nestling was almost fully feathered. At 1330 h, while Willoughby was photographing the brooding adult and nestling from a distance of 0.7 m the adult suddenly flew from the nest, followed immediately by the juvenile, which flew to the ground in a well-coordinated manner. Because the fledgling did not appear able to sustain level flight, Willoughby put it back on the nest and retreated. At 0820 the next day, the nest was empty. We assume the fledgling left the nest voluntarily, but we did not see it or the adults depart.

From their study of 58 Mourning Dove nestlings, Holcomb and Jaeger (1978) concluded that the usual fledging age was between 10 and 11 d. For a nestling 5 d old on 1 October, that age would occur on 6–7 October. Thus this young dove had attained a normal fledging age when it left the nest.

These observations indicate that at least one of the adults was able to adapt its parental behavior to disturbances in the following ways. (1) It located and brooded a nestling that survived the fall from the tree, although it was on a lawn some distance (1.5 m) from the fallen nest. (2) After we put the nest back in the tree, an adult found the nestling and cared for it adequately, although the nest was in an abnormal position at the end of a branch instead of on a more substantial horizontal branch closer to the trunk as favored by this species (Nice 1922; Tyler, U.S. Natl. Mus. Bull. 162, 1932). (3) Despite daily close approach to the relatively exposed nest by human pedestrians and observers, an adult fed and brooded steadily and the young left the nest at a normal fledging age. These observations also indicate that these doves' primary attachment was to the nestling, regardless of its location, rather than to the nest or nest site.—ERNEST J. WILLOUGHBY, *Division of Natural Science and Mathematics, St. Mary's College of Maryland, St. Mary's City, Maryland 20686* AND CHARLES T. KREBS, *9 Menzie Grove, East Ivanhoe, Victoria, 3079, Australia.* Received 10 Jan. 1986; accepted 16 Apr. 1986.

Effect of Laparotomy of Tree Sparrows and Dark-eyed Juncos during Winter on Subsequent Survival in the Field.—Laparotomy may be necessary to determine sex in wild birds, but knowledge of its effect on long-term survival is critical to later analysis of population data. Information on survival during and immediately after the operation (Fiala 1979, Risser 1971) and on survival of laparotomized nestlings to the age of leaving the nest (Blank 1981, Howe 1976) points to little mortality during those short periods. Similarly, survival rates of laparotomized caged birds living in protected and sometimes unnaturally aseptic environments tend to be high (Bailey 1953, Risser 1971). Reliable data on laparotomized birds released into the wild are few (but a notable exception is Wingfield and Farner 1976; see also Bailey 1953 and Miller 1959). In working with winter populations of small birds often subjected to severe weather, we thought it desirable to assess the effects of laparotomy using capture-recapture methods. We report recapture rates of Tree Sparrows (*Spizella arborea*) after laparotomies performed earlier in the same winter and of Dark-eyed Juncos (*Junco hyemalis*) laparotomized in one winter and recaptured in another.

Methods corresponded closely to those described by Risser (1971), except that we used ether as our anesthetic. A few birds died while we were improving our technique, both in administration of the anesthetic and in performing the operation, and we include in the data below only individuals that appeared healthy when released about 1 h after the operation. Some laparotomized birds were recaptured frequently (for as much as 2 mo), and inspection revealed that the incision was fully scabbed and uninflamed after about 1 wk. Accordingly, we treat any Tree Sparrow recaptured at least 8 d after its laparotomy (including the days of operation and recapture) as having fully recovered. A few laparotomized Tree Sparrows that were recaptured after less than 1 wk and in apparently healthy, healing condition are excluded from the samples reported below because their cases are ambiguous. Consequently we also excluded the few unlaparotomized individuals that were recaptured only within 1 wk of having been released.

Tree Sparrows.—At Bloomington, Indiana, in the winter of 1975–1976, we captured 78 Tree Sparrows between 15 December and 15 February. Fifty-four of these birds were anesthetized and operated on and 24 others, intended as controls, were anesthetized but not subjected to the operation. We made daily efforts to recapture the birds until 25 March. Capture and release dates were similarly distributed in the two treatment groups. Of the

sparrows not operated upon, 12 (50%) were recaptured at least 1 wk later and 12 were not recaptured. Of the experimentals, 28 (52%) were recaptured at least 1 wk later and 26 were not recaptured. Laparotomy, therefore, had no apparent effect on survival ($\chi^2 = 0.02$, df = 1, n.s.).

We repeated the effort in the winter of 1976–1977 but with one change. The Tree Sparrows that were not laparotomized were also not anesthetized: they were simply banded, measured, and released. There were 66 such birds, of which 30 (45%) were recaptured at least 1 wk later and 36 were not recaptured. Of 27 laparotomized sparrows, 18 (67%) were recaptured and 9 were not. Again, laparotomy seemed not to affect survival ($\chi^2 = 3.46$, df = 1, n.s.). Furthermore, frequencies of recapture of the anesthetized but unoperated upon sparrows in 1975–1976 and of the sparrows that were released without anesthetic in 1976–1977 were statistically indistinguishable ($\chi^2 = 0.15$, df = 1, n.s.). We interpret this as an indication that our anesthetizing in 1975–1976 did not reduce survival, although ideally this comparison would be made within a single winter rather than across winters.

Finally, we report recapture rates of 22 Tree Sparrows (46% males) laparotomized in December 1975 and January 1976 at Bowling Green, Ohio. Recapture efforts were less intense than at Bloomington and ended on 1 March 1976. Nine (41%) of the birds were recaptured at least 1 wk after the operation, which is indistinguishable from the data for the laparotomized sparrows in Indiana in 1975–1976 ($\chi^2 = 0.75$, df = 1, n.s.) and in 1976–1977 ($\chi^2 = 3.25$, df = 1, n.s.).

Dark-eyed Junco.—In the winter of 1976–1977 we caught a total of 221 juncos during trips to three sites: Kalamazoo, Michigan; Clemson, South Carolina; and Birmingham, Alabama. Fifteen of these were difficult to sex, and we laparotomized them. In the winter of 1977–1978 we recaptured 5 (33%) of these 15. We recaptured 25 (11%) of 206 unlaparotomized juncos. Despite the very small size of the sample, it seems fair to suggest that the operation did not increase the probability of mortality.

These data, which include the first controlled laparotomy experiments we are aware of, indicate that laparotomized Tree Sparrows and Dark-eyed Juncos survive over the long and short term as well as conspecifics not operated upon. Therefore laparotomy can be employed when capture-recapture is being used to estimate long-term survivorship in these and, we suspect, many other passerines (Wingfield and Farner 1976). This is true despite the fact that the birds in our samples were often released into severe weather.

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