

SHORT COMMUNICATIONS

UNUSUAL SEABIRD RECORDS FROM THE NORTHERN TERRITORY

From 28 January to 5 February 1973, the coast of the Northern Territory was swept by an extremely strong monsoonal stream with gale-force winds from the north-west. Cyclone conditions developed on either side in the Gulf of Carpentaria and along the northern coast of Western Australia.

Frigatebirds were noted commonly along the coast near Darwin in groups of up to thirty-five and three observations were reported to us of frigatebirds up to sixteen km inland from Darwin Harbour. All birds positively identified were *Fregata ariel*. Previous sightings by us, and others, including Crawford (1972, *Emu* 72: 131-148), of frigatebirds along the coast near Darwin have all been during squally weather.

The heavy weather also brought in large groups of frigatebirds, both *F. ariel* and *F. minor*, to Elcho Island, a large island near the coast about 128 km west of Gove, NT. Neither species normally occurs there (I. Morris, *in litt.*).

Eight reports were received by us of exhausted seabirds in the Darwin area. We were able to examine five birds.

A Wedge-tailed Shearwater *Puffinus pacificus* was found in a backwater at Rapid Creek on 5 February 1973. It died shortly afterwards and was prepared as a study skin (CSIRO, Div. Wildl. Res. Collections Reg. No. DL.20253). This would appear to be the first record for the species from the Northern Territory.

A live but exhausted Bridled Tern *Sterna anaethetus* was found by Mrs M. Smith in the centre of Darwin on 4 February 1973. She gave the bird to us; after sixteen days it had seemingly recovered and after banding was released at Fannie Bay. The following day it was found dead at the same locality. The specimen has been prepared as a study skin (CSIRO

Reg. No. DL.20254). *S. anaethetus*, although breeding on a number of off-shore islands, does not normally occur along the continental coastline of the Northern Territory.

On 5 February 1973, a Sooty Tern *Sterna fuscata* was found by Mr W. Hobson about four km south of Darwin. He gave us the bird; after fifteen days it had recovered and we released it at Fannie Bay. Coloured and black-and-white photographs, taken to authenticate the record, have been lodged in the archives of the Div. Wildl. Res., CSIRO, Canberra, ACT.

We concur with Storr (1967, Spec. Pub. W. Aust. Mus. 4: 1-90) that Lavery's observation (1964, *Emu* 63: 307-309) of small numbers of *S. fuscata* on Urquhart Islet (Sir Edward Pellew Group) in late November 1962 requires confirmation. An intensive survey of the fauna of the islands of the Group by Div. Wildl. Res., CSIRO, (July 1966-December 1967) failed to record *S. fuscata*. However, the rather similar *S. anaethetus* was present and breeding on several islets. The occurrence at Darwin thus appears to be the first verified record of *S. fuscata* from the Northern Territory.

On the night of 4 February 1973, a Common Noddy *Anous stolidus* flew into the side of a house in Rapid Creek, Darwin. It died shortly afterwards and was buried by Mr W. McLean. About four days later we heard of this and recovered the body, which has since been prepared as a skeletal specimen (CSIRO Reg. No. CHAS. 71).

Another *A. stolidus* was picked up exhausted at Fannie Bay. It died shortly afterwards and was prepared as a study skin (CSIRO Reg. No. DL.20252). Howe and Dodd (1973, *Emu* 73: 140) have published the only previous substantiated record of *A. stolidus* from the Northern Territory.

JOHN L. MCKEAN, *Division of Wildlife Research, CSIRO, PO Box 39998, Winnellie, NT 5789.*
MRS D. GRAY, *5 Holtze Street, Fannie Bay, NT 5790.*
2 April 1973.

BIRDS COLLECTED BY DR L. PREISS IN AUSTRALIA

During his stay in Western Australia between 1838 and 1842 the German physician Dr Ludwig Preiss collected birds as well as other natural history specimens. After his return to Germany his collections were dispersed among various museums (Whit-

tell 1941, 1954: 31; Glauert 1948; Serventy and Whittell 1948: 28). Recently, Meise (1951) has commented on some specimens located in German museum collections, and stated: ' . . . over 70 species and a considerable number of specimens, well

over a known minimum of 400, are unaccounted for. If not lost they must be stored in other European collections.'

In November 1845 the Vienna Museum of Natural History received a consignment of Australian birds from 'Hr Preiss' in Hamburg (Germany), the specimens being acquired through Mr Parreyss, a Vienna dealer in natural history objects. The consignment consisted of thirteen birds of twelve different species, for which the museum paid seventy-four Austrian Gulden. Because the specimens were only listed in the book of acquisitions in 1846 all of them bear the numbers of acquisition 1846 I (page), 1-12 (no.).

