

and recorded by Squires in 'The Birds of New Brunswick' (The New Brunswick Museum, Monographic Ser. 4, p. 134, 1952). Two, perhaps the same, were observed there on August 31, 1951, by Arnett and Corson (Records of New England Birds, 7[8]: 161, 1951). At St. Andrews, N. B., Miss H. W. Mac Coubrey reported one, apparently a male, on September 21, 1952, according to Squires (Nature News, 3[5]: 2, 1952).

Rand (Auk, 46 [2]: 247, 1929) summarized the Atlantic coastal records from northeastern United States and eastern Canada through 1928. To his summary, the following Canadian records may be added. Dwight (Auk, 20 [4]: 440, 1903) recorded a young male collected on September 13, 1902, on Sable Island, Nova Scotia. Smith (Auk, 55 [3]: 549-550, 1938) reported a specimen killed by a car at North Sydney, N. S., on December 3, 1929. Ball (Can. Field-Nat., 57[1]: 4, 1943) carefully identified one, apparently an immature male, near Cape Gaspé, Quebec, on October 18, 1940.—W. EARL GODFREY, *National Museum of Canada, Ottawa, Ontario.*

Survival Records of Young Feral Pigeons.—The object of this note is to present some recent data on the survival of the feral domestic pigeon (*Columba livia*) from egg to fledgling, utilizing the terms recommended by Davis (Auk, 69: 316-320, 1952).

Although we are well aware of the fact that the pigeon's clutch usually consists of but two eggs, we need to know the rate of recruitment of young pigeons into a flock. Recently it has been shown (Davis and Schein, Anat. Rec., 113: 549, 1952) that pigeon reproduction is not restricted to one short season; indeed, newly laid eggs were found in every month of the year. Therefore, the potential recruitment of young is very high.

In order to gain some idea of the actual magnitude of this recruitment, it was necessary to observe a series of nests from egg-laying to fledging of young and to determine the probabilities of hatching and fledging of the eggs. This was accomplished on two widely separated flocks of pigeons: one in the heart of the city of Baltimore, Maryland, and the other in the vicinity of the Johns Hopkins Hospital, approximately two miles away from the downtown flock.

The downtown flock of about 75 birds centered their activities about a church steeple which was used for both nesting and roosting. The steeple was a tall, tapering brick spire, with a base and seven progressively smaller wooden platforms at 20- to 30-foot intervals within the spire. All but the first platform were well illuminated through the many windows and openings in the steeple, and all but the base, first, second, and fourth platforms were directly accessible to the birds from the outside. The pigeons roosted on the platforms and ladders within the steeple, and on the windows and ornamental carvings and ledges on the outside of the steeple. Nests were usually located on the platforms and occasionally in an opening within the wall.

The base of the steeple, approximately two stories above ground level, was illuminated by a large window in which the glass was completely intact, thus affording no access to the outside at this level. The floor was covered with two to three feet of litter, consisting of skeletons of both pigeons and starlings, egg shells, old nesting material, and accumulated pebbles and droppings. Only two nests were found on this level, and both were abandoned before the eggs could hatch. In fact, the only birds which I saw on this level were nestlings and young fledglings which had fallen down from an upper level and were unable to escape.

The first platform was completely dark and piled with litter much as was the base; no nesting or roosting was observed on this platform. The second platform was fairly well illuminated from above, although there was no window at this level. Many birds frequented this platform, and 34.3 per cent of the total observed nestings occurred at this level. The third platform was well illuminated and was open to the outside on the south side. This provided the major means of ingress and egress for the birds, and consequently this platform was much used as a roost and 18.5 per cent of the total observed nesting occurred at this level. The fourth platform was fairly well illuminated but had no direct access to the outside. This level accounted for 32.4 per cent of the total observed nestings. Although the fifth, sixth, and seventh platforms were very well illuminated and freely accessible on all four sides, nesting activity dropped off sharply to 7.4, 5.6, and 0 per cent, respectively, on these platforms. There were few indications of roosting on the sixth platform and none on the seventh.

The flock around the hospital grounds varied from 75-150 birds at different times of the year. These birds roosted on the ledges around the buildings and nested in small window balconies, drain gutters, and ventilating towers atop the hospital building. Eleven sites were selected from which to make weekly observations. These sites encompassed most of the nesting areas on the hospital grounds and varied in areal size from one small window balcony to an entire roof with surrounding ledges.

