



# *The Raven*

BULLETIN OF THE VIRGINIA SOCIETY OF ORNITHOLOGY  
PUBLISHED AT LYNCHBURG, VIRGINIA

DR. J. J. MURRAY, EDITOR  
LEXINGTON, VA.

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## BIRD STUDY in the PUBLIC SCHOOLS

By Talbott E. Clarke

"Get a Boy or Girl genuinely interested in wildlife, and that boy or girl is well along the road to becoming a good conservationist."

The truth of this statement has been demonstrated over and over again in many communities where bird study has become an integral part of the school program. In the past, many educators undoubtedly would have frowned upon a proposal to use valuable school time for such "unimportant" work as bird study, but those who have had the opportunity to watch a group of students eagerly checking the identification of a "new" bird, studying its habits, and noting its outstanding characteristics, cannot question the wisdom of utilizing and guiding a youngster's natural interest in the various living forms which he sees about him. It has been found that one of the very first effects of organized and directed bird study is to substitute the attitude of protection, and the habit of careful observation, for the prevalent tendency of the average American boy to use his B-B gun in checking the identity of song birds perched in the trees in his back yard.

A Harrisonburg, Virginia, newsboy, who was having difficulty in convincing half a dozen of his friends that the crippled bird he carried was a "Strawberry bird", came to the office of the Forest Supervisor of the George Washington National Forest to prove that his Dad's identification of the bird had been correct. His six chattering friends, who were determined to prove him wrong, insisted that their teacher had "taught them a few birds". They were positive that the bird was a female cardinal, and indeed were quite ready to fight, if that became necessary, to win their point. When the bird was identified as a female cardinal, and it became necessary for the crestfallen newsboy to acknowledge his defeat, his disappointment at his Dad's obvious ignorance of the names of the most common birds knew no bounds.

Fortunately for tens of thousands of children in Virginia's schools, his childish embarrassment was not entirely in vain. The beginning of organized bird study in the public schools in the mountainous regions of the state developed as a result of the plight of the little newsboy, for from this incident the growing interest of the U. S. Forest Service and the Virginia Commission of Game and Inland Fisheries in a bird study program for children crystallized into a plan of action.

A peace conference ensued, after the identification of the female cardinal, and the boys soon departed. To them, the problem was solved, the case closed. Not so with the Forest officer to whom the heated discussion was an indication of the boys' intense interest in wildlife-- an interest worthy of guidance and encouragement. This was not his first contact with school children eager to learn more about the wild birds and other animals of their communities.

From the conversation which had taken place, it was obvious that at least one school teacher, without sufficient material or time, was attempting to introduce worthwhile bird study into the curriculum of the lower grades of one of the public schools. Undoubtedly, many others were attempting the same thing. Several weeks devoted to gathering facts revealed that there was a tremendous interest in birds throughout the state, and an equally tremendous lack of suitable material for study. These facts were brought to the attention of the U. S. Forest Service, and the Virginia Game Commission.

A collection of study skins, in which were preserved all the identification features of each birds, was prepared at the Harrisonburg office of the George Washington National Forest. Not to be stowed away in steel cases and reserved for the careful examination of learned ornithologists, these skins were placed in large glass tubes, which were fitted with corks for each end. Thus they were made available for study by eager youngsters and, at the same time, given at least some protection from too rough handling. Emphasis was definitely upon availability for study, however, rather than upon protection of the skins.

Then there arose the big problem of arranging to circulate these study skins among the schools without allowing the glass tubes to become broken or the skins damaged. A large wooden case was constructed with recesses cut to fit the tubes, which varied in diameter from one-half to three and one-half inches. Many interested persons doubted that the collection would last one complete school term.

At the close of the first school year during which the collection was in use, the records showed that the bird skins had been studied by 65,000 students as a part of their regular class work, and had also been used as an exhibit at the State Fair and at a number of County Fairs. The collection was still in good condition. By the end of two years the collection had created for itself an ever-increasing demand which was already too large to be met with the single series of skins. There had developed, practically everywhere that the collection had been used, a seemingly insatiable interest in bird study as a permanent part of educational program in every class from the kindergarten to the senior year of college.

Conferences with well-informed teachers led those in charge of the skin collection to decide that better coverage could be obtained by breaking the large

collection down into smaller units. Furthermore, it gradually became clear that the collection, although valuable as an educational device at almost every level of learning, was most desirable for use in the high schools and colleges.

Several teachers began to ask if it would be possible to obtain a few standing mounts to add to the series of study skins. At first, the idea of standing mounts being shipped and hauled over mountain roads in cars and in the back of Forest Service pickup trucks was considered impractical. But as time went on and student enthusiasm continued to grow, a sample collection of standing mounts was developed and tried out. Ten standing mounts, in two groups of five each were set up in a case. Each group was covered by a pane of glass. The case was wired for lighting, making it quite attractive in appearance, and the unit was equipped with an identification system to inject the element of chance into what many students already considered the most pleasant and exciting type of school work.

Immediately under each group of five bird mounts, there were placed five push buttons arranged in the same pattern as the group of birds. On the center panel, between the glass-covered mounts, there were ten buttons, each carrying the name of one of the birds. To check his accuracy in identification, the student could press the button in the same relative position as the bird which he wished to name, and at the same time press the button on the center panel which he believed carried the correct name of the bird. If he matched correctly the bird and its name, a concealed buzzer operated by a  $1\frac{1}{2}$  volt dry cell battery would give a satisfying buzz. If the wrong buttons were pressed, the student was greeted by a complete silence from the buzzer. The success of this first unit resulted in the construction of ten such cases, containing 100 species of birds.

Financing the first few units was difficult. Later, after the first few had demonstrated their value, voluntary public subscription, principally from the organized sportsmen's groups, solved this problem.

Working out a satisfactory system of distribution of the units presented another problem. The transfer of the cases from school to school, covering a schedule of over one hundred schools during each school term, seemed at first a serious obstacle because of the prohibitive cost. Finally, however, a schedule was worked out for the various counties whereby the state game wardens and the forest rangers took care of the necessary transportation, incidental to their regular work. This arrangement put an extra burden on the rangers and wardens, but it eventually proved to be quite satisfactory. The game wardens, while distributing the bird cases, had a splendid opportunity to meet and become acquainted with the pupils in the schools. The pupils had a chance to know the wardens as friends, and not as enemies who were out to 'catch' people and who should therefore be avoided. Many wardens took this opportunity to explain broader conservation principles in their contacts with school teachers and children, and as a result there are now many groups of school children who are growing up with a sympathetic understanding of the problems of wildlife management. In the case of the forest rangers, the results have been similar, except that the rangers have used their contact with the teachers and school children to explain their most important single job - fire prevention. Many students have thus become interested in forest fire prevention because of the damage fires do to the timber and to the land, and because of the havoc they work among the birds about which the boys and girls are studying.

in their regular classes.

Bird lovers are interested in the immediate effect which this type of bird study has on the attitude of the students in regard to bird protection. The answer to their questions is to be found in the reports of the cooperating game wardens, many of whom say that even the worst bird-killers among the boys in a community often develop an entirely different interest in song birds as a result of their bird study work.

One tough youngster is reported to have said: "I'd just like to see somebody try to kill a bird, especially those old grackles that walk around on the grass like they have their hands in their pockets." Indeed, this attitude seems to prevail among the boys and girls throughout the area in which the bird collections have been used.

The use of the collections varies somewhat between the various schools. Both the extent and manner of use seems to depend largely upon the personal interest of the individual teachers. In one town of about 5,000 population, three units received about 24,000 hours of student use during one month. The importance of bird study in the curriculum compares favorably with that of art study and similar activities in many schools. In fact, bird study is sometimes combined with art study.

Where the use of the bird cases is now accepted as an integral part of the school program, "bird walks" have also been scheduled for regular periods. These walks give the students a chance to practice their identification on living birds. They also give the teachers an added opportunity to observe their pupils and to study them in a situation unlike that encountered in the ordinary classroom. A child who identifies a bird that in the past was a total stranger to him, discovers something through independent thought. A few such discoveries, and the doors begin to open and expose to his view the really wonderful world in which he lives--a world full of the simple things which so many of us are never capable of enjoying to the fullest extent.

Records show that through this type of bird study, Fourth and Fifth Grade students are often able to learn to identify at sight as many as fifty birds. How many adult sportsmen would have difficulty matching this feat?

Requests for the bird study units are being received every day, from all sections of the state. Plans have been made for expanding the collection from ten to twelve or fourteen units this summer, but it will still be impossible to meet the ever-growing demand for this type of equipment. It is felt, however, that within five years enough of these units will have been built to permit the extension of their circulation into many counties in sections where it is impossible to send them now.

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#### SCRAPBOOKS FOR BIRD STUDY

By Evie Bromley Key

The idea for making scrapbooks on "Birds" for the use of Garden Clubs grew out of a love for the birds themselves, a desire to help in their protection and to increase their numbers as well as a need of the clubs for program material.

Large loose-leaf scrapbooks, size  $12\frac{1}{2}$  x  $14\frac{1}{2}$  inches, from the dime store are ideal for the purpose and are used to some extent, but realizing the rough handling they would encounter in the mails (since their mission in life is to visit the 161 Garden Clubs in the state) a substitute in the form of very heavy cardboard was used. These books are not at all fancy, in fact, they are rather bulky and clumsy -- almost crude. Two of the heavy pieces of cardboard  $12\frac{1}{2}$  x  $14\frac{1}{2}$  inches are used for backs and all kinds of clippings from magazines and newspapers, pictures of birds cut from magazines, postcards, and booklets from the National Audubon Society and the Department of Agriculture are placed between the two.

Twenty books called "Birds of the States" were purchased from The American Association; the same number of large pictures, in sets of twelve each, from Rudyard Bolton's "Traveling with the Birds"; postcards of Spring, Summer and Winter Birds from the National Audubon Society as well as a number of leaflets; several sets of 80 pictures and descriptions of birds from the Wildflower Preservation Society; from the Department of Agriculture all the booklets on birds were bought; as well as several copies of "Bird Houses" from the Cranbrook Institute of Science. Heavy paper, a quarter of an inch smaller than the cardboard, was used for the pages of the scrapbook when needed. This size will take articles and pictures from the largest magazines, even from "Life," which is the largest size used.

When an article on birds was not printed on both sides it was pasted onto this heavy paper with Paralastic, a paste with a rubber base which causes no puckering. If the article happened to be printed on the two sides of the same sheet it had to stand alone; that is, it went into the "heap" just as it was. This makes the finished book uneven, of course, as many of the magazines are much smaller, and most of the pamphlets are 6 x 8 inches; in fact, they are of all sizes. All short articles, small pictures and postcards were pasted directly onto the heavy paper.

Since the article with the printing on one side only was pasted onto the heavy paper, perhaps the next part of it ("continued on page so-and-so") would be printed on the reverse side also, then it was used as the next page following in the scrapbook, even though it was much smaller in every way. Perhaps the third part had the bird article in one column only! Then the "foreign" material was covered by pasting over it pictures of birds or even plain white paper; just anything to cut out the unwanted articles and advertisements. All pages, articles and pamphlets were placed in a neat and perfectly even pile with the boards front and back, then friend husband very carefully drilled holes through the entire heap. Every page is reinforced with the little gummed "buttonholes" so they will not tear loose from their moorings. Shoe strings are fine for tying them rather tightly together, though various kinds of cord were used. They were tied so that the clubs might take them apart if they needed a special item for a program as they are rather cumbersome to hold as a unit. (Naturally it is to be hoped they will be tied back!)

Of course to make a really neat, nice job the loose leaf books mentioned, with "windows" cut into the pages by hand, should be used; but after making two with "windows" it was seen that this would be an endless task, so by combining the material in the manner described ten have been compiled and have seemed to be quite popular, as they have been in constant use.

Here is a typical scrapbook: A mimeographed sheet on winter feeding, pictures of Ivory-billed Woodpecker, California Condor, Mergansers, Blue Birds, and many others; articles on the "Wren", "Arctic Visitors of Winter", "Skipper, the Murres", "Marsh Waders", "The Bald Eagle", "Bird Photography", "The Meadowlark", "Birds in the Garden", "Chimney Swifts", and so on. Birds of the States, Bird study for schools, How to Organize a Junior Club, Bird Houses, Bird Migration, Birds in a Hedgerow, Hawks, Rescuing an Island, The Solitary Ones, News on the Wing, Audubon Catalogue and Virginia Wildlife are the books included in this one. A number of other pictures and short articles are also enclosed in this scrapbook selected at random.

Magazines carefully saved for a number of years have yielded a rich store of material; They are Nature Magazine, Flower Grower, Madison Cooper's Gardening Magazine, House Beautiful, House and Garden, Country Life, Colliers, Life, Arizona Highways, Garden Gossip, Horticulture, Southern Sportsman, and Virginia Wildlife. Articles by Dr. J. J. Murray and Mr. Ruskin Freer are always enclosed. Wildlife stamps and the little picture cards from the Arm and Hammer people are very attractive and used in several of the scrapbooks; the old Bird Lore magazine and the Raven are occasionally enclosed. A very fine collection of pictures, leaflets and pamphlets were contributed by Mr. Douglas Orbison of the National Audubon Society.

