Frank J. Sonleitner, who read the manuscript critically and made numerous helpful suggestions. The University of Oklahoma Department of Zoology and Animal Behavior Laboratory provided funds and facilities for the research.

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ROY S. SLACK, *Department of Zoology, University of Oklahoma, Norman, Oklahoma 73069. Present address: Environmental Analysts, Inc., 224 Seventh Street, Garden City, New York 11530.* Accepted 28 Oct. 74.

Ground-nesting Purple Martins.—On 15 July 1974 my attention was drawn to an adult male Purple Martin (*Progne subis*) feeding unfledged young at the base of an elm tree in a fishing camp on Clam Lake near Siren in northwestern Wisconsin. The three well-feathered young were living in a natural cavity hollowed out in the base of the tree. Two young confined themselves to the cavity mouth, where only their heads could be seen. The third, a more venturesome bird, occasionally climbed a ridge on the trunk to a point perhaps a foot above the cavity, where it looked about and beat its wings at the approach of the parent. When either a person or a dog approached the tree, all three young retreated precipitously into the cavity. Of a dozen feedings witnessed, all were by the male parent; during 5 days there I saw no female parent in attendance.

My wife and I decided to examine the cavity at night (18 July), in order to avoid the risk of driving the young from the relative safety of their home. The oval-shaped cavity measured approximately 7 inches by 9 inches; the opening was about 6 inches high. A flashlight revealed two young birds (the third was never again seen), sleeping faced away from the cavity entrance. The floor of the cavity was bare ground, with no apparent "improvement." It was, as far as we could tell, quite clean; there was no evidence of nesting material, eggshells, or feces (we had earlier seen the adult carry away a fecal sac after a feeding).

It is possible, in the absence of eggshells and nesting material, that the young might have hatched in a martin house (two active houses stood within 75 yards of the tree), fallen to the ground, and sought shelter under the elm. But this assumes a highly unlikely chain of events: that three (or more) young from one clutch should fall to the ground, that three (or more) should survive the fall, and that three should be both motivated and able to search out the cavity 30 yards away where we found them. Then too, Forbush (1929, Birds of Massachusetts and other New England states, part 3, Norwood, Massachusetts, Massachusetts Dept. Agr., p. 141) states, "When a young [martin] falls to the ground it is soon deserted by its parents, who give up the attempt to preserve its life, and if not killed by the fall it is soon picked up by some cat or other prowler." The cavity must have been the original nest. No other explanation seems to me to account for the situation.

Of other primitive nesting records of the Purple Martin, Roberts (1932, The birds of Minnesota, vol. 2, Minneapolis, Univ. Minnesota Press, p. 55) reports a case only once removed from ground-nesting, in which O. L. Austin, Jr. found the species nesting colonially among large boulders on two islets in Lake Mille Lacs, Minnesota.—ALAN PISTORIUS, *R.D., Whiting, Vermont 05778.* Accepted 7 Nov. 74.

Clutch size and nesting success in Red-winged Blackbirds.—Variation in clutch size among birds is apparently due to many factors (von Haartman 1971: 419). Productivity is a function of both clutch size and of nesting success, and the relationship between these two parameters determines the clutch size that leads to optimum productivity. Several studies have shown that the usual clutch size for the Red-winged Blackbird (*Agelaius phoeniceus*) is 3 to 4 eggs (Wood 1938, Beer and Tibbitts 1950, Bent 1958, Case and Hewitt 1963, Meanley and Webb 1963), and the most common clutch size inland is 4. In blackbird nest studies in northern Ohio, productivity was compared between large versus small clutches.

The 211 Ohio nests contained 778 eggs; 144 nests were in an old-field habitat, 39 in a small marsh at the edge of Lake Erie, and 28 in a wet grassy meadow on the NASA Plum Brook Station. All locations were within a 5-km radius in Erie County. Sites were searched intensively for nests, and those found with eggs or young were checked periodically as long as eggs or nestlings remained. Only nests in which completed clutch size could be determined were included in this analysis. "Active" nests were those containing one or more eggs or nestlings, and "hatched" nests were those in which one or more eggs hatched.

Table 1 gives reproductive parameters of the 211 nests. Clutches of 1, 2, and 3 eggs were grouped as "small" clutches, and clutches of 4 and 5 eggs were grouped as "large" clutches. Chi-square tests showed no significant difference ($P > 0.05$) between large and small clutches in terms of the proportions of active nests in which eggs hatched, active nests that produced fledglings, hatched nests that produced fledglings, or hatching success of eggs. However, the proportions of eggs that produced fledglings, and of nestlings that fledged, were significantly greater ($P < 0.001$) from small clutches than from large clutches. Large clutches produced more nestlings per active nest and per hatched nest than did small clutches, but the same number of nestlings fledged per nest from large and small clutches. It follows that greater losses between egg-laying and fledging for large clutches were primarily in the nestling stage. Nestlings were found dead (apparently abandoned) in nine nests, all with 4- and 5-egg clutches. Parents apparently were unable to feed and