The Sleep of the Emu

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Not built to roost, and too heavy to adopt a one-legged stance, the nocturnal rest habits of the largest of the world's avifauna—the Ratitae—posed a question of singular interest to the behaviourist.

The studies reported in this paper were carried out at the Zoological Gardens of Frankfurt, Germany. In these gardens for ten consecutive nights, from dusk till dawn, I watched three adult African Ostriches (*Struthio camelus*) and two adult Australian Emus (*Dromaius novæ-hollandiæ*).

Immediately the sun has set, the Emu lies down to sleep, although it may rise up to eight times during the night for the purposes of defecating and feeding.

Prior to the culmination of a deep sleep position, the bird will squat flat on the tarsus for periods of up to twenty minutes. In this attitude preliminary drowsiness becomes evident, the Emu exhibiting a condition remarkably suggestive of a late-at-night reader in a comfortable armchair. The bill, initially held at the horizontal, begins to sink downward, whilst drooping of the eyelids gives the impression that the bird is almost asleep. A convulsive backward jerk and restoration to the primary alert condition, however, dispels such an impression. It is surmised that the bird sleeps only lightly on the tarsus, providing every opportunity of reaction in an emergency, as once the deep sleep attitude is reached the Emu seems insensible to the reception of noise or visual stimuli.

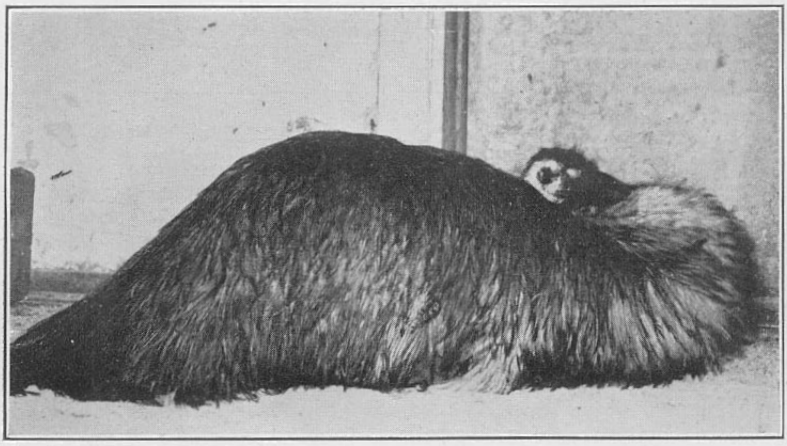
Unusual sounds prompt the bird to maintain the tarsal squat for a prolonged period of time, and at cessation of noise it may continue in this position for twenty minutes before relaxing to full rest. The aforementioned nightly meandering is also followed by a squat of several minutes previous to deep sleep.

When satisfied as to the safety of the surroundings, the Emu tips forward on to the breast, lowering the abdomen behind as it does so, until it is resting squarely on the ground with the legs doubled upon themselves beneath the body. The long plumage, brushing the earth beside the bird, now assumes the function of a water run-off, directing rain down and away from the body of the sleeper. When viewed from a distance, the resemblance of the bird to an ant-hill is remarkable, and is probably a highly effective camouflage.

The head and neck continue in an erect condition for some time after the complete body drop, although the state of drowsiness previously mentioned will persist. Then with

a sudden unrehearsed jerking motion, the neck is folded back until the nape rests over the mantle, and the bill is lowered along the throat so that the attitude resembles that of the foreparts of a snake in a close strike position. The eyes now fully close.

As the sleeper now assumes a seemingly comatose state, this stage of rest becomes considerably dangerous as regards predators, and the tarsal squat may be considered as intermediate between deep sleep and the alert.



A sleeping Emu, Frankfurt Zoological Gardens
Photo. by K. Immelmann

Displacement activities, such as pecking, are correlated with the preliminaries to full rest.

On an average, the Emu will awaken every 1½ to 2 hours, rise to the tarsus for a few minutes, then stand to defecate and feed. This interruption to sleep continues from 10 to 20 minutes, after which the entire process is repeated. In this manner, the Emu is disturbed from four to six times a night, the actual duration of complete rest being up to seven hours. It is as yet uncertain whether Emus in the wild state rise at night to feed, but very probably the pattern is similar, since defecation cannot be avoided.

A variation of the sleeping position in the adult Emu was observed in the juvenile—which, like the Ostrich, rests with the head and neck outstretched over the ground. This attitude is undoubtedly the outcome of possession of the longer, more slender neck, typical of the Ostrich. It makes extremely difficult the adoption of any more conventional position by this species.

A striking fact in relation to this rest state by the Ostrich is the period of actual sleep of the bird. Never in full sleep does it continue over many minutes at a time,

varying between one and sixteen minutes. This extremely interesting difference from the Emu must be correlated with the relative abundance of raptorial animals. In Africa they are very numerous in number and variety, but almost insignificant in Australia. Obviously the limited sleep of the African Ostrich is an adaptation to environment. Amazingly, the physiological mechanisms of the sleep-starved Ostrich do not appear to suffer under these seemingly adverse conditions.

Casual observation of two Cassowaries (*Casuarius* sp.) in an adjoining enclosure showed a similarity in position and duration of sleep to that of the Emu, with the exception of the period of squatting. There, the Cassowary maintains a drowsy vigil from 1 to 1½ hours prior to full retirement. Further investigation of these birds is, however, required.

As yet completely unknown are the sleeping habits of the South American Rhea (*Rhea americana*) which, it is assumed, having the bodily features of the African Ostrich, may adopt some similar pose.

REFERENCE

Immelmann, K. 1959. 'Vom Schlaf des afrikanischen Strausses', *Die Naturwissenschaften*, 46, p. 564.

Food Parasitism by Silver Gull.—It has long been known, in several parts of the world, that some species of birds will on occasions steal food that has been obtained by other species. This habit is distinct from that of robbing food by force such as is done by skuas and frigate-birds.

Snatching food from ducks is sometimes practised by Coots, and one species of duck has been reported snatching food from Coots. W. P. Baldwin (*Auk*, 63, 96-97, 1946) records Laughing Gulls (*Larus atricilla*) in South Carolina, U.S.A., robbing Brown Pelicans (*Pelecanus occidentalis*) of fish just captured by the latter, sometimes even alighting on the Pelicans' heads. At St. Helens, Tasmania, Robert Money (*Wild Life*, 9 (4), 151, 1947) reported having seen 'sea gulls', probably Silver Gulls (*Larus novæ-hollandiæ*), perching on the backs of Pelicans (*P. conspicillatus*) and occasionally robbing the latter of their catch of fish.

On February 27, 1960, in the company of Messrs. R. Schodde and K. G. Simpson, evidence of food parasitism by Silver Gulls was observed at the Salt Pans, between St. Kilda and Port Gawler, S.A. Altogether eight Pelicans were seen swimming and feeding, and each had a Gull perched on its back. When the Pelican lunged to take prey in the water, the Gull would walk along the neck of its host and then perch on the latter's head. As the Pelican withdrew its bill from the water, the Gull quickly settled on the water close to it and endeavoured to seize the catch. The associated birds