Of these thirteen specimens, eight are still preserved in our collections and one additional specimen may quite well have been part of the consignment. Originally all the specimens had been mounted, though later most had been made into study skins. When the collection was originally received nine of the twelve species were marked as being new to the Museum's collections. Unfortunately most of them are poorly labelled. There are no original collector's labels but they still have the labels which were attached to them at the time of acquisition. No later information is given on them than was originally noted by Josef Natterer, then curator of the bird collections in the Vienna Imperial Museum.

The following specimens are still preserved in our collections:

1. *Ardea pacifica* Latham.

(Inv. No. 47478. Number of acquisition 1846.I.10)

This specimen of the White-necked Heron bears the symbol '♀' on the original label of our museum and was listed as 'Female adult' in the book of acquisitions. The date '14 July 1839' given there must be considered as the collecting date. Unfortunately there is no precise locality on the label, only 'Nova Hollandia', which was the designation given to most Australian specimens in our Museum at that time. The specimen is still mounted and had been on exhibition in the public gallery for a long time before it was replaced by another specimen. It is still in quite good condition.

2. *Circus approximans gouldi* Bonaparte

(Inv. No. 49597. Number of acquisition 1846.I.1)

In the book of acquisitions the specimen appears as 'Buteo ? *Circus mas*. Nova Holl.' On the original label it was already identified as *Circus*, and the species name was added later. It is an entirely dark bird with a uniform-brown back and dark-brown with a rufous tone below, lacking any streaking on throat and breast. The upper tail-coverts are dark-brown but there are no whitish streaks on the nape. According to Serventy and Whittell (1948) these dark birds are apparently young. The specimen had

originally been mounted but later it was converted into a study skin but with the glass eyes still retained. The length of wing, 420 mm, supports the original designation as a male specimen.

3. *Porzana tabuensis immaculata* (Swainson)

(Inv. No. 48667. Number of acquisition 1846.I.12)

The specimen was not correctly identified when acquired and bore the following comment on the label: '*Rallus pectoralis* Cuvier-Zapornia Leach *Porzana Vieill.*' It was only later identified as *Porzana tabuensis*. On the label given to the specimen probably in 1846 there is a date '4 May 1839' which seems to be the collecting date but in the book of acquisitions the date is given as 14 May 1839. There is a further remark on the eye-colour, both on the label and in the book: '*Iris coccinea Palpebrae coccineae*', which is remarkable considering the time of collecting. The specimen is still in good condition and is preserved as a study skin though it had been mounted originally. No locality is given other than 'Nova Hollandia'.

4. *Tribonyx ventralis ventralis* (Gould)

(Inv. No. 48684. Number of acquisition 1846.I.9)

Apart from the species name and the usual remark, 'bought from Hr Preiss in Hamburg' the original label bears only the abbreviation 'Mas.' (= male). It was originally mounted but is now preserved as a study skin. Astonishingly enough, the specimen was marked as a species new to the collections, though already in 1839 two specimens of *Tribonyx ventralis* from the Swan River had been received in the Museum from Baron Hügel, who had also many Australian specimens in his collection.

5. *Calidris ruficollis* (Pallas)

(Inv. No. 49216. Number of acquisition 1846.I.8)

The Red-necked Stint was not specifically identified when acquired and was labelled as '*Arenariae* sp. nov. *Tringa*'. Later it was identified as *Erolia* (= *Calidris*) *ruficollis*. The sex was given as female. It is now preserved as a study skin.

6. *Neophema elegans* (Gould)

(Inv. No. 44852. Number of acquisition 1846.I.6)

The specimen is labelled as male. It is still a mounted specimen, which has faded somewhat through long exposure in the public gallery where I discovered it only recently when going through the specimens of parrots. It is of somewhat unnatural appearance because of its yellowish green artificial eyes, instead of brown. It is still in quite good condition.

7. *Neophema splendida* (Gould)

(Inv. No. 50700. Number of acquisition 1846.I.5)

The label bears only the remarks 'female' and 'Neu Holland' (= Nova Hollandia). The darker-blue of the head (though this colour does not extend very

far over the head) and the weakly red markings on feathers of the breast suggest that it might be a young male. The specimen had been mounted but had been turned into a study skin before Sassi (1939) included it in his list of the rare birds of the Vienna museum.

There seems to be no doubt that Preiss received or collected the specimen in Western Australia from where it has not been reported since for, over a century (Glauert, 1948). This species was also included in the list of specimens that Preiss offered to the government in Australia in 1838 (also according to Glauert). There is no other specimen of this rare species in our collection that has been collected in the wild.

8. *Ninox novaeseelandiae marmorata* (Gould)
(Inv. No. 49737. Number of acquisition 1846.I.2)

The specimen was originally labelled as 'Athene boobook Gould', a male, but with no date or locality. Lengths of wings are: 233 and 235 mm and the under surface is striped. Originally mounted, it is now preserved as a study skin.

