been dispersed during sea ice breakouts (Budd 1962, *Proc. zool. Soc. Lond.* **139**: 365-388), and others disrupted by ice avalanches from nearby icebergs (Wilson 1907, *Natn. Antarct. Exped. (1901-4) Br. Mus. (N.H.)* **2**: 1-31; Prévost 1961, *Écologie der Manchot Emperor*), the form of upheaval reported above has not been recorded before.

In summary, probably this rookery is now closer to the coast than previously reported (Budd 1961, *op. cit.*), when it was 18 km offshore. The disruption of the rookery in 1965 caused many birds to leave the original site and establish another rookery some kilometres away. This second site, not occupied on 28 August, may have been in the old Auster position. Because of this migration, actual mortality at the original site cannot be estimated, but it could have been significant especially among the chicks. The unexpectedly large number of adults (30,000) and the unusually low proportion of them with chicks (30%) may have been partly because of counting errors, which can be large for the methods used (Budd 1962, *op. cit.*). However, these anomalies might also have been because this season the rookery was unusually near the feeding grounds, and so feeding birds might have returned to the rookery more often than they can when the feeding grounds are further away.

ACKNOWLEDGEMENTS

I wish to thank Dr G. M. Budd for his assistance in the preparation of this paper and the Acting Director of the Antarctic Division, Department of External Affairs, for permission to publish the work.

DR A. S. CAMERON, *Medical Officer, ANARE, Mawson.*
Present address: Morphett Vale, SA 5162.
15 May 1967.

THE NESTING HABITS OF SITTELLAS AND NUTHATCHES

The Australasian species of *Neositta* (sittellas) are usually regarded as members of the nuthatch family Sittidae. Some authors (Mayr 1941, *List of New Guinea birds*, but *non* Mayr & Amadon 1951, *Am. Mus. Novit.* 1496: Rand & Gilliard 1967, *Handbook of New Guinea birds*) put them in a separate family Neosittidae. Familial characters do not clearly justify the separation, but the different nesting habits of *Neositta* and *Sitta* species are usually adduced as evidence for it. *Neositta* spp. make a cup-shaped nest in a fork of a dead branch while *Sitta* spp. are said to nest in a hole, usually in a tree, and plaster the entrance with mud. This difference seems important and is worth considering in more detail.

The nest of *Neositta* spp. is a neat cup made of bark fibre with an outer layer of flakes of bark, bound together with spiders' webs. It is lined with lichen and pieces of spider egg cocoons (Camp-

bell 1901, *Nests and eggs of Australian birds*: North 1909, *Nests and eggs of birds . . . in Australia*: Hindwood 1966, *Australian birds in colour*); Campbell (*op. cit.*) refers to hair and wool being used.

Nuthatches of the genus *Sitta* nest in holes. Most of the American species do not plaster the entrance, but the Red-breasted Nuthatch *S. canadensis* may smear pitch-pine resin round it. The European Nuthatch *S. europaea* plasters the entrance with mud, leaving a hole just large enough to pass through, and the Rock Nuthatch *S. neumayer* nests in rock crevices and plasters the nest entrance to form a small funnel with the entrance hole at the top. The habit therefore varies among species of typical nuthatches and its absence does not necessarily indicate lack of affinity.

Although the *Sitta* nuthatches nest in holes, they use nest material. *S. europaea* builds within the hole a substantial nest of flakes of bark, with thinner pieces for lining; this is well illustrated and described by Löhrl (1958, *Z. Tierpsychol.* 15: 191-252). Other *Sitta* spp. use flakes or fibrous strips of bark for the main nest structure, but line with varying small quantities of grass, leaves, fur, feathers and spider egg cocoons (Bent 1948, *Life histories of North Am. Nuthatches* . . . Bull. U.S. natn. Mus. 195).

Thus *Neositta* and *Sitta* spp. seem to resemble one another, as far as is known, in that the nest is usually made of flakes of bark with a lining of different material. The use of spiders' webs as building material is widespread among Australian passerines and is probably an adaptation to particular conditions, but the typical nuthatches, nesting in holes, do not need it. Several avian families have species that build cup nests in the open and species that nest in holes; so this character does not justify separation. Few birds outside Australia use bark as building material, but it is another practice which is rather common among Australian passerines. It too may be an adaptation to particular conditions in Australia or an accidental similarity among the species of Sittidae arising from the occupation of a similar ecological niche; yet it could also indicate affinity because the typical nuthatches are some of the few birds outside Australia using it. To summarize, the nesting habits, as at present known, may not justify separation and in some aspects may indeed indicate relationship.

Finally, sittellas often have additional birds helping the nesting pair and such helpers at the nest are also recorded in the Pygmy Nuthatch *S. pygmaea* and the Brown-headed Nuthatch *S. pusilla* (Skutch 1961, *Condor* 63).

C. J. O. HARRISON, *14 Dawlish Avenue, Perivale, Middlesex, England.*

2 August 1967.

TABLE I

Transect number	No. of quads.	Area in m^2	Shearwater burrows	Tern nests		Remarks
				occup.	unoccup.	
1	7	1500	0	0	0	Eastern tip—mostly *Casuarina* fringe.
2	9	2560	141	160	125	Most terns on south side of interior here.
3	9	2690	107	346	444	Including small clearing devoid of tern nests.
4	8	2740	147	96	112	Including small area of station and resort.
5	7	2000	147	0	0	Mostly research station and tourist resort.
Totals	40	11490	542	602	681	