Of course these scrapbooks are not all alike but each one is the same size and each carries similar material; except two specialized ones: one on "Hawks"; and the other on "Homes for Birds". Many clubs have borrowed them and any one interested is welcome to the use of them.

Buena Vista, Virginia.

(Mrs. Key, who is chairman of the Committee on Birds of the Virginia Federation of Garden Clubs has done some splendid educational work in her organization. She is also an active V. S. O. member. - Ed.)

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#### NOTES

Mrs. Leila F. Clark, Librarian of the Smithsonian Institution, Washington, D. C., is very anxious to complete the file of The Raven in the library of the that Institution. It lacks numbers 6, 8 and 9 of Volume I. She would be glad to buy or to receive as a gift any of these issues from members who could spare them.

Naruna, Va. On November 4, 1942, a farmer who lives next to the school building killed an American Bittern in his cornfield, and brought it to the school for identification. This is a new species for my list here. I have records of the Migrant Shrike from September 24, to November 4, 1942. We do not see the Migrant Shrike often here.  
Bertha Daniel.

Denbigh, Va. A former Biology student of mine has recently given me the following bit of his bird observations. "During the latter part of May, 1942, the drought was so severe in the environs of Denbigh, Virginia, that Barn Swallows were unable to obtain the mud necessary for nest construction. Through necessity they were forced to find a substitute in the form of material already at hand, namely, fresh cow dung. With this the cup was completed which was then lined

with feathers in good swallow fashion. Two broods were reared in this particular nest." Has this substitute for mud been observed before? I have asked him to get the nest for me, although I do not doubt his observation.

D. Ralph Hostetter,  
Harrisonburg, Virginia.

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Lexington, Va. For the first time in my experience a Brown Thrasher and a Catbird have wintered at Lexington. During December various reports of the two birds having been seen in the same part of town came to me. Finally on December 26, 1942, I saw the Catbird. It was apparently in good condition and very active, visiting the feeding tray of a friend to eat scraps of apples and bread. I did not see the Thrasher but am satisfied with the identification, which was made by several people familiar with the bird. American Mergansers were fairly common on North River throughout January and February.

J. J. Murray.

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Report of Treasurer of The Virginia Society of Ornithology  
Statement covering receipts and disbursements  
January 1, 1942 - December 31, 1942

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December 31, 1941 - Balance on hand as per last report.....	\$ 188.24
<u>RECEIPTS - 1942</u>	
Membership Dues . . . . .	101.00
TOTAL . . . . .	\$ 289.24

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DISBURSEMENTS:

Voucher No. 21 - January	6, 1942	- A. O. English	
" " 22 - January	6, 1942	Postage - "Raven".....	\$ 3.00
" " 23 - January	9, 1942	Mrs. Elsie Garst	
" " 24 - January	17, 1942	October & November "Raven"	5.00
" " 25 - March	7, 1942	Mrs. Elsie Garst	
" " 26 - April	1, 1942	December "Raven".....	5.00
" " 27 - April	6, 1942	A. O. English	
		Postage.....	1.00
		Cash	
		100 Envelopes @ 3¢.....	3.23
		Mrs. Elsie Garst	
		Postage - "Raven".....	6.07
		Mrs. Elsie Garst	
		"Raven".....	5.00

Voucher No. 28 - May	9, 1942 - Mrs. Elsie Garst	"Raven".....	\$ 5.00
" " 29 - July	29, 1942 - Mrs. Elsie Garst	"Raven" April and May....	5.00
" " 30 - August	1, 1942 - Dooley Printing Company	Envelopes.....	2.75
" " 31 - August	1, 1942 - Caldwell Sites Company	Stationery.....	20.80
" " 32 - August	1, 1942 - Mrs. Elsie Garst	Stamps - "Raven".....	9.00
" " 33 - August	13, 1942 - Mrs. Elsie Garst	June & July "Raven".....	5.00
" " 34 - August	27, 1942 - Mrs. Elsie Garst	August "Raven".....	5.00
" " 35 - September	16, 1942 - Dooley Printing Company	Envelopes.....	6.00
" " 36 - December	3, 1942 - Mrs. Elsie Garst	September, October, November and December "Raven".....	<u>10.00</u>
TOTAL .....			\$ 96.85
Balance on hand December 31, 1942, as per bank statement.....			<u>192.39</u>
TOTAL .....			<u>\$ 289.24</u>

Respectfully submitted,  
T. L. Engleby, Treasurer.

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#### 1942 CHRISTMAS BIRD CENSUS

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Seward Forest, Brunswick County, Virginia; (Through fields, pastures, and pine woods north to Whiteoak Creek; up creek about a mile through wooded lowgrounds; through woods and farm lands southwest to Rattlesnake Creek, down creek through beech-oak-holly woods to confluence of Mill Branch, and up branch home.) Same route as in 1941. December 24, 8 A. M. (E.W.T.) to 12:30, P. M. to 5:10. Clear, little wind, no snow, temp. at start 37, at noon 54, total miles afoot about 7, observer alone.

Turkey vulture, 4; Bob White, 2; Woodcock, 1; Mourning Dove, 21; Great Horned Owl, 2 (Heard before dawn.); Flicker, 4; Pileated Woodpecker, 4; Yellow-bellied Sapsucker, 3; Hairy Woodpecker, 1; Blue Jay, 7; Crow, 21; Chickadee, 4; Tufted Titmouse, 4; Brown-headed Nuthatch, 1; Winter Wren, 1; Carolina Wren, 9; Mockingbird, 7; Robin, 1; Hermit Thrush, 6; Bluebird, 10; Golden-crowned Kinglet, 2; English Sparrow, 2; Cowbird, 5 (small flock going south); Cardinal, 11; Goldfinch, 9; Savannah Sparrow, 8; Junco, 125 (partly est.); Field Sparrow, 22; White-throated Sparrow, 24; Song Sparrow, 12.

Total species 30, total individuals 334.

John B. Lewis, Field Naturalist  
Seward Forest, Triplett, Va.

Norfolk, Va. (Intersection of Route 615 and Sand Bridge Rd, south to brook swamp on Route 623, north to Horn Point, on Route 603, north to Sand Bridge, south to Fish and Wildlife Service Refuge and to that part called Green Hills, return to Headquarters). -- Dec. 20; 8:30 A. M. to 2:30 P. M. Fine snow pellets in morning, changing at noon to a very heavy snowstorm for this area, situation became serious for participants at about 1 P. M.; wind moderate at beginning, changed to 29 miles per hour at noon; temp. 27 at start, 21 at finish. Four observers, 3 together for 2½ hours, all 4 together for 3½ hours. Total party hours afield, 6 (3 afoot, 3 by transportation); total party miles, 46 (20 by car, 21 by truck, 5 afoot.) Great Blue Heron, 1; Whistling Swan, 25; Canada Goose, 120; Greater Snow Goose, 166; Black Duck, 62; Pintail, 1; Red-breasted Merganser, 28; Red-shouldered Hawk, 1; Bald Eagle, 1; Marsh Hawk, 3; Sparrow Hawk, 6; Bob-white, 4; Sanderling, 12; Herring Gull, 5; Ring-billed Gull, 40; Mourning Dove, 3; Kingfisher, 1; Red-bellied Woodpecker, 2; Red-headed Woodpecker, 1; Yellow-bellied Sapsucker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 1; Crow, 19; Carolina Chickadee, 3; Tufted Titmouse, 1; Brown-headed Nuthatch, 2; Brown Creeper, 2; Carolina Wren, 13; Mockingbird, 3; Hermit Thrush, 11; Bluebird, 6; Golden-crowned Kinglet, 32; Pipit, 196; Starling, 50; Myrtle Warbler, 5; English Sparrow, 20; Meadowlark, 5; Red-wing, 258; Boat-tailed Grackle, 4; Cardinal, 25; Goldfinch, 6; Savannah Sparrow, 5; Tree Sparrow, 2; Field Sparrow, 4; White-throated Sparrow, 105; Swamp Sparrow, 2; Song Sparrow, 29. Total 47 species; 1,283 individuals. The Red-headed Woodpecker and the Tree Sparrows were observed by Ben Coffey; 1 Osprey and 1 Black Vulture were seen on way to census area. -- Ben Coffey, (Memphis, Tenn.), H. A. Bailey, Mr. & Mrs. A. C. Reed, (Norfolk.)

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Lynchburg, Va. (fields, woods, low grounds around Timber Lake and College Lake). Dec. 29, 8:15 A. M. to 12:15 P. M., 1 to 3 P. M. Low clouds from northeast, rain, drizzle and fog to 10 A. M., when precipitation stopped; dense fog and wind from northwest, rain and drizzle, 12 M.; ground bare, soaked; temp. 8:15 A. M. 53°; 12 M. 60°; 1 P. M. 50°. Five observers in two parties. Total hours in field, 6 - all on foot; total party miles, 8 - all on foot. Turkey Vulture, 1; Sharp-shinned Hawk, 1; Rock Dove, 26; Mourning Dove, 1; Kingfisher, 1; Flicker, 2; Pileated Woodpecker, 1; Red-bellied Woodpecker, 1; Red-headed Woodpecker, 1; Yellow-bellied Sapsucker, 1; Hairy Woodpecker, 3; Downy Woodpecker, 2; Prairie Horned Lark, 5; Blue Jay, 31; Crow, 12; Chickadee, 14; Tufted Titmouse, 16; White-breasted Nuthatch, 5; Red-breasted Nuthatch, 3; Brown Creeper, 1; Carolina Wren, 6; Mockingbird, 9; Catbird, 1 (McIntosh and Stevens); Bluebird, 4; Golden-crowned Kinglet, 6; Ruby-crowned Kinglet, 1; Starling, 109; English Sparrow, 9; Red-wing, 1; Purple Grackle, 1; Cardinal, 21; Goldfinch, 5; Towhee, 7; Junco, 97; Tree Sparrow, 1; Field Sparrow, 2; White-throated Sparrow, 40; Swamp Sparrow, 2; Song Sparrow, 31. Total 39 species, 481 individuals. Lynchburg Chapter of Virginia Society of Ornithology (Kingsley Stevens, Kenneth Lawless, Billy McIntosh, Mr. and Mrs. Ruskin S. Freer.)

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Lexington, Virginia. (territory usually covered, somewhat restricted this year: Big Spring Pond, cedar woods and oak woods along North River near Lime Kiln Bridge, overgrown fields.) - Dec. 21; 9:30 A. M. to 1:00 P. M., 2:30 to 5:00 P. M. Clear; four inches of fresh snow on frozen ground; light northeast wind;

temp. 3 at start, 20 at return. Observers together; 3 in morning,  $3\frac{1}{2}$  hours, 3 miles afoot, 15 by auto; 4 in afternoon,  $2\frac{1}{2}$  hours, 3 miles afoot, 8 by auto. Great Blue Heron, 1; Black Duck, 11; Green-winged Teal, 10; Turkey Vulture, 12; Black Vulture, 9; Sharp-shinned Hawk, 2; Cooper's Hawk, 2; Sparrow Hawk, 4; Bob-white, 16 (covey); Killdeer, 2; Mourning Dove, 12; Kingfisher, 1; Flicker, 4; Pileated Woodpecker, 3; Red-bellied Woodpecker, 4; Red-headed Woodpecker, 1; Downy Woodpecker, 7; Horned Lark, 24 (3 flocks); Blue Jay, 4; Crow, 37; Chickadee, 16; Tufted Titmouse, 4; White-breasted Nuthatch, 4; Brown Creeper, 1; Winter Wren, 2; Carolina Wren, 9; Mockingbird, 10; Bluebird, 17; Golden-crowned Kinglet, 16; Migrant Shrike, 1; Starling 277; Myrtle Warbler, 15; English Sparrow, 49; Meadowlark, 11; Cardinal 15; Goldfinch, 6; Junco, 164; Tree Sparrow, 52; Field Sparrow, 1; White-throated Sparrow, 6; Song Sparrow, 35. Total, 41 species; 907 individuals. Dickson Vardell Murray (afternoon), R. P. Carroll, Joe Magee, J. J. Murray.

