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[PART 4

On the East Murchison.

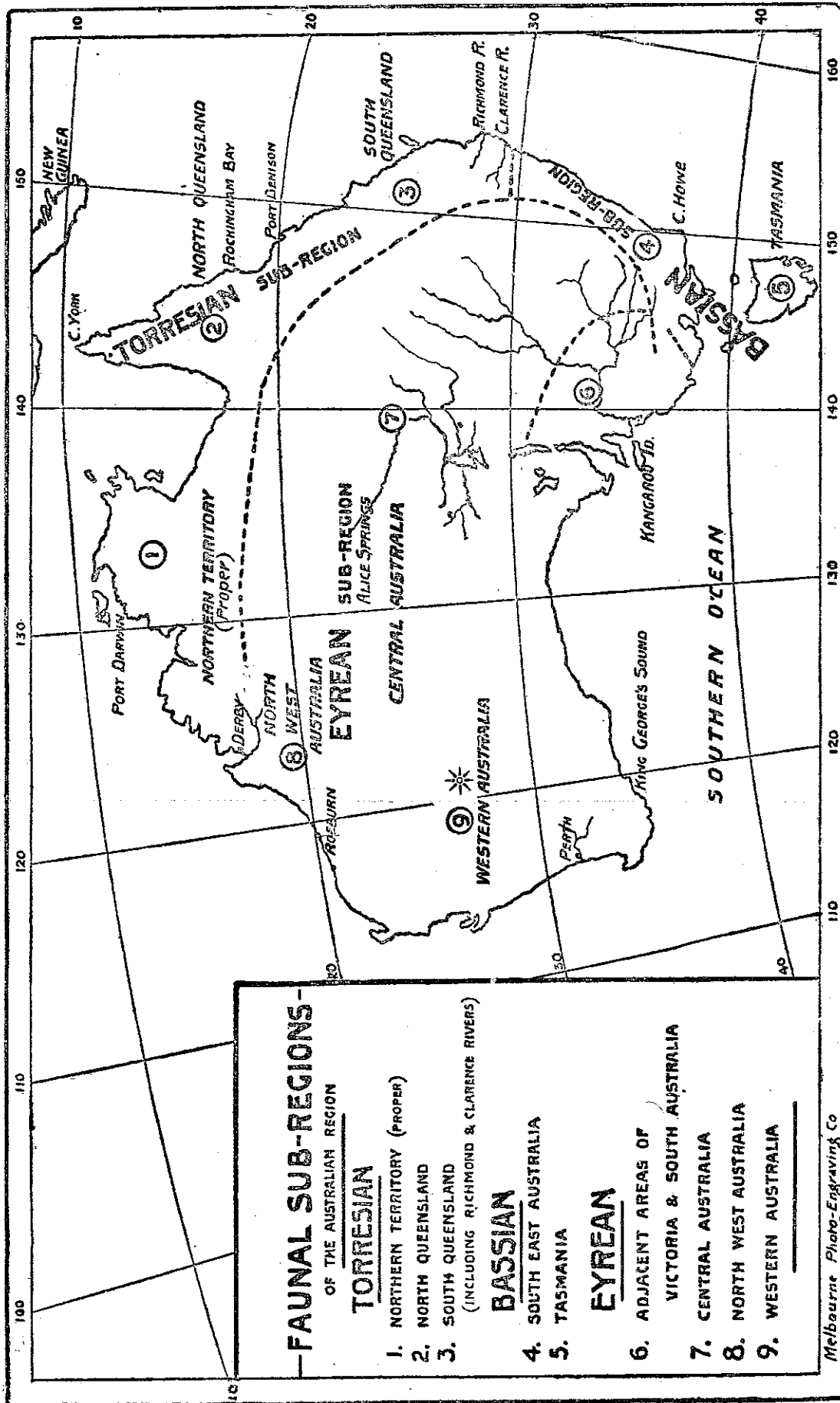
FOUR MONTHS' COLLECTING TRIP.

BY F. LAWSON WHITLOCK, YOUNG'S SIDING, D.R.,
WESTERN AUSTRALIA.

IN the year 1903 I was collecting birds in the vicinity of Lake Austin, a locality in the Murchison district of this State. In my wanderings around that centre I often came in contact with prospectors and others searching for gold in the neighbouring ranges. It is usual in these chance meetings to stop and exchange news, and to indulge in mutual inquiries as to success or otherwise. On my stating my quest was for birds, and not for gold, a kindly interest was often evinced in my work, and any information was always freely given. More than once reference was made to the variety of bird-life found around Lake Way—a locality much further inland and also in a rather higher latitude. It chanced that, towards the close of the same year, I met at the New Norcia Mission a very intelligent mechanic, who had lived for several years at Lake Way, and who personally took a more than passing interest in objects of nature. At the time he was living at Lake Way the ill-fated Calvert Expedition passed through, and he had several conversations with members of the party. This person fully confirmed all I had previously heard relating to the bird-life in the locality of Lake Way. This greatly excited my curiosity, and I determined I would visit the place at the first opportunity. The chance seemed to have arrived when Mr. H. L. White, of Belltrees, N.S.W., for whom I had been collecting on the Pilbarra goldfield in 1908, asked me if I would go out again, and at the same time asked me to suggest a promising locality. Eventually it was decided I should go to Lake Way and try my luck there.

Before starting I gleaned what information I could from the recorded experiences of other naturalists who had visited the district, and also looked up any old memoranda I had made. When all was totalled up the result was rather meagre, and one of my briefest notes referred to a single specimen of the Guttated (Yellow-spotted) Bower-Bird (*Chlamydodera guttata*). It read as

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* Locality of Whitlock's camps.

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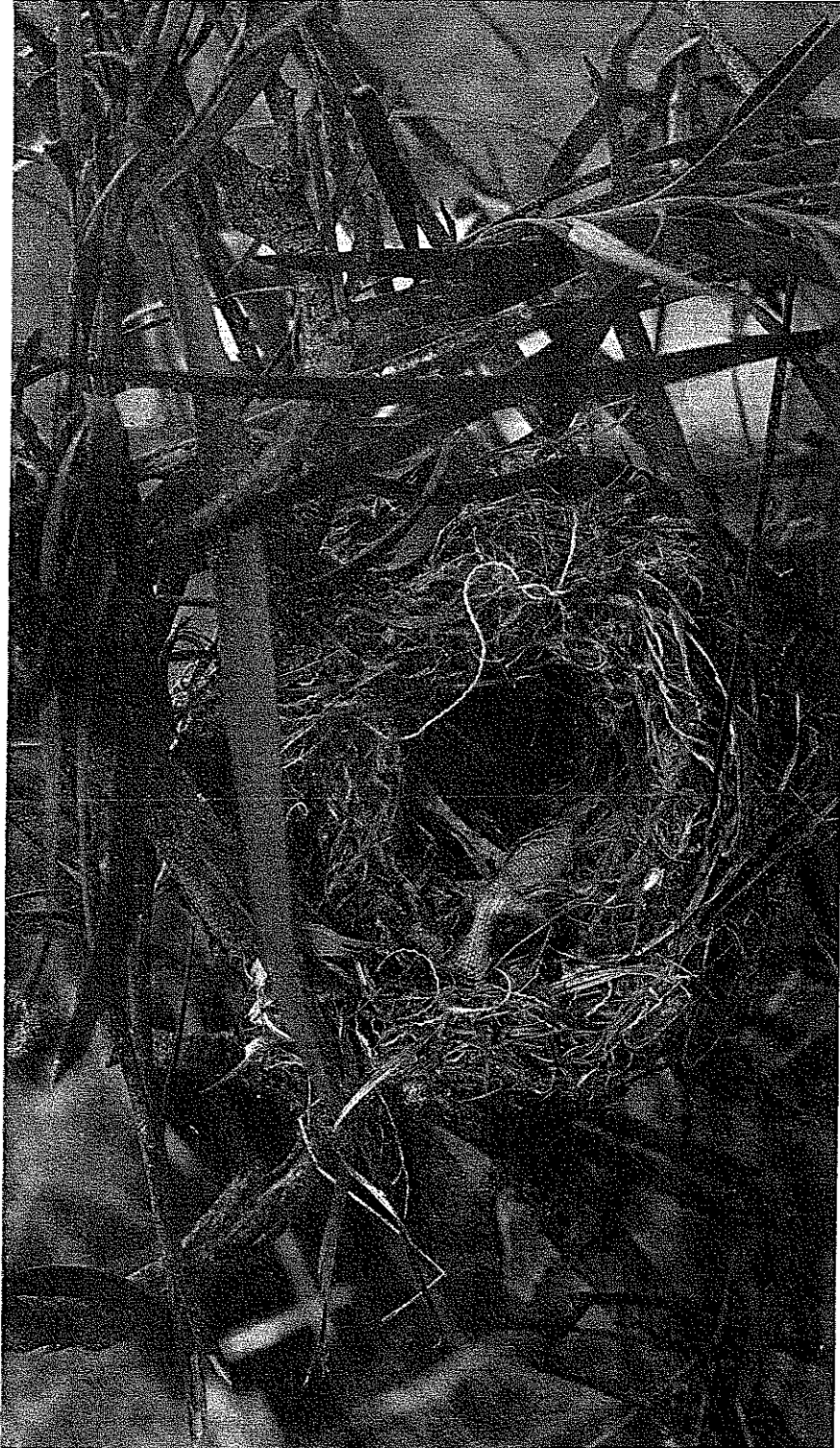
PLAN AFTER SPENCER-HALL.

follows:—"Guttated Bower-Bird, 50 miles N.W. of Lake Way.—J.T.T." This record was copied from a mounted specimen in the Perth Museum. I wrote to my friend Mr. J. T. Tunney with reference to this bird, and he very kindly informed me of the exact locality where he obtained it, adding that it was the only one he saw during his exploration of the East Murchison. I mention this matter specially as it led to an interesting result.

I left home 18th June, 1909, intending to reach Lake Way, or Wiluna, as the township is called, on 1st July. I arrived at Perth on the evening of the 19th, just escaping serious delay owing to washaways on the Great Southern Railway. I spent a couple of days in Perth, completing my outfit, arriving at Nannine, the head of the Northern Railway, on 23rd. *En route* I passed through my old hunting-grounds around Lake Austin, and was delighted to note the large body of water the lake contained, and also to observe the promising appearance of the local vegetation. Underneath the telegraph wires, at a point by the lake, I observed the wreck of several fine specimens of the Banded Stilt (*Chladorhynchus australis*), a species I did not observe on my previous visit.

I found I had a day to spare at Nannine, and naturally wandered off to see what bird-life I could in the vicinity of the township. Less than a mile to the north is a sinuous but narrow depression, which then contained quite a respectable body of water, but intensely saline in quality. Amongst the samphires I found quite a number of the beautiful Orange-fronted Chat (*Ephthianura aurifrons*), and also small parties of waders, which looked like the Little Stint (*Limonites ruficollis*), in company with the Red-capped Dottrel (*Ægialitis ruficapilla*). The Chestnut-eared Finch (*Tæniopygia castanotis*) was abundant, and had evidently been breeding for some time, as I saw young birds on the wing and found nests in various stages of completion. I was destined to meet with quite an extraordinary number of these nests later on.

I left Nannine the following mid-day, per express waggon. Having too much baggage to go by the ordinary mail coach, I preferred this method of travel, as there is nothing like keeping one's eye on such things as guns, camera, and the various impedimenta necessary to a trip, when travelling over these tracks—for of roads in the true sense there are none. We were favoured with a spell of fine but bitterly cold weather. A keen east wind met us in the face, and, despite the brilliant sunshine and plenty of clothing, I was unable to keep warm, and was only too glad to jump down and walk when the state of the track precluded our team from advancing at a faster pace than a walk. In making a push for a particular well that evening our leading waggon got hopelessly bogged, and, despite the efforts of nine powerful horses and much digging out of ruts, there we had to camp for the night. This, however, was the only mishap



Nest of the Whitlock Tit (*Acanthiza whitlocki*).
(Somewhat dilapidated by young Bronze-Cuckoo).

FROM A PHOTO. BY F. L. WHITLOCK.

during the five days occupied with the journey of 140 miles from Nannine to Wiluna. Around Nannine the country has been quite denuded of all timber of any size to supply firewood for the local mines, and this was also the case around some smaller centres for the first 20 miles of our journey. Generally speaking, the country is very level; so much so that the isolated hill called Mount Yagahong is more conspicuous than its actual height seems to warrant. This hill lies some 25 miles slightly north of east of Nannine, and is plainly visible at the latter township. After passing Mount Yagahong the country is less disturbed, and for the most part is thickly covered with scrub, roughly described as mulga, though in reality there is a great variety of bushes and shrubs other than of the true mulga, but none growing into the height of trees. Everywhere were signs of the recent heavy rains. Clay-pans were brimming full, and all rock-holes or stony beds of creeks contained an abundant supply of fresh water. The sight of all this gave me the greatest satisfaction, for I regarded it as an infallible indication for a favourable breeding season. Nests and eggs were my chief quest, but my personal ambitions bade me keep a keen eye open for possible new species. At Gum Creek we crossed the line of the rabbit-proof fence, and here were growing as usual on the banks of the creek a few examples of the flooded gum (*Eucalyptus rostrata*), of no great size, but for all that interesting as an indication of more to come. The further inland we advanced the richer became the soil on the extensive flats, and the larger grew the various varieties of mulga, acacia, and many other species whose names I am unacquainted with. Sandal-wood of a dwarfed growth was not infrequent, also its congener, the quandong, both species being fully laden with nuts. Another gnarled and curious tree is locally called a gidgi, and, as it is not favoured by mine-owners for firewood, it escapes the general destruction and attains to quite a respectable size, but for all that is really more curious than ornamental. Some 20 miles east of Gum Creek we entered upon our first spinifex plain. Here the soil is a light ferruginous sand, and as we called a halt for an hour or so for lunch and baiting the horses, I did a bit of scouting. I had not entered very far into the spinifex before I encountered a pair of very interesting birds. I felt sure they were a species of *Amytornis*, and, as subsequent researches proved, they were the Striated Grass-Wren. I was destined to have a troublous time with this species later on, but not at that precise locality. For some 40 odd miles west of Wiluna the track crosses an area of nearly 12 miles in width entirely overgrown with spinifex, and only broken here and there with narrow belts of stunted timber, and extending north and south for a distance I was unable to ascertain. We here encountered a returning camel team. A halt being called, I was

enabled to do a little more scouting, and the results were more interesting still. Not only did I encounter further pairs of *Amytornis*, but in following an individual of the latter species I flushed a tiny bird from a clump of spinifex almost at my feet. After a lot of persuasion the feathered mite showed itself. It was a veritable Emu-Wren, the blue throat of a fine male being conspicuously visible. Another bird which for a time puzzled me by its notes was a *Ptilotis*. I knew it could not be *P. ornata*, and, though it looked like *P. plumula*, I was very doubtful of its identity, when I considered the locality and surroundings I was in. However, the teams started again, and I had to postpone further investigations; but I mentally determined to visit this land of promise in the near future. Our camp that night was at the Bore Well. We were now within 30 miles of our destination. Between Bore Well and Wiluna the mulga, jam-wood, gidgi (*Acacia*), casuarina, beef-wood, and other trees attained a size I had never experienced before. Herbage was abundant, and the various species of everlastings, which are so prominent on the Yalgoo and Murchison goldfields, were in great abundance. Bounding the spinifex plain at Bore Well are a series of low ranges, and away to the south-east one could easily discern the bold escarpments of Mt. Lawrence Wells, which lie some 20 miles south by west of Lake Way. We were rapidly reaching our destination, and on 30th June, towards the evening, I had my first glimpse of Wiluna, which was to be my headquarters for the ensuing four months.

The driver of our team kindly gave me some useful hints as to where to camp, and I was enabled to select a sheltered site within a convenient distance of a Government well. Conveying my baggage to the spot, I soon had my tent up, and before darkness had set in was comfortably settled for the time being.

Next morning, 1st July, I was up betimes and off to the lake. It may be as well to explain here that Lake Way in reality consists of two shallow depressions, separated from one another by a tract of low-lying ground six or seven miles in breadth and thickly covered with scrub. The northern depression is usually termed Lake Violet, and is so marked on some of the Government maps. But for all purposes there is only one lake, consisting of a series of lagoons, divided by a network of sand-banks and other slight elevations. Nearly all my work was done at the northern end, owing to the scarcity of fresh water near the southern portion, and also the want of practicable tracks to convey my gear to a suitable camping-ground.

