available food (Dolnik and Blyumental 1967) migratory waves could also have evolved in response to other environmental factors, such as weather. Short periods of inclement weather would remove members of one wave but not those of each succeeding wave.

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Survival of a Blue Jay with a malformed bill.—On 12 December 1970, a Blue Jay (*Cyanocitta cristata*) with a badly malformed bill came to my feeding tray in Wilton, Connecticut. The upper mandible was thin, shortened, and bent upward; also it curved to the left, as shown in Figs. 1B and 1C. The bird had no difficulty in feeding on grain or suet, having adequately adapted to its infirmity. It scooped up seeds by tilting its head to the right and scraped at the suet with its lower mandible, using an upward thrust of the head.

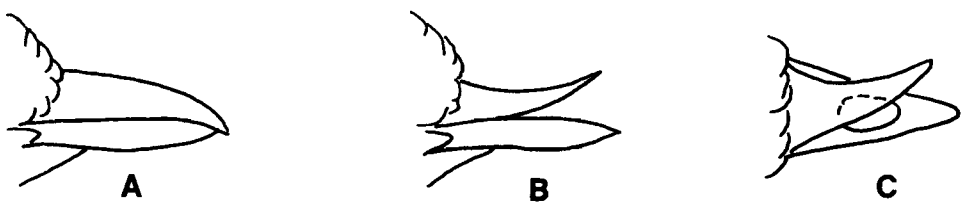

Fig. 1. Malformed Blue Jay bill. A, Normal shape, after Ridgway (1887, Manual of North American birds: Plate C,1.); B, malformed, side view; C, malformed, top view showing seed in normal lower mandible.

By the end of January 1971, the Blue Jay had gone, and it was not noticed in my yard again that winter nor during the next two. However, I had speculated incorrectly that its chance for survival was small; it appeared at the feeder again on 14 December 1974. There is no doubt that it was the same individual owing to the uniqueness of the malformation. As before, it stayed around for several weeks. It was not seen during the winter of 1975–1976.

In his compilation of longevity records, Dr. J. H. Kennard (1975, Bird-Banding 46 : 55) listed the longest lived banded Blue Jay to be 14½ yr. Privately he communicated that his own banding experience with 960 Blue Jays indicates their mortality to be considerably higher during the first 2 yr than in the 3–10-year-old period. Thus, the present individual had managed to survive well beyond the most precarious time of its life.

This particular Blue Jay's ability to survive for at least 4 yr with a gross malformation of its bill might be attributed to the fortuitous sideways curvature of the upper mandible. The right edge crossed over the trough of the lower mandible (Fig. 1C) enabling the bird to pick up seeds readily and hold them securely in its bill.

K. C. Parkes pointed out to me that abnormal mandibles that do not fit together well tend to grow longer than normal when they cannot be "honed" regularly. This individual's method of feeding may have served to keep the growing tips of the horny bill sheath honed down so that no perceptible changes in the shape of either mandible occurred during 4 years.—V. P. WYSTRACH, *20 Westfield Road, Wilton, Connecticut 06897*. Accepted 21 July 76.

A Slaughter of Mice by Common Crows.—On 13 February 1976 at 0755, the authors dumped 100 living adult and subadult laboratory white mice (*Mus musculus*) onto a barren knoll in a field of grass at Crab Orchard Lake Wildlife Refuge, Williamson County, southern Illinois. Red-tailed Hawks (*Buteo jamaicensis*), Red-shouldered Hawks (*B. lineatus*), and American Kestrels (*Falco sparverius*) were known to be frequenting the area, and from vantage points about 200 m north and west of the knoll, we and two associates (Gary Nunn and Kenneth Vail) waited for these predators to appear and detect the mice. Our hope, indeed our purpose, was to observe and film raptors capitalizing on a dense population of vulnerable prey.

Several mice soon separated themselves from their fellows and began to quest about, moving generally downslope, but throughout the observation period most of the mice huddled together or ran about on or near the summit of the knoll. At 0843, a Common Crow (*Corvus brachyrhynchos*) suddenly alighted amid the main concentration of prey. It stood motionless for a few moments and seemed to examine the mice very intently; then it took a few cautious steps toward a mouse and pecked at it, at the same time jumping back a bit; next it strode forward and with its bill seized, shook, tossed about, and nibbled on the mouse, which the crow then carried away, flying close to the ground. A second crow, and then a third, alighted on the knoll at about this time, and each of them more or less repeated the activities of the first crow, killing and flying off with a mouse. None of the crows emitted a sound, then or later.

The first crow cached its prey in grass about 100 m from the knoll. It soon returned and quickly caught, killed, and set out to cache another mouse, while the second and third crows, having cached their victims in the grass at various points some distance away, began to return, and soon they, too, obtained fresh victims and took them away and cached them. In this systematic fashion, the three crows killed and cached 79 mice in 127 min.

All morning a storm had been threatening, and at 1027 it broke, interrupting the slaughter. Wind, and hailstones up to 20 mm in diameter, flattened the grass in the prey-caching sites so completely that we failed, during several pauses in the storm, to locate even one of the cached specimens. We were compelled finally to leave the area before the storm ended.

One needs only read the accounts of genus *Corvus* in Bent (1946, Bull. U.S. Natl. Mus. 191: 183–302) to find reports of heavy predation on mice (*C. corax*), food caching (*C. corax*, *C. cryptoleucus*), and, of course, resourceful food gathering of striking kinds. There is even a description that to our mind can be interpreted as indicating a case of "surplus" killing of juvenile gulls by Common Crows in Maine. The case we report combines shades of all these elements in a singular way and may be instructive in showing the potential capacity of a widely distributed, common nonraptorial bird to help control mouse cycles of abundance.

The fact that in our experiment large numbers of mice were killed in a brief period does not seem to us, however, to represent what Kruuk (1972, J. Zool., Lond., 166: 233–244) termed "surplus killing": "the killing by a predator of prey, without the killing individual or its offspring or members of the same social unit eating anything from the kill, although there is free access to the carcass, and usually the particular prey species would be eaten by that predator." The crows, in caching every one of their victims, exhibited a pattern of behavior that seems consistent with an intention to eat the mice sooner or later.