TABLE 1. Foods in 53 pellets cast by a pair of Golden Eagles in central Alaska in 1963.

Food items	Frequency occurrences		Occurrences alone[a]		Pellets dominated (volume)[b]	
	No.	%	No.	%	No.	%
Ptarmigan	43	81.1	18	34.0	26	49.1
Snowshoe Hare	27	50.9	5	9.4	17	32.1
Marten	6	11.3	1	1.9	5	9.4
Weasel	1	1.9			1	1.9
Microtine	1	1.9	1	1.9	1	1.9
Passerine	1	1.9	1	1.9	1	1.9
Duck	1	1.9	1	1.9	1	1.9

[a] Pellets in which the item was the only item.
[b] Pellets in which the item predominated over other items (if any) with which it occurred.

Lagopus sp. were taken frequently. However, no previous North American study has recorded such a high incidence of birds in Golden Eagle food habits.

Hares were not common along the upper Steese Highway in 1962 or 1963, although there was a small concentration at mile 102, well within the range of the nest, and I regularly saw hares there. The proportion of hares to ptarmigan in the pellet analyses was almost certainly greater than their proportional occurrence in nature during the time of the study. Thus it seems evident that the eagles hunted hares preferentially. This is not surprising since lagomorphs have predominated in most previous food studies of North American Golden Eagles (see McGahan 1968).

The fact that marten remains constituted 75% or more by volume in five of the six pellets in which it occurred strongly suggests that more than one of these animals was taken. Rukovskii and Kupriyanov (1968) found marten remains at nests and speculated that food residues around the nests initially attracted the martens which were then killed by the eagles, perhaps more as nest-defense responses than as acts of food-getting. However, martens commonly occur above timberline (Streeter and Braun 1968) in typical Golden Eagle hunting habitat, and they are therefore subject to predation. During my study, tundra voles (*Microtus oeconomus*), the probable identity of the single microtine occurrence listed in table 1, were abundant in local uplands and they may have been the attractors of the prey martens in this case.

Short-tailed weasels (*Mustela erminea*) were common predators of ptarmigan nests in neighboring hills. The unidentified passerine listed here was almost certainly a Gray Jay (*Perisoreus canadensis*), a common species in the area, and the duck was probably a Harlequin Duck (*Histrionicus histrionicus*), a regular though not common summer resident along mountain streams in the area. I have seen this species on Birch Creek, within a mile of the nest site.

In the only other northern study I have reference to, that of Murie (1944), foods taken differed significantly from those reported here. As in most other North American studies, mammals predominated, but in this case by far the majority were ground-dwelling sciurids. Ptarmigan and lagomorphs, combined, occurred in less than 3.5% of Murie's total sample; he points out that both were rare in the areas he covered. Summarily, Cameron (1908) is probably correct when he suggests that individual Golden Eagles are opportunistic in their feeding, relying largely on items most convenient to their eyrie.

I acknowledge, with thanks, the assistance of the following people: R. B. Weeden for calling attention to the nest, suggesting the food study, and providing assistance with some of the identifications; F. C. Dean for advice and assistance while the study was in progress; and S. R. Johnson for critically reading the manuscript.

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CONFIRMATION OF THE NESTING OF THE GRAY JAY IN NEW MEXICO

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Although grown young have been seen and the species is known to be a resident in the state, no actual nests of the Gray Jay (*Perisoreus canadensis*) have ever been reported from New Mexico (Bailey, Birds of New Mexico, NM Dept. of Game and Fish, Santa Fe, 1928; Hubbard, Check-list of the Birds of New Mexico, NM Ornithol. Soc., Albuquerque, 1970). On 9 June 1972, I observed such a nest in the Sangre de Cristo Mountains of north-central New Mexico and was able to photograph two nestlings. The exact locality was in the subalpine on West Truchas Peak, Rio Arriba County, which is about 15 miles E of Truchas, New Mexico and at an elevation of 3470 m (11,400 ft) above sea level. The nest was located in spruce-fir forest and was placed in a 15-m spruce (*Picea engelmannii*), about 4.2 m above the ground. The nest measured 20 cm at its greatest diameter, with a cup 9 cm in diameter. Its composition was of spruce twigs, with an inner layer of lichens and grasses and a lining of wool, red thread, and feathers, including gray down and blue quills apparently from a Steller's Jay (*Cyanocitta stelleri*). The nest was free of fecal material.

On being disturbed, one of the nestlings climbed from the nest and up into the spruce tree, while the other flew to the ground and was captured. Its measurements include: length, 18.5 cm; wing spread, 22.0 cm; bill, 1.5 cm; and longest retrix, 7.5 cm; weight was estimated at 50–75 g. By the afternoon of 9 June, both nestlings were gone from the vicinity of the nest tree, and on 10 June the adult pair chased a Common Raven (*Corvus corax*) from the area. On 23 June, at my nearby base camp, a pair of adults and the two young were present; the latter were fed table scraps by their parents. The family group was still there as late as 22 October, the date of my last visit.