Between Wiluna and Lake Violet lies the chief portion of the auriferous belt, consequently the country is much disturbed by mining operations and has been denuded of all timber of any commercial value. It so happens that the premier mine of the district is at the southern extremity of the auriferous belt, so

that there is a considerable population living within a couple of miles of some of my best hunting-grounds. From an elevation near Wiluna I could see the gleam of a large body of water about four miles away, and I bent my steps in that direction. It was a good hour's walk over the rough, stony ground, but the country I traversed, after my Lake Austin experiences, seemed quite familiar—the same shallow creeks running down to the lake, with outcrops of quartz or ironstone, and a gradual dying out of shrubs and bushes, which eventually gave way to herbaceous plants of the *Salsolaceæ*, *Hibisci*, and the very abundant samphires. The birds were characteristic too—*Acanthiza*, *Xerophila*, *Cinclosoma*, *Malurus*, *Tæniopygia*, *Oreoica*, *Glycyphila*, *Sphenostoma*, *Ephthianura*, and a few others common to the surrounding district. I was not long in finding a nest. In a clump of dwarf tea-tree scrub I flushed a *Glycyphila* from her nest with two eggs. These proved to be eggs of *G. albifrons*; they afterwards frequently came in my way. This was encouraging, showing that the breeding season had already commenced. I found Lake Violet contained a large volume of water, the largest sheet averaging perhaps a mile in width by a mile and a half in length, with various arms and channels penetrating the surrounding flats or sand-hills. I worked this country with more or less success, and also the scrubs to the west and north-west of Wiluna, until 29th July, when I left for Bore Well and the adjacent spinifex plain, lying about 30 miles to the west of Wiluna, and where, as before mentioned, I had seen the *Amytornis* and *Stipiturus*. I put in a fortnight there, but, finding myself too early for nests and eggs of either species, I returned to Wiluna on 15th August, and again worked the neighbourhood of Lake Violet. Having previously found a nice pool of fresh water in a creek, I camped beside it, in what shelter I could find. I remained at this camp until the end of the month, meeting with fair success in the interim. I then returned to the attack at Bore Well, and this time met with better success, as will be shown in the sequel.

On 17th September I was back in Wiluna, preparatory to setting out to a sheet of water known as Milly Pool, some 20 miles or thereabouts to the north-west of the township, and lying on the stock route from Peak Hill and the Gascoyne and Ashburton Rivers. The country here was vastly different from anything I had previously met with on the Murchison goldfield. Eucalypts were abundant and of two or three species—one locally known as the flooded or river gum, the second a York gum, and the third known as blackheart. Some of these trees attained to considerable dimensions, and the majority, alas! were unclimbable without special preparations and assistance. Milly Pool itself was a depression in an extensive plain, somewhat resembling an almost effaced river-bed. The water it

contained was much discoloured, and, as there were from 500 to 600 cattle watering there, the fluid resulting became more and more unwholesome. This, combined with the great heat, the swarms of bush flies and other vermin, made my stay of six weeks at this centre the reverse of a picnic. However, compensation was to be found for all these discomforts in the presence close at hand of a party of Yellow-spotted Bower-Birds. Watching them with the ultimate hope of securing this rare nest and eggs comprised my most exciting and interesting occupation at Milly Pool. Success came at length, and on 6th November I said good-bye to Milly Pool, taking my last nest—a Nankeen Kestrel's—the previous day. This proved also to be the last nest taken on the trip. All the smaller birds had ceased to breed at this late date. The heat was becoming intense, a thermometer hanging in a bough shed at a neighbouring cattle-station having already touched 116° in the shade.

I must say a few words about the weather experienced during my four months' travelling on the East Murchison. Teamsters and others who had been on the roads since the goldfields "broke out" were unanimous in their opinion that there never had been such a season for regular rains. This part of the Murchison lies in the zone of the summer tropical rains, and the fall had been exceptionally good for the previous few months. During both my visits to Bore Well I encountered further heavy rain, accompanied by strong gales. However acceptable the rain, the accompanying winds proved to be a great hindrance in working the spinifex for nests of such secretive and feeble-flying birds as *Amytornis* and *Stipiturus*—the chief objects of my search for the time being—and my difficulties were much enhanced thereby. The mornings were usually bitterly cold, the frost often severe. I shall always remember with a shiver awaking on 30th July. We had arrived in camp at sundown the previous evening, too late to put up a tent, and I slept on the ground near our waggon. In the morning my rugs were white with hoar frost, a bucket of water had thick ice on it, and even the water in a billy-can with the lid on was coated with ice. Nannine, according to the railway survey, is 1,470 feet above sea-level. Lake Way, being further inland, averages perhaps a hundred or so feet higher. It is no doubt this elevation which produces such severe cold in a locality at no great distance south of the tropic of Capricorn.

Before giving a detailed account of the birds observed during my trip, I must add a few words relating to the aborigines. Around Wiluna, which is on the outer fringe of civilization, they are fairly numerous, and their numbers are frequently augmented by the visits of "wild blacks" from the little-known interior to the north and east. Taking an average, I found them inferior to the blacks of the north-west both in physique and intelligence,

but in their turn they are themselves superior in many respects to those around the Coolgardie fields. They were equally lazy, however, and persistent beggars, requests being made for "bacca," "matchie," "pflour," and even my trousers. To gain their goodwill I fed them freely, until I was tired of it, waiting in vain for the nests and eggs, which were to come "after the rain," or "when it come hot." In the end I had to enact the "sulky pfellow," and only exchange food for weapons. My dissimulation must have been weak or badly enacted, for when I told one particularly persistent beggar that I was a sulky fellow I was promptly called a liar, the term being qualified with a white man's adjective.

I must add that all the nests and eggs I took during the trip are in the collection of Mr. H. L. White, of Belltrees. For the names of the one or two plants referred to in my notes I am indebted to Dr. Alexander Morrison, late Government Botanist in this State.

In conclusion, I can only hope that the following notes will be of some interest to my brother ornithologists, also that they will form another link in the chain of our knowledge relating to the geographical distribution of Australian birds. The more we know of the latter branch of ornithology the easier will be the task of specialists in deciding on and discriminating between varieties, sub-species, and geographical races of birds.

Without nests and eggs of *Stipiturus ruficeps* and *Acanthiza whitlocki* the trip cannot be called a complete success. But I may perhaps be allowed to call attention to the fact that I was quite alone in my work, and entirely dependent on my own exertions. I never spared any trouble, and my energies were often severely taxed. On one occasion I covered 44 miles in 15 hours under a hot and almost tropical sun. Local stockmen and others shook their heads at me—"You will be found dead in the bush some day" was their comment.

Nomenclature—Mathews' "Handlist" (*Emu*, Supp., vol. vii.)

EMU (*Dromæus novæ-hollandiæ*).—Far from common on the East Murchison. The only flock I saw was one comprising about a score or so. This was on the western side of the rabbit-proof fence. On the spinifex plains I encountered a pair or two. Seeing an Emu's head above the spinifex one day when hunting nests of *Amytornis*, I stalked it in the hope of getting a photograph of a nest. It proved to be, not a sitting bird, but a cripple, the tarsus being badly broken close to the toes. For all this the bird appeared to be healthy and in no distress.

LITTLE QUAIL (*Turnix velox*).—I occasionally flushed a Quail or two, when searching for other things, but found no nests. They were most frequent near Bore Well. The only one I managed to shoot was an individual near my tent, which rather disturbed me by uttering its moaning call during the night. The call sounded like a low, deep "Oo-ah," uttered continuously for several minutes at a time. This proved to be a female bird.

LITTLE DOVE (*Geopelia cuneata*).—Generally distributed, but most common and breeding in October near Milly Pool.



Nest of Dotted Plover (*Pelecanus australis*).

FROM A PHOTO. BY F. L. WHITLOCK.

BRONZE-WING (*Phaps chalcoptera*).—Very common when the hot weather set in, in October, at Milly Pool. They came to drink in dozens at sunset, and later on, as the country dried up, I often flushed them from under shady bushes.

CRESTED PIGEON (*Ocyphaps lophotes*).—A few around Milly Pool, and near a clay-pan, prior to its drying up, some seven miles away. I noticed they came to drink at any time of the day. In flight their wings produce a peculiar whistling noise. In point of speed they do not approach the common Bronze-wing.

BLACK-TAILED NATIVE-HEN (*Microtribonyx ventralis*).—A pair or two at Milly Pool, but no signs of nests.

RED-CAPPED DOTTREL (*Ægialitis ruficapilla*).—Fairly common on the margins of the lagoons comprising Lake Violet. I shot a pair for identification. They both showed signs of early breeding, but I did not trouble to hunt for the eggs of such a common species.

DOTTREL (*Peltohyas australis*).—*—As I met with this species at Lake Austin, I looked forward with a certain amount of confidence to not only seeing it again but to finding its eggs. I had been at work just a week before I encountered the first pair. They were feeding amongst the samphires growing on the margin of an arm of the largest lagoon in Lake Violet. Four days later, and some two miles away, I came across a flock of quite twenty. Under the circumstances I felt justified in dissecting a single bird to ascertain as near as possible the probable date of their breeding. I judged I must wait fully three weeks before I could expect eggs. I determined, therefore, to keep watch, without disturbing them more than was absolutely necessary. On 19th August I was on the same samphire flat again, and after searching it carefully I saw a single bird running away to the left in a rather suspicious and suggestive manner. If I stood still she would halt too and watch me. On my moving nearer to the point from which she appeared to have run, she tripped a little further away, always keeping an eye on me. Feeling sure I was near the nest, I made a mark and commenced a systematic search around it. She halted on a little eminence and watched me silently. After a quarter of an hour's patient hunting, to my great delight I caught sight of the three brown eggs, half-covered with flakes of sun-baked clay. Had they been entirely covered I might easily have missed them, so closely did they assimilate to the dark ferruginous soil on which they lay. The black markings on these eggs being small renders them much less conspicuous than the more boldly marked eggs of other allied species. The nest was a very shallow depression, probably scratched out by the parent bird, and had no lining of any kind whatever, the flakes of mud being probably added after the eggs were laid. Surrounding the nest were a few pieces of white quartz and nearly black ironstone. The only vegetation was a sparse growth of stunted samphire, the tallest sprays of which did not exceed 6 inches in height. After packing the eggs, I turned my attention to the female. She had not moved from her point of vantage. I walked towards her, and she ran for a few paces as before, but now she gave utterance to a low note resembling the syllable "Kr-root," the *r* being uttered in rather a guttural manner. There was no sign of the male bird. Next day, after blowing these eggs, I returned to the nest, and, replacing them, with the flakes of clay, as nearly as possible as I found them, I photographed them *in situ*. Much to my disappointment, this was the only nest of these rare eggs I found. I visited the locality again and again, and often encountered the main flock, but, despite much searching, all was in vain. I can only surmise that, the species being resident, many pairs may breed during the summer rains, when insect-life is so much more abundant in these interior regions. No doubt beetles and such creatures form a large proportion of the diet of these interesting birds. When feeding a flock keeps in open order and one or other is constantly on

* See remarks on "Western Australian Birds," by A. J. Campbell, part 3, p. 165.

the run. If approached carefully they are not timid, but if fired at usually fly away to some distance. Amongst the samphires this Dottrel is very inconspicuous, and looks grey rather than ferruginous in colour. This may be due to the glare, which is very trying to the eyes until one is accustomed to it. In addition to the syllable "Kr-root" before described, this bird has a sharper call, which can be heard at some distance; it resembles the word "quick" uttered in a slightly metallic tone.

LITTLE STINT (*Pisobia ruficollis*).—A few non-breeding birds, with traces of rust-coloured feathers in their plumage, around the lagoons in Lake Violet.

CURLEW SANDPIPER (*Ancylochilus subarquatus*).—On 20th August, at Lake Violet, I shot a single male bird. It was, of course, a non-breeding individual. The plumage was much mottled with rufous.

STONE-PLOVER (*Burhinus grallarius*).—I frequently heard the weird, plaintive cry of this bird at night, chiefly around Milly Pool.

BUSTARD or WILD TURKEY (*Eupodotis australis*).—A fair number seen. They had evidently bred after the summer rains, as young were to be seen nearly half-grown at the end of June.

STRAW-NECKED IBIS (*Ibis spinicollis*).—A pair or two around Milly Pool.

WHITE-FRONTED HERON (*Notophoyx novæ-hollandiæ*).—A few pairs at Lake Violet and around Milly Pool. I think there was a nest near the latter locality, as I saw the remains of a young bird.

WHITE-NECKED HERON (*Notophoyx pacifica*).—A pair at the largest lagoon in Lake Violet.

BLACK SWAN (*Chenopsis atrata*).—A few on the largest lagoon in Lake Violet. This species breeds plentifully on Lake Naberu, some 70 miles, or thereabouts, to north-west of Wiluna.

MOUNTAIN-DUCK or SHELDRAKE (*Casarca tadornoides*).—A number on Lake Violet, and I think a pair was nesting in a rabbit burrow about a mile to the east of the big lagoon. These and other Ducks lead troubled lives, owing to the severe periodic bombardments they receive at the hands of Wiluna sportsmen. As Ducks soon learn to keep well out of gunshot, they are more frightened than hurt.

BLACK DUCK (*Anas superciliosa*).—A fair number on Lake Violet, Milly Pool, and other sheets of water. No doubt pairs occasionally breed, as the young have been shot before they could fly.

SPARROW-HAWK (*Accipiter cirrhocephalus*).—Scattered pairs are to be found throughout the district, breeding in suitable haunts. Near Milly Pool I found three nests—the first a very well constructed nest in a beef-wood tree. All the material was entirely new and neatly put together. The cup was shallow, but for all that profusely lined with green eucalypt leaves. The female sat close, and I could not see her from below. On climbing the tree I found four beautiful eggs, well marked, but with the blotches pale rufous, in which characteristic they differ from eggs of the European Sparrow-Hawk, which they otherwise resemble. A second nest was a rough, untidy structure, probably the old nest of some larger Hawk; but, like the last, the egg cavity was neatly lined with fresh eucalypt leaves. This nest contained three fresh eggs, quite spotless and almost white in ground colour. I was very unwell at the time, and in coming down the tree got caught on a snag, breaking two of the eggs. My third nest was in a very large casuarina, and was again an old nest re-lined. I took it probably before the clutch was completed. It contained but two fresh eggs.

WEDGE-TAILED EAGLE (*Uroaëtus audax*).—Far from common, and I heard of no breeding place near to Wiluna.

LITTLE EAGLE (*Utolmaëtus morphnoides*).—I frequently saw a fine pair flying over Lake Violet, but I could not get on the track of their nest.

WHISTLING EAGLE (*Haliastur sphenurus*).—A pair were nesting in a tall eucalypt near Milly Pool. The nest was a very massive one. On the ground below were sticks enough to have constructed a second nest. Without a rope ladder this nest was quite inaccessible. It was at a height of 70 feet, or thereabouts, in a flooded gum, and for 30 feet the bole of the tree was without a branch. In passing, I may state that these flooded gums are very treacherous to climb, big limbs breaking off without any warning. Nearly all old trees are hollow, and the wood is much subject to the attacks of termites. I had already sustained one fall, a limb as thick as my thigh breaking off close to the trunk. Luckily, I fell into a dam of water.

LITTLE FALCON (*Falco lunulatus*).—I only met with this species in the forest of eucalypts near Milly Pool. Though there was more than one pair about, I could find no nests. I regret to say an individual was wantonly shot and thrown away by a local "sportsman."

STRIPED BROWN HAWK (*Hieracidea berigora*).—Not so common as the following, but where I found one there I found the other. This species does not seem to choose the large eucalypts to breed in, but prefers a tree in a more open situation. I took typical eggs at Bore Well, and again near Milly Pool. The latter nest was in a solitary and stunted flooded gum growing in the centre of an extensive and open plain.

BROWN HAWK (*Hieracidea orientalis*).—More common than the preceding species. The large, dark females, standing sentinel-like on some dead tree or bush, were a familiar sight. I found several nests, but only obtained eggs in one instance. This was a very rough nest, probably the adapted wreck of an old *Pomatorhinus rubeculus* nest. It was placed on a horizontal branch of a beef-wood tree. The eggs were only obtained with difficulty and with the aid of a scoop. Young in down are fawn coloured.