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Blacksburg (Montgomery Co.), Va. (V. P. I. Campus & farm, Brush Mountain to New River, along New River 5 miles from Whitehorse Ferry to McCoy, within 13-mile diameter).--December 21; 7:30 A. M. to 7:00 P. M. Clear; 3 inches of snow; no wind forenoon to moderate East wind afternoon; temp.  $2^{\circ}$  at start,  $14^{\circ}$  at return. Observers 3 in 2 groups, afield all day. Total miles afoot, 30; by car, 25; total hours afoot and by car, 23, Mallard, 3; Red-logged Black Duck, 6; Common Black Duck, 7; Baldpate, 9; Pintail, 1; Lesser Scaup, 22; Golden-eye, 39; Unidentified ducks (seen at dusk, visibility too poor for identification), 100; Turkey Vulture, 48; Black Vulture, 5; Cooper's Hawk, 1; Red-tailed Hawk, 2; Red-shouldered Hawk, 2; Marsh Hawk, 3; Sparrow Hawk, 2; Ring-necked Pheasant, 1; Ruffed Grouse, 1 (fresh tracks); Bobwhite, 97 (7 coveys); Killdeer, 4; Wilson's Snipe, 22; Domestic Pigeon, 37; Screech Owl, 2; Belted Kingfisher, 3; Flicker, 5; Pileated Woodpecker, 2; Red-bellied Woodpecker, 6; Yellow-bellied Sapsucker, 3; Hairy Woodpecker, 12; Downy Woodpecker, 15; Mourning Dove, 78; Prairie-horned Lark, 380 (est.); Blue Jay, 29; Crow, 540 (est.); Carolina Chickadee, 61; Tufted Titmouse, 27; Red-breasted Nuthatch, 7; White-breasted Nuthatch, 20; Brown Creeper, 2; Winter Wren, 4; Carolina Wren, 4; Mockingbird, 5; Robin, 1; Hermit Thrush, 11; Bluebird, 79; Golden-crowned Kinglet, 94; Cedar Waxwing, 2; Migrant Shrike, 1; Starling, 2000 (est.); Myrtle Warbler, 3; English Sparrow, 67; Meadowlark, 129; Cowbird, 16; Cardinal, 83; Red Crossbill, 2; Goldfinch, 134; Savannah Sparrow, 3; Junco, 240; Tree Sparrow 164; Field Sparrow, 65; White-crowned Sparrow, 66; White-throated Sparrow, 2; Fox Sparrow, 1; Song Sparrow, 148; Total 62 species, 4,906 individuals.--C. O. Handley, C. O. Handley, Jr., and W. B. McIntosh.

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Mountain Lake, Giles County, Virginia (Little Stony Creek Valley, from Bob Fields on Big Mountain (elevation 4100 feet) to beaver pond on Hoge farm (elevation 3100 feet). Dec. 19, 9:00 A. M. to 6:00 P. M. (E. W. T.). Clear; strong wind from northwest; 4 to 6 in. snow; temp.  $20^{\circ}$  at start,  $25^{\circ}$  at finish. Two observers working together. Total hours afield, 9; total miles, 21 afoot. Ruffed Grouse, 11 (fresh tracks of 2 dozen others); Bobwhite, 12; Hairy-woodpecker, 12; Downy Woodpecker, 6; Blue Jay, 1; Crow, 3; Carolina Chickadee, 20; Tufted Titmouse, 6; White-breasted Nuthatch, 4; Brown Creeper, 1; Golden-crowned Kinglet, 15; Goldfinch, 7; Carolina Junco, 8. Total, 13 species; 106 individuals. W. B. McIntosh, and C. O. Handley, Jr.

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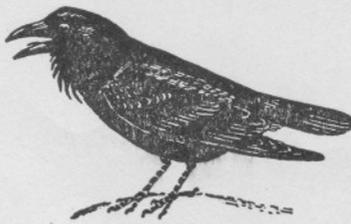
The following two lists cannot be considered as censuses since they consist only of birds accidentally observed during the course of duck hunts. No consistent effort was made to count or search out any birds. Claytor Lake is the largest body of water in Western Virginia, and the close association of coastal birds and birds of the mountains give it a distinctive fauna not found elsewhere in the state. As yet, this recently created fauna has been almost untouched by ornithologists, and so, offers a rich field of study for someone in the future.

Clayton Lake, Pulaski County, Virginia (South bank of lake, 3 to 5 miles above dam, elevation about 1,800 feet). Dec. 26; 8:00 A. M. to 4:00 P. M. (E.M.T.) Visibility 50 yards; no wind in morning to medium from west in afternoon; very thin ice on lake in spots; temp. 22° at start, 20° at finish. Two observers together. Total hours afield, 8; total miles 10 (6 afoot, 4 by boat). Pied-billed Grebe, 3; Mallard, 25; Black Duck, 125; Lesser Scaup Duck, 15; American Golden-eye, 75; Bufflehead, 75; American Merganser, 25; unidentified ducks, 200; Turkey Vulture, 2; Osprey, 1; Mourning Dove, 5; Flicker, 3; Yellow-bellied Sapsucker, 1; Hairy Woodpecker, 1; Downy Woodpecker, 3; Blue Jay, 2; Crow, 15; Carolina Chickadee, 5; Tufted Titmouse, 2; White-breasted Nuthatch, 3; Carolina Wren, 6; Golden-crowned Kinglet, 5; Starling, 10; Myrtle Warbler, 3; English Sparrow, 10; Meadowlark, 7; Cardinal, 4; Goldfinch, 25; Slate-colored Junco, 50; Field Sparrow, 25; Song Sparrow, 2. Total species 30; 733 individuals. J. H. Flannagan and C. C. Handley, Jr.

Claytor Lake, Pulaski County, Virginia (South bank of lake, 3 to 5 miles above dam, elevation about 1800 feet). Jan. 2, 1943; 8:00 A. M. to 12:00 Noon (E.M.T.). Clear; strong wind from west, causing whitecaps on lake; temp. 30° at start, 38° at finish. Two observers together. Total hours afield, 4; total miles, 10 (6 afoot, 4 by boat). Common Loon, 3; Horned Grebe, 1; Canada Goose, 1; Mallard, 29; Black Duck, 36; Bufflehead, 14; American Merganser, 49; Red-breasted Merganser, 15; Turkey Vulture, 13; Black Vulture, 1; Bobwhite, (covey calling at 8:00 A. M.); Mourning Dove, 2; Flicker, 1; Downy Woodpecker, 2; Prairie Horned Lark, 2; Crow, 6; Carolina Chickadee, 7; Tufted Titmouse, 3; Carolina Wren, 5; Bluebird, 2; Golden-crowned Kinglet, 3; Starling, 30; Myrtle Warbler, 2; English Sparrow, 10; Meadowlark, 3; Cardinal, 7; Goldfinch, 3; Slate-colored Junco, 40; Field Sparrow, 16; White-throated Sparrow, 17; Song Sparrow, 6; Unidentified ducks, 40. Total, 31 species, 369 individuals. -- J. H. Flannagan and C. O. Handley, Jr.

The difference in the number of ducks seen on the two days may be attributed to the weather conditions that prevailed. On Dec. 26 when 550 ducks were seen the surface of the lake was glassy smooth and the ducks were moving about a great deal, especially about the main body of the lake. On January 2 when only 150 ducks were seen, conditions reversed. The lake was very rough and a strong wind was blowing. Movement of ducks was at a minimum, and only mergansers ventured out into open water, the other ducks staying in coves and close to shore. The totals for both days probably represent only a fraction of the total number of ducks on the lake, since concentrations are usually greater 10 or 12 miles further up the lake where feeding grounds are better.

C. O. Handley, Jr.



# The Raven

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## In Memoriam: Ellison Adger Smyth, Jr.

In the death of Dr. Ellison Adger Smyth, Jr., on August 19, 1941, the Virginia Society of Ornithology lost its most distinguished member. At the organization meeting of the Society, December 7, 1929, he was one of the two men elected as Honorary Life Members, the other being Dr. William C. Rives of Washington. Dr. Smyth's span of service in various branches of biology covered more than half a century. While his interests were always broad, his largest services were rendered in entomology and ornithology. He was recognized as an authority on the Hawkmoths, and his collections in this field were extensive. His collection of bird skins, while not large, was choice and beautifully prepared. The papers which he published were prepared with the utmost care. We can only wish he had had time for more of them.

Ellison Adger Smyth was born at Summerton, Clarendon County, South Carolina, on October 26, 1863. The family home was in Charleston, but at the time his father, James Adger Smyth, was in the Confederate Army, and his mother, Annie Briggs Smyth, had returned to 'Cedar Grove', the Santee River Plantation of her family, to be with her own people and to escape the dangers of bombardment in the city. The boy was named for his father's brother, Captain Ellison Adger Smyth, who was only sixteen years his senior and who outlived him, to die in August, 1942, at the age of ninety-five. Captain Smyth was a cotton mill man, who installed the first induction motor drive to be used in a cotton mill in America. The grandfather, Dr. Thomas Smyth, came from Belfast, Ireland, in 1831, and was for forty years the minister of the Second Presbyterian Church of Charleston. He married into the family of James Adger, a wealthy Charleston merchant. A man of wide culture, Thomas Smyth had a remarkable private library of 17,000 volumes. When he inherited some money from an aunt in Ireland it was promptly put into books. The influence of this cultivated grandfather, who died when the boy was ten years old, awoke in Ellison Smyth the interest in natural history that became a life-long devotion. As a small child he played in this library, looking through the illustrated books on nature with which it was richly supplied and one of which was the Audubon elephant folio.

Like many small boys, Ellison Smyth had a zest for collection, but unlike most boys he never lost it. The family spent much time away from the city during the hot summers, at Summerton, at Pendleton, South Carolina, and at the summer home just outside town, on Sullivan's Island. There are still in his

collection specimens of butterflies that date back into the 1870's, testimony not only to the lasting quality of his enthusiasms but also to the thoroughness with which even as a small boy he prepared his catch. A member of the family reports an incident from those early days which shows how his love of nature had become a passion at times almost unruly. Some relative had died in the North and was being buried in the cemetery in Charleston. During the services little Ellison was noticed following with his eye an interesting butterfly. He had a small folding net in his pocket; and scarcely had the ceremony ended when he was away across the graves, to return in a few minutes with his specimen.

The boy's early education was received at a classical school in Charleston run by a Dr. Tarrant. Here the instruction was of the most thorough variety. To the end of his life Dr. Smyth could recite long passages of Latin and Greek, learned for the Friday afternoon declamations. He learned there too something better than Latin and Greek, the lesson of doing well whatever one undertakes.

Young Smyth entered Princeton University in 1880, just before his seventeenth birthday. He was attracted there by the fact that his grandfather and the famous Dr. James McCosh, the President, were friends. Having begun keeping notes on birds before this time, he kept up his records diligently while at the University. Once Dr. McCosh caught the boy climbing to a bird's nest in a tree in the sacred precincts of the Presidential yard, and promptly invited him in to tea and to a kindly lecture on the evils of robbing birds' nests. The tea made an impression on him; the lecture did not. At Princeton he was a member of Gymnast Team. He graduated in 1884 with the degree of A. B., receiving his Master's degree there also in 1887.

The father wanted his son to be a lawyer, so after leaving Princeton young Smyth studied law at Columbia University, New York, in 1885; then entered the firm of Smyth and Lee, of which his uncle, Augustine T. Smyth, was senior partner, and of which he soon became a junior partner; and then in 1887 again spent a year in the study of law at the University of Virginia under the famous Dr. Minor. But Law could not long hold him away from Nature. Briefs were dull work for a man whose head was full of birds and butterflies. When an uncle, Dr. Flinn of the First Presbyterian Church of Columbia, South Carolina, who was a member of the Board of Trustees of the University of South Carolina, told him that the chair of biology at the University was vacant and urged him to apply for the position, he did so without hesitation, and was elected. Not feeling qualified as full professor of biology he asked to be made adjunct professor. In 1889, after a summer at Woods Hole, Massachusetts, he took up his duties. These he performed so satisfactorily that he would soon have become full professor, but for the fact that he accepted a call to another post. Dr. John McBride, who had been appointed in 1891 to reorganize the Virginia Agricultural and Mechanical College (re-named the Virginia Polytechnic Institute in 1895), at Blacksburg, Virginia, asked Smyth, along with several other University of South Carolina professors, to go there with him.

From the beginning of his work as head of the department of biology at Blacksburg in the fall of 1891 to the time of his marriage in 1897 Smyth lived in the barracks with the cadets, entering into all their activities and winning a strong influence over them. He organized and coached the first football team the college had, built up and equipped a gymnasium, and organized a gym team. Through-

out his life at Blacksburg he worked hard, with many interests and activities outside his classroom and laboratory duties. For years he had only a student assistant. In the early years he made his own microscopic slides and collected much of his laboratory material. Even at the time of his retirement he had only one assistant professor. As the number of students increased he had to give up much of the research work which he loved and for which he was temperamentally equipped. From 1902 to 1906 he served as Dean of the college faculty in addition to all his other work, but finally had to give this up when his health began to fail under the strain. He usually had some special project on hand for the general good of the college. He took a leading part in the founding of the Agricultural Experiment Station, an organization which has been of immense value to the State. The college green-house was erected under his leadership and continued under his direction.

