater who does the same (the Whistling Eagle is an exception). Can you imagine a Heron carolling as he stands waiting for his timid, wary quarry to approach? Such birds have a voice, and use it as a call of alarm, even as Ducks do, or to sound the "all clear" at dusk to show others that some sheet of water is undisturbed for the night's labours. But insect-feeding birds sing all day long. Is it to galvanise into action, and therefore render visible, their food?

I merely state a problem, and profess no discovery, admitting such glaring contradictions as the song of the soaring Skylark, that is never feeding when he sings; but, when I find the only Kingfisher who seldom fishes famous for—shall we call it melody?—while the rest are silent, I begin to want to know why.

Australian birds are peculiarly undomesticated, and offer perfect opportunities for research. Having realised the opportunities of original research, I soon became struck by a new thing, and that was a series of apparent contradictions. The greatest of these was the curious mingling of birds typically tropical, or, shall I say, usually associated with the tropics and those supposedly Antarctic. It is possible within an hour to see both Penguins and Parrots, and that no distance from Melbourne: but, as food regulates the distribution of birds rather than temperature, the apparent phenomenon is explicable. In Europe, or even America, no such meeting of extremes could be found.

Again, in Victoria can be seen almost at the same time the jungle-loving Drongo, and the Chough, represented by its white-winged relative (*Corcorax melanorhamphus*), which anyone not bred in Australia connects with Alpine scenery in Switzerland or the cliffs of England's Atlantic sea-board. Almost equal surprise was in store for me in noticing how slowly native birds accommodate themselves to new conditions of civilisation. Ten years ago I knew some timber land in Victoria which had been ring-barked and was used as grazing country: this area was almost as full of wood-loving birds as the virgin bush itself. Now the land is grubbed and under wheat, but several large clumps of trees remain; yet the birds have left the place, while Sparrows and Starlings have come in; only the Magpies and Robins stay there as representatives of an older order. I think in years to come the birds will return, as has happened in Melbourne, but for the moment they are driven back into remoter districts.

The most bird-loved town I ever saw is Cairns. A small place, but still large enough to maintain two big picture houses, it is so full of bird life that a morning's walk there allowed me to identify 14 species in the streets. The common Mudlark (*Magpie Lark*) was in every street—ubiquitous; while Peaceful Ground Doves sat on the telephone wires. A few Drongos were there and Glossy Starlings, and a Sacred Kingfisher posed upon the post office roof. The street on the sea front gives a view of Reef Herons, Spoonbills and Egrets, Terns, Gulls and Stints. A Kite, Cuckoo-Shrike and Frigate-Bird completed my morning's list.

Is not the greatest charm of birds largely due to the fact that they are not nocturnal in the great majority of cases, while mammals so greatly are! Birds move where we can see them, and, when we can, let us bless them for it, and remember that even those which go about their business by night make the dark hours busy with their callings. I love the screams of the Stone Plover under the moon, or the gaggle of Ducks, and there is a

fascination in the hoot of an Owl, and, while the European Nightingale is famous, I have just as much enjoyed the small voice of an Australian Willie Wagtail at midnight.

Some nights are full of sound (perhaps a condition in the air causes it) when foxes bark and possums are noisy, whatever the reason. On one such night, as I was walking, a Magpie woke and gave a full cadenza of melody, whereat a chorus of others nearby answered magnificently, and the still air was ringing with sound, and that was all: it seemed as if the whole colony had contentedly cuddled themselves to sleep again for the rest of the night. I particularly admire the Magpie, and like to watch his returning home to roost. I know a place where I can stand at dusk and look southwards, knowing that soon at a great dizzy height these birds will be seen approaching, till at a certain spot their wings will be fixed, half closed, and they will swoop to the tree tops at a speed which is over 100 miles an hour, as if they loved it, and there, at the last second, check themselves with a rustling whirr of pinions, lightly to settle on some pine-tree. What a perfect finish to a sunny day! Those who have swooped in the same way in an aeroplane can, by a slight, imperfect imitation, imagine the feeling.

Since I began writing this paper, I went out into the bush to see how many different sorts of birds I could notice on one afternoon. Between 2.15 and 5.15 p.m., I had found 41 all told, of which one, the Orange-winged Nuthatch (*Neositta*), was new to me. This is a more fruitful walk (aided by a car) than I think any non-tropical country in the world could rival. To name a few only, there was the Crested Bell Bird (two only), Yellow-breasted Whistler, Friar-Bird, Spotted-sided Finch, White-browed Babbler, Allied Harrier, Yellow-tufted Honey-eater, and so on; and, on the afternoon just previous, I was in a swampy part and saw eleven birds there, all of which could have been added to the list of 41 had I so willed on the same day. Where else, I repeat, in a temperate climate, could a bird-lover rejoice so fully as by seeing 52 species so quickly? But this was done in virgin bush, uncultivated, where the imported usurpers have not yet arrived to starve the rightful owners.

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**White Tips to Tail Feathers.**—For many years past, my attention has been attracted to the great numbers of different species of birds that possess white tips to their tail feathers, and ranging from the smallest to the largest birds. The percentage of these forms among our Australian and Tasmanian species is very great, as well as with exotic kinds. This is only one of nature's many wonders, and it would indeed be very interesting if we were able to ascertain for what purpose the white tip is there.—SID. WM. JACKSON, R.A.O.U., Belltrees, N.S.W.

## Notes on Petrels washed ashore, West Coast, Auckland Province, N.Z.

By R. A. FALLA, R.A.O.U., Auckland, N.Z.

As questions arise from time to time in connection with the occurrence of numbers of dead Short-tailed and Wedge-tailed Shearwaters on Australian coasts, a few notes on the occurrence of dead Petrels on New Zealand coasts, more particularly the west, may prove of interest.

The few observations recorded here extend over a period of five years, and have been made whenever opportunities occurred for rush trips to points on the west coast within a thirty-mile radius of Auckland, between the Manukau and Kaipara Harbour entrances. Information thus secured is necessarily incomplete, but the following notes should serve as a preliminary record of the commoner species.

*Pelagodroma marina*. White-faced Storm-Petrel.—This is the only Storm-Petrel that has so far come under my notice on the coast, two specimens being found on Muriwai Beach early in January, 1920. It is common, however, on the east coast, breeding just outside the entrance to Auckland Harbour.

*Puffinus assimilis*. Allied Shearwater.—Not common. A few bodies appear on the beaches in November, and continue to wash ashore until early in January.

*Puffinus tenuirostris*. Short-tailed Shearwater.—This common Australian Mutton-Bird is rarely met with on the west coast here. One found during January, 1919, is my only record of it up to the present.

*Puffinus griseus*. Sombre Shearwater (New Zealand Mutton-Bird). Perishes in immense numbers between the months of October and February, while a few dead birds may be picked up as early as September, and as late as March or April. They are usually in good condition, and fairly fat, although the stomach is invariably empty.

*Puffinus bulleri*. Long-tailed Shearwater.—During January trips to the coast, I have twice found the remains of this rare Petrel, in each case too late to preserve any parts except tail, tarsi, skull, and a few of the primaries.

*Puffinus gavia*. Forster Shearwater.—Washed ashore on both east and west coasts from December until March, but not in great numbers.

*Puffinus carneipes*. Fleishy-footed Shearwater.—Although a common breeder on the eastern side of the Auckland Peninsula, this bird is evidently not very common in the Tasman Sea, as I have only one specimen from the west coast.

*Priocella antarctica*. Silver-Grey Petrel.—A straggler, so far found only once, during January.

*Procellaria parkinsoni*. Black Petrel.—Breeds at various places on the east coast of the Auckland district, but does not seem common on the west. Early this year (1921) I found the first that has come under my notice.

*Pterodroma macroptera*. Great-winged Petrel.—Breeds at several places along the west coast, north of Manukau Heads, and is often

found dead on the tide-mark, but, like nearly all the species mentioned, only during the summer months.

**Pterodroma lessoni.** White-headed Petrel.—The remains of this bird may often be found on the west coast beaches during the summer months.

**Pterodroma cooki.** Cook Petrel.—Dead bodies of Cook Petrel are common on the beaches in summer, and also those of similar species, whose minor differences it is difficult to detect in the mere bundles of bones and feathers which are usually cast up by the surf.

**Macronectes gigantea.** Giant Petrel.—A regular winter visitor to both coasts of this district, venturing into all the bays and harbours. Here in Auckland they may sometimes be seen circling about within a few yards of the wharves, fighting with the Black-backed Gulls for scraps. They appear in May and leave again in October, although they are absent for a few weeks in mid-winter, evidently going still further north. Their migratory movements thus seem to coincide with those of whales, although probably not so extensive, the latter going as far as Norfolk Island. Dead birds may often be picked up during the early summer.

**Prions** (all species).—During the winter months, these birds, with an occasional Albatross, are the only Petrels found on the beach. During westerly gales, all four species, with apparently intermediate varieties, perish in hundreds, being found miles inland, and often blowing right across the island from the west to the east coast. I have not met with specimens of the Blue Petrel (*Halobana caerulea*), but have heard that they occasionally suffer in the same way. Prions also wash ashore with the other Petrels mentioned during the summer months, when bodies of *Prion turtur* are more commonly found.

**Pelecanoides urinatrix.** Diving Petrel.—The usual December batch of dead Petrels always includes a few of these little birds, in very worn plumage, especially on the wings.

**Albatrosses.**—Except for the Wandering Albatross (*Diomedea exulans*) and the Black-browed (*D. melanophrys*) of which occasional specimens are found throughout the year, I have so far been unable to identify with certainty all the birds of this family found. Unless obtained quite fresh, the colours of bill and feet are very uncertain, while the comparatively loose plumage is soon blown off, leaving only a skeleton. The combined effect of hot sand and salt water on the bodies of smaller birds is to mummify them, thus rendering identification fairly easy, but this is not the case with the Albatrosses, whose remains are very soon scattered.

Consideration of the time of year at which the majority of birds above mentioned perish, seems to show that, except in the case of the Prions, heavy weather and gales are not an important cause of mortality among Petrels. In the case of species breeding locally it may be that the dead birds are the unfortunate surplus left over after a crowded breeding place has been fully occupied, but in the case of Petrels which breed further south it is more probable that the birds found are the stragglers of a migratory movement, who, through accident or weakness, lag behind while the others move south, and finally are caught in uncongenial conditions of summer weather off our coasts, with their usual food supply no longer so abundant in these waters as it was during the winter—Nature's method of weeding out the unfit.

## The White-Plumed Honey-eater (*Meliphaga penicillata*), Gould, and its various sub-species

By EDWIN ASHBY, F.L.S., M.B.O.U., "Wittunga,"  
Blackwood, South Australia.

Since describing a new sub-species of *Meliphaga penicillata* under the name of *Ptilotis geraldtonensis*, Ashby, in *The Emu*, vol. xx., p 190, my skins have twice been to Melbourne for comparison, and a considerable correspondence has passed between Mr. A. J. Campbell and others and myself in reference to its true place in the Natural Taxis.

On the occasion of a recent hurried visit to Melbourne I had the opportunity (with the facilities granted by Mr. J. A. Kershaw) of comparing the very fine series of *P. penicillata* and its congeners in the "H. L. White Collection" in the National Museum with the series in my own. The following is a *resume* of this examination.

Two very interesting results stand out; *Geraldtonensis*, which was taken by myself in the creek-beds both at Geraldton and at Dongara, in W.A., is the same bird that is common at Moora, 150 miles further south. *Geraldtonensis* is not *M. carteri*. Campbell, neither is it identical with *M. ladasi*, Mat., the possibility of this being so was suggested in a footnote in the said paper.

I am inclined to agree with Mr. Gregory M. Matthews in considering the whole series as one species, but I think it might be wise to recognise two divisions; one I should describe as the FOREST DIVISION and the other as the DESERT DIVISION. In each of these divisions connecting links still exist, and it is very probable that intermediates between the Forest series and the Desert series also exist, but in the series examined it is easy to assign all the forms to their respective division.

### FOREST DIVISION.

All the birds in this series are coloured in varying degrees with yellowish-green.

(1) From the "H. L. White Collection" a number of skins taken in Victoria were examined, and these were identical with skins in my own collection from the Adelaide Hills; they are the darkest of the series, the face and other coloured portions are greenish-yellow.

(2) A specimen in my collection from Torr Downs on the River Darling and another collected by myself near Broken Hill correspond with the birds in the "H. L. White Collection" from New South Wales, and are generally paler in tone than not; but the yellowish-green coloration is similar to skins from Victoria and South Australia.

(3) Two males collected by the writer on September 6th, 1916, in The Gorge, near Port Germain, S.A., on the western side of the Flinders Range, are still paler, and the yellowish-green coloration is more extensive and a little more yellow in shade.

(4) Three skins collected by myself at Geraldton, W.A., and two skins in the "H. L. White Collection" from Moora W.A., and labelled *P. carteri*, are identical and were described in my paper *loc. cit.* as *Geraldtonensis*. The skins from Port Germain, in S.A., are the nearest, but the Geraldton and Moora skins show a decided increase in the extent and brightness of the yellowish-green; also the streaks on the throat extend in the W.A. skins over the chest, and are almost pure yellow. This is easily the yellowest form of the Forest series.

Note.—Mathews sub-sp. *Mellori* and *Whitei* are represented by my No. 1. The type of Gould's *Meliphaga penicillata* probably corresponds with the skins I have marked No. 2. *Rosinae*, Mathews, is probably the same as my two Port Germain birds, that I have numbered 3. My own *Geraldtonensis* is at the head of this group as being the most divergent from type and containing the most yellow in its coloration of any of the forms that come under my suggested Forest Division. Although this form in its general characters evidently belongs to this division, there is a slight wash of "buff" in the central tail feathers, this character being much more in evidence in those I have assigned to the Desert Division.

#### DESERT DIVISION.

All the birds in this series are coloured with yellow, instead of yellowish-green, and all show a wash of buff so characteristic of Desert Birds.

1. Two skins in the "H. L. White Collection" from East Murchison and Lake Way, both females, are slightly darker on the upper side than the more northern form of *M. carteri*, but I cannot separate them from that sub-species.

2. Six skins in the "H. L. White Collection," two (a male and female) from Carnarvan and Pt. Cloates respectively; one (a male) from Lawson; three (both male and female) from Upper Coongan.

One skin from my own collection taken in August, 1911, at Roebourne. All these seven skins are alike and are identical with Campbell's type, which came from North-West Cape, half-way between the southern limit of Carnarvan and the northern limit of Upper Coongan. These are all strikingly pale desert forms, highly coloured with yellow and showing a buff tinge modifying the yellow in places, and giving a desert tone to the whole bird.

3. In the "H. L. White Collection" is a nice series of North's *leilavalensis*, from Oodnadatta, River Diamantina, Mt. Benstead and Flinders River. These are all smaller birds than *M. carteri*

from North-Western Australia, but nevertheless I think properly find their place in the "Desert Section"; the "black" of the ear-coverts is in this sub-species, grey.

Conclusion.—Since drafting the foregoing I have turned up the Rainfall Map of Australia as published in Mr. D. E. Hutchins' work on Australian Forestry. The great central belt with a rainfall of 10 in. and under, commences inside the States of Queensland and New South Wales, and covering a large part of South and Western Australia, runs out to the coast at Carnarvon and extends almost to North-West Cape, the type locality of Campbell's *carteri*, but this species has extended further north into the 20-inch rainfall belt. The East Murchison form, *ladasi* and *leilavalensis*, also have their habitats within this dry belt, which includes the whole of what is often termed the desert portion of Australia.

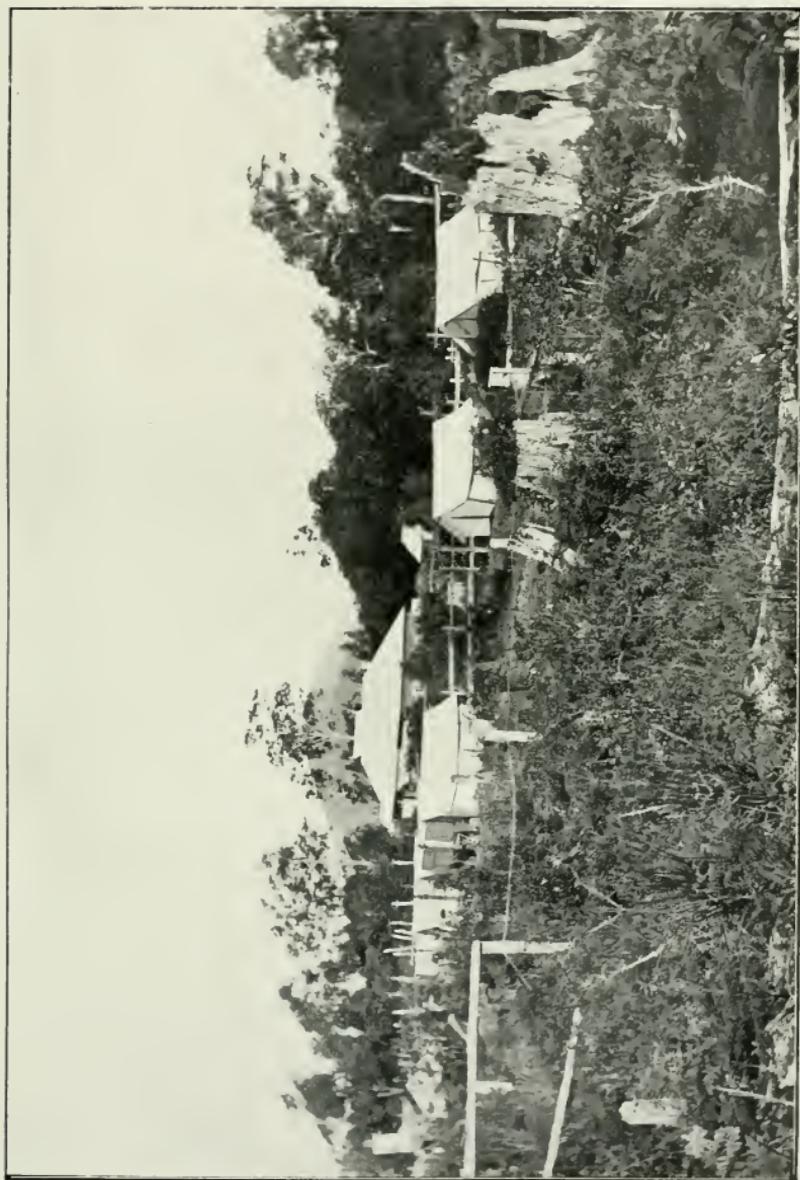
The difficulty Mr. A. J. Campbell found in separating *geraldtonensis* from his *carteri* was chiefly due to two very distinct forms and several minor ones, being included under the name *carteri* in the "H. L. White Collection." Also the artist, in the beautiful figure of *carteri*, in *The Emu*, vol. III., plate xvi., has failed to suggest the general modifying influence throughout the plumage of the colour I have termed "Desert Buff." He certainly has suggested it in the central tail feathers, but actually there is little of the plumage where the presence of this shade is not to some extent in evidence. Of the desert forms I should prefer Campbell's *carteri* as the type; North's bird was described the same year.

Note.—The skins referred to under my heading (1) will correspond with Mathew's *ladasi*. Those under the heading (2) will include *carteri*, Campbell, and *calconi*, Mathews. The heading (3) includes all the variants of North's *leilavalensis*. As I understand the forms classed above under the Desert Division are found in the Red Gums and other Eucalypts, in the creek beds, it seems a little strange that they should have taken on the desert coloration. Possibly it is due to the creek beds in these districts being separated by tracts of desert, whereas further south the intervening spaces are covered more or less with low scrub.

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## The Annual Congress and Camp-out of the R.A.O.U.

The Annual Congress and Camp-out of the R.A.O.U. was held from October 6th to 20th, in Sydney and at Lake Wallis. Twenty-six delegates from the four Eastern and Southern States attended and 23 took part in the Camp-out. In the absence of the President (Mr. C. A. Barnard), the senior Vice-President (Dr. J. A. Leach) occupied the chair.



The R.A.O.U. Camp at Ellerslie, Lake Wallis, N.S.W. The Kingfisher's nest is on the camp side of the big stump at the right of the picture.

Photo. by Charles Barrett, C.M.Z.S.



The annual report showed that, thanks largely to good management and special donations, the R.A.O.U. had weathered the financial storm, the balance sheet again showing a satisfactory credit balance. The auditors paid a well-deserved compliment concerning the state of the books to the Hon. Secretary (Mr. Z. Gray). Reports of the Librarian, Curators and Editor showed that library, collections and *Emu* were all in a state of efficiency and forward development.

Much business of importance to the R.A.O.U. was transacted during the sessions, which continued for three days in Sydney and also in the evening at the camp at Lake Wallis. Several illustrated lectures were given in the King's Hall, Sydney (by Mr. J. Ramsay, in the presence of His Excellency the State Governor and Dame Margaret Davidson), the Museum lecture theatre by Captain White (S.A.), at Lake Wallis by Captain White, and Mr. Cayley and Mr. W. B. Alexander (Q.), who lectured on "Bird Observation in Five Continents," and at Forster by Captain White.

Members paid visits of inspection to the National Park, Sydney, and the Taronga Park Zoological Gardens, Sydney. Messrs. Chubb and Campbell (Vic.) inspected the Macleay Collection in the Sydney University, and found it in urgent need of attention.

The Check-list Committee, assisted by the fine staff of the Australian Museum and the extensive literature and collection, practically completed the list of species and their scientific names.

The principal office-bearers were re-elected. The names are shown in full on the inside back cover of *The Emu*. A vote of thanks to the retiring officers and a special vote to the Assistant Editor (R. H. Croll, R.A.O.U.) were carried.

Committees appointed to deal with special matters (permits to collect, distinctions for members, affiliation with the Royal Zoological Society, the destruction of Hawks in Tasmania) reported later, and their reports were adopted.

Papers were read by Messrs. A. J. Campbell on Nomenclature (printed below), C. Coles, Esq., on Birds of Paradise; and H. Gogerly, and several ornithological discussions provided knowledge and entertainment for members in camp.

It was decided to recommend the Council to accept the offer of the Royal Zoological Society as set out below.

Resolution recommending that the State Secretary be supplied with £10 for the preliminary expense of the Annual Congress, and that authors be supplied with 25 reprints free were carried.

Prof. Ridgway's colour scheme was accepted officially. Messrs. Campbell and Cayley were appointed a sub-committee to report to the Council on the action that should be taken.

Messrs. Cayley, Campbell, and Barrett were appointed a sub-committee to report to the Council concerning the advisability

of a Gould Memorial Volume in connection with the 21st anniversary of the R.A.O.U. next year.

It was decided to communicate with each State Secretary concerning bird protection and the use of pea rifles by boys.

It was decided that the next session be held in Adelaide, and that the A.O.U. and B.O.U. be invited to arrange, if practicable, for representatives to attend the 21st anniversary celebrations in Adelaide.

A harbour excursion was cancelled owing to the death of Hon. John Storey, Premier of New South Wales, and the session adjourned as a mark of respect.

The report of the Check-list Committee (see below) was received, and the Council was authorised to make arrangements for publication when ready.

The Check-list Committee reported that—

(1) All points of difference between the Draft Check-list and Mathews' and Iredale's Name-list, as well as points raised by members of the Check-list Committee had been examined.

(2) A decision had been reached in all cases of difference. *Dacelo gigas* (Boddaert, 1st December, 1783—a definite date) was accepted as against the indefinite 1783 of *novæ-guinea* (Hermann). *Gerygone olivacea* being founded on error and having no priority of publication was not accepted for the same author's *Gerygone albogularis*—a matter of line priority and simultaneous publication.

(3) A sub-committee (Mr. Alexander and Dr. Leach) was appointed to prepare a circular on the form the list should take, the amount of reference, synonymy, etc., to be given; the Committee as a whole will then decide the exact form of publication.

(4) To expedite preparation three sub-committees of four members each were appointed to prepare—

(a) The scientific names, data, reference, etc.; (b) the vernacular names; (c) The geographical distribution.

(5) These committees are:—

(a) Messrs. Campbell, Hull, Alexander and Dr. Leach (convener); (b) Messrs. Barrett, Chisholm, Le Souef, Mattingley (convener); (c) Dr. MacGillivray and Messrs. R. Hall, H. L. White and Capt. S. A. White (convener).

(6) In accordance with the expressed wish of the members, as expressed at previous sessions, large genera have been used.

(7) In accordance with previous decisions, it was decided not to consider the validity of sub-species, but, as a help to field workers and others, to list under the proper dominant species the name and other reference of each sub-species proposed.

RECEIPTS		EXPENDITURE	
To Balance	£0 18 8	By <i>Emu</i> , Vol. 20—Printing, etc.	£314 12 3
Subscriptions, Arrears	£55 0 0	Blocks	42 1 11
Current	333 12 6	Color Plates	49 19 7
Advance	39 15 0	Reprints	29 14 6
Life (2)	21 0 0	Vol. 20 Patrons	1 15 0
Sales, £27/1/10; Covers, £4/2/6	449 7 6	Postage £16/16/11; Stationery £11/19/-;	£438 3 3
Blocks, £23/2/9; Exchange, £4	31 4 4	Insurance £1/14/3; Exchange £4/0/3;	
Donations	27 2 9	Commission £3/10/3; Covers £2/12/11;	
Color Fund—Donations	20 5 0	Bank Charge 7/6	
" ("W.A.")	35 16 5	Altering Rules £1/18/-; Filing 5/-;	
Advertisements	32 2 3	Perth Meeting £1/5/-	41 1 1
Trust Fund—Interest	2 1 0	Room Rent £32/10/-; Cleaning £4/18/-;	3 8 0
	69 19 8	Library 17/7; Cartage 15/-; Letter-	
	52 10 0	box 10/-; Napthaline, etc. £1/0/9;	
		Electric Light £7/19/2	48 10 6
		Cr. Balance Royal Bank	531 2 10
			120 5 1
	£651 7 11		£651 7 11

ASSETS		LIABILITIES	
To Cr. Balance Royal Bank	£120 5 1	By Book Case	£16 5 0
Subscription Arrears	£44 15 0	Skin Cabinet	32 0 0
Less Prepaid	42 15 0	Lantern Equipment	10 0 0
Library	2 0 0	Balance	1,746 2 7
Furniture and Specimens	325 0 0		
Blocks estimated at	243 5 0		
<i>Emus</i> on hand, estimated at	10 0 0		
Tent, Material, Punch, and Register	100 0 0		
Trust A/c. Commonwealth 6% Bond	3 17 6		
	1,000 0 0		
	£1,804 7 7		

Z. GRAY, L. C.A., Hon. Treasurer, } Audited and certified correct,  
Melbourne, 1st July, 1921. } 12th Sept., 1921.

JAMES BARR, F.C.P.A. } Hon. Auditors.  
JAMES HEDDING }

## OFFER OF AFFILIATION FROM THE ROYAL ZOOLOGICAL SOCIETY OF N.S.W.

The Royal Zoological Society of N.S.W. desires to foster the study of Faunal Groups, and has established sections—Entomological, Ornithological, Marine Faunal, Nature Photographs, etc.

These sections must appoint two executive officers—a chairman and a secretary—both of whom must be members of the Society.

The Society places its rooms at the disposal of each section on such days as may be fixed after consultation with the Secretary of the Society.

At such sectional meetings the business shall be determined by the members present.

The Society provides stationery and pays postage on sectional notices.

The Secretary of the Section must report to the Secretary of the Society in the month of June as to its operations during the year.

It is suggested that under the "affiliation clause" as contained in the Memorandum of Association of both the Society and the R.A.O.U., the State Branch of the Union may utilise the sectional meetings and the Society's rooms for the transaction of its business.

It is not compulsory for members of the Union to join the Society, but unless they do so they cannot act as sectional officers of the Society. The subscription to the Society is £1/1/- ordinary member; 7/6 associate member. Ordinary members receive passes and extra tickets of admission to Taronga Park. Both classes receive all publications of the Society free.

That this Congress recommends to the Council the acceptance of the offer of the Zoological Society of New South Wales to "affiliate." Recommended to Council.

### PRIVATE COLLECTIONS AND PERMITS.

Recommendations of Sub-Committee adopted by the Congress:—

1. That recognised ornithologists, pursuing some definite course of research, should be allowed to continue to collect specimens under statutory permit, with a view to the ultimate donation of such specimens to a public institution.

2. That permits be granted to special research students, limited to the species to be studied, and to the number of specimens to be taken.

3. That promiscuous collecting, or the formation of any new collection, be discountenanced, and that any collectors, other than those coming under recommendation No. 1, be advised to donate their collections to some recognised public institution.

4. That any member found guilty of collecting without a permit or in a sanctuary, or of any other breach of the Statutes relating to Bird Protection, shall be dealt with under the Articles.

5. That the State authorities be asked to consult the Union before granting any permit to collect birds or eggs.

6. That foreign collectors be required to describe any new species in an Australian scientific publication, and that the type specimen shall be deposited in a museum of the State in which it is taken.

7. That the Customs Department be urged to prohibit the exportation of the plumage and eggs of any Australasian bird.

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#### R.A.O.U.—DISTINCTIONS FOR MEMBERS.

(Proposed by Mr. A. H. Chisholm, R.A.O.U., State Secretary, Queensland, per Mr. W. B. Alexander, M.A.)

Assuming that nothing definite has been done in the matter of a scheme of distinctions for members of the Union, concerning which there was some discussion at last year's congress, I beg to submit the following proposal, which will be recognised as a variant and amplification of one tendered by me last year:—

(1) That in the Articles of Association, Clause 6 be amended to read as follows:—The Union shall consist of (a) ordinary members unlimited in number, (b) honorary members unlimited in number, who shall be persons resident in Australasia and have rendered valuable service to the cause of ornithology or the protection of Australian birds; (c) fellows limited to 25, who shall be members of the Union, and, in the opinion of a sub-committee of the Council (appointed for the purpose) endorsed by a majority of the whole Council, shall have carried out sufficient original research in ornithology to entitle them to the honor; (d) corresponding fellows, not exceeding at any time ten in number, who shall be foreign scientists or British scientists not resident in Australasia, and (e) life members, who shall be persons having made donations or rendered services to the Union of the amount or value or £25 or upwards.

(2) That the following words be added at the end of the Clause:—Fellows shall be presented with a badge denoting their rank in the Union, and corresponding fellows, life members, and honorary members shall be presented with a certificate to a similar effect.

Those who recollect the proceedings of last year in this matter will notice that provision has now been included for the retention of honorary members, though on a different basis to that which obtains at present. It is this difference, together with the pro-

vision for 25 Fellows, that constitutes the essence of the proposal for alteration. In submitting the motion, I should point out again that if the Union is to grow as strong as its objects warrant, it must offer more inducements to potential members. I find that to those not closely interested in ornithology four copies of *The Emu* are hardly sufficient recompense for a year's subscription; and there is nothing further except their right to participate in the annual excursion—a privilege that has seldom been restricted to members. Moreover, for those who are already in the Union ranks, there should be some definite inducement to research or other original work—some honour that cannot be purchased. It is this consideration that has prompted the section for the creation of Fellows. A distinction of this kind, not being bought, but achieved through work, would be fittingly appreciated, and the badge would be worn with pride as the tangible expression of something attempted, something done. For instance, the Fellowships awarded by the Geographical Society of Queensland appear to be much sought after; yet they represent work of considerably less importance than that associated with the R.A.O.U. Coincident with the awarding of such Fellowships, the Union would be the gainer, firstly, through the actual work on which the Fellowship was based, and, secondly, through the advertisement received through the use of the badge.

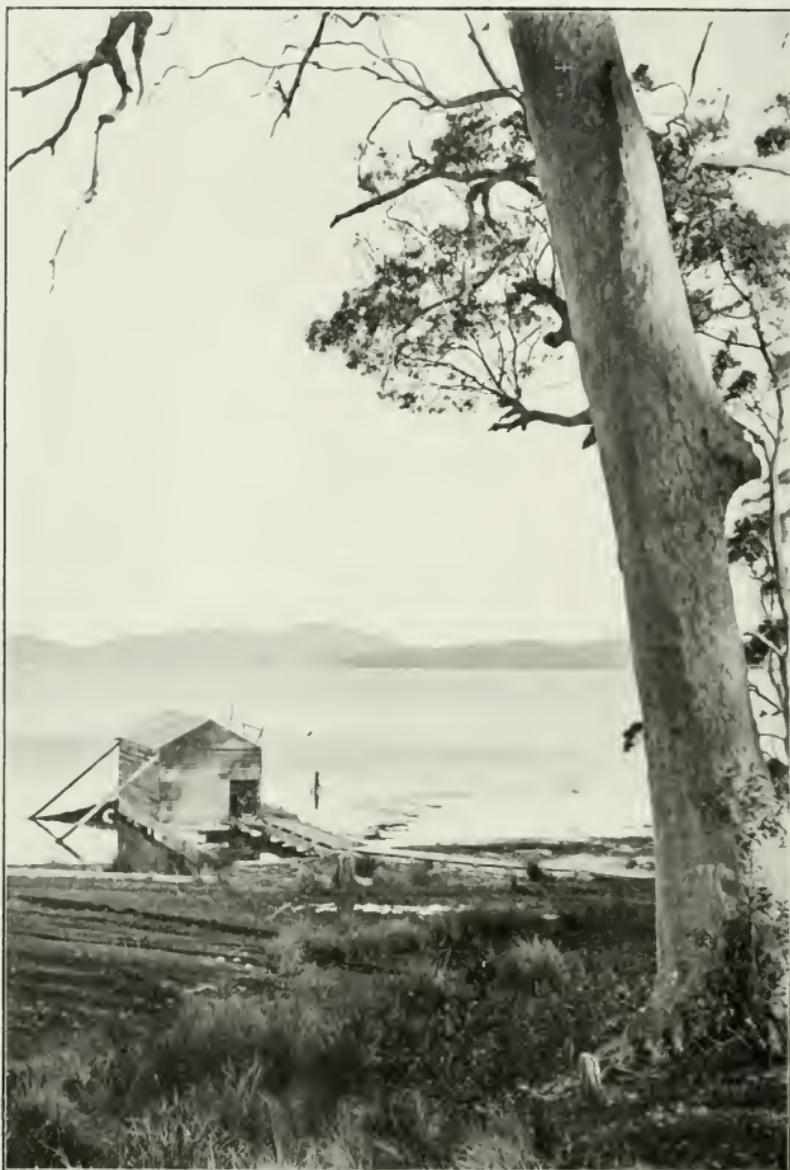
It is interesting to note that the American Ornithologists' Union embraces no less than seven classes of membership. Summed up, these are:—(1) Fellows, limited to 50 and eligible for office; (2) Members, limited to 100, who share with Fellows participation in the business of the Union; (3) Associates, unlimited in number; (4) Foreign Members, divided into Fellows (limited to 25) and corresponding Fellows (limited to 100). It will be seen that the A.O.U. places a limit on both Fellows and Corresponding Fellows. I consider, on reflection, that it would be well to do so in our case, and the number should be smaller.

My idea of Honorary Members is that the class should be restricted to persons who, while not doing anything notable in an original sense, have yet advanced the cause of bird protection or study in some notable way. A Minister of the Crown who fights a good fight for a plumage or protection bill might be regarded as a type of this class of member, which, of course, must not be confused with the Life Member class.

Finally, it may be suggested that now, when the Union is "coming of age," is an opportune time at which to introduce some broader-based system of membership recognition. The above proposals seem to me to bid fair to meet the case. They would stimulate members, and, while adding to the prestige of the Union, would not involve the Council in unnecessary expense.

I regret my inability to attend the Congress, but extend good wishes for a successful time.





Lake Wallis, near the R.A.O.U. Camp.

Photo. by Charles Barrett, C.M.Z.S

## Birds observed during the R.A.O.U. Camp-out Wallis Lake

This List was Compiled and Extended by  
S. A. WHITE, C.M.B.O.U., C.F.A.O.U., Wetunga, Fulham,  
S.A.

The compiler is indebted to the members for their generous assistance, for every one was anxious to make the list as complete as possible. My thanks are specially due to Mr. W. B. Alexander, M.A., for his kindness in completing the list after my departure from the camp, and for the very thorough way in which he compiled his list—a thoroughness which stamps all his work. The camp lasted ten days, and the members were able to cover a fair range of country. One hundred and sixteen species were identified.

*Lopholaimus antarcticus*. Top-knot Pigeon.—One or two small flocks of these birds were seen flying over.

*Columba norfolciensis*. White-headed Pigeon.—Only one or two birds seen. They are reported breeding at Cape Hawke, and a party journeyed there, but failed to find them. One morning a fine bird was seen on the edge of the scrub near the camp.

*Macropygia phasianella*. Pheasant-tailed Pigeon.—These birds were not at all plentiful, only an odd bird or so being seen.

*Geopelia placida*. Ground-Dove.—Were fairly plentiful, and their pleasing cooing call could be heard all day long.

*Chalcophaps chrysochlora*. Little Green Pigeon.—Often seen amidst the forest country; very tame and confiding round the camp, for they were often seen moving over the ground within a few feet of the observer.

*Leucosarcia melanoleuca*. Wonga Pigeon.—Not plentiful.

*Hypotaenidia philippensis*. Pectoral Rail.—Mr. Morse saw a pair of these birds in the swamp near the camp. This was after my departure.

*Podiceps cristatus*. Crested Grebe.—These birds were seen on the lake. The writer observed one crossing the course of the launch when on our way over the lake.

*Puffinus griseus*. Sombre Petrel.—Mr. Alexander picked up two dead birds on the beach, and upon finding the first one remarked to me that it was *griseus*; later other members thought it *P. tenuirostris*, but upon Mr. Alexander investigating his identification proved correct.

*Sterna caspia*. Caspian Tern.—These birds were often seen patrolling the lake.

*Sterna bergi*. Crested Tern.—Number of these Terns were met with on many parts of the lake, and they were seen in large flocks near the lake's entrance into the sea.

*Sternula albifrons*. White-shafted Ternlet.—Numbers of these beautiful little birds were nesting at the time of our visit on a large sand-bank near the lake's entrance; eggs were seen.

*Larus novæ-hollandiæ*. Silver Gull.—Many birds seen upon the lake, on the sea front, and at the lake's entrance.

*Hæmatopus ostralegus.* Pied Oyster-catcher.—Several pairs of these birds were seen, and they were breeding at the time of our visit.

*Lobibyx novæ-hollandiæ.* Spur-winged Plovers.—Were seen on the more swampy parts of the country.

*Pluvialis dominicus.* Golden Plover.—These birds were observed on the sand-spits at the lake's entrance.

*Charadrius ruficapillus.* Red-capped Dottrel.—Met with in several localities, and they were breeding on the sand-banks at the lake's entrance, eggs and young being seen. One of the young birds took an extreme measure to escape, and upon the party approaching the chick made for the water and threw itself upon the surface, with outstretched head, allowing the swift-running tide to carry it along. Needless to say, the bird was taken back to its mate.

*Charadrius melanops.* Black-fronted Dottrel.—Seen along the shores of the lake and the swamps.

*Numenius cyanops.* Curlew.—Observed at the lake's entrance and along the coast line.

*Limosa lapponica.* Barred-tailed Godwit.—Seen at the lake's entrance.

*Limosa limosa.* Black-tailed Godwit.—As with the preceding species, a small party seen at the lake's entrance.

*Pisobia ruficollis.* Little (Red-necked) Stint.—Seen in search of food on the sand-banks near the lake's entrance.

*Pisobia acuminata.* Sharp-tailed Stint.—In company with the preceding species on the sand-banks.

*Notophox novæ-hollandiæ.* White-fronted Heron.—Fairly plentiful along the lake and swamps. They were breeding at the time of our visit.

*Demigretta sacra.* Reef Heron.—A fair number of the dark phase was seen.

*Butorides stagnatilis.* Little Mangrove-Bittern.—These birds seemed plentiful in the district, and were breeding.

*Chenopsis atrata.* Black Swan.—A number of these birds was seen on the lake, and residents say that the birds collect in large numbers at certain times of the year.

*Phalacrocorax carbo.* Black Cormorant.—A large flock of these birds was seen near to lake's entrance. From statements made by old residents, these birds were in great numbers in this locality in days gone by.

*Phalacrocorax ater.* Little Black Cormorant.—This species was not nearly as plentiful as either the large black or pied species.

*Phalacrocorax varius.* Pied Cormorant.—A fairly common bird on the lake and at the entrance.

*Microcarbo melanoleucus.* Little Cormorant.—These birds were scattered all over the lake from the entrance up.

*Sula serrator.* Gannet.—Many birds were observed diving into the ocean off Elizabeth Bay.

*Pelecanus conspicillatus.* Australian Pelicans.—Were seen on the lake, but they were not in any great numbers.

*Uroæctus audax.* Wedge-tailed Eagle.—Both Messrs. Sutton and Cayley reported having seen this bird. The immature of the White-bellied Sea-Eagle can easily be mistaken for this bird.





Nesting hole of Sacred Kingfisher being drilled in a Termites' nest  
on a tree stump near the camp.

Photo. by Charles Barrett, C.M.Z.S.