9. *Eurostopodus guttatus* (Vigors and Horsfield)
(Inv. No. 50841. Number of acquisition 1846.I.3)

In the book of acquisitions there are listed two specimens of 'Caprimulgus', with no indication of the species, and referred to as 'adult et junior'. Only the 'junior' specimen is labelled as being from the Preiss collection. It has the typical reddish-brown colour and has no white in the tail, as is characteristic of immature Spotted Nightjars (Slater 1970). There is no information on place and date of collection on the original label, on which later was added only the identification as *Eurostopodus guttatus*.

Because the 'adult' specimen was lacking I searched for it among the mounted specimens in the public collections. There I located a specimen of *Eurost-*

opodus guttatus bearing only the word 'Australia' on the label, the original label being missing. It may well be the adult nightjar received in the consignment of Dr Preiss.

Thus eight (or even nine) specimens received from Dr Preiss are still preserved in our collections. The additional specimens from Dr Preiss were a honeyeater that was not specifically identified in the book of acquisitions, an also unspecified plover (listed as 'Charadrius (Morinellus)', an 'Arenaria Tringa Temminck aff. fem.', and a 'Totanus ? Numenius minutus Gould'. Probably all these have been lost or destroyed in the 125 years after their acquisition. The specimen of *Numenius* would be very interesting (if it was correctly identified as *Numenius minutus*) because until recently this summer migrant from the northern hemisphere had not been recorded south of North-West Cape (Serventy and Whittell 1967). Unfortunately I have no hope of the missing specimens being located elsewhere in our collections.

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DR HERBERT SCHIFTER, *Vogelsammlung, Zoologische Abteilung, Naturhistorisches Museum, Wien, Austria.*

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NOTES ON AGGRESSIVE AND TERRITORIAL BEHAVIOUR IN NECTAR-FEEDING BIRDS.

Daily between 11:00 and 13:00 from 29 May to 2 June 1972 I observed nectar-feeders that visited a grove of sixteen gum trees *Eucalyptus* sp at Lindfield, NSW. These trees cover an area of about 50 x 10 m and are separated from the nearest similar trees by 70 m. The nectar-feeding species seen in this time were Red Wattlebirds *Anthochaera carunculata*, Rainbow Lorikeets *Trichoglossus haematodus* and Scaly-breasted Lorikeets *T. chlorolepidotus*.

Rainbow Lorikeets only were seen up to 30 May. The following day all three species were seen and only the Red Wattlebirds remained on 1 June. On the last day, no birds were seen in the area. The following mainly deals with 31 May, when all species were recorded.

Four Rainbow Lorikeets and twelve Scaly-breasted Lorikeets were present when I began observations at 11:05; three Red Wattlebirds entered the grove twelve

minutes later. The lorikeets were in two of the trees at one end, 2–6 m above the ground. The Wattlebirds entered from the other side of the grove and immediately approached the lorikeets, dispersing them in all directions. They continued to chase the lorikeets after this until they were distributed throughout the grove. However, no birds left the area during these actions.

After chasing the lorikeets again, the Wattlebirds began to settle down to feed. A Scaly-breasted Lorikeet was observed at one time to reverse the role of aggressor and seized one of the Wattlebirds by the tail for a few seconds. The Lorikeet continued its chattering call during this incident and was joined by two other Scaly-breasted Lorikeets, also calling, until the Wattlebird moved away. The three Lorikeets then resumed their feeding with other lorikeets in the outer foliage.

When only Rainbow Lorikeets were present, they fed over the whole of the grove as did the Red Wattlebirds after 31 May. However, this was not so when the three species were together. The lorikeets fed in the outer foliage of a few trees while the Wattlebirds moved through the canopies. The lorikeets and Wattlebirds kept to these parts of the trees and whenever one approached the other, the Wattlebird would chase the lorikeet but not to the extent observed earlier. In this time, no birds left the area and all were feeding in their particular parts of the trees when I finished my observations on 31 May at 13:00.

Hindwood (1939) discussed nectar-feeders in the Sydney area and noted that Noisy Friarbirds *Philemon corniculatus* often attacked lorikeets feeding in the same trees. The Red Wattlebird has been recorded as aggressive (Gannon 1962: 164), though not with the pugnacity of the Noisy Friarbird, and in company with lorikeets (Courtney 1966). During the winter-flowering of *Eucalyptus*, the Red Wattlebird is probably not as numerous as the lorikeets (Keast 1968: 189–190; Forshaw 1969: 22, 27). This was apparently so in my area where lorikeets were not infrequently heard and seen but Wattlebirds were rather scarce, three being the maximum number at one time.

Ripley (1959, 1961) discussed similar aggressive behaviour in honeyeaters. Because the aggression was noted to be greater than warranted under the circumstances, the term *aggressive neglect* was introduced to explain this. The excessive aggressiveness was considered to be a cause of the reduced numbers of the honeyeaters. For my small area, the availability

of nectar would limit numbers and on 31 May with so many birds present aggressiveness would be expected but only while actually feeding and not to try to remove the competitors from the area.

