SHORT COMMUNICATIONS

TORPIDITY IN THE WHITE-BACKED SWALLOW

There were few more extraordinary discoveries in bird ecology in modern times than those which led to the validation, in some measure, of the discredited 18th-century belief that in certain circumstances birds may hibernate to tide over a period of stress. Various findings in hummingbirds and swifts earlier this century had prepared ornithologists to accept the fact of torpidity, 'a state of inactivity and lowered body temperature enabling a bird to conserve energy during a period of fasting' (Matthews 1964, 'Torpidity', *in* Thomson, A. L. (ed.). New Dict. Birds). But it was the chance discovery by the Californian naturalist, Edmund Jaeger, of prolonged torpidity, amounting to typical hibernation, in a nightjar, the Poor-will *Phalaenoptilus nuttallii*, that aroused widespread interest in the phenomenon. In December 1946 Jaeger found a Poor-will in a crevice in a deep canyon in the Colorado Desert, the bird sitting inert with greatly reduced temperature, respiration and heartbeat. The bird was ringed and subsequently found during four successive winters in exactly the same spot, remaining thus for the whole of each winter. A considerable literature has since appeared, reporting experiments on its physiology and the occurrence of torpidity in other species (see up-to-date citations by Dawson and Fisher 1969, Condor 71: 49-53).

No similar case of hibernation of the type occurring in the Poor-will, or even of the intermittent torpor undergone by swifts, or the daily cycle of torpor known in hummingbirds, has so far been reported in Australia. However, experimenting on the Spotted Nightjar *Eurostopodus guttatus* in Western Australia, Dawson and Fisher (*op. cit.*) found that this species possessed a capacity for dormancy, and they wondered whether it might become torpid in nature. So I listened with some excitement to an account given me in June 1969 by Mr W. Gable, headmaster of the Lathlain Park School, near Perth, of an experience he had with the White-backed Swallow *Cheramoeca leucosternum*. I asked Mr Gable to write out a report of his observations, which he did as follows:

> 'As a youth I roamed the area of wooded hillsides and wide open valley west of the old railway junction of Spencer's Brook (50 miles north-east of Perth) and a discovery that remains among the most fascinating in my experiences, concerns a colony of White-backed Swallows. The railway line to Perth had been re-routed and remnants of the disused embankment were burrowed into by rabbits and other creatures. In the winter of 1936, on a wet and cold grey day, I examined one of the banks and noted the nesting entrance of the swallows. Out of curiosity I opened up the nest and removed the overlay. Instead of unearthing a normal nesting cavity containing the usual remains of last season's nest, I was intrigued to find not only a larger cavity than usual, but that it was occupied by a group of adult birds. They remained in a listless torpid state as I lifted each individual out from the cluster and placed it in my felt hat. They showed no indication of fear or attempted flight, but remained inert, nestling into each other as if to escape from the bleak winter's day. There were some 16-20 birds in the cavity, completely filling my hat. I studied the birds for several minutes, passing my hand over them. I then returned them to the cavity and covered it up with a sheet of rusted iron on top of which I heaped up some earth.'

As there was a cold snap on at the time, Mr Gable and I decided to revisit the Spencer's Brook site the following weekend in the hope that we might be able to repeat his 1936 observation. We provided ourselves with thermometers and other apparatus, and examined the locality on 5 July 1969. It had altered very little in the intervening years, and Mr Gable had no difficulty in locating the exact site. We found several burrows in the embankments and opened up each. Unfortunately they contained no swallows, but in one of them was a last season's nest with four abandoned eggs. This area lies at the western boundary of the bird's geographical range in this general region, though on the coastal plain it is now spreading southwards towards Perth.

White-backed Swallows are known to use their own and other birds' nesting tunnels as overnight roosting shelters (Gould 1865, Handbook to the birds of Australia; Waterman & Llewellyn 1968, Aust. Bird Bander 6: 8), as many as 27 individual birds being reported in one burrow. So, behaviourally the species is pre-adapted, as it were, to resort safely to torpidity if it is physiologically capable of doing so and circumstances are compelling. One can well imagine that these swallows, depending solely on aerial insects for food, might find it biologically advantageous during inclement wintry spells, when food becomes scarce, to tide over such periods by relapsing into temporary torpidity or, in everyday language, suspended animation. With a burrowing species the habit might remain undiscovered indefinitely for knowledgable naturalists rarely have occasion to open up burrows except when eggs are sought. Other swallows with enclosed nests might conceivably share

this habit. A suggestive observation was made by Mr S. Marchant at Bungendore, NSW, on 24 October 1964, when he checked a sample of Fairy Martins' nests; in one nest he found seven or more dead and desiccated birds. This, of course, only proves the occurrence of communal roosting inside the nests. But torpidity should be watched for.