**Haliaeetus leucogaster.** White-bellied Sea-Eagle.—Several pairs of these birds were seen around the lake; one pair had a nest in a very high gum-tree near the camp, and the birds were seen daily going to and fro from the tree to the lake. A nest was found by Dr. D'Ombrain on the side of the lake, and Mr. Chaffer climbed up to it and took a photo of the young bird which the nest contained, as well as an addled egg.

**Haliastur sphenurus.** Whistling Eagle.—As one would suppose, these Eagles were numerous in the district, and doing great good. They are good scavengers, and do not touch poultry or lambs. They were breeding in the high timber quite close to the camp and on the edge of the lake.

**Ieracidea berigora.** Brown Hawk.—Seen upon several occasions; one bird was seen carrying a stick.

**Cerchneis cenchroides.** Australian Kestrel.—These birds were observed in the more open country.

**Spiloglaux boobook.** Boobook Owl.—The writer flushed a very dark plumaged bird from the deep scrub one day. These Owls were heard calling on the edge of the clearing every night.

**Glossopsitta concinna.** Musk Lorikeet.—Mr. Alexander kindly informs me that Dr. D'Ombrain recorded the bird at the camp, and that a party flew over when the boat was returning to Tuncurry on the last morning.

**Aprosmictus scapularis.** King Parrot.—Often seen on the edge of the scrub.

**Platycercus eximius.** Rosella.—These beautiful Parrots were plentiful, and showed much bright yellow coloration on the back.

**Podargus strigoides.** Tawny Frogmouth.—A few pairs met with, and in one instance breeding. Their strange call—"oom, oom, oom"—was often heard at night.

**Eurystomus orientalis.** Dollar-Bird (Australian Roller).—Several of these birds were to be seen showing off and chasing one another from one tree top to another almost any morning near the camp. They were evidently looking out nesting sites.

**Dacelo gigas.** Kookaburra (Great Brown Kingfisher).—Numerous round the camp, and were met with all through the country.

**Haleyon sanctus.** Sacred Kingfisher.—A very widely distributed bird; pairs were breeding in several districts. A pair of these birds were busy each morning near the camp in their efforts to drill a hole into a white ants' nest situated on a stump; both birds took their turn at this work within a few yards of the camp.

**Caprimulgus macrurus.** Large-tailed Nightjar.—Identified by that sound field-observer, Mr. Morse, who heard and saw this bird more than once.

**Cuculus pallidus.** Pallid Cuckoo.—Seen and heard in several localities.

**Cacomantis flabelliformis.** Fan-tailed Cuckoo.—The weird call of this bird was often heard on the edge of the scrub, and in the open timbered country.

A Bronze Cuckoo was seen, but its identity was not certain.

**Eudynamys orientalis.** Kcel.—Common birds around the camp, and were often seen and heard. Their strange loud call was one of the first to awaken the great scrub life in the early morning. The call suggested the name, "Cooee Birds."

*Centropus phasianinus*. Pheasant Coucal.—Were found in the long cutting grass and rushes of the swampy country.

*Menura novæ-hollandiæ*. Lyre-Bird.—Were often heard calling in the scrub quite close to the camp, and seen on many occasions. Members often listened to this bird's wonderful mimicking power.

*Hirundo neoxena*. Welcome Swallow.—Mostly found round the homestead. They were breeding at the time of our visit.

*Hylochelidon nigricans*. Tree-Martin.—Mr. Alexander saw these birds passing in and out the hollow spouts of dead trees, which without doubt pointed to their breeding.

*Microeca fascinans*. Brown Flycatcher.—Met with in pairs throughout the country, and they were breeding.

*Erythrodryas rosea*. Rose-breasted Robin.—Reported by numbers as having been seen.

*Gerygone albugularis*. White-throated Fly-eater.—The fine notes of these birds were often heard. They were breeding at the time we were there.

*Gerygone fusca*. Brown Fly-eater.—This bird was also breeding.

*Pœcilodryas capito*. Large-headed Robin.—Not at all plentiful.

*Eopsaltria australis*. Yellow-breasted Robin.—Met with occasionally here and there. They were breeding.

*Falcunculus frontatus*. Shrike-Tit.—These very useful birds were often met with in the timbered country.

*Pachycephala pectoralis*. Yellow-breasted Whistler (Thickhead).—Only a few birds seen; their notes resounding through the timber were very fine.

*Pachycephala rufiventris*. Rufous-breasted Thickhead.—Reported by some of the members.

*Rhipidura flabellifera*. White-shafted Fantail.—A common bird both in the scrub and forest country alike.

*Rhipidura rufifrons*. Rufous Fantail.—Often met with in and on the edge of the scrub.

*Rhipidura leucophrys*. Black and White Fantail.—Found all through the country, and they were nesting in many places. This bird seems to adapt itself to any climate, for it finds a home equally as well in the dry interior as it does in the tropical, damp scrubs of Queensland.

*Myiagra rubecula*. Leaden Flycatcher.—Reported as having been seen by several members.

*Monarcha melanopsis*. Black-faced Fly-catcher.—Observed in several localities.

*Graucalus novæ-hollandiæ*. Black-faced Cuckoo-Shrike.—Fairly plentiful and were nesting.

*Graucalus mentalis*. Little Cuckoo-Shrike.—This bird is certainly more plentiful in the Eastern States than it is in South Australia. Mr. Alexander informs me that there were many beetles in the crop of one of these birds; these included two Click-beetles (Elateridæ) and two Leaf-beetles (Paropsis sp.).

*Edoliisoma tenuirostris*. Jardine Caterpillar-Eater.—Dr. D'Ombrian and Messrs. Morse and Cayley state that they heard this bird.

*Psophodes olivaceus*. Coachwhip-Bird.—Quite numerous all round the camp, and their wonderful clear notes were a delight in the early morning and evening; they were breeding.





Nest of White-browed Scrub-Wren on edge of the track  
near the camp.

Photo. by N. Chaffer, R.A.O.U., Sydney.

*Epthianura albifrons*. White-fronted Chat.—Members of the party found this bird breeding.

*Chthonicola sagittata*. Speckled Warbler.—Mr. Alexander states that he saw a small party, very tame, hopping about on the ground on the bank of the lake.

*Acanthiza nana*. Little Tit-Warbler.—Were observed during our stay.

*Acanthiza pusilla*. Brown Tit-Warbler.—This species was more numerous, and breeding.

*Acanthiza lineata*. Striated Tit-Warbler.—These little birds were often seen and heard amongst the foliage of the gum trees and shrubs.

*Acanthiza chrysorrhoa*. Yellow-tailed Tit-Warbler.—A common bird, and nests of this species were found.

*Sericornis lathamii*. Yellow-throated Scrub-Wren.—Numbers of these birds were about and nests were found.

*Sericornis frontalis*. White-browed Scrub-Wren.—This bird was also breeding; a nest was seen by the writer, and others were found.

*Sericornis magnirostris*. Large-billed Scrub-Wren.—A nest of this Scrub-Wren was found quite close to the camp.

*Malurus cyaneus*. Blue Wren-Warbler.—Met with all round the lake, and was found breeding in several localities.

*Malurus lamberti*. Variegated Wren-Warbler.—Not so numerous as the preceding species; it also was breeding.

*Stipiturus malachurus*. Emu-Wren.—A small party was located on the edge of a swamp not far from the camp.

*Artamus cyanopterus*. Wood-Swallow.—Sparsely scattered round the lake shore and forest country.

*Colluricincla harmonica*. Harmonious Shrike-Thrush.—A common bird, and its beautiful note was to be often heard. Nests were found containing both eggs and young.

*Grallina cyanoleuca*. Magpie-Lark.—Fairly plentiful; breeding.

*Neositta chrysoptera*. Orange-winged Tree-runner.—A nest of this bird was found high up on a ringed eucalypt.

*Climacteris leucophaea*. White-throated Tree-Creeper.—This bird was also breeding at the time of our visit.

*Zosterops lateralis*. Silver-eye.—Were often met with both in the scrub and clearing or open forest land.

*Dicaeum hirundinaceum*. Mistletoe-Bird.—Members of the party reported this bird.

*Pardalotus punctatus*. Spotted Pardalote.—This also was reported by members in camp.

*Melithreptus brevirostris*. Brown-headed Honey-eater.—Mr. Wolstenholme reported seeing and hearing this bird.

*Myzomela sanguinolenta*. Sanguineous Honey-eater.—Several birds were seen, but not plentiful.

*Acanthorhynchus tenuirostris*. Spinebill.—Reported by several members.

*Glyciphila melanops*. Tawny-crowned Honey-eater.—Seen by Dr. D'Ombraïn and Mr. Alexander upon an open heathy piece of country.

*Meliphaga lewinii.* Lewin or Yellow-eared Honey-eater.—A common bird with a great range of notes; it was breeding at the time of our visit.

*Meliphaga chrysops.* Yellow-faced Honey-eater.—Often met with, but not nearly so common as the preceding species.

*Meliphaga leucotis.* White-eared Honey-eater.—Not a common bird.

*Meliornis novæ-hollandiæ.* White-bearded Honey-eater. A common bird.

*Meliornis niger.* White-cheeked Honey-eater.—Met with in many localities.

*Myzantha garrula.* Noisy Miner.—This bird of wide range was plentiful, and was also breeding at that time.

*Anellobia chrysoptera.* Brush Wattle-Bird.—Plentiful.

*Tropidorhynchus corniculatus.* Friar-Bird.—The strange calls of this bird were often heard.

*Anthus australis.* Australian Pipit.—This bird was breeding also.

*Stagonopleura guttata.* Spotted-sided Finch.—Seen in the more open grass country.

*Aegintha temporalis.* Red-browed Finch.—A common bird in many classes of country; they were nesting.

*Oriolus sagittatus.* Australian Oriole.—Reported by several members as well as seen by the writer; they were breeding.

*Ptilonorhynchus violaceus.* Satin Bower-Bird.—Many birds of both sexes were observed feeding in the early morning on the edge of the scrub.

*Ailurædus crassirostris.* Cat-Bird.—Fairly numerous. The strange call of these birds breaking the stillness of the scrub often startles one. The writer observed quite a large party moving from one tree-top to another; they were high up, and in search of berries and fruit.

*Sericulus chrysocephalus.* Regent-Bird.—We often watched these lovely birds from the camp, in the early morning. The gorgeous male birds came to the edge of the scrub, then flew down into the clearing to feed upon the Ink-Weed (*Phytolacca octandra*) and wild raspberries; a sight once seen never forgotten.

*Corvus* sp. Crow.—Crows were seen, but which species we do not know.

*Strepera graculina.* Pied Bell-Magpie.—These birds were often seen and heard and were found breeding.

*Craicticus torquatus.* Collared Butcher-Bird.—These birds were also breeding.

*Gymnorchina tibicen.* Black-backed Magpie.—Observed in many localities, and were breeding.

## Early Breeding of Ground or Low-nesting Birds

By H. GOGERLEY, R.A.O.U., Lake Wallis, N.S.W.

For some years I have been making a study of Lyre-Birds, and it struck me as strange that they should breed in June and July, the middle of winter in fact. After a few years' observa-



The Edge of the Jungle ; Cabbage Palms (*Livistona australis*) in the foreground.

Photo. by Charles Barrett, C.M.Z.S.



tion, I find that the majority of low-nesting birds nest early in the year on the north coast of New South Wales, in the Cape Hawke district. I have come to the conclusion that natural instinct makes them breed in winter or early spring, so that the young will be on the wing before September, when the Gohanna (*I'aranus varius*) makes its appearance after its long torpor.

I find that the young birds fall an easy prey to the big lizard if in the nest after the second week in September, the nest being so low that they have no chance. The fox is an introduced enemy, and cannot be guarded against in this way; but, fortunately, the fox is rare as yet in the northern brushes, so that the Lyre-Bird is fairly plentiful about this district.

To support my theory, I will give the experiences of a pair of Coachwhip Birds (*Psophodes olivaceus*). This year, 1920, while clearing some forest land, on the edge of the brush, I discovered a nest in a tangle of wild vines, 18 inches from the ground, with two nestlings about two weeks old. This was on 20th July. Before seeing the nest, I had cut away a small thick patch of saplings which screened the nest. I intended to put some bushes over nest to guard it, but forgot to do so.

Coming back after lunch, I was just in time to see a Jackass (*Dacelo gigas*) fly away with the second of the young birds. Blaming myself for not covering the nest, I wondered if the birds would build again or still use the old nest.

About a week later I saw the same birds building in a small thorn tree close to my stockyard. It was three weeks before the nest was finished and the eggs laid, and after 21 days' incubation one egg was hatched. I took the other egg, it being infertile. When the nestling was a few days old, about 20th September, a Gohanna took it. The Gohannas were just then showing out. This shows that the young birds are destroyed if the nesting is late. This pair of Coachwhips had a feeding range in a belt of brush left for a breakwind.

Another pair of birds ranged next, and they were fortunate in rearing their young, the young birds being fully fledged (with the exception of the white throat, which I think they do not get until the first moult) by the end of August. If any of the young birds or parents came on to the other range, they were driven off by male bird, when he would utter his whip call very fiercely.

All the young birds that I have seen since are plain brown without a white throat. I think they get this at the first moult.

This is a list of birds that I found nesting early:—Lyre-Bird (*Menura nova-hollandia*); Coachwhip Bird (*Psophodes olivaceus*); Spotted Ground-Bird (*Cinlosoma punctatum*); Little Tit (*Acanthiza nana*), young on wing in August; Scrub Wren (*Sericornis magnirostris*); Field Wren (*Calamanthus campestris*); Spine-tailed Log-runner (*Orthonyx temmincki*).

## Some remarks on Re-naming Birds and the Rules of Zoological Nomenclature

By A. J. CAMPBELL, C.M.B.O.U., F.A.O.U.

Read at Sydney Session, R.A.O.U., 6/10/1921.

The scientific or technical names of birds constitute at present a burning question in Ornithological circles all over the Empire. Apparently the stumbling block\* has been the so-called "bed-rock priority" of name, which has been in vogue for over 160 years without giving finality to numerous names. It was thought that the International Code of Zoological Nomenclature would settle the question in Zoology generally, but it has failed in Ornithology in particular. The Code is disregarded by many workers.

As Linnæus was the father of the simple forms of binomials in biological nomenclature, it was resolved to make his work (*Systema-Naturæ*, 1758) the starting point. That is, no name prior to his work was to be recognised as "official." Then came a nomenclatural movement in 1842-3, when the British Association for the Advancement of Science prepared what was known as "Stricklandian Code." Strange to say, some American nature societies in 1845 adopted the code before the British Association itself did in 1846. W. H. Dall, an American Zoologist, in 1877 prepared a code for the American A.A.S. said to be one of the best essays on the subject ever compiled, yet it was never wholly adopted by the Americans.

The American Ornithologists' Union adopted what promised to be an excellent Code of Rules, but, as this Society was limited to Ornithology, Zoologists in general had no opportunity of bringing forward their difficulties. At last a French Savant, Raphael Blanchard, conceived the idea of an international code, which was worked into shape at subsequent Zoological Congresses—Paris (1889) and Moscow (1892). The German Zoological Society in 1894 adopted a code of its own. When the International Congress next met at Leyden (1895), it was found that British systematists followed the Stricklandian code; the French, the International; the Germans, their own; while Americans had a combination of the Stricklandian and other codes.

At Leyden a commission was appointed to inquire into the different systems, to suggest unification, and to report at following Congresses. This was done, and was completed at Berne (1904), when a permanent commission was appointed. This commission was, however, only a deliberative and advisory body, with no legislative powers. Neither could the commission, nor the Congress, enforce its rules, and every person is still in a position to follow any code, or prepare his own, if he so desires.

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\* The author, of course, expresses his own opinion. (Eds.)

So far as some Australian workers are concerned, the chief objection to the International code is its keystone, namely, the so-called "law of priority," which, if taken away, the code falls to pieces like a house of cards. The date of the Linnæan system (1758) is far back in the dim dawn of Ornithology, when the science was in a crude and confused state, and all the types and specimens have long crumbled to dust and decay. Australian Ornithology was born in broader daylight, many years after Linnæus. It has most of its types preserved in some museum or other, and is comparatively free from complications that beset old world workers, who, in striving to right themselves, turn us upside down by altering Australian bird-names that have been commonly used for 60, 70 and even 100 years, and in endeavouring to remove all inconsistencies by the adoption of *one basis*, and thus—

"In seeking to undo  
One riddle, and to find the true,  
Will knit a hundred others new."

There is no doubt that the great Swedish Botanist created a scientific epoch with the introduction of his binary system of nomenclature. And so surely did the immortal John Gould create a purely Ornithological epoch when he gave to the world the high heap of great folio pictorial works, including seven volumes and supplement of "The Birds of Australia." (Gould sailed from England in May, 1838, for Australia, and returned laden with new and wonderful spoils of this country in 1840.) One has only to turn up the files of the past to understand how Gould was appreciated in his own country. *The Times* (London), on September 3, 1851, published the long and ably written review, reprinted in our last issue.

Australians can therefore hardly forget Gould, while many, especially teachers of popular ornithology, approve of the Gouldian limit of priority of names, *i.e.*, for purely endemic species, but, of course, birds of world-wide habitat would conform to the oldest accepted or authoritative name. We can never hope to kill sentiment. In the Preface to that recent masterpiece, "A Monograph of the Pheasants," by William Beebe, Hy. Fairfield Osborne, President of the New York Zool. Soc., for certain cogent reasons states "the monograph presents a very strong sentimental appeal to all bird lovers!" Sentiment in ornithology is not dead, as some people suppose.

The law of priority is as inflexible as it is inartistic. Take, for instance, the classic generic name of the king of our avifauna, the Emu. Gould calls it *Dromaius*. Bedrock priority says *Dromeicus*. Hear the verdict of the late Professor Alfred Newton, of Cambridge: "The obvious misprint of *Dromeicus* in this author's (Vieillot) work has been foolishly followed by many naturalists, forgetful that he corrected it a few pages farther on to *Dromaius*" (Dictionary of Birds). The arbitrary law of bedrock priority is also mischievous, discredits many

standard works, and, above all, is unnecessary for the study of ornithological science.

Referring to the Emu we read the bird "was first described and figured under the name of the New Holland Cassowary, in Governor Phillip's Voyage to Botany Bay, published in 1789. To this work, Dr. Latham contributed very considerably in the ornithological department, and it is therefore probable that the description of this remarkable bird was furnished by him. The figure, taken from a drawing made on the spot by Lieut. Watts, is extremely defective. In the ensuing year a second figure, taken from the same specimen as the former, but very different in appearance and equally inaccurate, was given in White's Voyage to New South Wales, the Zoological part of which work appears to have been superintended by Dr. Shaw, whose Miscellany likewise contains a copy of the same figure."—(*Gardens and Menagerie of the Zoological Society. Delineated* vol. ii.).

The foregoing appears to be the earliest and very interesting history of the Emu, and well worth being quoted in Cayley's "Birds of Australia." My point, however, is, because Shaw called the Emu a Cassowary ("Southern Cassowary"), according to Gould; see Handbook, vol. ii., p. 200), why should that invalidate the widely known name *Casuarius australis* for the Australian Cassowary? In the realm of common sense the thing is preposterous, for there can possibly arise no confusion in using the prior name *australis*, for the Australian species or subspecies as the case may be. The suggested alteration to the name *johnsoni* tends to the "chaos of words" from which the "Rules" are intended to rescue science.

"No changes should rest on uncertainties" (W. H. Dall). A good maxim. Who was Bosc? It is said he described a live Quail from anywhere. At least Mr. Matthews had to declare its locality 122 years afterwards. There is also the uncertainty as to its species. But why hanker after an absolutely obsolete name to resuscitate which is not an iota of value to science, especially when we have had John Gould's immortal plates and names in vogue for nearly 80 years!

Then there is the "Priority" puzzle about our Snipe, under the singularly alliterative title "Scopoli or Scopolax." "Let sleeping dogs lie." Because in ancient times Sanderlings, Snipes, and Sandpipers were, as you may well suppose, much mixed, not only in companies, but also in names, *australis* for *Gallinago* cannot stand! Who said so? Not G. R. Gray, because in all his "official" editions ("official" because issued under the authority of that National Institution, the British Museum), he places *hardwickii* as a synonym to *australis*; likewise do the later British Museum's "Catalogues of Birds," as well as does Henry Seebohm—that great Plover authority. Did Gray declare the type of *hardwickii* by "original designation"? There was no such term in his day. The expressions "Type by original designation," "Type by absolute tautonymy," etc., apply, I take it, subsequent

to the making of the "National Rules," and should not be made retrospective for a century.

Can anything be more foolish than an attempt to change the specific name of the familiar Kookaburra (Laughing Jackass), *gigas*, to *novæ guineæ*? *Gigas* has obtained for 138 years, while *novæ guineæ*, besides being geographically erroneous, has not, until recently, been used authoritatively, or, as a matter of fact, by ornithologists at all.

Now, we come to another interesting point—interesting because of an attempt to stand down the strictly prior and well known name *superba* for the Lyre-Bird. It is the devotees of the law of priority who make the rule to overreach itself. They take the letter (technicalities) for the law (actual).

The history of naming the Lyre-Bird is a case in point. Major-General Davies described the wonderful new bird before the august Linnæan Society of London, 4th Nov., 1800, adding a postscript to the description, June, 1801, in which year it was probably published. That year (1801) Dr. Latham named the Lyre-Bird *novæ-hollandiæ* in a supplement of his "Index." For convenience sake, the Linnæan Society apparently bound its three years' "Proceedings" in one cover, under date 1802. Because it did so, is General Davies to lose priority in actual point of time? Moreover, the plate of the *Menura* which accompanied his paper is inscribed "F. Davies, del. 1799"—two years before the date of Latham's Supplement. The common usage of the name *superba* for the Lyre-Bird is simply a "historical fact." It is futile to argue against a fact. No academical decree or technicality can alter a fact.

Again touching the two fine and favorite parrots—the Red-wing and the King. In 1865 Gould in his "Handbook" (vol. ii., p. 37), wrote:—"The birds for which I propose the generic appellation *Ptistes* are, in my opinion, sufficiently different in form and colouring to warrant their being separated from *Aprosmictus* and formed into a new genus." There you have a definite starting place—a priority point; yet some nomenclaturers would transpose one name and bestow the new name of *Alisterus* on the other. To alter the long standing and ornithologically correct names of two common parrots, is, to borrow the expression of a learned judge—"as a matter of common sense, it has no justification."

What is the remedy for a permanent ornithological nomenclature? As easy as it is final. It has been truly stated that "the terrible war has broken down all tradition, all precedent, all regard to settled practice." In any case the bottom has been knocked out of the "International Commission for Zoological Nomenclature" for generations to come, if not for all time. Dr. Wardwell Stiles—its talented secretary—I think, will tell you that. Then let us start afresh with the English-speaking peoples' committee for the new *Systema Avium*, and declare and fix authoritatively all bird-names, dropping, or at least modifying, the inflexible law of "bed-rock priority."

I have previously mentioned that bed-rock priority in nomenclature was the key-stone of the International Code. Take away the keystone and the code collapses. Moreover, nomenclature is not a science, or even a quasi-science; therefore the keystone is already insecure. And because you are up against an eternal truism. The Lord made no cast iron law of priority when He said, "Many that are first shall be last and the last first." "And the scripture cannot be broken." What is right in a psychological sense is also correct in temporal affairs.

In the great war that has just been won by the Allies, were appointments to the higher army commands made by selection or by seniority—*absolute seniority*? You may answer that question to yourselves. Similarly in every walk of life. In a great commercial concern it is not always the senior employee who sits in the manager's chair.

Then, regarding the *authority* of the International Commission or its rules, are they not strictly *ultra vires*, as the legal phrase goes? Can rules, or regulations made so recently as 1904—only 17 years ago—act retrospectively for over 100 years, as in some of the cases I have cited? (I venture to suppose that the thing is unheard of in any legislative measure.) Or yet, take another example—Gould in his early enthusiasm named the beautiful and songful little yellow Gerygone, *olivacea*, from an immature skin he received in England. When he came to Australia, a huge undertaking in those days, he found that the mature bird was the one which he had well named *albugularis* on account of its white throat, and sunk his other name *olivacea* as a synonym. Can any person or body of persons legislate 66 years subsequently and say that Gould committed an error; that he should have used his first name? Nonsense, and so much the worse for the International rules if they act so illogically. Moreover, it is contrary to common-sense to take, as the basis of nomenclature, a description, or name which the author himself had openly condemned and had corrected, and one which had no priority of publication.

When Professor Blanchard first drew up his celebrated Code, probably he had not the slightest idea how far-reaching and upsetting would be some of its effects, especially with regard to the priority business. He had no doubt in his mind that in many countries of Europe each had a different name for the same species, and it was wise to suggest that the first, or oldest name, if correct, should prevail. But here, in the island Continent of Australia we have had in common use for many species, one out-standing or only name, to alter which, except for ornithological error, tends to confusion and to defame standard works of reference. Because the insect-world alone has had four millions species (almost equal to one for every soul in the Commonwealth), or because in Medical Zoology (often a matter of life or death) a certain species has forty or more synonymous names in use, some exacting rule, such as bed-rock names is





Nest, young and adults of the Leaden Flycatcher (*Myiagra rubecula*)

Female with adult antlion

Male near nest

Photos. by E. M. Cornwall, R.A.O.U., Mackay, Queensland.

necessary. However, that is no reason why the most popular of sciences—ornithology—with its comparatively limited number of species should be so treated and set back.

The wording of some of the rules might with advantage be amended. Examples—(1) Art. 21. "The author of a scientific name is that person who first publishes the name in connection with an *indication*, or definition, or a description." To let bed-rock priority rest on a mere "indication" has been the cause of much evil in nomenclature. Therefore the words "an indication" should be expunged from the rule. It seems hardly just that in "an indication" such as "little lighter above," or "much darker below (as the case may be) than so-and-so" with a trinomial, the name should take precedence for all time. The description should be scientific, not slovenly.

(2) Art. 32. "A generic, or a specific, name once published cannot be rejected (even by its author) because of inappropriateness." Some up-to-date authors read this rule in a negative sense and continue to create inappropriate names. For instance, *Harrizhitea*—a proposed new generic name for the Northern or Albert Lyre-Bird.

Regarding three similar names—*Alisterus*, *Alisteranus*, and *Alisterornis*—coined by Mr. Mathews for separate Australian genera, and in referring to them I do not intend to disparage that author's work, but merely mention them to stress what may be permitted under the so-called and supposed high authority of "The International Code of Zoological Nomenclature" which we are led to believe is "to rescue science from becoming a mere chaos of words."

I am not the only voice "crying in the wilderness." In England, Mr. Robert Gurney, M.A., F.Z.S., in an ably written address, "Modern Zoological Nomenclature" (Trans. Norfolk and Norwich Naturalists' Society, 1918) has drawn attention to the unworkableness of the International Code. Mr. Gurney's paper should be read in its entirety.

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## Camera Craft

**The Leaden Flycatcher.**—I am sending some nesting pictures of the Leaden-coloured Flycatcher (*Myiagra rubecula*). The male gave me no trouble, and seemed to trust me perfectly. He came and took up the post as I was focusing on the nest only two feet from the nest, and remained there all the time I was at work. In fact, I had to ask him to leave so as to give me a chance at his mate. The hen bird was quite a different proposition, and I had to wait several days before she gave me my opportunity. The rate of growth of these little chaps is truly remarkable. In one picture, the male is brooding the young birds, which were about two or three days old, and was able to sit right into the nest. Only five days later he was fairly

crowded out by the lusty youngsters. It was most amusing to watch his antics while I was taking the pictures. He tried his best to shield his progeny from my view, but failed utterly. It was not until the young were well grown, about the eighth or ninth day from the egg, that the hen bird allowed me to snap her. The youngsters had huge appetites, and both parents were fully occupied feeding them. It was most interesting to note how the young were fed in their proper turn. Although I watched for some time, I did not detect a single instance of a young one being fed out of its proper turn.—E. M. CORNWALL, R.A.O.U., Mackay, Q.

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## Stray Feathers

**The "White Gallinule"** (*Notornis alba*), an extinct bird.—In addition to the Dinornis, or Moa, there is another Australasian bird—once, it is said, fairly common on Lord Howe and Norfolk Islands—which has also become extinct, namely, the "White Gallinule" (*Notornis alba*), which is described and figured in "Phillip's Voyage to New South Wales," published in 1789. "This beautiful bird" (says the account given in the famous "Voyage") "resembles the Purple Gallinule in shape and make, but is much superior in size, being as large as a dunghil (*sic*) fowl. The length from the end of the bill to that of the claws is two feet three inches; the bill is very stout, and the colour of it, the whole top of the head and the irides red. The rest of the plumage is white, and the legs red. This species is pretty common on Lord Howe's Island, Norfolk Island, and other places, and is a very tame species." The male was said to have had some blue on the wings, therefore, apparently, this description refers to a female specimen. One "A. Latham" is the artist responsible for the painting of the "White Gallinule" reproduced in "Phillip's Voyage," and it is doubtless the first drawing made from a specimen of this long-extinct bird, the tameness of which, coupled with its limited range, no doubt assisted in sealing its fate. The compilers of "The Voyage" gratefully acknowledge the assistance they received from "Mr. Latham" as regards the descriptions, etc., of the birds and beasts figured in it, and therefore Latham is probably the individual responsible for the description of the "White Gallinule." A specimen of this extinct bird is said to exist in a museum at Vienna. It corresponded, no doubt, to the *Notornis* of New Zealand, once believed to be extinct, but which, I think, is still seen occasionally in remote parts of that country. Birds of the *Notornis* species have a remarkable resemblance to the Bald Coot, but are built on a much larger scale. There is apparently no record of the time at which *Notornis alba* became extinct, but in all probability the mutineers of the "Bounty" during their residence at Lord Howe Island used this bird as food, and so helped in its extinction.—H. V. EDWARDS, R.A.O.U., Bega, N.S.W.



I. Black Bell-Magpies (*Strepera fuliginosa*) and Noisy Miner (*Myzantha garrula*) feeding with fowls during the heavy snowfall at The Steppes, Tasmanian Highlands. Note the Miner's legs outstretched to support itself in the snow.

II. Black Bell-Magpies: three on ground, one on fence being fed. (See "Emu" Oct., 1921, p. 147)

Photos. by Miss Madge Wilson. The Steppes, Woodbridge, Tasmania.



**Blue Wren-Warblers Roosting High.**—Returning one afternoon (October, 1919) from a ramble in the bush, I passed through a patch of bracken which is always the haunt of a family of Blue Wren-Warblers (*Malurus cyaneus*). It was just after sunset, and I paused—as always—to watch the busy little creatures hopping about on the fallen timber. A tall stringy-bark tree grew on the edge of the bracken-patch. It went up straight quite 25 feet without a branch, and at the end of the first branch grew a large bunch of mistletoe (*Loranthus*), quite 30 feet from the ground. Whilst I watched the Wrens the little blue male suddenly flew to this big tree, and clinging sideways to the rough bark of the trunk, and (looking like a little jewel) began calling to his family in imperious tones till all the little brown birds came fluttering out of the bracken. Then one after the other, led by the little blue male, they all hopped up the rough bark of the tree, like miniature Tree-Creepers, until, coming opposite the pendant bunch of mistletoe, they fluttered across the intervening space into it and all disappeared amongst its thick leaves, evidently settling down there for the night, as they appeared no more that evening.

I have never seen Wrens climb up a tree like this before, though others may have done so. Their small round wings could scarcely carry them so high in a single flight, or else the exertion was more than they cared to undertake, so they took advantage of the rough-barked trunk as a stairway to their aerial bedroom.—(Mrs.) S. P. W. NORTON, R.A.O.U., Tamworth, N.S.W.

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## State Secretaries' Reports

### QUEENSLAND.

On 27th October, when some other States were preparing for the annual celebration of Bird Day, Queensland was doing its part by passing through its Parliament a modern and efficient measure for the protection of native fauna. This is the most important development of recent years in the movement for the preservation of the birds and animals of the tropics and sub-tropics, many of which are unique and wonderful. It is also a development that has taken a good deal of organising. Birds have no votes, and the unfortunate fact is that there are still some politicians who measure their value accordingly.

Queensland's present bird protection legislation is antiquated. Back in the good year 1877 it dawned on some perceptive citizens that "native birds are disappearing rapidly from some of the districts of this colony, and it is expedient to protect them and their progeny"; wherefor, the first Native Birds Protection Act came into being. Seven years later the Act was reinforced with provision for the establishment of sanctuaries for native game. Nothing had been added to or taken away from this legislation

until the passage of the new Animals and Birds Bill. Three years ago, however, we came close to effecting a considerable measure of reform. After being waited upon by a deputation from the natural history bodies, the then Minister for Agriculture (Hon. Wm. Lennon) introduced a measure known as the Game Bill, which was designed to replace the existing legislation covering fauna and fish. That measure aroused unexpected opposition. It was alleged in one quarter to be prompted by the squatters of Central Queensland, and eventually it became a "slaughtered innocent," getting no further than the first reading.

The exigencies of party politics left no loophole for the conservationists in succeeding sessions of Parliament. Propaganda was having its effect, however, and early in the present session a far-seeing Minister for Agriculture, Hon. W. N. Gillies (who is also Deputy Premier), introduced the new Animals and Birds Bill, the provisions of which, remodelled from the Game Bill, had our entire approval. The first reading passing on 2nd September, with the blessing of all political parties, safe conduct of the bill seemed assured. Alas for the man or bird who trusts too blindly! A trivial disagreement on the second reading, on 13th September, led to an Opposition member moving to postpone the motion (which he had supported) for three months. That little misunderstanding nearly wrecked the measure. Matters of international importance intervened, and the luckless Bird Bill rested at the bottom of the business paper until 27th October. That was the last day of the session. A desperate situation called for desperate action. Journalistic and kindred influences entered the fray, and the House sat during half of the dinner hour that day to pass the Animals and Birds Bill! It was the last measure passed by the Assembly, and was given an historic touch by being also the last measure to be passed by the abolished Legislative Council.

The new measure, which comes into operation at the beginning of 1922, affects birds and animals, whether native or imported. All previous Acts of the kind are repealed, but all proclamations made under them (including the gazettal of sanctuaries) are permitted to remain in force. Power is given the Governor in Council to adjust close seasons, and, among other things, prescribe the maximum number of any specified animal or bird which any one person may take or kill or have in possession on any one day, or within any specified period. This provision for the placing of a limit on game bags is a welcome innovation that is much in vogue in the United States, and should be so also in Australia.

The taking or killing at any time in a sanctuary of any animal or bird is absolutely prohibited, except under the written authority of the Minister. This is a notable concession. The old Act was very hazy on the point, and it required notices to be erected "not more than half a mile apart," an impossibility in big areas. "Convenient and conspicuous places" is the requirement of the

new Act regarding notices. The Game Bill suggested that sanctuaries should be only for those animals and birds specified in the order of proclamation. This was unsatisfactory; a sanctuary must be seldom, if ever, disturbed if birds are to realise their immunity. In gaining this point it was fair to concede that the Minister should have power to issue authority to certain persons to shoot in a sanctuary when necessity might demand it. Otherwise, some of the present big reservations would have to be unlocked, for no person is permitted to carry a gun in such an area. Under the South Australian Act of 1919 (which seems to be the only one to equal that of Queensland as regards sanctuaries), dogs are to be kept off reservations. This point was excised from the Queensland Act as being unnecessarily drastic; under it dwellers on reserved islands, for instance, could not keep dogs. The penalties under the sanctuaries' clause are salutary. For killing, or attempting to kill, or having in possession any means for killing, animals or birds upon such an area, the fine is to be not less than £2, and, in addition, not less than £1 for each animal or bird affected. A minimum penalty of £2 is also provided for anyone who attempts to place poison in a sanctuary or removes or defaces notices. Altogether, the provisions relating to sanctuaries are an important section of the new Act.

There is also a penalty of £2 (minimum) provided for anyone who unlawfully kills a bird or animal in a place other than a sanctuary; but in such cases there is no additional fine based on the numbers killed. Then there is the buying and selling clause. A penalty of not less than ten shillings is provided in the case of each animal or bird (or skin or carcase thereof) bought or sold during the close season, with a total minimum of £5 for a second offence. Dealers are to have ten days of the close season in which to dispose of surplus stock of partially-protected creatures. This concession has been proved to be a reasonable one. The Minister is given power to grant permits to collect for scientific purposes and for public gardens, etc., and also to authorise specified birds to be kept in a state of domestication, there being, of course, no objection to certain birds being confined under proper conditions. Moreover, this innovation does away with the bad old section, contained in practically every Act of the kind in Australia, allowing persons to have a free hand in confining birds. This is the point upon which the New South Wales Act has recently been proved to be very weak.\*

A second weakness in the New South Wales Act is one that could have been guarded against by a reference to the clause in the old Queensland Act, allowing persons to kill protected birds on private land, for the bona fide protection of crops and orchards. A provision of this kind enables birds that occasionally eat fruit to be retained on the protected list. South Australia has

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\* See "Emu," Vol. XXI., p. 73.

a similar provision. In the new Queensland measure the old clause on the point is reinforced with a safeguard placing the onus of proof of the bird's destructiveness on the owner of the land. Another case in which the onus of proof is upon the person charged, is in respect of the possession of any portion of a protected bird or animal. It is not for the prosecution to prove guilt in such a case, but for the accused to prove that he came by the creature or material lawfully. Further, the onus of proof of lawful intent is upon the owner of poison suspected of being intended for killing birds or animals. No trapper is permitted to have cyanide of potassium in possession.

There was no protection for eggs under the old Act; the new Act provides a maximum penalty of ten shillings for each egg unlawfully taken.

Wide powers are given honorary rangers (who include all policemen) under the new measure. They may, without warrant, at all times enter any lands or premises, inspect any instruments suspected of being used in contravention of the Act, and seize any animal or bird, or any instrument or poison through which the Act is being contravened. For the arrest of persons in charge of such material a warrant is needed. Such persons, however, may be summarily arrested by the honorary ranger if they fail to give their names and addresses, and forfeit material which is unlawfully held. Any person who obstructs an officer, or incites another person to do so, is liable to a penalty not exceeding £50, in addition to any other penalty incurred under the Act. All complaints are to be heard summarily, and it is provided that no court shall reduce penalties provided under the Act. This was possible with first offenders under the old Act, some of whom escaped very lightly.

Finally, the Governor in Council is given power to strengthen the Act by regulations. These regulations may govern the issue of licenses and permits, the propagation of birds, the further safeguarding of sanctuaries, the defining of powers and duties of societies which may be subsidised under the Act, the licensing of bird dealers and keepers, and inspection of their shops or premises, and the "enforcing and elucidating of the provisions of this Act, and furthering the objects thereof."

The passing of this measure marks a distinct epoch in the history of bird protection and study in Australia. Western Australia passed a modern measure in 1912, South Australia in 1919, Victoria in 1915 and again in 1917, Tasmania in 1919, New South Wales in 1918; and now Queensland has made the chain complete by passing what promises to be one of the most effective of all the links. It is for naturalists generally, and bird-lovers in particular, to see that all this legislation is made effective.

A. H. CHISHOLM,  
State Secretary.

## Reviews

[The Austral Avian Record, vol. iv., part 6, August 1st, 1921].

An interesting number of this journal of importance especially to Australian ornithologists contains: (1) The conclusion of the article on Sherborn and the Systematist; (2) Additions and Corrections to the List of the Birds of Australia, 1913, and Check-list Pt. 1, 1920; (3) Notes of Interest, and (4) a new generic or subgeneric name—*Amorphelia*—to be used with *Columba turtur* as type.

The Additions and Corrections are mainly to synonymy and type designation and some correct dates of publication. Few changes of generic or specific names are made necessary by these. *Eudytes cristatus* replaces *E. serresianus*, *Geobasileus chrysorrhous alexanderi* replaces *Acanthiza pallida* Milligan, 1903, preoccupied by *Acanthiza pallida* "Temm." Finsch, 1898; *Mirafra javanica soderbergi* replaces *M. j. nigrescens* Mathews, 1912, preoccupied by *Mirafra nigrescens*, Reichenow, 1900—a well-merited recognition of the work of Dr. Soderberg in North-West Australia. Dr. Soderberg's report was reviewed in a previous issue.

In the "Notes of Interest," Messrs. Mathews and Iredale first give details of "Lichtenstein's Sale Catalogues." Many of the names used are *nomina nuda*, but "unfortunately" one portion "includes Illiger's names, and cites references validating them." Fortunately for us, no Australian bird name is included.

"Berthold's Edition of Letreille," 1827 likewise does not cause changes. It adds only to the synonymy of one Australian cockatoo; *Eurhynchus*, a synonym to *Probosciger* (1820), now proposed for *Microglossus* (1822).

An article by Cassin entitled "Encyclopedia Londinensis," published in Philadelphia, in 1867, provides a synonym for the Emu-Wren (*Stipiturus malachurus*). The authors show in a short article the vicissitudes of "*Turdus varius*" regarded as valid, preoccupied, valid again, and finally preoccupied as different discoveries in ornithological literature have been made. Mathews and Iredale now include the name in the synonymy of the Noisy Miner, *Myzantha garrula* of the Check-list and *M. melanocephala* of Mathews and Iredale's Name-list, 1920.