I am grateful to various people for information on the status of the Gray Jay in New Mexico and to John P. Hubbard for comments on an earlier draft of this note. Color slides of the nest and nestlings were taken and are in my personal collection.

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THE BIOENERGETICS OF THE BLUE JAY IN CENTRAL ILLINOIS

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Experiments on the House Sparrow (*Passer domesticus*) show a seasonal adjustment in bioenergetics as a condition for permanent residency (Kendeigh 1949). Migratory species appear not to have evolved as great a capacity for a photoperiodic-induced change and this may be why they move to areas with more suitable climates in winter (Seibert 1949). The breeding range of the northern subspecies of the Blue Jay (*Cyanocitta cristata bromia*) extends northward to Edmonton, Alberta, Canada, and southward to the northern parts of the Gulf states in the United States. Birds from the more northern part of the range are known to migrate south during the winter, while those in the more southern part are presumed to be stationary. The jays in central Illinois during the winter represent a combination of the sedentary and migratory populations. This investigation attempts to determine and quantify the bioenergetics of the permanently resident birds.

No studies of existence metabolism have been conducted on a passerine bird as large as the Blue Jay. Thus, a further objective of this study is to extend and verify the equations of Kendeigh (1970) depicting the relation of weight to existence energy requirements.

METHODS

Blue Jays were captured in 36-mm mist nets in the vicinity of Champaign County, Illinois, using cracked corn as bait or a mounted specimen of the Great Horned Owl (*Bubo virginianus*) as a decoy. During the summer (May, June, July) the birds were used immediately in summer-phase experiments. The survivors were housed out-of-doors and used the following winter, along with additional captures in early October, for the winter-phase experiments. Because winter migrants were not present in Champaign at the time of trapping, I assumed that the birds were residents. Fifty-two birds were trapped of which 31% lived long enough to complete one successful experiment. Jays that died from unknown causes or shortly after capture averaged 85.7 ± 2.4 g and were quite fat. Wild birds weigh 84.5 ± 17.5 g.

Those that survived the initial caged conditions were maintained in good health on dog food and cracked corn. The dog food was Ken-L Ration, which has a guaranteed content of 10% crude fibre, 0.4% ash, 0.5% calcium, 0.3% phosphorus, and 600 U.S.P. units of vitamin D_2 per pound of feed. The ingredients include meat by-products, soy grit, horse meat by-products, oatmeal, cracked barley, cracked milo, iodized salt, onion powder, choline chloride, garlic powder, vitamin A supplement, irradiated yeast, sodium nitrite, and thiamine mononitrate. The moisture content was 69%, and the average caloric value was 5.61 kcal/g. The cracked corn contained 12.5% moisture and had a caloric content of 4.45 kcal/g.

Weighed portions of cracked corn were given to the birds at the beginning of each experimental run. The dog food was given to the birds in weighed, daily portions to maintain its palatability and to reduce spoilage. The dry weight of the fresh food was calculated.

The energy balance experiments were similar to those of Kendeigh (1949). The runs varied from 2 days at low temperatures to 3 days at elevated temperatures. At the end of each run the excreta, corn, and dog food were separated from each other by hand, dried at 65°C until the sample weight stabilized, weighed, and the caloric value of the excreta determined in a Parr macro-bomb calorimeter. The caloric value of the feces and of the urinary waste is the *excretory energy* (EE). The measured dry weight of the excess food was subtracted from the calculated value of the initial weighed portion to determine the *gross energy intake* (GEI). The GEI minus the excretory energy is the metabolized energy of the food consumed. No correction was made for fermentation of the undigested food or for energy used by bacteria in the intestine. *Existence metabolism* (EM) is the amount of energy utilized during periods when the birds did not vary more than 2% in weight. During an experiment, the birds were kept in 46 × 32.5 × 45 cm cages with 2.5-cm wire mesh false floors. A 1.25-cm diameter dowel perch was placed across the cage. A pan underneath the cage caught the falling feces and scattered food. Water was supplied at temperatures above 0°C and snow at temperatures below freezing.

The experiments were performed after the birds had acclimated to the experimental conditions for a week, or until they maintained constant weight. Each group of three to seven birds was run at several consecutive descending or ascending temperatures. Birds were changed from one experimental temperature to the next in 5°C steps. Experimental temperatures were maintained at ± 1°C in walk-in temperature cabinets. The humidity in the cabinets ranged from 35 to 98%.

The photoperiods in the "winter" and "summer" experiments were 9L:15D and 15L:9D, respectively. The light intensity ranged from 20 foot-candles at −30 and −20°C to 80 foot-candles at 28 and 38°C.