In the early years of his work at Blacksburg Dr. Smyth devoted most of his attention to entomology. He built up a large and valuable collection of butterflies and moths, with special emphasis upon the Sphingidae, exchanging with collectors all over the world and buying collections from certain missionaries, particularly in Mexico and Australia. Specimens of Argynnis diana, which were in great demand, were very common about Blacksburg, and with these he was able to obtain many specimens which he desired, both foreign and American. His collection at his death amounted to nearly 5,000 species and nearly 30,000 specimens. He established the identity of several varieties of butterflies and moths, and had a number of forms named for him. He was a founder of the Entomological Society of America, and during his first ten or fifteen years at Blacksburg was a regular contributor to Entomological News. P. P. Calvert, in a brief obituary of Dr. Smyth in the Entomological News, November, 1941, summarizes some of his accomplishments: "He contributed eighteen papers and notes to the volumes of the NEWS for 1895, 1899-1904, 1907, 1908, 1912, and 1916. They are concerned with the butterflies, sphingids, Catocalae and Dynastes tityus of Montgomery County, Virginia, within which Blacksburg lies, butterflies and Allorhina of South Carolina, life histories of sphingids and descriptions of two new species from Mexico, a sphinx, Philampelus elisa, and a Morpho (thoosa). In the NEWS for May, 1908, he figured and briefly described 'Two Freaks:- Papilio ajax and Eudamus tityrus'. Nearly twenty years later, the latter was 'christened' Epargyreus tityrus aberration smythi by R. C. Williams, Jr. (Transactions, American Entomological Society 53: 262.1927)." During these years he also made an extensive collection of birds' eggs, which unfortunately was destroyed in the science hall fire. His collection of skins amounted to about 1,500. He also mounted many specimens, most of which are still at Virginia Polytechnic Institute.

The increase of Dr. Smyth's teaching load not only hampered the research work which he would like to have done, but prevented the publication of much of his work. The ornithological papers were much fewer in number than those devoted to insects. The chief of these was his paper in The Auk (October, 1912, pages 508-530) on "Birds Observed in Montgomery County, Virginia", which was a model annotated list of 195 species observed over a period of twenty-one years. This was supplemented by a paper (The Auk, January, 1927, pages 44-46), "Additional notes on the Birds of Montgomery County, Virginia, reporting on 13 new forms and giving additional data on many others. The most striking record in these notes was that of a Black-capped Petrel (Aestrelata hasitata) taken at Blacksburg after

the storm of August, 1893, the third record for the United States. This record was mentioned by Newton in his book, A Dictionary of Birds. He had reported this bird at the time of its capture (The Auk, October, 1893, pages 361-362). In addition to other short notes in The Auk, he wrote a pamphlet, "Notes on the Feeding Habits of the Common Hawks and Owls of Virginia," (Va. Agric. & Mech. Col. Agric. Exp. Sta., Bul. No. 38, Blacksburg, Va., March, 1894, pages 23-39). The only paper which he wrote for The Raven was published in the November-December issue, 1938, page 96, "First Recorded Capture of the Swallow-tailed Kite in Virginia."

Dr. Smyth prepared a biography and estimate of the work of John Bennett, a Charleston writer, for the Library of Southern Literature. In 1910 he wrote an article for the Sewanee Review, "Poe's 'Gold Bug' from the Standpoint of an Entomologist." In 1922, on the occasion of the semi-centennial of the Virginia Polytechnic Institute, he prepared a history of the college. He also supplied occasional articles on popular science for the children's magazine, St. Nicholas.

He had been an Associate of the American Ornithologist's Union since 1892, and an Honorary Life Associate since 1933. He was a member of the American Association for the Advancement of Science, of the New York Entomological Society, and of the scholastic fraternity, Pi Kappa Phi. The University of Alabama made him a Doctor of Laws in 1906. Although he was an honored member of the Virginia Society of Ornithology and interested in its work, we were never able, because of his poor health and also because of his retiring nature, to induce him to attend a meeting of the Society.

Dr. Smyth was a great lover of music. Although he had only one formal music lesson in his life, he taught himself to play both the piano and the organ. He was in the Glee Club at Princeton, and led the Glee Clubs at the University of South Carolina and at V. P. I. In his early years at Blacksburg he played the clarinet in the college band, and for twenty-five years played the organ at the Blacksburg Presbyterian Church. He was also fond of painting, doing some scenes of the islands around Charleston in oils, and beginning work on plates of butterflies, larvae and chrysalids in water colors. This work was accurately done, but he did not carry it very far. During the first World War he was in great demand in his section of Virginia for Red Cross talks. He had a quiet but deep religious faith; was for fifty years an elder in the Presbyterian Church; and for more than fifty years taught a men's Bible Class.

His deepest interest was always his home. In 1897 he married Miss Grace C. Allan of Charleston. She was the daughter of James Allan, who came from Wick, Scotland, to South Carolina with his father when he was seven years old, and of Amey Hoberoft Allen, who came to South Carolina from London at the age of eighteen. From the time of his marriage Dr. Smyth's life centered about his home, his wife and his children. He loved nothing better than to have the members of his family gather about the piano in the evening and sing while he played. On Sunday afternoons his regular practice was to gather the children for a round of the Shorter Catechism and for a period of reading; and then after a nap to take them for a country walk, on which no wild thing escaped notice and interesting comment.

In 1925 his health, which had begun sometime before to fail under the load of his work, reached such a state that he felt he must retire. Ten years earlier he had bought a farm in the hills three miles from Salem, Virginia, and about forty miles from Blacksburg, which he named 'Little Orchard'. Here the family had been accustomed to spend the summers, and here they moved on his retirement. After retirement he continued his field work in a desultory way, although most of his time and energy was taken up with the farm itself. During most of these years he had strength enough for a great deal of physical labor, but toward the end he was rather feeble. Here he passed away quietly in the early morning of August 19, 1941. He is buried in Sherwood Cemetery, in Salem. One daughter, Miss Amey Smyth, died in July, 1940. He is survived by Mrs. Smyth; by one daughter, Miss Grace Smyth, of Salem; and by three sons, Thomas Smyth, of the State Teachers College, Indiana, Pennsylvania; Ellison A. Smyth, III, minister of the Presbyterian Church, Hartsville, South Carolina; and J. Adger Smyth, specialist in fish management, in Mexico.

Dr. Smyth was modest, shy, exceedingly retiring, but very friendly. He cared little for appearances, and nothing for prominence, even among the men whose labors he shared. He asked only to be allowed to follow in peace and with industry the activities in which he was interested. He was democratic in a natural and utterly unaffected way. His sincerity and inherent goodness made his life a benediction to all who came in contact with him.

J. J. Murray.



# The Raven

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THE WRENS  
of  
SOUTHWESTERN VIRGINIA AND NORTHEASTERN TENNESSEE

- Bruce P. Tyler -

The Wrens are classified in order Passeriformes, which is the order including the perching birds. Etymologically speaking, it means birds having the form of the Sparrow (Latin, Passer, a sparrow). The family is Troglodytidae, referring to its etymological meaning, it indicates the birds that gnaw and crawl (Greek, trogein - to gnaw, and dyein - to enter). More broadly, it may derive its family name from Troglodytes, meaning a cave dweller, in allusion to its cavity inhabiting proclivities.

The author has observed in this vicinity, over a period of thirty-five years, five species of Wrens which are resident or transitory in occurrence.

In the genus Troglodytes we have one representative, Troglodytes domesticus baldwini, or the Ohio House Wren, a sub-species of Troglodytes aedon aedon. Personally, I am not over enthusiastic about sub-species built up on minute differences which cannot be identified in the field, so for better, for worse, I adhere to the specific name aedon aedon. The following may explain, to some extent, the why and the wherefore. Greek Mythology tells us that Aedon, queen of Thebes, who had grievous sorrows, was changed by Zeus into a nightingale to assuage her grief, so we have the House Wren, the bird loving to dwell in the seclusion of an old tin can, an abandoned coffee pot, an old sunbonnet hanging on the back porch, and predominantly, a sweet and persistent singer, vying with the erstwhile Aedon, the sweetly singing nightingale. The House Wren is rare south of the Virginia-Tennessee State Line. It has been observed on Roan Mountain in the Canadian Zone and very rarely near Cox's Lake at Johnson City. Also, on Beaver Creek, just south of Bristol, Tennessee. It is a breeding bird in the valley extending from Bristol toward Roanoke, Virginia. There has been but one record of its nesting near Johnson City. This was recorded by Mr. R. B. Lyle.

On one occasion one of these birds, a lone male, appeared in my garden at Johnson City, where it sang lustily for several days. I welcomed this stranger, but his behavior was to prove so bad that I afterwards wished that I had killed him on sight. At that time I had in my lattice a pair of Bewick Wrens breeding. Coming home one evening I noticed "war" going on among the Wrens. I drove away the House Wren, but when I returned home the next evening, I discovered that the "war" had been resumed in my absence, - that the nest of the Bewick Wren had been destroyed. The battle ground was silent. Gone were my pets and charges, gone was the intruder, - all to return no more. Dr. Oberholser informs me that this is a common occurrence where the ranges of these two species overlap. This habit of quarreling seems more or less common among the Wrens. For several years I have had a Winter Wren wintering in my garden and roosting in my conservatory, to which it has continuous access via a two-inch weep hole in the side wall. Should I make a surprise entry this intelligent little bird does not fly against the glass, seeking hasty exit, but dives promptly under the bench and leaves through the weep hole. He enjoys my hospitality in the cozy and cat-proof shelter. During this last winter a Carolina Wren has been wintering nearby and has persistently fought the Winter Wren until it has perished or deserted, much to my sorrow.

Likely due to difference in nesting and migrating habits, the Carolina Wren and the Bewick Wren have always shared this region. Yet, though the years the latter has continuously decreased in numbers, possibly due to uncongenial relations.

In the genus Nannus we have (to again digress into the region of the sub-species) Nannus Hiemalis pullus the Southern Winter Wren. This is a sub-species of Nannus hiemalis hiemalis, or Eastern Winter Wren. This is an extremely interesting little fellow, who derives his scientific name from the Greek nano, meaning dwarf, and troglydites, a cave dweller. The former name applied to this bird, nano, dwarf, and hiemalis, meaning winter. This is pre-eminently a wren of the Canadian Zone, where it breeds on White Top, Mount Rogers, Grandfather and Roan Mountains. It visits the vicinity of Bristol and Johnson City during the winter months. It may be classified as a common bird on its breeding grounds, and a casual winter visitor in the lowlands.

In the genus Thryomanes occurs Thryomanes bewicki bewicki, the Bewick Wren. This bird is named for the English Naturalist, Thomas Bewick. The name has reference to its supposed habitat among the rushes and is derived from the Greek thryon, a rush, though it is not ordinarily an inhabitant of rushes. This Wren is a hardy summer resident, sometimes arriving in February and usually disappears shortly after the breeding season. It is, next to the Carolina Wren, our most common species of this family. It loves to nest about buildings just as much as does the House Wren. Near Johnson City we have a record of its nesting in a pocket of an old coat hanging on the back porch of an occupied dwelling. At my house it has nested on the top of the brick piers that support the porch. The second nest was begun before the fledglings had flown from the first nest. Two broods were raised. Once these birds nested in an old fish bucket hung under the back porch. In order to secure a photograph I took down the bucket, opened it, made my picture, returned the bucket and nest to its original position, where the birds continued incubation and raised the young.

In the genus Thryothorus we have Thryothorus ludovicianus ludovicianus, or Carolina Wren, the predominant representative of the family in our vicinity.

Resident, filling the lonesome woodland and dooryards with its cheery song during the winter months, as well as in the breeding season. Loved by all, the Carolina Wren is ever welcome in our gardens and forests. It is not given generally to nesting about our homes and outbuildings, but I have one record where a pair built their nest in a fernery on the front porch of a dwelling and, although the porch was used constantly, none knew of the nesting birds until the fledgelings were about to leave the nest, when their insistent demands for more and bigger bugs attracted attention. It is a common bird in this locality.

In this genus Telmatodytes we have Telmatodytes palustris iliacus or Prairie Marsh Wren. Its name refers to its habitat and appearance. This bird is an occasional visitor in migration and can be found along the Holston and Watauga Rivers and their tributaries. In addition to observations on Watauga River at Picken's Bridge I have found it on Boone's Creek and several times in Suggar Hollow, where it seems to love the low overhanging banks of the stream. This species (iliacus) was reported by Stupka in Great Smoky National Park - See Migrant for March, 1942 - and should have been noted for Johnson City area. Dr. Oberholser tells me that this sub-species differs from dissaeptus slightly in coloration, - so very slightly in fact, that it cannot be discerned in the field but the song is the determining factor for field identification and this I have particularly noted.

As to abundance, the Wrens may be listed as follows:

- 1 - Carolina Wren
- 2 - Bewick Wren
- 3 - Winter Wren
- 4 - House Wren
- 5 - Prairie Marsh Wren

Measurements of the eggs of three species, breeding Northeastern Tennessee, are given below. The measurements are furnished by Mr. Robert Barton Lyle.

<u>Bewick Wren</u>	<u>Carolina Wren</u>	<u>House Wren</u>
.51 x .60	.58 x .75	.52 x .68
.53 x .66	.57 x .73	.54 x .70
.53 x .63	.59 x .75	
.52 x .65	.60 x .76	
.52 x .64	.57 x .72	

215 West Unaka Avenue  
Johnson City, Tenn.

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Some 1942 Observations  
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Pied-Billed Grebe Ice Fishing - On September 17, 1941, a Pied-Billed Grebe came to the marsh above the causeway near my home and remained there until March 12, 1942. He had excellent fishing all winter. As the tide went out small fish concentrated above the screened outlet. The grebe never left the territory except as the marsh became frozen over. Such spells lasted only a few days. As soon as the ice had thawed, he would be back again. On February 20, ice covered the marsh

except for one hole which appeared to me to be about 3 feet in diameter. Here the Grebe floated, diving and swimming under the ice. At nightfall, he was still diving for fish from his ice hole. I wondered how he managed to take flight from such a small opening.