"Miller's Illustrations," a rare work concerns an Australian penguin, *Eudytes chrysocome*. Forster stated the specimen was killed in Tasmania, and his son made a drawing. Forster saw another specimen from Falkland Islands, and commissioned Miller to paint this example. When describing "the new species, Forster gave as localities Van Diemen's Land and the Falkland Islands, and in his description included Bougainville's account of Falkland Islands specimens." Mathews and Iredale find that the pencil drawing of the Tasmanian bird is from a species

known as *pachyrhynchus* and that the "*chrysocome*" of Forster was too much of a mixture and should be dismissed. The authors admit theirs is not the "final word on the subject."

In another interesting note, the authors show that the sub-specific name *cinereus* for the Grey Noddy is preoccupied.

Apparently further changes may be caused by a tract issued in 1845 by Reichenbach, of whom the authors say: "Probably no author has served up so much trouble as the one here named. . . . He was a great ornithologist, but his procedure does not endear him to the present-day systematist."

Australian ornithologists are also interested in a section headed British Bird Names.

In anticipation of the preparation of the list of names of Old World birds for the *Systema Avium*, our Check-list Committee has the second edition of the Official Check-list almost completed. Mathews and Iredale, members of the British committee, mention several names of British birds as awaiting correction.

"Another Overlooked Bird List," published by Thomas Forster in 1827 in *The Pocket Encyclopædia of Natural Phenomena*, is also discussed.

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[The Birds of Australia, Gregory M. Mathews, vol. ix., part 3. London, H. F. & G. Witherby, June, 1921.]

This part treats fully six of the eight Australian birds included in the family of Cuckoo-Shrikes and Caterpillar-eaters. It also begins the treatment of the seventh member of the family, and completes that of the Fly-catchers. As about 150 species still remain to be treated, this monumental work will, at this rate, not be completed for a few years yet. As publication began in 1910, Mathews' *Birds of Australia* is likely to create a record for Australian publications in time taken to complete publication. The fine plates are all by the well-known bird artist, Gronvold, though in the part to hand plate 417, depicting the "Caterpillar-catcher" (*Metagraucalus tenuirostris*) is not included, apparently it was omitted in error.

Under the Ground Cuckoo-Shrike, details are given of a discovery of great interest to Australians. *Many, if not a large majority, of the types of the species of birds described by Gould from Australia previous to 1847 are in THE BRITISH MUSEUM, and not at Philadelphia.*" Mr. Mathews promises that a "complete revision of the location of the Gouldian type species will give the exact number." Mr. Mathews considers, "This explains the action of the Trustees of the British Museum in refusing the purchase of the Gouldian Bird Collection."

The work maintains fully its very high standard in plates, information concerning the birds themselves from well-known field observers, and discussion of the history of literature concerning the different species.

## Obituary

THE LATE MR. A. H. C. ZIETZ, R.A.O.U.

Time has claimed another original member and one of the founders of the R.A.O.U. in the person of Mr. Amandus Heinrich Christian Zietz, who died recently at Kingswood, South Australia.

The late Mr. Zietz was born in Slesvig-Holstein, Denmark, 82 years ago. He started his career as a teacher, but this did not agree with him; and being passionately fond of natural history, he obtained a position in the world-famed Godefroi Museum, where the authorities selected him to collect specimens. Mr. Zietz returned from the trip with an excellent collection, which he afterwards arranged for the museum. His services were next sought after by the Kiel Museum, where he was employed for several years. At the Fishery Exhibition held in Berlin he gained the highest medal for the best work done, and shortly afterwards was appointed Curator of the Kiel Museum.

On the recommendation of Dr. Haacke, then Director of the Museum, Adelaide, Mr. Zietz received an appointment and came to Australia in 1884. His services at the Museum were much appreciated, and he did valuable work helping the cause of science. Among the most important tasks accomplished by Mr. Zietz was the arranging of the specimens in the new museum. Mr. Zietz was Assistant Director when he retired under the Septuagenarians Act, July, 1910. In 1893 he and the late Director, Professor Sir Edward Stirling, explored fossil remains at Lake Callabonna. As the result of this investigation, Professor Stirling and Mr. Zietz published a memoir under the auspices of the Royal Society, dealing with the extinct *Diprotodon australis*, and a large Emu-like bird, the *Genyornis*. The *Diprotodon* was established at the Museum, and after an immense amount of patient labour, one skeleton was completely assembled, and casts of it have been made and sent to other museums. In 1906 Mr. Zietz and his son enriched the Museum with specimens collected during a tour in the "big scrub" of the Clarence and Richmond Rivers, N.S.W. Mr. Zietz wrote several valuable papers for the Royal Society of this State, and gave particular attention to research, especially in connection with birds and fish. One of the papers contributed by him concerned the fishes of the Lower Murray.

Mr. Zietz has left a widow, and one son, Mr. F. R. Zietz, to whom all members of the R.A.O.U. will join in expressing to them their sincere sympathy, while science has lost an earnest worker. Mr. F. R. Zietz, R.A.O.U., is ornithologist at the South Australian Museum.

## Economic Section

### BIRDS AND THE CATERPILLAR PEST

By H. B. SLANEY, R.A.O.U., Moorooduc (Vic.).

How to combat, or insure against, future raids of caterpillars is a problem exercising the minds of farmers all over Victoria at the present time. To the scientist the answer is a simple one, for he would tell us that the most economical and obvious means of protection is through the agency of the caterpillars' natural enemies—the birds. But the man on the land wants to know where the birds are to come from in sufficient numbers to be of any use in checking the devastation such as they have recently suffered. In addition to the Starlings, whose numbers seem woefully inadequate at a time such as this, birds preying upon the caterpillars include Stubble Quail, Horsfield's Bush Lark, Ground Lark, Silver-eye, Magpie, Magpie-lark, Black-faced Cuckoo Shrike, Pallid Cuckoo, and the Fantailed Cuckoo, and even the much despised Sparrow has been doing its bit.

In the Mornington Peninsula I have noted all these birds at work upon the grubs, each performing wonders in proportion to its size, but without stemming the voracious horde in the least.

The caterpillars are hatched from eggs laid in the early spring by a medium-sized dark-brown moth, well known as the Bogong Moth. Like the female blowfly, the moth uses much discrimination as to where the eggs are laid. They are placed where Nature tells her the young caterpillars stand the best chance, not only of hatching, but also of reaching maturity. Therefore she chooses the damp spots in a field of luxuriant growth, such as a crop of oats. Like the poor, the moths are always with us—a fact not known to most farmers—but we are not pestered with them annually, for in normal seasons 90 per cent. of the eggs laid fail to hatch because climatic conditions are not favourable to their incubation. Warm showery days extending well through November seem to be the ideal conditions needed for their propagation, and when it comes to weather conditions, the average farmer is a fatalist. After all their presence is but one more instance of "Polarity." The rain and the temperature favour a suberabundance of food, and also caterpillars to devour it. Action and reaction is Nature's law, and will remain so to the end of time. Man creates artificial conditions in his well-tilled fields of cereals, and needs must use artificial means for their protection. It is a popular fallacy that caterpillars are able to cover great distances in search of fresh fields. Experiments upon travelling caterpillars marked with flour dusted upon them lead one to doubt if they are capable of averaging a chain in 24 hours, and since their life is very brief (from 10 to 14 days), they must quickly perish unless suitable food is soon forthcoming on the way. I have also noted their objection to hot sunlight, which stimulates them to unwonted activity. Almost invariably

they place the stem or leaf of the food plant upon which they are feeding between themselves and the rays of the sun, so that whilst walking casually through a paddock with one's back to the sun their presence will remain unnoticed. Turn, however, and face towards the sun, and the ground seems black with them.

Aided by a succession of south-west winds, the moth has been distributed almost universally over the State, and any solution of the problem involves its destruction also. Experiments should be conducted to determine the best means of trapping or gassing them. In the meantime every possible encouragement should be given to the fostering of all the night-feeding birds—Frogmouths, Owls and Nightjars—and a rigid protection be extended to the ground-feeding Quail, Plover, Curlew, Ibis, and others. In America, acting under the advice of the U.S.A. Bureau of Ornithology at Washington, many of the States have been restocked with the "Bob White"—a Quail somewhat similar to our Stubble Quail, with remarkable results, and the time is not far distant when similar action will have to be taken here.

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## Notes

### CENTRAL QUEENSLAND NATIVE BIRDS' ASSOCIATION.

The Hon. Secretary of the Central Queensland Native Birds' Protection Association, Mr. P. V. Maloney, is in receipt of the following letter, dated the 3rd instant, from the Under-Secretary for Agriculture and Stock, Mr. E. G. E. Scriven:—"I desire to inform you that His Excellency the Governor, with the advice of the Executive Council, has, in pursuance of the provisions of the Native Birds' Protection Acts, 1877 to 1884, been pleased to declare Great Keppel Island to be a reserve under and for the purpose of the above-mentioned Acts. Notifications of the same will appear in the *Government Gazette* of to-day's date, a copy of which will be forwarded to you in due course." Mr. Maloney writes as follows:—"In order to preserve the bird life on these islands, I moved in April last, through the association, to have North and South Keppel islands made sanctuaries for their protection, and the lessees fell in with my views and agreed to the move. From personal observations and periodical trips to the Keppel Islands I found that hundreds of birds from the mainland have made their way there. A few years ago there were only sea birds to be found on the islands. I attribute the increase to the onward march of closer settlement along our coastline from Yeppoon. Many birds have been driven out in consequence, and have now made the islands their breeding haunts. Unfortunately at Easter time and Christmas time there seems to be a wide-spread passion among camping parties for the indiscriminate killing of these birds, and it was lamentable

to see the way the pea rifle was being used on them. My association is out to preserve the bird life on these islands, and help our Central district to retain its bird wealth. The interests of bird protection will now be advanced a step further, and it is hoped that campers will make a note that the new regulations issued for shooting or interfering with birds in future on the islands will bring a heavy penalty.—From *The Morning Bulletin*, Rockhampton. 10/9/21.

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The R.A.O.U. and kindred bodies received a good advertisement through the State Secretary for Queensland, when the new Animals and Birds Bill was being considered recently by the Parliament of the big Northern State. The Minister for Agriculture (Hon. W. N. Gillies), in introducing the measure to the Legislative Assembly, returned hearty thanks to Mr. Chisholm and other naturalists for their assistance, and complimented them on their perseverance in the interests of native birds and animals. The leader of the Opposition (Mr. W. J. Vowles), whom many members of the R.A.O.U. met at Dalby in 1919, joined in the personal appreciation, as did also the Hon. J. G. Appel. There was very little debate on the measure in the Legislative Council, but *Hansard* for that Chamber reports that the Hon. Randolph Bedford, M.L.C., described Mr. Chisholm as "a great bird-lover and very excellent Australian," and one whose work "deserves something in the way of recognition by the Council."

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Visitors to Australia are frequently able to assist materially in the campaign for better appreciation of Australian fauna. Notable cases in point have been those of Sir Arthur Conan Doyle and Lord Northcliffe, both of whom made strong public pleas for the safeguarding of the unique birds, animals, and plants of the Commonwealth. Viscount Northcliffe was particularly interested in the work of Mr. Harry Burrell, R.A.O.U., among monotremes, and stated that the hour or so he spent with the New South Wales naturalist was one of the most interesting of his life. What Sir Conan Doyle thinks of the fauna of this land becomes apparent in his new book, "The Wanderings of a Spiritualist." Numerous impressions of bird-life are given, and the author confesses that a certain Victorian marshland, where he stole out to listen to water-fowl at night, will always be to him "the real Australia." Incidentally, Sir Conan Doyle pays cordial tribute to the work of two South Australian ornithologists, Captain S. A. White (State Secretary of the R.A.O.U.), and Mr. T. P. Bellchambers, and also to the State Secretary for Queensland, Mr. A. H. Chisholm.

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For various reasons, including a wealth of scientific material due to the enterprise and generosity of Mr. H. L. White, publication was delayed until January 14th, 1922.





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THE EDWARD LYRE-BIRD

(*Menura nova-hollandia edwardi*)

Male—lower figure.

Female—upper figure

# The Emu

Official Organ of the Royal Australasian Ornithologists' Union

"Birds of a feather."

VOL. XXI.]

1ST APRIL, 1922.

[PART 4.

## The Lyre-Bird, *Menura novae-hollandiae*,\* Latham

A Key to Varieties, or Sub-species.

By A. J. CAMPBELL, C.M.B.O.U., F.A.O.U.

1. Mantle brownish (mummy brown); outer (lyre-shaped) tail feathers notched on the inner web with broad bars of chestnut reaching to the shaft—male; outer tail feathers with narrow bars of chestnut almost reaching to shaft—female.

*M. n. victoriae*. Victoria Lyre-Bird.

2. Mantle brownish (or fuscous); outer (lyre-shaped) tail feathers notched with hazel bars reaching to within quarter of an inch of shaft—male; tail bars hazel, narrow, and half an inch apart—female. *M. n. novae-hollandiae*. Lyre-Bird.

3. Mantle olive-brown; outer (lyre-shaped) tail feathers notched with tawny or russet bars, reaching to within a quarter of an inch of shaft—male; tail bars tawny, narrow, and three-quarters of an inch apart—female.

*M. n. edwardi*. Edward Lyre-Bird.

Note.—The above descriptions are taken from material in the "H. L. White Collection," National Museum, Melbourne. *M. n. edwardi* was described by Mr. A. H. Chisholm, R.A.O.U., *Emu*, xx., p. 221, while most valuable field observations on this northern variety, contributed by Dr. Spencer Roberts, R.A.O.U., here follow. It will be observed that the Victoria Lyre-Bird in general coloration is darkest, the common Lyre-Bird lighter, and the Edward lightest. Again, in the Victoria bird the bars of the lyre feathers cross the inner web to the shaft, whereas in the other two varieties the bars fall short of the shaft by about a quarter of an inch. Another interesting point is that in the outer tail feathers of the female Edward bird, the tips are black, or blackish, as in the male. Not so in the other two varieties.

Mr. H. L. White, R.A.O.U., most generously defrays the cost of the accompanying coloured plate.

\* Former name *M. superba*, historically the older name, but nomenclators hold that *novae-hollandiae* was first published. A.J.C.

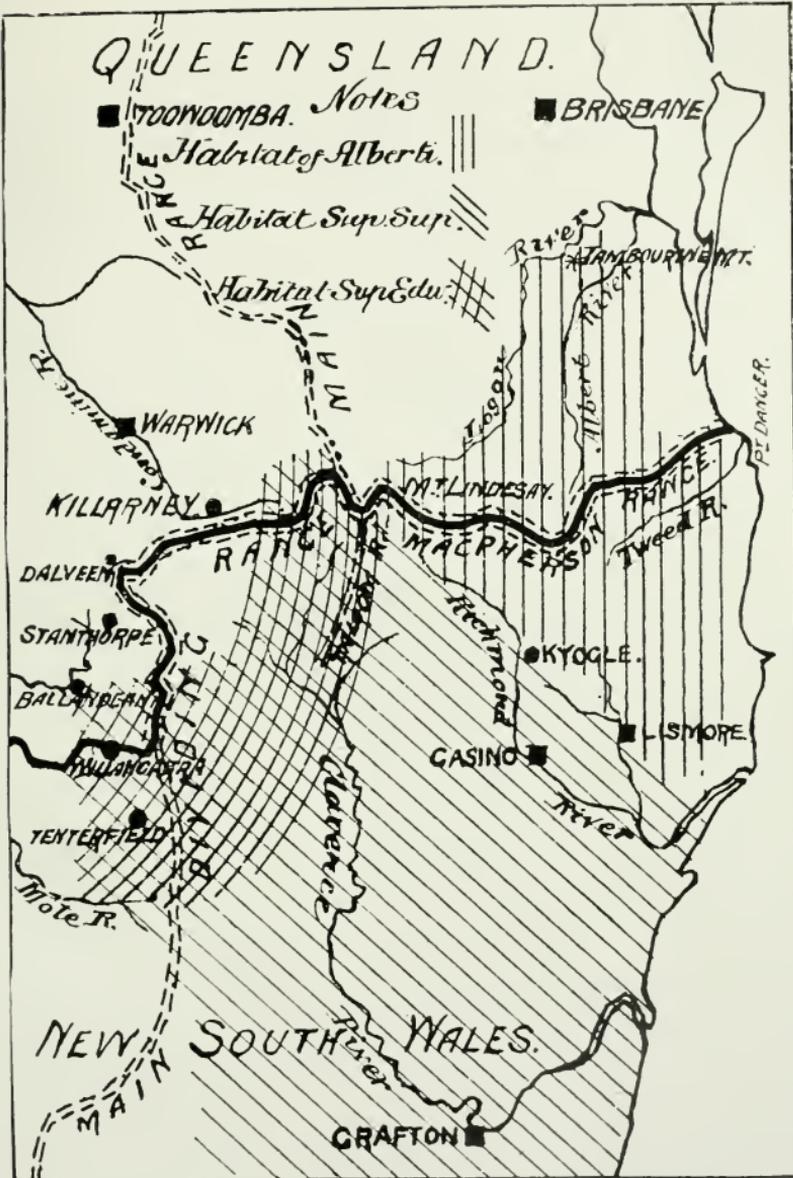
## Prince Edward's Lyre-Bird at Home

By SPENCER ROBERTS, M.B., R.A.O.U., Stanthorpe,  
Queensland.

During 1915, I came to live, for family reasons, in this highland district of southern Queensland, known to dwellers therein as the Granite Belt. As the train breasts the height and enters it at Dalveen, the traveller on the weary trip from Brisbane to Sydney takes a few deep breaths of appreciably different air; he leaves it and the Queensland train, with a sigh of relief an hour and a half later at Wallangarra. This is all: otherwise it is remote as Timbuctoo. Roughly a hundred miles away, as the crow would fly, is the sea at Point Danger, where New South Wales and Queensland waters meet, and the land border commences. Running almost due west along the McPherson and Main Dividing Ranges, the border meets this strange outcrop, senses the difference, and swerves due south; it feels at the edge for 20 miles, crawls over a small part, and then turns west again to cut boldly across it. I refer in detail to this man-made land border, for it is curiously and inextricably interwoven with the borders of the range of three Lyre-Birds (*Menura alberti*, *M. novæ-hollandiæ*, and *M. edwardi*) which make up the family *Menuridae*.

This Granite Belt, in itself a geographical entity and undoubtedly the north-west corner of the Kingdom of Lyre-tails in Australia, is a point one might almost say where three empires meet: on its north the Darling Downs black soil fringed with sand; eastwards, the rough country of the head waters of the Clarence clad in sub-tropical scrub, and away west, the heated Inglewood-Goondivindi hinterland. Towards this western area the waters of the belt flow to form a headwater for the great Murray system. To the south, the granite overflows into New South Wales, and is traceable in the New England tableland far beyond the range of the bird under consideration, throwing out eastwards bastions which overlook the very coastal ranges. Again I apologise for these details, but even the bastions play their part in the story, as it is along them that the highland bird makes contact with the lowland. The special topography of the country so far as it concerns the *Menura* will be related later. Meanwhile, let it be said that if one would expect such a spot, isolated and towering 2000 feet above its neighbours, to contain isolated and rare objects of natural history, disappointment will not be met. Undoubtedly there are wombats of great size, the Platypus (*Ornithorhynchus*), the Spiny Ant-eater (*Echidna*), and the Lyre-Bird. Surely four strange enough creatures.

My first introduction to the Lyre-Bird was soon after my arrival as numerous tails adorned, *horribile dictu*, the houses of many of my patients, distracted my attention, and wiled away many a tedious hour of waiting. I was never tired of looking at



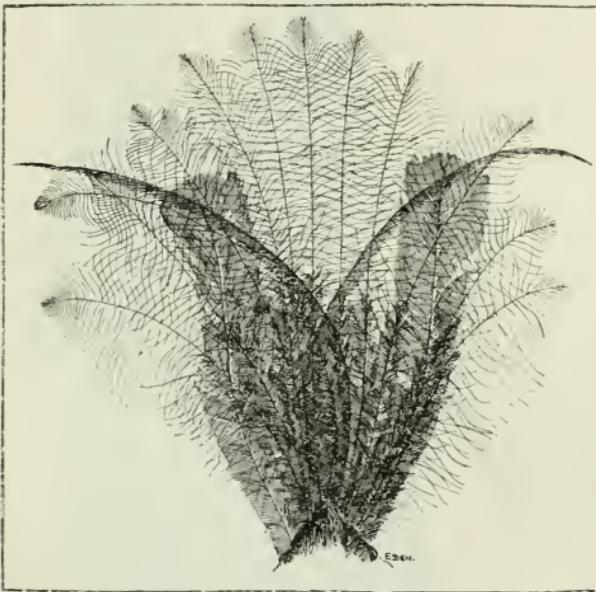
RANGE OF THE ALBERT AND EDWARD LYRE-BIRDS.

SCALE 25 MILES TO AN INCH

Vertical lines show range of *Menura alberti*.  
 Oblique lines show range of *M. nova-hollandiae*.  
 Crossed lines show range of *M. n. edwardi*.



them; I tried to visualise the living bird, magnificent with the beauty of their main curved feathers. And here it is fitting to quote Mathews, who in placing *alberti* in a separate genus, says (*Austral Avian Record*, vol i., page 109, 1912): "Differs from *Menura* in the form of the tail lacking the long curved out rec-trix." There is no inkling in Leach, or Hall's Key, which are alike a standard and inspiration for many of us, and rarely fail us. Skins amply justify his distinction, but whether a generic division is justifiable is a question which must be left to others. My reason for stressing the point and introducing the farm-house and the drawing (kindly done by Mr. Douglas Eden of this town



from a Tambourine Mt. specimen) is this: it enables without further slaughter immediate identification of the farm-house specimen, and is therefore of intense value in establishing the range of *novæ-hollandiæ* as opposed to *alberti*, a much mis-handled question at present.

Here then was no *alberti*. What was it? My acquaintance with the actual bird did not take place immediately on account of its extremely restricted range in even this extremely restricted district, the whole of which is roughly only 35 miles north to south, by 15 miles east to west. In 1919 curiosity overcame my love of the bird, and I took two eggs, one of which has since been described by Mr. H. L. White as the type of *Menura novæ-hollandiæ edwardi* (*Emu*, July, 1921). In 1921, just before the nesting season, I obtained two males and a female. One of the

former was forwarded to the "H. L. White Collection," Melbourne, and described by Mr. A. H. Chisholm as a new species, *Menura edwardi* (Emu, April, 1921). The other pair will go to the same destination as the first male. During August, 1920, Mr. A. H. Chisholm spent a day with me amongst the rocks and birds, and to him I am indebted for the permit from the Queensland Government to obtain the skins. To Mr. Huxham, Minister for Education, the thanks of all bird lovers are due for the active interest he took in the birds whilst on a visit here, resulting in the propaganda for protection through that best of all media—the schools.

The actual range of the bird in Queensland, and I always except the Killarney Range (*vide infra*), is, as I have indicated, very restricted. A line drawn from Ballandean due east to the border, and from Ballandean due south to the border would catch nine-tenths of the birds in the district, and the other one-tenth would be close up. By producing these lines into New South Wales, valuable boundaries will also be defined. The total range here then would be over an area of 12 x 12 miles slightly greater previously, but now restricted by settlement. It is the roughest and highest part of the belt (a land of beauty and barrenness), averaging 3500 feet above sea level, and picturesque to a degree. A reference to Plate I will show the class of country; narrow, deep gorges flanked by enormous smooth rocks or broken country, in which are poised huge round granite boulders in groups. The timber is essentially open—rather stunted eucalypts, chiefly stringy bark, tea-trees, wattles, and light undergrowth, the litter as a rule *extremely dry and very loose*, an important point, and where there is a soak moss abounds. These soaks soon drain the spongy soil lying on top of the granite foundation, and with the free access of sunlight account for the condition of the litter, and the presence of the moss beds. The bare flat rocks in places cover many acres, and are deeply scored and stained by the soak runs. A small one is shown in the foreground of Plate I. In the middle distance on the right are the Pyramids—two enormous, round, bare hills, one mile and a half in circumference and 500 feet above the surroundings. In the background is Mt. Norman, with Castle Rock, 4000 feet odd above sea level. I have seen Lyre-Birds right up to its summit.

Further study of the picture reveals the special distribution of the pairs at nesting time, their territory, of which each male is a king, and occupied year after year. Each has headquarters in a group of rocks, 1, 2, 3 and more acres in extent. At the base of the Pyramids is a group (A); half a mile to the left is a second group (B); beyond B, and again within an easy half mile to the left of B are two more groups, C and D. These groups are in constant occupation in each nesting season, and are mentioned especially, not only as typical of the whole area, but because the three eggs which I have sent to the Belltrees collection were taken from the three groups of rocks, A, B, C, nearest the artist during the seasons of 1919-1921. From the fourth group



Plate i. TYPICAL GRANITE BELT VIEW.





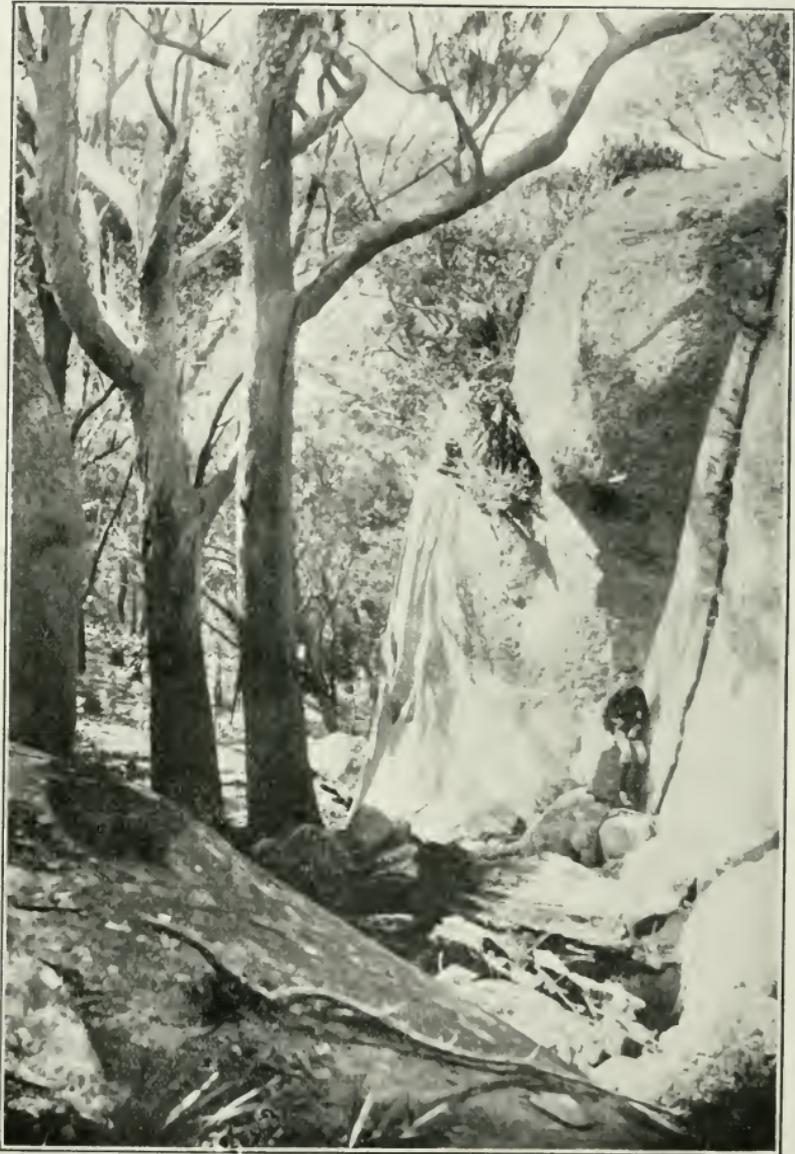


Plate ii. Note Nest on ledge to small boy's right, amongst vegetation.

no egg has been taken (though the opportunity has frequently presented itself), as this nest was most interestingly placed in a cold, damp, absolutely sunless cave, and was so easy of approach for observation that it was left for this purpose. The position from which the picture was made was also in a nesting group, and within half a mile north, south, east or west were further nesting groups. And so it goes on all over the area.

But it must not be thought that the birds confine themselves to this territorial system except at breeding time. They are communistic, and scattered indiscriminately over the countryside, congregating where food is plentiful. A male may be seen picking the moss over on a sloping rock, whistling, and quite content with himself: a hundred yards away a couple of other males are playing about between boulders, running along logs, or up a sloping tree and parachuting down. An odd hen or two will be seen here and there. Peace, perfect peace! But in April the nesting instinct awakes at the first breath of winter, and is manifested in the wish of the male to acquire a territory of his own, a group of rocks for a castle, a few secluded patches of undergrowth for dancing mounds, and a sufficient territory for a food supply. This instinct becomes an obsession: he fights fiercely for his place in the sun; he whistles his defiance and possession; he dances on the mounds to show his art. The hen comes to watch him, sometimes several at a time, and witnesses the almost sacred rites of the mound carried out with exquisite punctilio, and there is something almost Druidical in these ceremonies amongst these granite monoliths. Once he is established, the hen makes a choice, and perhaps more than one may choose the same territory or the same male. Which it is I do not know, but it results in battles on the part of the females. I will give no account of the mound displays or courting, for though doubtless inclusive under the heading "Bird Territory," they are so perplexing and entrancing that a special article would be required. Undoubtedly the mounds are signs of possession, notice boards for others to keep off, and in a good many cases if the lie of the land is suitable, constitute actual boundary marks.

Once established, the pair proceeds with the matter of nesting. Plate 2 introduces a view within a nesting group of rocks. It is a small part of B, as the largest rocks did not lend themselves to photography. Within a hundred yards of the camera were six nests, new, old, dilapidated, three on sloping ledges, one in a sulcus on a round boulder, one in a tree stump, and one in a mass of rock which had fallen down a 50 feet crack, and was stuck 8 feet up. This nest is illustrated in Plate 3, A, and would weigh 50 or 60 lbs.; it was occupied four years ago, and this year. A new-nest was constructed last year. In 1919 I fancy it was the nest in the tree stump, but of this one, and this one only, I cannot speak positively. A careful scrutiny of these nests reveals most of the interesting points in nest building. All the positions in which the nests are built are exemplified except one, viz., the ground, which is very exceptional here. There is the

nest in the sulcus, in the tree stump, on the ledge, and in the rock in the cleft, and at no time do they build with the base not firmly planted, *e.g.*, in a cleft without a supporting rock. In April, towards the end, all are investigated by the nesting couple, special attention being paid to those two years old or over. Each is thoroughly exposed to the weather, the rough outer sticks displaced, the outer dome opened up and flattened (*vide* Plate 3 B). Last year's nest is difficult to deal with, and is therefore rarely used. Take the nest in the cleft used this year, and four years ago: two years ago it was slightly disorganised, last year flattened, and this year used as a base for the nest (*vide* Plate 3 A). More information can be obtained, however, from an absolutely new nest, built last year on a shelf sloping downwards and inwards, and devoid of vegetation or debris. The experiment was disastrous, and though the disaster was as far as possible guarded against by the birds, circumstances overcame them; heavy and continuous rain beating against the rounded, upright surface of the rock, flooded their ledge and with it their nest. This is in my experience a fairly common cause of disaster. The birds know it, and to guard against it first lay a foundation of soil picked up in the form of growing mossy turf, spongy, but once soaked with water a good deflector, and additionally weighty. Into this are worked sticks as a reticulation and joists. It is built up four or five inches, uprights are gradually worked amongst its joists, and a few rough sticks thrown across the top. The nest proper is built upon this foundation, and within this framework. Upon the foundation are placed scraps of stringy bark mouth-chewed and crimped, forming a second spongy layer in degree and position, and being rather a remarkable piece of work. Then comes the first water-proof layer, consisting of leaves in texture similar to a garden gladiolus, but a little harder. Hard grasses, roots, etc., according to availability, come next into use, and are woven so as to form a continuous inside lining for bottom, sides and dome, and it is a beautiful piece of thatch. A few dried leaves attached to small twigs are invariably added to the exterior of the dome as a final touch, and the nest is complete. There is no landing platform, hood, and at present no soft, downy lining.

These architectural efforts have been tedious and long drawn out, but in the case of an old nest or growing vegetation being used as a base, the extreme care taken with the base has not to be repeated, though it does not shorten building operations much. The whole building takes a couple of months, and if disaster overtakes the nest after completion and laying, I have never known the birds to start afresh that year, nor is a second brood ever attempted after a successful effort.

A consideration of the aspect chosen cuts no ice: it is anywhere, but never exposed to full sunlight for more than a few minutes at a time, and picturesque statements of unimpeded views of valleys, etc., convey an erroneous impression. I have seen scores in which the nest faced a blank wall, and in which the birds were veritable troglodytes, the desideratum being a



Plate iii. Nest in crack Used 1921 and built on remnants of 1918 nest.

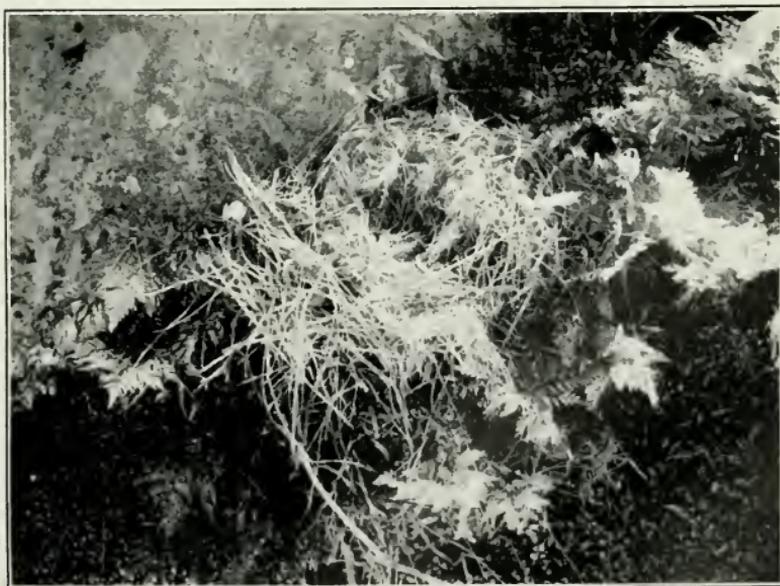


Plate iiib. 1919 nest, now flattened and exposed, will probably be used 1922.



double or treble bolting lane so that the bird can get quickly out of sight.

As to height, I have seen them placed on the ground and 25 feet up, and though usually about 8 feet, I feel sure the bird can jump twice this height without disturbing a feather.

Now is the time to get exhibitions of volplaning, which will be briefly described for the reason that it can be better studied in this open country than in other haunts of the bird. It is a unique function, and requires special technique to get a good view. Proceed as follows:—Creep up on to the top side of a rock, on the other side of which a bird is performing, and if you are heartless rush round. The male at other times makes off in a hang-dog way, his tail as nearly between his legs as he can get it, and quietly obliterates himself. But now, losing sight of his mate in the excitement, he will appear 50 yards off on a boulder or sloping tree, leaping, jumping, twirling. Disregard him, and make in the direction the hen has taken. Do your worst to frighten her. She will surely make towards her excited mate. On reaching him, they volplane 100 or 200 yards with a very gradual slope, and at a rapid pace, rising slightly at will, taking curves, and generally having some control of direction. Parachuting is similar but slower and used in play; gliding I will refer to later. The wings in all three are used only as balancers.

In July the hen lays her egg, plucks a few feathers from her thigh coverts, and leaves the nest for a few days. The egg becomes wrapped in the clinging feathers, and is well hidden, and if you extract it from the nest, you always get on the fingers a few feathers, which form the only soft lining. Returning in a day or two, she sits closely, the tail over the back along the top of the nest. I have not been able to verify *here* the statement of Ramsay and Keene (*Australian Zoologist*, vol. 1, part 4, Oct. 8, 1917, page 82), who describe the egg as being found cold for hours at least at a time, and whenever I have called upon a brooding lady, she has always been at home, or it meant disaster. During incubation it is not easy at times to flush the bird, and it is sometimes a matter of poking her off almost. She takes her bound from within the nest, no pause, no delay, and makes off round a rock out of sight. At times she will sit whilst you watch her, and if you go away and return in a few minutes she will have made off. Nor is it easy to make the bird desert either the building or the occupied nest, and handling the egg and the young are without effect. I am usually careful not to do too much of either, but within reason it is quite allowable. No attempts have been made to photograph the bird at the nest, etc., as I think the results do not justify the means; it would fuss the hen bird certainly, and the effect on the cock I do not know, as he rarely appears. May be, he would refuse to function more easily than the hen, as his general behaviour is very perplexing.

After a month's incubation—it may be a few days over, but this is difficult to decide—the young is hatched. It is a peculiar object, and is, too, wrapped in the clinging feathers. An analysis

of its leading features reveals that the upper surface is covered in *jet black down*, the under surface bare. The down follows the adult pterylae (or feather tracts), and is not uniform in distribution or in length as it is in a chicken or duckling. That on the cephalic (head) tract is very long and striking, and stands straight up in a tuft, giving the young bird the appearance of a South Sea Islander. The neck is scantily clad, the back lightly covered, and the ventral tract is simply indicated by a narrow black line almost devoid of even a suspicion of down. The down on the cephalic pteryla persists throughout the time the bird is in the nest, and is at a month old an inch long at least: the ventral tract never produces any appreciable down, and is the first to bring forth a covering of feathers. The only other striking features are the legs and feet, to which reference will be made later.

Growth is very slow comparatively, and at a fortnight the bird is quite helpless as regards co-ordinated movements, and in respect to this sub-species I cannot agree with the statement of Ramsay and Keene (*vide supra*), who state, when speaking of a bird near Gosford: "The young bird then about a fortnight old . . . temporarily escaped and had to be chased through the undergrowth."

At a month the young bird is still quite helpless as regards running, or even standing unsupported, and pants heavily in the sun if removed from the nest. I have already indicated its feathering, and there are no tail feathers. If you approach the nest, keeping out of the line of sight from the entrance, and walk round quietly, the young will chirrup gently. It never puts its head out to inspect the surroundings, and keeps up the chirruping till it catches a glimpse of the intruder, when it will gaze for a few moments and finally sink out of sight. Peer in at the opening, and it will stand up, partly supported by the walls, puff up its down and feathers, and look fierce just as a young domestic pigeon; put in your hand, and it will back to its rump finally sitting right down on its rump and hocks, the enormous feet completely shielding it. And these feet are a thing of wonder to me; they have needle sharp claws and a wonderfully co-ordinated grip in striking contrast with the other developed movements of the bird. They make one truly mindful of an instrument rather than a tool, and there can be no doubt of their precision. A young Magpie will blindly grasp and hang on with its feet: not so these, for they open, shut and grasp beautifully, like an accurate piece of machinery.

Meanwhile, it utters loud cries of alarm, similar to the adult, and chief being a high-pitched K-e-r-w-i-s-t; the mother answers, and coming from nowhere fearlessly rushes down the rocks, affording a perfect view of her carriage and gait, and another, an extraordinary movement, of which a description will be given later. The gait is a regular foot and wing movement, the foot for propulsion, the wing for balancing. Gliding from rock to rock, the feet and wings extended, she touches as a breath any-

thing the feet come in contact with, in order to get fresh impetus. Standing on a rock, the bird, vivid, fascinating, looks the personification of grace, much more chic than her mate under similar circumstances: there is a style about the whole thing, and in keeping with it is the movement to which I have referred as extraordinary. I was struck dumb when first I saw it in perfection, and it bit into my memory. The ordinary domestic hen of childhood should be called to mind: she was on one side of the fence, and you gave her chickens a start on the other; dirt, noise and vulgar scratching filled the air. Not so this belle. She may be standing on a heap of rubbish, and she may obey the same instinct as the hen, but instead of scratching she lifts the rubbish (which has been specially mentioned as light and loose) beautifully as with a hand, taking up a full grasp, and placing it on one side. The delicacy is astounding, and I have never seen any other bird do it. Many times the nature of the scratchings have been a puzzle. In my early days as a student in Sydney, the enormous power of the bird in turning over rocks had been graphically described to me: I could almost hear them crash. A. G. Campbell (Mathews' *Birds of Australia*, vol. 7, page 404) says: "The birds love to work on a bank where they can shoot their scratchings down hill." Neither of these statements holds good so far as this bird is concerned, and after looking carefully I have never seen one rock displaced, though the place is simply paved with them, and the ground beneath alive with insects. Further, hundreds of extensive scratchings have been examined. They are not haphazard, but exactly like a garden mulch skilfully loosened and having no mark of rake or fork. In the soft moss-grown soaks, bill marks are plainly visible, and this is a position much beloved by the birds in their search for food. In handling litter they prefer that which is dry, and not deep. I have never seen a hole scratched out, and this combined with actual observation, has made me come to the conclusion that scratching is a little used movement in their search for food, which consists of beetle larvae, snails, etc., the chief factor being that the animal should be a *vehicle of lime*.

The further history of the young bird is uneventful. It gradually becomes clothed in feathers, the legs strengthen, and the wings become developed. It certainly remains in the nest till it is able to move about freely, but I cannot say I have disturbed them much in these later periods, on account of the well-known proclivity which all young birds exhibit of jumping out of the nest and refusing to be replaced. It is at least seven weeks before the average bird leaves the nest and vanishes from view.