KESTREL (*Cerchneis cenchroides*).—This species was generally distributed throughout the district, though nowhere common. It was, perhaps, most frequent near Milly Pool, where the numerous hollow eucalypts afforded convenient nesting-places. The first nest I found was in the hollow-spout of a large flooded gum at the north-east end of the pool. It was only a few chains away from my tent, and my attention was called to it by hearing the querulous cries of the parent birds. The nesting site was only about 25 feet from the ground, and I could look right into the hollow limb and see the four handsome eggs lying on a bed of decayed wood. These eggs were of the type in which the whole of the shell is quite obscured by the rich ferruginous markings. The eggs from a second nest in a similar situation lower down the pool were totally different. The markings in this case were distributed in large blotches, leaving spaces of the shell quite bare. They reminded me irresistibly of well-marked eggs of the European Sparrow-Hawk (*Accipiter nisus*). A third nest, on the opposite side of the pool, was in a hollow left by the snapping off of the main trunk of the tree. I was having a bath—or, rather, a wallow in the mud—when I saw the female enter the hollow. I walked round to the tree and climbed it. Someone had previously chopped out a Parrot or Cockatoo's nest, leaving a convenient orifice. Thinking the female had left the nest, as I could see the four eggs, I put in my hand and safely withdrew three of them. When making for the fourth, she made a vicious drive at my hand with her claws, and I can still see the scars she left. These eggs were intermediate in type between the two former sets. A fourth nest, which I reached after a lot of labour in chopping steps up the slippery trunk of a flooded gum, contained only two newly-hatched young. The majority of the males of this species have a bar at the end of the tail, which is very pale grey, but what I take to be old males have the tail nearly white and with no bar. All females I have seen possess the bar, and usually show fine black streaks on the breast. I observed no pairs breeding in old Crows' or other open nests. I quite expected local birds would prove to be the Western Kestrel (*C. unicolor*).

MARBLED OWL (*Ninox ocellata*).—I shot a single example of this species near Wiluna, chiefly for identification. At Milly Pool I could hear them calling, and I saw one enter a large cavity in a hollow eucalypt. After a lot of trouble, I gained access to the hole, only to find it was a roosting-place.

BARE-EYED COCKATOO (*Cacatua gymnopsis*).—I saw little of this familiar cage-bird until I went to Milly Pool. Here they were fairly common, and breeding in the hollow eucalypts. I located several nests, but, being unprovided with a rope-ladder (not anticipating such large timber), I was quite helpless until some Cockatoo-hunters came out from Wiluna. All my nests contained well-feathered young, which were obtained by hauling the lightest of the party in a boatswain's chair up to the limb containing the brood.

PINK COCKATOO (*Cacatua leadbeateri*).—Rare; a few breeding to the east of Wiluna.

RED-BREASTED COCKATOO or GALAH (*Cacatua roseicapilla*).—These noisy birds were breeding too in the eucalypts, but not in anything like the numbers of *C. gymnopsis*. I also saw them in flocks near Bore Well. One pair had a nest in the same tree from which I took the first-mentioned nest of *Cerchneis cenchroides*. This tree contained two other nests in addition—viz., a nest of the North Parrakeet (*Barnardius occidentalis*), and one of the Yellow-throated Miner (*Myzantha flavigula*).

COCKATOO-PARRAKEET (*Calopsittacus novæ-hollandiæ*).—Flocks seen at Bore Well, and the species became common at Milly Pool when the hot weather set in. I think this and the preceding species may have bred during the summer rains.

ALEXANDRA PARRAKEET (*Spathopterus alexandra*).—This was a species I hoped to meet with in the district, but unfortunately I did not get on its track until the breeding season was over. Some time ago there appeared in *The Western Mail* (one of our illustrated weeklies) a photograph of an individual of this Parrakeet living in captivity at Perth. I know this bird came from the East Murchison or Mt. Margaret goldfields. What information I gleaned around Wiluna concerning this Parrakeet I owe to my friends the Cockatoo-hunters. Out east and north-east of the township are vast areas of spinifex, and it is on their margins the Alexandra Parrakeet is met with. Three young were taken from a hollow eucalypt in the early part of October of the present year (1909). I saw two of these. They were rather more than half-feathered, and had the beak coloured pink or carmine. The beautiful soft tones of green and pink on the breast, flanks, and tail were only just showing. The legs and feet were deep pink. The adult birds were described to me as appearing very slender when perched in the timber, and were stated to have a habit of sitting longitudinally on the branch. In this position they were very difficult to detect if motionless. The two young birds appeared to bear captivity very well, being full of life and activity. I rather coveted one, but most exaggerated ideas of their monetary value were prevalent. The local name for this species is "Spinifex Parrakeet."

NORTH PARRAKEET (*Barnardius occidentalis*, North).—I saw nothing of this species, with the exception of a solitary old female, which I shot, in the intervening tract of country between Lake Violet and the main Lake Way, until I reached Milly Pool. Here it was common, and breeding in the hollow eucalypts. With the aid of ropes brought out by the Cockatoo-hunters, I got several nests, but only one clutch of six eggs. These were in a filthy state, and had to be cleaned with hot soapy water. The eggs were fresh, but two of them were claw-marked. This was on 27th September, and must have been rather a late laying. I seldom have the luck to get a perfect clutch of Parrots' eggs—one or other is sure to be cracked or to have a small hole pierced in the shell.

MANY-COLOURED PARRAKEET (*Psephotus multicolor*), locally "Mulga Parrot."—This was the most generally distributed of the Parrot family

around Wiluna. I met with it almost everywhere, the exception being amongst the lagoons and sand-hills of Lake Violet. It was breeding commonly at Milly Pool, and I found several nests with young, being too late for eggs. All were in hollow limbs of eucalypts.

WARBLING GRASS-PARRAKEET (*Melopsittacus undulatus*).—Met with in flocks everywhere. The edge of the big spinifex plain was a good place, as they feed on the seed of the spinifex, which was very abundant the present year. Like the last-mentioned species, they were breeding commonly around Milly Pool. I chopped out several nest-holes, but only found one clutch of six eggs, and these were on the point of hatching.

SHORT-WINGED FROGMOUTH (*Podargus brachypterus*).—This interesting bird was found in scattered pairs throughout the district, and I found nests with both eggs and newly-hatched young. I shot a male for purposes of identification. I think it is now admitted that this is a good species, and should be separated instead of being joined with *P. humeralis*.

OWLET NIGHTJAR (*Egotheles novæ-hollandiæ*).—In hunting for Parrots' nests I found two nests of this species, but was only successful in getting one egg—an infertile one. Newly-hatched young are covered with white flaky down, which is very long and dense around the beak. A pair hawking for insects reminded me strongly of the European Merlin (*Falco æsalon*).

RED-BACKED KINGFISHER (*Halcyon pyrrhopygius*).—The only Kingfisher met with. I found it breeding in hollow trunks the interior of which had been filled up with red earth, conveyed there by termites. It is a late breeder, and I took a clutch of five eggs on 29th October. A second pair were still excavating their tunnel.

BEE-EATER (*Merops ornatus*).—I heard the familiar notes of this species as they passed over, migrating to the south.

SPOTTED NIGHTJAR (*Eurostopus argus*) (*guttatus*).—I flushed a Nightjar when climbing some rocks lying to the east of Wiluna. It looked very rufous, and may have been of this species. It was the only one I saw.

PALLID CUCKOO (*Cuculus inornatus*).—Far from common. I saw or heard most of it on the verge of the spinifex plain at Bore Well.

BLACK-EARED CUCKOO (*Mesocallius palliolatus*).—Much commoner than the last, but I had no luck in finding its eggs, though I was very keen in the quest. It is not the first time I have been disappointed in a locality where the bird has not been uncommon. I am inclined to think we have much to learn respecting its breeding habits.

NARROW-BILLED BRONZE-CUCKOO (*Chalcococcyx basalis*).—Fairly common, its high-pressure notes being much in evidence around the margins of Lake Violet. I got several eggs from nests of *Malurus leucopterus*, and also found a young bird just ready to leave a nest of *Acanthiza whitlocki*, and again saw a second pair of these birds feeding a young one, which I caught.

SWALLOW (*Hirundo neoxena*).—Found near water throughout the district.

BLACK-AND-WHITE SWALLOW (*Cheramæca leucosternum*).—Fairly common. It favours the mining belt, where it often breeds in abandoned shafts or in the face of old alluvial workings.

RED-CAPPED ROBIN (*Petræca goodenovii*).—This little gem was the common Robin, or, more properly speaking, Stone-Chat, of the district. It was familiar everywhere; the only place it seemed to avoid was the tract of eucalypts near Milly Pool. It began to breed at the end of July, and nests might have been found up to the middle of October. Though it breeds when a year old, I do not think males assume full nuptial plumage until their second birthday is passed—in some cases perhaps a little later. I estimated

the proportion of brown males to males in full plumage at five to one, and it is significant that I found in those cases where a brown male had paired the eggs resulting were not more than two, and in two instances an egg of the pair was infertile. Old females show traces of red on the forehead and breast, and I saw males apparently only just changing into scarlet and black at the close of the breeding season. All but one of the nests I found were very low down, and usually placed on dead wood. The exception was a nest near my camp at Bore Well, which was fully 8 feet from the ground. This nest was completed and eggs laid within nine days.

PIED ROBIN (*Petroeca picata*).—Distributed in scattered pairs throughout the district. I obtained several nests with eggs, which do not differ from those of *P. bicolor*. This Robin was one of the earliest birds to call in the morning. Long before the sun was up I used to hear their cry of "Kwē-kwū-kwū," only to be heard at that hour of the day. More often than not I was then shivering over my freshly-kindled fire. This species is double-brooded. A pair were building on 4th October. I had rather bad luck with the nests I found. Several were destroyed by Crows or Babbler, and others I had to leave before the eggs were laid. This was very vexatious, as the parent birds are very wary and will not go back to the nest when watched.

SHORT-BILLED TREE-TIT (*Smicrornis brevirostris*).—Only met with in the eucalypt saplings at Milly Pool, and around Dural station, to the north-west. I was too late for eggs.

SOUTHERN FLY-EATER (*Pseudogerygone culicivora*).—Distinctly rare. One or two seen or heard near Bore Well.

BLACK-AND-WHITE FANTAIL (*Rhipidura tricolor*).—Breeding in scattered pairs throughout the district. Several nests found, but only examined for Cuckoos' eggs. This was another early bird, and at Bore Well I was reminded at daybreak that "I must please be strict"—in my general behaviour, I suppose.

I had the vexation to lose a specimen of a *Rhipidura* that may have only been *R. preissi*, but may equally well have been *R. albicauda*. It was the only one I saw during the trip.

GROUND CUCKOO-SHRIKE (*Pteropodocys phasianella*).—I only met with this interesting bird immediately around Wiluna, and again near Milly Pool. It was distinctly uncommon, though by no means timid, as I often saw a pair amongst the stores and private houses comprising the main street of the township. The pairs were widely scattered, and nests consequently difficult to find.

It was not till I got to Milly Pool that I had any luck. On my arrival there young were already on the wing, but I noticed a pair of old birds which seemed to hang around a particular group of York gums. On 18th October I visited the spot, and caught sight of a nest on the topmost branch of a York gum, the sitting bird, with her long tail, being plainly visible. I had never taken eggs of this species before, and though I did not like the look of the slender branch holding the nest, I resolved to climb as far as I could, and see how things looked on a closer inspection. The nest was fully 30 feet from the hard-baked ground below, but I climbed to within 8 feet of it without any difficulty. There was one more fork, and if this would only bear my weight I had my prize within my grasp. I comforted myself with the thought that York gums are exceptionally tough, and took the risk. I had my reward in taking a record clutch of four beautiful eggs. All were perfect and typical specimens except one, which had less gloss than the others. These eggs were a second brood and quite fresh.

BLACK-FACED CUCKOO-SHRIKE (*Coracina robusta*).—This is a migratory species on the Murchison, and it was not until 13th August that I saw the first. This was at Bore Well. In the gums around Milly Pool a few pairs were breeding. I noted several nests. In each case they were placed in

the outermost fork of some horizontal branch of a flooded gum. I was not to be tempted. It was a great risk, even armed with a 10-foot scoop, so treacherous are these trees.

WHITE-SHOULDERED CATERPILLAR-EATER (*Lalage tricolor*).—Another migratory species, which I found moderately common around Bore Well in September. I took a typical clutch of eggs on the 13th of that month. It was also nesting sparingly near Milly Pool. At this period the surrounding country was a mass of blue and yellow, owing to the innumerable flowers of *Brunonia australis* and *Podolepis aristata*.

BLACK-VENTED GROUND-BIRD (*Cinclosoma marginatum*).—I was well acquainted with this species, having obtained half a dozen specimens in the neighbourhood of Lake Austin some six years previously. A pair of these have been mounted, and for several years have been on exhibition in the Perth Museum. Unfortunately, I left Lake Austin for the neighbourhood of Yalgoo, a locality much nearer the coast, before the breeding season had really commenced.

On arriving at Wiluna, I soon found my birds in the ferruginous country in and around the auriferous belt, and, not being a shy bird, I have more than once seen individuals within a quarter of a mile of Wiluna post-office. To find the nest and eggs of this species was one of the objects of my journey. But it was not immediately around Wiluna that I was successful. The reason of this was not far to seek: I was in another locality at the best time of the breeding season. However, there were a few pairs to be found in the low ranges bordering the spinifex plain near Bore Well. Having previously shot specimens to be certain the local birds were not referable to *C. cinnamomeum*, I contented myself with watching the pair nearest to my camp. Soon after sunrise the male perches himself on some dead branch, or other point of vantage, and utters his rather plaintive and monotonous call. This may be represented by the vowels *i* and *e*. The *i* is uttered short, and is rather rapidly repeated, the final *e* being long-drawn and half a note higher in tone. It may be perhaps expressed as follows:—"I-I-I-I-e." This call is repeated at short intervals, and two or three males will often reply to one another. Provided the bird remains at the same place, I never found any difficulty in locating the sound. It varies a little in its apparent distance through the bird turning its head about. At times the call is uttered from the ground, and the male bird frequently takes a run between each call. It is not so easy to locate the sound under these conditions. The method I adopted was to take a compass bearing on the spot from which the sound appeared to travel, and then to lay a straight stick pointing in the right direction. I repeated this for several mornings, and, estimating the distance, I followed my line and almost walked right up to the nest. The female sat close, but flew right away when I flushed her. The nest was on an ironstone flat, in fairly open country, but close at hand was a very shallow watercourse, with a line of large mulga and other bushes growing along its banks. In the shade of these bushes herbaceous plants were plentiful, and the nest itself was sheltered by a very small grey-leaved salt-bush of not more than a foot in height, and barely large enough to shade the nest from the morning sun. The nest was a moderately deep depression in the ground, from its neatness and even shape probably scratched out by the female bird. It was lined with strips of soft bark and a few acacia leaves, or leaves of the gidgi tree. The eggs were two in number, and of a very pale buff in ground colour; the markings were small, but numerous, and in the form of dots of irregular shape, distributed all over the shells, but more numerous at the larger end. In colour they were of various shades of brown, with a few underlying spots of neutral tint. The eggs were a fairly even pair, both in size, markings, and shape, and were slightly attenuated ovals. The skins of the birds I had shot previous to finding this nest had been placed in the hands of Mr. A. J. North,



Nest of Black-vented Ground-Bird (*Cinclosoma marginatum*).

FROM A PHOTO. BY F. L. WHITLOCK.

of the Australian Museum, Sydney, for confirmation of identity. Soon afterwards there was published one of the "Records" of that institution (vol. vii., No. 4, 1909), under the date 30th August, 1909. This record describes the plumage of the female of *Cinclosoma marginatum* (Sharpe), in addition to other interesting information, and purports to have been taken from a skin shot by Mr. C. G. Gibson, Assistant Geologist to this State. The skin referred to was received so long ago as July, 1908. If this specimen was in a recognizable condition, it is odd indeed that such an interesting bird should so long remain undescribed. Mr. Gibson was recalled from his work at Wiluna very shortly after obtaining this specimen, and was sent out as geologist, on behalf of this State, to accompany the Transcontinental Railway survey party. This party, however, returned to Perth prior to Christmas of the same year, so that, had further information been required by Mr. North, Mr. Gibson was at hand to supply it. *Cinclosoma marginatum* happens to be not only a very loose-plumaged bird, but, in addition, the skin about the loins, head, and neck is remarkably tender. I defy anyone but a practised hand to make a skin without losing a large percentage of the feathers and badly tearing the skin, and, even if fairly successful in that direction, to restore the various feather tracts to their proper positions in the completed skin. Mr. Gibson deserves every credit for his interesting field notes, but why these should be necessary in describing the plumage of the female it is hard to see. Mr. North has recently described two new species of birds collected by myself at Lake Way, and without applying to myself or to Mr. H. L. White for further particulars other than were attached to the skins. In addition to describing the plumage of the female, the record contains an excellent photograph of the nest and eggs taken *in situ* by Mr. Gibson. This is accompanied by a description of the eggs and nest by Mr. North. According to the report, Mr. Gibson took nests with eggs on 13th June, 30th August, and 1st September, 1908. There is some discrepancy here. On the two last dates Mr. Gibson was away on the Transcontinental Railway survey. There can, however, be no doubt of the identity of these eggs, but it is as well to be accurate in records of this nature. It is probable that the two latter clutches were collected by some local man on behalf of Mr. Gibson.*

I do not consider *Cinclosoma marginatum* a shy bird. As before mentioned, it still frequents country where active mining operations are in progress, and can be seen within easy distance of the main street of Wiluna. All that is necessary is to walk through the bush quietly, keeping one's eyes well ahead. At the first alarm, perhaps, a pair may run under a bush, but if the observer stands motionless the female, followed by the male, soon comes out again, and both will quietly feed right up to one's feet if reasonable quiet is maintained.