Bald Eagle Drowning Pintail - On March 5, I started to cross the causeway at the north end of Stumpy Lake, when I noticed a commotion among about 300 Pintails below the causeway. They were swirling around in an ellipse, so that they gave the appearance of an eddying whirlpool. I could see no cause for the disturbance. Then they settled down on the water and began tipping up for their food.

Soon the Pintails whifled up again, and this time they left the spot. Then I noticed a Bald Eagle swooping down on a solitary female Pintail, which he proceeded 'to drown.' Methodically the Bald Eagle swung down over the duck in an arc about 60 feet wide. Ascending after each swoop, the Eagle would laboriously bank its wings and awkwardly turn, then swoop down again. I counted 53 swoops which he made without stopping and I did not start counting from the beginning. He had made at least 8 swoops before I began counting. To make these abrupt descents, the Eagle maneuvered clumsily, and plainly it was an effort for him to do so.

In the meantime the Pintail was gradually drowning. As she became exhausted, she flubbed her dives. She would dive too soon and come up as the Eagle was almost upon her, and then have to dive again before she had rested. Once the Eagle's claws almost caught her before she slid under the surface. Three times she tried to fly, but could not lift herself from the water. Twice a male Pintail, doubtless her mate, flew down over her as if to encourage or help her. Shouting on my part had no effect on the Eagle.

Finally the Eagle became tired, and while the Pintail was under water he alighted on a low stump. The Pintail came to the surface, gulping badly. Then to my astonishment she swam directly toward the stump on which sat the Eagle. Perhaps she was too exhausted to see him, perhaps she took the Eagle to be a part of the stump. At any rate, her swimming straight to her doom after such a gallant struggle, was more than I could endure. I started running through a bit of woods to get nearer the scene. When I came out on shore a few minutes later, neither the Eagle nor Pintail were to be seen.

On the Refuge, Mr. Bailey says, the Coot is the species which the Bald Eagle is most likely to select as a victim for drowning. Coots are fine divers. I have seen an eagle endeavoring to drown such an excellent diver as the Lesser Scaup. Ducks, whether surface-feeding or diving ducks, which the eagle succeeds in catching by forced drowning are largely crippled or weakened birds I believe. Surface-feeding ducks such as the Pintail are much too swift in taking off from the surface to ordinarily fall prey to it. I have also noticed that the Bald Eagle commonly selects a duck which is feeding by itself in open water away from vegetation, and this is most apt to be a diving duck.

Migration of Black-throated Green Warblers - There seemed to be this spring, 1942, an unusual small migration of Black-throated Green Warblers. On April 5 I saw one on North Shore Point. April 7, I saw three, at different places in Seashore State Park, so that they could not have been duplicates. April 16 there was still another at Pungo. All of these were first heard singing. They are my first positive records of this species. On September 23, at White Pond, I again saw a Black-throated

Green. This warbler has unmistakable yellow cheeks in any plumage I think. There was still dusky on the sides of the throat before the bend of the wing. Once before in the fall I thought I glimpsed a Black-throated Green Warbler near White Pond. The Black-throated Green Warbler is a constant singer at least until August. If Wayne's Warbler (*Dendroica virens waynei*) breeds in Seashore State Park, as Mr. A. O. English believes, I have not heard it singing. But the place where I would look for it most is around White Pond.

A Duet by Summer Tanagers - On April 26 Mrs. Barefield and I saw a sight which I wish to record because of its beauty. In Princess Anne County by a farmhouse there was a wisteria vine, trimmed to form a shrub, and on its crown about a foot apart were two Summer Tanagers, facing and singing to each other. When our close watching disturbed them, they flew to a telephone wire where they continued to look toward each other singing. Finally they flew away; one going to a woods far back on the right hand side of the road, and the other to a woods far back on the left hand side. Now their territories were far apart. I do not think they were announcing to each other their territorial areas. Rather I think there was something more subtle and exquisite in their singing. I believe that in the presence of each other they were stimulated to sing as they would do to attract their desired mates, although I do not mean their singing was in any sense a courtship song. The females had not yet arrived from the south; therefore, these two males were simply superbly serenading each other atop the wisteria blossoms.

The Baltimore Oriole Comes to Me.- There is a saying that birds come to those who love them. Of course, the truth is that people who love birds are constantly watchful for them. The uncommon is probably more common about us than we are aware and would be reported more often if there were more observers. Sometimes, however, it does seem as though a special magic brought birds to those who love them. Such is the case of the Baltimore Oriole with me. The only two records which I have of it, here have occurred in the cherry tree by my kitchen window; one, April 27, 1939; the other, April 30, 1942. Each time I have stood spellbound for a moment as the rich coloratura whistled notes came in the window. Each time he has lingered only 10 to 15 minutes, then continued his migration. But for the rest of the day, I hear waves breaking on a lake shore, and see blue mountain tops, and hear the orioles and Rose-breasted Grosbeaks, the Purple Finches, and Warbling Vireos singing among the shade trees along the streets of my home in New Hampshire.

The Raven Croaks - On June 16 Mr. Reed and I stood on the causeway at Stumpy Lake. There were 11 American Egrets in full nuptial plumes. The wind was lifting lightly their exquisitely filmy white plumes. At the lower end of the lake I had seen a Snowy Egret in beautiful nuptial plumage. There were several Little Blue Herons, adults and immatures, in the second year pied plumage. (These latter were more numerous last summer than I have ever seen them. Of course, I am sure there has been a heronry for at least three summers somewhere near North Landing.) However, I had been studying a heron which I could not identify, when I heard a great commotion among the crows in the pine woods beyond. I looked up to see a large bird, which at a glance I took to be an immature eagle, being following by crows. I paid no attention as I was too absorbed in my unknown heron to care whether it was a hawk, or an owl, or anything else which the crows were fussing at. Then I glanced up and saw that the large bird was headed my way. Still I paid no attention. As it passed overhead a little beyond me, I glassed it. To my astonishment it was a great black crow. The feathers on the throat hung conspicuously down. Now I have studied the Raven at the Audubon Camp in Maine; have seen it a few times in New

Jersey when with Mr. & Mrs. L. L. Walsh; and have observed it two summers on the Skyline Drive. I have heard its croak a number of times; but I have never before seen so closely the pointed feathers hanging down from the throat. A little beyond us 'the crow' uttered its harsh two-note croak. I do not see how this croak can possibly be confused with the common fish crow's nasal note or the caw of the eastern crow. I looked at Mr. Reed and said, "That was a Raven." He replied, "It certainly was no crow!"

Three Days on The Fish and Wildlife Service Refuge - Through the courtesy of Mr. Bailey, Mr. Reed and I spent July 28, 29, and 30th on the Refuge. There are only a few things I would like to record. The wild rice which grew so colorfully in the marshes at Dam Neck and Sand Bridge has practically disappeared. Mr. Bailey thinks it is because the Redwings ate all the seed. I think more likely it is due to the fact that the marshes are filling up with cattails because of the drought conditions which have prevailed during the past two summers. The wild rice has been crowded out.

Each morning I climbed the tower at dawn. The most entertaining thing which I saw was afforded by the Boat-tailed Grackles. Shortly after sunrise these grackles came in flocks from the marshes and islands of the Bay. They passed by on a level with the tower house. I would hear them before I saw them. The air would suddenly fill with a peculiar thrumming sound. Then a flock of grackles would go by, each bird opening its bill as wide as it could and uttering a twanging note like the sound of a banjo string being unmusically struck. They flew to the sand fences where they walked about rapidly on the slopes of the dunes, perhaps gleaning some sort of small crustacean or insect diet there. It was a noisy and amusing sortie which they made each morning from their beds in the marsh to their breakfast on the dunes.

Also each morning about 6:30 (D.S.T.) a flock of 18 - 25 Little Blue Herons, adults and immatures, flew past the tower. Mr. Bailey told me that he also had observed them during the summer. Evidently there is a heronry of Little Blue Herons south of the Refuge. One morning I thought there were 4 Louisiana Herons among them. This might have been, for we saw 6 Louisiana herons on the flats. However, all the Louisiana herons which I have seen here have been in the immature plumage.

Although Black Terns were migrating along the coast, they seemed to prefer flying over the fresh water of Back Bay and over the marshes and sand flats. Hudsonian Curlews were migrating in good numbers. One night we had an electrical storm and in the lulls following the claps of thunder and flashes of lightning, the Great Horned Owl hooted.

Ospreys Migrating - On August 16, Mrs. Barefield saw 37 Ospreys migrating in one group. This would seem to be early for Ospreys to be migrating, although it is in August that we see groups of Ospreys (perhaps families) gathered at the fish nets. It is not uncommon to see 10, 13, 17 or so. The extraordinarily large number of Ospreys migrating together might be due to the fact that defence activities all along our coast began the middle of July last summer. The anti-aircraft, bombing practice, and patrol might have caused an exodus of the Ospreys from farther north.

The Barn Owls of the Ghent Methodist Church - On August 22 Mr. Reed and I went to the Ghent Methodist Church with Mr. Bill Larson to see the Barn Owls. Two days

before an adult owl was caught in an air shaft of the apartment house next to the church. Mr. Helvin, SPCA Officer, was asked to remove the owl by the people in the apartment house, who also requested that the owls be removed from the church tower because they disturbed people's sleep. Mr. Helvin told me that the adult which was caught had a large rat in its claws. He kept the owl overnight, releasing it the next morning within the confines of the city.

On the evening of August 22, it was about 8 o'clock before the first owl appeared in one of the windows of the tower. He looked very white. Within the tower we could see forms moving, as if other owls were lifting or exercising their wings.

Then a large, darker owl came from the rear of the tower. As it flew around the tower it gave the "ik-ik-ik-ik" call. This may have been the mother owl for according to A. C. Bent the female is often darker. Also in Bent we read that the "ik-ik-ik" call is "the flight call, apparently signifying the bringing of food", and again, the barn owl utters a series of notes click, click, click, ... delivered with diminishing emphasis and shortening intervals toward the end of the series. From the changing direction of the sounds, it is evident that the notes are uttered in flight as one bird closely follows another." I thought the mother bird was trying to induce the young to leave the tower.

There were 4 small owls besides the large one. One owl flew to the top of the tower and another perched on its shoulders, much as young birds sometimes climb on each other in the nest. The owls constantly flitted about the tower. They seemed whiter than the moon which was on the wane and shone in the sky to the right of the tower. Occasionally an owl flew over the trees of Stockley Gardens, but at no time did an owl appear to leave on a forage. I believe the young were just learning to fly. Even from below in the street, one sensed the soundlessness of their flight and observed the mothlike movement of their wings. The young owls continuously gave a rasping call which sounded as though someone were cutting glass with a file except that the sound was more respiratory. This is said to be the "food call."

On August 31 I again visited the tower. At 8:20 an owl which had probably been on a forage returned to the tower. It seemed to drop something into one of the windows. Shortly afterwards 2 owls flew out and went off by themselves. Evidently some of the young had learned to fly.

Mr. Helvin and I made an attempt to climb the tower with the janitor of the church. We were unsuccessful in reaching the second story of the tower. There is no way that the owls can be excluded from the tower except by screening all the windows of both stories of the tower. Some of the people in the apartment house enjoyed watching the owls. Others were greatly disturbed by them, especially by the screams of the adults. This is the second year the owls have nested there and from reports I should judge they raised a larger family this year. I reminded the complainants that there were a great many apartment houses in the area of Stockley Gardens, that the waterfront is only a block away, that there is the Norfolk General Hospital with extensive fields beyond, and that unquestionably the owls were exceedingly beneficial in removing rats from that section of the city.

Pigeons in numbers roost at night underneath the colonnade at the front of the church as well as on the church across the street. I noticed two old skeletons of pigeons in the tower. According to the janitor the owls do not bother

the pigeons. (The Church authorities wish they would!) For the duration of the war, I should say the Barn Owls are secure in their penthouse abode in the Ghent Methodist Church tower. May they increase!

Bobolinks and Ragweed - On September 8, as we were driving to Stumpy Lake, Mrs. Barefield glimpsed some Bobolinks in a field of ragweed. We counted 50 which were feeding upon the ragweed seeds, and there were more down among the weeds. It was on September 13, 1941, that Mrs. Angwin first saw Bobolinks near Stumpy Lake. We have been looking for them among the wild rice in the marshes along the coast but have never seen them there. They pass north in spring in enormous numbers. For the most part they must migrate south farther inland. This is my first fall record.

