

11. The young climb to the entrance of the hole to receive food from the parents on about the fifteenth day.

12. The young left the nest in question for the first time on the twenty-sixth day, but in other nests observed, this time has varied from the twenty-second to the twenty-sixth day.

13. Even after leaving the nest the young birds are under parental care for some time.

Laboratory of Ornithology
Cornell University
Ithaca, N. Y.

NEST SURVIVAL OVER WINTER

BY H. ELLIOTT McCLURE

IN the course of a study of the life history of the Mourning Dove, *Zenaidura macroura* (Linn.), in southwestern Iowa during 1938, it became evident that the presence of old nests of other birds was important in the economy of the dove. Following the winters of 1938-39 and 1939-40, all of the nests that had withstood winter rigors at Lewis, Iowa, were counted. The town covers an area of approximately 160 acres in which there were over 1600 trees an inch or more in diameter. In the summers of 1938 and 1939, all of these trees were examined every two days in an effort to discover Mourning Dove nests. Incidentally, the nests of other birds were noted, too. When the post-winter survey was made in March of 1939 and 1940, it was possible not only to record the nests that were remaining, but also to indicate those that had been used by doves the previous season.

Table I lists the information concerning this post-winter survey. Any nest that had retained its structure, such as high walls in that of the Eastern Robin or the Bronzed Grackle, was considered in good condition. Any one that was falling apart was considered in poor condition. Of those found in both years, more than sixty per cent were in good condition. Nests of the Eastern Robin ranked first in survival for the two years. Those of the Baltimore Oriole were second in number.

The nest of the robin is an important aid to Mourning Doves in their nesting. It is large enough to contain the dove nest that is often built within it, and sturdy enough to survive bad storms, so that dove-nesting success is higher in the robin nest than in one of dove construction alone. Nineteen per cent of the robin nests surviving each winter had already supported dove nests during the past

TABLE I
NUMBER OF BIRD AND FOX SQUIRREL NESTS SURVIVING WINTER WINDS ON
160 ACRES OF TOWN PROPERTY, LEWIS, IOWA.
1938-1939

Nest	Number of nests	Condition		Per cent of total	Number used in 1938 by
		Good	Poor		
Eastern Robin (<i>Turdus m. migratorius</i>)	127	70	57	57.0	Dove, 18 English Sparrow, 1
Baltimore Oriole (<i>Icterus galbula</i>)	29	10	19	13.0	
Mourning Dove (<i>Zenaidura macroura</i>)	26	24	2	11.6	
Bronzed Grackle (<i>Quiscalus quiscula aeneus</i>)	15	9	6	6.7	Dove, 9 English Sparrow, 1
English Sparrow (<i>Passer domesticus</i>)	2	2	0	.9	
Blue Jay (<i>Cyanocitta c. cristata</i>)	4	1	3	1.7	
Catbird (<i>Dumetella carolinensis</i>)	3	3	0	1.3	Dove, 1
Fox Squirrel (<i>Lasiurus niger rufiventer</i>)	17	8	9	7.6	
<i>Total</i>	223	127	96	99.8	Dove, 28; English Sparrow, 2
1939-1940					
					Number used in 1939 by
Eastern Robin	98	66	32	40.0	Dove, 26
Baltimore Oriole	45	30	15	18.2	
Mourning Dove	29	22	7	11.3	
Bronzed Grackle	17	13	4	6.9	Dove, 8
English Sparrow	5	5	0	2.0	
Blue Jay	4	3	1	1.6	Dove, 1
Eastern Kingbird (<i>Tyrannus t. tyrannus</i>)	2	1	1	.8	
Warbling Vireo (<i>Vireo g. gilvus</i>)	3	3	0	1.2	
Catbird	3	2	1	1.2	
Fox Squirrel	40	32	8	16.2	Dove, 2
<i>Total</i>	246	177	69	99.4	Dove, 37
<i>Two-year total</i>	469	304	165	99.6	Dove, 65; English Sparrow, 2

season. When the dove moves in from the south in the latter part of March and April, it seeks these old robin nests and selects them for nesting sites. Because of the abundance of the robin, there were many more of its nests available than those of the Bronzed Grackle. However, the Bronzed Grackle built in small colonies in evergreens scattered throughout the town. The first choice of the dove for nesting sites in the spring was these evergreens. Grackles finish their brood raising in midsummer and their nests then become available to the dove. Fifty-three per cent of all grackle nests found with-

standing the winter had supported dove nests the past season. The use of these nests was also high in the spring.

During April of 1938, ten per cent of the dove nests were in old nests of other birds. In 1939 this figure increased to twenty per cent, and in 1940 it reached twenty-seven per cent. The three-year average use of other birds' nests in April was nineteen per cent.

