POST-INCUBATION ACTIVITY OF ADELIE PENGUINS

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ABSTRACT

From 30 December 1972 to 24 January 1973 records were kept of Adelie Penguin activity at Hallet Station, Antarctica. A total of 312 hours of observation time was spent observing 13 penguins of various ages. Quantitative evidence is presented on the amount of time spent by members of each age group at their respective activities.

INTRODUCTION

Several recent studies (Muller-Schwarze 1968, Yeates 1971, and Derksen 1974) have investigated diurnal activity in the Adelie Penguin *(Pygoscelis adeliae)*. However, since most of these studies were conducted on adult birds during the incubation period, very little information is available on the activity budgets of non-breeding birds or adult birds after their eggs have hatched. The purpose of this paper is to examine the activity budgets of non-breeding two- and three-year-old birds and breeding adults during the latter part of the nesting season and to relate these observations to data at present available on breeding adult Adelie Penguins.

Methods and Materials:

All observations were taken during the period 30 December 1972 to 24 January 1973 at Hallett Station, Antarctica (72°19'S, 170°13'E). The duration of various activities was determined by stopwatch while I was sitting in a small shelter near the study colonies. Oftentimes a non-breeding bird would move from one colony to another at which time I would move from the shelter and follow it at as great a distance as possible. A pair of 7 x 35 binoculars proved useful in observing these non-breeding birds.

Activity budgets were computed for the following birds: Five two-year-old birds, five three-year-old birds, and three breeding adults each with two chicks. The observations on the breeding birds were made while the chicks were still being cared for by the adults and before creches were formed. All penguins studied were of unknown sex.

Daily observation periods varied, but each penguin was observed for one complete 24-hour period (for example, one day I would observe from 1300-1600 and from 1900-2200 and the next day from 1600-1900, etc., until observations for a complete 24-hour period were obtained). This gave me a total of 312 hours of observation time on the 13 penguins studied.

All activity observed was placed into one of the following classifications:

(1) Resting — Sleeping in any of the various positions used by Adelie Penguins and all postures with open eyes in which the birds were not visibly alert.
(2) Alert — Postures characterized by the head being elevated from the resting positions, often with the crest feathers erected.
(3) Nest building — The time spent gathering new stones for the nest or rearranging those already in the nest.
(4) Territory defence — Threat displays directed at other individuals and actual pecking or fighting.
(5) Wandering — Time used by young penguins in wandering from one colony to another.
(6) Courtship — Includes mutual pair-forming displays (Sladen 1958) and copulation.
(7) Chick care — Time spent feeding and caring for chicks.
(8) Body maintenance — Includes preening, body shaking, stretching, yawning, and excretion.

RESULTS

Activity budgets for the 13 Adelie Penguins studied are contained in Table 1. The time spent resting and alert by the breeding birds compares favourably with the data presented by Derksen (1974) for incubating birds. However, as can be seen, the two- and three-year-old penguins spent significantly less time resting and more time alert. As would be expected, they also spent more time nest building than the breeding birds due primarily to their stone-gathering activity whereas the breeding penguins had only to maintain a nest built earlier in the season. The percent time spent resting, alert, and nest building was tested using as analysis of variance and found to be highly significant ($(P< .01)$).

The three-year-old birds spent significantly more time in territory defence than either the two-year-olds or the breeding adults. This is probably related to the fact that two-year-old Adelie Penguins spend more time wandering from colony to colony than the three-year-old birds. The two-year-old birds tended to not defend a nest as long as the three-year-olds. The breeding birds showed low activities in both of these categories because they remained on a territory established earlier in the season.

Courtship was also more prevalent among the three-year-old birds. Again, this is probably due to them showing a stronger nest-site attachment than did the two-year-olds. Courtship was non-existent in the breeding birds because their mates were not present while they were being observed.

The amount of time spent on body maintenance was about equal for all three groups, and since the non-breeding birds had no chicks they spent no time on chick care.

Table 1. Activity budgets for two-year-old, three-year-old, and breeding Adelie Penguins.

	Age		
Activity	Two(5)[1]	Three(5)	Breeding(3)
Resting	41.97[2]	45.16	84.01
Alert	43.71	41.20	14.12
Nest building	2.19	3.81	0.11
Territory defense	1.00	2.97	0.38
Wandering	0.81	0.79	1.16
Courtship	2.11	5.06	0.00
Chick care	0.00	0.00	0.22
Body maintenance	8.19	1.01	0.00
Unknown	0.02	0.00	0.00
Total	100.00	100.00	100.00

[1] Number in parentheses is sample size.

[2] Refers to percent of total time.

DISCUSSION

LeResche & Sladen (1970) state that females first breed when 3-4 years of age and males at ages of 4-6. They also state that older "wanderers" show a stronger nest-site tenacity than one- and two-year-old birds. This study has provided quantitative substantiation of these observations as well as presenting data on other activities of these non-breeding penguins.

Derksen (1974) has admirably performed a quantitative analysis of Adelie Penguin behaviour during the incubation period using time-lapse photography, and has hypothesized on how this behaviour might enable the Adelie to survive the harsh Antarctic environment. My observations presented here for the breeding adults compare favourably with his. Apparently little behavioural change is exhibited between the incubation stage and guard stage, except that increasingly more time is spent on chick care as the season advances.

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SHORT NOTE

THE BANDED DOTTEREL IN NEW CALEDONIA

The winter distribution of the Banded Dotterel *(Charadrius bicincta)* to the north of New Zealand is not well defined. The species has been recorded at Norfolk Island (Wakelin 1968), the Fiji Islands (Morgan & Morgan 1965, Smart 1971) and the New Hebrides (OSNZ 1970: 45). However, in his authoritative monograph on the birds of New Caledonia and the Loyalty Islands, Delacour (1966: 76) did not include the Banded Dotterel but commented that it is very likely that waders other than the nine he listed may occur there from time to time.

On 24 August 1974 at 1600h we observed a party of six Banded Dotterels in breeding plumage at Magenta, Noumea. They were feeding at low tide on a small sandbank 40 metres from the shore near the end of a light aircraft aerodrome runway. The Dotterels were accompanied by one Turnstone *(Arenaria interpres)* in breeding plumage, three Eastern Bar-tailed Godwits *(Limosa lapponica)* and seven Pacific Golden Plovers *(Pluvialis dominica)* one of which was in breeding plumage. The birds were disturbed from time to time by light aircraft taking off over the sandbank on which they were feeding. No waders were seen on visits to the area on 22 August and 1 September.

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