legs were thrust forward during an attempt at prey capture. Goslow (1971, Auk 88: 815) measured the velocity of pelvis and leg thrust of various raptors during prey capture under laboratory conditions. Two female Goshawks had average foot velocities of 2250 cm/sec (50 mph) at the moment of impact with the tethered pigeons. The forward velocity of the pelvis was about 1980 cm/sec (44 mph). In the wild, Goshawks characteristically capture prey by short fast dashes from perches or while flying at considerable speed through the woods to surprise potential prey. Motivations of hunger and the excitement of the chase could conceivably result in much greater velocities of the feet and pelvis than those recorded under lab conditions. Goslow also recorded foot velocities of 1140 cm/sec for the Cooper's Hawk (*A. cooperii*) and 650 cm/sec for the Red-tailed Hawk (*Buteo jamaicensis*). As with the Goshawk, the pelvis velocity was about 15% less than the foot velocity. The potential for injury would appear to be considerably greater for the Goshawk given its mode of hunting, densely wooded habitat, and the velocities attained during prey capture.

During banding operations at Hawk Ridge the fall of 1976 I caught three more hawks with sticks in them as follows: On 9 September an immature female Sharp-shinned Hawk (*Accipiter striatus*) had a twig roughly 120 mm long through the right patagium close to the body. On 21 October an immature Red-tailed Hawk (*Buteo jamaicensis*) sex unknown, had a stick about 210 mm long that entered just above the left side of the furculum, passed just left of the crop and neck, and out the back of the neck; it extended about 25 mm in front and 130 mm in back. On 25 October another immature, unsexed Red-tail had a stick 32 mm long in the left wing between the radius and ulna. All three birds seemed in good condition and flew with no apparent difficulty before capture. I removed the sticks and applied antiseptic to the wounds, none of which needed suturing, and the birds flew off handily after being banded.

I thank the Hawk Ridge Nature Reserve, Robert Rosenfield, and Donald Scheer for their contributions to the banding program.—DAVID L. EVANS, *Department of Zoology, North Dakota State University, Fargo, North Dakota 58102.* Accepted 11 Feb. 76.

Jackass Penguins sunning at sea.—I saw Jackass Penguins (*Spheniscus demersus*) sunning themselves at sea in the vicinity of the Cape Peninsula, South Africa, on 8–9 December 1975 during a cruise of the University of Cape Town's Research Vessel, *T. B. Davie*. The sea was calm and the sky was clear. Table 1 gives the number and percentage of birds sunning and number of birds seen at different times of the day. Sunning was noted commonly only in the first 2½ hours after sunrise by both adult and juvenile birds. Sunning behavior consisted of rotating the body approximately 45° around its long axis so that one flipper, held away from the body, and one foot, with a spread web, were above the water surface and exposed to the sun. Jackass Penguins use a similar posture in bathing groups at sea when preening their axillary region, but no preening was noted and the head was held in a forward position. Birds commonly altered their position relative to the sun to watch the boat, but I had an impression that the back of the flipper and body initially faced the sun in most cases.

Jackass Penguins are conspicuously marked birds with black backs and white fronts, this pattern being repeated in the flippers. The feet, unlike those of non-*Spheniscus* penguins, are black. It is suggested that exposing the black back, flipper, and foot to the sun results in a positive heat gain. Jackass Penguins have extensive arterio-venous associations in their flippers and feet that facilitate heat retention (Frost et al. 1975, J. Zool. 175: 231). On land, Jackass Penguins commonly orientate themselves relative to the sun to promote either heat gain or heat loss and the surface temperature of the back can exceed body temperature (Frost et al. 1976, J. Zool. 179: 165).

Sunning presumably helps the birds warm up after a night spent at sea. During the day heat gain probably

TABLE 1
SUNNING OF JACKASS PENGUINS AT SEA

	8 December 1975			9 December 1975		
	1000–1100	1330–1515	1615–1800	0630–0730[1]	0730–0800	0800–1000
No. sunning	0	0	0	7	2	1
Percent sunning	0	0	0	78	67	11
No. observed	10	16	10	9	3	9

[1] Time of sunrise 0528; time of sunset 1948.

occurs through the back, which is normally exposed to the sun during surface swimming or resting. This cannot occur at night, and sunning therefore occurs in the early hours of the morning to compensate for overnight heat loss. Boersma (*in* Stonehouse 1975, The biology of penguins, London, Macmillan Press, p. 108) reported Galapagos Penguins (*S. mendiculus*) at sea with dry backs and considered that they were sunning. The birds were not described as holding their feet or flippers above the water.