The purpose of this note is to draw general attention to the possibility that this phenomenon occurs more generally, and to invite observers to pay attention to the contents of these nests during winter months.

If Mr Gable's observation is confirmed, it will be the first demonstration of this habit in any of the swallow tribe, the classical example of it in 18th-century natural history lore. It is pertinent, in the circumstances, to quote the following from Gilbert White's letter to Daines Barrington (Letter XII, 9 March 1772), from *The Natural History of Selbourne*. 'I am more and more induced to believe that many of the swallow kind do not depart from this island, but lay themselves up in holes and caverns; and do, insect-like and bat-like, come forth at mild times, and then retire again to their latebrae.' White was in error in respect to the Swallow *Hirundo rustica* of England, but his summary may well have been prophetically right for an antipodean species that was not scientifically described until almost half a century after his death.

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27 August 1969.

BOWER-BUILDING AND DECORATING BY THE REGENT BOWERBIRD IN CAPTIVITY

The Regent Bowerbird *Sericulus chrysocephalus* is not an uncommon bird in most parts of its extensive range, but because its bower and display ground are not often found there has arisen a body of local opinion that such structures are rarely built. Thus, Iredale (1950, Birds of Paradise and Bowerbirds) has suggested that the Regent Bowerbird is 'still a novice at bower-building', that it may be 'only learning the art', and that in this species bower-construction is a 'possibly recent habit'.

This view has been previously rejected (Marshall 1954, Bowerbirds) on theoretical grounds and on the practical evidence that the Regent Bowerbird, unlike all other Australian members of the family, displays relatively quietly at a small inconspicuous meagrely adorned display ground and bower that is generally placed not at the sunny edge of a rain-forest but deep in a tangle of lawyer vines *Calamus muelleri* and other vines of a kind that is usually skirted, and rarely examined, by most potential observers. Ramsay (1867, Ibis 2 (3): 456-457), for example, stood for some minutes within a yard of a bower, and discovered it only when a brilliant male actually hopped up to it.

Nevertheless, the local naturalist's opinion persists. It is well summarized by Chisholm (1965, Bird Wonders of Australia) as follows:

'How curious it is that this pretty bird should possess the chief talents of the family (bower-building and decorating) and yet, as it would seem, only rarely exercise them! . . . Apparently the Regent bird lacks some of the real bower-building impulse. He is not a consistent builder, for his playing places are rarely seen, and they are rudimentary structures in comparison with those of other members of the group; the walls are straighter, shorter, never arched . . .'.

There is only one Regent Bowerbird in the aviaries at Snake Gully, the 36,360 m^2 experimental area on the Monash University campus. [This area is now known as the Marshall Zoological Reserve.—Ed.] It was captured in 1965, and was of undetermined sex until it was seen by a technician to be changing colour on 12 February 1966. It seems probable that the colour change started during the moult, which occurs post-nuptially in adult birds at about that time each year. On 17 February 1966 the technician reported the discovery of a complete bower.

The aviary, in which the bird was confined alone, measures about 11 x 3.5 m and is 1.8 m high. It is well planted with young *Pittosporum undulatum*, Scrub Box *Tristania conferta* and naturally growing Prickly Bush *Spinosa bursaria*, and its corners are stacked with tea-tree bushes to provide protection, concealment and future nest sites. The young bird spends much of his time in one such thicket, but comes under close surveillance each day at feeding time, and his plumage metamorphosis, therefore, was detected almost immediately it began. The bower, orientated at 50°, was built in a corner of the aviary where the overhead protection was greatest and where the structure was most difficult to see. Because it was inconspicuous and well hidden, we have no idea of the date on which it was first built.

The bower, unlike the simple platform built by juvenile Satin Bowerbirds *Ptilonorhynchus violaceus* but like all Regent Bowerbird structures recorded in the serious literature (references in Marshall *op. cit.*), was in no sense rudimentary. Its measurements were as follows:

Platform:	thickness (above ground)	50 mm
Avenue:	width at platform level	89 mm
	width at top of walls	64 mm
Walls:	outside height from ground	241 mm
	thickness at base	102 mm
	length of longer	204 mm
	length of shorter	158 mm

The walls, as will be seen from the above figures, did not meet in an arch. Nevertheless, on some occasions an arch is formed (see Marshall *op. cit.*, plate 17).

Unlike those of the Satin Bowerbird and most members of the genus *Chlamydera*, the bower adornments were, with the exception of a single green *Tristania* leaf, small and of colours that did not attract human attention. They were as follows:

12 yellowish-brown pebbles (6 x 13 mm in diameter)
140 grey rat's faeces
1 fragment of orange peel faded to dull-yellowish colour
1 pale-yellow grass-straw
6 dry *Eucalyptus* leaves decomposed partly to a dull-orange tint
9 globular plant galls decomposed to a dull-orange tint
1 fresh green leaf of *Tristania conferta*

It will be seen that the colours of all adornments, except the single green leaf, bore some resemblance to those of rival juvenile or adult males.