Table II lists information concerning the species of trees in which old nests were found, the number and percentage of each species of tree as related to the total number of trees bearing old nests, and the numbers and percentages of each species of bird whose nest was found in each tree species. This table is self-explanatory and need not be discussed except for certain items. Twenty-three species of trees supported old nests following the winter of 1938-39, and twenty-two species following the winter of 1939-40. It will be noted that American elm constituted 48.6 per cent of the trees bearing old nests and had among its branches 45.6 per cent of all the nests. Second in importance, ranking as a tree supporting many nests, was box elder, and third was red pine. The relationship between the percentage of trees of each species and percentage of nests that this species supported was very close; that is, as in the box elder, 16.9 per cent of the trees bore 15.2 per cent of the nests. Further, a perusal of Table II will show also the types of trees most used as nesting sites by each species building durable nests. Table II also shows the percentage of each species of tree present in Lewis. This gives a comparison between the percentage of total trees and the percentage of trees of each species bearing old nests. From this we have data indicating the choice of trees by the several species of birds whose nests have lasted over the winter.

TABLE II
SPECIES OF TREES AND SHRUBS BEARING OLD NESTS AND THE KINDS OF NESTS IN THEM

Tree	Percentage of total trees in Lewis	Number having old nests			Nests	Number		
		1939	1940	total		1939	1940	total
American elm (<i>Ulmus Americana</i>)	33.0	95	89	184	Baltimore Oriole	25	36	61
					Fox squirrel	7	27	34
					Eastern Robin	61	45	106
					Blue Jay	2	2	4
					Mourning Dove	2	3	5
					Bronzed Grackle	1	0	1
					Warbling Vireo	0	3	3
					<i>Total</i>	98	116	214
<i>Per cent of total</i>		47.2	50.0	48.6		44.0	47.1	45.6

TABLE II (Cont.)

SPECIES OF TREES AND SHRUBS BEARING OLD NESTS AND THE KINDS OF NESTS IN THEM

Tree	Percentage of total trees in			Number having old nests			Nests	Number					
	Lewis	1939	1940	total	1939	1940		total					
Box elder (<i>Acer negundo</i>)	15.0	35	29	64	Eastern Robin	33	17	51					
					Fox squirrel	2	5	7					
					English Sparrow	1	0	1					
					Baltimore Oriole	1	4	5					
					Blue Jay	1	4	5					
					Mourning Dove	0	1	1					
					Eastern Kingbird	0	1	1					
					Bronzed Grackle	0	1	1					
					<i>Total</i>	38	33	71					
<i>Per cent of total</i>						17.0	13.4	15.2					
Red pine (<i>Pinus resinosa</i>)	1.0	18	11	29	Mourning Dove	10	10	20					
					English Sparrow	2	0	2					
					Bronzed Grackle	9	9	18					
					Eastern Robin	1	3	4					
										<i>Total</i>	22	22	44
<i>Per cent of total</i>						9.9	9.0	9.4					
Soft maple (<i>Acer saccharinum</i>)	7.0	10	9	19	Fox squirrel	6	4	10					
					Eastern Robin	5	1	6					
					Baltimore Oriole	0	5	5					
					Blue Jay	0	1	1					
										<i>Total</i>	11	11	22
<i>Per cent of total</i>						4.9	4.4	4.6					
Blue spruce (<i>Picea pungens</i>)	.4	2	4	6	Mourning Dove	7	5	12					
					Bronzed Grackle	1	0	1					
					English Sparrow	0	5	5					
										<i>Total</i>	8	10	18
					<i>Per cent of total</i>						3.5	4.0	3.7
Norway spruce (<i>Picea abies</i>)	.7	5	3	8	Eastern Robin	3	3	6					
					Mourning Dove	5	6	11					
					Bronzed Grackle	0	3	3					
										<i>Total</i>	8	12	20
					<i>Per cent of total</i>						3.5	4.8	4.2
Ash (<i>Fraxinus</i> spp.)	3.0	7	5	12	Eastern Robin	5	2	7					
					Fox squirrel	1	2	3					
					Baltimore Oriole	1	0	1					
					Blue Jay	0	1	1					
										<i>Total</i>	7	5	12
<i>Per cent of total</i>						3.7	2.0	2.8					
Silver poplar (<i>Populus alba</i>)	.3	2	1	3	Baltimore Oriole	1	0	1					
					Eastern Robin	1	1	2					
										<i>Total</i>	2	1	3
<i>Per cent of total</i>						.9	.4	.6					
Apple (<i>Pyrus malus</i>)	10.0	5	3	8	Eastern Robin	2	2	4					
					Bronzed Grackle	2	0	2					
					Catbird	1	1	2					
										<i>Total</i>	5	3	8
<i>Per cent of total</i>						2.2	.17	1.9					