Now I have no wish to labour my points unduly. But an appreciation of observed facts should not leave the story derelict with the deserted nest, and there should be some linking up of function and structure, a passing glance in fact at applied anatomy; this more especially in so obscure a bird as the subject of these notes. It is a commonplace of Zoology that the entire class of birds is not the equivalent of a single order of, say, rep-

tiles, "to whom they are a neighbour and near bred": that the Emu and the Raven, extremes in the bird world; present nothing like the anatomical differences to be found between a lizard and a chameleon, or between a turtle and a tortoise, allies in the reptiles. It follows then that classification in birds is dependent on characters, which would be considered insignificant in other classes: characters determined as a rule by internal anatomists, who have taken a special subject and worked it up. So it is not surprising to find that the diagnostic points of the order of *Menuriformes* as laid down by Sharpe, consists of a series of comparative anatomical details, not one of which is peculiar to this order alone. Here it is: "Nestling thickly covered with down; furcula complete; sternum with a slight indentation near the outer edge of the posterior margin; plantar tarsi strongly scutellated; tail feathers greatly produced, and mostly devoid of hooklets; tensor patagii muscle Picarian; intrinsic muscles of the syrinx fastened to the ends of the semi-rings of the trachea (acromyotine); plantar tendons free."

Mathews (*B. of A.*, vol. 7, page 393) adds applied to comparative anatomy, saying: "Recent investigations have shown that great stress can be laid on superficial features if these be thoroughly studied, and that they assist in the interpretation of anatomical characters. Future consideration of these birds (*Menuridae*) must give full value to each, and a better alliance will therefore be propounded, the present being undoubtedly unsatisfactory."

Therefore I ask permission to enlarge on superficial features.

*Flight and Movement Generally.*—The movements which I have described under the name "volplaning" is this bird's chief, if not its only method of flight (parachuting and gliding are modifications of it), and if the wings are moved it is simply for balance, and not for propulsion. In jumping, the wings too may be used sometimes as balancers, but this is the exception. Jumping serves a dual purpose: first the ordinary every-day one of getting to some higher place, *e.g.*, the nest, etc., and secondly, as a preliminary to planing, without first attaining height on a rock or tree. The former can be passed by, but in the field one cannot but be struck by its grace, its efficiency, and its ease. The hen can jump almost into the nest, and certainly clean out of it, and I have already said there is absolutely no landing platform. The other purpose is worthy of closer scrutiny, and I will quote an example. The hen, for some reason unknown, will at times conceal herself under a bush till you almost stumble on her, when she bursts forth with a mighty jump, and if the lay of the land is satisfactory immediately breaks into a volplane, and travels 100 yards or more. Now this argues terrific initial muzzle velocity, and involves great muscular effort. Combined with the grasping action of the foot, which I have already alluded to, it makes one wonder whether a re-examination of the feet, legs and thighs in view of these facts would not reveal new material for classification. The grasping action in the young bird is devel-

oped, and thoroughly co-ordinated prior to any attempt at walking or locomotion. I will not enter into anatomical details. The work of Garrod on the thigh muscles, and of Garrod and Furbringer on the patagial muscles is described in general terms in any good text book on the myology of birds, and I would not dare to comment on them. *The Encyclopædia Britannica* (vol. 17, page 180 b, 1911) quotes Eyton, who states that the "Metatarsals are very remarkable in form, and their tendons strongly ossified," which is the only specific reference I can find in my limited library to the Lyre-Bird's ankle and foot. I have simply indicated in what way the actions of the bird, as seen in the field, differ from those of other birds: I will not even say essentially differ, but they certainly do superficially.

*Nesting.*—The nesting in the season at which the birds do, is undoubtedly connected with a food supply of a specialised kind. The fact that the hen is rarely found keeping the young bird warm even shortly after hatching, argues that she requires most of her daylight to collect the necessary food, and the habit of storing it up in the gular pouch and feeding the young *en masse* is a further time-saving device. As to the single egg, it has been rightly suggested it may be the specialised reproduction of a bird sure of rearing its brood. On the other hand the temperature at times falls here to 12 deg. F. in the screen; the nest is in terribly cold and exposed passage-ways, in many cases sunless, and probably the temperature all day does not rise above 35 deg. The base of the nest is wet and cold. My suggestion is that the bird uses her very big thigh coverts (examine a female from here at least, and you will be struck by them) and the thighs themselves to almost marsupialise the egg. Could she deal with two or three eggs and raise the temperature 80 deg.? I wonder? In this district, as I have said before, I cannot verify the statement of Ramsay and Keene of the egg being found hot and cold. The down covering differentiates the bird from Passeres, the young of which are born naked. I can find no record of its length persistence and characteristics except one by Leycester quoted by Gould in regard to *alberti*, in which he mentions down as being present at one month. Observations on this and other points would be interesting, especially those made in the warmer coast districts, for there is certainly a great discrepancy in the recorded observations of the general development of the young bird as found there and those observed here.

My experience of the habitat of *Memura* agrees entirely with that of Leycester (*vide supra*) in regard to the sharpness with which it is defined. He says, "And what is most remarkable, though similar, mountains and brushes exist on the rivers north and south of these rivers (Richmond and Tweed), yet the *M. alberti* is never to be found in them." There is great difficulty in getting any information as to the western boundary of the range of *Memura*. The north in the case of *novæ-hollandiæ* is defined sometimes as the Clarence usually as being the Richmond River, and the south in the case of *alberti* is defined (*vide supra*)

as the Richmond. I therefore accept these. In the north, *alberti* has been frequently recorded around Tambourine Mountain, and its usual habitat is spoken of nowadays as the MacPherson Range, but how far west each ranges I am not prepared to say. If *alberti* is a Richmond River and Logan River bird, and *novæ-hollandiæ* a Clarence River species, they should extend as indicated on the map, and a glance at this will show best what is meant. I will definitely vouch for the range of *edwardi* as shown in it. Further, *edwardi* certainly meets a Clarence River bird in the region of the Taloom Scrub and Range, and the sweep up north into Queensland to enter once more the western watershed is by way of this remnant of what was once the "Big Scrub" of the Clarence. But whether it extends over the Main Range into the MacPherson, I am not prepared to say, though it should do as the Taloom Scrub runs up into the region of Mt. Lindsay. Apparently then, *M. novæ-hollandiæ edwardi* would seem to be a highland and western race of the lowland Clarence bird, irrupting into Queensland and the western watershed at two points, making direct contact with *novæ-hollandiæ* in the region of the Taloom Range *via* the granite bastions to the east of Tenterfield, referred to earlier, and with *alberti* in the region of the junction of the Main Range and the McPherson Range east of Killarney.

My thanks are due to Mr. James Henderson for the map and photographs, to Mr. Douglas Eden for the drawings, and to Mr. W. Meharg for placing his bushcraft at my disposal in all weathers and at all times.

## The Dusky Miner (*Myzantha obscura*), Gould, with its sub-species, compared with the Yellow-throated Miner (*Myzantha flavigula*), Gould.

By EDWIN ASHBY, F.L.S., M.B.O.U., "Wittunga," Blackwood, South Australia.

I have always been dissatisfied with Gregory M. Mathews' treatment of *Myzantha obscura*, treating it, as he does, as a sub-species or geographical race of *Myzantha flavigula*, Gould.

In November of last year, I collected specimens of what were supposed to be typical *M. obscura* at Moora, about 150 miles north-east of Perth, in Western Australia. In my article in *The Emu*, xx., p. 136, attention was called to the dissimilarity of these birds to an example of *M. obscura* I had collected near Perth in August, 1901.

Later on, Mr. C. E. Orton was good enough to send me specimens which he had taken at different seasons of the year, and from which I was able to make fair skins. These investigations satisfied me that *M. obscura* deserved full specific rank, and really was not a sub-species of *M. flavigula*.\*

\* The Check List Committee at the Sydney Session of the R.A.O.U. separated these birds as two species—Eds.

It was easy to recognise two Western Australian forms and one eastern form. (1) *M. obscura*, Gld. *sensu stricto*, inhabiting the wet forest country from Perth southwards, a dark, large-billed bird. (2) The bird from Moora, a small-billed, lighter and generally smaller bird. (3) The far eastern bird described by Mr. F. E. Wilson as *M. melanotis*, and inhabiting the belt of Mallee from the River Murray eastward across the Victorian border to the Kow Plains. This is also a small-billed form, and in general size and build, very similar to the Moora bird, but easily distinguished by the black of the lores being carried right over the eye and joining the black auricular region. The upper tail coverts are in this species the same dark brownish-grey as the back, whereas in all the Western Australian forms the tail coverts are lighter than the back; this I recognised as sub-species No. 2 of *M. obscura*.

For the past year I have been endeavouring to obtain a sight of Mathews' *M. flavigula clelandi*, from Broome Hill, W.A. While satisfied with the correctness of the conclusions stated above, one could not help feeling that any paper published without reference to Mr. Mathews' *clelandi* would be inconclusive. Was Mathews' *clelandi* identical with or closely allied to the Moora bird or was it really a sub-species of *M. flavigula*?

On the occasion of a hurried visit to Melbourne on the 8th and 9th of November, the writer has in company with Mr. A. J. Campbell been privileged to examine, through the courtesy of the Curator, Mr. J. A. Kershaw, the very fine series of the genus *Myzantha* in the "H. L. White Collection" in the National Museum, Melbourne.

As I suspected, the race from Broome Hill is certainly referable to *M. obscura* and not to *M. flavigula*, and is intermediate between the dominant form and the Moora bird. I do not think we are justified in recognising more than one sub-species of *obscura* in Western Australia, and as Mr. Mathews has designated the Broome Hill bird under the name *clelandi*, we shall probably have to refer all variants in W.A. to that sub-species or the dominant species, but for the purposes of this paper I will designate the Moora bird as *M. obscura ortonii* after the gentleman who has assisted me with specimens, and has done so much work amongst the birds of Western Australia. This race seems to be the extreme variant of *obscura* in Western Australia, and it is possible that it occurs in the belt of coastal mallee and timber as far east as the Nullarbor Plains, and it is not unlikely that there may be a link between *ortonii* and *melanotis* still to be found between Eyre's Peninsula and the Nullarbor Plains. I should like to have taken measurements of the very fine series in the "H. L. White Collection," but time did not permit.

### ***Myzantha obscura*, Gould. Dusky Miner.**

Large bill, culmen 27 mm. Upper side, except tail coverts, dark brownish-grey, under side about the same tone without the

brownish shade; chin, throat, and cheek about the same shade of dark, brownish-grey as crown and neck. By cheek throughout this paper is meant that strip of feathers between the gape and the lower extension of the lower mandible, and extending well below the ear coverts and measuring about 18 mm. in length. Upper tail coverts a paler shade than the back, but otherwise the same colour.

One specimen, female, collected by writer near Perth, at Bayswater in August, 1901.

One specimen, male, from near Perth, in S.A. Museum, similar to above.

One specimen in National Collection, Melbourne, not quite typical, probably a juvenile, from Guildford, near Perth. Another specimen in same collection labelled as from near Perth (no locality) is the inland form, *clelandi*, Mat.

(a) Northern Variant.—Two males were sent to me in the flesh by Mr. C. E. Orton on 20th October last from Dandaraga, about 100 miles north from Perth, and within 50 miles of the coast. These birds are as large as the birds from near Perth, but are washed throughout with a marked brownish tinge; the cheeks, chin and throat are paler than the crown and neck; they are both evidently breeding, or I should have thought the brown tinge was due to immaturity.

#### *Myzantha obscura clelandi*, Mathews.

Small bill; differs from the dominant form in being generally paler; cheek, chin and throat paler than crown and neck.

Three specimens in the "H. L. White Collection" collected by Mr. Tom Carter at Broome Hill, 200 miles S.E. of Perth, and marked *obscura*.

Two specimens, both males, from the Stirling Range, the nearest part of which is about 25 miles south of Broome Hill. These were collected by Mr. Whitlock.

#### *Myzantha obscura ortonii*, Ashby.

Small bill; culmen 20 m.m. Differs from *M. o. clelandi* in being generally paler, the brown tinge present in all the other forms from W.A. being almost absent; the cheek, chin, and throat silvery grey.

Four specimens in my own collection, two of which were taken by myself from Moora, which is situated about 100 miles north of Perth and the same distance from the coast.

One specimen, a very large one, in the "H. L. White Collection," marked *obscura*, from Esperance Bay, about 250 miles further to the east than any of the other localities referred to. But for its large size this Esperance Bay bird corresponds closely to the birds from Moora.

#### *Myzantha obscura melanotis*, Wilson.

Small bill; culmen 20 mm. Differs from *M. obscura sensu stricto* and the two sub-species noted above, in that the black of

the auricular region is continued right over the eye to the lores. It differs from *clelandi* and *ortoni*, in having dark grey cheeks, almost as dark as the dominant form, but it corresponds with *ortoni* in the almost silvery-grey of the chin and throat, but in the eastern form there is some evidence of streaking on the chin and throat. The whole of the under side corresponds with *ortoni*, but the upper side is almost as dark as *M. obscura*, but it differs from all the western forms in showing no paling of the upper tail coverts, they being practically the same shade of brownish-grey as the back. The yellow gular mark is most developed in *ortoni* and least developed in *melanotis*; in fact in this latter form it is sub-obsolete.

This very distinct form has up to the present only been recorded in South Australia from that belt of mallee lying, roughly, between a point 20 miles south of Loxton to the Pinaroo railway line, and commencing within a few miles of the River Murray and extending eastward to the Victorian border. This bird inhabits an eastern extension of this belt as far as the Kow Plains in Victoria.

I have taken a nice series at Karoonda, and also within five miles of the River Murray, 10 miles north of Mannum. *Myzantha garrula*, Latham, is common in the large red gums along the banks of the Murray, but five miles back in the mallee the bird under discussion is the only species of *Myzantha* seen.

In the "H. L. White Collection" are two skins—a male and female—from Kow Plains in Victoria, which are identical with the Karoonda specimens.

### *Myzantha flavigula*, Gould. Yellow-throated Miner.

Differs from *Myzantha obscura* and its three sub-species dealt with in this paper, in having white cheeks, almost white chin, strongly developed yellow gular marks and extremely light, almost white, upper tail coverts.

These features are consistent in all the forms, and while there is some range of divergence in specimens from widely separated localities, their general tone is characteristically lighter than any of the forms of *M. obscura*. I have in my own collection specimens mostly collected by myself, from Pungonda, 20 miles south of Renmark, near Broken Hill, Mt. Gambier, Port Germain and Leigh's Creek, all, with the exception of Broken Hill, in South Australia. I also collected this bird in August, 1901, on the gold-fields in W.A. at a point about 300 miles due east of Moora.

In the "H. L. White Collection" I saw a very fine series commencing at the Murchison and extending round the north-west of the same State through the Northern Territory, through the Gulf country into Queensland, in addition to skins from New South Wales and Victoria. The whole of the series are consistent in their general characters and easily separated from any of the forms of *obscura*.

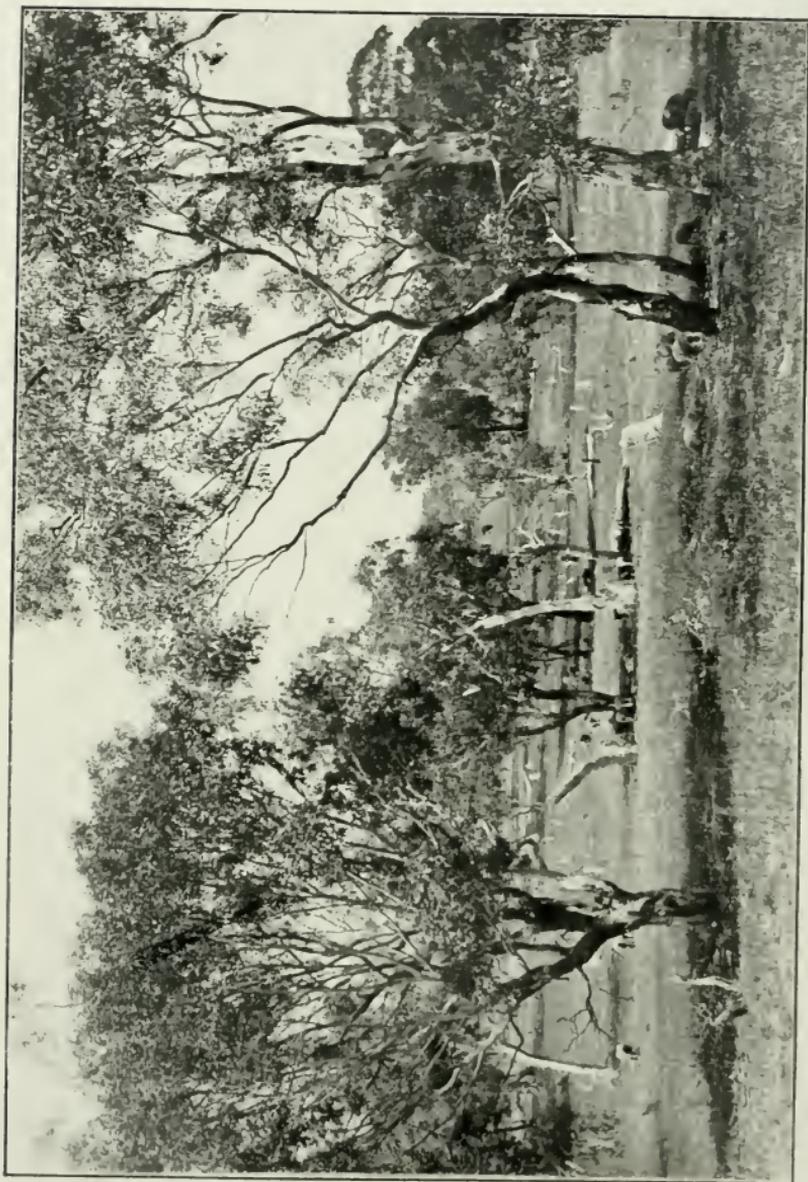
Conclusion.—The claim that *M. obscura*, with its variants, is a geographical race of *M. flavigula* is, I contend, without sub-

stantial foundation. I was much astonished to find *M. flavigula* at Pungonda, on the Victorian border, the skin taken by me, corresponds with those I have taken on Spencer's Gulf and east of Broken Hill. I also saw in the "H. L. White Collection" two similar specimens of this species from the border mallee of Victoria. It will thus be seen that the range of the habitat of these two distinct species, almost, if not quite, overlaps; certainly they come within 20 miles of one another.

Another interesting feature is that the specimens collected by the writer at Speakmans, on the W.A. goldfields, 400 miles inland, were certainly *M. flavigula*, whereas at the same latitude 300 miles further west we have *M. obscura ortonii*, and in a coastal range 50 miles further west we have a large-billed variant of *M. obscura*.

It appears as if the whole question of habitat resolves itself into one of rainfall and its attendant vegetation. Thus as far as my experience goes, *M. flavigula* is found within the salt-bush and blue-bush area, in all the localities given by me above, from the Victorian border at Pungonda to the far west at Speakmans; this is certainly the case. On the other hand, even Karoonda, in the South Australian mallee, where *M. obscura melanotis* is so numerous, is just outside the line of salt-bush, although not many miles away. Again, in Western Australia, *obscura sensu stricto* is confined to the wet south-west corner of that State in an area probably well defined by the growth of jarrah (*Eucalyptus marginata*), but in the belt of dryer country to the east, well defined by the growth of "Jamwood" (*Acacia acuminata*), we have the two small-billed forms, *M. obscura ortonii* in the north, and *M. o. clelandi* in the south, with *ortonii* recurring at Esperance. In 1888 I noted that the "Jamwood" grew to perfection in the neighbourhood of Etipup, now called Broome Hill, and last year I noted the same acacia at Moora, though there less robust in growth. Mr. A. W. Milligan, in *The Emu*, iii., p. 11, 1903, says, in his description of the birds of the Stirling Range, "The Dusky Miners were found only in the 'jamwood' (*Acacia*) country at Toll's Creek"; and on the following page, "Again I was not satisfied of the identity of the Dusky Miner (*M. obscura*); the Stirling Range bird appeared to be much smaller than the Swan River bird." Finally I would submit the opinion that *Myzantha obscura* is not directly descended from *Myzantha flavigula*, but that they are each modern representatives of two distinct branches of some ancient stock. The *flavigular* stock have developed the yellow gular mark and yellow tuft at the gape to a striking degree, whereas these features are much modified in *obscura* and in the eastern sub-species, whose habitat overlaps that of *flavigula*, these features are sub-obsolete. It is more than likely that some intermediate form of *obscura* will turn up between Esperance Bay in Western Australia and Eyre's Peninsula, in South Australia. I think it should be sought for in the belt of country between the sea and the line of salt-bush.





Typical open forest country, Canberra, Federal Capital Territory.

Photo. by Charles Barrett, C.M.Z.S.

## Birds Around a Homestead

By CHARLES BARRETT, C.M.Z.S., Melbourne.

Glimpses of bird life in the Federal Territory, during two visits (the latest in November, 1921) do not encourage me to compile a list, for I have notes on fewer than fifty species. My observations, beyond the paddocks of Tuggranong, were made from a motor car, on journeys to and from Yass and the homestead, with a side glance at Duntroon.

I believe that the Territory is good bird country, for the small area which I was able to "work" afoot, with a little leisure, held more than forty species, and nearly all were strong in numbers. The Canberra country is diversified. Pleasant landscapes lie all about the capital. Wherever you wander, you are glad that you came, though in summer heat you may wish for more trees in some parts, and the music of running water. Still, there are streams, and wide tracts covered in eucalypts, mingled with other trees. There are hills too within the Territory and beyond; hills that are always beautiful, from sunrise till the last flake of light has faded from the sky. There are long winding roads that lead over slopes and through wide valleys to the rivers. Forest and pasture land, paddocks aglow with wild flowers, rocky rises, and creeks that flow, shadeless, through crumbling grey earth, or beneath old willow trees.

There are gardens, too, about the homesteads, where trees from other climes stand beside familiar natives. Duntroon and Tuggranong and the plantation reserve are sanctuaries for bird life; but they shelter more aliens than natives. Goldfinches are so abundant that often their notes drown the songs of other species in the garden. They nest in rose bushes, and pink-flowered hawthorn as freely as Sparrows in a hedgerow.

On the journey from Yass, I noticed a little comedy. A Brown Hawk (*Ieracidea berigora*) flew high over the car, pursued by two Magpie-larks (*Grallina cyanoleuca*) and a Black and White Fantail (*Rhipidura leucophrys*). The Hawk appeared to be flustered. He dodged and changed direction once or twice, but the smaller birds baffled him, and at last the Fantail alighted fairly on his back, and rode for fifty yards or more, probably pecking at its foe all the time; though, lacking glasses, I could not be sure about this. The Hawk soon afterwards flew on to a telegraph line, and was left there in peace.

My business took me to Tuggranong homestead, where the official history of the Australian Imperial Force in the war is being written by Mr. C. E. W. Bean. The garden and orchard, with a creek flowing through, a long drive lined with pine trees, and paddocks stretching away to the hills claimed me in leisure hours.

Bird observing began at dawn, when songs from the garden rippled through my dreams. It was good to be stirring then, to

go down a rose-bordered pathway to the creek, where Rufous Whistlers (*Pachycephala rufiventris*) were singing high in the willows. Every day I heard them, triumphing over lesser birds that called and sang much nearer to the ground. One Whistler favoured an almond tree, whose boughs reach over the homestead roof; his nest, maybe, was close at hand, but I failed to discover it.

Just over the creek, in the orchard, lay the haunt of many birds. Flocks of Rosellas (*Platycercus eximius*) and Crimson Parrots (*P. elegans*) came to the trees every morning, but rarely remained for long. The "residents" included Black and White Fantails, Blue Wren-Warblers (*Malurus cyaneus*), Brown Tit-Warblers (*Acanthiza pusilla*), Silver Eyes (*Zosterops lateralis*), and other familiar small birds. Here, too, I saw the Kookaburra (*Dacelo gigas*), and heard the piercing call notes of Grallinas along the water side. Wood Swallows (*Artamus cyanopterus*) were nesting, and, rarely, a Pallid Cuckoo (*Cuculus pallidus*) called.

Walking through the sheepyards, down past the woolshed, I had the company of Welcome Swallows (*Hirundo neoxena*), and saw many Sparrows, whose nests were hidden about the roof of the old building. Swallows nest under the verandah of the homestead, and rear their broods every season. One nest is on a window sill, close to a wire-screened door—a good hunting-ground for flies.

In November, Bee-eaters (*Merops ornatus*) were plentiful around the garden. They perched on boughs and clothes lines, singly or in rows of three or four, darting after insects now and then, and uttering the notes that fall so pleasantly on a bird-lover's ears. Among hawthorn bushes, relics of a hedge, or strays from an old garden, Tit-Warblers and Robins were fairly plentiful. I saw flocks of the Yellow-tailed Tit-Warbler (*Acanthiza chrysorrhoa*), and found a few nests. The Scarlet-breasted Robin (*Petroica multicolor*) was here; but he had a rival in the Red-capped Robin (*P. goodenovii*), whose glorious coloring won the admiration of an English lady at the homestead. "He is more brilliant than our Robin Redbreast," she said. This bird was so tame that it allowed me to approach within two yards of its perch on a fence post. Then, as I remained still and watchful, it flew down and captured an insect in the grass close to my feet. Each morning I saw it in the same place; once the female was there, and the pair danced attendance on two young Redcaps, which called from a bower of hawthorn leaves. The behaviour of these Robins indicated that they had rights over a small territory, though I did not actually see them drive away intruders. Earlier in the season, doubtless, before their brood had ranged, the Redcaps were less tolerant. I am convinced that at least some species of Australian birds, like those of which Eliot Howard has written ("Territory in Bird Life," by H. Eliot Howard), guard areas, whose boundaries are more or less well

defined, in the breeding season. When studying the Warblers, this ornithologist "became aware of the fact that each male isolates itself at the commencement of the breeding season, and exercises dominion over a restricted area of ground." Here is an untilled field for Australian observers. The breeding territory, as Eliot Howard observes, is "useful in various ways, but not necessarily in the same way for every species." Food supply must be one factor. When rival males fight, it is possible that, in some cases, the trial by battle is not for the sake of a mate, but for the right of dominion over some area suitable for the species to nest in, and yielding a rich supply of food. Often enough, the males fight after they have mated, or a male with a nest building may attack an unmated bird which ventures into his territory. The evidence in support of the theory of territory in bird life is lucidly discussed in Eliot Howard's work, which I would advise every Australian bird observer to read.

Digressions are pardonable in writing of birds about a homestead, where your eyes may be won from a fragrant rose to follow the flight of a Swallow. Notes cannot be neatly packed into paragraphs, headed by the name of the species, if one wishes to convey an impression of the birds and their environment. We need more freedom in writing, I think; all facts are scientific, though they may not be marshalled in the conventional way.

A mile from the homestead, one Sunday morning, I rambled along a road, which ran through a stretch of open forest country. Sheep were resting in pools of shade, formed by wide-branching eucalypts, and the air was thrilling with insect noise. "All the live murmur of a summer day." Bird song mingled with humming and buzzing. It was pleasant, after a walk in sunshine, to lie on the grass, and name all the birds from their voices. The Murrumbidgee was not far away. I had set out to see it, but birds lured me from the road, and I gave my leisure morning to observing their ways and listening to their music: a profitable use for hours of idleness.

Black-backed Magpies (*Gymnorhina tibicen*) were feeding young birds on the ground. I followed one later close to the homestead, and found that it could fly almost as well as its parents. Some of the Magpies had broods on the wing; others were still busy with cares at the nest. Black-faced Cuckoo-Shrikes (*Graucalus nova-hollandia*) also were nesting in trees along the roadside. But the most abundant birds here were Brown Tree-Creepers (*Climacteris picumna*), and the White-shouldered Caterpillar-Eater (*Campephaga tricolor*). The high, piping call of the one, and the loud, running notes of the other, were heard continuously. The songs of White-throated Fly-eaters (*Gerygone albobularis*) were heard, too, reminding me of rambles about our camp at Ellerslie, on Wallis Lake, where these small singing birds were so plentiful.

Among the gums White-winged Choughs (*Corcorax melanorhamphus*) were foraging in companies. They were bold and in-

quisitive, and noisy, too. But not more familiar than the flocks of White-browed Babblers (*Pomatostomus superciliosus*), which hopped from branch to branch of a tree almost within hand's reach. They regarded me at first with some signs of curiosity, but soon continued their game of "follow the leader."

Fantails, the Shepherd's Companion, I saw feeding among the flocks; one, now and then, would perch for a minute on a sheep's back. White-shafted Fantails (*Rhipidura flabellifera*) were not rare; and I heard the call of a Restless Flycatcher (*Seisura inquieta*) not once, but many times; with the "Peter, Peter, Peter" of the Brown Flycatcher (*Microeca fascinans*) sounding farther away. All familiar birds, you see, but good company for an observer at any time of the year. Maybe we have yet much to learn respecting our commonest species.

Returning from my ramble, I dipped down to the creek, seeking a bend where Fairy Martins (*Hylochelidon ariel*) had a colony of nests last season. But winter floods had swept away great flakes of the high bank, and the birds had gone elsewhere to nest. Within cooe of the creek a pair of Spurwing Plovers (*Lobilyx nova-hollandia*) reared a brood. These birds are not rare in the Territory; often, at night, I heard them calling, as they flew over the homestead. Another voice of the night was that of the Boobook Owl (*Ninox boobook*), which sheltered by day in the pine trees.

Around Tuggranong I had no glimpse of the White Cockatoo (*Cacatua galerita*); but the species abounds in the Territory. I heard that hundreds had been poisoned in one paddock. "They are terrible pests," was the reason advanced for this destruction of beautiful birds. And a sheep farmer, when I spoke to him of the value of the Wedge-tailed Eagle (*Uroaetus aodax*) smiled grimly. He laughed at words in praise of the Crow (*Corvus coronoides*), holding it to be one of the worst birds in sheep country. The man on the land does not always recognise his friends. It seemed to be news to this farmer that crows devour the larvae of blowflies, "grubs" that fatten in the "golden fleece."

Just beyond the shed, where shearers were working on a small flock, I discovered the nest of a pair of Black-backed Magpies, fifty odd feet up, near the end of a horizontal bough. While I was looking at it, a Friar Bird (*Tropidorhynchus corniculatus*) claimed attention. It led me from tree to tree, until I wearied of the chase. I thought that this might be the bird which had entertained me earlier, at the homestead. There it had found a supply of nesting material—a loose end of clothes-line hanging from a post. From the garden, I watched the bird fly up to the post, then on to the rope, at which it tugged stoutly with its bill, striving to gain strands for its nest, I suppose. Half a dozen times it essayed the task, retiring in the intervals to rest in a tree near by. At length it acknowledged defeat, and flew, straight as an arrow goes, to a belt of gums, nearly half a mile away.

These are but glimpses of the bird life around Tuggranong, gleanings of brief rambles. With more time for observing, one might have named, perhaps, a hundred birds for the district.

In the books of early travellers, there are records of bird life in the vicinity of Canberra. Dr. George Bennett, in the "thirties" of last century did some observing in the Yass district. He states that Black Cockatoos (*Calyptorhynchus funereus*) and White Cockatoos had become very numerous, the former apparently attracted by trees settlers had felled to make a clearing for cultivation. He saw small trees whose downfall was due to the attacks of Black Cockatoos, which sought for insect larvæ in the trunks. "Should the object of their search be situated (as often occurs) far in, before they reach it, the trunk is so much cut through that the slightest puff of wind lays it prostrate."

Canberra's future bird lovers will have a fair choice of places for their field days. Bird life should remain plentiful on the plains and among the hills, long after the city has been built and peopled.

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## Observations and Records of Australian Sea-birds, 1920-1.

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On March 6th, 1920, the writer left Fremantle for Durban. On the following day a single Wandering Albatross (*Diomedea exulans*) was astern of the ship for a few hours, but this was the only bird seen until Cape Hens (*Procellaria aequinoctialis*) appeared on March 11th. At that date, however, we were in 31 deg. S. lat., 87 deg. E. long., a position considerably nearer to Amsterdam Island than to Australia. Wandering Albatrosses reappeared on March 12th.

On July 2nd, 1921, on a voyage back from Capetown to Fremantle, our noon position was 32 deg. S. lat., 96 deg. E. long., and I was once more in Australian seas. Owing to the season being mid-winter, and perhaps partly also owing to the rather more southerly course, birds were seen in numbers throughout this voyage. The species met with in Australian waters will be referred to below.

During a brief stay in Perth, Mr. L. Glauert, F.G.S., of the W.A. Museum, showed me a number of specimens of Tubinares obtained since my departure, and kindly gave me full particulars about them.

Subsequently, by permission of Mr. H. A. Longman, F.L.S., the director, and with the assistance of Mr. M. J. Colclough, the ornithologist, I was permitted to examine and make notes upon the seabirds in the collection of the Queensland Museum, Brisbane.

I travelled to the annual conference of the R.A.O.U. in Sydney by steamer from Brisbane, and, in spite of the very rough weather experienced, was able to observe a number of sea-birds. Whilst in Sydney, through the kindness of Mr. J. R. Kinghorn, I examined the collection of Cormorants in the Australian museum. Unfortunately the continuous sessions of the Union and the Check-list Committee left me no time to look at certain other specimens which I had hoped to see.

The notes obtained on these several voyages, with some scattered observations on birds seen on the east coast in New South Wales and Queensland, and the specimens in the three museums mentioned will, I think, add a little to our knowledge of Australian sea-birds and their distribution, and as regards Tubinares, supplement my article in *The Emu*, vol. xx., pp. 14-24 and 66-74.

**Eudyptula minor.** Little Penguin.—A specimen captured at Coolangatta, Queensland, just north of the New South Wales border on May 15th, 1920, is in the Queensland Museum. The capture was recorded by Mr. Longman in the *Memoirs of the Queensland Museum*, vol. 7, but has not, I think, been previously mentioned in *The Emu*. New South Wales ornithologists consider that the bird is extending northwards in that State, and it is interesting to note that a pioneer has just managed to reach Queensland, where it suffered a fate which is not uncommonly the lot of pioneers.

**Oceanites oceanica.** Wilson Storm Petrel.—In *The Emu*, vol. xxi., p. 191, Mr. Campbell records that Mr. McLennan saw numbers of Storm Petrels near Cape York on July 7th and 8th, 1921, which he thought were of this species. Mr. Campbell adds: "Considering the latitude, I think this is doubtful." While agreeing with Mr. Campbell's further remark that it is a great pity specimens could not be collected to settle the point, it seems to me highly probably that Mr. McLennan's suggestion is correct. Dr. R. C. Murphy has shown conclusively, in a paper entitled "A Study of the Atlantic Oceanites," in *The Bulletin of the American Museum of Natural History*, vol. xxxviii., p. 117, that this species, after breeding in the Antarctic regions south of the Atlantic, regularly migrates through the tropics into the North Atlantic, reaching as far north as the British Isles and Labrador, and being common from May to September on the Atlantic coasts of the United States. Whilst in a paper on birds of the South Atlantic in *The Auk*, vol. xxxi., p. 439, the same author records seeing them almost every day in numbers in a voyage to South Georgia in October and November, and on the return voyage in March and April right up to New York. I saw specimens, which I feel confident were of this species, in April, 1920, in the tropical Atlantic on both sides of the Equator.

In the Indian Ocean, Wilson's Petrel has been obtained off the Mekran coast of the Arabian Sea in May, and there is a specimen in the British Museum supposed to be from Port Essington.

In view of these facts, its occurrence off Cape York in the winter would not be surprising, though it has never yet been recorded from the North Pacific.

**Fregetta tropica.** Black-bellied Storm-Petrel.—There is a mounted specimen of this species in the Queensland Museum labelled S.E. Queensland. Unfortunately no particulars as to its capture are available, and it is possible that the label is intended to indicate its probable distribution within the State, not that it was obtained in that region. Only two specimens are on record as having been captured in Australian waters, though both Gould and Giglioli record seeing them in the seas south of the continent. I had the pleasure of watching one for some hours on June 24th, 1921, in the Indian Ocean in 34 deg. S. lat., 58 deg. E. long. It mostly kept very close over the water near the stern of the ship, rarely flapping its wings, but hopping along over the surface with its wings spread out, gaining much of its impetus from its feet, which struck the water simultaneously, not alternately as commonly depicted in pictures of Storm-Petrels. It was a long time before I satisfied myself that it had a black stripe on the belly, as it rarely rose high enough to show much of its breast, even from the comparatively low stern of the cargo-boat on which I was travelling. The specimen in the Queensland Museum agrees closely with the description of the Australian specimen in the Macleay Museum given in Mathews' and Iredale's Handbook, except that it has no white margins to the feathers of the upper surface. The culmen measures 14 mm., and the tarsus 42 mm.

**Pelagodroma marina.** White-faced Storm-Petrel. — The Queensland Museum has a specimen captured in Moreton Bay. The previous most northerly record on the east coast appears to have been the Tweed River, N.S.W.

**Puffinus assimilis.** Gould Shearwater.—There is a specimen in the Queensland Museum labelled S.E. Queensland. As in the case of the specimen of *Fregetta tropica*, this may be meant to indicate its supposed range, and as particulars of its capture are wanting, it cannot be taken as evidence that the species occurs in the seas of eastern Australia.

**Puffinus griseus.** Sooty Shearwater.—Large numbers of dark Shearwaters were seen off the coasts of northern New South Wales, especially off the Solitary Islands, when travelling south to Sydney on October 2nd, 1921. They were also seen out at sea from the coast opposite the R.A.O.U. camp at Wallis Lake. Two dead birds picked up on the beach at the latter locality seem to be referable to this species, and not to the very similar

Mutton-bird (*P. tenuirostris*). According to North, the Wedge-tailed Petrel (*P. pacificus*) is the common species on the coast of New South Wales. On October 22nd, at Coolangatta, South Queensland, I saw a specimen of one or other of these species a few yards out from the shore floating about inside the breakers. I waded out to capture it, thinking it must be wounded, but just as I reached it it started paddling away, and rapidly took to flight, circling back inland and settling on the beach. Here two dogs made a rush for it, but it just managed to avoid them, and, skimming away over the sandhills, disappeared from sight in the direction of Tweed Heads.

**Procellaria aequinoctialis.** Cape Hen.—My observations on this species on two recent voyages across the Indian Ocean seem to have some bearing on the question of its occurrence in our waters. In March, 1920, when travelling from Fremantle to Durban, a pair appeared in 31 deg. S., 87 deg. E., and considerable numbers were seen every day after that until we reached the African coast. On the return voyage they were seen in great numbers the first two days after leaving Capetown in June, 1921. The next two days they were still numerous, and on each of the following days two were seen. The last were observed in 34 deg. S., 48 deg. E. Ferguson records that further south in 41 deg. S. lat. this species was observed daily until well south of Australia (*Emu*, vol. xxi., p. 110). This seems to constitute the first definite record of this species in Australian seas, as Gould is perfectly explicit in his statement that the birds he saw in the neighbourhood of St. Paul and Amsterdam Islands and thence to Australia were the Spectacled Petrel (*P. conspicillata*).

It is interesting that Ferguson saw one of this latter species off the South African coast. Is it perhaps a dwindling species which has become much rarer since Gould's time? It is noteworthy that the specimens in Museums are nearly all old ones. I have seen numbers of Cape Hens in the last two years on the coasts of Peru, Chile, Uruguay, Brazil and South Africa, and all the way across the South Atlantic from Rio de Janeiro to Capetown, but not one with the spectacle markings. Murphy did not meet with them in his South Atlantic voyages referred to above, though according to Mathews and Iredale most of the specimens recorded have been met with in that ocean.

**Procellaria cinerea.** Brown Petrel.—I saw two specimens of this bird on July 2nd, 1921, in 32 deg. S., 96 deg. E., and another the following day in 32 deg. S., 101 deg. E. The former position is about intermediate between Amsterdam Island and Australia, but the latter is definitely nearer to the continent, so that I can add my own name to those of Gould, Giglioli and Macgillivray as having seen it in Australian waters. (See *Emu*, vol. xx., p. 21.) I had previously seen it on a number of occasions

further west in the Indian Ocean. It is very similar in general coloration to the Mediterranean Shearwater (*Puffinus kuhli*), but can be distinguished by its dusky under wing-coverts and under tail-coverts. The birds seen in the Indian Ocean were solitary individuals with a flight much like that of the Cape Hen, and some of them followed the ship for hours, often coming close to the stern. In the South Atlantic I twice saw great flocks of these birds—on March 30th, 1920, not far from the South African coast, and on May 5th, 1921, off the coast of Rio Grande do Sul, Brazil. These flocks had presumably collected to feed on shoals of fish, and their behaviour was very different from that of the solitary birds previously mentioned. They were flying low over the water, sometimes rising up and circling round and at intervals shooting down diagonally and plunging beneath the surface. On the second occasion many were also seen resting on the water.