The Wilson's Phalarope - On September 17 while Mrs. Darden was taking pictures of shorebirds, Mrs. Barefield and I spied an individual which was glitteringly white beneath and on the breast and neck. Also it had conspicuous, bright yellow legs. Its very dainty head, neck, and body proclaimed it a phalarope and 'Peterson' was promptly brought out. The bill was fine and needle-like. As it fed in the soft mud, we saw it whirl completely around in a full circle quite fast. Also it whirled from side to side when feeding. Much of the time, it fed in a crouching position with breast lowered toward the ground. It was quite tame and allowed a close approach. There remained but one thing to do and that was to flush it. There were no noticeable wing bars. Because of the conspicuous yellow legs, we thought the only thing with which it could be confused was the Lesser Yellow-legs. But we had no worry here, for at the moment a group of 10 Lesser Yellow-legs (16 in all) and one Greater Yellow-legs (4 in all) were feeding about 50 feet away in the shallows. In comparison to the Lesser Yellow-legs the phalarope was dazzlingly white and exquisitely dainty in neck and head. At no time did the phalarope swim about in the water, possibly because we tagged it about so much. At first it kept entirely by itself, but as we followed it, it fed with 12 pectoral sandpipers, 4 white-rumped sandpipers, and semipalmated sandpipers. Mrs. Darden took pictures of it. When in Wisconsin one of the loveliest things I saw, were the groups of Wilson's Phalaropes. Often they were among the grasses or on the edges of the water feeding. In the fall I saw a few with the real yellow legs. I also saw Northern Phalaropes, and I had forgotten which species had yellow legs in fall.

Finally a shadow descended upon the shorebirds. With a rush of wings, all the birds swept off the flats, including a group of about 30 Caspian Terns, 21 Willetts, 15 Hudsonian Curlews, Ruddy Turnstones, and others. We looked up in time to see the end of a beautiful sweeping dive by a Duck Hawk. He was unsuccessful in catching anything. However, our mud flats had become denuded of birds.

Western Palm Warbler - On October 20, on the Sandbridge Road I stopped the car because a little warbler, jetting its tail, was in the middle of the road. Consulting 'Peterson', Mrs. Barefield and I studied it. Its cap was brown only on the forehead; there seemed to be the faintest wash of yellow on its breast; Markings on the sides were dim; the underneath parts were whitish; the undertail coverts contrastingly yellow; and the line over the eye absolutely white as far as we could see. We decided it was the 'Western Palm.'

Mr. Ewell has Two Records

The Glossy Ibis - One evening I showed Mr. and Mrs. Clayman Ewell my father's bird collection. When Mr. Ewell saw the Glossy Ibis he asked me what it was. Then he said that he had seen four, and killed one, on Ragged Island. It was in the spring of 1928, he thought during the first week of May, but he could not give the exact date.

The Long-billed Curlew - In like manner, Mr. Ewell picked out the Long-billed Curlew, and said he had seen three in the spring of 1932, either the last of April or the first of May. This was likewise on Ragged Island.

Mr. Ewell's father was caretaker of the Ragged Island Gun Club and Mr. Ewell was born and raised on the island. When the Gun Club sold out to the U. S. Biological Survey, Mr. Ewell became Mr. Bailey's assistant. He has known no other life except that of hunting in Back Bay until recently, when he became a member of the Army Engineer Corps. The Hudsonian Curlews, of course, he is familiar with.

August 20, 1942, 2 Marbled Godwits, H. A. Bailey, Refuge.

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(Neither the Wilson's Phalarope nor the Glossy Ibis has ever been previously recorded in Virginia. It would seem that Mrs. Reed's record of the Wilson's Phalarope is as sound as a sight record could be. She knows of the rarity of the bird; she was previously acquainted with the species; and she and her companion observed it in detail. Editor)

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Seward Forest, Triplett, Virginia

An unusual quirk in our bird population for last winter was the absence of the Myrtle Warbler and Purple Finch until late in February. Not a single Myrtle Warbler was seen until February 21, and not a Purple Finch until March 8. From February 27 through their usual migration season Myrtle Warblers were present in about the usual numbers; but Purple Finches were scarce all through the spring.

Woodcock were present in about the usual numbers through the winter. Cowbirds were seen more often than usual.

John B. Lewis

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John B. Lewis - Again Honored

A few years ago Mr. Lewis discovered a new sub-species of the Golden Mouse in Amelia County. This mammal was named for him, Peromyscus nuttali lewisi (The Raven, 1939, December). How he has turned up a species of Asarum (Wild Ginger), which proves to be new to science. Dr. Fernald, of Harvard University, who has examined the plant, has named it Asarum lewisi, in honor of its discoverer. It is not given to

many non-professional naturalists in these days to discover either a plant or animal unknown to science, but Mr. Lewis has done both. The Virginia Society of Ornithology is proud of its member, so advance in years, but as wide-awake as the most youthful of us.

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#### FOREST FIRES AND BIRD LIFE

By

C. C. Steirly, District Forester  
Virginia Forest Service

Forest fires have a very disastrous influence on most forms of our land bird life both directly and indirectly. Unfortunately, the spring fire season, from March 1st to about May 15 in a normal year, overlaps with the nesting season of many of our species. This means that there is an appalling loss of eggs and nestlings in addition to the loss of parent birds in many cases.

On even the smallest of forest fires the destruction of nests and eggs is inescapable. In such fires the parent birds usually escape, although some of them become panic stricken and succumb to the flames. On larger fires conditions are much worse owing to more intense heat caused by the fire making its own draft and the greater extent of flames adding to the bird's confusion. A method of fire fighting that frequently has to be resorted to on the larger fires is backfiring. In this method the forest wardens are forced to retire ahead of the main fire and set fires from the edge of a road, stream or raked line. These set fires burn back toward the main fire thus creating a burned area between the main fire and the fire break. Any living thing caught between these fires is bound to perish. As the two approach each other a terrific draught is created and the flames usually reach heights of fifteen or twenty feet. It is indeed a terrifying spectacle to behold. Is there any wonder then that birds, reluctant to leave their nests as they are, become panic stricken and fall victims to this intense heat.

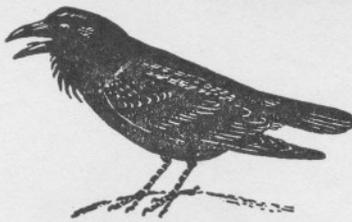
Aside from the decimation of bird life all of the familiar small animals can be listed as victims of the flames. Rabbits often become bewildered and are soon overpowered by the flames. Young squirrels frequently trapped up in their tree hollows. On the larger fires even such swift animals as the deer are killed or maimed.

Forest fires destroy habitats or seriously alter the normal plant succession. Any burned-over woodland holds no attraction to birds or mammals for at least one or two seasons until nature has had an opportunity to repair or replace the damage as best it can. For too frequently this is a long time proposition, as in the case of restoring an area to the forest condition. To those of us interested in the study of plant and animal Ecology this is very apparent as we have learned through observation and study that certain phases of animals and bird life are adapted to only certain vegetative habitats. Even on the smaller forest fires this temporary destruction of habitat has some bearing on bird and small mammal populations because of the competition of breeding pairs for territory. This can readily be understood by reading portions of Eliot Howard's "Territory in Bird Life".

A further appreciation of the relationship of bird life to natural habitats can be had by re-reading Roger Tory Peterson's interesting article "Life Zones, Biomes, or Life Forms" in January 1942 issue of the Audubon Magazine.

Another important aspect of the destructiveness of forest fires is the complete ruin of the aesthetic values of the forest. An appreciation of the beauty of the unburned forest goes hand in hand with the study of bird life or any other form of nature study. Following fire, heavy growths of briars of thorny vegetation can be observed succeeding where other, more pleasant plants have been eliminated by fire.

Over ninety percent of Virginia's annual forest fires are caused by human carelessness. These causes can and should be eliminated. The more common cause of forest fires are careless smokers, brush burning, camp fires, burning broom sedge fields, railroad engine sparks, lumbering operations, warming fires, etc. Nature's sole cause of forest fires is lightning, a very infrequent cause in Virginia. Every year forest wardens of Virginia put in long, hard hours combating the fires so carelessly and heedlessly set by their citizens. The objective of every county Chief Forest Warden is to hold the burned acreage of his county to a minimum. During a portion of the year these men strive to educate the public and make their fellow citizens forest fire minded.



# The Raven

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## The Nest of a Red-tailed Hawk

By J. J. Murray

When in the spring of 1941 I found a Red-tailed Hawk's nest early in the season, I was delighted at the chance of studying it throughout the nesting period. Although I knew that this pair was using this area and had hoped to find the nest, it was just a lucky accident when it was located. We had stopped the car on the highway to look at another bird, when I noticed a Red-tail soaring overhead. As I watched him he flew into a grove of white pines on the hill-top. Here, as it turned out on a later visit, was the nest. No more beautiful location could be imagined. The nest was sixty or seventy feet in the air, near the top of a great white pine tree which towered above its fellows. The tree stood at the end of a high, wooded ridge, looking out over a broad and fertile valley, with an unbroken view of the range of mountains which encloses the famous Goshen Pass.

The first visit to the nest was made on April 17. As soon as the climb began, a Red-tail screamed in the distance. Before the nest was reached one of the birds, its wings spread to an expanse of over four feet, flew just overhead, screaming, and lit in a large oak two hundred yards away. There it was soon joined by the other bird of the pair. They stayed in the neighborhood as long as I did, sometimes perched in the oak, sometimes flying about and screaming, "sheee-e-er," at me, but never coming closer than a hundred yards. The nest was a large one, measuring two feet across one way and four the other, set in one of the characteristic whorls of the white pine, where a group of branches forked away from the trunk, and where in this case the trunk bent to make a good platform. It was situated about ten feet from the top of the tree where the trunk was slender enough to give the climber a good ride when the wind blew hard. The nest was made of long sticks, those at the bottom as large as a man's thumb, with smaller ones on top, and a lining of soft cedar bark. In the deep cup were three beautiful eggs, almost as large as a hen's egg, white but marked with reddish splotches.

On May 5 James R. Sydnor, of the Assembly's Training School, and I climbed to the nest again. There were now two small birds, one of them half again as large as its younger brother or sister, both of them covered with a soiled white down, and looking, with their small bodies and large heads and

stomachs, like grotesque carvings. Their only conversation was a succession of weak squeals. From the remains in the nest and on the ground below, these young birds had been fed mainly upon squirrels up to this time. Later we found that rabbits had been brought to them. There were no signs of poultry; and only once were there any bird feathers, apparently the remains of one blackbird.

A third visit, on May 20, found the young birds well grown but with still a marked difference between the advancement of the two. While the younger bird was still largely in the down, the other had large feathers in its wings and tail and patches of feathers on its back. By this time they were very active. One picture I took of them shows the younger bird raised up with its forelegs flat on the ground, while the older bird is standing behind at full length with mouth open and wings spread wide in defiance. But even at this time, with their disproportionately large heads still covered with down, they looked as much like little monkeys as like birds.

A final visit on May 24 was made in order to band the young birds before they left the nest. I took two of the aluminum bands furnished by the United States Fish and Wildlife Service, the use of which has added much to our knowledge of the movements of birds. This time the old birds were much noisier and more active in the air above the nest. Before I reached the nest the larger of the young birds leaped from the nest and went sailing over the tree tops, landing in the edge of a pasture a quarter of a mile away. Later we found it, put a band on its right leg, and took it back to the neighborhood of the nest, where the parents could take care of it. The smaller bird stayed in the nest, but was very active and pugnacious. In order to keep it from leaping on me with its sharp claws I threw an old army blanket over it and held it until I could put the band on the leg. It is not much fun to battle a fully grown young hawk in the top of a pine tree, sixty feet from the ground. The banding accomplished, I bade my hawk family farewell. If any of you who read this happen to find a dead hawk with Band No. 40-736,736 or 736,737, please let me know, for it will be the one of my young Red-tails.

Some of my farmer and hunter friends, to whom "the only good hawk is a dead hawk," have asked me why I did not kill these birds while I had my hands on them. I tell them that they would not feel that way, if they knew more about hawks. Hawks are not all the same. Some hawks interfere with man's interests. The Cooper's and Sharp-shinned Hawks, known to Southern boys as the large and small "Blue darters," will eat chickens or kill the quail that hunters want themselves to kill. But others, like the "Fish Hawk," are harmless; and still others like the lovely little Sparrow Hawk which lives off of the grasshoppers and other insect enemies of the farmer, are entirely beneficial. If I were a farmer I would not think of letting anyone shoot a Red-tailed Hawk or a Red-Shouldered or Marsh Hawk on my farm, for their food consists of squirrels, rabbits, and still more largely of the rats and mice which do so much damage to our crops.

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#### PASSENGER PIGEONS

#### The Great Virginia Pigeon Roost

Sportsmen are now having an exciting time in Buckingham County, Va.

A correspondent writing under date of the 16th instand, describes the great pigeon roost "on the old furnace lands near Canton. The area of the roost is four square miles, and to one who never saw a sight of the kind it is truly amazing. From one hour of sun until night the air is darkened with countless thousands of the birds flying from all directions (south of the river) inland to the roost. There is a grandeur indescribable in the mournful sound of rushing wings as the trackless armies, marshalled in the viewless wind, come sweeping to their bivouac. But the evening sight is not to be compared to that of the morning when the pigeons are leaving the roost. Rising upward from the bushes like columns of blue smoke, the rays of the morning sun paint them with rainbow tints, and a canopy of shadows the woods like the sulphurous clouds above a battlefield. Wheeling in great divisions in the air, they divide, each army to its leader, and the heavens grow lighter as they disappear to refill their craws with acorns."