TABLE II (Cont.)
SPECIES OF TREES AND SHRUBS BEARING OLD NESTS AND THE KINDS OF NESTS IN THEM

Tree	Percentage of total trees in		Number having old nests			Nests	Number		
	Lewis		1939	1940	total		1939	1940	total
Tamarack (<i>Larix laricina</i>)	.2		3	2	5	Eastern Robin	3	2	5
						Bronzed Grackle	1	4	5
						Mourning Dove	1	0	1
						<i>Total</i>	5	6	11
<i>Per cent of total</i>			1.5	1.2	1.3		2.2	2.4	2.3
Juniper (<i>Juniperus</i> spp.)	2.0		1	3	4	Eastern Robin	1	1	2
						Mourning Dove	0	3	3
						Catbird	0	1	1
						<i>Total</i>	1	5	6
<i>Per cent of total</i>			.5	1.6	1.0		.4	2.0	1.2
Mulberry (<i>Morus rubra</i>)	1.0		1	3	4	Eastern Robin	1	2	3
						Eastern Kingbird	0	1	1
						<i>Total</i>	1	3	4
<i>Per cent of total</i>			.5	1.6	1.0		.4	1.7	1.0
Hackberry (<i>Celtis occidentalis</i>)	.7		3	0	3	Blue Jay	1	0	1
						Eastern Robin	1	0	1
						Mourning Dove	1	0	1
						<i>Total</i>	3	0	3
<i>Per cent of total</i>			1.5		.7		1.3		.6
Chinese elm (<i>Ulmus parvifolia</i>)	2.0		1	3	4	Mourning Dove	1	0	1
						Eastern Robin	0	3	3
						<i>Total</i>	1	3	4
<i>Per cent of total</i>			.5	1.6	1.0		.4	1.7	1.0
Catalpa (<i>Catalpa catalpa</i>)	1.5		2	3	5	Eastern Robin	2	3	5
Pear (<i>Pyrus communis</i>)	.5		1	2	3	Eastern Robin	1	3	4
Lilac (<i>Syringa vulgaris</i>)			2	1	3	Catbird	2	1	3
Walnut (<i>Juglans nigra</i>)	5.6		1	0	1	Baltimore Oriole	1	0	1
Black locust (<i>Robinia pseudoacacia</i>)	.2		1	0	1	Eastern Robin	1	0	1
Hard maple (<i>Acer saccharum</i>)	.5		1	0	1	Eastern Robin	1	0	1
Plum (<i>Prunus domestica</i>)	5.0		1	2	3	Eastern Robin	1	2	3
Cottonwood (<i>Populus deltoides</i>)	.4		1	1	2	Eastern Robin	1	2	3
Linden (<i>Tilia americana</i>)	.1		1	1	2	Fox squirrel	1	1	2
Spirea (<i>Spirea</i> sp.)			0	1	1	Catbird	0	1	1
Cherry (<i>Prunus avium</i>)	5.5		0	1	1	Eastern Robin	0	1	1
<i>Total</i>			199	179	378		223	246	469

It is obvious that strongly constructed nests would withstand winter winds better than poorly constructed ones. In two years, out of twenty-five hundred Mourning Doves' nests, only fifty-five withstood the winter. Since the dove builds a flimsy nest, only nests in the more protected places would last. As no count of total numbers of robin nests was made, we do not know what percentage of the total built the old ones represented. Other nests would grade in between these two extremes.

SUMMARY

Old nests of birds and fox squirrels that have withstood winter winds were counted in Lewis, Iowa, in March of 1939 and 1940. A total of 469 nests of nine species of birds and one species of squirrel were found in twenty-three species of trees. Nests surviving the winter in the greatest numbers were those of the Eastern Robin, Baltimore Oriole, fox squirrel, and Mourning Dove. Trees supporting the greatest numbers of old nests were elm, box elder, and red pine.

Nebraska Game Forestation and Parks Commission
Upland Game Bird Survey
Ord, Nebraska

CROSS-MATING OF CANADA GEESE WITH EMDEN GEESE

BY ALEXANDER W. BLAIN, M.S., M.D., F.A.C.S.

Plate 16

THE crossing of certain wild ducks and pheasants has been carefully studied. The condition is undoubtedly much rarer in the wild state than in birds kept in a semi-domesticated state upon which most of the studies have been based. J. C. Phillips discusses this in an interesting article entitled 'A Further Report on Species Crosses in Birds' (*Genetics*, 6: 366-383, 1921). Anyone who has bred various types of pheasants in captivity has had much the same experience. The crossing of the Mallard with the white call-duck has proved a troublesome problem in my flock, and while the offspring all reverted to the wild state and nested on my property outside of the pen, there was never any trouble in distinguishing the interesting hybrid as it flew from the nest or was seen in the water.

The polygamy on the part of some birds is very well known. This is especially true in this part of the country among Red-winged Black-birds. On the other hand, the belief has been quite constant on the part of ornithologists and hunters that the Canada Goose (*Branta*