Although the paucity of the data is recognised, sunning of Jackass Penguins at sea has not been observed previously (Siegfried et al. 1975, Zool. afr. 10: 87) and the peculiar posture has not been described for other members of the order. For this reason the attention of workers in a position to make observations is drawn to the phenomenon.

This note is one in a series of papers dealing with the ecology and conservation of the Jackass Penguin. The research is supported financially by the National Geographic Society, the Witswatersrand Bird Club, the Oppenheimer Memorial Trust, and the University of Cape Town.—J. Cooper, *Percy FitzPatrick Institute of African Ornithology, University of Cape Town, Rondebosch 7700, South Africa.* Accepted 1 Mar. 76.

Chemical residues in Arizona Harris' Hawk eggs.—The association of chlorinated hydrocarbons with reproductive failure of certain raptors has been documented (Hickey and Anderson 1968, Science 162: 271–273) and studied in a number of North American hawks, falcons, and eagles. This paper presents information on chemical residues and egg shell thicknesses found in five Harris' Hawk (*Parabuteo unicinctus superior*) eggs that I collected in Pima and Pinal Counties, Arizona in the Lower Sonoran Desert in 1975 from different nests, either as an egg that did not hatch among a brood of young (2 cases), or as an egg from a deserted clutch (3 cases).

The five eggs contained the following chemical residues as measured in ppm wet weight (mean is first, range second): DDE, 1.10, 0.34–2.20; dieldrin, 0.04, 0.02–0.06; hexachloro benzene, 0.01, 0 (four eggs had amounts less than 0.01 ppm); heptachlor epoxide, 0.06, 0.02–0.13 (one egg did not have this residue present); aroclor 1260, 0.26, 0.80–0.10 (one egg had quantity estimated). Mean thickness of egg shells with membrane was 0.392 mm (range = 0.350–0.440, shell thickness for one egg was average of five measurements), and without membrane 0.292 mm (range = 0.250–0.320).

Fifteen pre-DDT (prior to 1947) Harris' Hawk (*P. u. superior*) eggs (from 5 sets) in the egg collection of the Western Foundation of Vertebrate Zoology, had a mean shell thickness with membrane (as measured in the middle latitudes of the egg, opposite the blowhole, using their modified machine) of 0.406 mm (range = 0.333–0.473). One set may possibly have lacked shell membranes. Thirteen post-DDT eggs (from 4 sets) in the same collection had a mean shell thickness with membrane of 0.404 mm (range = 0.363–0.470). These values are very close to the mean of 0.392 mm in my study and it appears that egg shell thinning is probably not occurring in Harris' Hawk populations in southern Arizona.

Peakall (1970, Science 168: 592) includes the following as symptoms of raptor reproductive failures attributable to pesticide contamination: (1) failure to lay eggs, (2) failure to relay after the loss of an initial clutch of eggs, (3) egg breakage, and (4) abnormally late breeding. I have recorded only the third symptom in my years of Harris' Hawk study from 1969 to 1975, and this requires an explanation. Although broken eggs were occasionally found at nests, it was not clear whether the breakage was caused by pesticide contamination, careless adult hawks incubating, or predation. Judging from the low chemical residues in the eggs, I suspect that the latter two explanations are the most probable.

In my study all chemical residues occurred in low levels. Compared to the high amounts of DDE and dieldrin associated with nesting failures in other raptorial species, Harris' Hawks in saguaro-palo verde (*Carnegiea gigantea-Cercidium* sp.) flatland in southern Arizona appear presently stable as regards a possible population decline from chlorinated hydrocarbons. Egg contamination is probably coming from biocides consumed by resident prey populations. The fact that the prey species are almost exclusively resident and that the nests sampled averaged 16 km from agricultural areas (range = 5–26 km) suggests that some contaminants may filter into Harris' Hawk habitat by seasonal water drainages. Also Harris' Hawks that live short distances from agricultural areas may pick up contaminants when prey populations have declined in winter and the hawks move about more and into cultivated areas.

Snyder et al. (1973, Bioscience 23: 300) correlated increasing DDE residues in Cooper's Hawk (*Accipiter cooperii*) eggs with an increasing percentage of birds in the diet. Prey birds in this study included migratory species. Also, many raptorial species hardest hit by the pesticide syndrome, include hawks and falcons with a high percentage of birds in the diet. Mader (1975, Living Bird 14: 59) recorded the following for 91 observed prey deliveries at two Harris' Hawk nests and nest vicinity in southern Arizona: 52 mammals (57.1% indiv., 72.1% biomass), 32 birds (35.2% indiv., 26.2% biomass), and 7 reptiles (7.7%