

# A DIURNAL RHYTHM OF ACTIVITY BY THE ADELIE PENGUIN

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## ABSTRACT

A diurnal rhythm of the numbers of Adelie Penguins (*Pygoscelis adeliae*) leaving from the rookery was observed at Cape Bird, Ross Island, Antarctica. No diurnal rhythm in numbers of birds returning to the rookery was observed.

## INTRODUCTION

Diurnal rhythms of activity in the Adelie Penguin (*Pygoscelis adeliae*) in continuous light conditions has been noted by Wilson (1907), Muller-Schwarze (1966, 1968), and Spurr (1972). Most of these studies dealt with activities of chicks or adult birds at the nest site, rather than with the movement of large numbers of birds. In the present study counts were made of the numbers of penguins leaving from and returning to the rookery area, at Cape Bird, Ross Island, Antarctica (77°13' S, 166°27' E).

## METHODS

Between 15 and 21 December 1973, ten minute counts were made on the hour, every hour, of the number of Adelie Penguins leaving for and returning from the Ross Sea fishing grounds. Birds were counted, from near the laboratory site using 8 x 30 binoculars, on the rookery beach, between two meltwater streams approximately 1 km apart where the birds gathered for ice-free access to open water. The status of the birds could easily be determined by the condition of plumage and direction of travel. Stationary birds were not included in the totals. Concurrent observations were made of light and temperature.

## RESULTS

Birds left the rookery in large groups of 30 to 100 individuals, numbers reaching a maximum at 2400 hrs, and a minimum at 1200 hrs (Fig. 1A). Returning birds were in small groups of up to ten and numbers showing no apparent rhythm (Fig. 1B). The total number of birds, leaving the rookery, per hour, increased over the observation period: at 2400 hrs on 15 and 16 December a mean of 180 birds per hour was observed, increasing to a mean of 300 birds per hour on 20 and 21 December. Cycles of light intensity and temperature reached a minimum at 2400 hrs and a maximum at 1200 hrs.



were easily recognisable from the shore by their black backs; the white bellies of those returning are hard to distinguish in the fissured sea ice . . .”

At Cape Bird observations were made during the latter part of the chick hatching period. The increasing number of chicks, and hence increasing demand for food, and shorter period of attendance at the nest site by the adults, is reflected in the gradual increase in the total numbers of adults leaving for the Ross Sea.

From the graphs (Fig. 1) there is apparently a greater number of birds leaving the rookery than returning. This difference could be attributed to the behaviour of the birds. Birds leaving gathered in large groups which progressed across the beach, few birds moving across the beach individually. Hence, each count included one or two groups on an otherwise deserted beach. Returning birds, however, travelled in small groups and on reaching the shore proceeded to their respective nest sites. Accordingly, there was a continual stream of returning birds throughout the day.

Although the maximum number of birds leaving the rookery was observed at 2400 hrs, high numbers were also observed later in the morning. These later birds were from the rear of the rookery. Groups of birds were observed moving through the rookery from 2400 hrs onwards but did not reach the beach where counts were made until 0200 hrs onwards.

A count should be made of the total number of returning birds, rather than the number present at one time. This would show numbers equal to those leaving and whether or not there is, in fact, a diurnal rhythm of numbers of birds returning.

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