

of the jays. Within 15 seconds of this chase the jay flew to where it and its associate had landed originally, and these two birds then moved about in the branches for approximately five minutes, periodically giving musical *wheee* notes. During this time several or all of the adult warblers uttered nearly constant chip notes, though the vocalizations of the young nearly ceased. At this point a female Black-throated Green Warbler also virtually dropped toward the ground, giving only sporadic flutters during its descent. It dropped to a level of three to four feet in another small balsam fir, and I would have mistaken it for a young bird unable to fly adequately, had it not landed in a position directly in front of me. One of the jays immediately pursued this warbler down to a low level, alighting only a few feet from the bird. In neither instance did the behavior of the warblers directly following this drop change appreciably from that preceding the action. They recommenced chipping at this low level and proceeded to ascend the tree via short flights to the immediate vicinity of the young. Within 30 seconds of the second chase both jays moved away in the direction from which they had come originally. Following the departure of the jays the hostile encounters between the two pairs of Black-throated Green Warblers, which had nearly ceased in the presence of the jays, increased to their former intensity and still were continuing when I left the area 10 minutes later.

The similarity between the dive-display of both Black-throated Green Warblers and motions of a young fledgling that is scarcely able to fly was striking. It would appear that the jays had responded initially to these performances as they would to that of a young bird; as soon as the adult warblers terminated the behavior, the jays ceased to pay attention to them.

At the time of this encounter both adult and young warblers were conspicuous as a result of both their vocalizations and movements. The young remain conspicuous during the extended period of dependency or partial dependency upon the adults (probably in excess of one month in some instances) as a result of the nearly constant loud begging notes that they produce. Hence, they would appear to be vulnerable to predators at this time. The Blue Jay, along with the red squirrel (*Tamiasciurus hudsonicus*) probably is one of the most important predators of eggs and nestlings of small birds in the spruce forests. These observations, as well as those of Lamore (Wilson Bull., 70:96, 1957) and Chase (Wilson Bull., 11:57, 1899) suggest that Blue Jays will also take newly fledged individuals.

Cruickshank (Auk, 53:480, 1936) reported a display similar to the two reported here given by a Black-throated Green Warbler when he approached its nest. The general lack of observations of this particular behavior may be due to the fact that young seldom are approached by a human when high enough in a tree for adults to respond as described above. These are the only records of this precise behavior that I have noted during six years of intensive study upon this and a large number of other species of wood warblers.

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Meadowlarks feeding on road-kills.—On the afternoon of 17 December 1967, we obtained information which showed meadowlarks (*Sturnella magna* and *S. neglecta*) to be feeding on the carcasses of road-killed birds. The area was along New Mexico State Highway 26 between the towns of Hatch and Deming in Dona Ana and Luna counties. The date marked the third consecutive day of near-blizzard conditions in

southwestern New Mexico, and at the time we passed, most of the terrain, including the road, was covered with 6 to 10 inches of snow. The temperature was in the low twenties, and there were cloudy skies with occasional snow flurries and a strong southwesterly wind. The only snow-free areas visible to us were in the sets of tire tracks that traversed the highway. In the tracks were gathered many birds, including mainly Mourning Doves (*Zenaidura macroura*), Horned Larks (*Eremophila alpestris*), Lark Buntings (*Calamospiza melanocorys*), and meadowlarks.

Although traffic was sparse through the area, many birds had been killed or injured by automobiles, and their bodies littered the highway and roadside. We stopped frequently to identify these carcasses and to salvage specimens. During one of these stops we observed a meadowlark fly up from the badly mangled carcass of another meadowlark. Alerted to the possibility that the bird might have been feeding on the road-killed carcass, we subsequently noted the frequent association of meadowlarks with road-kills as we drove along. We noted this association at least 10 times with carcasses of various species. On one occasion, while we were stopped, a meadowlark was actually observed pecking at a carcass. None of the other species of small birds we saw appeared to be feeding on carcasses, nor did they appear to be associated with them. Hence it appeared that only meadowlarks were involved in this behavior.

Later, the stomachs of two meadowlarks (one each of *S. magna* and *S. neglecta*) we salvaged were examined and found to contain numerous feathers and some skin, along with stones and a few seeds. In each case the identifiable feathers proved to be those of Mourning Doves, which were almost certainly two different individuals. Interestingly, the stomachs of other birds obtained at the same time (3 *Eremophila alpestris*, 1 *Spizella breweri*, and 1 *Zonotrichia leucophrys*) were found to contain only numerous seeds and stones, which again suggests that they were not feeding on road-kills.

Although the habit of feeding on road-kills is commonplace in the area among hawks (e.g., *Buteo jamaicensis*, *B. lagopus*, *B. regalis*, *Circus cyaneus*), ravens (*Corvus cryptoleucus*, *C. corax*), and the Turkey Vulture (*Cathartes aura*), we have not previously observed it in meadowlarks. In fact, there seems to be only one other reference to such behavior, that of a *S. magna* feeding on the partly-smashed carcass of another of its kind near Bath, New York, on 5 July 1939 (Terres, Auk, 73:289-290, 1956). Normally, the highly animalian diet (63 to 74 per cent) of meadowlarks is confined to arthropods, but occasionally small vertebrates such as amphibians are also eaten (Bent, Life histories of North American blackbirds, orioles, tanagers, and allies, U.S. Natl. Mus. Bull., 211, 1958).

Nevertheless, it is not particularly surprising that meadowlarks will turn to road-kills for food, particularly under conditions which make the procurement of normal food items difficult. In fact, since meadowlarks winter much further north and in areas where adverse weather is more prevalent, one wonders whether or not this type of behavior is more commonplace than suspected. Even before the advent of road-kills, such sources as predator kills may have furnished food under adverse conditions and allowed meadowlarks to survive until normal food was again available. One also wonders whether the stimulus to be carnivorous is primarily from exposed or mangled carcasses, or whether intact bodies, such as might result from deaths due to disease, starvation, or freezing, are also attacked.

We are very grateful to Mrs. Roxie Laybourne of the Smithsonian Institution for identifying the feathers from the stomachs of the two meadowlarks.—JOHN P. HUBBARD AND CLAUDIA L. HUBBARD, *Rockbridge Alum Springs Biological Laboratory, Goshen, Virginia 24439, 5 February 1968.*