As to its geographical distribution, Mr. Gibson is approximately correct. Probably its southern limit overlaps the northern limit of *C. castanonotum* about the latitude of Menzies or Leonora. How far east it extends is unknown. Westwards I have met with it within 100 miles of the coast, in the latitude of Geraldton; but, despite much search for it on the Pilbarra goldfield, I failed to find it there. No doubt it extends much further north than Wiluna. I have little doubt that the specimens of *C. castanonotum* recorded as shot near Separation Well (see Campbell's "Nests and Eggs," p. 256), should have been referred to the present species and not to the latter.

* From this somewhat contradictory evidence it would appear as if Mr. Gibson's specimen of the female bird was too mutilated for detailed description, and that Mr. North fell back on the specimens of both sexes collected by Mr. Whitlock, which were placed in his (Mr. North's) hands for identification, or, rather, for confirmation, by Mr. H. L. White. However, Mr. Whitlock can claim to have cleared up the indification of this little-known and interesting bird.—EDS.

WHITE-BROWED BABBLER (*Pomatostomus superciliosus*).—Distributed throughout the district. The breeding ranges of this and the next species overlap in these latitudes.

RED-BREASTED BABBLER (*Pomatostomus rubeculus*).—I only met with this species around Milly Pool and further to the north-west, along the Peak Hill stock route. I question if it occurs much further south. I cannot recollect seeing it away from the flooded gums, either near Lake Way or in the north-west of this State. It is probably double-brooded. Young were on the wing when I arrived at Milly Pool, and I was watching a newly built nest, in the hope of getting eggs, till the day I left—viz., 6th November.

FIELD-WREN (*Calamanthus campestris*).—A *Calamanthus* was not uncommon in certain tracts of samphires around Lake Violet. I also saw a pair near Dural station, in an extensive salt-bush flat. I shot one or two for purposes of identification. I could see little, if any, distinction between these specimens and others I shot around Lake Austin. The latter were submitted to Mr. A. J. Campbell by Mr. A. W. Milligan some six years ago, the verdict being *C. campestris*. The Lake Way birds were sent to Mr. North, and were returned with the note that they were intermediate between *C. campestris* and *C. isabellinus*, with a leaning towards the latter. If this be the case, then *C. isabellinus* is only an interior form of *C. campestris*, connected by "existing" links. Thinking my birds were only *C. campestris* I did not seriously hunt for their nests until too late in the season. This Field-Wren breeds early, and young birds were on the wing by the first week in August. Apparently it is not double-brooded, as later on in the season I saw family parties feeding amongst the samphires.

BROWN SONG-LARK (*Cinclorhamphus cruralis*).—Local and by no means common, being confined to the sand-hills around Lake Violet, with a few pairs inhabiting the extensive salt-bush flats along the Nannine track and the Peak Hill stock route.

RUFIOUS SONG-LARK (*Cinclorhamphus rufescens*).—A pair or two near Lake Violet, but not uncommon on the big flats around Milly Pool. I obtained one nest with three handsome eggs at the foot of a small bush. The nest was a poor, ill-constructed affair of a few dried grasses. Date, 24th September.

TRICOLOURED CHAT (*Ephthianura tricolor*).—These lovely birds were not uncommon in suitable localities throughout the district. They seemed to prefer the open salt-bush flats. They were fairly plentiful around my camp at the north end of Lake Violet, but they had only just commenced to build when I left for Bore Well. On my return from there (14th September) I espied a female sitting on her nest as we drove by. The nest was within 3 feet of the road. It contained but two eggs.

ORANGE-FRONTED CHAT (*Ephthianura aurifrons*).—Much commoner than the last. I even saw them in the streets of Wiluna. In the samphires around Lake Violet they were numerous, and I found a dozen nests without troubling to hunt for them. Some contained three eggs, others only two. The parent birds sat close, and would return to the nest whilst I was near. I more often flushed the male from the nest than the female. Perhaps the latter takes her turn at night. All the nests were low down, but seldom actually on the ground. This species was breeding near Milly Pool, but it was distinctly rare there. I was timing the period of incubation in one instance. I called at the nest just when I expected the young to be hatched and found it empty.

Ephthianura albifrons, though frequent around Lake Austin, is a noteworthy absentee at Lake Way, not once being observed during this trip.

LARGE-BILLED TIT (*Acanthiza robustirostris*).—This was one of my old Lake Austin friends, where I discovered the species in 1903. It is an

inconspicuous species, and may easily be mistaken for the more common *A. uropygialis*, with which it often consorts. It was its harsher call notes that attracted my attention to the first pair I procured. I was not long in picking it out again at Wiluna, though I had not heard the notes for fully six years. It has a low-pitched, twittering song, which is not unpleasing, but can only be heard when the bird is at close quarters. In addition, there are certain loud and clear joyous notes, very similar to those of *A. uropygialis*. The harsh "Thrip-thrip" seems to be a call note or alarm note, and is uttered by the male, and responded to by the female, when building operations are in progress. According to my observations, the female does all the building, the male hanging around the nesting site and keeping an eye on things in general. The favourite situation for the nest is a medium-sized or even small narrow-leaved mulga bush, growing in company with two or three similar bushes, but often quite isolated. Where the mulga is large and growing in thickets it is useless to look for the nest, although the bird itself may be found feeding there. The nest is a pretty little structure, and has been described by Mr. A. W. Milligan. Spiders' webs and cocoons enter largely into its construction. Some nests are much more profusely lined than others. In all I have found perhaps thirty nests. By far the greater number were at a height of from 4 to 6 feet from the ground. One I found in a pine tree was at a height of fully 15 feet, and another was only a few inches from the ground in a small broad-leaved salt-bush. These were the only two nests I observed that were not built in the customary narrow-leaved mulga. I found both these latter nests on the Yalgoo goldfield. A full clutch is invariably three. The eggs are exceptionally fragile, and as a rule very well marked, chiefly at the larger end, with rust-red spots. Two handsome clutches had the markings all massed together at the apex, and another egg in a third clutch was quite white. Curiously enough, I shot a specimen of this *Acanthiza* nearly white, but it showed sufficient of the snuff-coloured upper tail coverts to make identity pretty certain. Compared with *A. uropygialis*, and other species found in the south-west of this State, I consider *A. robustirostris* a silent bird. It is especially quiet and wary when the young are hatched. I have often stood by a nest containing young, and waited in vain for the parents to show themselves. An easy way to find the nest is to stand within sight of the male, when he is fussing about, uttering the harsh call note, and watch for the female. Presently she may be observed flying from bush to bush, until she disappears into the topmost twigs of some solitary mulga. Ten chances to one there you will find her nest, which, from the ingenious way the narrow leaves of the mulga are woven into the sides, is by no means a conspicuous object. On the Yalgoo goldfield I obtained an egg of the Bronze-Cuckoo (*Chalcococcyx basalis*) in a nest of this *Acanthiza*. The species is double-brooded, the breeding season commencing early in July and lasting till the beginning of October. If this bird lived in agricultural districts it would be a useful little friend to the farmer and orchardist, as it devours numbers of grubs and caterpillars, as I have myself witnessed.

WHITLOCK TIT (*Acanthiza whitlocki*, North).—This was one of two new species I procured on the East Murchison, and at the request of Mr. H. L. White Mr. A. J. North paid me the compliment of naming it after me. It somewhat resembles in appearance *Acanthiza apicalis* of our south-western coastal districts. A full description will be found in *The Victorian Naturalist*, vol. xxvi., No. 5, pp. 55, 56.

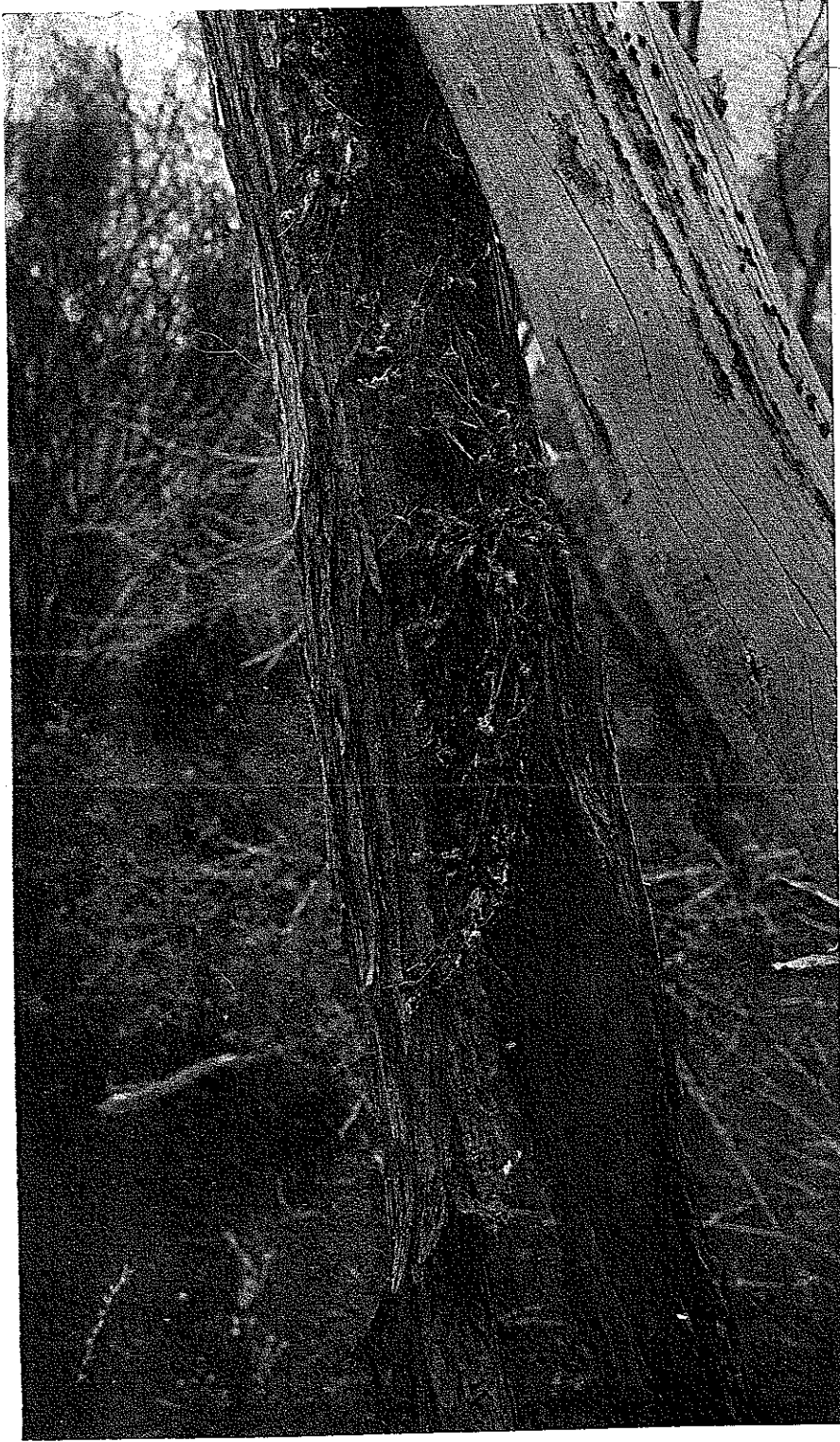
The first pair I met with were in a thicket of tea-tree scrub bordering the big lagoon in Lake Violet. They were closely searching the sprays of foliage for insect life. They were very silent, and though I stood watching them for some time not a sound did they utter. I was puzzled. The only way out of the difficulty was to shoot them. This I did, securing both without serious damage. I could see I had got an *Acanthiza* which somewhat resembled *A. apicalis*, but both the markings on the throat and breast and

the general tint of the plumage lacked the boldness and depth of these features in the latter. Again, *A. apicalis* is an animated, fussy species, always restless, and seldom silent. I resolved to keep an eye open for others. About a mile away, and in similar scrub, I came across a second pair, and, though it was early in the breeding season, I resolved to watch them, in the hope that they were building. After the exercise of much patience, I followed them to a sheltered spot in the scrub which they seemed loth to leave. There I spied a neat, dome-shaped nest, placed low down, without any concealment, in the tea-tree scrub. It looked remarkably substantial for an *Acanthiza*'s nest. But there were the two birds, apparently anxious at my presence, and no other birds at hand except *Taniopygia castanotis*, and, despite the large size of the nest, I was forced to the conclusion that this pair of *Acanthizas* were the real owners. However, I was completely taken in. The nest appeared to be completed, but it was not until more than a fortnight later it contained eggs. They were unmistakably those of *Pyrrholaemus* (*Sericornis*) *brunnea*.

I met with other pairs of this *Acanthiza* later on. It was not confined exclusively to the tea-tree scrub around Lake Violet, as I met with a single pair in some fairly thick country near the township of Wiluna, and again I found several pairs near Milly Pool. It is by no means a noisy or fussy bird, like so many of its congeners, but appears to be somewhat of a mimic. Near Wiluna I heard it utter the "Thrip-thrip" of *A. robustirostris*, but its most usual notes were an imitation of the call of the Narrow-billed Bronze-Cuckoo (*Chalcococcyx basalis*). There is some evidence that the mimicry of these latter notes has its disadvantages, for on 8th October I found the real nest of this species in tea-tree scrub at Lake Violet, and it contained a young Cuckoo just ready to fly. I handled the latter bird, to the great agitation of the foster-parents, which actually flew in my face, brushing me with their wings. I even placed my hand over one of them. After such a display of courage I let the young Cuckoo go again, and contented myself with photographing the nest, despite the fact of its being much tumbled and disordered by its intruding tenant. At Milly Pool another pair were feeding a Bronze-Cuckoo, which I caught. All this rather suggests that the mimicking of the Cuckoo notes attracts the female Cuckoo to the vicinity of the *Acanthiza*'s nest, and she takes the opportunity to foist her egg upon the lawful owners.

I found a second nest from which the young had flown, also near Milly Pool. This was very low down in a small salt-bush. The parents, with their brood, were near at hand. This nest, too, was much disordered, so that I cannot give a precise description of it. It was dome-shaped, with the entrance at the side but not so near the top as in the case of a *Malurus* nest. Outwardly it was constructed of soft strips of bark, wound round rather than interwoven. The interior was lined with finer bark, with a few feathers and flakes of rabbit fur. The Lake Violet nest was similar, but the remains of an old chaff-bag had been used in the lining, and a piece may be seen in the photograph hanging out of the entrance. (See illustration.)

CHESTNUT-RUMPED TIT (*Acanthiza uropygialis*).—A very common bird throughout the district, but rather avoiding the scrub immediately around Lake Violet. I found many nests containing from two to four eggs. With one exception all were in hollow stems of bushes, some of them remarkably small. The walls of the nests were thin, but the lining always profuse, consisting of fur, feathers, string, or any soft material to hand. Despite the situation of the nest, it is a true dome-shaped structure, with the entrance near the top. The species is double-brooded. The exceptionally placed nest alluded to above was built in a pipe of bark which had peeled off a dead mulga, but from which it was still suspended. I photographed this nest, as it is exceptionally substantial. (See illustration.) It was eventually torn from its position. There were fresh Emu tracks near by.



Nest of Chestnut-rumped Tit (*Acanthiza uropygialis*),
in pipe of bark.

SMALL-BILLED TIT (*Acanthiza tenuirostris*).—I was glad to renew my acquaintance with this *Acanthiza*, which I added to the avifauna of this State in 1903. I obtained the first Western Australian specimens at Lake Austin in that year. I believe these specimens were referred to Mr. Zietz, who declared them identical with the types of *A. tenuirostris* from South Australia. There is yet a large tract of country to be bridged over before the geographical range becomes continuous.