**Pterodroma macroptera.** Great-winged Petrel.—When traveling west across the Indian Ocean in March, 1920, these birds were only met with two days before reaching Durban; but, on the return journey in June and July, 1921, they were seen almost every day between 48 deg. E. and 101 deg. E., generally solitary birds or two or three together.

**Pterodroma lessoni.** White-headed Petrel.—Small numbers of these birds were seen every day but one between 73 deg. E. and 101 deg. E. on the same journey. The latter position is within our limits.

**Pterodroma mollis.** Soft-plumaged Petrel. I made the acquaintance of this species in the South Atlantic on May 25th, 1921, in 30 deg. S., 24 deg. W.; thence to Capetown they were seen nearly every day. After leaving the Cape, we soon met with them again, and they were among the most numerous of the birds about the ship right across the Indian Ocean, several being seen on the morning of July 6th—the date on which Rott-nest was sighted at noon. They were extremely abundant in 48 deg. E. and 53 deg. E. on June 22nd and 23rd. The white forehead, dark patches on the side of the neck, and dark band from the wings across the middle of the slaty-grey back readily distinguish the bird if a good view is obtained.

On my arrival in Perth I was most interested to be told by Mr. Glauert that he had captured a specimen with a broken wing on the beach at Cottesloe on March 29th, 1920. He states that it was an immature female, and that the stomach contained the eye of a cephalopod and beaks of the same. The previous specimen captured at Cottesloe was then still in England, where I had taken it to confirm my identification of the species and to show it to Messrs. Mathews and Iredale. Judging from memory, Mr. Glauert's bird is a good deal lighter blue-grey in general coloration. Since then I have read with satisfaction Ferguson's

remarks (*Emu*, xxi., p. 110), in which he records having seen this species on several occasions in the South Indian Ocean, and also in the western part of the Bight. He says: "I believe that it will be found to be not uncommon in Australian seas, at any rate at some seasons of the year." How dangerous it is to assume that absence of specimens in museums is proof of the absence of the species! Mathews and Iredale in their Manual say: "Atlantic Ocean only—the specimen recorded from Australia shows no appreciable difference from typical birds."

**Macronectes giganteus.** Giant Petrel.—This large, dusky bird, with its pale bill, was seen at intervals during the voyage across the Indian Ocean in June and July, 1921, a solitary specimen generally appearing and flying about the boat for a few hours. The last was seen in 110 deg. E. two days before reaching Fremantle. Mr. Glauert tells me that it was not at all rare at Cottesloe during the winter of 1920, but only one was preserved as the Museum had plenty of specimens. Mathews and Iredale state in their Manual, "Occurrence in West Australian seas recorded, but no specimens seen," after giving its range as "East Australian Seas." Mr. Mathews could have seen the specimens if he had asked to do so when he was in Perth some years ago. I saw a few individuals when travelling from Brisbane to Sydney in October, 1921, off the northern coast of New South Wales, and Ferguson also records seeing it north of Sydney. A pair in the Queensland Museum obtained by Mr. Colclough on Mud Island, Moreton Bay, show that its range extends to the coasts of South Queensland.

**Daption capense.** Cape Pigeon.—This well-known species was observed by me every day on my journey across the Indian Ocean in June and July, 1921, the last being seen on the morning of July 6th just before Rottneest Island was sighted. In *The Ibis*, 1920, p. 693, Mr. T. Carter records the occurrence of this species on the coast of Western Australia almost as far north as Geraldton, in October, 1916, after a heavy gale. No definite record of the actual capture of a specimen of this bird in Australia seems to have been published hitherto, but I can now record no less than four. The Queensland Museum contains a mounted specimen, which Mr. Colclough tells me was obtained many years ago in Moreton Bay by Mr. A. Alder, and the W.A. Museum now contains three specimens from Cottesloe, obtained respectively on June 23rd and October 26th, 1920, and July 14th, 1921.

**Prion vittatus.** Broad-billed Prion.—Two more specimens of the Western Australian form of this species reached the W.A. Museum in July, 1921. One was captured alive at Yarloop, in the Darling Ranges, 30 miles inland, on the 5th, and the other picked up on the beach at Cottesloe on the 14th. During the past two years I have had the opportunity of inspecting the

Petrels of the genus *Prion* in the British Museum; National Museum, Washington; American Museum, New York; Brooklyn Museum; Buenos Aires Museum and Capetown Museum. In every case where there is a series from a single locality, considerable uniformity is apparent, and in many cases two or more types can be picked out. Far the most striking is the typical Broad-billed *Prion* from New Zealand, which can be picked out at sight in any collection, and the statement made that it came from New Zealand without looking at the label. However, in the Capetown Museum the birds from Tristan d'Acunha show a close resemblance to the typical specimens. In my opinion the gap between these Broad-billed *Prions* and the birds found in Western Australia which Mathews names *P. v. missa* is at least as great as between these latter and *P. desolatus*. At any rate I can support Mathews' main contention that when localities are taken into account there is a constancy about the series observed which plainly indicates the existence of species or at least subspecies amongst the *Prions*, even though a set of birds taken at random may show almost every gradation from the broadest bill to the narrowest.

I am in agreement with Ferguson that it is quite impossible to distinguish species seen at sea, though like him I have constantly met with large flocks when travelling in southern latitudes. On at least two occasions whales were seen just where the flocks of these birds were most numerous, justifying the sailors' name of Whalebird. Probably an abundance of plankton is the cause of the presence of both whales and birds.

**Prion Turtur.** Fairy *Prion*.—There is a specimen of this very distinct species in the Queensland Museum labelled S.E. Queensland, but no particulars of its capture are available.

**Diomedea exulans.** Wandering Albatross.—Only one of these birds was seen in Australian waters after leaving Fremantle on the westward journey in March, 1920, though a few were seen in the central part of the Indian Ocean. On the return journey in June and July, 1921, they were seen every day from Capetown to Fremantle, the last leaving us just before Rottneest Island came in sight. They were numerous off the northern coast of New South Wales in October, 1921, and one followed our ship in through the heads of Sydney Harbour and continued to fly round us for an hour or more while we were anchored in Watson's Bay waiting for the doctor. According to Mathews' and Iredale's Handbook, birds from the South Atlantic, Indian Ocean, and South Pacific differ in the colour of their eyelids. I have been unable to observe this, but the birds I saw when crossing the South Atlantic appeared to have decidedly yellow bills, whilst those seen in the Indian Ocean and on the coast of New South Wales had rosy bills shading into yellowish at the tip. All the birds seen in the South Atlantic had the whole of the primaries black, whilst in the Indian Ocean and on the New

South Wales coast individuals were observed with practically the whole of the wings and tail white; all had, however, some black on the tips of the primaries and tail feathers. Possibly these very white individuals were *D. chionoptera*, but every gradation was seen between them and birds with the greater part of the wings dark. In the Indian Ocean most of the whiter birds had conspicuous orange patches on the side of the neck. One or two were seen on the coast of New South Wales with well-marked dark caps on the head, and all those seen in the South Atlantic had a dark tinge on this region. The plumage variations in these great birds are undoubtedly very puzzling, and observation of the large numbers which can be closely observed at sea makes one realise how unlikely it is that the matter can be solved by study of the comparatively small series existing even in the largest museums.

**Diomedea melanophrys.** Black-browed Mollymawk.—This species was very abundant about the Cape of Good Hope, and was seen in small numbers every day as far as 68 deg. E. in June, 1921. A single bird in 106 deg. E. was the only one seen in the eastern half of the Indian Ocean. They were numerous on the coast of New South Wales in October, 1921. There is a specimen in the Queensland Museum labelled S.E. Queensland. The immature bird with its dark grey neck and dark bill was seen on several occasions, and I agree with Ferguson that some observers may have mistaken this bird for the Grey-headed Mollymawk (*D. chrysostoma*). I made this mistake myself when I saw this form in the South Atlantic, but subsequently when I had better views of them in the Indian Ocean realised my error. A specimen in this plumage was obtained by Mr. Glauert on the beach at Cottesloe on August 21, 1920, and is now on exhibition in the W.A. Museum alongside the other species so that the differences can be readily noted.

**Diomedea chrysostoma.** Grey-headed Mollymawk.—A second specimen of this species was obtained on the beach at Cottesloe by Mr. Glauert on June 21st, 1920. It agrees with the bird previously caught there in having a much darker grey head than typical birds, though this may be a sign of immaturity. In the Queensland Museum there is a specimen labelled S.E. Queensland which has a white forehead and pale greyish-white colouring on the crown and cheeks. The rest of the head is pale grey, slightly darker in front of the eye. It is unfortunate that no definite particulars of its origin are available.

**Diomedea chlororhynchus.** Yellow-nosed Mollymawk.—In coming westward across the Indian Ocean this bird was first seen in 68 deg. E., where a single individual appeared on the same day that the last Black-browed bird was seen, with the single exception already referred to. Thereafter the Yellow-nosed species was seen every day, gradually becoming more plen-

tiful as the West Australian coast was approached. Great numbers were seen close to Rottneest Island, and some were flying about between the island and the mainland. Until this day none had been observed with black bills, but here they were in the majority. The plumage of the back and wings in the black-billed specimens is distinctly brownish black. It is of interest to learn from *The Ibis*, 1920, p. 693, that Mr. Carter observed a good many off Point Cloates on September 12th, 1913, in this plumage, indicating that the bird he secured there previously, which became the type of *D. carteri*, was not a mere casual visitor. It would appear that the immature birds hug the coast, and do not venture out into the ocean like the adults, though presumably they cross the ocean from some remote breeding ground to reach Western Australia. A few of this species were observed on the coast of New South Wales in October, 1921.

**Diomedea cauta.** White-capped Mollymawk.—These birds were fairly numerous off the Cape of Good Hope in June, 1921, and odd specimens appeared on five occasions in the Indian Ocean in longitudes 32, 63, 68, 82 and 110 E., respectively, the last being not very far from the West Australian coast. On November 19th, 1921, I picked up the remains of a Mollymawk at Wellington Point, Moreton Bay, which from the dimensions of the bill and form of the groove on the lower mandible, must be attributed to this species. Mrs. Mayo informed me that she had seen it a week earlier at the same spot, when it was in comparatively good condition. The skull is now in the Queensland Museum.

**Phoebetria fusca.** Sooty Albatross.—These birds were seen in the Indian Ocean every day but three for a fortnight between 49 deg. E. and 106 deg. E., being specially numerous in 63 deg. E. They generally come so near the ship that it is easy to make out the characteristic features, including the white ring round the eye, the white shaft of the first primary and the yellow groove on the mandible. A very interesting specimen was observed on June 26th. It had a white patch on the nape, and the neck was whitish all round. The rest of the plumage was more mottled than in ordinary birds, and the bill was black without any yellow line on the mandible. This agrees with the description of the young of *P. fusca* given in Starke and Sclater's *Birds of South Africa*. The bird was certainly not *P. palpebrata*, as the mantle was as dark as in *P. fusca*, two specimens of which were in view at the same time. Subsequently I saw another specimen, which had a pale grey patch on the back of the neck. Ferguson records several specimens more or less similar (*Emu*, xxi., pp. 108-9).

**Gelochelidon nilotica.** Gull-billed Tern.—This species is common at Brisbane, and during the winter numbers may be seen on the Brisbane River at all times. A few remain throughout the summer. I have never previously had good opportunities of

watching these birds, and have been interested therefore in observing their habits. Their flight is less rapid and more gull-like than that of other Terns, though when they observe something in the water which attracts their attention they hover for a moment to observe it, and then dive towards the water in the regular Tern manner. I have never yet, however, seen them actually plunge into the water, but just before they reach the surface they check their fall and swoop over the surface, picking up the desired object therefrom with the bill like a Gull. It is possible that this observation may not be of general application, but due to local circumstances. The Brisbane River is so muddy that objects are not visible at any distance beneath the surface, and it may be that in clearer water they would dive for food like their congeners.

In writing about the White-tailed Black Tern (*Chlidonias leucoptera*) in *The Emu*, vol. xvii., p. 95, I suggested that it was possible that in this species the supposed winter plumage was worn by the bird throughout its second year. I now make the same suggestion as to the Gull-billed Tern. All through the winter, specimens in three distinct plumages could be observed: (1) A few birds with heads white more or less spotted with black. (2) Numerous birds with the crown white, but a stripe of black along each side of the head from the bill through the eye. (3) Numerous birds with the crown and sides of the head entirely black.

I have seen all three of these plumages also during the summer, but have not seen enough of the birds to come to any definite conclusions as to whether their proportions are the same.

I suggest that birds in plumage (1) are first-season birds, (2) birds in their second season, and (3) adults. And the evidence points to the probability that once the adult plumage has been acquired it is not lost again during the winter in Australia, whatever may be the case in the northern hemisphere.

It is noteworthy in this connection that whilst many ducks of the northern hemisphere, both in Europe and North America, only wear bright plumage for a brief season in the early summer, and pass the rest of the year in the so-called "eclipse" plumage, no similar seasonal change occurs among Australian Ducks, nor as far as I can learn among the Ducks of South America and South Africa.

The Great Crested Grebe (*Podiceps cristatus*) in Europe only wears its ruff during the summer, but, according to Mathews, in Australia and New Zealand this ornament appears to be worn throughout the year. I suggest that the Gull-billed Tern once having acquired the black crown never loses it, and that the birds supposed to be in winter plumage are really second-year birds which have not yet acquired their black crown.

**Catharacta skua.** Great Skua.—I am using this name to cover all the birds of this genus, as Hartert considers the southern forms only subspecifically distinct from the Great Skua of the

northern hemisphere (Vogel der Palaearkt. Fauna, p. 1758). Ridgway says that there are "at least four species or sub-species" (*Birds of N. and M. America*, vol. viii., p. 675). Mathews recognises eight forms belonging to four species. From my observations I do not consider it is possible to differentiate the forms or species when met with at sea, and therefore for the field observer it is convenient to be able to use a single name to cover them all. I saw a few of these birds on the west coast of South America in November, 1920. They were very plentiful at the Cape of Good Hope in June, 1921, especially in Table Bay, a few entering the Capetown docks and sitting on the water with the gulls during very stormy weather on June 15th. A single individual was seen in the South Atlantic in longitude 10 deg. E., two days before we reached Capetown, and another in the Indian Ocean in 27 deg. E. two days after leaving. Great numbers appeared again as we neared the West Australian coast on July 6th, some being seen between Rottneest Island and the mainland, and one flying over Fremantle harbour. Several were seen in Moreton Bay, Queensland, on August 20th and 21st, 1921. The amount of white on the wings varies very much, and not infrequently the white areas on the two wings of the same individual are noticeably different. Captain Hutton is responsible for a statement that they rarely settle on the water, but this does not at all agree with my experience. Both off South Africa and off Western Australia they were often to be seen sitting on the water, rising up when the ship approached and flying round for a time, and then frequently flying ahead and settling down again as if to wait for her. They are said to obtain their living largely by robbing Gulls and Terns, but in my experience the majority of them frequent a zone further out to sea than that frequented by the latter, only a few coming close to land. On one occasion I saw a Skua catch a Gull by the tail with its beak for a moment, but I don't think the Gull had anything edible to give up. This was in the zone off the Cape, where the Gulls were just beginning to turn back to the shore, and the Skuas were arriving from the sea to take their place. Off Fremantle the Skuas escorted us all the morning until we were a few miles from Rottneest, when the majority left us just as the Gulls began to come out from the island to meet the ship. I consider, therefore, that Skuas are perhaps not as black as they have been painted.

***Stercorarius parasiticus***. Arctic Skua.—A few birds of this species were seen off Cape Moreton, Queensland, on October 1st, 1921.

***Phalacrocorax fuscescens (gouldi)*** and ***P. varius (hypoleucus)***. The two species of large white breasted Cormorants have been much confused, and in consequence we have no clear idea of the distribution of each. The R.A.O.U. Check-list gives the range of the former as "Queensland, New South Wales, Victoria, South and West Australia, Tasmania," and that of the

latter as "Australia generally." On the west coast, as far as I am aware, *P. varius* is the only species found, but on the south coast of W.A. *P. fuscescens* occurs in the Recherche Archipelago. Mr. E. Ashby recently stated in *The Emu* that he observed this latter bird at Geraldton, W.A., but unless he collected specimens I think he must have made a mistake in identification. On the east coast also *P. fuscescens* must be very rare if not absent, since all the birds in the Queensland Museum prove on examination to be *P. varius*, and even in the Australian Museum there are only two specimens of *P. fuscescens*, and neither of them has any data. All the specimens with data showing that they were obtained in New South Wales are *P. varius*, though the British Museum has a specimen of *P. fuscescens* presented by the Australian Museum labelled New South Wales. Gould states that he saw it on the Hunter. I do not know whether it is possible to distinguish the two species in life, as I have never to my knowledge met with *P. fuscescens*, but the feathering on their heads and the form of the bill at once distinguish them when they are handled. I would like to appeal to members of the R.A.O.U. to examine every large White-breasted Cormorant they find dead on the beach, and if necessary make a sketch of the form of the naked skin on the head, so that we may get some accurate data as to the real distribution of these common birds.

***Sula serrator.*** Australian Gannet.—This species was seen off the West Australian coast about two hours before Rottneft Island was sighted on July 6, 1921, and others were seen near Rottneft. A few were seen in Moreton Bay, Queensland, in August, and numbers were diving off the coast opposite the R.A.O.U. camp in northern New South Wales in October, when one would have expected them to be in Bass Strait breeding, as many of them appeared to be adult.

***Fregata minor.*** Greater Frigate-bird.—Only one authentic specimen of this species obtained in Australia seems to be on record, viz., one captured in Perth (*Emu*, xvii., p. 238). In the Queensland Museum there is a young bird which was shot by Mr. Colclough at Point Lookout, Stradbroke Island, some years ago. Its plumage agrees precisely with the description of an immature male from New Zealand given in Mathews' and Iredale's Handbook, but the culmen measures 101 mm.

***Fregata ariel.*** Lesser Frigate-bird.—On October 22nd, 1921, two males of this species flew close over me on the coast at Tweed Heads, New South Wales, giving me an excellent view. The white patches on the sides under the wing at once identified them as of this species. These birds have been said to be fore-runners of storms. Was it only a coincidence that a violent thunderstorm accompanied by strong squally wind occurred a few hours afterwards? As far as I have been able to ascertain, the species has not previously been met with in New South Wales.

## Papua—The Land of Birds

By A. H. WILSON, visiting Ornithologist from Great Britain.

Communicated by Dr. J. A. LEACH, C.M.B.O.U.

Australia's nearest neighbour and largest possession—Papua—has always attracted me as a field for bird-observation since, as a boy, I saw Gould's book and tried to believe his colours were not imaginary. This year, armed with a telescope, I went there to see for myself, and spent many delightful weeks among birds in such numbers and variety that identification of species was difficult. The official "Handbook of Papua," 1912, which, though now out of date, precedes the war years, and therefore a period during which little or no research was carried out, states that over 500 species of birds are found, of which 50 or 60 genera are peculiar to the island.

Now this statement is beyond dispute, because over 500 species certainly abound there, but the words "over 500" to me imply less than 600, and even less than 550, and I know that, if such a number only has been recorded, there is open a vast field for a man or a society wishing to add new species to science. I have seen four birds which neither Gould, nor Australian museums, nor Papuan collections have given names to. In four days devoted to the watching and identification of birds I had distinguished 158 different species. Is it humanly possible to find over one in four of the birds of a country about as large as New South Wales and Victoria together in four days, never moving more than 10 miles from a given centre?

Papua seems to be the meeting place of birds from Mongolia, through Siam and Borneo to India, with those of Australia and the Islands, birds in vast numbers and every hue. One hot mid-day in the jungle I stopped on my way, below a hollow-centred, bushy tree, near a few tall cotton-trees and breadfruits. Idly I made a squealing noise like a small bird in trouble, and in a few seconds came fussily a pair of dappled Flycatchers, black and grey. They bustled over my head excitedly, but would not leave. I went on calling, and suddenly I saw a pair of Honey-eaters appear, a shining glory of gold below, with heads as black as jet. These and the first-comers joined with me in uproar, attracting a Black-crested Flycatcher, all sombre black with crown erect, and behind him yet another Flycatcher, like a Foxhound, white, black and tan. Then the babble increased with sudden crescendo as a flock of the glossy Calornis arrived, the Starling that rivals the opal and flashes a brilliant ruby eye. A Pink-headed Fruit Pigeon last appeared from overhead, and now there were six varieties in view, with a Parrot calling above, when suddenly all grew silent, and not a bird could be seen on my humble tree: but a Grey Falcon with rosy breast sailed overhead.

I had thought that a flock of Black Swans rising from water made a considerable noise, but that is nothing to the deafening

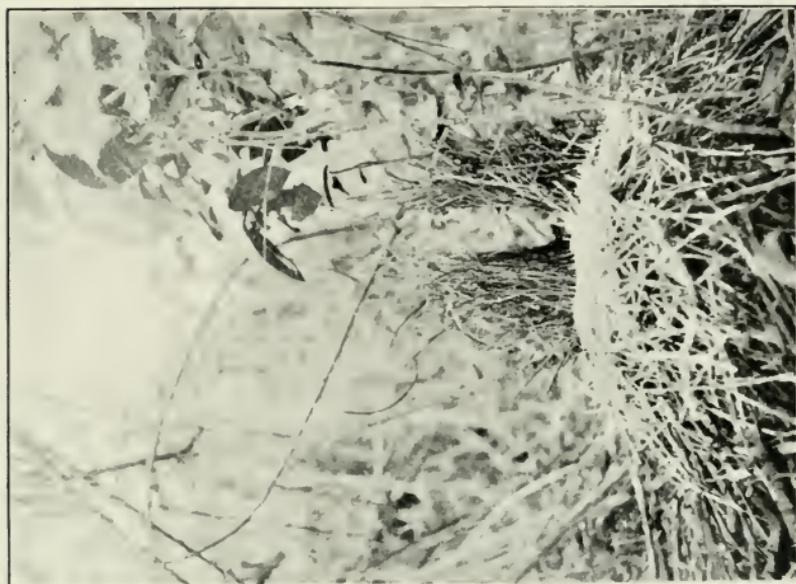
roar made by the lumbering flight of a flock of Hornbills moving across one's path. This hideous bird is the enemy of the coconut planter, and has to be shot at sight. He is dark green, chestnut and white, and his bill is used instead of human scalps by the cannibal who wishes to advertise his deeds.

There are many varieties of Bower-Birds, mottled green, brown with golden crest, and black and gold, but the most interesting to me was one of a dull brown colour. This bird rivals the Lyre-Bird as a mimic, and has often fooled me into thinking I had heard a species new to me, or the reverse. It does its mimicry when playing on its bower, not unlike that of the Satin Bird, but raised on a solid platform often 18 inches high. Its decorations are uniformly green—berries or leaves. The taller jungle trees are busy with Starlings, Fish-tailed Drongoes (almost as noisy), Pigeons of every hue, Parrots, Cockatoos, Friar-Birds, Cuckoo Shrikes, and Kingfishers, to name only a few common sorts.

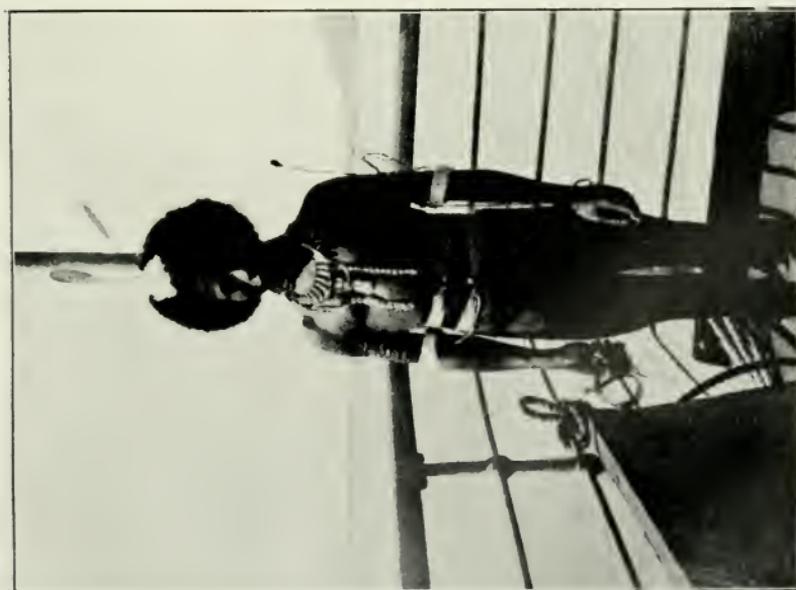
The natives are good naturalists, knowing all the birds by sound and sight, but cannot recognise families; for instance, each Pigeon has a different name, and each Kingfisher also, but there is no word for "Pigeon" or "Kingfisher" as a class. The feathers of birds are used by the boys for personal adornment, head-dresses of Paradise-Birds, crested Goura Pigeons, Bower Birds and Parrots being the ruling fashion, while even their spears have feather decorations. For the hair a wing or tail feather is often stripped to the quill, leaving only a tuft at the tip, by which decoration a young buck advertises the fact that he is courting, or even, by a different combination, that he is courting another man's wife.

The Papuan is a master at catching birds alive. He will bring you for a shilling any bird you ask for. I saw a perfect Long-tailed Kingfisher with scarlet bill taken by means of a frog placed between two nooses in the hollow of a half bamboo, while swooping down, while Pigeons are snared in tunnels between the foliage of the taller trees, where observation has proved them to make a highway, and the many Rails are often driven into nets (home-made by women). Scrub-Fowl, akin to the Mallee Fowl, make an even larger mound than that of these latter, and are very common though shy.

Among so many, how can I choose a few to discuss in a short paper, without omitting some of the most interesting? As an instance of too much material to work on, I was one day watching the splendid flight of a flock of Frigate Birds wheeling in play, at the same time as a Pitta was investigating my camera placed on the ground. Let me then tell of the Eclectus Parrot, that flies home to roost at 5.30 every evening, and always on exactly the same line. So regular is he that I could take you with me and say, "In four minutes a Parrot will pass right overhead, and three minutes later two more will pass immediately above the kapok tree over there." And it would be so.



Bower of Light Brown Bower-Bird (*Chlamydera cerviniventris?*)  
Note the elevation, presumably designed against floods.



New Guinea Native with bird plumes  
in his head dress.

Photos. by Mr. A. H. Wilson.



There is a Devil Bird in Papua, one that makes a weird moan or inhuman wail, making the listener, be he native, shiver; and no man has ever seen it. White men have often stalked the sound, but without ever seeing anything; and the natives fear to try; they treat it as an ill-omen, and refuse to hunt wallaby or go fishing after the Devil-Bird has spoken. I have been told, however, that once a shooting boy shot one, and it was merely a large Pigeon, but I cannot verify the story.

One evening, while sitting beside a jungle pool, I was amused by watching a small flock of Jacanas (Lotus-Birds) running along the leaves of water plants. Their enormous feet seemed to make their going easy, but no one could call it graceful. Their great advantage over other wading birds, such as Coots and Bitterns, made them the bullies of the pool; more than once, I saw them drive away larger rivals, but their appearance is mildness personified.

Parrots were less common than I expected to find them, but one, the Pygmy Parrot, fascinated me. When I first saw these birds, I thought they must be Finches, but their un-Finchlike behaviour soon brought out the telescope and exposed the error. A native caught one, and a spider was found considerably larger than the Parrot, which I did not measure, but it could not have exceeded  $2\frac{1}{2}$  inches in length. This little fellow attacked my thumb with all the ferocity of a White Cockatoo.

A never-to-be-forgotten exhibition of flight was given me one day by a pair of Brown Quail. I happened to be strolling along a native track towards the village, when I noticed three Quails busy dusting themselves on the path ahead of me. The sight was not new, so I went on. Here just on the left was a grove of betel-nut trees, almost within a foot of the path; now a betel-nut grows straight upright, and these were some 30 feet high. The Quails rose vertically, topped the trees, and then wheeled away out of sight. I never imagined that any bird could rise at an angle of 30 in 1, and stood amazed.

The Superb Warbler of Papua is slightly larger than the Victorian Blue-Wren (*Malurus cyaneus*), and in colour scheme I prefer the hen bird to the female of any other Wren-Warbler, it is of a delicate shade of brown with pale blue head and rump. These birds I found very shy, keeping deep hidden in the cane grass or lawyer vines of the jungle, but on being called by the noise of kissing made by the lips, they come fussily alert to make inquiries.

Grey-headed Nuns work over the cane grass, or cocoanut plantations in large flocks, all moving after a single leader and busy searching the soil. For no apparent reason the whole flock will suddenly take flight, and settle somewhere near by. A much rarer Black Nun I saw only once.

It became my fate to miss a schooner, which should have carried me to Port Moresby, and spend eleven days alone with native boys on Yule Island, a mile or two off the mainland. Here, with

nothing to do, I found a secluded cove, where many birds used to come down to the sea for salt, an essential for birds as for men and animals, as any good observer of birds who lives near the sea can tell you. Here came Fruit-Pigeons and Honeyeaters at constant intervals, usually to pick the dry salt from holes in the rocks, where evaporation had left a deposit, and it was here one sunset that the doings of the Ravens drew my attention. I was surprised to see that every Raven on the island flew over to the mainland at night to roost; but I never saw any other bird go with them. Their morning arrival was timed for 5.45, when the first croak came floating over the still lagoon.

The common Australian Willie Wagtail is everywhere in Papua, and also the Cuckoo Shrike, Friar Bird and Welcome Swallow, while the Double-banded Dotterel and Spur-winged Plover can be seen and heard, so an Australian is soon reminded of home.

Night is always lively with the chug-chug of answering Nightjars, the whirr of passing Teal, or the hoot of an Owl, and the chirrup of that moonlight singer, the Gecko, a small lizard, whose call, when I first heard it, made me ask what bird it was, to the amusement of the natives.

A beautiful Bee-eater is common; very much like the Australian kind, his flight over, around, and into a flame tree in full bloom is a vivid delight. Every patch of grass country is full of the Coucal (not *Centropus phasianinus*, but a darker kind), one of the world's poorest flyers, who fills the air with "who-whoing" in different keys, and becomes almost as monotonous as the Brain-fever Bird (which I pursued all over the place, but never saw; only his fearful cry was ever prominent). The Coucal seems to be forgetting the art of flying, the effort of reaching a height of 10 feet to the fronds of a palm-tree seems to be almost too much for it.

While Papua is so full of birds, it is curious to see how little to the eastward birds have found their way. The eastern Pacific Islands are, except for sea birds, almost empty of them; there are some large islands there where land species are only represented by three varieties. I speak from hearsay that the Honolulu museum contains four specimens only of land birds, and yet is complete. I am liable here to contradiction.

Were I to close without a tribute to the Birds of Paradise, I would be as one talking of Egypt without its Nile. The Paradiseidae are peculiar to Papua and the surrounding islands and the eastern coast region of Australia, and between 70 and 80 different species have been described.

Personally I saw only two kinds in a wild state, but that was because time forbade my penetrating far enough inland to find them in vast numbers as is possible. The word Paradise means "a place with a wall round it," in which meaning it applies to the bird, whose export from British territory is forbidden, and that with great care; and also to the fact that all but a few white men have never seen these birds alive outside of an aviary.

## A Visit to the Archipelago of the Recherche S.W. Australia

By A. F. BASSET HULL, C.F.A.O.U., Hon. Ornithologist  
Australian Museum, Sydney.

### I. THE NARRATIVE.

The Archipelago of the Recherche lies between 121 deg. 30 min. and 124 deg. 10 min. E. long. There are about 100 islands in the group, and numerous rocks and shoals. It was named after one of the ships of the French explorer D'Entrecasteaux, and was surveyed in 1802 by Captain Matthew Flinders of the *Investigator*. H.M.Ss. *Waterwitch* (1897) and *Penguin* (1900) carried out more detailed surveys, and Admiralty charts were published in 1897 and corrected in 1901.

Some years ago I made inquiries as to the possible means of access to these islands, with a view to investigating the bird life thereon, but the quotations for transport were so high that the project was abandoned. In 1921 Mr. A. S. Le Souef made further inquiries in the same direction, his object being to secure some of the mammals known to inhabit the larger islands of the group. He collected a considerable amount of information, and obtained a quotation for a motor launch that appeared to be reasonable. However, other business calling him to Europe, he kindly handed the correspondence to me to make such use of it as I might think fit. One of the letters was from Mr. J. Whar-ton White, of Esperance, W.A., who stated that he had visited the Islands for over twenty years, putting sheep on and off. He gave an enthusiastic account of the plentiful and varied birds and animals to be found there, his list of the former including "Mutton Birds, Penguins, Gannets, two or three varieties; Red-bills (Oyster-catchers), Molly Hawks, Cape Barren Geese, two or three varieties of Quail, Mother Carey's Chickens, and a variety of small birds." He added, "The Penguins, Mutton Birds, and Mother Carey's Chickens nest in the ground, digging holes like small rabbit holes from a foot to two feet deep." This list, and the biological details as to the nesting habits of the three burrowing birds, made most attractive reading, and I determined to visit the islands, if possible. I therefore submitted the matter to Mr. H. L. White, of "Belltrees," N.S.W., who at once offered to find the funds for the expedition. He also agreed to allow two representatives of the Australian Museum to have passage in the motor launch.

On the 5th November last, accompanied by Mr. Henry Grant, Taxidermist at the Australian Museum, I left Sydney by the s.s. *Katoomba* for Albany, where we were to meet Mr. Wright, Assistant Taxidermist at the same institution, at that time on an expedition to the Nullarbor Plain, on the Transcontinental

line. Calling at Melbourne, we attended a special meeting of the R.A.O.U., and had the pleasure of seeing many of the Victorian members. On arrival at Adelaide I received a telegram from Esperance, W.A., informing me that the sailing of the s.s. *Eucla* from Albany to Esperance had been postponed for a week. This meant a serious delay in commencing operations at the islands, and a curtailment of the time available for my investigations. The thirty-six hours at Adelaide were pleasantly spent in the company of Captain S. A. White, who showed us a portion of his collection, and the birds inhabiting the grounds of his historic homestead.

Albany was reached at noon on November 15th, and there we were met by Messrs. Troughton and Wright, who had completed their work on the Plain, and were collecting marsupials in the vicinity of Albany. Calls were made on several persons who were reputed to have knowledge of the Recherche Archipelago, and a quantity of information was gathered. Much of the information related to the experience of long-gone-by days, and convincing details were lacking. Captain Douglas of the *Eucla*, however, was able to give us the most reliable and recent information, he having been engaged for many years navigating the Archipelago. From him I ascertained that the "Molly Hawk" was the Pacific Gull; that Mutton Birds and Penguins were found on most of the islands, and that he was unaware of any Albatrosses or other Petrels breeding in the group.

Rabbit Island, near Albany, being the recorded locality for the Great-winged Petrel (*Pterodroma macroptera*), I engaged a motor launch, and, accompanied by Messrs. Troughton, Grant, and Falkner (an Albany resident who formerly resided at Esperance and visited some of the Recherche Islands), I devoted Sunday, 20th November, to an investigation of Michaelmas and Rabbit (or Mistaken) Islands, in King George Sound.

Michaelmas Island lies just inside of Breaksea Island at the entrance of the Sound. Leaving Albany at daylight, we reached the island at 7.30 a.m., and effected a landing without much difficulty, there being very little sea. The shore is steep granite, with rugged boulders projecting through dense scrub, which grows nearly down to the water line. Grant went along the shore to the eastward, while we climbed up to the top and descended to the other or seaward side. Grant rejoined us after having traversed the coast to the eastern extremity and returned along the ridge. We saw no trace of occupation by any sea birds, and the only land birds seen were the Green-backed White-eye, Yellow-breasted Whistler, Grey Bell-Magpie or Squeaker (*Strepera versicolor*), and an *Acanthiza* not identified. I was surprised to find no evidence of occupation by Mutton Birds or Penguins, as both are found on the adjacent Breaksea Island, and Michaelmas is entirely uninhabited, while Breaksea is occupied by the lighthouse keeper and his staff. Leaving Michaelmas Island about 11 o'clock, we proceeded to Rabbit Island, which lies close to

the entrance to Albany Harbour. Here we found numerous Little Penguins, in some cases sitting on eggs, in others with young birds in varying stages of growth. Under one shelf of rock a large group of adult birds was observed. Grant discovered a number of small burrows, similar to those excavated by the White-faced Storm-Petrel, but uninhabited, and evidently abandoned for some months. The burrows were only from six to eight inches in depth, the soil being hard and gravelly. There was a nest-chamber and some traces of an old nest of broken-up reeds, and spiders' webs were spun over some of the entrances. This may be a deserted breeding-place of the White-faced Storm-Petrel, occupied in the 1920 season, and abandoned for some reason; or else it may be that of another small Petrel which breeds in May or June. No trace of Mutton Birds was seen, although one Albany resident informed me that he had taken a case of their eggs from this island early in one December!

The weather was mostly cold, wet, and boisterous during our stay at Albany, but we made several excursions into the coastal scrubs. White-bearded and White-fronted Honey-eaters, and Green-backed White-eye were noted, a solitary Collared Sparrow-Hawk (*Accipiter cirrhocephalus*), and along the shore, some Sandpipers (*Actitis hypoleucis*), and Pacific Gulls.

We left Albany at 1.30 p.m. on November 23rd in the 500-ton Government steamer *Eucla*, a first-class little sea boat with a good table, but indifferent cabin accommodation. Point Rich was our first port, the steamer lying in the roadstead and taking cargo off and on in the boats. Bremer Bay was reached at 4 a.m. next morning, and on our way out I saw Glassy Island, said to be inhabited by hundreds of Gulls and Mutton Birds. As there are no locally owned boats, a visit to this island could only be made by taking a vessel from Albany. It is quite a small islet, rocky, steep at the sides, with a little vegetation on the top. Landing would be extremely difficult, unless in exceptionally fine weather. Doubtful Islands were passed at 8 a.m. They consist of two large granite islands, the larger about half a mile in length. A landing could be effected on the larger island in fine weather, and the ascent from the spot I examined through my binoculars appeared comparatively easy, although the remainder of the coastline was extremely steep. There is a quantity of low scrub on the eastern side and over parts of the summit, which would offer good shelter for Petrels. The only way in which this group could be investigated would be by chartering a boat from Albany to Bremer Bay, and working out from there as the weather permitted—a distance of about twelve miles of open sea.

We arrived at Hopetoun, the port of the Ravensthorpe Copper Mines, at 1 p.m., and remained there five hours. The only birds seen were the White-faced Ternlet and the White-bearded Honey-eater. After a rough night at sea, we reached Esperance at 6 a.m. on the 25th. This is a very old settlement. At one

time it was quite an important port, the goldfields' traffic going through it. That was before the railway from Perth diverted the stream of passengers and goods. From the long pier we could see quite a number of the Islands of the "Archipelago of the Recherche" dotting the ocean to the south. The boat we had engaged lay at her moorings close to the shore, and another slightly larger boat was anchored near by. Two or three dinghies on the beach completed the local "shipping." I was met by Mr. F. P. Hurley, agent for the Government steamship service, who had made local arrangements for me, and with his assistance I stored our equipment in a shed, formerly the office of the *Esperance Times*, and, the weather being too boisterous for going out to the islands, made the acquaintance of several local residents who had information to impart about the islands. As we had already experienced at Albany and on the way down, much was told of expeditions in the early days, and there was considerable conflict as to what was to be found on certain islands. All were unanimous, however, as to the Mutton Birds breeding "in millions," but we were told that young birds would be in the burrows by now. Geese were plentiful on some, and Quail were in flocks on other islands. Seals, both hair and fur, tamar (Dama) wallaby were as thick as rabbits; "deaf adders," other snakes, rats, etc.—all these and other desirable birds, beasts and fishes were abundant, or anyhow they were when the informant was last on the spot. We inspected our boat, and were not impressed by the "dinghy," an oblong contraption made out of packing-case pine with pointed ends nailed on to show which way the craft was progressing.

