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Foot-tapping by Juvenile Bridled Terns *Sterna anaethetus*: A Form of Communication?

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The three main types of non-vocal sounds of birds are those made by the tail feathers, wing feathers and the bill (reviews by Welty 1979; Manson-Bahr 1985). Welty (1979) also mentions the sounds made by several members of the grouse family (Tetraonidae), which stamp their feet on the ground in courtship, and van Tyne & Berger (1976) state that kiwis *Apteryx* spp. stamp their feet 'when annoyed'. However, we know of no example of foot-tapping similar to the one described here.

During a visit to Tryon Island, Queensland (22°15'S, 151°47'E) in January 1985, we heard continual soft tapping sounds after dark at ground level, below the tree canopy of *Pisonia grandis* and *Pandanus tectorius.* We eventually realised that these sounds were being made by juvenile (entirely downy) Bridled Terns *Sterna anaethetus* as they stamped their feet on the fallen branches and leaves on which they perched.

We could find no evidence that the birds were being irritated by insects despite a thorough examination of their immediate surroundings by torchlight. The birds showed no signs of distress and no unusual preening or pecking was noted. This suggests that annoyance by biting insects or ectoparasites was not the cause of this behaviour.

During the night, foot-tapping seemed to increase considerably in frequency, but ceased or was only occasional in daylight. Curious about this behaviour, we counted tapping sounds made by one chick a few metres from our campsite.

Our counts (n = 38; Fig. 1), made between 18-24 January 1985 (during which time the chick remained on the same perch), show a marked trend through the course of the day. Mean counts/min from sunrise to sunset and from sunset to sunrise were 9.4 and 64 respectively; tapping frequency was lowest in the morning and early afternoon and began to increase in the late afternoon. The highest count was 112 taps/min at 0400 h. Most taps, especially at night, consisted of a rapid double strike of one foot against the perch (counted as two taps). The relatively high mid-morning counts of 18 and 19 taps/min (Fig. 1) coincided with the only two occasions on which the chick was agitated; on one occasion an adult was flying overhead and both chick and adult were calling.

If the function of foot-tapping was to maintain communication with the parent birds, it would explain why the frequency of tapping was so much greater at night when visual contact between chick and adult was impaired (the latter, when present, roosted about 4 m above the chick in the trees). We found a tapping chick more difficult to locate than a vocalising chick and if a ground predator had similar difficulty, it might deter the predator from a lengthy search.

Why there should be a gradual increase in foot-tapping frequencies during the afternoon when there is still ample light is not clear. This hypothesis also fails to explain the function of foot-tapping when both parents are absent. Perhaps the proximity of other chicks merits future inves-

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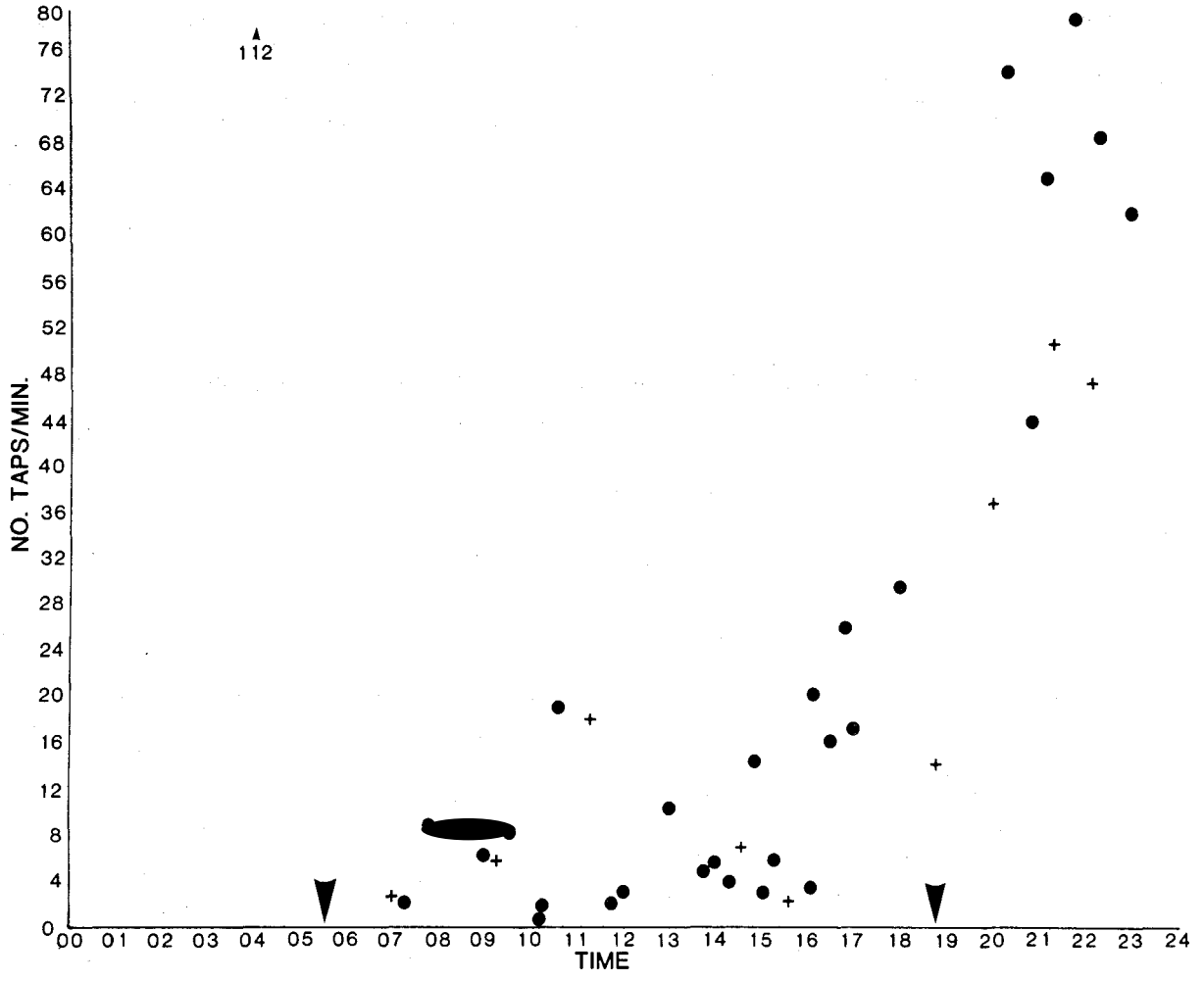

FIGURE 1 Frequency of foot-tapping by juvenile Bridled Tern. Counts were made over 5 min periods and the mean number of taps/min for each period is shown. A '+' indicates counts made on one day, 23 January 1985. Arrows show the mean times of sunrise and sunset during the study period.

tigation, as does the age to which birds continue to exhibit this behaviour.

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