important because the eyrie is near the southern limit of peregrine distribution for the northern hemisphere, and is in an area that has mild temperatures during the time peregrines nest. Nevertheless, it is unlikely that even both of these effects in combination could produce such a large reduction from the average.

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ADDENDUM

An additional record of a small peregrine egg was recently brought to my attention. Charles Bendire (Smith. Inst. Spec. Bull. No. 1, 1892) noted an egg with dimensions of 38.5 mm x 30 mm (L x B). This egg is smaller than any I could find recorded, but it was a single example (a runt) and not a clutch as in the case of the Sonoran eggs.

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Eyrie Aspect as a Compensator for Ambient Temperature Fluctuations: A Preliminary Investigation

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Raptor ecologists have long recognized that nest site characteristics may influence reproductive success for many birds of prey (Olendorff 1973; Porter and White 1973; Ogden and Hornocker 1977). However, few studies have demonstrated relationships between nest site characteristics and physical factors that may provide energetic or reproductive advantages.

It has been suggested that the Prairie Falcon (*Falco mexicanus*) prefers nest sites with a southerly exposure (Enderson 1964; Olendorff 1973; Porter and White 1973; Denton 1975; Ogden and Hornocker 1977). Additionally, Leady (1972) and Williams (1981) noted a component of easterly-facing eyries. McGahan (1968) speculated that an easterly eyrie aspect in Golden Eagle (*Aquila chrysaetos*) in Montana may negate early morning chill and temper afternoon heat, however, he did not test this prediction.

In 1980, I studied the reproductive phenology of a local population of Prairie Falcons nesting at high elevations ($\bar{x} = 2720 \pm 199$ m) in central Colorado (Williams 1981). Of the 14 eyries examined, 7 had east or southeasterly aspects between 93-165°. I initiated a preliminary investigation using one of these eyries to estimate the relationship bet-

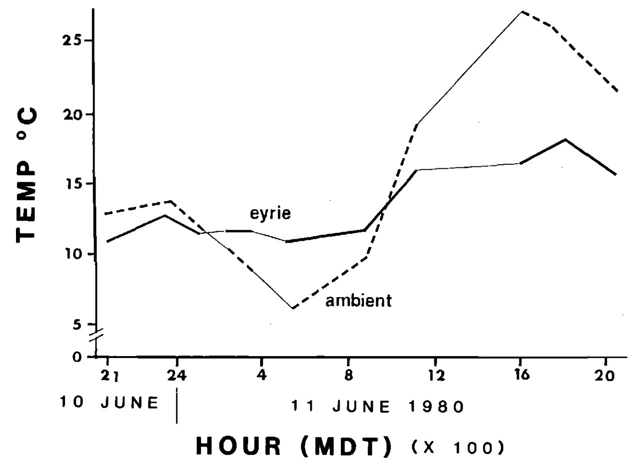

Figure 1. Eyrie and ambient temperatures for eyrie No. 2, 10-11 June 1980. Solid line denotes eyrie temp. Dashed line denotes ambient temp. Thin lines represent time periods when data were not collected.

between eyrie aspect, eyrie temperature and ambient temperature.

I collected eyrie and ambient temperatures over a 23 h period (2100 H MDT 10 June 1980 - 2000 H MDT 11 June 1980) from eyrie No. 2 (Williams 1981) in North Park, Colorado (eyrie aspect = 95°, cliff aspect = 80°, elevation = 2650 m). Temperatures were recorded using a Yellow Springs Thermistor Unit with wire temperature probes. Eyrie temp was monitored via a wire probe taped to the rear wall of the eyrie. The probe was in the shade at all times, placed 0.4 m above and behind the nestlings in the center rear portion of the eyrie. I do not believe the probe was close enough to the nestlings to have been influenced by their metabolic heat. The nestlings were 16 d old at this time. Ambient temperatures were collected in the shade at the cliff base. Temp was recorded at 15 min intervals from a secluded spot 30 m from the eyrie where my presence seemed to have no affect on the behavior of the adult birds. Weather during the 23 h period was clear with winds between 12-18 kph.

Minimum and maximum eyrie and ambient temp and ranges during the study period are shown in Figure 1. Eyrie temp was higher than ambient temp from 0100-0930 H, whereas ambient temp was higher than eyrie temp from 2115-0100 H and 0930-2000 H. Paired t-Tests were used to compare ambient temps higher and lower than eyrie temps. Both tests were significant: higher ($t = 7.07$, df 31, $P < 0.01$) and lower ($t = 10.9$, df 17, $P < 0.01$).