Wattlebirds had been observed before 29 May feeding in this area, possibly the same birds, and on 25 May one was observed chasing a pair of Spotted Pardalotes *Pardalotus punctatus* out of the grove. Otherwise, I saw no species of possible competitor until the lorikeets arrived.

As noted, the lorikeets and Wattlebirds fed randomly when undisturbed, whereas this did not apply when more than one species was present. The temporary feeding territories adopted by the birds were a possible consequence of the Wattlebirds' failure to chase the lorikeets away.

Aggression in feeding and its effect in the formation of territories has been described for other nectar-feeders, e.g. hummingbirds (Stiles and Wolf 1970). With the Wattlebirds and lorikeets, excessive aggressiveness by the Wattlebirds changed the feeding behaviour of all species present in this way. Although the lorikeets could easily have moved from one tree to another, they remained within the outer foliage of the particular tree they were chased into.

Aggressive and territorial behaviour as described with the Wattlebirds and lorikeets may be of significance in limiting competition in restricted habitats. Further observations are needed to determine the extent and value of these interpretations.

I am grateful to Messrs A. R. McGill and R. I. Orenstein for comments and corrections to an original draft of this note.

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M. D. BRUCE, 8 Spurwood Road, Turrumurra, NSW 2074.
26 March 1973.

NESTING OF FAIRY MARTINS IN CULVERTS

During the 1972 RAOU Field-outing on 4, 5, 7 and 10 October we investigated Fairy Martins *Petrochelidon ariel* nesting in culverts near Myall Lake 320 km north of Sydney (lat. 32°35'S, long. 152°15' E). Twenty straight concrete pipes of three sizes had been laid under a double-lane road, newly made of earth, which runs east-west for six kilometres through low swampy coastal heathland. There was another pipe under a side-road. The pipes were inspected from both ends but they were too small or difficult to enter to inspect the nests more closely.

Three pipes, 0.9 m in diameter, had nests in the early stages of construction. The depth of water varied from 0.15 to 0.35 m; the flow was fast in one. Thus, the Martins had a flying space between 0.55 and 0.75 m high.

Six pipes, 0.6 m in diameter, had nests at all stages of construction from the first mud-pellets to completion. Judged from activity, the birds were probably sitting in some completed nests, but we could not inspect their contents. Each pipe had water in it between 0.02 and 0.18 m deep and it was fast flowing in three of them, leaving a flying space between 0.42 and 0.58 m high.

Seven other pipes, 0.6 m in diameter, had no nests. One was half-filled with sand; another had sand at one end and deep water at the other; two had wasps' nests, but three seemed as suitable for nesting as those used by the Martins.

Five pipes, 0.45 m in diameter, had no nests. Four were just wet or had water 0.18 m deep and the fifth pipe had 0.20 m of sand. The space was from 0.25 to 0.45 m high.

All nests were in the top quarter of the pipes. The pipe with most nests was 0.6 m in diameter and had five groups of nests, in all at least fifteen. There was only 0.04 m of slowly moving water in this pipe, leaving a space of 0.56 m high. We could not determine how long it took to build a nest but during the seven days covered by the observations more than half the body of a nest was built and some nests that at first had no spouts had them at the end of this period. Heavy rain fell during the period of observation and it must have temporarily raised water-levels. This did not interfere with building of nests.

Mr A. G. Walters, also attending the Field-outing, reported on the contents of a set of three box-type culverts approximately 3 m² in section, over a distance of 0.32 km. Two of these culverts had about fifty nests in each, but the third, the most southerly, was empty. All three had still water in them and there was no appreciable difference in air space.

The following week, four culverts under a road in north-eastern Victoria were examined. Two were

pipes 0.38 m in diameter and dry, and a third was 0.76 m diameter and wet, but none had any nests. The fourth was a box-type culvert approximately 2 m² in section with 0.03 m of slowly flowing water and this had a large colony of mud-nests in it.

Fairy Martins are well known to choose man-made sites for nesting. In EMU, Volumes 1-72, there are forty references to this, describing nests in railway and road culverts, inside sheds, under eaves, verandahs, bridges and wharves, particularly in coastal regions (Sharland 1943). Ten nests have been recorded in an iron cylinder, 1.4 m in diameter and 2.1 m long, open at both ends (Boss-Walker 1932). Though these sites are usually very close to water, they may be 50 m distant (Sedgwick 1952).

EMU has twenty-eight references to Fairy Martins nesting in cliffs or under overhanging rocks and eight references to nesting in caves. The cliffs may be of granite, sandstone, ironstone, limestone, shale or chalk. The caves are described as small and the nests are at the entrances (Hamilton Smith 1965). There are records of colonies 2 m below ground-level in mine-shafts (Sedgwick 1952). A colony in a cave 200-300 m from the Hardie River is described (Robinson 1933), but it is not stated whether there was water closer.

