which has extended its range across the Rio Grande into the United States. A well marked set." While the label appears to have been written by Armstrong, we have no idea as to who may have collected the egg set for him or where he might have been at the time.

The set of eggs show good agreement with three sets in the United States National Museum of Natural History, being whitish in ground color and heavily dotted and flecked with reddish brown. The eggs average 33.9 mm × 24.6 mm, with the extremes being 31.7 to 35.9 mm in length and 24.0 to 25.3 mm in breadth. The series of Brown Jay eggs in the USNM (northeastern Mexico) averages 35.3 × 25.0, with the extremes 32.8 to 36.7 and 24.4 to 25.8. From our comparisons we have no question as to the correct identity of the set.

Armstrong is known to have been somewhat vague about some of his collecting localities, but at this juncture we are inclined to accept data of the egg set as valid because of the details specifically stating that it was taken in the United States. Smith's reputation for accuracy and precision was excellent and we see no reason to query the data of the skin.

We are uncertain of the Brown Jay's present northern limits of regular occurrence in eastern Mexico, but Ridgway (1904, Bull. U.S. Natl. Mus. 50: 299) records the species in Nuevo León at Monterrey, Boquillo, and China and in Tamaulipas at Montemorelos and Altamira. Recently Webster (op. cit.) noted two birds seen on 28 April 1969 and two seen on 15 June 1972, both times below Falcon Dam on the Rio Grande. Shifflett (op. cit.) reported 3–5 photographed on 7–8 June 1974 10 miles west of Roma, Texas on the Rio Grande. These last three records are from about 100 miles west and slightly north of Brownsville and, more significantly, about 55 miles north of China, Nuevo León. The Rio Grande Valley would seem to be a likely region of attraction to a wandering jay (or flock), probably far more so than the arid northern portion of Tamaulipas.

Based on the evidence at hand, we suggest that both the egg set and the skin of *Psilorhinus morio* are acceptable evidence of the occurrence of this species in southern Texas. These would thus constitute the first valid records of the Brown Jay in the wild in the United States.

We thank Lloyd F. Kiff for commenting on these records.—John P. Hubbard and David M. Niles, *Delaware Museum of Natural History, Greenville, Delaware 19807. Present address of first author: Game and Fish Department, State Capital, Santa Fe, New Mexico 87501.* Accepted 3 Sep. 74.

Hunting behavior of Eastern Bluebirds.—In late spring and summer of 1973 I studied hunting by Eastern Bluebirds (*Sialia sialis*) in Franklin County, Ohio, concentrating on prey catching tactics, success of adults and young, prey selection, and hunting territories of a pair of bluebirds during different phases of nesting. In the semirural places the birds I watched hunted mostly around lawns and only occasionally foraged in other habitats.

The fly-down was the commonest tactic of adult and immature birds. Birds perched on lower tree limbs and scanned the ground. When a bird spotted a suitable prey item, it glided to the ground to try to seize the prey. Birds ate small items immediately, while they beat large prey against hard substrates. Fly-downs made up 444 of 508 hunting sequences witnessed. Fly-catching was the next most frequent tactic (45 sequences), while rarely (19 sequences) birds flew to pick prey

from tree foliage. Often birds hovered at the leaf when trying to catch prey this way. Bent (1949) describes similar hunting tactics.

Mean flight distance for 31 fly-downs was 6.6 m; some were longer. One male flew 24.4 m to take a 7-mm green caterpillar from grass that closely matched the insect's coloration. No clear relationship existed between the distance bluebirds flew to prey and prey size, but my numbers of observations were small.

Hunting perches were from 0.6 to 8.2 m high (N = 48); these perches afforded birds unobstructed views of the air and ground, and in this respect differed from display perches. By perching at different heights birds may be exposed to different prey items (MacArthur 1972), and hunting technique differences between sexes exist in some species and probably enhance the efficiency of each sex (Selander 1966). Hunting perches of male bluebirds averaged 2.3 m (N = 31), and females' hunting perches averaged 1.8 m (N = 15), but heights did not differ significantly between the sexes (Mann-Whitney U-test). The sexes did not differ in the proportion of large and small prey taken.

Adults were more skillful hunters than young that probably were out of nests less than 2 weeks. Insects, spiders, and earthworms were the usual food, and I could tell if a bird captured an item by watching hunting sequences carefully. Five adults caught prey in 126 of 189 sequences, while five young succeeded in only 49 of 154 sequences. These success rates differed significantly (χ^2, $P < 0.001$). Young of other species also find hunting more difficult than adults do (Recher and Recher 1969). Two young received supplemental feedings from an adult female in their early postfledging lives.

The frequency of hunting forays differed (albeit statistically insignificantly, $P = 0.17$) between adults and young. Adults perched an average of 95 sec (N = 37) before chasing prey, and presumably they rejected some potential prey because of its unattractiveness. Young perched for shorter times between forays (mean = 71 sec, N = 47), and this difference may reflect attempts by young to capture items adults would ignore.

Bluebirds selected large prey items. I estimated prey length in terms of multiples of the bird's bill length, about 13 mm. Multiples used were 0.25, 0.5, 1.0, 2.0, 3.0, and 4.0 bill lengths. I measured and assigned to bill length categories insects, other arthropods, and earthworms from lawns where birds hunted. I allowed for error in estimating by dividing the range of potential prey lengths at midpoints between two bill length multiples and assigning items to the closest multiple. For example, potential prey from 19.5 to 32.5 mm were assigned to the two bill length multiple. Fig. 1 shows lengths of potential prey and items the bluebirds took, and the two distributions differ (χ^2, $P < 0.001$). Birds took fewer small and more large items than expected. Adults may have found small prey uneconomic and ignored small prey to await larger items. A male had difficulty with a dog-day cicada (*Tibicen* sp.) that lodged in his throat. Prey of this size (4.5 × 2.0 bill lengths) may be as large as bluebirds can handle.