Saturday, November 26th, was fine with a strong south-westerly wind blowing. Larry Sinclair, one of the oldest residents, thought we might venture out as the wind would drop by noon. As he recommended Lion Island for our visit, stating that there were Mother Carey's Chickens there, we took him along. Sure enough, the wind did drop when we were about half way to the island, which lies eight miles from the pier. It was then I suggested that the motor might be brought into action. The engine was not responsive for some time, and then, after a few convulsive wobbles, it stopped. The light airs took us over a long ground swell, and in about two hours we reached the island. It is very steep, with a great granite cap weathered out like a huge cave. As we approached, a flock of Nankeen Night Herons rose and circled over the summit. Three Hooded Seals were seen on the rocks almost within reach of the surge. I sent Wright to try for the largest seal, a magnificent beast with a tawny mane. Sitting gingerly on one of the dinghy's pointed ends, with his rifle between his knees, Wright was taken towards the rocks by our skipper. The seal was not alarmed, and the risk of capsizing the craft if the gun were fired being too great, a landing was effected, but with no little difficulty, and at some distance from where the seal was basking. Climbing over a

high granite shoulder, Wright approached quite close, and secured the animal, killing it with one shot. Grant was then sent to assist in removing the skin, a task that was accomplished with considerable difficulty, the seas washing up to the body, and threatening to sweep it away. As the last ligament was severed, a wave came up, and the great carcass rolled back with it. The skin was then hauled out of reach of the waves, and an inspection of the island commenced. The dinghy was run up on a ledge, Grant and the crew of two going up the rocks, while Wright went after two smaller seals further round the island. Grant soon found a colony of White-faced Storm-Petrels in their burrows, each bird sitting on its egg. Many of these were quite fresh, and others showed slight progress in incubation. The burrows were in hundreds, every available patch of soil in the gullies being taken up. The Nankeen Night Herons had their nests on the ground between a hedge-like growth of wind-shorn scrub and the face of the great granite cap. There were about forty nests, each containing two young birds in varying stages of growth, one nest with two eggs, which proved to be about one-third incubated, and one with three young birds. Grant also saw two pairs of Black-cheeked Falcons, and discovered their nests on ledges away down the cliff on the western or seaward side of the island. Both nests contained two eggs, but were quite inaccessible. Sooty Oyster Catchers were also seen on the island. Larry Sinclair informed me that he had seen Owls in the caves on this island, but none were there on the occasion of our visit. The wind hauled round to the south-east in the afternoon, and blowing in directly on our anchorage, I decided not to attempt to land, and called off my party. The loading and transport of the heavy skins was a ticklish task, the cranky dinghy nearly sinking when launched from the ledge, but eventually all hands got safely on board the boat, and we left for Esperance, arriving towards dusk. On the way we passed the Limpet Rock, a typical Recherche islet, conical in shape, swept by every wave up its sloping sides to a height of from five to fifteen feet or more. A black strip showed the wave limit, covered with a slippery coating of algae and studded with the gigantic Limpet shell (*Patella neglecta*) and jagged barnacles.

This first trip convinced me that the "motor" was useless, and as the boat was otherwise unsuited to a long voyage, I cancelled the engagement, and arranged with the owners of the only other boat, Messrs Jones brothers, to take us for the rest of our expedition. Their boat was a 24-ft. sailing boat, roomy and well-found, but the want of a motor was a very great drawback, and resulted in restricting our operations to what is known as the "Inner Ring" of islands.

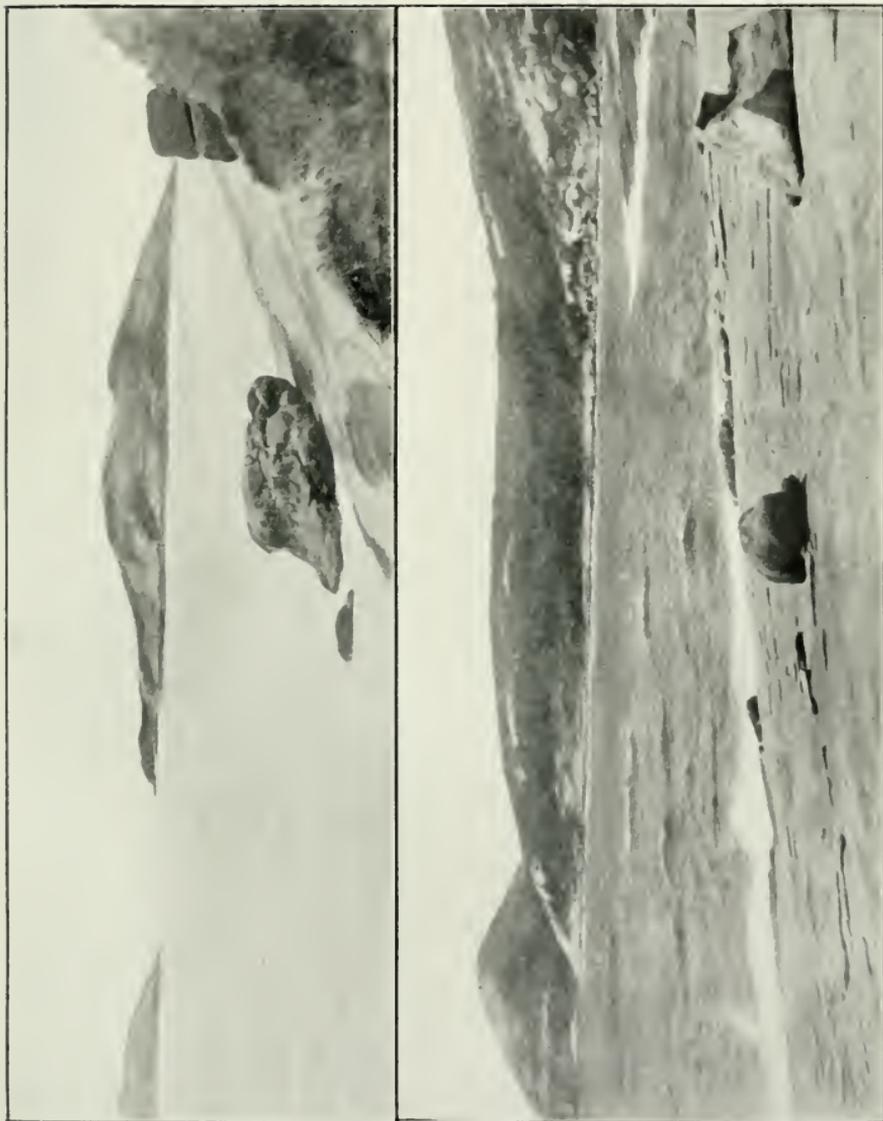
Mr. Wharton White called on me, and a conversation soon showed me that his accounts of the fauna were based on the experiences of twenty years ago. Since then there have been

many fires on the islands, some of which are used for pasturing sheep suffering from the "coast sickness." Mr. White confirmed the identification of his "Molly Hawks" as Pacific Gulls; his Gannets included the Crested Tern, and for the rest he admitted that we might land on some islands without even seeing a "deaf adder."

Sunday, 27th, and Monday, 28th November, were spent in cleaning up the Lion Island collections, and walking along the coast near Esperance. The scrub is thick in places, and bird-life moderate. Singing and White-bearded Honeyeaters, White-fronted Honeyeaters (*Glyciphila albifrons*), Black-faced Cuckoo-Shrike (*Graucalus novæ-hollandiæ*), Crow (*Corvus ccilæ*), and other species common to South-west Australia were noted. I searched carefully for signs of the Long-billed Bristle Bird (*Sphenura longirostris*), but without result; none of the residents I interrogated knew of any bird answering to its description.

On Tuesday, 29th, we went in Jones Brothers' boat to Charley Island, twelve miles out. It was cloudy, with a strong breeze when we started, and on arriving at the island we landed on a staunch little dinghy, running it up on the slippery slope. It started to rain shortly after landing, and poured all the morning. However, we worked the island thoroughly, finding several colonies of the Fleishy-footed Petrel, or Mutton Bird. This species evidently has not the punctual habit of laying on the 27th November that characterises the Short-tailed and Wedge-tailed Petrels. Of about 25 burrows investigated only three contained birds sitting on perfectly fresh eggs; all the others were empty or contained a bird without an egg. There is not much soil on the island, the granite rock showing bare or but scantily covered with mesembryanthemum for the greater part of the surface. Where the sand and decayed vegetation had collected in the gullies, the Petrels had constructed their burrows, from two to six feet in length, straight or tortuous according to the nature of the soil and obstacles such as roots and stones. The eggs were very clean and white, but it was difficult to keep them so, working in greasy black soil with incessant rain pouring on us. On top of the island we came upon a flock of Rock Parrots, but failed to find their nests. There were crevices under large "scales" of granite which had exfoliated under weathering, and some small burrows under boulders embedded in the soil. All likely spots were investigated, but no trace of a nest discovered. A Western Brown Hawk was shot, and a White Goshawk seen. An interesting feature on this island was the presence of immense numbers of a land mollusk (*Bulimus sp.*), which crawled out from under the mesembryanthemum to enjoy the rain. The Singing Honey-eater was plentiful, and a single Little Penguin was seen, but no nests were found.

November 30th was bitterly cold and wet, the wind being south-westerly almost of gale force. I arranged with Jones



Upper—Landing-place on Charley Island; Cull and Rabbit Islands in distance.  
Lower—Landing-place on Mondrain Island, looking east.

Photos. by A. F. Basset Hull, C.F.A.O.U.







Upper—Looking towards Esperance from Charley Island.  
Lower—View on Charley Island; Rabbit Island in distance.

Photos. by A. F. Basset Hull, C.F.A.O.U.

brothers to be in readiness to start out for Mondrain Island when the weather moderated. All equipment was got ready for a week's camp out, and at noon on 1st December we started, beating out of the bay against a strong north-easter. In this locality the summer winds are strong north-east in the morning, changing at noon to stronger south-east, with an occasional variation to a south-westerly gale with rain. By nightfall we had reached Cape Gove, under the towering Cape Le Grand, 1150 feet in height, a great rounded mass of almost bare granite. Here we camped for the night under a clump of Christmas Tree topped with a mass of bright orange flowers. In a small bush growing on the beach a White-eye was sitting on three fresh eggs. At daylight on the 2nd we resumed the weary beat against the wind, rounded the cape, and made no less than nine boards to cover a mile between Big and Little Ram Islands. All round us were islands, rocks and reefs, where the white foam spouted up at intervals like great geysers. And it was cold! A little variety was afforded by an hour's fishing for snook, a fine sport while it lasted, some of the catch being upwards of seven pounds weight. They take a spinning bait trailing out astern. After passing the Ram Islands, which are barely half a mile apart, we took longer boards, and reached Lucky Bay by midday. There we pitched our camp and sunk a well just above high water mark, getting a good supply of water. We then inspected the scrub round the bay, seeing only the usual Honey-eaters, Silver-eyes, etc. A fine pair of Pacific Gulls patrolled the beach, and a few Crows passed over. All the small birds were very shy; a few old nests were found.

On 3rd November, Wright and I left the bay at 9 a.m. for Mondrain Island, eight miles distant. The wind was fair, the distance being covered in two hours. Landing was difficult, and we both got wet and scratched. The dinghy was hauled up, our tent and boxes landed, and Jones brothers returned to the bay, there being no anchorage at the island. Mondrain is the largest and loftiest island in the Archipelago, being about  $2\frac{1}{2}$  miles in length, containing about 2000 acres, and having a peak 740 feet in height. There is said to be permanent water near the top of the peak, but we did not investigate! Soon after landing we found the Fleishy-footed Petrel in colonies, and about one-third of the burrows inspected contained birds, some with eggs. These colonies extended over large areas, partly open, grassy slopes near the shore leading into the dense scrub of the gullies, where digging out was impossible owing to the depth and the tangled mass of roots and surface debris. We ascended one gully, forcing our way through a thicket of hakeas, paper bark tea-tree, and sword grass, until we reached the granite outcrop, steep, weathered smooth, and as slippery as glass. In the scrub I noted the Singing Honey-eater, the White-eye, and heard a Scrub-Wren (*Sericornis*), but did not see it. All these

birds were singularly shy, considering that this island is not visited for years at a stretch.

Traps were set for mammals, and further patches of scrub were entered, but no other birds were seen. On the rocks near the shore a pair of Sooty Oyster-catchers were visible, and three Pacific Gulls hovered about. Numerous broken shells of the common Turbo and the large Limpet showed where they got their principal food supply. These birds were very curious, flying round and settling near our camp, but they were extremely suspicious. A piece of meat was thrown out on the rocks, and they circled round it for hours, occasionally dipping as if to pick it up, but sheering off again as if they suspected some trap. It was still untouched when we left the island. During the night Wright went round his traps and along the edge of the scrub with an acetylene "jacklight," but did not see any of the tamar wallaby said to be so numerous on the island. In the morning the traps were untouched except one which contained a rat. Two small snakes were captured when fixing up the camp, and lizards were numerous; we saw no death adders. Other colonies of Fleshy-footed Petrels were examined, and a few eggs taken; many burrows were empty. Two specimens of the Green-backed White-eye were taken, and a number of old nests of the Singing Honey-eater were found in the scrub. Jones brothers called for us about midday, and we returned to Lucky Bay, passing close to Rob Island, which lies to the east of the bay. There were about fifty seals visible on this island, and a pair of Cape Barren Geese, but the surge was too heavy to permit of landing.

Mr. J. T. Tunney collected for the Perth Museum on Mondrain some years ago. Our boatmen took him there, left him for a week, and brought him back to Esperance. He captured a variety of wallaby there, but I have not been able to find any record of the birds he discovered. One might easily spend a week on this island, and then not exhaust all its possibilities, but it is more than doubtful whether the reward would be commensurate with the trouble. So many times have fires been put through the scrub that only such persistent birds as the Mutton Birds could survive.-

During our visit to Mondrain, Grant had walked over to Mississippi Bay, but found little of interest. On December 5th it rained nearly all day, but I went westward to Thistle Cove in the hope of locating the Bristle Bird, but without success. Wright and Grant revisited Mississippi Bay, and observed the Spotted Scrub-Wren (*Sericornis maculata*), the White-faced Ternlet and Hooded and Red-capped Dotterels (*Charadrius cucullatus* and *C. ruficapillus*), and the White-bearded Honeyeater. They were not successful in getting any wallaby, although some were seen in the distance. On the 6th we left Lucky Bay and beat out to Rob Island. The sea was very heavy, and after repeated attempts, Wright managed to jump ashore and keep his feet, while Grant passed over his rifle and ammunition. He explored the

island, which is quite small, but high and steep, taking a small seal, a pair of Cape Barren Geese and Little Penguins, with two eggs. He also found a number of small burrows, which had been tenanted comparatively recently by the White-faced Storm-Petrel, a wing and portion of an egg shell being brought off for identification. It would appear that this colony has a much earlier date for breeding than the one on Lion Island. While Wright was on the island I had a fine view of the seals tumbling about on the rocks and plunging over the ledges into the water. They came round the dinghy, and one of the Geese which fell into the water was nearly captured by a seal, Grant winning in the chase literally by a neck! After getting Wright and his bag off, we left for Woody Island with a fair wind, arriving there in the afternoon. The Geese were soon skinned, and their bodies went into the pot, making the most delicious stew we had ever tasted, but then we had been without a meal from 6 a.m. to 6 p.m.

Woody Island is one of the few which have anything in the way of trees on them, a small clump of mallee having established itself in a gully and escaped the fires. Here we found old traces of long-deserted Mutton Bird burrows, but there were no Penguins or other sea birds. Brush Bronzewing, Brown Quail, Rock Parrots, Yellow-breasted Whistlers, and Singing Honey-eaters were observed. Traps were set, and the weather being fine, Jones brothers stayed on the boat at anchor—this being one of the few islands with any kind of an anchorage—while we camped on shore. Traps were set, and the morning revealed five nice specimens of the local rat, one of which had left his tail in one trap, and his body in another! This island is used for sheep, and three were seen by us. There is a small artificial waterhole, but the water was too foul for use. A young Pacific Gull was found wandering about on a headland, the parents feeding down on the rocks.

Our water supply having run out, we returned to Esperance and spent a couple of wet days cleaning up and skinning specimens. The weather continuing wet and stormy, we did a little exploration of the coastal scrub, and went out to the Pink and Green Lakes, three miles from Esperance. On a fine day these lakes are most brilliantly coloured, the one a deep rosy pink, and the other an emerald green. Both are shallow and salt; immense quantities of the mineral are taken from the Pink Lake. Large flocks of Red-capped Dotterel were seen on the shores of the lakes, and in the scrub we saw a few immature specimens of the Red-capped Parrot (*Purpureicephalus spurius*), Dusky Miner (*Myzantha obscura*), Collared Butcher-Bird (*Cracticus torquatus*), and Black-faced Cuckoo-Shrike.

We had hoped to get a run down to Figure-of-Eight Island, 18 miles south-west, but the wind was against us, and Jones brothers could not guarantee a certain return in time to catch

the *Eucla* on the following Tuesday. I therefore revisited Charley Island, and found the Fleishy-footed Petrels in fairly large numbers, and mostly with eggs, some showing slight signs of incubation, but several were quite fresh and white. I also found a nest of a Western Brown Hawk, probably the bird we shot on the former visit was the owner. This nest was a very large structure of sticks and twigs, placed in a medium-sized paper bark tea-tree, about 15 feet from the ground, and contained two slightly incubated eggs. Immediately beneath the nest was another belonging to a former occupation. We then proceeded to Rabbit Island, about half a mile distant, and found more burrows of the Fleishy-footed Petrel, and two nests of the Little Penguin, both containing two eggs. This excursion occupied the whole of December 10th.

On Monday, 12th, Wright and I started out for Sandy Hook Island, 12 miles as the crow flies, but as we had to beat the whole way, we must have covered four times that distance in the seven hours it took us to reach a point a mile from the island. Here the wind dropped, so we took the dinghy and pulled over the remaining distance, only to find that the surge was too heavy to allow a landing. There is a cove with a beach on the southern side of the island, but to reach this would have meant pulling the dinghy two miles further, and three back to the boat, so we abandoned Sandy Hook and landed on Gunton Island, which we had passed on the way out. This island proved barren of all birds except the Singing Honey-eater and a solitary Kestrel.

This completed our island visits, as the *Eucla* was expected to arrive the following evening, and we had all our specimens to pack up. The results of the expedition, so far as regards the bird life, were not very encouraging, but the experience gained would be useful in the event of another expedition being undertaken. The failure of the motor boat made a great difference in the matter of time, the beating in and out against contrary winds and currents in a sailing boat hampered us seriously, and the necessity for constant caution in case of a change of wind prevented us from examining many of the smaller islands which we passed by, but could have visited had we been certain of getting away independently of the wind. This is a country of contrary winds, and the islands are widely scattered over a sea that is only navigable by daylight and in finest weather. Rocks awash and reefs jut out in every direction, and one sails over an unbroken surface for a while and then runs on to "foul ground" where the seas jump up in a most upsetting manner. The Admiralty charts contain the warning words, "Dangerous to navigation," and a strictly defined track is marked, outside of which, of course, lie the most desirable of the islands—those that have never been used for depasturing sheep or burnt off. Landing on all but the most frequented (about four) is a matter of chance, and always attended with danger. The handling of

camp outfit from a small dinghy is most difficult in a sea that sweeps up and down the slippery rocks from three to ten feet perpendicularly. Only one island, Sandy Hook, has a "beach," in all other cases one lands on the rocks. The only way in which the whole Archipelago could be examined satisfactorily is by means of a ten to twenty-ton yawl with an auxiliary engine, and with six months' time to pick suitable weather conditions. Every island of any size has its story of wreck and disaster, and the beach at Esperance has the remains of several broken craft towed in from the rocks of the islands. The trawler *Penguin* was wrecked on Middle Island, and during our visit two men were down there breaking her up. They were practically marooned on the island for some weeks, five attempts to get a boat down to bring them back to Esperance having been frustrated by contrary winds.

The question naturally arises, "Would it be worth while to fit out such an expedition as outlined?" The answer is, in my opinion, Yes, provided that all branches of natural science are represented on the expedition. Corbett, Wilson, Hood, Howe, and Termination Islands, off Esperance, and in the danger zone, would all be worth looking at. Further east, and lying between Mondrain and Middle Islands, there are Beaumont, Manicum, Glennie, Coombe, and a dozen or more small islands, all with possibilities. The Eastern Group, however, and the South East Isles, the position of which is marked "approximate" on the chart, I consider the most likely to contain new records or rare species. Christmas Is., the largest of the Eastern Group, is described by Mr. Stow, of Esperance, as being densely wooded, lofty, and having permanent fresh water.

Although I saw no Albatrosses while cruising amongst the islands, numbers of at least three species were seen crossing the Bight, and they were especially numerous at a point directly south of the Archipelago. It has always appeared possible to me that a colony of the Black-browed Albatross may be found on one of the islands in the Bight, and also that such Petrels as the Soft-plumaged, White-headed, and Great-winged, together with the little Fregettas (Storm-Petrels) breed in this locality. It would only be by exhaustive search of every accessible islet that the soundness of my theory could be proved or otherwise, but specimens of all the birds mentioned have been seen and taken in south-western Australian waters or washed up on the shores. That none was seen in the vicinity by me is not remarkable. I did not see a single White-faced Storm-Petrel, except one or two when on the *Katoomba*, and yet there were literally thousands breeding on the islands of the Archipelago. The explanation doubtless is that most of these Petrels are nocturnal in their habits.

The expedition was at least successful in bringing back to Sydney, for the Australian Museum, a fine collection of mam-

mals, fishes, mollusks, and insects, now being classified and worked out by the institution's experts.

## II. THE BIRDS.

This list contains particulars of the Birds noted on the Islands of the Recherche Archipelago only. References to other species noted on the mainland will be found in the narrative.

1. *Synoicus australis*. Brown Quail.—Several seen on Woody Island; one female taken.

2. *Phaps elegans*. Brush Bronzewing.—Fairly plentiful on Woody Island; four males taken, all fully developed, but showing remarkable variation in the frontal patch, the colour being from slaty-grey to yellow.

3. *Eudyptula minor*. Little Penguin.—Birds and eggs taken on Rob and Rabbit Islands; one bird seen on Charley Island. Not plentiful.

4. *Pelagodroma marina*. White-faced Storm-Petrel.—One colony in several sections in full breeding on Lion Island. Abandoned colony on Rob Island. Eggs taken on Lion Island showed rather above the average number of reddish markings.

5. *Puffinus carneipes*. Fleishy-footed Petrel.—Seen in large numbers feeding over the ocean between islands. Found breeding on Charley, Rabbit, and Mondrain Islands. Laying evidently commences about November 27th, but only a few eggs found on 29th. On later dates to December 12th fresh eggs found, and numerous burrows being still prepared for laying. The following table of dimensions of the eggs taken is interesting, as showing the wide variation. They are generally smaller than those of the Short-tailed Petrel (*Puffinus tenuirostris*).

Locality.	Charley Is.	Rabbit Is.	Mondrain Is.
No. of eggs measured . . . . .	14	2	12
Greatest major axis . . . . .	76 mm.	69 mm.	77 mm.
Greatest minor axis . . . . .	47 mm.	48 mm.	49 mm.
Least major axis . . . . .	66 mm.	67 mm.	64 mm.
Least minor axis . . . . .	42 mm.	48 mm.	43 mm.
Average . . . . .	69.50 x 45.50	68 x 48 mm.	70.25 x 46 mm.

Average dimensions of the whole series measured—69.25 x 46.50 mm. The birds show most marked variation in measurements, and in the colour of the bill. Some specimens when taken out of the burrow had a bill of a dull leaden colour, not unlike that of the Wedge-tailed Petrel; others were whitish, and others again had a distinct reddish tinge. The following table will show that there is no relation between the sexes or localities and the various nature of the bill colouring:—

Locality.	Sex*	Total.	Wing.	Tarsus.	Culmen.	Colour of Bill.
1. Charley I.	♀	390	310	53	42	Whitish.
2. "	♀	380	320	53	41	Whitish, tinged red
3. "	♀	375	310	52	42	Whitish.
4. "	♀	390	320	54	44	Reddish.
5. "	♀	390	315	51	41	Whitish.
6. Mondrain I.	♂	390	320	53	42	Whitish.
7. "	♂	390	310	53	42	Reddish.
8. "	♂	395	318	53	42	Yellowish horn.
9. "	♀	380	315	52	41	Yellowish horn.
10. "	♂	400	330	56	41	Reddish, very robust.
11. Rabbit I.	♂	390	325	53	44	Yellowish, tinged red.

No. 4 has all the breast feathers fringed with light brown.

6. *Sterna bergii*. Swift (Crested) Tern.—Seen only on Cook's Rock, near Charley Island, and an occasional wanderer on the cruises. Probably breeds in a colony on one of the outer ring of islands.

7. *Larus novæ-hollandiæ*. Silver Gull.—A pair seen on Mondrain Island.

8. *Gabianus pacificus*. Pacific Gull.—Pairs seen on Mondrain, Charley and Woody Islands; young birds seen on Woody Islands.

9. *Haematopus unicolor*. Sooty Oyster-catcher.—Several seen on each island visited.

10. *Nycticorax caledonicus*. Nankeen Night-Heron.—Colony of at least forty pairs found breeding on Lion Island, November 26th, most of the nests containing young birds in varying stages of growth. The nests were on the ground, under shelter of a hedge of scrub.

11. *Cereopsis novæ-hollandiæ*. Cape Barren Goose.—Two pairs seen on Rob Island, and one pair secured. This bird is said to breed on several of the islands in October and November. It is not protected in this locality.

12. *Phalacrocorax carbo*. Cormorant.—Several of each species seen on reefs, but no breeding place noted.

13. *Phalacrocorax fuscescens*. White-breasted Cormorant.—

14. *Astur novæ-hollandiæ*. White Goshawk.—One specimen seen on Woody Island.

15. *Falco peregrinus*. Black-cheeked Falcon.—Two pairs found breeding on Lion Island.

16. *Cerchneis cenchroides*. Nankeen Kestrel.—One seen on Gunton Island, where it was probably breeding in a hole in the cliff.

17. *Jeracidea berigora*. Brown Hawk.—Pair breeding on Charley Island.

18. *Neophema petrophila*. Rock Parrot.—Numerous on Charley and Woody Islands.

19. *Pachycephala pectoralis*. Yellow-breasted Whistler.—One male taken on Woody Island.

20. *Sericornis maculata*. Spotted Scrub-Wren.—One heard in the gully on Mondrain Island. (A specimen of this species was taken at Mississippi Bay on the mainland opposite Mondrain Island.)

21. *Zosterops gouldi*. Green-backed White-eye.—Common on Mondrain and Woody Islands.

22. *Meliphaga virescens*. Singing Honeyeater.—Very numerous on all the islands visited. (At Esperance the local name of this species is the "Dairy Bird.")

23. *Meliornis novæ-hollandiæ*. White-bearded Honey-eater.—Fairly plentiful on Mondrain and Woody Islands.

24. *Anthus australis*. Australian Pipit.—One specimen taken on Woody Island.

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\* ♀ Venus's Girdle—sign for female. ♂ Mars' arrow—sign for male.

## Birds Observed near Wellington, N.Z.

By R. H. D. STIDOLPH, R.A.O.U., Masterton, N.Z.

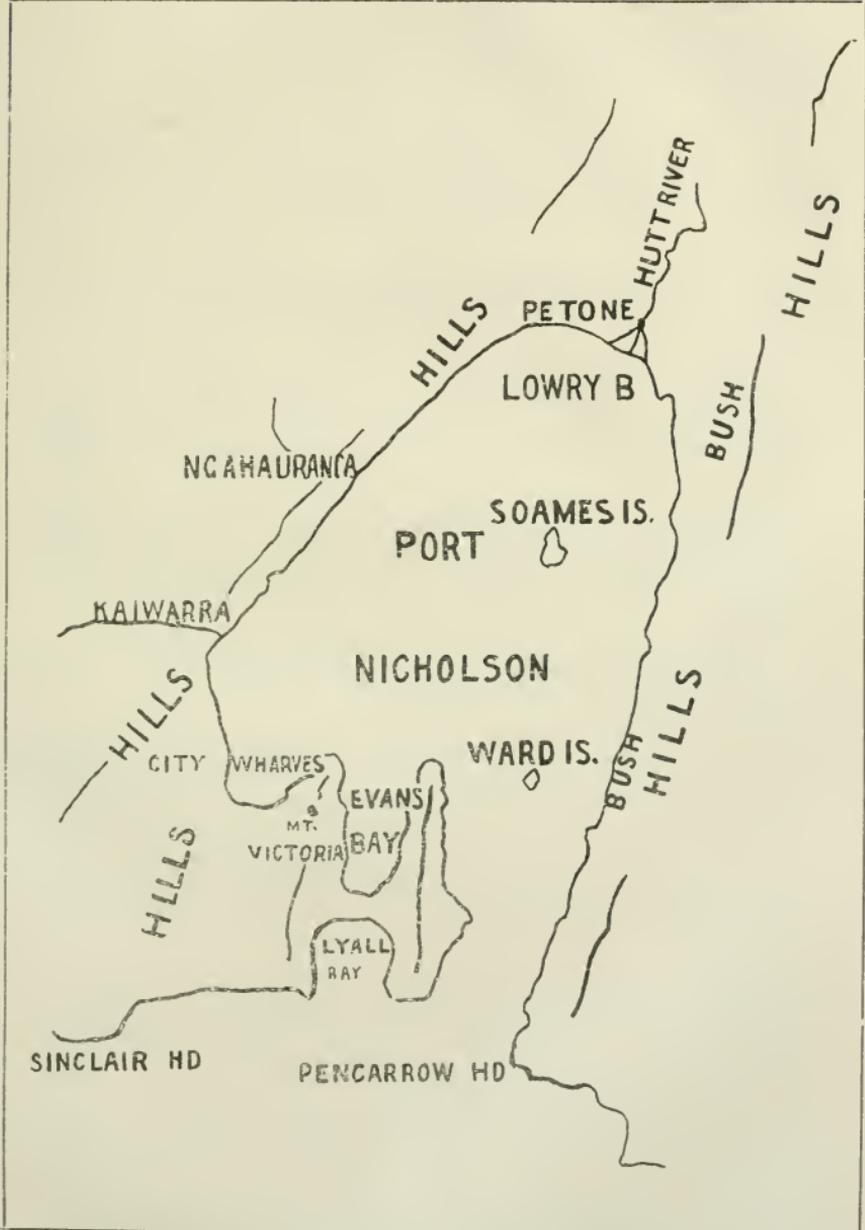
An endeavour has been made in the following article to "list" the species of birds at present found near the city of Wellington, N.Z. It is as well, perhaps, to mention, for the benefit of the readers of this journal, the nature of the country concerned.

The town is situated on practically the southern extremity of the North Island, and the ocean naturally borders it on the southern side. East, north and west, hills arise to heights varying from 600 to 1000 feet, and literally hem the city in, the only area devoid of them is naturally the 20,000 or so acres forming the waters of Port Nicholson, and the fertile Hutt Valley, stretching from the northern end of the harbour for about 12 miles northward, and of an average width of about one mile. The only river is the Hutt, flowing through the valley of the same name.

As far as native bird life is concerned, a vast change has taken place. Originally, practically the whole of the surrounding lands were covered with dense forest and scrub—now nearly a thing of the past. In these forests were found thousands of Tuia (*Prosthemadera nova-zealandia*); Hakas (*Nestor meridionalis*); Parrakeets (*Cyanoramphus nova-zealandia*; *C. auriceps*); Pigeons (*Hemiphaga nova-zealandia*), etc. In the Hutt Valley the now practically extinct Huia (*Heteralocha acutirostris*) was found around the homes of the early settlers; likewise the Saddleback (*Creadion carunculatus*); the Stitch-bird (*Pogonornis cincta*) not authentically reported from the mainland of the North Island for the last 40 years, nested in the Kaiwarra Gorge, but two miles from the city. The rare native Thrush (*Turnagra tanagra*) also inhabited these parts, and many others, long since gone, driven away by the destruction of the forests and the onward march of civilisation.

Left to us are still a few of our native birds, with a large list of introduced ones. Of the native forest, it is pleasing to know that practically the whole of the miserable remnants left are public property, and in them birds are protected. By far the best reserve around Wellington is the Day Bay Bush, but 6½ miles across the harbour from Wellington. The total area of the reserve is about 623 acres, but about one-half only of this area is forest. The balance is principally open scrub and fern land. The red-beech (*Nothofagus fusca*) and black-beech (*N. solanderi*) are the dominant trees of the forest, with a sprinkling of tawhero (*Weinmannia racemosa*) and rata (*Metrosideros robusta*). Ferns of all kinds are in abundance. Bird life is not as plentiful as might be expected.

The birds mentioned in this list are mostly permanent residents, the remainder being those of annual occurrence or regular



visitors. The Maori name of each species is given after the scientific name.

1. Grey Warbler (*Gerygone igata*), Riro-riro.—Evenly distributed all over the district. Is the most frequently recorded foster-parent of the young Shining Cuckoo (*Lamprococyx lucidus*).

2. White-breasted Tit (*Petroica toi-toi*), Miro-miro.—It is only in the larger pieces of native forest that this bird is to be found. It is most plentiful on the eastern side of the harbour. The female, being of a retiring disposition, is not so often seen as the male.

3. Pied Fantail (*Rhipidura flabellifera*), Tiwakawaka.—One of the commonest native birds left about this district. I have observed it even in Lambton Quay, one of the main streets of Wellington.

4. Black Fantail (*R. fuliginosa*), Tiwakawaka.—This species is of rare occurrence in the North Island. I have observed it once or twice in the Wellington Botanical Gardens. Very often breeds with the preceding species; the young, however, either resemble one or the other parent.

5. Whitehead (*Certhipanis albicapillus*), Popokatea.—Met with in the bush on the eastern side of the harbour, where it is one of the commonest native birds. Popularly called the Bush Canary.

6. Ground Lark (*Anthus novæ-zealandiæ*), Pokoihoi.—The New Zealand representative of the Pipit family is met with in most parts of the district under review.

7. White-eye (*Zosterops lateralis*), Tau-hou.—This bird, as is well known, came to New Zealand from Australia about 1856, and becoming very common has spread everywhere, and is now perhaps the most abundant of native birds.

8. Parson-bird (*Prosthemadra novæ-zealandiæ*), Tui.—One or two pairs still live in the vicinity of Wadestown and Khandallah, suburbs of Wellington. Also to be found at Day's Bay and vicinity.

9. Green Wren (*Xenicus longipes*), Matuhi.—This small bird is found only in the bush on the Day's Bay side of the harbour.

10. Rifleman (*Acanthidositta chloris*), Tititi-pouamu.—Met with in the same locality as the preceding species. Has a habit of constantly flicking its wings.

11. Kingfisher (*Halcyon vagans*), Kotare.—Most in evidence in winter and early spring, when it comes to the sea in search of food.

12. Shining Cuckoo (*Lamprococyx lucidus*), Pipiwharauoa.—Migrant. Regularly appears every year, usually in the early part of October.

13. Long-tailed Cuckoo (*Urodynamis taitensis*), Koekoea.—A rather irregular visitor, but I doubt if a year passes without one or two of these migrants visiting the district.

14. Bush Hawk (*Nesierax australis*), Karewarewa.—Occasionally pays a visit to the Hutt Valley. One, about three years back, wrought havoc among Canaries until shot.

15. Harrier (*Circus gouldi*), Kahu.—Generally to be observed soaring around in search of prey.

16. Morepork (*Ninox novæ-zealandiæ*), Kuru.—The familiar cry of this bird, from whence it takes its name, is heard all around Wellington.

17. Wood Pigeon (*Hemiphaga novæ-zealandiæ*), Kuku.—Now of rare occurrence, and only found in the bush on the eastern side of the harbour, but I doubt if it breeds there.

18. Blue Heron (*Demiegretta sacra*), Matuku-Moana.—Five or six of these birds inhabit the northern parts of Port Nicholson. They alternately appear at Lowry Bay and between Ngahauranga and Petone. It is believed they breed on a small islet off Soames Island, in the harbour.

19. Godwit (*Limosa novæ-zealandiæ*), Kuaka.—This annual migrant regularly appears about the mouth of the Hutt River.

20. Caspian Tern (*Hydroprogne caspia*), Tara-nui.—Found in the same locality as the preceding species, but I do not believe it is resident in the district.

21. White-fronted Tern (*Sterna striata*), Tara.—Flocks of these graceful birds are usually to be observed on the harbour.

22. Black-backed Gull (*Larus dominicanus*), Karoro.—Very plentiful on the harbour at all times of the year.

23. Red-billed Gull (*Larus scopulinus*), Akiaki.—Equally as plentiful as the preceding species.

24. Nelly (*Ossifraga gigantea*).—A few are generally to be observed about the waters of Point Nicholson, and approach quite close to the wharves.

25. Blue Penguin (*Eudyptula minor*), Korora.—Mostly found outside the harbour, but occasionally may be seen inside the heads and on Soames and Ward Islands.

26. Gannet (*Sula serrator*), Takupu.—Except in the breeding season a regular visitor; probably wanderers from Cape Kidnappers.

27. Black Shag (*Phalacrocorax carbo*), Kawau.—Frequents the mouth of the Hutt River mostly, where Dr. C. M. Hector has watched their evolutions under water, on a clear day, by the aid of good glasses. He has often timed them with a stop-watch, and finds 23 to 30 seconds to be the usual time of submersion.

28. Grey Duck (*Anas superciliosa*), Parera.—Frequents the Hutt River, and occasionally the harbour about Point Howard, Lowny Bay.

Mollymawks (? species) very rarely enter the harbour. Whale-birds (Prions) sometimes are picked up dead on the beaches after storms. A couple or so years back a Bittern (*Botaurus poiciloptilus*), and a White Heron (*Egretta alba*) were shot near the mouth of the Hutt River, but none of these can be claimed as inhabitants of the district, only chance visitors, which, in the case of the White Heron, may not occur again for a lifetime.

Of introduced birds, all more or less common, there are many. They are:—Song Thrush (*Turdus musicus*); Blackbird (*Turdus merula*); Hedge Sparrow (*Accentor modularis*); Goldfinch (*Carduelis carduelis*); Greenfinch (*Ligurinus chloris*); House Sparrow (*Passer domesticus*); Chaffinch (*Fringilla coelebs*); Redpoll (*Linota rufescens*); Yellow-hammer (*Emberiza citrinella*); Starling (*Sturnus vulgaris*); Indian Myna (*Acridotheres tristis*); Skylark (*Alauda arvensis*); Black Swan (*Chenopsis atrata*); Rock-dove (descendants) (*Columba livia*); Californian Quail (*Lophortyx californicus*); White-backed Magpie (*Gymnorhina hypoleuca*)—a total of sixteen.

I do not claim the above list to be complete. It is quite probable that other species of birds may be found—for instance, Dottrels, or some of the migratory shore birds. I have mentioned, however, all I have myself noted, or had authentically reported to me by careful and reliable observers, especially Dr. C. M. Hector and Mr. H. H. Travers, to whom I am much indebted.

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**Great Bower-Bird and its playthings.**—I notice in Dr. Morgan's interesting account of his trip to North-Western Australia, in the January number of the *South Australian Ornithologist*, where he found several bowers of the Great Bower-Bird (*Chlamydera nuchalis*). He states there that he noticed that the birds in collecting glass, stones, etc., for ornamenting the back and front of the bowers, put the same coloured article in each patch, one being of dull green glass, another of lumps of charcoal, and so on; the colour of the glass in each patch was exactly the same. I have noticed in the bowers of these birds, not far from Cape Yorke, where the birds, having no glass, stones, etc., to collect, got flowers instead, they being very plentiful, but the birds did the same thing with the flowers: each patch they made was formed of flowers of the one colour, and although I saw many patches, they never mixed the colours, as far as I knew of, practically doing the same as Dr. Morgan found in North-Western Australia. Possibly other members may have noticed the same thing with other Bower-Birds.—W. LE SOUF.





## PLATE I.

- Fig. 1. Left lateral aspect of the skull and mandible of the Wedge-tailed Eagle; natural size; jaw detached.
- Fig. 2. The mandible shown in Figure 1, viewed from below; natural size.
- Fig. 3. The cranium shown in Figure 1, viewed upon basal aspect. The skull here figured is from the skeleton presented by Captain S. A. White.

## On the Skeleton of the Wedge-tailed Eagle (*Uroaetus audax*, Latham)

By R. W. SHUFELDT, M.D., C.M.Z.S., R.A.O.U., Washington, D.C.

At different times, and in various places, I have, during the past thirty years, published accounts of the skeletons of a number of extinct and existing eagles. With the exception of *Pithecophaga philippiensis*, all of the species thus described and illustrated have been North American ones; and, while they differ in not a few respects, it may be said that, in the main, the osteological characters, as seen in all these typical aquiline forms, vary but little. Osteologically, however, most eagles have some distinctive character or characters to distinguish them, such as the great, transversely compressed beak of the Monkey-eating species of the Philippines, and so on for others.

Within the past year I have enjoyed the opportunity to study the skeleton of the famous Wedge-tailed Eagle (*Uroaetus audax*) of Australia and Tasmania. This has been made possible through the generosity and kindness of Captain S. A. White, who some months ago sent me a skeleton from Adelaide, and of the National Museum of Melbourne, which institution presented me with a beautifully prepared skeleton from its collections. Both are skeletons of adult birds, and more or less perfect in character. A short time after they came into my possession, I made photographs of a variety of their bones, and reproductions of those photographs are to be seen on the plates accompanying the present account of the skeleton of this species.

When about to commence work on the osteology of this famous Eagle, I was not aware that the subject had been touched upon by any previous writer; so it was a surprise to me when my friend, Mr. Henry K. Coale, of Highland Park, Chicago, kindly presented me with a copy of the interesting and useful little brochure entitled a "Memoir on the Wedge-tailed Eagle (*Uroaetus audax*) (Latham), a Study in Avian Osteology" by Mr. H. H. Scott. This appeared from the Launceston Museum on November 18th, 1909. The remarkable part of this work is that it appears to have been published by *The Examiner Daily and Weekly Courier, Illustrated*, of Launceston, Tasmania. But whether it appeared in that journal originally is a point upon which I am not informed at this time. One thing is certain, however, no American newspaper would for an instant think of issuing such a print; we have not yet reached such a phase of advancement. However, it matters not whether the *Examiner* published this neat little work, or whether it only came off their presses and was not a contribution to the paper; it is, apparently, in some respects a useful addition to the literature of the subject, and the facts and statements set forth in it will be

taken into consideration in the present account of the skeleton of the Wedge-tail.