In Western Australia I have as yet never met with this *Acanthiza* away from the samphires. Indeed, it seems to exclusively haunt the margins of the salt lakes, where this plant and a few varieties of the *Salsolaceæ* abound. I cannot recollect ever seeing it perch in a bush, or even in tea-tree scrub, though the latter is abundant enough around certain of its haunts. It is an inconspicuous little bird, gifted with very feeble powers of song, though its call note is distinct and peculiar. To me these notes resemble the syllables "Tip-tip-tip" uttered rapidly but with a distinct glassy ring about them. Possibly it has a song, but I have only heard this call note between the sexes. I have watched the parents feeding their young, and have also watched pairs before the breeding season had set in. They seem to spend most of their time busily searching the samphires or salt-bush for insect life as they flit from bush to bush, and as the observer moves towards them they are rather wary, and, unlike other species of *Acanthiza*, will not permit of a near approach.

I was very keen on getting the nest and eggs of this species. The nest has already been described by Mr. A. W. Milligan, from an example I obtained containing young at Lake Austin. It was only after repeated visits to Lake Violet that I located a pair, and, as I knew this *Acanthiza* was an early breeder, I spared no trouble and pains in my efforts to find their nest. All was in vain until too late for eggs, for, though I did eventually find the nest of this particular pair, the young had already flown. In dealing with these small species one wants a reasonable amount of calm, sunny weather. In the remarkable season of 1909 such weather was conspicuous by its absence. Bitterly cold and strong east winds, often varied by rains from the south or south-west, accompanied by still heavier gales, prevailing well into September. However, despite my non-success with this particular pair, I was not beaten. On the 26th August I went to take a photograph of the big lagoon in Lake Violet. My objective point was the highest sand-hill I could find. To reach this I had to cross a samphire flat and then pass through a small belt of tea-tree scrub. On the other side of this was a mixed growth of samphire and salt-bush, with a few dead or dying bushes of various species. I was just entering this little belt of vegetation when I heard the familiar "Tip-tip-tip" of *A. tenuirostris*. I pulled up, and, unslinging my camera, began to watch. I caught sight of what I took to be the male, and I could also hear the female replying to his call at no great distance. For some time I could make nothing out, and, concluding I might be too near the nest, I walked over to where I could see the male. He met me, and I commenced a systematic search. I was not long in finding a small, neat, domed nest, low down in a salt-bush, the male meanwhile perching close at hand and continually calling to the female, who, however, did not venture near. The nest contained three eggs. But I did not quite like the look of things. *Malurus leucopterus* was about, and the nest was suspiciously like that of a *Malurus*—very well woven and rather elongated. I walked away and sat down to watch, hoping the female would go on. After a quarter of an hour I got tired of this. Incubation had not commenced, so I determined to photograph the nest and return again to settle its identity. As soon as I set up the camera the male came back and watched the proceedings, but the female kept persistently away. It appeared to me she was most often calling at a point behind me and some five chains away. I made up my mind that if the present nest proved to belong to a *Malurus leucopterus* her own home would be somewhere in that direction. I returned to the spot next day, and, quietly walking up to

the nest in the salt-bush, flushed a female *M. leucopterus* from the eggs. This was disappointing, though no more than I expected. The *Acanthiza* did not put in an appearance at all. I walked over to the spot I suspected, and, after a few minutes' search, found a second nest, not in the salt-bush, but cleverly interwoven and sheltered by the topmost spray of a clump of samphire. This nest was more globular, too, and more loosely woven, and in a circular fashion. It was the image of my Lake Austin nest, now on exhibition in the Perth Museum. To my delight this nest contained three eggs. The male and female were skulking near, but would not come up to the nest. Carefully packing the eggs, I went home quite satisfied as to their identity. They were the first authentic eggs ever taken of *Acanthiza tenuirostris*. They differed from typical eggs of *Malurus leucopterus*, the markings being more sparse and fainter. In size, too, they were slightly smaller, but the structure of the nest was totally different, and agreed with the nest I eventually found of the first pair except that the latter had a lining of rabbit fur whilst the present nest had a lining of white or buffish vegetable down of the plant known as *Dicrastyles fulva*.

RED-THROAT (*Pyrrholæmus (Sericornis) brunnea*).—Generally distributed throughout the district. It breeds early. The young were on the wing second week in August. I obtained two typical clutches of eggs. These nests remained empty so long that I quite gave them up, thinking they had been robbed by the blacks. One was in a salt-bush, the other in tea-tree scrub. This species is a splendid mimic, and reproduces the songs of all the surrounding birds. In passing, it may be worth recording that on one occasion I took eggs from a nest built in the burrow of a lizard and quite under ground. A blackfellow in front of me walked right over the nest, flushing the female in so doing.

BANDED WREN (*Malurus splendens*).—Rare and very local. Though I heard of blue birds at Lake Way, which came round one's camp, I hardly expected them to be of this species. It was one of the surprises of my trip. I only met with two parties near Wiluna, and another near Milly Pool.

WHITE-WINGED WREN (*Malurus leucopterus*).—The commonest Wren of the district. I found seven or eight nests. Several contained four eggs, and in three instances the nest contained an egg of the Narrow-billed Bronze-Cuckoo. Several clutches were very boldly marked, the blotches inclining to hazel-brown rather than rufous-brown.

PURPLE-BACKED WREN (*Malurus assimilis*).—Sparingly distributed throughout the district. I found one nest, but it must have been disturbed, for when I visited it later it was quite abandoned.

RUFIOUS-CROWNED EMU-WREN (*Stipiturus ruficeps*).—Rare, and confined to the big spinifex plain west of Bore Well. In its habits this rare Emu-Wren differs but little from the commoner species in the south-west. It is a terrible skulker, and a very feeble flier, but hops along the sand between the tufts of spinifex at a remarkable speed. Though it is such a skulker it is not really a shy bird. The difficulty is to find it. But when once found it is easy, by imitating its feeble notes, or the cry of a wounded bird, to make it show itself. By the latter method I brought a male right up to my feet. Despite much labour, I failed to get eggs; but I found a very small nest of the previous year—smaller than that of *M. leucopterus*—and also differently woven. This was placed in stunted spinifex, and was woven of soft dry grasses, bleached nearly to whiteness. The lining appeared to have been white or buff-coloured vegetable down. On returning home I tramped through all this spinifex, a distance of 12 miles, in the forlorn hope of finding a late nest. As luck would have it I walked right into the midst of a family party. I secured the male and two of the young. The former had only two tail feathers. The young are much less rufous than the adult, being of a dull snuff-colour, with the same markings as the female.

* See remarks on "Western Australian Birds," by A. J. Campbell, part 3, p. 165.

PLATE XX.



Nest of Large-tailed Grass-Wren (*Amytornis giganteus*).

FROM A PHOTO BY F. L. WHITLOCK.

LARGE-TAILED GRASS-WREN (*Amytornis gigantura*, Milligan).—This was another Lake Austin friend I hoped to meet with at Lake Way. I was not disappointed. It is a most difficult bird to find, especially if the weather be windy or wet and cold. As at Lake Austin, it was strictly confined to the salt-bush near the lake. This family of birds is said to favour rocky or stony places. It may be true of other members, but I never saw the present species in any such country. Though there were outcrops of rocks near two of its haunts at Lake Austin, and again a huge outcropping quartz reef at Lake Way, I never saw an individual amongst the *débris* surrounding these formations. The species of salt-bush it prefers grows to a height of about 3 feet. The leaf is very small and sappy, and at fruiting season it has a small bright red berry, which is not unpleasant to the taste. When bruised the leaves have a scent like common garden sage. These bushes always grow singly, and generally on rich alluvial flats, but also on low sand-hills.

I can give no hints as to how to find this bird. One may pay visit after visit and spend hours in its haunts without seeing more than its tracks. Another day one may walk right up to the bush it is skulking under, but it does not follow that the *Amytornis* will break cover. If it has a song it seldom utters it. The call note is faint and very high-pitched, but both at Lake Austin and Lake Way I heard individuals utter a sound precisely like the mew of a cat. The female is much more wary than the male, and one seldom gets more than a glimpse of her as she bounds from bush to bush. On a single occasion, the weather being calm and genial, I had the exceptional opportunity of seeing three of these Grass-Wrens at the same moment. I knew a party was about, and at the expenditure of some patience and artifice I enticed them around me. One hopped to the top of a salt-bush, another came out in the open, and even began pecking about whilst a third took a series of peeps at me from behind another bush. From the large size of their tails I judged all these to be males. The male, too, shows no rufous patches at the side of the breast.

I was very anxious to secure the nest and eggs of this little-known Grass-Wren. It was only after much labour I was successful. Knowing that a party inhabited a certain tract of salt-bush at the foot of some sand-hills, I resolved to "stick to my covey" and concentrate my efforts on this bit of country alone. In addition to the salt-bush there were many clumps of spinifex on the sand-hills, and I resolved to carefully search them too. I tried all sorts of methods. Wherever I saw the birds about, there I examined every salt-bush on hands and knees, and many a disappointment I got—dark-looking domed nests in the centre of the bush either proving to be *Tamias* nests or old nests of *Pyrrholæmus brunnea*.

It was not till 23rd August that I had any luck. I had been through nearly all the salt-bush, and had been beating the clumps of spinifex with a stick, when I came to a few dense salt-bushes near the belt of tea-tree and other scrub bordering the big lagoon at Lake Violet. I parted with my hands all salt-bushes that the light did not penetrate through, and had almost come to the last one when in the centre of a fairly large bush I found a perfect cup-shaped nest containing three remarkable and beautiful eggs. I was puzzled. I was expecting a domed nest with the entrance at the side. Here was a substantial cup-shaped nest of dried grasses and green shoots of salt-bush, with very thick walls and a fairly deep cup, lined with finer grasses, vegetable down, and even a little fur. The shape of this nest is remarkable when compared with that of its near ally, *A. striatus*. The eggs, too, were unfamiliar. I listened to the song or call note of every bird around me. *Xerophila* was there, also *Artamus venustus*, and the eggs did resemble certain varieties of the latter, but they were much too large, and the nest was totally unlike a Wood-Swallow's. I listened again. Then I heard the faint, high-pitched alarm-note of *Amytornis gigantura*. The problem was solved, but I had to make identity sure. I sat down within

sight of the bush containing the nest and its immediate surroundings, and waited till I was weary. I resolved to go away and return in an hour's time, and as the ground was sandy I would try and steal silently up to the bush, and, if possible, surprise the sitting bird, and procure it before it could slip away. I carried out this plan, and, very cautiously approaching the bush, I peeped into the nest. There was a veritable *Amytornis gigantura* sitting on the eggs! It flushed with a cry of alarm, but I secured it. It was a male. I waited in vain for the female, as I was most anxious to secure a specimen—there being only two in existence. Both are in the Perth Museum—one the type, described by Mr. A. W. Milligan, and secured by Mr. J. T. Tunney, near Mt. Magnet, Murchison goldfield, and another collected by myself at Lake Austin. I subsequently photographed the nest and eggs *in situ*, and also the surrounding haunts. (See illustration.) This was the only nest of this rare bird I found. The nest and eggs are new to science, and have been recently described in *The Emu* (p. 136).

I may note that some time afterwards I visited the same spot again, and heard notes resembling those of *Amytornis striatus*, which I have described in another place as resembling the syllables "Tū-tū-tū." Probably they were uttered by a male of the present species.

Much uncertainty seems to prevail about the identity of this and two other closely allied species. There seems a tendency on the part of certain ornithologists to refer both *Amytornis textilis* and *A. gigantura* to one species. In a very interesting letter to Mr. H. L. White, Mr. G. A. Keartland, who accompanied the Calvert Expedition, refers to two species of *Amytornis* observed in the country at and around Lake Way. One he identifies as *A. striatus*, and in that I think he is perfectly correct. But his reference to a second species, haunting and observed running about amongst the samphires at Lake Way, has caused me some perplexity. This latter species he refers to *A. textilis*, despite the fact that Gould described *A. macrurus* as a larger and more robust form of the latter, and, moreover, its Western representative. I can hardly credit the statement that such a secretive bird as *A. gigantura* can have been observed amongst the samphires at Lake Way. In my experience it does not frequent such vegetation, but I saw *Calamanthus campestris*, which has a carriage very much like an *Amytornis*, in the samphires every time I walked through them. This latter bird has, however, a much shorter tail. As my foregoing notes will illustrate, the difficulty I had in finding the bird alone should be apparent. Mr. Milligan, in describing the types, gives comparative measurements of five species of this genus (*Vict. Nat.*, xviii., No. 2, June, 1901), and it will be seen that the dimensions of *A. gigantura* altogether exceed those of *A. textilis*, and even Gould's measurements of *A. macrurus*. Mr. C. G. Gibson, in his article on the "Birds Observed between Kalgoorlie and Eucla" (*Emu*, vol. ix., p. 73) groups *A. macrurus* with *A. gigantura*. There is no reason for this, but until a large series of both supposed species have been collected from various localities in this State, and carefully compared, the question must remain an open one, and it may be just as well to let the two species (?) stand as at present. In any case, the Western birds should not, with our present knowledge, be referred to the smaller and less robust *A. textilis*. I only hope my observations on the habits of the Lake Way birds, with my photographs of the nest *in situ* and breeding haunts, will aid in the final settlement of this question.*

* Since writing my remarks on *Amytornis gigantura* I have seen *The Victorian Naturalist* for February, 1910. In this journal is an account of the finding by Mr. C. G. Gibson of the nest and eggs of *Amytornis macrurus*. The account is accompanied by a description of the nest and eggs by Mr. A. J. North, and is illustrated by Mr. Gibson's photograph of the nest *in situ*. Nothing could have been more opportune. A distinct superstructure in the form of a dome over the nest is observable in the photograph of the nest of *A. macrurus*. As my notes emphasize, the latter feature is quite absent from the Lake Way nest of *A. gigantura*.

PLATE XXI.



Nest of Striated Grass-Wren (*Amytornis striatus*).

FROM A PHOTO. BY F. L. WHITLOCK.

I must just add that, on reading further Mr. Keartland's letter, he refers to *A. striatus* as being the rarer of the two local Grass-Wrens near Lake Way. My experience is precisely the opposite. I only got, and that with much difficulty, three specimens of *A. gigantura*. Had I been so desirous, or had it been advisable to do so, I could readily have obtained thirty or forty specimens of *A. striatus* in the spinifex plain near Bore Well. He further states that in the samphires or salt-bush *A. textilis* may be seen hopping about and singing. *A. gigantura* has no song—that I am certain of—but *Calamanthus campestris* does hop amongst the samphires, and sings very musically too. Mr. Keartland's description of the situation of the nest and the markings on the eggs, too, is quite at variance with my experience.

STRIATED GRASS-WREN (*Amytornis striatus*).—This species, which I had met with the previous year in the north-west of this State, was destined to give me much trouble, and at the same time keen delight. On my way to Wiluna I noted it in several places in the huge spinifex plain between Limestone and Bore Wells—a distance of 12 miles—with an unknown extension to the north and south of the track. This was rather a large area in which to locate a small bird's nest, and the number of eligible building sites was beyond computation. I could only put all my heart into the task and hope for a bit of luck. I returned to Bore Well from Wiluna on 30th July, a very cold day, and I was destined to have a rough time, as far as the weather was concerned, during my fortnight's camp on the edge of the spinifex plain.

I had very little to guide me in estimating the probable nesting time of the Grass-Wren, so I resolved to shoot a pair and carefully examine the state of their organs. Next day I was fortunate in securing a female. On dissection, I did not quite like the look of things. I greatly feared I was too early. The same opinion prevailed when I dissected a male. However, I was on the spot, and resolved to learn as much as I could of the habits of the birds, and if necessary return again at a later period. In the breeding season, at any rate, this Grass-Wren is much easier to find than *Amytornis gigantura*. The male has rather a pleasing song, and on calm, sunny days he will perch at a height of 3 or 4 feet and pour it forth. He even keeps up the performance for ten minutes at a time if undisturbed, and in this respect he resembles a *Calamanthus*—another rather secretive bird. The common call note is a clear, liquid, and musical "Tū-tū-tū," and this is frequently responded to by any other males (and possibly his own female) within ear-shot. These notes are incorporated in the song, and are followed by other more rippling notes, which again are followed by further sounds difficult to describe on paper. The whole effect is distinctly pleasing, and in the semi-desert country inhabited by these Grass-Wrens gives life to otherwise rather dreary surroundings. Indeed, were it not for the bird-life on these spinifex plains silence would absolutely prevail. During a month's constant tramping I never saw a kangaroo or other marsupial. Lizards were not numerous, snakes I never saw at all, and, with the exception of the usual bush flies and two or three species of beetles, insect life was not very apparent. The alarm note, or warning note, is faint and high-pitched, but when an individual is suddenly disturbed from a tussock of spinifex at one's feet it dashes off—a streak of brown—with a shrill shriek, not unlike the effect produced by rapidly drawing one's finger over the highest octave of the piano, in an upward direction.