(From Lynchburg Daily Virginian, February 23, 1872.)

"Wild Pigeons - A gentleman who walked out in the woods a couple of miles Sunday, near Candler's mountain, informs us that he saw a great quantity of wild pigeons flying over the woods. A horseman passing along had to dismount and lead his horse, the animal becoming frightened by the noise of the birds. They were bearing in a Southwest direction, and were flying very low. These we suppose are some of the Buckingham pigeons, which we published on account of the other day".

(From Lynchburg Daily Virginian, February 23, 1872.)

Contributed by Ralph M. Brown.

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BIRD RECORDS FROM CAMP PICKETT, VIRGINIA  
PVT. WILLIAM M. CRAVEN

April 17, 1943 (6:00 P. M. to 7:00 P. M.) Junco, White-throated Sparrow; cardinal; Downy Woodpecker; Tufted Titmouse; Carolina Chickadee; Brown Thrasher; Blue-gray Gnatcatcher; Robin; Carolina Wren; Towhee; Mourning Dove; Chipping Sparrow; Oven Bird - was singing night song; Whip-or-will.

April 18, 1943 (9:00 A. M. to 10 A. M.) Chipping Sparrow; Tufted Titmouse; Myrtle Warbler; Crow; Downy Woodpecker; Goldfinch; Sharp-shinned Hawk; Black Vulture; Field Sparrow; White-throated Sparrow; Robin; Cardinal; Towhee; Mourning Dove; Pine Warbler; Flicker; Oven Bird; Carolina Chickadee.

April 18, 1943 ( 3:30 P. M. - 5:30 P. M.) Prairie Horned Lark (2); Meadowlark; Mockingbird; English Sparrow; Chipping Sparrow; Field Sparrow; White-throated Sparrow; Turkey Vulture; Junco; Cardinal; Towhee; Carolina Chickadee; Crow; Goldfinch; Ruby-crowned Kinglets; Golden-crowned Kinglets; Carolina Wren; Brown-headed Nuthatch; Winter Wren; Myrtle Warbler; Black and White Warbler; Blue-gray Gnatcatcher; Downy Woodpecker; Hairy Woodpecker; Flicker; Pine Warbler; Black Poll Warbler; Yellow-throated Vireo; Red-eyed Vireo; Blue-headed Vireo; Oven Bird; Tufted Titmouse.

April 20, 1943 - 6 P. M. Prairie Horned Lark - 1.

July 15, 1943 - American Egret, at Birchin Lake.

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"The Wild Turkey in Virginia"

A Review

By J. J. Murray

"The Wild Turkey in Virginia: Its Status, Life History and Management", by Henry S. Mosby and Charles O. Handley, with two full-color plates and four sketches by Fred Everett; 68 photographs, maps and diagrams; foreword by T. E. Clark, Executive Director of the Virginia Commission of Game and Inland Fisheries; appendix of tables, bibliography and full index; pages xx and 281; published jointly by the Virginia Commission of Game and Inland Fisheries and the Virginia Cooperative Wildlife Research Unit, at Richmond, Virginia, 1943.

This handsome volume brings great credit on the State of Virginia. It can be said without hesitation that it is one of the best pieces of game research work that has been done in America. It is strange that this noble bird, the finest of all our game species, should have waited so long for a full-length biography; but here practically everything that is known about the Wild Turkey, apart from purely historical material, has been brought together, and with it a great deal of original work. From the standpoint of careful research, of completeness of data, and of attractiveness of preparation the book is altogether satisfactory. It is the major result to date of the splendid work that has been done under the direction of Charles O. Handley at the Virginia Cooperative Wildlife Research Unit, which has functioned at Blacksburg since 1935. Such work has been made possible both because of Handley's leadership and because of the fact that so many groups have combined in the support of the Unit: the Bureau of Biological Survey (now the Fish and Wildlife Service), the American Wildlife Institute; the Virginia Polytechnic Institute; the Virginia Commission of Game and Inland Fisheries; and the federal funds of the Pittman-Robertson Projects. With such backing Mr. Mosby has done an admirable piece of research. More than three years of full-time field work have gone into this undertaking.

The book consists of three parts: History and Status; Life History; Propagation and Management. The first part deals with the history of the Wild Turkey, with its status in the United States, and in more detail, in Virginia, and with methods of hunting the bird. It is interesting to note that while the Wild Turkey has disappeared from all but 34 per cent of its original range in Virginia, it is still to be found in some numbers around the site of the first permanent English settlement in the New World at Jamestown Island. To the student of ecology one of the most interesting chapters in the book is the closing chapter of this first section, dealing with the environment of the Wild Turkey in Virginia. The section which will be of most value to the bird student is that on Life History, with its chapters on general characteristics, breeding activities, nesting losses, decimating factors other than disease, diseases and pathological conditions; food habits, and roosting, flocking, flight and longevity. Under the last head the author states that meager data available indicates that the average wild turkey probably does not live over five years, but that under exceptional conditions birds may live ten or twelve years. Of less interest to the nature lover but of very great importance to sportsmen and to conservationists is the section on management, in which is discussed both the rearing of birds in captivity for use in restocking and the management of the environment for wild or liberated birds. As is well known, some original work has been done in Virginia in the matter of rearing these

these birds, as well as the Bobwhite and Ruffed Grouse, in captivity. The book closes with "A suggested Policy and Program for Wild Turkey Management in Virginia." Not the least interesting feature of the book is its fine series of photographs, of which the striking close-up of a Wild Turkey in flight, on page 172, deserves special mention.

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"The Roseate Spoonbill."

A Review

By J. J. Murray

"The Roseate Spoonbill" is a book, in paper covers, of xviii and 142 large octave pages, printed in two columns, with a colored frontispiece of the bird by Roger Tory Peterson, and with 20 photographs and 44 drawings, maps and diagrams. The author, Robert P. Allen, is a member of the staff of the National Audubon Society, now on duty with the Coast Artillery Corps of the United States Army. At one time he was Supervisor of Sanctuaries for the National Audubon Society. The book was published by the Society in December, 1942, at \$2.50.

Research is a necessary element of the modern conservation movement. It is not enough to raise money and spend it; nor is it enough to secure legislation. The problems are too great, and, as we have come to realize, too intricate in their relationships for hit or miss action. Apparently, for example, the Spoonbill problem is one that cannot be settled inside the United States, no matter how much we try to do about it. Careful research is required to find the answer to most of our conservation problems. Probably less talk and more study should be our motto for the days ahead. The need for loud argument between nature lover and sportsman about hawk-killing campaigns has long passed, even though too many ill-informed people do not yet realize it. That question has been settled by the field researches of Stoddard and Leopold and Errington and many other naturalists. There are other problems, however, about which we still talk loudly because we have little accurate information. The proper approach in most of our problems is to seek the information. The National Audubon Society has little money to spend on research that is primarily technical; but the Society has very wisely decided to lay out a small proportion of its funds in research for conservation, for the tackling of problems that directly affect the future of species of birds or mammals or of areas of particular interest that seem to be in danger of destruction. A fine beginning has been made; and the results of two of these research efforts are now in print for all to study. Research Report No. 1, "The Ivory-billed Woodpecker," by James T. Tanner, was reviewed in the November-December Issue of the Raven. The book at hand is Research Report No. 2. Like the first, it is a piece of work of which its sponsors may be proud and for which the nature lovers of the Americas may be grateful. It should reach an even wider audience than the first, for the Spoonbill belongs to our sister American republics to the south even more than to us in the United States.

The book is divided into eight parts: Distribution; Abundance; Migration and Postnuptial Wanderings; Breeding-Cycle Behavior; Food and Feeding Habits; Plumages and Molts; and the Future. The original distribution of the Spoonbill, the author says, was much the same that it is today, except that it covered more of southern Florida and a portion of Louisiana now deserted. Almost driven from

its United States range by 1890, the bird would probably have become extinct in this country but for the northward pressure of a reservoir of supply to the south of us. There has been in recent years a substantial recovery in Texas, but the species continues to decline in Florida. A survey in the summer of 1941 showed 5,698 Spoonbills in the United States, only 513 of which were in Florida, and 150 in Louisiana. Of these birds about 3,500 were non-breeding birds that had wandered to our coasts from Mexico and possibly from Cuba and South America. The sections of the book on breeding behavior and on feeding habits are particularly interesting pieces of life history work.

Naturally, the thing we most want to know about the Spoonbill is: What can be done to increase its numbers in Texas and to put it on a safe basis around the rest of the Gulf Coast? That major question, Mr. Allen says, cannot yet be answered. We know that we must continue and improve our guardianship of the birds wherever groups of them are found. We know that we must seek to establish as inviolate sanctuaries all important breeding, resting and feeding areas for the bird. But the author himself points out that his study is a piece of unfinished business. He has gone far enough with it to realize that the answer to the most important spoonbill problems in the United States lies in the situation of the Spoonbill to the south of us. It is from this direction that the renewal of our depleted numbers has come. It is in this direction that we must look for guidance in our efforts to help the bird in our country. "We should initiate, as promptly as possible," Mr. Allen says, "field research in those countries to the southward on which the United States seems dependent for breeding Spoonbill re-population. Special consideration should be accorded the condition, habits and distribution of Spoonbill colonies in Cuba, possibly in certain of the other West Indies, and in northern South America." And Warden-patrolled sanctuaries should be established where critically needed in those regions. It is to be hoped that this study can be continued and everything possible done to save for future generations in our country this almost unbelievable strange and beautiful bird.



# The Raven

BULLETIN OF THE VIRGINIA SOCIETY OF ORNITHOLOGY  
PUBLISHED AT LYNCHBURG, VIRGINIA

DR. J. J. MURRAY, EDITOR  
LEXINGTON, VA.

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## Brown-Headed Nuthatches

By Mrs. Floy Barefield

My home is built on Little Creek Inlet which is a salt water body. There are salt marshes in front of the house, sand dunes, loblolly pines and live oak trees to the east and north, and an area of dead pines and salt marsh to the west. The ground cover consists of coarse grasses, prickly pear (*Opuntia opuntia*) which in spring flowers into a mass of brilliant yellow blossoms, yellow jasmine (*Gelsemium sempervirens*) which sprawls all over the sand or climbs the pines, butterfly pear (*Clitoria mariana*) which forms a mat on the dunes and which in mid-summer has large delicate lavender-blue flowers, and southern fox-grape, or muscadine (*Vitis rotundifolia*). Scattered over the hills are also huge clumps of the French mulberry (*Callicarpa americana*) which in fall has the berries of an indescribably beautiful, and vivid purple hue.

I first began noticing the little brown-headed nuthatches in 1938. That which first struck my observation was the way they travelled in groups. One begins seeing them in groups as early as June. During the second week of this past June, I counted 21 brown headed nuthatches in my yard. One sees them in their little groups until early spring. All fall and winter they travel about in small bands like roving gypsies. I do not know the exact extent of their maneuvers, but I know that they probably travel about 2 miles west into the pines, about 3 blocks north to Chesapeake Bay, and south and east along the shore of Little Creek Inlet. I see them about my house in the morning and again in the late afternoon when they come with regularity for food and water. One's attention is attracted to these little bands by their continuous chatter, 'ya-ya, ya-ya, ya-ya,' given very fast and which to my mind sounds like a kittenish call, - not a whimper, but a very busy kittenish note. Or I would say that their note resembles the call of the least tern, only given much softer. The brown-heads consistently keep to the high branches of the pine trees and always appear very busy feeding. Sometimes they give a strong peck on a limb of a tree which is almost as strong as the peck of the downy woodpecker. They feed with short nervous movements from one branch to another, and when they fly from one pine to another, it is with such a quick flight as almost to escape the eye. It is by their kittenish talking that one usually finds them. In late summer and winter, both adults and young are very tame and allow one to get within 3 feet of them.

All winter long the nuthatches bathe and feed about my house. When coming to bathe, they wait until all the other birds have left the bath before they approach. Other birds which drink and bathe here in winter are bluebirds, mockingbirds, white-throated sparrows, juncos, and myrtle warblers. The nuthatches usually cling to the trunk of a pine tree near the bath, sometimes one above the other, until the bath is clear. Or they may perch on a limb and wait. When bathing, 2 or 3 may perch on the rim waiting their turn, but only one at a time flutters in the water. When through, they fly to a nearby perch and flutter and shake their wings for a few minutes, then they are off to the tops of the pines. However before bathing, the nuthatches usually feed on the suet. They are extremely fond of suet. After pecking on it, they fly to a branch and wipe the bill with a sidewise motion of the head. I do not know exactly how or where they sleep, but I have heard them at dawn on winter days in the pines about my home.

With spring there comes a decided change in the habits of these little nuthatches. They no longer move in groups. They become very shy. When one sees them it is usually in pairs, or they come singly to the bath. Their voices change now to a softer, more loving call, which I call their courtship song. It becomes difficult now to locate them because of their quietness. In fact they seem to disappear from the scene entirely. I realized this when I came to hunt for their nests. While taking their bath, a pair will give their little love calls and look at each other as if talking to each other. Then they fly off together. I have not seen any other actions denoting courtship.