In any discussion whether bower-building is constant, evidence that one male Regent Bowerbird built a bower is statistically meaningless. Nevertheless, the fact that this single bird built immediately, or perhaps even before, it changed into its epigamic plumage is at least suggestive. Of real significance is the fact that it chose the most obscure part of a shady aviary in which to place its bower, and that this structure was fully formed, and had in front of it an extensive accumulation of decorations, before its attendant, Mr L. Vandevelde, an extremely acute observer with much field experience in Africa and Australia, became aware of its existence. It can be readily appreciated, therefore, how easily such a structure may be overlooked in the dim recesses of a rain-forest.

A further point that emerges is that the bower, like others previously described, is not in the least degree rudimentary. Architecturally, it is little different from the bowers of other avenue-builders. It is sturdy and durable, and the sticks of its wall are securely anchored in its basal platform. Certainly, the structure is smaller than that of any other avenue-building species. But so, too, is the bird that builds it.

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[This paper was found by the late Prof. Marshall's wife among his papers and was passed to Dr D. F. Dorward who submitted it to the 'Emu'. It is an unexpected privilege to be able to publish it.—Ed.]

NESTS AND EGGS OF THE AUSTRALIAN ROCK PIGEONS *PETROPHASSA* SPP.

Results of the Harold Hall Australian Expedition No. 25. The previous number in this series appears above, pp. 9-11.

In 1968 on the fifth phase of the Harold Hall Australian Expedition a nest of the White-quilled Rock Pigeon *Petrophassa albipennis* and the presumed nest of the Chestnut-quilled Rock Pigeon *P. rufipennis* were found. Because doubts have been expressed about the authenticity of earlier accounts (Lindgren 1967, Emu 67: 383-386) this additional information is given here.

Kilgour (1904, Emu 4: 37-43) made a brief mention of the nesting of *P. albipennis* as follows: 'I flushed a White-quilled Rock Pigeon from its nest, which was a slight hollow in the sand and lined with grass; the eggs were two in number, cream-coloured, pointed at both ends, and about half as big again as those of *Lophophaps*.' Possibly in this area *P. albipennis* does nest on level ground. Alternatively Kilgour may have seen the nest of the Partridge-Pigeon *Geophaps smithii*, although later in his paper he makes particular note of the obvious white patch on the wings of birds in question. Dr G. M. Storr, during a visit to the area where Kilgour worked, confirmed the presence of *P. albipennis* there.

G. F. Hill (1911, Emu 10: 258-290) described the nest of *P. albipennis* as 'built of twigs placed on the most exposed surfaces of rocks'. Our experience as detailed below suggests that without much doubt this does indeed refer to *albipennis*. Also Hill at the same time collected the nest and eggs of *Geophaps smithii*, and would have appreciated the difference between these two species.

In 1967 Lindgren reviewed the above records and added to them a photograph of a nest supplied to him by Mr I. M. Crawford, anthropologist at the Western Australian Museum. The picture was taken in the Kimberleys on the southern side of the St. George Basin. The nesting material and situation agree with the two nests described below.

Humphries (1947, Emu 47: 59-60) described what he thought were the eggs and nest of *P. rufipennis*, although he was undoubtedly mistaken. He writes, of the birds observed, 'during one of my many walks in that area, I disturbed from its nest on the ground, a pigeon, the outstanding feature of which was its large red wattles'. He also records this bird as 'flying up into high trees'. Although many observations of these species were made during the HHAE neither *P. albipennis* nor *P. rufipennis* was seen to perch on anything other than rock. As Lendon (1948, Emu 47: 235-237) and Lindgren (*op. cit.*) have suggested, the observed birds were probably *Geophaps smithii*.

The new records are as follows:

PETROPHASSA ALBIPENNIS

The White-quilled Rock Pigeon *P. albipennis* was frequently encountered in the broken sandstone country on either side of Manning Creek, Kimberleys. Its habitat consisted of large rugged reddish sandstone boulders and ridges with stunted eucalypts and spinifex grass. The photograph published by Hill (1911, Plate 31) is very typical of this habitat.