There are nineteen references to nests on creek-banks and nine to nests attached to trees, which always had an overhanging branch or projection; or the tree itself leant to one side often over water. The nests were on the under side.

In the RAOU Nest Record Scheme there are seventy-six cards for Fairy Martins. Fifty-one records refer to pipes or box-shaped culverts, eleven to other man-made sites and fourteen to natural places. The size of the culvert is generally not stated, but where it is given the diameter is greater than the minimum of 0.6 m being used for nesting as described in this note. Occasionally water is stated to be in the pipe or culvert but one cannot assume that all others were dry if this condition was not stated.

Fairy Martins probably need overhanging cover near water for their nesting site. This is admirably provided by culverts and, according to our observations, the minimum diameter is 0.6 m with a space of at least 0.4 m above water or sand. Because the Martin nests do not interfere with the function of the drains, road-making authorities would encourage these useful insectivorous birds by using pipes of this size or larger where possible.

Though this study was short and incomplete, further more detailed work could usefully be carried out co-operatively by local groups. Such a study could also determine whether Martins will exploit man-

made conditions in areas previously not used for breeding.

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USE OF NESTS OF OTHER SPECIES BY THE TRUMPETBIRD

When describing some nests and eggs of New Guinean birds, one of us (Harrison 1971) attributed to the Koel Cuckoo *Eudynamis scolopaceus* a large egg found in the nest of a Slaty Thicket Flycatcher *Peneothello cyanus*, on the grounds that it was not the egg of a flycatcher although a flycatcher was collected on the nest, that it was thought by the collector to be a cuckoo's egg, and that this cuckoo appeared to be the only likely species. The egg was not similar to previously known eggs of the Koel, which vary in type where the host species differ in different parts of the range; and we have no other examples from this region. The egg (BM Reg. No. 1970.5.1) is elongated, glossy and pink, densely marked with fine specks, streakings and irregular elongated markings in reddish brown and purple.

A similar egg (Reg. No. 1941.1.4.112) was found among a small number of eggs from New Guinea, partly unidentified but thought to be those of birds-of-paradise, in the Rothschild Collection. This specimen is of similar shape, size and texture to the first, and is pale-pink, profusely marked with minute specks and streaks of purple and reddish brown, and with larger spots and a few underlying streaks of the same colour, mostly towards the larger end. It is sufficiently like the first egg to suggest that the two could have come from the same species.

Following this lead, the eggs of the birds-of-paradise in the collection of the Museum were examined. The eggs of these birds in a number of genera, including *Paradisaea*, have a very distinctive pattern, being buff to pink in ground-colour with bold, usually thick, longitudinal stripes of purple and reddish brown, mostly towards the larger end, and often rather sparse. Most eggs of the Count Raggi's Bird-of-Paradise *Paradisaea raggiana* (or *P. apoda raggiana*) are of this type, but among them were three which resemble the first two described above.

Of these three, the first (Reg. No. 1966.7.5) is finely and densely speckled with purple and reddish brown, with sparse elongated pale-purple streaks; the

second (Reg. No. 1966.7.6) is paler-pink with similar but sparser speckling, more numerous elongated pale-purplish streaking and a few reddish brown streaks; the third (Reg. No. 1966.7.7) is pink with a slightly warmer tint, again profusely speckled with elongated pale-purplish streaking, particularly towards the larger end, and a greater number of similar but smaller streaks of reddish brown.

These five eggs are not separable from eggs of other birds-of-paradise in shape, size or texture; but in markings and colour they closely match those of the Trumpet bird *Phonygammus keraudrenii*. They measure:

No. 1970.5.1, 38.0 x 24.9; No. 1941.1.4.112, 39.4 x 25.7; No. 1966.7.5, 38.6 x 26.6; No. 1966.7.6, 37.0 x 25.2; No. 1966.7.7, 38.0 x 26.1 (all mm).

The three eggs collected as those of *P. raggiana* were taken by Choo Kok Leong for F. Shaw Mayer at Minj, Wahgi River, New Guinea on November 1950. Shaw Mayer commented (Sims 1955-56) that by mid-November *P. raggiana* 'were breeding and several nests were observed; in nearly every case the nests were high up, 50-60 ft., in casuarina trees. Each nest contained only one egg'. These comments presumably refer to the nests from which the three atypical eggs were taken. There are no further data linking eggs, nests and birds.