Ambient temp fluctuated 21.2° C, whereas eyrie temp fluctuated only 7.4° C during the 23 h sampling period (Fig. 1), suggesting that a microclimate exists within easterly-facing eyries which buffers nestlings from ambient temp extremes. This buffering is most readily seen where early morning and late afternoon ambient temps varied greatly from eyrie temp. Eyrie and ambient temps were equal (13° C) at 1000 H. Eyrie temp increased only 4° C during the next 8 hours, whereas, ambient temp increased 14° C. Platt (1974) noticed a 5-8° C difference between ambient and eyrie temperatures, with the eyrie invariably cooler during the hottest time period of the day. Clayton M. White (pers. comm.) also noted clear differences between ambient and cliffside temperatures while entering Gyrfalcon (*Falco rusticolis*) and Peregrine Falcon (*Falco peregrinus*) eyries in Alaska.

In the cold climates of both Alaska and high elevation Colorado, environmental temperature fluctuations are apparently ameliorated by the action of solar radiation falling on the cliff surface. The cliff functions as a heat sink during the day, slowly absorbing heat from solar radiation and serves as a heat source at night, slowly losing the absorbed heat to the cooler night air. This keeps the cliff-face warmer than the minimum ambient temp at night and cooler than the maximum ambient temp during the day. Nesting falcons were able to utilize the moderated environment to initiate reproductive activities (courtship and egg-laying) while ambient conditions were still quite harsh. In both Alaska (C.M. White pers. comm.) and Colorado (Williams 1981), this was necessary so that nestling phenology was timed with peak abundances of prey species.

The relatively moderate microclimate of eyries should enhance nesting success. Adult falcons can devote less time to brooding and shading of young during daylight hours, thereby providing increased time for predator detection, eyrie defense and hunting. Increased prey deliveries would greatly benefit the youngest nestlings, who often do not survive the nestling period during times of food shortage. All of these factors could increase the probability of nesting success and the number of young fledged by reducing nestling mortality.

Further studies are needed to define the role of eyrie aspect in nest site selection by Prairie Falcons. Data on eyrie and ambient temperatures from the courtship to fledging phases of nesting phenology should be collected from north, south, west, and east facing eyries across a spectrum of elevational and latitudinal locations. Such information could be coupled with existing data on nest site selection and productivity to identify general trends (and local patterns) in nest site selection of Prairie Falcons throughout their breeding range.

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Successful Breeding of a Pair of Sharp-shinned Hawks in Immature Plumage

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Adult plumage in *Accipiter* is usually acquired during an individual's second summer (1 year after hatching). Since this molt is not completed until the following fall, nesting accipiters can be easily identified as immature (yearling) or adult (2 or more years) on the basis of plumage. Although Bent (1937) stated that each of the three North American *Accipiter* species may breed as yearlings, published accounts of such breeding, particularly of yearling males, are uncommon. In the Northern Goshawk (*A. gentilis atricapillus*) and the Cooper's Hawk (*A. cooperii*), yearling females are known to occasionally pair with adult males and breed (Meng 1951; McGowan 1975; Reynolds and Wight 1978). I could find no published account of such pairing in the Sharp-shinned Hawk (*A. striatus*). However, K. Tuttle (pers. comm.) observed this at 1 of 26 nests found in Utah and Idaho during the 19-y period 1963-1981, and C.M. White (pers. comm.) saw this at another Utah nest in 1963. Breeding by yearling males is apparently a rare event. Two cases each of breeding by yearling male Cooper's Hawk (Kline 1975; Rosenfield and Wilde 1982) and European Goshawk (*A.g. gentilis*) (Glutz von Blotzheim 1971) have been reported. R. Rosenfield (pers. comm.) has recently observed this at 2 additional Cooper's Hawk nests. To my knowledge, breeding by yearling male Sharp-shinned Hawks has not been documented. K. Tuttle (pers. comm.) observed this in 1973 at a Utah nest site at which an adult male had been shot and killed the previous year. This note documents the successful breeding of a pair of Sharp-shinned Hawks, both in immature plumage.

On 23 May 1983, while searching for nests as part of a breeding ecology study of accipiters in central Utah, I encountered an immature female Sharp-shinned Hawk in what later proved to be the nest stand. The male was first observed on 3 June and appeared virtually identical to the female in plumage and eye color. It was easily separable by its smaller size and higher pitched call.

The nest stand was at an elevation of @ 2000 m on a gentle, north-facing slope in the Uinta National Forest, 8 km northeast of Provo, Utah County. A partially constructed nest was found during the initial observation of the female. The nest was located 4 m above ground near