Judging from certain bones of the skeleton, all of the American Eagles examined by me would appear to exceed *Uroaetus audax* in the matter of size. It is, moreover, considerably smaller than *Pithecophaga philippensis*, as may be proved by measuring and comparing any or all the bones of the skeletons of the two birds. It is also smaller than the Kamchatkan Eagle (*Thalassoaetus pelagicus*)—a bird fully one-third or more larger than the Wedge-tail, which latter is again exceeded in size by the Harpy Eagle (*Thrasaetos harpyia*). In fact, with respect to size, our present subject appears even a trifle smaller than the Golden Eagle (*Aquila chrysaetos*), judging from the comparative lengths of the long bones of the pectoral limbs. But little difference is apparent in the skulls of these two birds. This is likewise true with respect to the White-headed Eagle of America, in which species the bones of the pectoral limb are longer than they are in the Australian bird.

#### THE SKULL. (Plates I.-III., Figs 1-6.)

There is a very considerable amount of uniformity with respect to characters in the skulls of all Eagles, in so far as I have examined and compared them, and to this statement the Wedge-tailed Eagle forms no exception. In this matter, however, there is one well-known departure, and that is with respect to the skull of the famous *Pithecophaga philippensis*, of the Philippines—a bird having, as I have elsewhere shown, as far as the cranium is concerned, unusual depth in the vertical direction, and at the same time extraordinary transverse compression of the mandibles, more especially the upper one.

As compared with the crania of such species as our White-headed Eagle (*Haliaetus leucocephalus*) and the Golden Eagle (*Aquila chrysaetos*), it will be noted that the Australian bird belongs in with the short-faced forms represented by this species, rather than with those with somewhat more elongate crania, as the White-headed species.\* In passing it may be noted that *Pithecophaga*, despite the great depth of its skull, is more or less representative of the short-faced forms. Then, too, as is the rule throughout the vertebrata, there is almost invariably present very distinct differences, both with respect to form and measurements, among the skulls of Eagles of the same species. This is well exemplified in the skulls at hand of the subject of the present paper. For example, while the transverse diameter between the post-frontal processes is the same in each cranium, the skull of the Eagle from Captain White is notably narrow posterior to those processes.

\* Shufeldt, R. W. "Osteology of Birds," State Museum Bull. 130, Albany, N. Y., 1909, P1.5, Fig. 6, and P1.7, Fig. 12.

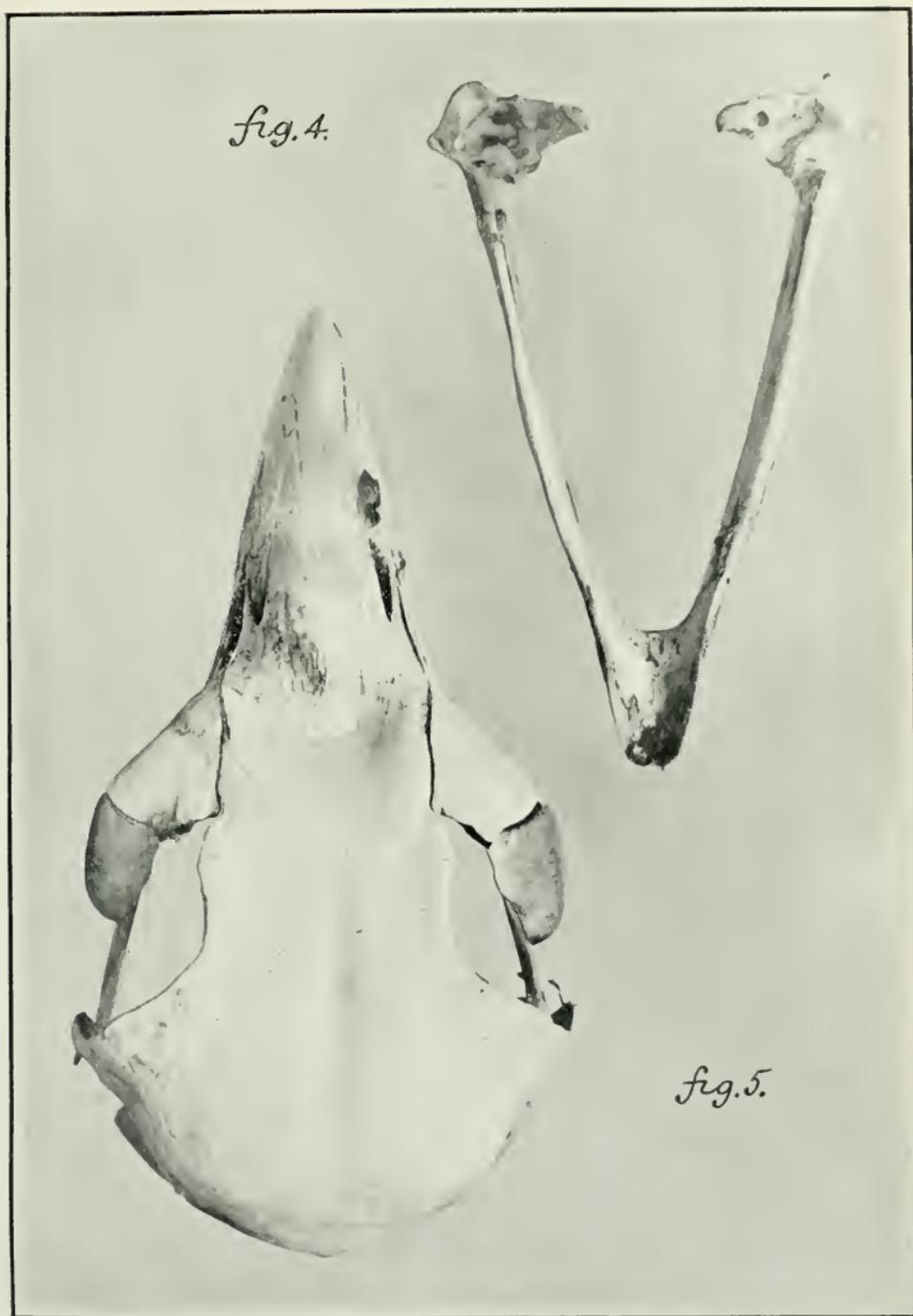


PLATE II.

Fig. 4. Mandible of the Wedge-tailed Eagle, viewed from above; natural size.  
Fig. 5. Cranium on dorsal aspect. Same skull as figured in Plate I.





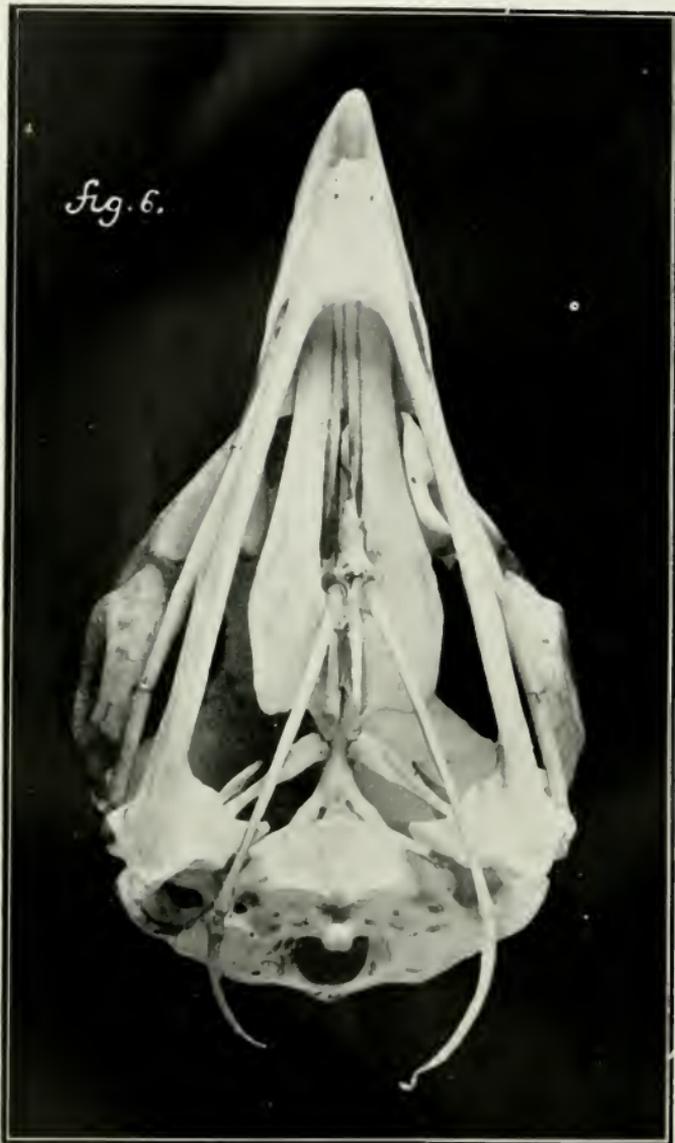


PLATE III.

Fig. 6. Basal aspect of the skull of the Wedge-tailed Eagle, with mandible, hyoid arches and sclerotals of the eyes held *in situ*. This is the skull of the specimen from the collections of the National Museum of Melbourne.

Such individual differences in the skulls, or, indeed, in any part of the skeleton of birds (or other vertebrates) of the same species, is a matter I have frequently invited attention to in my osteological papers; yet many writers on avian osteology, in describing the skeleton of some particular bird, present us with tabulated measurements of bones, in a way that leads one to believe that those same measurements will be found to obtain in all adult specimens of the same species of bird. This is by no means true, and will hold no better with birds than it will with our own species; we all know how the skull and other bones of the skeleton in *Homo* vary in such particulars. Sometimes, in fact, very frequently, such differences may either be due to sex or to the age of the individual; but not always. Take Eagles, for example, we may find that the skulls of two adult males of the same clutch, hatched at the same time and having the same parents, present, when both become adult, very perceptible differences in any of the bones of their skeletons, and especially in the skulls. Among not a few others, a good example of this may be noted in the case of these Wedge-tailed Eagles. Mr. Scott, in the skull of that species described by him (see *antea*) says: "The extreme length of the skull between verticals is 122 mm." I find the extreme length to be 124 mm. in the skull sent me by the Melbourne Museum, and in the skull from Captain White it is 120.5 mm. This may be a sexual difference—a point I cannot pass upon with certainty, for the reason that the sexes of these two birds are not known to me; evidently they were both adult.

Similar differences or even greater ones, are seen to exist in the cases of the interorbital fenestræ—strikingly so in "the depth of the beak" and other measurements. This is not only true of measurements, it also applies to characters; and Mr. Scott states, in the case of the Wedge-tailed Eagle examined, that "upon the vertex of the skull there is a median depression similar to that found in the Chestnut-faced Owl, but less strongly marked." This is quite true of the skull of the Eagle from Captain White; but no such furrow or depression exists in the skull of the Eagle from the Melbourne Museum, where the medium fronto-parietal region is quite flat or even a trifle full.

One example more, and we will again pass to the consideration of the skull. Apart from similar differences in the measurements of the sternum, Mr. Scott says of the sternum of the Wedge-tailed Eagle that "the sternum of this Eagle, unlike that of the Indian Vulture, has no posterior fontanelles, and the notching is also slight."† Now there are no posterior sternal foramina in the sternum of the Eagle from the Melbourne Museum, and no notching whatever to the straight posterior

† There is no paging to Mr. Scott's brochure, so the pagination cannot be given in quoting him. R. W. S.

margin to the bone, it being at right angles to the keel. On the other hand, in the Captain White specimen, there is a considerable foramen on the right side, well within the postero-external angle, and the hinder margin of this sternum is markedly concave, the convexity being directed anteriorly. In some species of Eagles, as will be seen further on in this paper, the sternal foramina are very large.

Returning to the consideration of the skull, and viewing it upon its dorsal or superior aspect, it is to be noted in such Eagles as are at my hand at this writing; that is to say, in addition to *Uroaetus*, the Philippine bird (*Pithecophaga*), the White-headed, the Golden, and the Kamchatkan, there is invariably a more or less evident median concavity at the point where the nasal processes of the premaxillary are lost from sight posteriorly. This concavity possesses no defined borders, being simply a median depression in the region of the locality designated as the "facial hinge" in some birds when a certain degree of mobility exists there. Usually, in the Eagles here being compared, the sutures between the premaxillary and the bones in contact with it are readily made out, especially should the bird be a subadult individual, when they are very clearly defined, as in the case of the skull of a White-headed Eagle at hand (No. 19926). Posterior to this concavity, the interorbito-frontal region is broad and generally flat, with the extensive orbital margin on either side rather sharp and thin. The external vault of the cranium is likewise broad and smooth, presenting a uniform convexity throughout its extent. Anteriorly and mesially it occasionally possesses, as pointed out above, a shallow, median groove in the frontal region.

In these characters, as thus far enumerated, all these Eagles practically agree, the cranial region merely being relatively somewhat broader in the Wedge-tailed Eagle than it is in any of the other species under consideration.

All true Eagles have very large *lacrymal bones*, and either one of these articulate with a free, subtriangular piece of considerable size at its outer, free margin—a flat, thin bone, generally designated as the *accessory lacrymal*. Apparently, in subadult Eagles, as for example in the White-headed Eagle (No. 19926, U.S. Nat. Mus. Coll.), the free, posterior margin of a lacrymal is rounded, and the ligamentary attachment of the accessory piece is feeble in character, and readily comes away in the preparation of the skeleton. In other specimens, where the birds are adult, the attachment is much firmer and coextensive with the long, straight edge of the outer margin of the lacrymal. (Pl. ii., Fig. 5.)

In the big Kamchatkan Eagle the horizontal portion of either lacrymal is very small, both relatively and actually as compared with the size of the bird and the skull it has. On the other hand, the descending part of the bone in this species is massive

and strong, and this is especially true of the part where it joins with the remainder of the bone above it.

In the Wedge-tailed Eagle, the lacrymal and their accessory pieces are likewise large and massive in character, the latter being thoroughly performed in bone as in *Pithecofaga*, while in Golden Eagles and the Kamchatkan one this accessory piece may long remain in cartilage.

As is the case with nearly all the rest of the skull, the lacrymals are highly pneumatic in character.

*Uroaetus aular*, in common with other Eagles, possesses a large, quadrilateral *pars plana*; it is completely ossified, pneumatic, and stands out sub-perpendicularly from the mesethmoid on either side. In no Eagle examined by me does it come in contact with the lacrymal of the same side.

Eagles, as a rule, possess enormous *orbital cavities*, and to this the Wedge-tail forms no exception. Their great size accounts for the crowding backwards the cranial brain cavity, which, in the case of any of the species, is reduced to its minimum capacity for birds of their size. Both the Kamchatkan Eagle and the Monkey-eating one possess remarkably small brain cavities for the size of the skull; indeed, in an Eagle skull every part of the bony structure seems to be in a way subordinated to the necessity for possessing capacious orbital cavities. Either eye, too, has in its make-up a wonderful circlet of *sclerotic plates*, and these, in very old Eagles, may fuse into one solid ring. (Pl. iii., Fig. 6). When this happens, the sutural lines are almost entirely obliterated.

As to the strong, bony *interorbital septum*, present in all Eagles, it is, in our present subject as well as in *Pithecofaga*, *Haliaetus*, and *Aquila*, centrally perforated by a good-sized, elliptical vacuity; while in the Kamchatkan species the septum is entire and very solid. As a matter of fact, in all Eagles the orbital cavities possess osseous walls of more or less density on all sides but the outer one, and this renders it a simple matter to detect the usual foramina entering or passing out of an orbit, for their definition in any case is clear.

Up to this point of our comparison, no very distinctive characters have been discovered, which can, with certainty, be employed to distinguish the skull of *Uroaetus* from the skull of some other Eagles of a similar size. To be sure, the big Philippine bird can be thrown out, as its superior mandible distinguishes it at once.‡ Turning to the Kamchatkan Eagle, its skull, as compared with our present subject, may at once be recognised by its superior size; by the absence of any vacuity in its interorbital septum, and by a few other insignificant characters.

In the Golden Eagle the nasal septum is perforated, and the

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‡ Shufeldt, R. W. "Osteological and other notes on the Monkey-eating Eagle of the Philippines, *Pithecofaga jeffreyi*, Grant." Philippine Journal of Science, vol. xv., No. 1, Manila, P. I., July, 1919, pp. 31-58, Pls. I.-XI.

skull is appreciably smaller than that of the Wedge-tail; but beyond this there are no conspicuous characters to distinguish them.

Finally, upon critically comparing a skull of the White-headed Eagle (*Haliaetus l. leucocephalus*, No. 19926, Coll. U.S. Nat. Mus.) with the skull of the Wedge-tail sent me by Captain White, I find that not only do the two skulls possess the same length and width, but the characters in this part of the skeleton of the two birds are almost identical. We find the nasal septum perforated in the American bird, and not in the Wedge-tail; but there is reason to believe that the former was, to a degree, a sub-adult specimen, and that perforation might have filled in with age.

Another interesting point to be reckoned with is this: the descending post-frontal process in the White-headed Eagle is *broad* and uniformly curved; in the skull of the Wedge-tail (White's specimen) it is narrow, rather stout, and pointed; but then, on the other hand, this process in the skull of the Wedge-tail from the Melbourne Museum agrees in *all* particulars with that apophysis in the White-headed Eagle here used in comparison. In other words, with respect to this particular cranial character, it does not agree in the crania of the two Wedge-tails, while in the case of one of them it exactly agrees with the same cranial character in the White-headed Eagle.

Again, the cranium of the Wedge-tail from the Melbourne Museum is wonderfully similar to the cranium of a Golden Eagle in the United States National Museum (No. 19443), and resembles it more closely, character for character, than it does the cranium of a bird of its own species sent by Captain White, which, as stated above, more nearly agrees with a skull of the White-headed Eagle.

Turning to the base of the cranium of this Wedge-tailed Eagle, we find the same thing existing. Each and all of the skeletal characters there to be found are typically aquiline, and as such I have defined them in upwards of a dozen memoirs on the osteology of these birds.

Taking them up, character by character, the maxillo-palatines, the palatines, the zygomas, the quadrates, the rostrum, and the bases of the cranium, I find the skull of *Uroaetus audax* (R. 7338) sent me by the National Museum of Melbourne to agree very well in such a comparison with the skull of a Golden Eagle (*A. chrysaetos*), Coll. U.S. Nat. Mus., No. 19443), while the skull of a Wedge-tail sent by Captain White has those characters more as we find them in a skull of the White-headed Eagle (No. 19926, Coll. U.S. Nat. Mus.). In this latter specimen I find, at the base of the cranium, at their usual sites when present in birds, diminutive, sharp-pointed processes representing aborted *basipterygoid processes*; these "prickles," as Parker used to call them when they were non-functional and as rudimentary as these, are *entirely absent* in the White specimen of *Uroaetus*, but



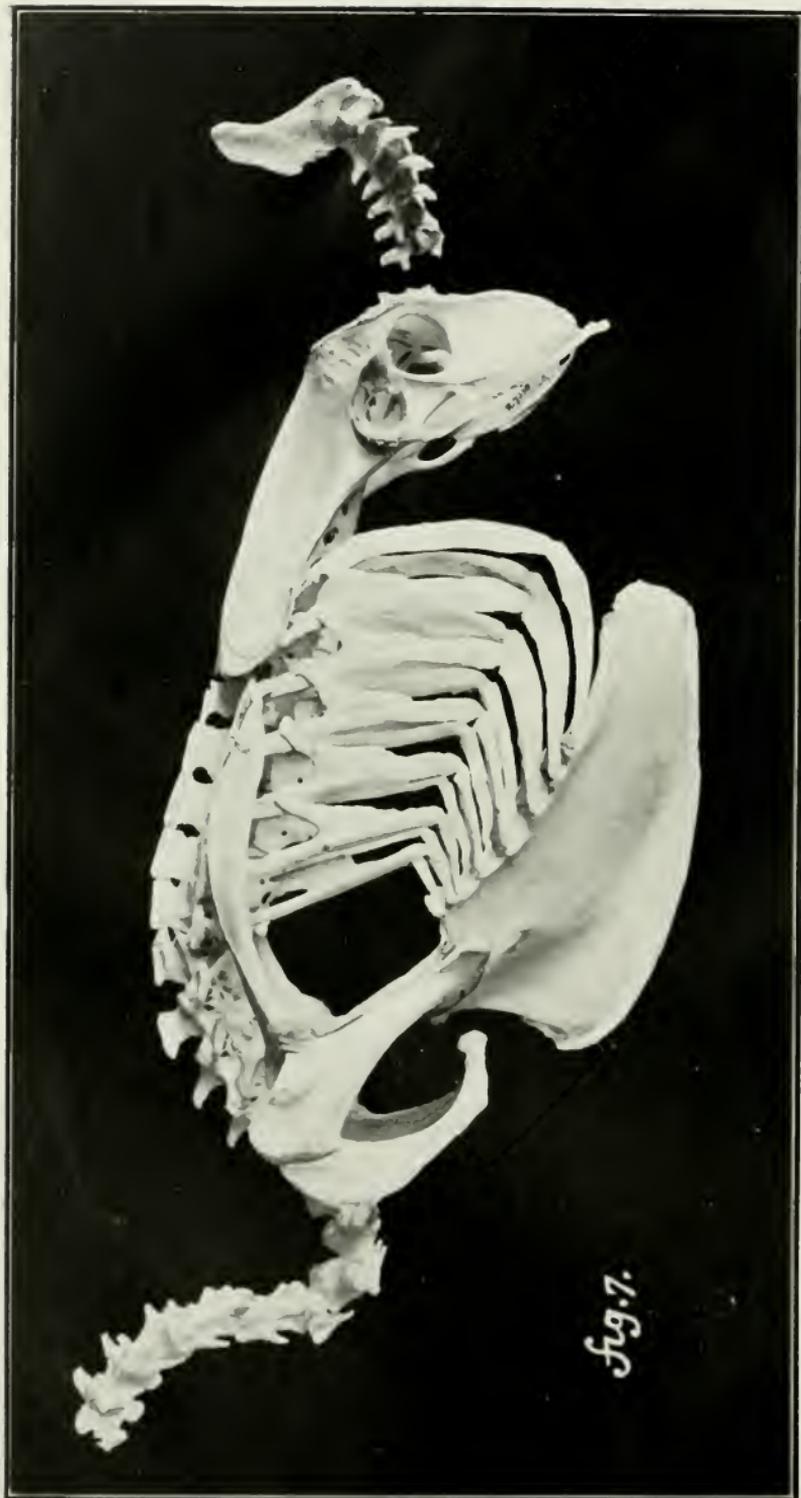


PLATE IV.

Fig. 7. Left lateral view of the trunk skeleton of *Uroaetus audax*, considerably reduced; caudal vertebrae and pygostyle detached. From the skeleton furnished by the National Museum of Melbourne.

faintly indicated in the cranium of that bird from the Melbourne Museum; further, they are quite evident in the skull of the White-headed Eagle (No. 19926). There is not the slightest indication of them in the skulls at hand of the Kamchatkan Eagle or in *Pithecophaga*. However, in view of the fact that they are present in *one* skull of *Uroaetus* and not in another—both skulls being from adult individuals—it would seem that the feature should carry but little weight as a classificatory character.

Turning to the *mandible* (Pl. i., Figs. 1, 2; Pl. iii., Fig. 6), we find that the characters it presents in no way differ from what I have described for Eagles in other places. §

Some Eagles have the interramal angle more acute than others, even in individuals of the same species, as is the case with the jaws of the two Wedge-tails at hand. The depth of the symphysis also varies; but these are merely individual variations that occur in all animals of the same species. Our Golden Eagle has the rami of the mandible very shallow; it is somewhat deeper in the White-headed Eagle; proportionately still deeper in the Kamchatkan bird, and, relatively as well as actually, deepest of all in the Wedge-tail. All Eagles possess a more or less massive mandible, in which no *splénial vacuity* ever exists.

The bones of the tongue (hyoidean arches) in our subject present no characters beyond what we meet with in all true Eagles (Pl. iii., Fig. 6), with the few usual variations, either individual or specific.

Already I have stated, in my article on the osteology of *Pithecophaga*, that "in many publications here and abroad I have described the skeletons of various species of Eagles, Falcons, Hawks, and their near congeners, both fossil and existing forms, and it may be said that we meet with few marked differences in any of them with respect to the characters presented on the part of the hyoidean arches or skeletons of the lingual apparatus (Pl. iii., Fig. 10)."

A noteworthy departure in the case of the tongue-bones is to be seen in the Kamchatkan Eagle. In that giant Eagle we find the glosso-hyal extensively ossified at its basal extremity, where it assumes the form of a capital letter H, as it does in some of the lesser *Falconidæ*—in *Circus*, for example; a figure of the hyoid bones in that species may be seen in my "Osteology of Birds" (P. 56, Fig. 22).

#### SKELETON OF THE TRUNK.

Where we find, in birds of the same sub-family and more or less nearly related genera, their skulls and associated bones very much alike with respect to their characters, it is fair to presume that the same will obtain with respect to the vertebræ, ribs, pec-

§ See bibliography of my publications on the osteology of eagles in the above cited brochure on *Pithecophaga*.

toral arch, sternum, pelvis, and so on. It requires but a very superficial comparison to find this to be the case with respect to the trunk skeletons of the several species of Eagles at hand. In each and every one of these, including the subject of the present contribution, we find fourteen cervical vertebræ, the last two (13th and 14th) bearing each a pair of free ribs (very rudimentary on the 13th vertebra). There are five dorsal vertebræ, all having ribs connecting with the sternum through costal ribs. There are two pairs of pelvic ribs, and both pairs connect with the sternum through costal ribs. All these dorsal and pelvic ribs, save the last pair of the latter, support large, elongate, epipleural appendages, in each case being solidly ankylosed to the border of the rib. Costal ribs are also stout, the first pair being the shortest, the remaining ones becoming longer and longer as they advance from before, backwards.

For a side view of the Eagle *pelvis*, see Plate iv., Fig. 7, and for a dorsal view of the bone in the Golden Eagle see my "Osteology of Birds" (P. 97, Fig. 48); it is fully described in my paper on *Pithecophaga* (*antea*, p. 40). There are eight caudal vertebræ, plus a large pygostyle.

There is but little variation in the case of the bones of the *shoulder-girdle* among any of the true Eagles, and this applies to the various species at hand at this writing. The coracoids are stout and large; the *os furcula* is a big, wide-spreading U-shaped bone, and the scapule are broad and long. (See Pls. iv.-vi. of the *Pithecophaga* memoir; Pl. iv., Fig. 7 of this paper, and several figures in my Osteology of Birds.)

There is a great similarity in the case of the *sterna* of Eagles, and this, too, applies to the bone as we find it in *Uroactus*, *Aquila*, *Pithecophaga*, *Haliactus* and *Thalassoactus*. It is twice as long as broad; dorsally it is deeply concave, and correspondingly convex ventrally; the keel is more or less deep anteriorly, but becomes gradually shallower from before, backwards; it is lost on the body of the sternum, far in advance of the transverse, unnotched xiphoidal border; the anterior carinal border is concave from the small, trihedral manubrium to the carinal angle; the coracoidal grooves decussate in the median line. There may or there may not be an elliptical foramen on either side, far back on the xiphoidal part of the bone, and more or less near the outer angle; these foramina vary in size, and they may be entirely absent, or there may be only a single, small one on one side or the other. As a classificatory character, these foramina are valueless, as their presence or absence may obtain in birds of the same species, either upon one side, or both. The entire trunk skeleton is pneumatic, save more or fewer of the distal caudal vertebræ.

Apart from the presence or absence of the xiphoidal foramina, the sternum of *Uroactus* is almost identical in all of its characters with that bone in *Haliactus*—size included. While



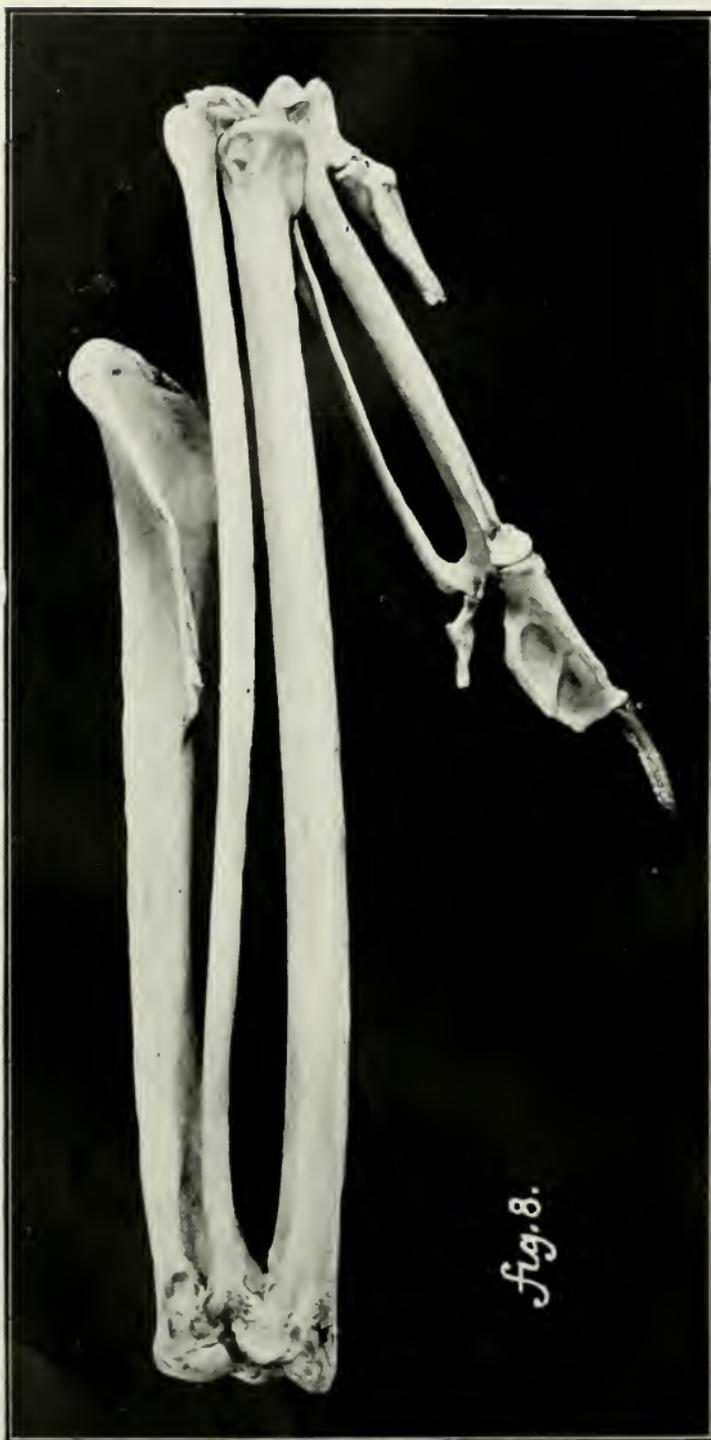


PLATE V.

Fig. 8. Right pectoral limb of *Uroaetus aulax*; palmar aspect; normally articulated, and considerably reduced. The National Museum specimen.

the widths are equal, it is relatively somewhat longer than the sternum in the Golden Eagle. I have already pointed out, in my paper on *Pithecophaga*, some of the osteological characters of the sternum of Eagles, and devoted Plate v. to the trunk skeleton of the Harpy Eagle.

Now while these latter birds agree pretty well in this part of their osteology—more particularly in their pelvis—not sufficient attention was paid to the *sternum* of *Thrasactos harpyia*. In some respects this bone differs from that of any other Eagle at hand at this writing. Some disease or other in the specimen before me (No. 225806, Coll. U.S. Nat. Mus.), had attacked the coracoidal grooves and sternal extremities of the coracoids, causing considerable exostosis; and it is a little difficult to say, from this specimen, whether the grooves in question decussate or not. I am, however, strongly inclined to believe that they do, thus agreeing in this particular with most existing Eagles. This Harpy's sternum is very deep and capacious ventrally, and its posterior moiety differs in one respect from the sternum of any other species of Eagle before me at this writing. Its entire xiphoidal part is broad and handsomely rounded. There is a large elliptical fenestra on either side, while the most striking feature consists in the fact that the outer angles of this part of the bone are considerably produced lateralwise beyond the costal border of the bone, and curve forwards, each as a broad, rounded, triangular hook, with its apex pointing to the front. The transverse line between the apices of these processes measures 8.3 cms., while the transverse line measured directly anterior to them, from one edge of the sternal margin to the other, is but 6.5 cms. Taken as a whole, the hinder margin of this bone is rounded, the concavity being to the front. On either side of its central part there is a shallow notch. The fenestræ are well within this border.

The anterior pair of *costal ribs* in the skeleton of this Harpy are short and small, and their sternal ends articulate with a minute facet on the *anterior margin* of the costal process of the same side. This is unusual, and different from any Eagle examined by me.

The pelvis of the Harpy Eagle is considerably compressed from side to side as in *Pithecophaga*, even to a slightly greater extent. To a slight degree the Wedge-tail also exhibits this character, while the sternum is most spreading in the Kamchatkan bird.

In a survey of all the general osteological characters presented on the part of the trunk skeletons of these Eagles, I would say that, in this part of their osteology, the Wedge-tailed Eagle and the Golden Eagle (*Aquila chrysaetos*) were in the closer agreement, the latter being somewhat the larger species. Sharpe, in his "Hand-List" (vol. i., p. 260), places *Uroaetus* as the leading genus in the sub-family *Aquilinae*, and, in the same group, the next

genus is *Aquila*. Thus far the skeleton would appear to support this arrangement.

#### OSTEOLOGY OF THE PECTORAL LIMB.

As will be noted from an examination of Plate v., Fig. 8, there are no especial characters to be found in the bones of the wing of the Wedge-tailed Eagle, other than those occurring in the corresponding bones in the wings of other Eagles. These characters have been quite fully described by me for several aquiline species, in my various writings, and particularly does this apply to the memoir on *Pithecophaga*, which appeared in the *Philippine Journal of Science* in 1919.

As compared with that of the Harpy Eagle, the *humerus* of the Wedge-tailed Eagle is a much more slender bone and a shorter one. With respect to length, it differs in different individuals. For example, the *humerus* of the Wedge-tail received from Captain White is but 17.9 cms. in length, while the corresponding bone in the skeleton of the Wedge-tail from the Melbourne Museum has a length of 18.5 cms. The *humerus* of the Harpy Eagle at hand (No. 225806, Coll. U.S. Nat. Mus.) is 19.5 cms. long, and is a much stouter bone in all respects. Its radial crest is shorter and higher at the apex of the triangle. The sigmoidal curvature of the two bones is identical, and both are thoroughly pneumatic.

With the usual Eagle character present, the *humerus* of the Kamchatkan Eagle (*T. pelagicus*) indicates an aquiline species of great size and power. It has an extreme length of 22.7 cms., with a corresponding bulk. Judging from the *humerus* alone, I would say that the Kamchatkan Eagle was a bird fully one-fourth larger in all respects than the Wedge-tail.

Our Golden Eagle possesses a *humerus* very similar to *Uroaetus audax*, while it averages a few millimetres longer. The two bones possess almost identically the same characters, even to the amount of curvature to the shaft. This curvature is more marked in the *humerus* of *Pithecophaga*—an Eagle in which the bone presents an average length of 20 cms., and the species as a whole is probably a larger bird than the Wedge-tail.

Even the American White-headed Eagle possesses a larger and longer *humerus* than the Wedge-tailed species—that is judging from the *humerus* belonging to the skeleton of an *H. leucoccephalus* of the United States National Museum (No. 19,926), and it has an extreme length of 19.2 cms.

Bones of the *antibrachium* and *pinion* are well shown in Plate v., Fig. 8, of the present paper. With respect to the *ulna*, that bone in the arm of the White specimen of *U. audax* has a length of 22.3 cms.; that of the Melbourne Museum specimen a few millimeters shorter, while the big Kamchatkan Eagle has an *ulna* measuring no less than 25.0 cms. in length, and the Golden Eagle from 22.3 to 22.4 cms.



PLATE VI. Fig. 9. Right pelvic limb of *Uroaetus atidax*; mesial aspect; bones normally articulated in part, and considerably reduced. The actual length of the tibio-tarsus is 16.2 cms. The National Museum specimen.



Radius presents some curvature along its rather straight shaft, as is shown in Plate v., Fig. 8. Distally, it projects beyond the ulna, and has attached to its inner-antero angle of that extremity an *os prominens* of good size. This, which I described many years ago, is probably present at the wrist, or near the same, in all typical Eagles, if not in the *Falconidae* generally.

In the Kamchatkan Eagle the radius has a length of 25.2 cms., its shaft being of uniform calibre, and presents the usual amount of curvature along its continuity.

The skeleton of the hand in *Uroaetus audax* is very similar to the same part of the skeleton in the Golden Eagle, the latter, as a rule, being but a trifle longer, bone for bone. Curiously enough, the small distal free phalanx of the Golden Eagle is notably shorter and smaller than the corresponding bone in the manus of the Wedge-tail.

The long bones of the antibrachium in the wing of the Philippine Monkey-eating Eagle have the same lengths as the corresponding ones in the forearm of our present subject.

Thus it will be seen, taking it all in all, that the skeleton of the *pectoral limb* of *Uroaetus audax* is most like, in characters and proportions, that of the Golden Eagle, and this resemblance seems to be sustained by other bones of the skeleton.

#### THE PELVIC LIMB.

Apparently all the bones of the limbs in the Wedge-tailed Eagle are pneumatic, and the foramina occur at their usual sites as seen in other diurnal Raptores.

In the case of the femur, the *pneumatic foramen* is large, as may be appreciated at a glance by turning to Plate iv., Fig. 9, where the skeleton of the *pelvic limb* is well shown.

While the characters of the bones of the pelvic limb are quite in agreement, in so far as the skeletons of the several species at hand at this writing are concerned, there exist curious differences in *lengths*, and to a slight degree in calibres. This can best be shown in a tabulated form, where the measurements are given in centimeters and fractions, thus:—

SPECIES	Femur	Tibio-tarsus	Tarso meta-tarsus	Mid anterior toe	Remarks
<i>Uroaetus audax</i> ... ..	11.6	16.5	10.9	8.5	Rather stout
<i>Aquila chrysaetos</i> ...	13.2	17.6	10.5	8.5	„ „
<i>Haliaetus leucocephalus</i>	12.9	16.6	9.9	9.1	Stout
<i>Thalassoaetus pelagicus</i>	13.0	17.2	9.8	10.5	Very Stout
<i>Pithecophaga jeffreyi</i> ...	13.2	20.4	12.0	9.5	„ „
<i>Thrasaetos harpyia</i> ...	13.0	18.2	?	?	„ „

The degree of pneumaticity seems to vary, the *femur* always enjoying that condition to the fullest extent, and usually the proximal moiety of the tibiotarsus—sometimes the entire bone. Usually all the bones of the foot, including the tarso-metatarsus are non-pneumatic.

Eagles as a rule possess a small *patella*, which is flat on top and anteriorly, but convex posteriorly; in the Wedge-tail its greatest transverse diameter measures about a centimeter and a half, and rather less in the vertical direction.

### CONCLUSIONS.

From a survey of all the characters here shown, it would seem that *Uroaetus audax* is slightly smaller than *Aquila chrysaetos*, in so far as its skeleton is concerned, and much smaller than such species as the Monkey-eating Eagle and the Kamchatkan. In its osteology it appears to be most nearly related to the Golden Eagle (*Aquila chrysaetos*), and this relationship will probably be supported by the characters presented on the part of the remainder of its morphology, when that comes to be studied.