The following comment occurs at the end of Giliard's (1969) account of the Trumpetbird: 'The matter having come up several times, I must mention an apparent error in the literature of this bird. W. J. C. Frost (in Rothschild 1930: 9) apparently erroneously reported that this species lays its eggs in the nest of *Paradisaea apoda* (in the Aru Islands) and that it has the mannerisms of an avian parasite'. Rothschild's (1930) original statement when exhibiting the eggs of *Phonygammus keraudrenii* at a meeting of the British Ornithologists' Club was: 'It has remained for Mr W. J. C. Frost to discover the curious nesting habits of this bird of paradise. It lays its eggs in the nests of *Paradisaea apoda* and its behaviour is

exactly that of the parasitic cuckoo. The *Phonygammus* is always seen following the females and young of *P. apoda* about, but never approaches the old males on the dancing trees of the latter'.

An egg among those of the Trumpetbird in the BM Collection (Reg. No. 1941.1.2.56) was taken by Frost on 30 November 1926, and marked by him as *P. apoda*. It was accompanied by a note 'watched building 15 days' and although the egg is that of the Trumpetbird it was obviously the Greater Bird-of-Paradise that Frost watched building the nest.

From the data available it appears, *pace* Gilliard, that eggs attributable to the Trumpetbird have occurred in the nest of the Slaty Thicket Flycatcher as well as those of some birds-of-paradise *Paradisaea* spp. Whether in some or all of its range the Trumpetbird is a brood parasite or merely uses newly built nests of other species as its own is an open question, although on present evidence the latter seems the more likely. Admittedly the flycatcher was sitting on the Trumpetbird's egg, but the full clutch of the latter is two eggs, and the flycatcher might have been attempting to re-assert ownership in the period before the clutch was complete and the other species took over. Several clutches of Trumpetbird's eggs in the

BM Collection were taken together with the bird on the nest, and in these circumstances Trumpetbirds of both sexes have been collected at nests containing their own eggs. In one instance the eggs were well incubated.

Whenever the eggs of this species have been found or suspected in nests of whatever species there is no record of the eggs of other species also occurring. If the Trumpetbird is a brood parasite it must therefore either remove or destroy the eggs of the host, or inhibit the host from laying by anticipating the host's clutch with its own.

The problem is one which requires further observation in the field.

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DR C. J. O. HARRISON and M. P. WALTERS, *Sub-department of Ornithology, British Museum (Natural History), Tring, Hertfordshire, England.*
 12 May 1973.

A RECORD OF THE PAPUAN HAWK OWL

We recently caught and banded a Papuan Hawk Owl *Uroglaux dimorpha* at our banding station near Port Moresby. Very little is recorded about this owl either in collections or in publications on New Guinean birds except for a repetition of the original description by Salvadori in 1874, Gould and Sharpe's more detailed description in 1886 and Hartert's notes in 1930.

The type-specimen of *Athene dimorpha* was discovered by D'Albertis near Sorong, Irian Jaya. In 1875 Sharpe transferred *A. dimorpha* to the genus *Ninox* from a description and coloured sketch sent to him by Count Salvadori. Sharpe added that he was not at all sure that it is a *Ninox*: 'the wing looking too short'. Hartert (1930) also suggested a change of genus and finally Mayr (1937) described the new genus *Uroglaux*, although he did not give details of study-material in support of the description, nor does *U. dimorpha* appear to have been collected during the expedition to which those notes are attached.

The Papuan Hawk Owl was considered rare 100 years ago and it could be considered even more so today. There are so few specimens available for study

-and more than half of these lack supporting details of locality, measurements or sex-that it is difficult to set down known facts on distribution, habitat and possible plumage variations for male and female birds.

A brief summary of available records is given below; there may be additional information recorded in Dutch-language publications. Dates of collections in Irian Jaya are from 1874-1889, six specimens; 1928-1931, three specimens; 1962, one specimen. And for Papua New Guinea from 1877-1903, nine specimens and one doubtful fledgling; 1928, one doubtful juvenile.

Our research shows distribution to be confirmed only at two widely separated parts of New Guinea: the Vogelkop Peninsula and Japen Island in Irian Jaya, and the Central District, Milne Bay and Collingwood Bay areas of south-eastern Papua New Guinea, and possibly the Madang district to the north.

Preference for habitat cannot be stated when there is so little information available on the localities. Confirmed localities cover such a wide variety of habitat

from sea-level to the slopes of mountain ranges that one would expect *U. dimorpha* to be more frequently recorded. Range can be stated to be between sea-level and 1,500 m.

Our Laloki banding station is 7 m above sea-level, 17 km north-east of Port Moresby, in savannah country with small pockets of rainforest, and approximately 200 m from the bank of the Laloki River.

The first observation (unconfirmed at the time) of *U. dimorpha* was made on 27 February 1972 while mistnets were being set at 17:00 at Laloki River. On 23 July 1972 *U. dimorpha* was caught in mistnets and banded with CSIRO Band No. 110-37334. After banding, the owl was taken to Mr W. S. Peckover for photographing and was then released at the banding site. On 7 January 1973 the same bird was re-trapped in exactly the same place.

