BREEDING SCHEDULES OF ANTARCTIC AND KERGUELEN TERNS AT MARION ISLAND

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ABSTRACT

Observations on *Sterna vittata* and *S. virgata* breeding and foraging at Marion Island are reported. The breeding season of *S. vittata* corresponds with the period of least strong wind. The breeding periodicity of *S. virgata* is apparently less affected by seasonal wind variation, since the bird obtains much of its prey on land.

The Antarctic Tern *(Sterna vittata)* and the Kerguelen Tern *(Sterna virgata)* occur at Marion Island (46° 54'S, 37° 45'E), where the two populations have been estimated at 10 - 30 pairs (pers. obs) and 150 individuals respectively (van Zinderen Bakker, Jr. 1971). The Kerguelen Tern breeds at Kerguelen and Crozet islands and Marion Island. The Antarctic Tern breeds throughout the subantarctic region, but has not yet been confirmed as breeding at Marion Island. At Marion Island, tern eggs have been recorded in November (Rand 1954) and February (Crawford 1952).

Identification of the two tern species in the field at Marion Island proved initially difficult, in spite of detailed plumage descriptions given by Falla (1937). We were only able to identify solitary terns after we had compared both species at close range. Antarctic Terns were seen more frequently than Kerguelen Terns.

Two Antarctic Tern nests, each containing a single egg, were found at Marion Island in February 1975. The eggs measured 50.4 x 34.3 mm and 45.8 x 33.7 mm, and were situated on raised black lava platforms, within 10 m of the sea. One egg hatched on 15 February, and the second egg was found on 27 February. On 14 March, we observed a recently fledged juvenile being fed by adults at a third locality. No Kerguelen Tern eggs were found, but four recently fledged juveniles were seen at two different localities on 15 and 27 February. On both occasions the juveniles were part of small mixed flocks comprised of Kerguelen Terns and a few Antarctic Terns. At this time, all the Antarctic Terns were in breeding plumage, whereas all the Kerguelen Terns were in various stages of winter plumage.

According to Falla (1937), the two tern species have allopatric breeding schedules at Kerguelen where the Kerguelen Tern nests in October and November, and the Antarctic Tern nests in January and February. At the Isle de l'Est, in the Crozet islands, the last Kerguelen Tern eggs are laid in mid-December, 8 - 15 days before the first Antarctic Tern eggs are laid (Despin *et al.* 1972). Serventy (*in* Crawford 1952)

suggested that the February breeding records of the Kerguelen Tern at Marion Island possibly referred to the Antarctic Tern. Our data on Antarctic Tern nests, and on the temporal occurrence of various plumage phases (breeding, non-breeding and juvenile) support this suggestion. A tern nest and egg found on 9 February 1974 on an inland grey lava ridge at Marion Island (A. Burger pers. comm.) is attributed to the Antarctic Tern, on the basis of the date.

Antarctic Terns were often seen foraging over the kelp zone 20 - 200 m from the shore. On two separate occasions, a single Antarctic Tern was seen diving in brackish ponds, situated within the salt-spray zone at the coast. We could not, however, see whether the birds had obtained prey. The Antarctic Tern apparently feeds predominantly in the kelp zone at Heard Island (Downes *et al.* 1959) and at South Georgia (Murphy 1936), although intertidal polychaetes and limpets have been recorded in the diet of the birds at Heard Island (Ealey 1954). The Antarctic Tern has not yet been recorded as feeding on terrestrial invertebrates. At Marion Island, Kerguelen Terns were seen feeding on invertebrates in damp *Tillaea* meadows. At Kerguelen, the Kerguelen Tern has been recorded as feeding in the surf zone during the day, and on spiders and insects on marshy terraces at dusk (Falla 1937). Crustaceans, fish and insects were recorded in the diet of Kerguelen Terns at Isle de l'Est (Despin *et al.* 1972). Further study may show a similar partial overlap in the diets of the two terns at Marion Island.

Wind is an important environmental factor affecting the fishing ability of terns which dive for prey (Dunn 1975). Terns are unable to fish at optimum efficiency at high windspeeds, because of rough sea surface conditions, and starvation of chicks can result (Dunn 1975). Marion Island is subject to frequent strong winds, typical of subantarctic, oceanic weather. The three months at Marion Island with the least number of moderate gale days (during which the wind averages 54.8 km/hr for at least one hour) are February, March and April (Schulze 1971). The breeding season of the Antarctic Tern thus corresponds with the period of least strong wind. The breeding periodicity of the Kerguelen Tern is apparently less affected by seasonal wind variation, since it obtains much of its prey on land. It may similarly be possible to correlate differences in clutch size (1 - 3 eggs) in the Antarctic Tern at different localities (Murphy 1936) with the relative amount of wind and concomitant interference of feeding efficiency. In windy localities, parents may only be able to obtain enough food for one pullus.

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SHORT NOTE

LONG-TAILED FRUIT BATS AS PEREGRINE PREY

The hunting of insectivorous bats by Peregrines *(Falco peregrinus)* has been recorded in several parts of the world (Porter & White 1973, *Brigham Young Univ. Sci. Bull., biol. Ser.* 18: 30). Studies at a Peregrine eyrie at Joske's Thumb in southern Viti Levu, Fiji Islands, proved that the large Flying Fox fruit bat *(Pteropus tonabus)* which weighs over 700 g. was the staple food of the falcons there (Clunie 1972, *Notornis* 19: 302-322; 1976, *Notornis* 23: 8-28).

Bones collected from the Joske's Thumb eyrie reveal that the considerably smaller Long-tailed Fruit Bat *(Notopteris macdonaldi)* was also taken quite often by the Peregrines. The Long-tailed Fruit Bat, like the Flying Fox, is not strictly nocturnal, frequently venturing out of its roosting caves several hours before sunset to feed on yaqoyaqona *(Piper puberulum)* flowers growing along creek banks near Joske's Thumb.

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