## Tasmanian Notes

By H. STUART DOVE, F.Z.S., West Devonport, Tasmania

**Movements of Swifts in Tasmania.**—A disturbance arose from south-east on 26th January, 1920—a vivid flash, a peal of thunder, then rain and high wind, quite cold. Next day fine, but S.E. wind continued. Just before sunset the first of the Spine-tailed Swifts (*Chaetura caudocuta*) seen this summer began to come over from North-west, flying rather languidly, "fluttering" the wings, more than usual, and in small, straggling parties, at a height of from 100 to about 200 feet. They were passing from 7 p.m. until nearly 7.30, against the wind; sky fairly clear. Next morning air quite sharp, with frosty tang in it. No more were seen until the end of February, when at 2.30 p.m. several were seen at no great height making their way, one at a time, to the west. At 5 p.m. a large number appeared, at first making way towards S.W. against a strong wind; they afterwards played about at a great height, then moved away in a north-westerly direction, towards the sea. Others appeared at a much lower elevation, also making to N.W. Weather cool and windy, after rain, which had succeeded several weeks of heat and drought. On 9th March, a pair of Swifts was observed towards evening making away to north-west, wind S.W. fresh, fine after rain yesterday. On 14th March, a single bird flew to south-east; calm, overcast, electric, rain threatening. It was fine, with very strong southerly breeze on 21st March, after N.W. gale, with heavy rain previous day; small party of Swifts feeding about 2 miles inland, many flying quite low. 23rd March: Fine Aurora

last night till daylight this morning; in afternoon large number of the birds appeared, some low, others various heights up to a great altitude, all apparently insect-catching; rain began while I was watching; nice long shower, hardly perceptible N.W. breeze. While on Ulverstone Show Ground, about 12 miles west of Devonport, on 25th March, a number of the birds appeared, flying quite low; calm, sultry day, with a few light showers. Between 5 and 6 p.m., a large number appeared (also at Ulverstone) at a great height overhead, circling in a mazy dance for a long time at about the same spot. Some appeared to make off over the sea (north) before dark, others seemed to move eastward; there was another light shower, then clear. A friend told me that a large number of Swifts were over Devonport the same afternoon I observed those at Ulverstone, some very low; towards evening they rose to a considerable altitude, and apparently passed to eastward. The same night another Aurora was seen, so there was evidently much electric tension in the atmosphere, causing the peculiar movements of the birds. They evidently migrated at this time, as none was seen later. During the summer of 1921, the birds began to appear just after New Year; on evening of 2nd January a considerable number passed over Devonport towards south-east, about 7.30, at various heights, some at a very considerable altitude. The previous day had been extremely muggy, with electrical disturbance, and rain from north at night. On evening of 4th March, a pair passed over going south or inland; next day, heavy wind from south, with shower or two. A solitary Swift seen on afternoon of 17th March, passing towards S.W., in teeth of strong wind; air dry. Morning of 21st was overcast, smart shower from N.W. before noon; shortly afterwards a dozen or so of Spine-tails passed towards S.W. at medium height; in later afternoon and evening brisk cool S.W. wind. On 23rd March, a friend and myself started from Devonport for Hobart on a beautifully sunny morning; about dinner-time we passed large numbers of Swifts on the hills just off the main road, between Ross and Tunbridge, flying backwards and forwards over sparsely-timbered country, evidently taking insect food; they continued for about ten miles, so there must have been a great company altogether. Early afternoon somewhat sultry, with light N.W. breeze, afterwards clouded over, heavy shower before 5 p.m., heavy wind and showers next morning. This was by far the largest quantity of Spine-tails encountered this summer; the last observed were after tea on 9th April, at a medium height, going directly towards N.W., not feeding, evidently on migration; wind S.W., strong, squally; there had been high wind and rain the previous night, and rain also followed their departure.

**The first Spring Migrants** to arrive were the Pipits (*Anthus australis*), a small party of which were seen on the morning of 3rd August in a grass paddock close to Don Road. They looked

very spruce in rather dark-brown plumage (upper surface), as if not long moulted. The previous day had been miserably cold and wet from south-west, but the 3rd was sunny, and the birds had probably arrived in the early morning. On 15th August a Pallid Cuckoo (*Cuculus pallidus*) crossed the road from one thick shrubbery to another, quite silently, nor did this species begin to call until 6th September. This fact of the first Pallids to arrive remaining silent for two or three weeks has been previously noted. Are they all females? The other common species, the Fantailed (*Cacomantis flabelliformis*), seems to call almost immediately upon arrival. The first newcomers of these were here early in August, but the Bronze Cuckoo (*Lamprococcyx plagosus*) was late, not being heard until 10th October. The little Tree-Diamond (*Pardalotus striatus*) or "Pick-it-up," was not noted until 20th September, although its cheerful call is usually heard in the gums close to my cottage just at the end of August or in the first few days of September. The Welcome Swallows (*Hirundo neoxena*) were in the town on 30th August, but did not appear on the hill where I live until a week later. On 18th September a solitary Wood-Swallow (*Artamus cyanopterus*) was seen coming from W.N.W., while on 20th a pair of Summer Birds (*Graucalus novaehollandiae*) was noted among the gum-saplings in wet, windy weather, N.E. to N.W. This species has since appeared in considerable numbers, while both Pallid and Fantailed Cuckoos are also in plentitude, but Bronze very scarce so far. The little Tree-Martins (*Hylochelidon nigricans*) I did not see until the middle of October, although probably in the more heavily-wooded country they would have arrived some time ago.

A somewhat remarkable occurrence took place on the last day of July, the morning of which broke fine and clear, and when the sun began to have some warmth, at about a quarter past eight, a Fantailed Cuckoo (one of the few which winter with us) began to utter its soft trill from a tree near the window. In the meantime, a squall-cloud had been working up from the mountains to the south, and at half-past eight large flakes of snow began to fall, the first I have seen in Devonport for many years. The fall lasted for an hour, and was succeeded by others through the day; this put an effectual stop to the Cuckoo's singing, nor was it heard again for several days. It is the first occasion on which I have known the "closure" to be applied to a Cuckoo by a sudden snowstorm.

W. Department, Tasmania, 27/10/1921.

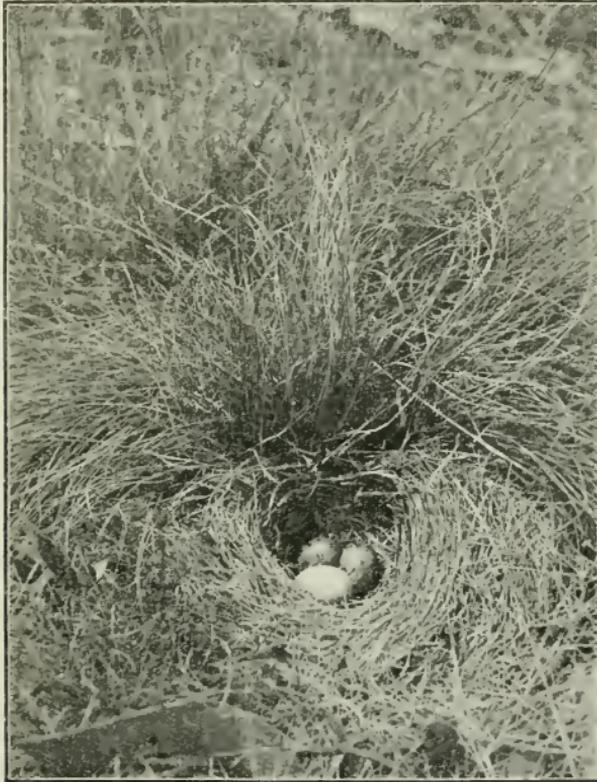
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#### ABOUT MEMBERS.

The American Ornithologists' Union has elected A. H. E. Mattingley, C.M.Z.S., and W. B. Alexander, M.A., two well-known members of the R.A.O.U., Corresponding Fellows of their Union.

## Camera Craft

**Pallid Cuckoo's Egg in Pipit's Nest.**—On December 28th last I found a nest of the Pipit (*Anthus australis bistriatus*) containing three eggs, one of which was of the Pallid Cuckoo. Two days afterwards the young of the Pipit had hatched out and the Cuckoo was close upon that stage, but when I visited the nest the following day it had completely disappeared with eggs and young. Gregory Mathews, in his recent work on Australian



Nest of the Tasmanian Pipit containing two eggs of the Pipit and one of the Pallid Cuckoo.

Photo. by M. S. R. Sharland, R.A.O.U.

birds includes *Anthus australis* in the list of the Pallid Cuckoo's foster parents, but such a thing is rare with the Tasmanian form, *A. australis bistriatus*. Littler, in his work on Tasmanian birds, has no mention of it, while Mr. Robert Hall and other local ornithologists have no knowledge of previous cases. The intruding egg was considerably larger than those of the rightful owner, and the contrast in the colouring of the two kinds was most

marked, the light pinkish hue of the Cuckoo's being most conspicuous against the sombre colouring of the Pipit's egg.—M. S. R. SHARLAND, R.A.O.U., Hobart.

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**Nest of Black Tree-creeper.**—In continuation of the description of nest of *Climacteris melanota* given in *The Emu*, ante., p. 166, Mr. McLennan has sent me a photo., which appears in this issue, and some further notes, from which I take the following description of what appears a typical nest.

"12/11/21.—A fresh lot of *Climacteris melanota* seen; one appeared to come from a hollow 40 feet from the ground in a Bloodwood (*Eucalyptus*) tree. Watch this tree for about an hour, but the birds had disappeared. Locate them again about 200 yards away, watch them for half an hour; no result. Go back and climb to hollow from which I thought the bird had flushed; could not see into it, so broke part of the entrance away. Nest in it all right, apparently finished and ready for eggs; but I suppose the birds will leave it now.

"21/11/21.—Nest of *Climacteris melanota* that I found on 12/11/21 appears deserted.

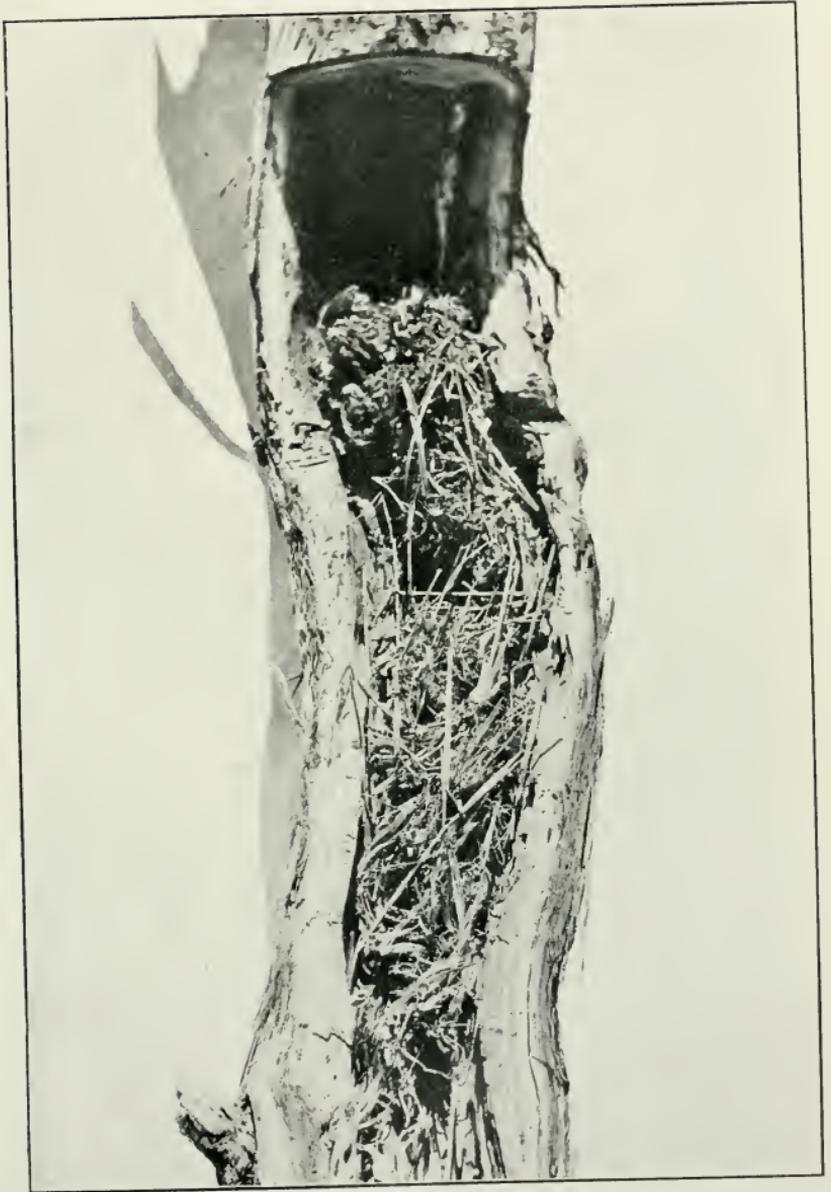
"25/11/21.—Go to where *Climacteris melanota* had deserted a nest noted 12/11/21. Cut off limb to examine and get description. Nest in an upright dead limb, hollow for 3 feet; base of nest four inches of coarse tufts of grass and strips of bark; on top of this four inches of horse manure, some of the balls unbroken (in another nest dingo droppings were used instead.—H.L.W.); then the lining or nest proper consisting of fine shredded bark, fine short grass, wallaby fur, cattle hair, a few snake-scales, and a handful almost of small bits of charcoal. Entrance to hollow, 3 inches; depth to nest, 12 inches, where the diameter was 4 inches; base of nest almost destroyed by termites."—HENRY L. WHITE, "Belltrees," N.S.W. 5/9/22.

\* \* \*

**A Climb to the Nest of the Mistletoe-Bird.**—Sydney William Jackson, age 49 years, weight 16 stone, climbing a *Eucalyptus crebra* sapling to secure a specimen of the Mistletoe (*Loranthus pendulus*) by the nest of the Mistletoe-Bird (*Dicaeum hirundinaceum*), Belltrees, February, 1922; it is considered that Mr. Jackson is able to climb any man his age and weight in Australia.

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Mr. D. Le Souef, until recently Hon. General Secretary R.A.O.U., has a spare set of Mathews' fine work, "The Birds of Australia," to dispose of. The first seven volumes are well bound, the rest unbound; the latter include five parts of Volume 8 and four parts of Volume 9. The total cost is £94/10/—the cost price. The work is still coming out.



Nest of the Black Tree-Creeper.

Photo. by W. McLennan, R.A.O.U.





Sid. W. Jackson, R.A.O.U., at nest of Mistletoe-Bird.

Photo. by H. L. White, C.F.A.O.U., "Belltrees," Scone, N.S.W.



## Stray Feathers

**Black Kites.**—Reading some back numbers of *The Emu* I noted in vol. ii., part 2, 1902, that the explorer Sturt apparently feared attack from the Common Fork-tailed Kite (*Milvus migrans*), whilst in the interior of the continent. Your contributor, "H.Q.H.," asks if any other explorer has observed this peculiar trait of the Kite. Whilst not an explorer, I can justly claim to be conversant with the habits of these birds, as I have had a life-long experience of them in the interior, and I can without hesitation state that it will not attack human beings. I have seen hundreds of these graceful birds flying at one time. When one is riding over the plains in the inland, these Kites often swoop down towards one. They do this to find out if the rider is disturbing grasshoppers; if not, they soon clear off again. Should grasshoppers be plentiful, the Kites will accompany the horseman for long distances, capturing the disturbed insects in their talons and eating them as they fly along. On many occasions the birds, in their endeavour to capture an insect, will come within arm's reach, and often, to avoid contact with the horse or rider, will spread out the tail feathers and talons, give forth a shrill whistle, stop abruptly, and shoot up into the air. The Kite is a great feeder on grasshoppers, and when this pest is plentiful one rarely notes these birds hunting for other food in the shape of offal or carrion. It is interesting to note that the Kite invariably captures the insects in the talons.

I have never observed it capture a rabbit or a bird; though its young are often fed on small rabbits, and I have noted it attempt to capture a Shell Parrot from a large flock. After many unsuccessful dashes into the flock, it gave up and flew off as if quite satisfied.

At shearing time, which in the interior takes place from June to August, these Kites are very numerous, and hundreds may be seen on the ground or flying near the woolshed, where they pick up scraps thrown from the shearers' kitchen, or lambs' tails, etc., thrown out from the yards. I have often seen men betting on the ability of these birds to catch a piece of meat thrown up into the air. It is truly wonderful how adept these Kites are in this respect. It is amusing to see a bird that has thus caught a tit-bit chased by its companions. Sometimes when closely pressed it will allow the morsel to drop, but it is invariably caught by another bird before it reaches the ground. Though it has often been seen feeding with domestic fowls, and even venturing into a wire-netted fowlhouse, the Kite has not been seen to molest fowls or chickens.

To sum up. It is a most inoffensive bird, has no bad habits, is of great economic value on account of the destruction it causes to the grasshopper pest, and is as worthy of total protection as any bird that I can call to mind.—J. NEIL, MCGILP, King's Park, S.A.

**Spotted Crake in a Grass Crop.**—I was mowing a field of Sudan grass the other day, and the machine cut the head off a bird, and on examining it, it proved to be *Porzana fluminea* (Spotted Crake). I was surprised to find this bird so far from a swamp: the nearest swamp is some miles away. Has this bird been found in a similar situation before? I also found some time back a nest of the *Coturnix pectoralis* (Stubble Quail) containing 16 eggs. As these eggs are large considering the size of the bird, it is always a puzzle to me how the bird covers them.—N. GEARY, R.A.O.U., Mount Pleasant, Dalby, Queensland. 27/2/1922.

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**Australian Magpie and Sparrow.**—While the bandsmen were practising in the mill one day in February, 1922, they were eye-witnesses to bird cannibalism. A White-backed Magpie swooped down on a Sparrow, killing it by picking its head, and then going behind a post tore open the Sparrow's breast and commenced to eat the flesh. When disturbed, the Magpie carried its repast to a safer distance. No doubt, owing to the dry weather and the scarcity of grubs and insects, Magpies, for the sake of sustenance, take on Sparrows or any other small birds they can get their claws on.—J. M. SEXTON, State School, Henty, Vic.

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**Nankeen Night Herons and Young Ducks.**—It is an interesting fact that as far as I can remember, for fully forty years past, and probably a great deal longer, Nankeen Night Herons (*Nycticorax caledonicus*) have been roosting during the day in the Melbourne Zoological Gardens. It is quite likely they were nesting here in days gone by, but now only roosting. As soon as it gets dusk, the birds fly off in companies, sometimes two or half a dozen, as the case might be, apparently to the mouth of the Yarra, and there they evidently feed. The number varies according to the time of the year; just now there are about eighteen, that being the number that passed over in various-sized companies last evening. When the nesting season is on, there are only seven or eight birds, these being the young of the last season, and therefore, not old enough to nest. Another interesting point is that they are very keen on feeding on any young Ducks they can get hold of. One of our Ducks brought out five young ones last October; we did not know they were there, but the Nankeen Herons found out very quickly and ate the lot before we could stop them. Therefore they probably also take the young of many different kinds of waterfowl. Another fact of interest is that the Egyptian Nankeen Night Herons roost in just the same way during the daytime in the Zoological Gardens at Cairo. Their habits there are practically the same as ours here. I remember seeing them on several occasions. They also have a habit, in common with ours, of hunting round open en-

closures where the birds are fed on meat in case any scraps remain.—W. H. D. LE SOUEF, Zoological Gardens, Melbourne.

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**Fossil Birds in New Zealand.**—An item in a Masterton paper of April 14th, 1920, taken from the Wellington *Evening Post*, is of interest to those ornithologists who study the former distribution and extinction of New Zealand birds.

“On occasions even scientists have heavy manual tasks to perform, says the ‘Post.’ Recently Dr. A. Thomson (Director of the Dominion Museum) and two members of his staff, Messrs. H. Hamilton and Phillips, excavated and hauled by hand from a deep fissure in some limestone rock in the Wairarapa district about seven tons of Moa bones and other valuable relics.

“About four years ago, while deer-stalking over Mr. Murdoch McLeod’s Haurangi estate, near Martinborough, 62 miles north from Wellington, Mr. Walter Harrison, of Masterton, came across this fissure in a limestone ridge, in which he discovered a number of bones. He reported the discovery to the Museum authorities, and an investigation was undertaken by Dr. Thomson. The find, indeed, has proved a most interesting one.

“From the fissure were taken the remains of about twenty-five Moas and of fifteen Aptorries. The latter were extinct birds resembling the Weka, but very much larger—standing about three feet high, with sturdy limbs, and necks. Remains of the Notornis were also found. The Notornis is a bird about which there was much discussion recently owing to the discovery of a live specimen in Otago, and of which three are known to have been seen alive. About twenty of them had left their bones in this opening in the rocks. Piled up were also the remains of numbers of Kakapo (a Parrot), the Kiwi, extinct Ducks, and, strangely enough, bones of the tuatara lizard, which is now only found on Stephens Island, and one or two other islands round the coast. There were remains of the New Zealand Crow, the Huia, and the large Laughing Owl—a very rare bird.

“Round about were other similar openings in the rocks, but only in this one were these relics of a past age found. The scientists find it difficult to account for this fact, and for so many being accumulated there. Recently a similar discovery was made in a cave near Pahiatua. One theory is that the fissure formed a bird mausoleum, to which in a past age the birds went to die. There were no evidences of human bones, and the scientists estimate that the bones have been there for at least five centuries, and thus date back to before the coming of the Maori.

The remains have been brought to Wellington, and are at present being cleaned, sorted, and classified.

Dr. Thomson believes there may be collections in other caves between Pallister Bay and Napier, and particularly asks that any discoveries should be reported.”

Of the above mentioned birds, the Notornis has long been extinct in the North Island, and is now believed to inhabit only the country around the rugged West Coast Sounds of the South Island. The Kakapo is extremely rare in the North Island, but is found in moderate numbers in parts of the South, while the Laughing Owl is very rare and confined to the latter island.

Kiwis, Crows and the Huia, of course, still exist; but the last-mentioned is on the borderland of extinction.—R. H. D. STIDOLPH, Masterton, N.Z.

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**Cuckoo carrying egg.**—In looking through *The Emu* of April, 1919, I notice a record of an observation by the late Arthur P. Ingle of a Cuckoo removing a Wren's egg and depositing one of its own, which reminds me of something similar observed by me during this season. While watching some Flycatchers, I noticed a Bronze Cuckoo (*Lamprococcyx*) fly from a tree with something in its bill and perch upon a limb about 50 yards distant, and upon approaching the bird it flew away, dropping an egg, which, upon examination, proved to be that of a Flame-breasted Robin (*Petroica phoenicea*), and upon examining the tree I found a new nest of this Robin, so it would appear the Cuckoo was clearing the way for its own egg.—W. N. ATKINS.

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**Change in Plumage in the Koel Cuckoo** (*Eudynamys orientalis*).—When collecting some skins of the Koel Cuckoo for Dr. D'Ombra in this year, I found some interesting plumage phases. The first bird I shot I thought by the plumage was a female, but I found on dissecting the bird that it was an immature male.

The bird was fully fledged with no sign of quills, and was a last season's bird. It seems probable that the male Koel assumes the blue black plumage when about three years old or at the earliest at second moult.

On examining the specimen taken, the plumage was seen to differ very much from the adult female, the feathers being not pencilled so clearly as in the female, and having more black down the back of the head and back. The breast and wings, however, were the same as in the adult female.—By J. F. H. GOSLER, R.A.O.U., Ellerslie, Wallis Lake, N.S.W.

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**The Northern Bell-Magpie.**—In the note upon *Strepera graculina robinsoni* (Mathews), in *The Emu*, vol. ante., pp. 164, 165, I remarked that, at the time, I had not examined a skin. It will interest those to whom I have sent eggs, and others, to know that a series of skins has since come to hand, and proves Mr. Mathews' sub-species to be good, though I am unable to agree with his points of difference from the type. My specimens show the northern bird as having much more white on the wings and tail, with a wing measurement of 270 mm., as against 240 in Mr. Mathews' type, and 260 for an average bird from New South Wales. The bill of *Strepera g. robinsoni* is longer, very much stouter, and more arched; length, 62 mm. by 26 mm. in deepest part, as against a "Belltrees" (N.S.W.) bird: 59 mm. in length, deepest part 22 mm.—HENRY L. WHITE, "Belltrees," Scone, N.S.W. 5/9/22.

**Change in Colour of Bill and Iris of the Oriole.**—Making a study of the Oriole (*Oriolus sagittatus*) through seeing both black and red-billed birds about, I thought the black-billed bird was a variety as all the birds I shot were full grown. I was all at sea with regard to the birds, when a friend came to put light on the subject. He had reared a young Oriole from the nest and said that when the bird was two years old, or at the third moult, both the colour of the bill and iris changed from black to red, and the plumage assumed a brighter tint and was more clearly pencilled on the breast. Evidently the bird starts to breed when changing, for I have seen no black-billed birds nesting at any time: only the birds with red bill and iris.—By J. F. H. GÖGERLEY, Wallis Lake, N.S.W.

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**Drongo Shrike and Hornets.**—Last autumn on a cold, wet day a pair of Drongo Shrikes paid a visit to the homestead. One of the birds took up a station on a grape vine trellis and fed on the brown hornets that had built their paper-like nests all along the fascia boards on the house

The hornets were there in hundreds when the Drongo started. Before the bird had finished with them, they were practically exterminated. The bird stayed about the house for two days, but when the hornets were gone, the bird left for the north, I expect.

The Drongo (*Chibia bracteata*) visits us every autumn or late summer for about a fortnight, and then leaves again.—J. F. H. GÖGERLEY, R.A.O.U., Ellerslie, Wallis Lake, N.S.W.

\* \* \*

**Starlings interrupt telegraph lines.**—The Postal Department has experienced considerable trouble during the past week or so through interruptions to telegraph lines between Murrurundi and Quirindi, and in a lesser degree between Murrurundi and Muswellbrook.

The authorities were for a time completely baffled in their endeavours to ascertain the reason for the trouble, which was not traceable to ordinary causes, and generally came on in the evening and disappeared before morning.

On Wednesday last the trouble arose at 5.55 p.m., and the local linesmen were instructed to proceed towards Maitland as quickly as possible. About six miles on the Maitland side of Singleton two dense clouds of starlings, estimated to number tens of thousands, were encountered, and it is considered probable that they had been disturbed from the wires between 7 and 7.45 p.m., the fault having then cleared. Action is being taken to have the particular sections in which the starlings congregate patrolled at dusk for the next few nights, in order that the birds may be scared and prevented from settling on the wires, (thus causing a short circuit).—*The Maitland Daily Mercury*, N.S.W., 7th February, 1922.

**Starlings roost in the Zoological Gardens** at night in many thousands now that the breeding season is over. They come in companies of from five to forty odd birds from different points of the compass, where they have been feeding during the day. They very often fly round the Gardens a good deal at first, and finally settle among the trees or shrubs for roosting. Now and again they are disturbed by some Hawk, although Hawks find it easier to catch a Dove than a Starling. In the morning you can easily find out on what shrubs these birds have roosted in their huge numbers by the mess made on the ground. I do not know whether any of our friends living in Melbourne who have similar gardens have the same trouble, if it can be so called. The birds all turn out in the morning a little after daylight.—CECIL LE SOUEF, R.A.O.U.

\* \* \*

**Abnormal Clutches of Eggs.**—*Eopsaltria australis*. Yellow-breasted Robin.—Four eggs taken by Mr. D. Floter at Cape Hawke, N.S.W., November 10th, 1921. Three is the usual clutch, four rarely.

*Grallina picata*. Magpie-Lark.—Six eggs, one of which was quite empty, though the shell was intact when taken by Mr. H. Gogerly at Wallis Lake, N.S.W., on December 4th, 1921. The eggs were apparently laid by one bird.

*Philemon argenteiceps*. Silvery-crowned Friar-Bird.—Two clutches of three eggs each taken by Mr. W. McLennan near Coen, Cape York Peninsula, during January, 1922. This is the first recorded occurrence of three egg clutches.—HENRY L. WHITE, "Belltrees," N.S.W. 6/3/22.

\* \* \*

**Birds on Kosciusko.**—During a walk from Corryong to Kosciusko, via Tom Groggan's, at the end of December, 1921, I saw the nest of a Ground Lark (*Anthus australis*) at approximately 7000 feet. There were four eggs in it. For shelter that night we dropped a few hundred feet to a quiet corner. We were still above the timber line, so you may imagine our surprise to be wakened next morning by the musical crooning of a contented Magpie. Later some Gang-gangs and a few Crows were heard on the skyline, a Snipe was flushed on the last slopes of Mt. Townsend (7260 feet), and about a dozen Ducks were noticed on Lake Albina (6340 feet above sea level). On the Blue Lake (6150 feet) were also several Ducks. There was still a good deal of snow about.—R. H. CROLL.

\* \* \*

**Bold Stone-Curlews.**—On November 10th, 1921, I was crossing a paddock at Sherwood, near Brisbane, when I noticed a pair of Stone-Curlews. They were not so timid as usual, only running a short distance and stopping to look at me. Later in the afternoon, when it was getting dusk, I returned past the same spot. To my surprise the two Curlews came running towards me, and when I stopped to watch them, the one in advance, which I took to be the hen from her slightly duller

plumage, squatted down on the ground as if on a nest, her mate standing behind her. Feeling confident that the bird was only trying to fool me, I remained standing still, and, after a minute or so, she got up and moved a few yards before sitting down again. Being certain now that she was only putting up a bluff, I proceeded slowly on my way. Immediately the birds changed their tactics, and came running straight towards me, making a loud hissing note, the wings being slightly lifted and the tail raised and spread in a fan like that of a Turkey. About five yards away the front bird, still I think the hen, halted and spread out her wings to their full extent, twisting them at the same time so that they were held vertically, the beautifully marked under surface being directed straight towards me. The mottled brown, grey and white marks and patches beneath the wings and the black and white spots at the tips of the tail feathers were thus fully displayed, whilst the remarkable hissing sound was kept up almost without intermission. The male was meanwhile indulging in a precisely similar display, but keeping some yards behind his mate.

Each time I took a step the bird came nearer, till she was within two yards of me, and it seemed that at her next advance she would commence the onslaught that she had been threatening. The performance had, however, attracted the attention of a cow grazing in the paddock, and also of my host, who had heard the curious noise from the house several hundred yards away. These reinforcements approaching simultaneously from opposite sides frightened the birds, and they resumed their normal demeanour.

It was now almost dark, so I forbore hunting for the nest, which I was convinced was close at hand, for fear of treading on it without seeing it. Less than a minute's search the following day revealed an egg and a newly hatched bird on the ground close to the spot where I had been standing. The second egg hatched next day, but this chick unfortunately died directly after leaving the egg.

I am informed by an old inhabitant of the district that he has seen the birds driving away cows from their nests by the method described, but I have not met with a description of it in print. It would be interesting to hear of other instances of these shy birds behaving so boldly in defence of their nests.—  
W. B. ALEXANDER, Sherwood, near Brisbane. November, 1921.

---

#### ERRATUM.

A slight error crept into the lines beneath photographs of Tree-creepers' nests, published in *The Emu* for October. Both pictures—one by Mr. A. H. Chisholm and the other by Mr. D. W. Gaukrodger—were, as the accompanying letterpress showed, referable to the Brown Tree-creeper, not to the White-throated Tree-creeper.

## Forgotten Feathers

### Notes on the Fauna of King Island from the Logbooks of the "Lady Nelson."

Communicated by W. B. ALEXANDER, Sherwood, near Brisbane  
January, 1922

King Island in Bass Strait was discovered by Mr. Reid in the schooner "Martha" in 1799. It was not, however, named until January, 1801, when Captain Black, of the "Harbinger," met with it on his way through the straits, and named it after Governor King of New South Wales.

The "Harbinger" was the second ship to pass through Bass Strait on a voyage from England to Sydney, having been preceded in the previous month, December, 1800, by the "Lady Nelson" under Lieutenant Grant. The "Lady Nelson" was a small ship of 60 tons lent by the Admiralty to the Government of New South Wales for purposes of exploration. She is best known as the ship in which Murray discovered Port Phillip, but that she played a very important part in exploration and development in early days is evident from a perusal of her log-books, which have recently been published by Mrs. Marriott.\*

Earlier on the same voyage on which Port Phillip was discovered, the "Lady Nelson" visited King Island and surveyed its east coast. Lieutenant Murray makes several allusions in his log to the animals and birds of the island, and as these contain references to the extinct Emu it seems important to bring them under the notice of ornithologists. Up to the present it has generally been supposed that the account given by the French naturalist, Peron, who visited the island eleven months later, was the only written evidence about this interesting extinct bird. On Saturday, January, 9th, 1802, Murray notes: "Saw the loom of the land from the masthead, which I take to be Governor King's Island."

January 11th. "I now went on shore, found a good deal of surf on the beach till we got on the southern side. . . . Here we landed, and the first thing we saw was a number of sea elephants of an immense size lying asleep on the beach, each of them, Barnes, the boatswain's mate told me, would make eight or nine barrels of oil; as we rowed down the shore we took them to be bluish rocks. We found along this beach two fresh water lagoons full of those animals which made it taste brackish. . . . We could not get near the upper part of them on account of the number of elephants playing in them both. I named the bay Elephant Bay from this circumstance."

[The Sea Elephant (*Macrorhinus leoninus*), the most remarkable seal of the southern hemisphere, has long been extinct in

\* The Logbooks of the "Lady Nelson" with the Journal of her first commander Lieutenant James Grant, R.N., by Ida Lee, F.R.G.S. (Mrs. Charles Bruce Marriott). Grafton & Co., London, 1915.

Australian waters, though still surviving at Macquarie Island and other Antarctic islands.—W.B.A.]

January 12th. "Boat returned on board. They caught four badgers [wombats] and saw several kangaroos, but were not able to get any from the thickness of the brush. They also found feathers of Emus and a dead one. Snakes are here, as the skin of one was found. We got several gallons of elephant oil out to-day as a specimen to Government and for our own use."

January 17th. "Mr. Bowen [first mate] came off; he brought on board three seals with hair of prime fur, and told me there was a vast quantity on shore. Elephants are also in abundance, and the woods full of kangaroos, emmues (sic), badgers, etc. Some few shells were found. . . . After dinner I went on shore. The brush is very thick, which rendered it impossible to get any way in. There is little doubt of plenty of water being here as we in our search started 15 or 20 kangaroos from 30 to 40 pounds weight. An Emu was caught by the dog about 50 lbs. weight and surprising fat. At one place on this beach an acre of ground at least was covered with elephants of a most amazing size, and several were all along the beach and playing in the water. . . . I named this last discovery the Bay of Seals from the number of these animals on the shores of it."

January 19th. "A wambuck (sic) was caught; served it, a swan and a kangaroo to ship's company."

January 22nd. "Close to the Elephant Rock . . . This rock is about  $1\frac{1}{2}$  miles in circumference, and it is entirely covered with seals of prime fur, some of which the officer brought. There might be 6 or 7000 seals of different sizes on shore."

January 23rd. "I was told that the Rock was full of Mutton-birds; in consequence of this I had the boat on shore, and procured 80 or 90 of them; served ditto to the people."

January 24th. "We took leave of this large and fine island where the benevolent hand of Providence has fixed the chief necessities of life and the means to procure some of its luxuries."

Murray's report of the abundance of seals and sea elephants on King Island led the sealers from Port Jackson to visit it very promptly, for, as we know, when the French ships visited it at the end of the same year sealers were already at work there, and it was from them that Peron obtained his account of the King Island Emus, which they were utilising for food. Professor L. Brasil published Peron's notes in an article in *The Emu*, vol. xiv., p. 88 (1914). One of Peron's questions to the sealers (No. 6) was: "What is the largest size they attain?" The answer being, "In King Island almost  $4\frac{1}{2}$  feet; they are smaller than in Sydney." (7) "What is the weight of the bird then?" "The heaviest weighs from 45 to 50 pounds." As we have seen, the one caught by Murray's dog was "surprising fat" and weighed 50 pounds: an interesting confirmation of this statement.

## Obituary

From New York comes news of the death, on August 29th, 1921, of Dr. Joel Asaph Allen, Curator of Birds and Mammals at the American Museum of Natural History, and one of the seven Corresponding Members of this Union. Dr. Allen was 83 years of age, and ornithology in general, and American ornithology in particular, have profited greatly by his long term of active work.

He was one of the founders of the American Ornithologists' Union, was its president for the first seven years of its existence, and edited *The Auk* for twenty-eight years. He also edited twenty-two volumes of the *Bulletin of the American Museum of Natural History*. His scientific field work was extensive. Between the years 1865 and 1877 he made several collecting trips into remote parts, and his many experiences are recorded in his "Autobiographical Notes," published by the Museum in 1916.

Dr. Allen was deeply interested in nomenclature, and the excellence of the A.O.U. "Check-List" is acknowledged in *The Auk* as due, to a large extent, to his ability and energy. His interest in the subject also won for him a place on the International Commission on Zoological Nomenclature. His death removes one more of the pioneers of ornithology, and places the task of maintaining the science in its present high plane more heavily upon the shoulders of younger workers.

---

### MRS. MARY ROBERTS, C.M.Z.S.

Mrs. Mary Roberts, a well-known nature-lover, and a former member of the R.A.O.U., died at Hobart on November 27th, 1921, in her 81st year.

Some years ago Mrs. Roberts established a collection of the Tasmanian fauna, and her private zoo at "Beaumaris," near Hobart, was known to thousands of visitors. She was an enthusiastic nature-student, and was considered the greatest authority on the habits of the Tasmanian Devil and the Tasmanian Tiger. It is understood, too, that she was the only woman honoured by election as C.M.Z.S.

The collection at "Beaumaris" contained some animals now almost extinct, and was stated by scientists to be exceedingly valuable. After the death of Mrs. Roberts, her relatives expressed the desire that the collection be taken over by some public body in Tasmania to form the nucleus of a zoological gardens, and the Hobart City Council has accepted the responsibility of carrying out that purpose.

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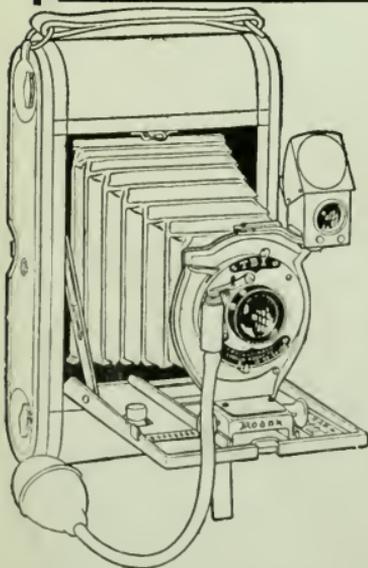
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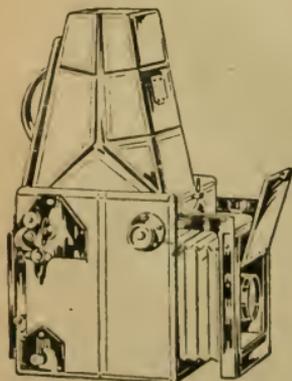
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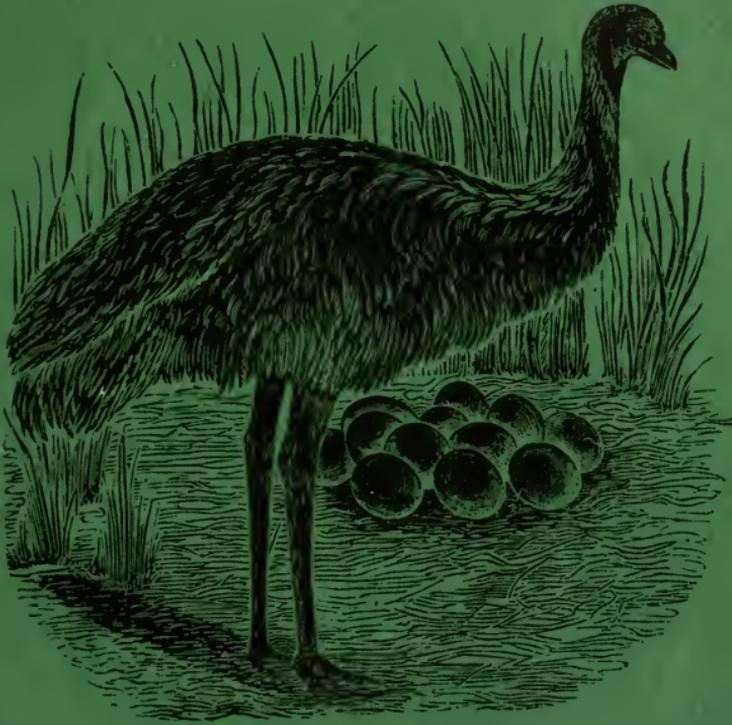
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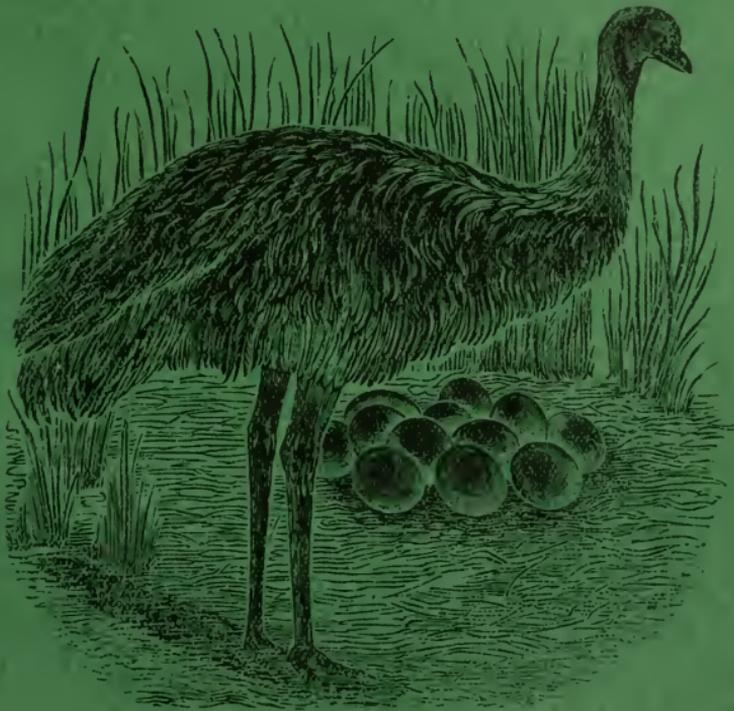
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