Of all the observation sites, one deserves further mention. This site was the inside of a ventilating tower atop one of the buildings of the hospital group. It was about eight feet in diameter and about fifteen feet high; the uppermost seven feet were louvred. The base was a giant fan which was not used, and the top was a dome set on a platform with a large hole in it. Birds entered the tower through the louvres and roosted on them, while nesting occurred between the incomplete platform and the dome. Nestlings therefore had the benefit of warm air coming up from the building through the ventilating ducts and collecting under the dome. In fact, a ten-month check of air temperatures at all of the observation sites disclosed the fact that only at this site was there no correlation between the outside air temperature and the temperature near the nests. All other sites were at or near outside temperatures, while this site was usually considerably warmer during the winter months.

The church stations were visited weekly from January 11, 1951, until June 23, 1951, while the hospital areas were visited weekly from February 12, 1951, until May 24, 1952. At each visit the fate of the previous week's nests was recorded, and new nests were assigned a code number and plotted descriptively so the progress of each could be followed in the ensuing weeks. Eggs that did not hatch after 3 consecutive weeks of observations were considered abandoned, since the incubation period of pigeon's eggs is approximately 18 to 20 days (Whitman, C. O., *Posthumous Works*, Vol. III, 1919). Fledging usually occurred about 45 to 50 days after the finding of the nest, and young missing from the nest after 45 days of observation were considered to have fledged successfully. Those missing from the nests after less than 45 days of observation were considered to have died, and in most cases a quick search of the area uncovered the dead nestling.

In the church flock, 85 of 152 eggs hatched, and 47 of these subsequently fledged, giving a probability of eggs hatching of 0.559 and of eggs fledging of 0.309. The probability that nestlings would fledge was 0.553. In the hospital flock, 149 of 293 eggs hatched, while 83 subsequently fledged, giving a probability of eggs hatching

of 0.509, and of eggs fledging of 0.283. In this group, the probability that nestlings would fledge was 0.557.

The recruitment probabilities are strikingly similar in the two flocks, even though one was observed only during the spring months whereas the other was observed for more than a year. Indeed, a test of the difference between the probabilities of hatching of the two flocks showed the difference to be not statistically significant.

It has been mentioned above that the ventilating tower station on the hospital grounds was not subject to the extremes of outdoor temperatures, and it might be assumed that this would have an effect on the survival probabilities at this station. However, a tally of the nests at this station showed that of 111 eggs, 59 hatched and 33 subsequently fledged, which give probabilities of hatching and fledging of 0.531 and 0.297 respectively, very close to those mentioned above.

Since the two flocks were by and large very similar, the data were combined for the following estimate of survival of young pigeons in Baltimore, Maryland:

Number of nests in survey	234
Number of eggs	445
Number of eggs hatching	234
Number of nestlings subsequently fledging	130
Probability that eggs would hatch	0.526
Probability that eggs would survive to fledge	0.292
Probability that nestlings would fledge	0.556

It is hoped that the above information will add to the fund of basic information needed to analyse more intelligently the factors of survival and mortality in birds. The author is indebted to the staff of the Vertebrate Ecology Division of the Johns Hopkins School of Hygiene and Public Health, and in particular to Mr. Phillip Ottenritter, for help in making the observations from December 29, 1951, to May 24, 1952.—MARTIN W. SCHEIN, *U. S. Department of Agriculture, Jeanerette, Louisiana.*

A Captive Gannet.—On September 22, 1952, my son Stephen brought home a Gannet (*Moris bassana*) that he had found unable to fly and swimming just beyond the surf-line of Galveston Island. It was one of the few examples of this species ever secured in Texas. I kept it in my garage for three weeks and then released it on Galveston Island. Since observations on Gannets at close quarters are not common, the following notes may be of interest:

Parasites.—The bird was heavily infested with lice. I dusted it with a pyrethrum-base insecticide, and the lice fell off in great numbers within a few minutes. No louse was seen on it afterward. Mr. John Simmons, Department of Biology, the Rice Institute, identified some I collected as *Pectinopygus bassani* (17 specimens) and *Menopon* sp. (8 specimens).

Plumage and molt.—The plumage succession of young Gannets is very complex, and I did not find the plumage phase of this bird described in any of the usual authorities. The back and wings were entirely dark brown, as were the tail feathers, except at the base. The underparts were dirty white except for a broad, indistinct dark band around the lower neck or upper breast. The top of the head was white flecked with black. The tertials on both wings had evidently been molted and not replaced, and the very distinct gap left in the wing surface next the body probably accounted for the bird's inability to fly. These tertials had grown back almost to normal length within three weeks. The iris (which also changes color with age) was gray-blue.

Feeding behavior.—For the first three or four days it was force-fed with strips of codfish or ocean-perch steaks bought frozen and thawed out. The bird resisted