My fears that I was too early for nests were fully realized, and after vainly searching in what I then conceived to be the most likely localities, with a persistence that deserved success, I decided to go back again to the neighbourhood of Lake Violet, and to return to Bore Well a little later on. I arrived in Wiluna on 15th August, and, after a successful fortnight's work, was back again at Bore Well on the 29th. In the interim I had found the nest of *Amytornis gigantura*—a much more difficult task. This gave me

great encouragement, and I resolved not to come away from the spinifex without authentic eggs of *A. striatus*, even if I had to camp out in their actual haunts.

I had been much astonished that I had found no nests of previous seasons. Having discovered several old *Malurus* nests, this was the more remarkable, and rather discouraging. On the last day of the month things took a turn for the better. In a tract of spinifex where the growth was rather stunted and in the form of rings rather than clumps, I found a nest of the previous season, and of the character I was searching for. It was placed on the top and half-embedded in the spinifex. Outwardly spinifex stems formed the bulk of the structure, but the woven part of the nest was of flat grasses, and the interior warmly and neatly lined with buff-coloured vegetable down from the plant known as *Dicrastyles fulva*. It was a domed nest, with the entrance at the side but rather nearer the top than the circumference. Viewed from above the entrance was invisible, and I had to stand back several yards before I could detect it. All the nests I found were of this character. In no sense could the nest be described as open or cup-shaped. My experience therefore differs considerably from that of other field naturalists (*vide* descriptions Campbell's "Nests and Eggs," also North's "Nests and Eggs of Birds found Breeding in Australia and Tasmania"). Finding this old nest was a step towards ultimate success, and I took careful stock of my surroundings. Hitherto I had imagined the most likely spot for the nest would be in some natural gap or depression in the large and vigorous clumps of spinifex. I was quite wrong. Of the seven nests I found (old and new) all were in tracts where the growth was low and more of the character of rings and lines than clumps. The only reasons I can imagine why this should have been so are that where the spinifex is less dense it shows more of the bleached stems of the plant, and thus the materials of the nest readily harmonize in colour and aid in its concealment. Also the sitting bird has a better view of approaching enemies, and can more readily slip off to a distance until the danger is past.

On 3rd September I found another similar nest, except that it looked newer. I cautiously felt within. Apparently it was empty, and the lining seemed to have been disturbed. I investigated further and became conscious of two solid objects embedded in the down of the lining. Gently tilting the nest up until I could look inside, I could just see a portion of the shell of a white egg. I soon had the pair out, and had the satisfaction of gazing upon my first eggs of the Striated Grass-Wren. They were pure white in colour, sparingly marked, chiefly at the broader end, with pale rufous-brown. They were nearly true ovals in shape. Texture of the shell fine, with a slight gloss. I saw no signs of either parent, neither could I hear the alarm note. Shortly afterwards I flushed a female right off her nest. This was in the usual situation, but there was a low growth of acacia amongst the spinifex, and the nest was right at the foot of one of these bushes. This nest contained two newly-hatched young. The lining of this nest was extremely neat, and formed a warm, soft bed, in the shape of a cup, for the young to rest upon. I tried in vain to entice the female back to the nest, but she utterly refused to show herself.

On the following day I found a fourth nest, containing two incubated eggs. It was a very windy day, and I nearly walked past the sitting female before she dashed off her eggs. The spinifex was again low and in the form of a ring, the nest being placed on the inner side of the ring, where the bleached stems of the plant were visible. In addition to some stunted acacias there was a growth of a species of *Erica*. I had often seen and heard of Grass-Wrens amongst tracts of these shrubs, but I had hitherto regarded such localities as favourite feeding-grounds. On 9th September I found another last season's nest, of the usual type; but three days later, on the top of a rise, and near a line of blood-wood eucalypts, I flushed a female from her nest in very low and sparse spinifex. This nest contained three eggs,

and to aid in its concealment dried spinifex stems had been loosely piled on the top. My seventh nest was a last year's one, and differed in one respect from all the others. A year or two ago a large tract of the spinifex plain had been swept by a fire. A growth of a species of soft grass had taken the place of the spinifex. This grass grows in swollen tussocks, and is very dense. Amongst a group of these tussocks, and at the foot of a dead bush, was an *Amytornis* nest. No spinifex was employed in the construction of this, the last nest I found. (For a typical nest see illustration.)

Before I left Bore Well I had the luck to catch a young Striated Grass-Wren, getting my hands well pricked in the process, the points of the spinifex breaking off in the wounds and producing much irritation. This young bird was much duller in colour than adults, snuff-brown rather than ferruginous-brown. The striations on the throat and breast were visible. The under parts were greyer, but palest on throat and abdomen. Iris coffee-brown; beak horn colour, with a pink tinge, especially on the lower mandible; legs, feet, and claws flesh-pink. This nestling uttered the shriek of the parent birds when I chased it. The latter both showed themselves, but kept at a respectful distance. Another pair probably had a brood in the spinifex, as on my imitating the cry of a bird in distress they actually followed me, the female showing herself so freely that I could easily distinguish her from the male by her rufous flanks and sides of breast. In a series of male skins not much difference in plumage is apparent, but in what I take to be older birds the striations on the throat and breast are more pronounced. The seven eggs I obtained do not vary much in size or shape, but in several of them the markings have a tendency to form a zone.

WHITE-BROWED WOOD-SWALLOW (*Artamus superciliosus*).—This Wood-Swallow is not very well known as a visitor to this State. In the early part of August many Wood-Swallows were migrating to the west and north-west, and a flock of over a thousand birds became weather-bound, heavy gales with rain setting in from the south-west. These were mostly *Artamus personatus*, but amongst them I detected several darker individuals of a more robust build. I managed to shoot one or two of either sex. They proved to be of the present species.

GREY-BREASTED WOOD-SWALLOW (*Artamus cinereus*).—A single specimen obtained at Lake Violet.

MASKED WOOD-SWALLOW (*Artamus personatus*).—Large numbers passed during the latter half of July, and again during the earlier part of August. On the spinifex plain at Bore Well during the latter period a large flock became weather-bound. I was hunting for *Amytornis* nests, and these Wood-Swallows proved a serious distraction. It was very fascinating to watch such large numbers of birds feeding all round one. They were not hawking for insects, but were extracting the nectar from the flowers of a very curious plant, which was growing abundantly where the spinifex had quite recently been swept clean by a bush-fire. I took a specimen of this plant to Perth, and submitted it to Dr. Alexander Morrison, late Government Botanist to this State. He tells me it is a very little known species, having quite recently been figured and described. He names it *Brachysema daviesioides*. The most curious habit of this plant is that it throws out its flowers at the base of the stalk. The Wood-Swallows were crouching down quite flat in extracting the nectar, and their foreheads and crowns were thickly coated with the yellow pollen. All these flights of Wood-Swallows were accompanied by flocks of *Ephthianura tricolor*, and by small numbers of the Pied Honey-eater (*Entomophila leucomelas*).

A number of the present species remained to breed in the scrub just on the edge of the spinifex plain. I examined a dozen or two of their fragile, ill-constructed nests. None contained more than two eggs. The nests were

placed in a variety of situations. When I passed through the spinifex on my return in November not a Wood-Swallow was to be seen.

WHITE-VENTED WOOD-SWALLOW (*Artamus venustus*).—This was the most generally distributed Wood-Swallow around Lake Way. Occasionally I saw small parties, but more often I saw pairs, many of which are, I believe, resident. This species is a late breeder, and I did not get any nests and eggs until I went to Milly Pool, where I obtained several handsome clutches. One nest was rather out of the common, being loosely constructed of light feathery seed-stems of a native grass and lined with horse-hair. So untidy was this nest that I was on the point of passing it by as that of a *Taniopygia*. To secure another nest I had to climb about 20 feet up a "cork tree" (*Casaurina*).

BUFF-BELLIED SHRIKE-THRUSH (*Collyriocincla rufiventris*).—This Shrike-Thrush was generally distributed throughout the district, but was comparatively rare around the margins of Lake Violet. I did not have much luck with its nest and eggs, finding but three in all, two of which contained newly-hatched young. It was not till 1st November that I obtained a pair of eggs. I took these from the fork of a casuarina when hunting for a Bower-Bird's nest some seven miles from my camp. The nest was remarkably deep, being built on a foundation of needles from the tree. The walls of the nest were constructed exclusively of strips of soft bark.

MAGPIE-LARK or PUGWALL (*Grallina picata*).—A pair or two at Gum Creek, and a few pairs around Milly Pool, where it was breeding in the flooded gums.

VARIED-BACKED MAGPIE (*Gymnorhina dorsalis*).—Rare. I shot a female on the spinifex plain, and observed a pair or two around Milly Pool.

PIED BUTCHER-BIRD (*Cracticus picatus*).—A few around Wiluna, and again at Milly Pool. I saw two nests, only one of which was accessible, and from which I took one incubated egg.

WHITE-WINGED BUTCHER-BIRD (*Cracticus leucopterus*).—Sparingly distributed throughout the district in suitable haunts. Around Milly Pool it was most frequent, but when I arrived there the young were already on the wing.

RUFIOUS-BREASTED THICKHEAD (*Pachycephala rufiventris*).—Generally distributed throughout the district. I found three nests, containing three, two, and one egg respectively. Males in nuptial plumage were quite exceptional, and I had a difficulty in obtaining one.

CHESNUT-BELLIED WHITEFACE (*Aphelocephala (Xerophila) castaneiventris*).—Another Lake Austin friend, which I found fairly common around Lake Way. It was perhaps most numerous in the neighbourhood of Wiluna and the mining belt to the south. I found a number of nests, all of which were built in hollow trunks, at no great height from the ground. There is some misconception as to where this species makes its nest. Mr. Keartland refers to their bulky nests being seen in the country between Mullewa and Lake Way (see Campbell's "Nests and Eggs," species *Xerophila leucopsis*). This Whiteface does not build in bushes, or make a bulky nest, but occasionally it builds inside the old nests of Babbblers (*Pomatostomus*).

Again, Mr. A. W. Milligan, in his account of a trip through the Yandanooka district (see *Emu*, vol. iv., p. 151), writes of nests in prickly hakea bushes. I have little doubt the latter nests were those

of *Tæniopygia castanotis*. Hollow trunks are the most favoured, either perpendicular or recumbent; but in addition I have found nests under the eaves of buildings, and one in an empty fruit-tin lying on the ground. Only on one occasion have I seen a nest in the open, and that was built in the interior of a very dense climbing plant, which I had to break away to obtain the eggs. The eggs are very handsome, varying in ground colour from pure white to light pink, and the markings from deep umber-brown to claret colour. Some eggs are profusely spotted over the entire surface with small spots; these usually have the pink ground colour; others, again, are boldly blotched, often in the form of a zone. The nests are a mass of feathers, fur, down, pieces of string, or any soft material to hand. The female sits close. It is easy to find these nests, as the birds will convey building material heedless of the presence of an intruder.

WEDGEBILL (*Sphenostoma cristatum*).—It always seems to me an error to place this species amongst the Paridæ. It runs, never hops, seeks its food on the ground, builds an open nest, and lays blue eggs—all un-Titlike habits. Around Lake Way it was far from plentiful, and I only got one nest. This contained two typical eggs.

BLACK-CAPPED TREE-RUNNER (*Neositta pileata*).—Sparingly distributed in suitable haunts. I found one nest in course of construction. I fear it was eventually robbed by the blacks, as it was empty and abandoned when I revisited the spot. As usual, four or five birds were fussing around during the building operations, but it was the adult female who arranged the material and shaped the walls with her breast.

WHITE-BROWED TREE-CREEPER (*Climacteris superciliosa*).—Not at all common, and always met with in isolated pairs, chiefly in big mulga or casuarina country. In its habits it hardly differs from its congeners, and its notes are characteristic of the genus. Probably it has a song like *C. rufa*, but I never heard it—to recognize it, that is. At Bore Well a pair frequented the vicinity of my camp, and on 3rd September, after much watching and following them about, I got on the track of their building-place. I always lost them at a particular clump of large mulgas, which I searched over and over again for a likely nesting cavity. On this date I followed them to the usual place, but took a wider cast around. Presently I spied an uprooted and dead mulga trunk, which was leaning at an angle of about 45° against a big living mulga. From where I stood I could see the trunk was hollow. I walked quietly over and peeped into the cavity. I could just make out the bright beady eyes of the sitting bird and a faint eye-stripe. I tapped gently on the trunk and she came out. Pushing a handkerchief down the cavity to protect the eggs from chips, I carefully broke open the sides, and exposed the three beautiful eggs. The lower part of the trunk was filled with *débris* produced by termites, and on this a soft cup-shaped bed of vegetable down (*Dicrastyles*), rabbit fur, and a piece of wadding filched from my camp, had been constructed. This seems to me an equitable arrangement, and I hope that breeding birds will note that I am at all times prepared to supply wadding in return for clutches of eggs. The three eggs were quite typical, and I could detect no characteristic distinguishing them from eggs of *C. rufa* or *C. melanura*, the other two Western Australian species I am acquainted with. One egg looked a little different from the other two, having a tinge of neutral pervading the markings. This

egg was infertile, and offensive when blown, though the other two were quite fresh.

The call note of this species is rather shrill and somewhat stridulant.

ALFRED HONEY-EATER (*Lacustroica whitei*, North).—This little bird has only recently been described as new by Mr. A. J. North, from a series of skins I secured near Wiluna and Milly Pool. It is sufficiently distinct to require a new genus for its reception. It is described as belonging to the Honey-eaters. If this is the case, then as a field naturalist I should place it next to *Zosterops*, to which it has a superficial resemblance, and also some similarity in general behaviour and in its notes. In possessing a dark bar near the tip of the tail, and in certain other features, it shows a divergence. (See coloured plate.)

At Lake Austin, in 1903, I shot a pair of small birds I could not identify. Speaking from memory, I think they were identical with the present species. They were sent down to the Perth Museum with other skins, but I never learned to what species they had been referred.

This little Honey-eater is confined to tracts of country where large mulga and other tree-like bushes are growing. It does not seem to favour eucalypts, but I have seen it amongst flowering acacias. It is a very difficult bird to pick out from a party of *Acanthizæ*, busy, like itself, in searching the foliage for insect prey. It looks slightly larger than the three local species of Tits, but in its attitudes and its perpetual motion there is absolutely nothing to distinguish it from these commoner birds. The notes are altogether the best guide. They are rather difficult to describe on paper. They may, perhaps, be described as a succession of five or six monotonous, high pitched but musical, and uttered in a rapid, sibilant manner. Each bar is repeated several times, to be followed by an interval before the next cadence is commenced. Certain other notes resemble those of *Anthus australis* when engaged in a love-flight, but the volume of sound produced is much less and the tone shriller. Others, again, resemble those of the Carter Desert-Bird, which in their turn somewhat resemble the before-mentioned notes of *Anthus*. In the generally high-pitched voice, and to a lesser degree the manner of utterance, I was reminded of the notes of *Zosterops lutea* and *Z. gouldi*.

