**Avian nesting success under gamma radiation exposure.**—It is evident from Wetherbee's (1966) literature review that the sensitivity of birds to ionizing radiation (as measured by lethal dose (LD) determinations) decreases through the egg, nestling, and adult stages. For example, Norris (1958) administered acute exposures of 200 to 600 Roentgens (R) to nine Eastern Bluebird (*Sialia sialis*) eggs and 400 to 1200 R to four nestlings. Only one-third of the irradiated eggs produced fledglings, but all four irradiated nestlings fledged. Willard (1963) administered acute exposures to two age groups of bluebird nestlings for which he reported a $LD_{100}$ of 3000 R and a $LD_{50}$ of 2500 R for the 16-day nestling period. However, nestlings irradiated with 300 to 500 R at the age of 2 days were significantly stunted in growth and feather development. Therefore, Willard (1963) estimated a $LD_{50}$ of about 500 to 600 R for transition of nestlings to the fledgling stage.

Despite these studies, radiation data on wild birds is scarce. Therefore we took the opportunity as time permitted to watch birds nesting under chronic gamma radiation stress when a 10,000 curie $^{137}Cs$ gamma radiation source was operated on a 20-h day schedule (1230 to 0830) from 3 May to 16 October 1972 in a northern forest community near Rhinelander, Wisconsin. A description of the facility, flora, and fauna may be found in a monograph edited by Rudolph (1974). Radiation exposure for the incubation and nestling periods was estimated by using lithium fluoride dosimetry and by comparing field observations of morphological development with published descriptions of stage of ontogeny with respect to age (Friedmann 1929; Bent 1939, 1949, 1950, 1953; Nice 1953; Welty 1962).

Six species were represented in the 11 nests located (Table 1). Eight nests (Nos. 1 to 8) received 3 R/20-h day or less which resulted in a maximum exposure of 64 R during the incubation and nestling stages of development. Within this group there was only one known instance of hatching failure. In the remaining nests (Nos. 9 to 11), 50, 25, and 20% of the eggs failed to hatch after receiving incubation period exposures of 390, 430, and 500 R respectively. Although all nestlings in nests 9 and 10 survived after receiving total exposures of 760 and 1380 R, respectively, all nestlings in nest 11 died after receiving total exposures of 500 to 1120 R.

In view of the many unknowns, the fact that radiation was actually delivered in fractionated doses, and interruptions in the irradiation schedule caused by equipment failure, our observations suggest that chronic exposures of about 400 to 500 R during incubation are apt to increase hatching failures or to have subsequent lethal effects during the nestling stage. Our conclusion agrees with those reported by Norris (1958), Willard (1963) and Wetherbee (1966) and is also similar to that reported by Wagner and Marples (1966), who concluded that the $LD_{100}$ for wild passerine eggs would be 500 to 1000 R for chronic exposures.

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TABLE 1
SUMMARY OF AVIAN NESTING SUCCESS IN RELATION TO GAMMA RADIATION EXPOSURE

| Nest no. | Species | Clutch size[1] | No. hatched | Dose rate (R/20-h day) | Exposure (R) | | | Nesting results | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Incubation | Nestling | Total | No. days after hatching nest vacated | Observation |
| 1 | Hermit Thrush (*Catharus guttata*) | 2 | 2 | 0.2 | 2 | 1 | 1 | 5–6 | Nestlings seen |
| | Brown-headed Cowbird (*Molothrus ater*) | 1 | 1 | – | 2 | 1 | 3 | 5–6 | Nestlings seen |
| 2 | Hermit Thrush | 2(1) | 2 | 0.3 | 3 | 3 | 6 | 10–12 | Nestlings seen |
| | Brown-headed Cowbird | 1 | 1 | – | 3 | 3 | 6 | 10–12 | Nestlings seen |
| 3 | Ovenbird (*Seiurus aurocapillus*) | 4 | 4 | 0.4 | 3 | 1 | 4 | 3–8 | Nestlings seen |
| 4 | Common Flicker (*Colaptes auratus*) | 10 | 7[2] | 0.6 | 6 | 6 | 12 | 15–16 | Nestlings seen |
| 5 | American Robin (*Turdus migratorius*) | 4 | 4 | 1.9 | 8 | – | – | 0–14 | Nestlings seen |
| 6 | American Robin | 4 | 3 | 1.4 | 13 | 10 | 23 | 12–18 | Nestlings seen |
| 7 | Common Flicker | 8 | 5[2] | 1.5 | 16 | 22 | 38 | 19–26 | Nestlings seen |
| 8 | Red-eyed Vireo (*Vireo olivaceus*) | (3) | – | 3.2 | – | – | – | – | Eggs disappeared |
| | Brown-headed Cowbird | 2 | 2 | – | (a)[3] 32 | 28 | 60 | 9–12 | Nestlings seen |
| | | | | | (b) 32 | 32 | 64 | 9–11 | Nestlings seen |
| 9 | Hermit Thrush | 3 | 2 | 39 | 390 | 370 | 760 | 10–12 | Nestlings seen |
| | Brown-headed Cowbird | 1 | 0 | – | – | – | – | – | Egg failed to hatch |
| 10 | American Robin | 4 | 3 | 128 | 430 | 950 | 1380 | 11 | Fledged prematurely by observer's presence |
| 11 | Red-eyed Vireo | 3 | 2 | 69 | (a) 500 | – | 500 | – | Nestling died at 1 day |
| | | | | | (b) 500 | 70 | 570 | – | Nestling died at 1–3 days |
| | Brown-headed Cowbird | 2 | 2 | – | (a) 500 | 210 | 710 | – | Nestling died at 3–5 days |
| | | | | | (b) 500 | 620 | 1120 | – | Nestling died at 9–12 days |

[1] Number in parentheses is the known additional number of eggs that apparently were removed by cowbirds.
[2] Minimum number known to have hatched.
[3] The letters (a) and (b) identify individual nestlings.

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**Nocturnal predation by a Black-crowned Night Heron at a Common Tern colony.**—Scattered reports appear in the literature of actual or suspected predation by Black-crowned Night Herons (*Nycticorax nycticorax*) at Common Tern (*Sterna hirundo*) colonies. Marshall (1942) reported seeing a single heron eating Common Tern eggs at night in a western Lake Erie colony that all adult terns had temporarily left; he gave no data on numbers of eggs taken or on the duration of observation. Collins (1970) reported the remains of a 2- to 4-day-old Roseate Tern (*S. dougallii*) chick in the stomach contents of a Black-crowned Night Heron collected at 0700 on 13 July 1968 at Great Gull Island, New York. He suggested that night-herons may also have been responsible for the disappearance of several 1- to 3-day-old Common Tern chicks from the same colony. Nisbet (1975) suggested that most of the nocturnal predation in a Massachusetts Common Tern colony was caused by Great Horned Owls (*Bubo virginianus*) although he noted footprints of Black-crowned Night Herons and a raccoon (*Procyon lotor*) near the colony. This note presents details of nocturnal predation in a Common Tern colony by a Black-crowned Night Heron and discusses the significance of such predation as a factor influencing the terns' reproductive success.

We made these observations at one of several Common Tern colonies near Port Colborne, Ontario, where we have been studying tern reproductive biology for the past 3 years. The ternery was on a concrete shelf forming part of a breakwater at the Lake Erie terminus of the Welland Canal. Egg-laying began in early May 1973 and continued until early August 1973. During the course of recording hatching and fledging data for approximately 400 marked nests, we noted that numbers of eggs and young chicks disappeared between daily visits for no reason obvious from diurnal observations. In an attempt to assess the possibility of loss