Use of space by the male and female of one pair changed during nesting. I mapped these birds' perches during the prenesting and nesting periods of their second clutch. Their nest was surrounded by lawns, old fields, forests, roads, and parking lots. The birds used lawns from 10 to over 600 m from the nest. From 12 to 27 June the female showed little interest in the nest box, and the male frequently called at or near the nest. His average perch was 58 m from the nest (SD 61 m, N = 101), usually near the tops of trees; 43% of his perches were within 30 m of the nest, and 19% were at the nest. He fed both near and far from the nest.

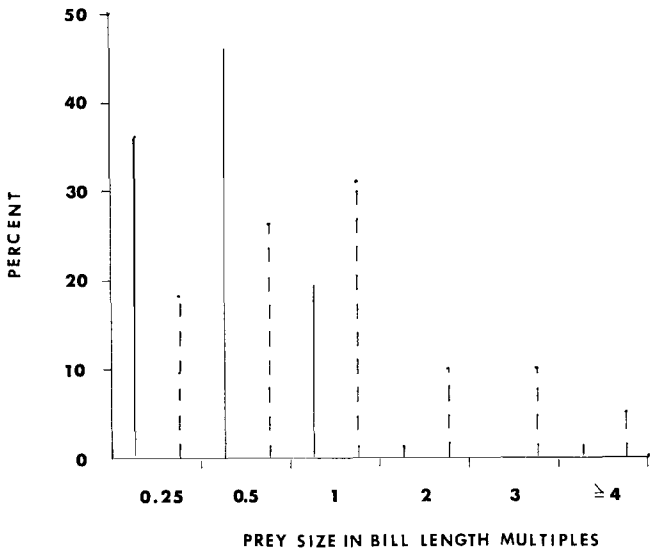

Fig. 1. The sizes of potential prey items (N = 355, solid lines) and prey items taken (N = 164, broken lines) by Eastern Bluebirds.

I mapped 99 perches of the male and 78 of the female during incubation. These were mainly hunting perches, but the male had one from which he seldom hunted. His perches averaged 82 m (SD 36 m) from the nest, and he rarely vocalized during this period. The female divided her time between incubating and feeding, and when feeding she perched an average of 92 m (SD 36 m) from the nest. Perch distances of the sexes did not differ significantly. Neither bird spent much time near the nest; about 7% of the male's and about 4% of the female's perches were within 30 m of it.

After the eggs hatched the birds ranged farther from the nest. The female's average perch was 138 m (SD 98 m, N = 124) from the nest, while the male perched an average of 145 m (SD 99 m, N = 75) from it. Perch distances of the sexes did not differ significantly. The adults spent virtually all their time hunting, traveling as far as 400 m from the nest. Neither spent much time near the nest; 6% of the female's and 8% of the male's perches were within 30 m of it. Both parents fed the young, and they often synchronized visits to the nest. When one captured food, it often waited for the other parent to join it before both flew to the nest. Both removed fecal sacs, carrying them some distance before disposing of them. The female once deposited a fecal sac on an upper tree limb about 90 m from the nest.

The adults had to meet the energy requirements of the young and themselves. They captured food for the young at about the same average distances (141 m) at which they perched and did not divide the territory into a part supplying the young and a part supplying themselves, as some birds do (Ricklefs 1971). The young received most large prey. Of 59 prey items I saw captured during this period 35 were about one bill length or less and 24 were longer. The parents took 40% of the smaller items and 79% of the larger items to the young, and this

difference was significant (χ^2, $P < 0.01$). Adults delivered a given amount of energy to the young in fewer trips by taking large prey, which may make it more difficult for predators to find the nest.

Robins (1971) argues that if the sexes rely on the same food but play different roles in caring for the young they should use the territory differently. The individual that expends more energy in care of young should hunt closer to the nest; some birds behave this way (Williamson 1971). The bluebirds I studied did not differ in use of the territory when feeding the young, perhaps because both parents played about the same role; nor did they differ during the incubation period when the female was investing more energy towards hatching the clutch.

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Yearling male Eastern Bluebird assists parents in feeding young.—The Eastern Bluebird (*Sialia sialis*) is normally monogamous in its mating system (Verner and Willson 1969, Ornithol. Monogr. 9: 16), although Laskey (1947, Auk 64: 314) reported a case of two males of that species defending the same nest box and apparently paired with the same female. During 1974 I observed a case of two adult male Eastern Bluebirds taking part in the feeding of young in a nest box near Washington, Macomb County, Michigan. All of the birds were color-banded and their histories well known.

A family group of two adults and one young male they had reared during July 1973 overwintered in the nesting area. In April 1974 the adults started nesting in the site used previously. The young male obtained a mate and occupied a territory 1.5 km away and began nesting there. Both nests were successful, and each resulted in two young fledged. On 11 July the young male returned to the area of his birthplace along with his two fledglings but not with his former mate. At the time of his arrival the two adults had a second nest in the same site and were caring for a brood of five young hatched on 10 July. On 24 July I found that both males, together with the two fledglings reared by the two older birds (but not those of