A nest was found on 2 July 1968 eight km south-east of Joint Hill (16°27′ S. 125°56′ E.), Kimberleys, Western Australia. An adult female *P. albipennis* (British Museum No. 1969.4.108) was flushed from the rocks and collected by W. H. Butler. Upon examining the area from which the bird flew D. J. Freeman found the nest. It contained two eggs and was placed in a shallow depression on top of a mushroom-shaped piece of rock, about 0.75 m from the ground. This nest would have been in direct sunlight all day except during late afternoon. The nest material was fine twigs, vines and grasses, up to 100-120 mm in length, and a few dry leaves, forming a very thin platform 165 mm in diameter. There was almost no material beneath the eggs. The two eggs were cream-coloured and medium-glossy, and measured 29 x 21.2 and 29.8 x 21.6 mm, weighing when fresh 6.0 and 6.7 gm respectively. They contained embryos, probably within two or three days of hatching. These are preserved in spirit in the British Museum collection.

PETROPHASSA RUFIPENNIS

I collected a nest almost certainly of this species on 14 October 1968, 15 km south-south-west of Oenpelli Mission (12°19′ S. 133°03′ E.), Northern Territory. It was in very similar sandstone country to that described for *P. albipennis* at a point where the rock escarpment met a large plain with shallow permanent lakes. The nest was found beneath a small overhang on a ledge of bare rock in the escarpment approximately 15 m above the plain (Plate 1). In this position it would have been in shade almost all day. The nest material was like that of the White-quilled Rock Pigeon's nest, but there was about twice the quantity. The nest was empty and would appear not to have held young because there were no droppings.

Though no birds of this species were seen in association with the nest the following facts would seem to confirm its identity: (1) It was in all essentials like the known nest of the allopatric species *P. albipennis*, (2) *P. rufipennis* is one of the commonest birds in this rocky area, and the only species known in this locality that would build a nest of this kind of rock, (3) among the nest material I found a rump feather of *Petrophassa* and many small fragments of white eggshell, which suggest that the nest was found by a predator and the eggs broken or eaten *in situ*.

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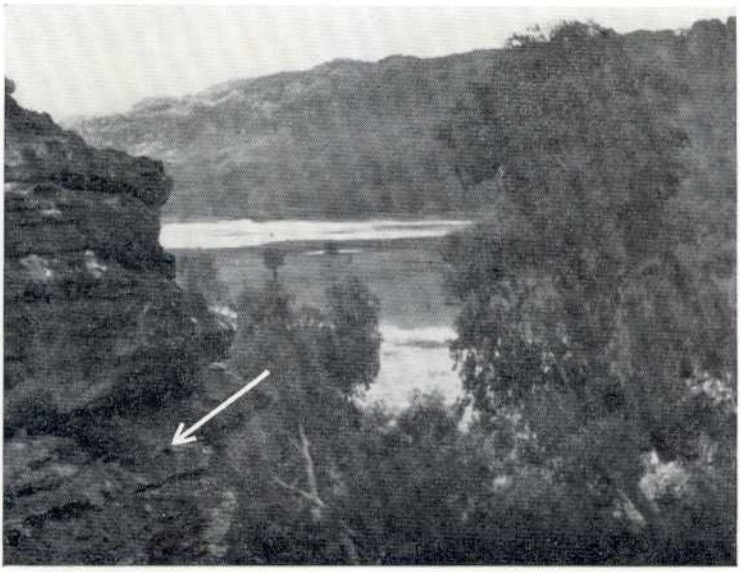
31 October 1969.

PLATE 1



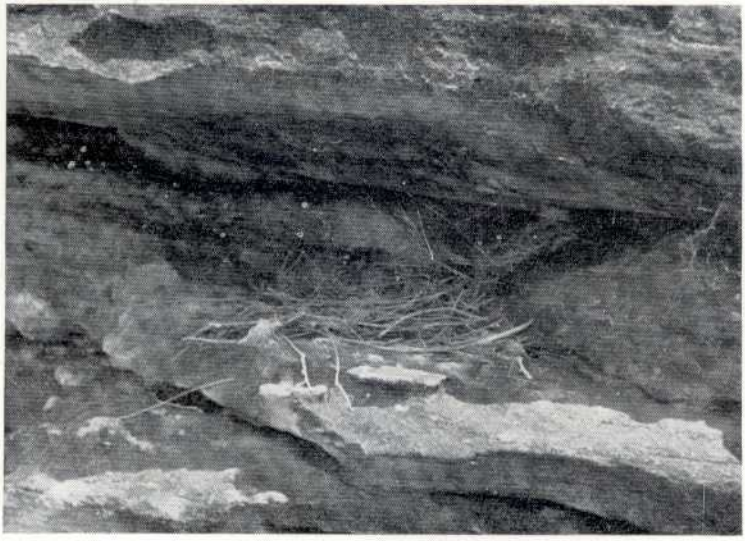


PLATE 1A (above)

Presumed nest-site of *Petrophassa rufipennis* on sandstone at edge of escarpment.

PLATE 1B (below)

Close up of presumed nest of *Petrophassa rufipennis*. The nest is somewhat disturbed, because it was examined for egg remains before taking the photograph.