When re-trapped in January, it was carrying the body of a recently killed Magnificent Fruit Pigeon *Megaloprepia magnifica*, which was also in the nets with *U. dimorpha*. The body of *M. magnifica* had small stones and dirt adhering to the cavity left in the neck and some feathers had been pulled out of the wing but there were enough left to determine the age as that of a fully fledged bird.

Before being released again the owl and its food were taken home for observation, and to obtain a photograph of the wing pattern, for which we are indebted to Mr R. D. Mackay. The wing is as described by Mayr (1937) and is almost identical to Specimen No. MAC7086 in the Queensland Museum.

We have not satisfactorily determined whether the row of white patches on the outer edges of the scapulars, as described by Sharpe and illustrated in Gould and Sharpe (1875-88), belong only to the male bird, or to a subspecies. Van Oort's plate (1907-08) is of a female bird but does not show these white spots. This point cannot be checked satisfactorily from museum specimens because the sex is so seldom given.

While under observation at home, *U. dimorpha* at one stage adopted what seemed to be a camouflage pose, with its head tucked well down into its neck and

the wings drawn well round the body, and this, combined with the habit of closing its eyes when being observed, would make positive field identification difficult. From the back *U. dimorpha* looks like a long-tailed hawk.

A short call, like a song bird, was given while the owl was being held in the hand. And on this point we would correct the statement made by Grossman and Hamlet (1965) that the genus *Uroglauis* has the weak feet characteristic of *Ninox theomacha*. We found the claws of *U. dimorpha* were strong, and capable of inflicting wounds when the bird was held in the hand.

Weights (g) and measurements (mm) taken in July 1972 and January 1973 are as follows (with July figures first):

Weight 256, 248; length 310, 315; wing 225, 230; bill 19, 20; tarsus 40, 41; tail 143, 152. Age, adult; sex ? female.

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We are indebted to Mr W. S. Peckover for allowing us the use of his library, and for advice and assistance in checking references. Similarly we thank Mr R. D. Mackay for advice on historical papers and early records. We are particularly grateful to Mr D. P. Vernon, of the Queensland Museum, who supplied information and answered queries; and to Mrs M. LeCroy of the American Museum of Natural History, without whose help we could not have attempted the research necessary for this paper.

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T. M. and I. L. WESTON, PO Box 249, Port Moresby, Papua New Guinea.
17 May 1973.

OBSERVATIONS ON THE FOOD OF SOME BIRDS OF SOUTH-WESTERN WESTERN AUSTRALIA

Several species of insectivorous birds have been observed feeding actively in and round commercial potato crops heavily infested by insects in the Manjimup-Pemberton district of south-western Western Australia. The purpose of the present study was to

examine the food and feeding habits of common insectivorous species to determine their status as predators of larvae of the Potato Moth *Phthorimaea operculella* and so, via their droppings, as vectors of Potato-Moth virus, which is of potential importance

for the control of the pest (Reed and Springett 1971).

Insectivorous birds feeding in potato crops or near-by jarrah *Eucalyptus marginata* or karri *E. diversicolor* forest were collected by shooting during January and February 1970. The gizzard of each specimen was removed and its contents preserved in 70% alcohol. In the laboratory, the arthropods in each gizzard were identified to ordinal level and their numbers assessed from the larger recognizable fragments. Larvae of Potato Moths were individually identified and counted. The presence of each arthropod order in each species of bird was expressed as a percentage of the aggregate number of arthropods eaten by all specimens of that species. Vegetable matter occurring in a gizzard was noted but not included in the numerical analysis of the food.

FOOD ANALYSIS

Seventy-one specimens of twenty-two bird species were collected, and Table I shows the number of birds examined, the results of analysis of their food and the mean number of arthropods per gizzard for

each species. The latter values have been included to allow better interpretation of the percentages of food in the analysis, particularly for the smaller samples. The list of birds is compiled in descending order of the number of specimens collected.

Arthropods formed the bulk of the food of each species of bird and vegetable matter was found only in the gizzards of six Silvereyes *Zosterops gouldi* and of one Western Shrike-Thrush *Colluricincla rufiventris*. In each specimen the vegetable matter formed less than half the gizzard contents by volume and consisted of soft pulp and small unidentified seeds.

The analysis of the gizzard contents showed that of the seven arthropod orders represented, Coleoptera, Hymenoptera, Hemiptera, Orthoptera and Arachnida occurred most frequently. The proportion of each arthropod order in the food varied greatly between species. Lepidoptera were found only in the food of Silvereyes, Yellow-tailed Thornbills *Acanthiza chrysorrhoa* and a single Grey Fantail *Rhipidura fuliginosa*. Unidentifiable adults formed the entire lepidopteran portion of the Grey Fantail's food and

TABLE I
Percentage of the arthropod orders in the food
of birds; January-February, 1970.

