

sonal observations of Baptista, Leopold, and DeBell, and I wish to thank J. Davis, O. P. Pearson, and F. A. Pitelka for their comments on the manuscript.

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### UNUSUAL PREDATORY ACTIVITIES OF MEXICAN JAYS AND BROWN-HEADED COWBIRDS UNDER CONDITIONS OF DEEP SNOW IN SOUTHEASTERN ARIZONA

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Snows of any depth and duration are unusual in the Chiricahua Mountains at the elevation of the Southwestern Research Station (5400 ft). Usually the snow covers the surface for only a day or two, after which large patches melt off, allowing ground-feeding winter birds access to foraging areas. On 14 December 1967 an area-wide storm struck southeastern Arizona and southwestern New Mexico. By 17 December 31 inches of snow covered the ground. It remained for a full week before the first patches of earth were exposed. Many local birds were obviously hungry and the Mexican Jays (*Aphelocoma ultramarina*) became especially aggressive at our feeding stations.

During this time one of these jays was seen to swoop down on a small bird and kill it by pecking. The prey appeared to be a sparrow but could not be retrieved because of the deep snow. On the same day two male Brown-headed Cowbirds (*Molothrus ater*) were seen attacking a junco (*Junco* sp.) on the snow. A female cowbird standing in the snow about a foot away watched the attack. Both males were pecking at the junco, which was struggling in the snow. The attackers were disturbed by the author and the junco flew off, but fell into the snow about 50 ft away, obviously hurt or weakened. Feathers were strewn about the area of attack. Tufts of feathers, perhaps also of juncos, gave evidence of three other attacks, probably by jays. The evidence is circumstantial but there were no mammal tracks about, or predatory birds. The cowbirds were not seen again, but a flock of 13 jays remained in the area through the winter. A. C. Bent (U.S. Natl. Mus., Bull. 191, 1946, and Bull. 211, 1958) does not mention predatory activities by this species of jay or by the Brown-headed Cowbird.

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### ROOSTING HABITS OF WHITE-BREASTED NUTHATCHES

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The following observations bring out three peculiarities in the roosting habits of White-breasted Nuthatches (*Sitta carolinensis*): (1) a close interchange with Downy Woodpeckers (*Dendrocopos pubescens*) in use of roost holes, many of which were probably excavated by the woodpeckers originally; (2) the regular removal of feces from its roost hole by *S. carolinensis* at dawn, and (3) a reversal of dominance at roost holes in the spring when the female takes over the hole occupied by the male. These situations have been noted in Lyme, New Hampshire, between 1963 and 1970, among wild as well as among several pairs of hand-raised individuals in an aviary.

A first roost hole noted was 30 cm from the top of a paper birch stub 3 m tall and 12 cm in diameter. Between 16 and 31 December 1964 a Downy Woodpecker flew from this hole on nine early winter mornings, but on 25 January and on 3 February 1965 the woodpecker had left and a male White-breasted Nuthatch emerged at dawn. Nuthatches do not always,

however, roost in cavities in stubs. At 15:50 on 5 January 1967 a male White-breasted Nuthatch gave a sudden burst of *aan* notes, then swooped into a curl of bark partially loosened and hanging down from a high, dead maple limb. Three days later he returned to roost in the same place, again at 15:50. The lowest roost hole encountered was in a small hemlock stub less than 2 m above the ground. Here a male White-breasted Nuthatch made a sudden swoop down into the hole at 16:30 on 18 February 1967. When I knocked on the stub, he did not come out.

A male (MB), coming to a swamp where flooding by beavers had resulted in numbers of stubs, used three of them, all of yellow birch, at different times. The first stub was one in which a Downy Woodpecker had roosted for a week previously. On 2 February 1969 MB emerged from it at 06:55 with a gob of feces in his bill. He emerged in similar fashion a week later at 06:57. In the following winter MB was roosting in an adjacent yellow birch stub. Here the hole, instead of being round, was elliptical and about twice the size needed for the bird to emerge. On 21, 25, and 26 December 1969 MB flew from it at 07:20, 07:25, and 07:30, respectively, having a gob of feces in his bill on each occasion. He usually deposited the feces on the bark of the first tree to which he came. On 22 and 27 February 1970 MB flew from a hole 7 m up in a third well-rotted