After shooting a male soon after my arrival in Wiluna, I came across a pair on 23rd July, which I resolved to watch. They were within easy distance of the main street of Wiluna, and my chances of securing nest and eggs were not enhanced thereby. Further observations showed them to be busy at the extremity of a horizontal branch of a narrow-leaved mulga or kindred tree. Both birds were at work, and I waited till both were away before making a closer examination. A nest was evidently just being commenced, as I could plainly see spiders' webs had been attached to the branch of the tree where the birds had been working. Progress was very slow, and I shortly left Wiluna for Bore Well, not returning until the 15th August. On returning from the latter locality I called *en route* at several nests I was watching, only to find them pulled out by the blacks. It was with some trepidation I visited my "*Gerygone*" nest, as I then called it. Tracks of blacks' feet were only too plentiful, and I hardly expected to find the nest safe. Judge of my delight when I could see the frail little structure quite intact, and with the tail of the sitting bird projecting over the side. I could just reach the branch. Cautiously bending it down, I peeped in. There were two remarkably large eggs for so small a bird, with the glow of the yolks shining through

the shells. I carefully removed and packed them, and then broke off the branch holding the nest. The latter was a frail affair, and lacked neatness and finish in its architecture. The walls were very thin, the eggs being plainly visible from below. An attempt had been made to bend long horse-hairs into a circular form, with more or less success. These were held in position by spiders' webs and cocoons, but long ends had been left dangling about in a very unfinished manner. The whole structure was sufficiently elastic, and was attached to the branch of the tree with spiders' webs. The dimensions of the nest are as follows:—Long diameter, $2\frac{3}{4}$ inches; short diameter, 2 inches; depth of cup, nearly 1 inch. The eggs were quite fresh, and the descriptions are as follow:—At first glance resemble those of some types of the *Ephthianurinae*. Shape swollen oval, texture of shell being fine and slightly glossy; colour white, moderately marked with small rich reddish-brown spots, while some of dull purplish-grey, and appearing as if beneath the surface of the shell, are mixed with the other markings, but only at the larger ends of the eggs. Specimen *a* is much more heavily marked than specimen *b*, and the spots are larger. The markings on both eggs are confined chiefly to the larger ends. Measurements in inches:—(a) 0.71 x 0.49; (b) 0.68 x 0.48.

In the field this little bird looks almost uniform grey. A fully fledged nestling, shot 24th October, has a tinge of greenish-yellow on the throat, showing an affinity to *Zosterops* in this direction.

MISTLETOE-BIRD (*Dicaeum hirundinaceum*).—A few around Bore Well, but nowhere common.

RED-TIPPED PARDALOTE (*Pardalotus ornatus*).—Uncommon. I shot specimens for identification in the scrub near Lake Violet, and met with a few pairs in the gums around Milly Pool. In a hollow, terminated trunk was a nest-hole, but the young had obviously flown, so I did not climb up.

RED-BROWED PARDALOTE (*Pardalotus rubricatus*).—A single specimen was procured at Bore Well.

BLACK HONEY-EATER (*Myzomela nigra*).—Found in scattered pairs throughout the district, but showing a preference for stony hill-sides. I found several nests, and secured perfect clutches of eggs, also a pair of nestlings. The female does all the work of nest-building. The male perches near at hand on some conspicuous twig, where he utters his monotonous call, with an occasional erratic flight around. When the female arrives with building material he flutters down to the half-finished nest—I suppose to show his appreciation.

WHITE-FRONTED HONEY-EATER (*Glycyphila albifrons*).—Very common at Bore Well and around Wiluna and Lake Violet. I found a number of their neatly constructed nests. They were always placed low down. Two I found were in the cavity formed by the snapping in two of a dead mulga trunk. All these nests were lined with the buff-coloured down of the plant known as *Dicrastyles fulva*.

BLACK-AND-WHITE HONEY-EATER (*Certhionyx variagatus*).—A few pairs around Lake Violet, but more common on the big spinifex plain west of Bore Well. They arrived during the last week in July and early part of August. Parties were still travelling throughout the latter month. At Bore Well they fed, in company with the Wood-Swallows, on the curious ground-flowering plant, *Brachysema daviesioides*, and the foreheads and crowns of several I shot were so thickly



Nest of Pied Honey-eater (*Certhionyx variagatus*).

FROM A PHOTO. BY F. L. WHITLOCK.

coated with pollen that I had to scrape it off with a knife. In the early part of September they were breeding amongst the scrub on the spinifex plain. The favourite nesting site was in the branches of the handsome red-flowered *Hakea multilineata*, with its oleander-like growth. On the East Murchison this shrub attains a height of 15 or 20 feet, and to reach one or two of these Honey-eaters' nests I had to climb the lower branches. The nests were very substantial. Outwardly they were made of dried spinifex and other grass stems, the cup being wonderfully neat and lined with similar but finer material. In the ten clutches of eggs I found not much variation in type is apparent. One pair was pyriform, and these reminded me irresistibly of miniature eggs of the European Marsh-Sandpiper (*Totanus stagnatilis*). The latter bird is an accidental visitor to Australia. During the breeding season the female is not much in evidence, but the male careers around in his erratic flight, tossing himself vertically in the air and in his descent uttering his piercing but monotonous and long-drawn cry of "Tē-tītē-tē-tē-tē."

LESSER BROWN HONEY-EATER (*Stigmatops subocularis*).—Rare. A pair or two around Lake Violet and again near Milly Pool. At the latter locality I found a nest with young in a dense growth of vegetation around the foot of a big mulga.

SINGING HONEY-EATER (*Ptilotis sonora*).—Fairly common, especially on the spinifex plain. I obtained several typical nests with eggs.

YELLOW-FRONTED HONEY-EATER (*Ptilotis plumula*).—A very small colony on the big spinifex plain to west of Bore Well. I was greatly surprised to find them so far north and so far inland. They were extremely local, and I could make nothing out regarding their nesting. I shot several specimens for dissection, and none showed signs of immediate breeding. It is possible they may have bred during the summer rains, or perhaps some time after I left Bore Well. On my return in mid-November I shot a fully-fledged nestling, which was being fed by its parents. This was the only evidence of their breeding I encountered.

CARTER HONEY-EATER (*Ptilotis carteri*).—I hardly expected to meet with this species so far inland, but I even found a pair or two within a stone's throw of the main street in Wiluna. At Milly Pool it was common, and I found nests containing eggs, and also young. I saw some evidence, in the presence of immature birds with pale brown beaks, of this species having bred during the summer rains. These immature birds were observed near Wiluna in July.

YELLOW-THROATED MINER (*Myzantha flavigula*).—A few around Wiluna, but common near Milly Pool. When I arrived there on 17th September, some pairs had young on the wing; but other pairs were building, and I found a number of nests, eventually securing several fine clutches of eggs. All the nests I observed were fairly high up. They were very substantially made, with a plentiful and very neatly arranged lining of cow-hair, fur, or other soft material. The eggs were three or four in number.

SPINY-CHEEKED HONEY-EATER (*Acanthogenys ruficularis*).—Very common on migration in July and August, but comparatively few remained to breed. I found a very pretty nest on 20th July, with one fresh egg. At Bore Well, the first week in September, I found nests containing young just ready to fly, but at Milly Pool on 24th

September I obtained a pair of incubated eggs. This nest was in a bunch of mistletoe.

PIBIT (*Anthus australis*).—Distributed in scattered pairs throughout all open country, but nowhere numerous.

LESSER BUSH-LARK (*Mirafra secunda* (?).—In the spinifex at Bore Well I saw a brown bird whose actions and flight reminded me of this species, but it was the only one I saw, and I am not too certain of its identity.

CHESTNUT-EARED FINCH (*Tæniopygia castanotis*).—Never before have I seen this Finch so abundant. Around all wells, rock-holes, or permanent water they were in dozens upon dozens. I found nests near Nannine in June, and, from the numbers of immature birds on the wing, they had evidently been breeding for some months. When I left Milly Pool, 6th November, pairs were still building. Their nests were everywhere—from the hollow spouts of eucalypts to the smallest salt-bushes. It was only in the samphires that I failed to find them. One hakea bush near my camp at Milly Pool contained thirteen nests, all of this season. In this bush three nests were actually touching one another. Other nests in quite an unfinished state contained eggs. All were of the same type—oval in shape, and built of fine grasses, with the entrance sheltered by a spout or pent-house. The lining of a new nest is neat and warm, and consists as a rule of the soft, down-like flowers of *Dicrastyles fulva*. Six eggs was a common clutch, but more often four or five. Some were white, others had a tinge of yellow; others, again, were bluish-white. I made it a rule to peep into all accessible nests, in the hope of finding a Cuckoo's egg, but had no luck in this respect.

This was the only Finch I identified with certainty; but on two occasions, in the spinifex at Bore Well, I met with another species that I failed to secure. In the first instance I encountered a single bird; I fired at and missed it. A heavy gale was blowing at the time. On the second occasion I saw three, but had used my last dust-shot cartridge, and had only No. 3 left. I fired to the side of one bird with a quarter charge, in the hope that a stray shot would hit it. But again no luck. These Finches looked like *Stictoptera annulosa*, but I am very uncertain. I hope some other ornithologist visiting the East Murchison will clear this point up.

CROW (*Corvus coronoides*).—Nowhere numerous, but always a flock hanging around the slaughter-yard at Wiluna. I examined the remains of half a dozen or so which appeared to have been poisoned, but they were too much mutilated to determine whether or not they were of the present species or *C. bennetti*. A pair had a nest near Bore Well, but the young flew soon after my arrival.

LEADEN CROW-SHRIKE (*Strepera plumbea*).—Distinctly rare. I caught sight of a single bird at Bore Well, and also heard the notes of a pair near a likely-looking nest in a tall gidgi tree. The situation of this nest was too dangerous to warrant an attempt to rifle it—a weak horizontal branch at a height of 35 feet, with the nest on the extreme end, out of reach of a scoop, and an outcrop of jagged ironstone rocks below. A broken limb in these lonely scrubs is a serious matter, the chances of timely assistance being remote.

YELLOW-SPOTTED BOWER-BIRD (*Chlamydodera guttata*).—When I left home I had just the faint hope I might encounter this rare and



Play-ground of Yellow-spotted Bower-Bird (*Chlamydodera guttata*).

FROM A PHOTO. BY F. L. WHITLOCK.

little known species. My only encouragement was in the fact that my friend Mr. J. T. Tunney had seen a specimen about 50 miles to the north-west of Lake Way some twelve years ago. His further information that it was the only one he saw during his travels on the Murchison was not too cheering, but I resolved to leave no stone unturned in my endeavours to get the nest and eggs. One result of Mr. Sid. W. Jackson's successful trip to tropical Queensland after the eggs of the Tooth-billed Bower-Bird was to make the nest and eggs of the present species the only remaining blank in the series of Bower-Birds' eggs in Mr. H. L. White's great collection. To fill this blank was a great incentive in itself.

Inquiries (accompanied by sketches of the play-ground) of local sportsmen resulted in nothing but discouragement. No one had seen such structures or had encountered such a bird. One of the more intelligent blackfellows, however, to whom I showed a sketch of a play-ground, looked thoughtfully at it for a time, and then laconically uttered the words "Milly Pool." The latter locality had been described to me as "a creek in the hills." This was very misleading, and in driving out we actually passed by the pool, under the impression it was just a casual sheet of water due to the exceptional rains. However, it is an ill wind that blows nobody any good, for by over-shooting the mark I was led to other things. In a tract of York gums near a shallow clay-pan I thought I saw an unfamiliar-looking *Ptilotis*, and I resolved to return to the spot and investigate further. Fortunately we overtook some stockmen, who told us we had passed by Milly Pool, and from their description we recognized in the clay-coloured sheet of water on the flat some seven miles behind us our real destination. There was nothing for it but to return. On arrival, after unloading my gear, I soon had my tent up, under two small, shady casuarinas, and next day was hard at work. I turned south. A mile from my tent, and a quarter of a mile from the extremity of the lower sheet of water, was a dense thicket of acacias. The latter were growing on the verge of open country, grassed for the most part, but with patches of salt-bush and lines of small flooded gums. Still further south thick scrub of vigorous growth occurred, chiefly of the mulga family, but with occasional gums and some exceptionally fine casuarinas and beef-wood trees, with a host of smaller bushes whose names I am unacquainted with. Half a mile to the west was the foot of a gently rising elevation, whose summit perhaps may have been 200 feet above the surrounding plain. As I walked alongside the acacia thicket admiring the vivacity of the numerous Carter Honey-eaters I caught sight of a thick-set bird perched in a large hakea bush. It was craning its neck, and appeared to be very curious as to my presence. I approached cautiously until I was within 6 feet of the bird, which, except for moving its head from side to side to get a better view of me, did not change its position. It occasionally gave vent to a harsh, disagreeable sound, like a very old man clearing his throat. I could only see its lower parts distinctly, so I imitated as well as I could the sounds it was making. This had the desired effect. It hopped lower down, and I could clearly see the spotted upper parts and silvery feathers of the head. There was no lilac visible on the nape, and the plumage had a thin, immature look about it. Also the angle of the gape was yellow. I had no gun with me, and was very uncertain what to do. There was not a sign of another bird like it to be seen. After watching it, and studying the plumage very



Clump of Scrub where the Bower-Birds built, Milly Pool.

FROM A PHOTO. BY F. L. WHITLOCK.

carefully, I felt convinced it was immature. I resolved to go back to the camp for my gun. I returned in half an hour's time, only to find the bird gone. I searched carefully around, and after a time spied it perched on a dead eucalypt, from which it dived down into the acacia scrub. I could see it still, and fired, knocking it over. It was a veritable Bower-Bird, but unmistakably in thin, immature plumage. I was packing it up when I heard a rustling, accompanied by a harsh note, in the acacias overhead. There, within a few feet of me, was a similar bird! I replied to the note, and to my great astonishment a third bird put in its appearance. The last arrival looked older. Its plumage was deeper in tone and had a distinct gloss. It presently hopped further into the scrub, and I crawled after it until I came to a sort of play-ground. There was no inverted arch, but a large number of small sticks had been carried to a clear space, with a feather or two and a few sandal-wood nuts. My bird had disappeared, but I called to it, and immediately got a reply. I repeated the sound, and the bird presently returned and hopped down to the play-ground. I continued to call, and to my great surprise got replies, accompanied by rustlings, from other parts of the thicket. The sounds got nearer, and presently I found myself the central object of interest to no less than seven Yellow-spotted Bower-Birds. This was very exciting, and I found it rather difficult to sit still. I was crouched down in the midst of the acacias, and, with the exception of one bird, all were in the branches overhead. The performance then commenced. The bird on the ground was presently joined by two others, which perched on very low branches near at hand. He then puffed out his feathers, showing the beautiful pink (not lilac) tract of plumage on his neck to great advantage. With various harsh cries he advanced into the centre of the cleared space and made a vigorous attack on some long, red-looking object. He advanced and backed, hopped from side to side, pecked vigorously, jumped into the air, and with much apparent ferocity made rushes at one of his immediate audience. I took this to be his mate. Now and again she uttered a short, harsh cry, but otherwise seemed to regard the demonstrations made by the male as very matter-of-fact and hardly worthy of notice. I watched the performance at close quarters for over an hour, the remaining birds in the meantime studying me. They squatted rather than perched on the branches, the tarsus being quite invisible. Occasionally one or other uttered a harsh cry, or dodged a buffet from a passing Carter Honey-eater, otherwise their attitude was one of strained curiosity—their necks craned in my direction and their eyes staring.

The matinee being over, the male, followed by his mate, hopped up to the top of the acacias and flew off. I scrambled out and followed as best I could, but soon lost sight of both in the thick scrub. Occasionally I could hear their harsh notes, but gradually I lost sound of them too. So I turned back to camp. I had found my birds. The problem to be solved was—When and where would they breed?

I skinned and dissected the bird I had shot. It was a young female, the ovules being extremely small. I was not encouraged when I reflected she might easily have been one of a brood hatched during the summer rains.

In a year like 1909, when these rains had been so unusually copious, the breeding of many species of birds gets out of its ordinary routine, making the solution of such a problem as I had before me all the more uncertain. Taking a line from Mr. Sid. W. Jackson's experiences in

Queensland, I reflected that if the adults in the present party did not intend to breed very shortly they would hardly have assembled at their play-ground and behaved in the manner they did. Also, with food so abundant, there would be nothing so very remarkable if a second brood was reared in the same year, though there might be an unusually long interval between the broods. Under the circumstances I did not expect to find eggs for seven or eight weeks, and as the sequel will show this estimate was not far out.

Next morning I was down at the acacias again. I was very early. Not a Bower-Bird was to be seen or heard. I returned again in the afternoon. The performance was on, the "stage manager" being in great form, and the audience numbering five. The red object was again vigorously attacked, shaken, and well scolded. It proved to be a large dead and dried-up centipede. At the conclusion the whole party flew off as before into the tract of thicker scrub.