Birds	No.	Per Cent							Mean No. Arthropods gizzard
		Lepid- optera (moths)	Hemiptera (bugs)	Coleoptera (beetles)	Hymen- optera (wasps, ants)	Diptera (flies)	Orth- optera (grass- hoppers)	Arachnida (spiders)	
Silvereye <i>Zosterops gouldi</i>	21	54	3	34	6	3			24
Yellow-tailed Thornbill <i>Acanthiza chrysorrhoa</i>	9	40	2	35	10	3	6	4	12
Grey Fantail <i>Rhipidura fuliginosa</i>	6	2	3	4	87	4			24
Golden Whistler <i>Pachycephala pectoralis</i>	5		5	33	48		10	5	4
Australian Pipit <i>Anthus novaeseelandiae</i>	4		42	42	4		12		7
White-naped Honeyeater <i>Melithreptus lunatus</i>	3		52	24	10	5		10	7
White-breasted Robin <i>Eopsaltria georgiana</i>	3		16	24	60				8
Splendid Blue Wren <i>Malurus splendens</i>	3			19	80			1	30
Scarlet Robin <i>Petroica multicolor</i>	2			60			10	30	5
Western Shrike-Thrush <i>Colluricincla rufiventris</i>	2		14	71	14				4
Western Thornbill <i>Acanthiza inornata</i>	2		5	54	41				19
Red Wattlebird <i>Anthochaera carunculata</i>	1			12			88		8
Banded Plover <i>Zonifer tricolor</i>	1			38			63		8
Spotted Scrub Wren <i>Sericornis maculatus</i>	1		25	25	50				4
Willy Wagtail <i>Rhipidura leucophrys</i>	1			100					32
Dusky Woodswallow <i>Artamus cyanopterus</i>	1			20	60		20		5
Pallid Cuckoo <i>Cuculus pallidus</i>	1			8			84	8	24
Red-tipped Pardalote <i>Pardalotus striatus</i>	1			43	29	14		14	7
New Holland Honeyeater <i>Phylidonyris novaehollandiae</i>	1		11	56	22			11	9
Tree Martin <i>Petrochelidon nigricans</i>	1			12	17	72			18
Western Warbler <i>Gerygone fusca</i>	1			25	75				8
Broad-tailed Thornbill <i>Acanthiza apicalis</i>	1				100				8

65 per cent of the Yellow-tailed Thornbill's food, the remaining 35 per cent consisting of larvae of the Potato Moth. The Lepidoptera in the Silvereye's food were entirely larval, and 99 per cent were Potato Moths. The Silvereyes had each eaten on average thirteen larvae, but the Yellow-tailed Thornbills had eaten on average only two. The food of the Yellow-tailed Thornbill was more diverse than that of the Silvereye, in spite of the smaller numbers examined, but samples of the other species were too few for comment.

Of the twenty-two species sampled, the food of nineteen had been previously reported (Lea and Gray 1935-36). The insectivorous status of each species has been confirmed, although less diversity of food was evident in the birds sampled during the present study. This clearly results from the small sizes of samples and from the short sampling period. The species for which no earlier records are available are the Banded Blue Wren *Malurus splendens*, Western Thornbill *Acanthiza apicalis* and the Pallid Cuckoo *Cuculus pallidus*, although the Pallid Cuckoo is often said to eat hairy caterpillars (Cayley 1931).

FEEDING HABITS

Silvereyes, in addition to being the most numerous species, were the only birds that preferred to feed throughout the potato crops that were known to be heavily infested with larvae and adults of the Potato Moth. Yellow-tailed Thornbills, though not normally extending their feeding activities far from the forest edge, foraged actively in potato plants and on the ground at the edges of crops close to forest. The other species, which were always fewer than Silvereyes and Yellow-tailed Thornbills, fed in pastures or forest areas bordering crops.

Silvereyes normally fed in flocks ranging in size from a few to about one hundred. Feeding in potato crops was characterized by a pattern of continual movement of individuals or small groups to and from the crop to neighbouring trees or bushes. In contrast to the Silvereye, the Yellow-tailed Thornbill did not associate in flocks, and individuals or small groups confined their feeding to the ground and low bushes with occasional forays into trees.

Flocks of Silvereyes ranged far, and frequently flocks entered a crop after flying over nearby forest or farmland. When they left a crop, it was common to recognize a pattern of movement that suggested they avoid the interior of the forest. No flocks and few individuals leaving crops were observed to fly more than 100-200 metres into forest and several surveys failed to find Silvereyes inside the forest. Yellow-tailed Thornbills were occasionally seen inside the forest but were most often found moving only locally at forest edges. By virtue of their abundance, preference for feeding in potato crops and nomadic habit, Silvereyes demonstrate considerable potential as a vector of Potato-Moth virus.

I would like to thank Dr G. M. Storr, who kindly identified the birds.

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J. N. MATTHIESSEN, *Division of Entomology, CSIRO, Private Bag, PO Wembley, WA 6014.*
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