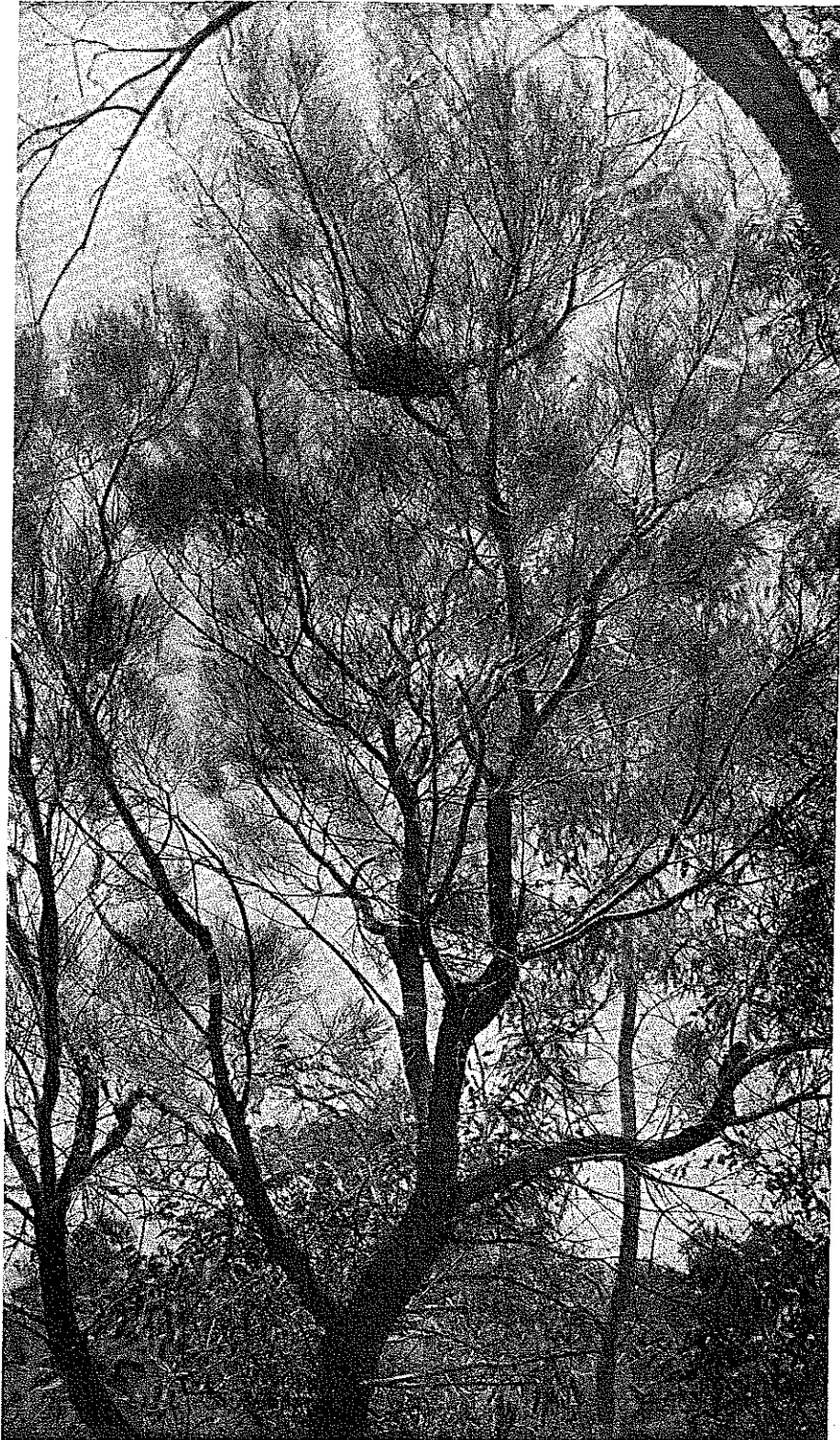
On the following day I determined to make a thorough search in the immediate neighbourhood for any signs of nesting, past or present. In a couple of casuarinas, less than half a mile away, were two nests very much like those of the Tooth-billed Bower-Bird depicted in Mr. Sid. W. Jackson's photographs. They were both built of small, dead twigs, with a lining, if it could be called such, of needles from the casuarina tree. Both had an unoccupied look about them, though otherwise in good preservation. For the size of the bird they appeared small, but there was no other surrounding species to which they could belong. They were altogether too unsubstantial for old nests of *Cracticus leucopterus*. I felt sure they were last season's nests of the local Bower-Bird. However fascinating and exciting all this was, there was other work to do, and I determined to clear up the mystery respecting the *Philotis* I had seen when I drove out.

On 21st September I walked out to the spot, distant some seven miles, and hunted around. I could see no *Philotis* other than *P. carteri*, so concluded I was mistaken. It was a hot day, so I turned towards a neighbouring clay-pan which contained some very uninviting clay-coloured water. On my way I passed several large mulgas, and a large, spreading casuarina with the lower branches trailing on the ground. A thick-set bird flew out with a harsh cry, which resembled that of a Bower-Bird. I looked under the tree, and there was a perfect play-ground, with an inverted archway, filled with white flakes of limestone, mulga beans, sandal-wood nuts, and a few green leaves. I hid myself close at hand and commenced calling. I soon had the male back, and presently two or three more birds, but, owing to the surrounding cover being much less dense than at the acacia thicket, this party was much more shy. Their behaviour, however, was just the same, but if I made any movement, the performance ceased at once. My luck was evidently in, and I resolved to secure nest and eggs of one or both parties of these Bower-Birds, even if I had to wait till the next summer rains. I did not then take into account one contingency which happened in connection with this second party.

To write out all my notes in full on these interesting birds would occupy too much space, so I propose to give a summary of my observations, extending over six weeks' close contact with them. I eventually found a third play-ground, about three-quarters of a mile to the south of the acacia scrub. At this play-ground I never saw more than two birds: It was situated, as before, under a large,

spreading tree, with the branches trailing on the ground. The tree was a mulga in this instance. The country was more open, and there was no convenient cover near enough to watch this party, which I feel sure was quite distinct from that at the acacias. The archway and surroundings were very perfect, and looked newer, and rather less massive, than those at the clay-pan. In addition to the flat flakes of limestone, pieces of bone had been here added to the collection. Old sandal-wood nuts were numerous on the outside of the run, and the green ones were evidently thrown out from the inverted arch when they became discoloured. At the clay-pan I managed by crawling under the big casuarina to photograph the bower, with the male and female perched close at hand, using the camera with the legs unextended. The subject was an awkward one from a pictorial point of view, as I could only get a view of the archway by focussing between two thick trunks. I feared to go to the other side of the tree, and haul away, even *pro tem.*, the obstructing branches. The birds must not be disturbed at any cost, a photograph being a secondary consideration to the nest and eggs. The dimensions of this playground were 7 feet in length by 5 feet in width. The foundation was a mass of innumerable twigs of about one-eighth to a quarter of an inch in diameter and about 9 inches in length on the average. This raised the foundation of the inverted arch some 6 or 8 inches above the ground. The walls of the latter measured 18 inches to the tip of the highest twig, but the general height was an inch or two less. The average thickness of the walls was about 6 inches, and the length of the run 25 inches. In the run were thirteen flakes of limestone of about a square inch in size, also about a dozen small green seed-pods, with a few mulga beans. There were no feathers or shells.

On 14th October I visited the clay-pan again, and had a big try for the nest or signs of building. I came across a pair of the birds a short distance away. One of the pair flew from a large mulga. I examined this bush carefully. There was unmistakably the commencement of a nest in the upper branches. I watched for some time, and both birds, came back again. One fact caused me some uneasiness at this visit—the water in the clay-pan had nearly disappeared, and I knew of no other supply within several miles distance. The third play-ground was very similar to the one described in the foregoing, but it appeared to be newer, and the walls were less massive. The twigs used in the construction of the walls were long and very supple. Many showed a diagonal cut, and had no doubt been nipped off by the beak of the bird. The source of supply was a low, dense bush, which appeared to be all twigs and no leaves; the wood is very elastic, like a willow, and in the green state fairly soft. Close at hand, by the wreck of another large mulga tree, were the remains of an old play-ground, but the inverted arch had quite disappeared. All that remained was the mass of small twigs comprising the foundation. I constantly visited this play-ground, also the haunt at the acacias, sometimes finding no birds present, but usually some were near at hand. In my search for nests I occasionally came across Bower-Birds, and soon got to recognize them by their flight, which is direct, very undulatory, and never at any height above the scrub. When they seek cover they appear to pitch headlong down—to make a dive, in fact. On the wing they have the outline of an *Oreoica* (Bell-Bird), but their flight is much quieter, and with no whirring of wings whatever. Their tail looks much shorter in flight than that of a Shrike-Thrush, and their



Nesting-Tree of Yellow-spotted Bower-Bird (*Chlamydodera guttata*).

FROM A PHOTO. BY F. L. WHITLOCK.

appearance is darker than that of either of the foregoing species. The most usual notes heard resemble the ordinary harsh sounds produced by the White-browed Babbler, and in calling up Bower-Birds I have often brought Babblers in their place. But the male Bower-Bird, and also, I think, the female, is a great mimic, and reproduces to perfection the notes of many surrounding birds. All the same, he seems to have a preference for harsh sounds, such as the alarm notes of the local Shrike-Thrush, Carter Honey-eater, White-browed Babbler, and the tremulous cries of young Hawks clamouring for food. I have heard a male imitate the notes of *Cracticus leucopterus* to perfection, and, again, a female gave a perfect rendering of those of *Cracticus picatus*. Certain other notes of the male were an exact imitation of the sound produced by a rabbit running over a heap of dried twigs. This was an unmistakable piece of mimicry, as the whole acacia thicket was growing on the top of a big rabbit-earth. Other sounds were like the mewling of a cat, and may have been acquired from the Red-breasted Babbler, which was breeding near at hand.

Towards the end of October the attendance at the acacia playground, and also at the playground under the mulga to the south, became less constant. I threw out all the green sandal-wood nuts from the archway at the latter, and they were not replaced. The plot was thickening, and my anxiety to find the nest grew intense.

Near this latter playground was a tract of open grassy country with a few beef-woods and isolated gums. It was in the shape of a bay, and was merely an extension of a much larger area of plain away to the east. On the north side of this bay was a thicket of fairly large mulga bushes, with a few casuarinas and gums. The eastern extremity of this scrub formed a narrow projection into the bay of open country. In a group of very small casuarinas I found two interesting-looking nests. One of these I decided was old; the other bore a close resemblance to the nest of the Tooth-billed Bower-Bird photographed by Mr. Sid. W. Jackson. I was watching this nest, and I always mentally referred to it as Jackson's nest. There was one feature about it I did not quite like—a small bunch of casuarina needles was suspended outside the nest and looked as though it had been removed from the lining. The playground was about 500 yards to the west of this nest. On 28th October I was passing the neighbourhood of this nest after a long search in a large belt of scrub to the south and on the other side of the bay, and thought I would have a look. I walked to the foot of the tree. Things appeared quite unchanged, and I did not climb up. I continued my walk, but had hardly got clear of the casuarinas when I caught sight of a Bower-Bird in a neighbouring bush. I came to a sudden halt and watched. Presently it began to preen its feathers. This was interesting, and I began to feel a pleasurable excitement. After watching for five minutes, the bird wheeled round and flew off in the opposite direction to where the nest lay. I followed as quickly as I could, and had not gone far before a dark, thick-set bird flashed past me going towards the nest. I made a mental note of the fact, and commenced a close search in all the neighbouring bushes. All in vain. However, I was not surprised, having hunted that scrub more than once. I returned again to the foot of the tree containing Jackson's nest. There was no sign of any bird whatever. For all that I decided to climb up. Hardly had I set foot on the lowest branch before, with a great

hissing, spitting, and fluttering of wings, at me dashed a Bower-Bird. She was violently agitated, and almost brushed my face with her wings, uttering at the same time loud, clear notes, imitations of the cry of the Black-throated Butcher-Bird. I was soon up to the nest, which was barely 15 feet from the ground. I cautiously felt inside. There were two eggs. I raised one into view; it was a typical Bower-Bird's egg. Down I went for cloth cap and wadding, and soon had the satisfaction of gazing on two perfect specimens of these rare and little-known eggs. They were similar to eggs of *C. maculata*, but hardly so glossy—the ground colour a delicate French grey or greenish-grey. The markings were of various shades of brown. The lighter brown markings were in the form of continuous lines, wound in and out, in a more or less circular manner, around the wider part of the shell. The darker markings were in the form of irregular blotches of colour, but they are hardly so bright and pronounced as in typical eggs of *C. maculata*. In shape this pair may be described as slightly elongated ovals, with no very great distinction between either end. The eggs were quite fresh. It will be convenient to give the measurements here:—Specimen *a*, 1.48 x 1.07 inches; *b*, 1.52 x 1.05 inches. The nest was near the top of the casuarina tree, and was outwardly an irregular-shaped structure of dried and black twigs. The cup was fairly well defined, but rather shallow. It had a lining of fine twigs, with a few casuarina needles. The lining was sufficiently substantial to hide the contents of the nest from below. After I had robbed the nest the parent bird quietened down and made no further hostile demonstration towards me. As I packed the eggs she remained sitting on a neighbouring branch.

There was a point to be cleared up concerning the plumage of the female. In Hall's "Key"—compiled largely from the British Museum "Catalogue of Birds"—the female of *C. maculata* is said to have no lilac band, and as nothing is said to the contrary in referring to the female of *C. guttata*, we may assume, too, that she in turn was thought to possess no lilac band. Now, during my close watching of the party of seven at the acacia thicket I became aware that three of the performers possessed this so-called lilac band. Two of them, however, were much less strongly marked in this respect than the adult male I called the stage manager. From his behaviour towards one of these individuals I felt sure the latter was a female. Now was the opportunity to prove my theory. Though very loth to do it, I shot this bird. I had to take into consideration the scepticism too often meted out to the field naturalist when his observations are unsupported by tangible evidence. On dissection, my suspicions proved to be correct—she was a fully adult female. Whilst on this subject, let me repeat that the colour of this nuchal band is not lilac, but in these East Murchison birds of a vivid pink, with just a suspicion of silvery-lilac when viewed in certain lights. In the female it is much smaller than in the male, and rather difficult to detect when the bird is in repose. The same is the case with the male, the band in both sexes then appearing as a narrow longitudinal stripe, rather more conspicuous in the male than in the female. Immature birds possess no trace of this colouration whatever; but a male, probably in his second year and non-breeding, showed as much colour as an adult female. The plumage of the adult male in my birds is black on the upper parts, with a slight velvety gloss. The spots, which are most numerous near the hind neck but largest on the greater coverts, vary from fawn-



Nest and Eggs of Yellow-spotted Bower-Bird (*Chlamydodera guttata*).

FROM A PHOTO. BY S. W. JACKSON.

colour to cream. The feathers of the forehead and crown are very small and dense, and the spots small and very numerous and of a light hazel-brown colour, but half-hidden in a wash of silvery tint, which somewhat reminds me of burnished tea-lead. On the lower margin of the pink nuchal patch is an arrow-shaped mark of black. This, though small, is very conspicuous when the male is displaying before the female. The under parts agree with previous descriptions. Beak black, the upper mandible being rather conspicuously longer than the lower. The angle of the gape, in both adults and young, yellow; iris deep brown; legs and feet yellowish-green (this colour fades altogether in the skin). Much elated with my prizes, I returned to camp, blew my eggs, and skinned and dissected the female. Whilst thus engaged two Bower-Birds actually perched in the casuarinas overhead. I then returned with the camera, photographing the nest *in situ*, and also the patch of scrub containing the nesting-tree.

I had yet to deal with the party at the clay-pan. On 1st November I camped at an intervening well, the weather being very hot and dry. I was destined to meet with a great disappointment with this party. As I feared, the birds had deserted the locality. The water in the clay-pan had quite evaporated, evidently soon after my last visit. The nest I had based my hopes upon had progressed no further. I spent the greater part of the day hunting the surrounding scrubs, and I think I did the work thoroughly, but without success. The only Bower-Bird I saw was an adult male at the play-ground.

My work was now nearly finished. All small birds except *Tæniopygia* had finished breeding, and I began to think seriously of home. I left Milly Pool for Wiluna a few days later.

Examination of Contents of Stomachs and Crops of Some Australian Birds.

BY J. BURTON CLELAND, M.D., Ch.M., Principal Assistant
Microbiologist, Government Bureau of Microbiology,
Sydney, N.S.W.

THE following results of the examination of the stomach contents of 57 birds may prove of interest. They are from specimens collected for scientific purposes by myself in 1909. In addition to an investigation of the food supply of birds, the skins were also, of course, preserved, the intestines and tissues were searched for parasitic worms, and blood-films made and examined for protozoa, such as *Halteridium*. A summary of the interesting discoveries in the latter two directions it is hoped will be available shortly. The utmost possible scientific use has, I believe, been made of every specimen of bird thus obtained.

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M., followed by a numeral, indicates the number of the bird