How shy they become at this time can best be explained by the search which I had to make to find a nest. I began looking for signs of nesting the first of March and I did not locate any nest until April 21. I became quite forlorn, fearing that I would never find one. Of course, my lack of success might have been due to the fact that I had a baby of my own to take care of and I could spare only about 2 hours a day for the search. But how I hunted! I looked at all the dead pine trees and stumps, woodpecker holes, and wherever there were cracks in the bark of the pine trees. I would try to follow a pair after they had taken their bath, but they were always too quick for me. Then one day I was sitting very quiet on the edge of a small area of dead trees when I heard their kittenish call. With binoculars I searched every tree about. Then suddenly out of a tiny hole came a brown-head.

The next day I found another nest about 200 yards from the first one. This was located in a dead pine about 50 feet tall, and the nest was about 10 feet from the top. All about the base of the tree were young pine seedlings, 2 to 4 feet high. The ground was wet and marshy. The water was standing rain water due to the fact that there was no drainage. Because of the difficult terrain and the fact that I had so little time to give, I put all my observation on the first nest.

This first nest was about 18 feet high in a dead pine tree. On April 21 when I first saw the nest, the nuthatches were excavating, taking turns and digging. I watched them from 1:45 to 2:45 P. M. One would dig about 15 minutes, when the other would come to the hole, they would exchange kittenish calls, then the first would fly off to a nearby tree. This one would feed among the fresh, new pine cones for about 15 or 20 minutes, then return to the nest and resume the digging, while the other flew away to feed. While digging, the digger would bob up to the entrance about once every few seconds and eject particles. I observed this excavating as follows:

April 22, 11:45 A. M. - 1:30 P. M.  
" 24, 1:15 P. M. - 2:30 P. M.  
" 25, 9:00 A. M. - 10:00 A. M.  
" 29, 10:00 A. M. - 11:45 A. M.

At one time during the excavating, a male bluebird flew to the entrance and pecked in. In a flash, one of the brown-heads flew from a nearby tree and put up a terrific fight, flying at the bluebird and flapping his wings and seemingly pecking, or trying to peck, the bluebird on the head.

On May 1, I observed the nest from 2:30 to 3:15 P. M. After I had been watching it for 30 minutes, one of the birds came out and flew away. I did not see either bird again before I left. I concluded that probably the female was laying.

It was not until May 10 that I was able to visit the nest again, when I watched from 9:30 - 10:15 A. M. During this time I saw one bird leave the nest to fly to a nearby pine tree where it fed for only 10 minutes, then it returned to the nest and remained there until I left.

The next day, May 11, I observed from 7:10 to 7:40 P. M. Almost immediately a bird flew off the nest and the other perched at the entrance for a few seconds, pecking in, then it went inside. The first bird did not return before I left. I never was able to distinguish between the male and female, for they seemed so exactly similar. I assumed at this time that they were taking turns incubating. Perhaps it was the little male going onto the nest for the night that I had witnessed.

Only on 3 occasions did I see the parents entering the hole with food in their bills. I cannot tell of what the food consisted. I did observe one parent make several trips to the base of a pine tree in the wet marsh and return with food. Also they would take food from beneath the bark of the pine trees, and again particularly from the base of the young pine cones. Furthermore I saw the brown-headed nuthatches make 5 trips in succession carrying suet from my home and going in the direction of the nest.

May 23, at 6:50 A. M. was the first time that I saw the babies. Four babies were on a pine limb near the nest. Both parents were feeding them. The afternoon of the same day, 10 brown-heads were in my yard. This must have included the young of two broods.

On May 24 at 11:15 A. M., 2 adults and 4 babies were feeding in my yard. The parents would take suet from the tree and feed each baby in turn. Young brown-headed nuthatches are very light about the throat and ear, with a brownish head and a spot on the nape as in the adult, but the spot is not as noticeable. They flutter their wings and call loudly when a parent approaches with food. They are exceedingly gentle and tame. Both babies and adults would now come to within 3 feet of me as I stood by the suet, the adults having become again very tame. The parents fed the babies for at least 8 days about my house.

Wishing to investigate the nest I chopped down the dead pine in which it had been located. The entrance hole was really long and narrow being  $1\frac{3}{4}$  inches wide and 3 inches in height. From the bottom of the entrance hole, the nuthatches had excavated down  $6\frac{1}{2}$  inches when they were certainly stopped by a hard

node where at one time there must have been a branch extending out from the tree. As best I could determine the nest was made of string, dried grasses, very fine plant fibers, and a mass of felted, woolly material which was mouse-colored. Under the lens, however, this woolly mass appeared composed of fine, glistening threads which I thought must be plant fuzz or down. The nest was infested with mites and seemed to be full of empidermal scales, probably due to the scratching by the young.

All during their nesting, the chief menace to the brown-headed nut-hatches was ~~swamp~~ or grass fires, all of which it was thought were purposely started by someone who wished to burn the marsh grass. I personally put out 5 fires near the nesting sites, one of which I struggled with for an hour before the fire engine came. During the fires, much marsh grass and many little pine trees were destroyed.

On August 10 I noticed 2 baby brown-heads in a pine tree outside my yard. There were fluttering their wings and giving the baby call for food. This I should think would indicate 2 broods.

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Norfolk, Va.

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#### T. Gilbert Pearson - An Appreciation

By J. J. Murray

When Dr. Pearson retired from the National Audubon Society on December 31, 1942, he had rounded out thirty-eight years of Audubon work. It is given to few men to serve one organization so long. Since these years began with the incorporation of the Audubon movement as a national institution, Pearson's name and the Audubon work have become almost synonymous. Eight years ago he had turned over the direction of the Society's affairs to others and had become President-Emeritus, but that by no means meant the cessation of his interest in the work to which he had given his life. Maintaining an office at Audubon House, he had turned his energies to the field of international bird protection, the cause which for years had been making an increasingly strong appeal to his imagination and enthusiasm.

To every man who has been fortunate enough to live both well and long there comes a day when he is ready to give into other hands the work which he has built up and to turn himself to the personal interests and activities in which he may find continued usefulness but less strain. While Dr. Pearson's service by the calendar test has been not inconsiderable, its measure is far greater on the achievement scale.

The boy Gilbert Pearson had the good fortune to spend his days in the Florida so gracefully portrayed by Morjorie Kinnan Rawlings in The Yearling. Central Florida was then virgin country, a paradise alike for birds and beasts and for small boys. Like most boys he unconsciously felt himself a part of the wide world of Nature; but unlike most boys he also knew a conscious and a sensitive interest in particular birds and mammals. He early had a passionate desire to know the names of these wild creatures and to learn their ways. For the satisfaction of this eagerness there were few external aids. Identification bookswere almost

non-existent; color plates were scarcer still; and even when available to others they were beyond the slender finances of a boy of the back country. Consequently he had to learn his birds the hard way. The very necessity of so striving for his knowledge not only made it more precious, however, when achieved, but gave the struggler a life-long sympathy with other boys and girls similarly handicapped. From those difficulties stemmed, no doubt, his zeal for the Audubon Junior Club leaflets and their colored sheets.

Education at Guilford College, the Quaker School in North Carolina, was financed by the egg collecting of those early Florida years and by the North Carolina Bird skins laboriously worked up in later days. Teaching days at Guilford and later at the State Normal and Industrial College at Greensboro, where pioneer experiments in field instruction in biology were undertaken, added to the knowledge which was to stand him in such good stead in his years of legislative battling.

His interest in conservation and his efforts for bird protection date from Pearson's earliest manhood. It is a long way back from the 1940s when the United States is becoming conservation conscious, when many organizations are active in the effort to preserve the out-of-doors, and when the National Audubon Society stands in the forefront of this movement, to the early 1900s when bird societies were still few even in the North, and when down in North Carolina Pearson was rounding up a few zealots to save the robins and the redbirds. The methods, however, which he was then developing in the hard school of practical politics were the same methods which were to be so successfully followed throughout his life work with Audubon groups. In 1901 William Dutcher, then Chairman of the Committee on Bird Protection of the American Ornithologists' Union, saw a little book, Stories of Bird Life, and immediately wrote the author for his help in the formation of a state Audubon Society in North Carolina and in the passage of protective legislation in that state. Next year, in the second year of its life, Pearson became a member of the National Committee of Audubon Societies.

Bird protection in the South, on any worthwhile scale, began in North Carolina and with this man's leadership. The North Carolina Audubon Society was launched in 1902. In 1903 through the efforts of the infant society the model Audubon law was passed by the State legislature. It was the first law in any South Atlantic or Gulf State to provide for a state game warden system. Interestingly enough, the Audubon Society was made the executive agency for the administration of the law. Even more interestingly, the society, although young, measured up to its opportunity.

It was inevitable that a man of Pearson's ability and energy should come to the front in any field which he might choose as his life work. These two words, 'ability and energy', are, by the way, the characteristic marks of the personality of this man. Relations with Dutcher, Pioneer protectionist of the country, grew closer and more sympathetic. Pearson became one of the incorporators of the National Association of Audubon Societies in January, 1905, and was elected its paid secretary, with Dutcher as President. When Dutcher, stricken with paralysis in 1910, entered ten years of helpless illness, Pearson, although leaving to his senior the title of President, became the directing head of the organization. At the death of Dutcher in 1920 he was made President in name as well as in fact.

The years as Association Secretary and President were filled with hard work, with great success in securing both friends and funds for the Association and for bird protection, and with brilliant political statesmanship. As he himself has stated in his autobiography the aims during these years were: first of all,

to secure the passage of laws for the protection of non game birds, of which the plumage bills were the most outstanding and spectacular; next, to create sanctuaries where birds might rest in winter and breed in summer secure from human enemies; and, finally, to cooperate with other conservation groups, including always the better types of sportsmen's organizations.

They were years of fighting, when every bill passed meant a hard struggle against ignorance and indifference and organized selfishness, and when the passage of the law meant only the beginning of the battle for its enforcement and against the efforts that would abolish or amend it. Highly organized commercial interests, greedy 'sportsmen', ignorant politicians, and an indifferent public made such efforts difficult. A great milestone was passed when the Migratory Bird Treaty with Canada was ratified by Congress on December 7, 1916. Although the leadership in this achievement was naturally taken by government agencies, the Association was a strong supporter of the movement and Dr. Pearson had an active part in the effort to secure and in the formation of the terms of the Treaty.

There were years of education as well as of warfare. State and local branches of the Association spread the message of conservation. The President of the Association and the state representatives working under his direction were speaking all over the nation. A strategic move was made when the protection idea was carried to the children in the schools. The Junior Audubon work began when Dr. Pearson secured \$5,000 per year for seven years from Mrs. Russell Sage for work among the school children in the south. The plan was then followed throughout the rest of the country. Gifts for this phase of the work increased until finally in 1922 an endowment fund of \$200,000 was presented to the Association. By this popular and effective work over five million children had been reached by 1934.

These were the years when Dr. Pearson's work stretched far beyond this country. Time fails to tell of the international work, always dear to his heart and receiving after his retirement from the Presidency the major portion of his time and interest. In several visits to Europe, where with a few notable exceptions there was so little protection for birds, existing organizations were stimulated, new national groups were formed, cooperation between countries fostered. Finally the International Committee for Bird Protection was launched, the first national section having been organized in Great Britain. Trips were made in more recent years to the West Indies and to South America, a model law in Puerto Rico coming out of one of these visits.

Along with these activities, which might have filled the time of a man less energetic, books were written. First was the book for children, Stories of Bird Life, which brought the author to the attention of national leaders and which was for some of us in the South our introduction to ornithology. Two other children's books followed, The Bird Study Book, and Tales from Birdland. The Birds of North Carolina, one of the pioneer Southern state books, first published in 1919 and revised last year, was written in collaboration with Messrs. H. H. and C. Brimley. The crown of Dr. Pearson's activity was Adventures in Bird Protection, which is not only the autobiography of this remarkable man, but is the history of conservation in the United States as well.

This is the man whom the National Audubon Society salutes today! He has won high honors for himself because of his tireless efforts to serve the cause of conservation in the Americas and to build a sound, strong organization which we trust will carry on those efforts as long as animals need protection and

human beings need the peace and beauty of the world of Nature. It is the wish of the Directors and members of the National Audubon Society that the years may bring him increasing satisfaction in these achievements.

(This article, which appeared in the Audubon Magazine, January-February, 1943, is reprinted by permission of Audubon Magazine. It was written on the occasion of the retirement of Dr. Pearson from active work with the Society to which he had given so much of his life. Now the sad news has come that Dr. Pearson passed away at Lenox Hill Hospital, New York City, on September 3d, after a few days of illness, and has gone to his reward. The work of one of the greatest conservationists of modern times is finished; the effect of his life stands, and his memory lives with all who love wild things.)

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#### BIRD NOTES FROM SEWARD FOREST

By John B. Lewis

A nest of the turkey vulture was found under the branches of a large fallen pine about half a mile southeast of Seward Forest headquarters on April 9, when it contained two fresh looking eggs. When visited on May 6, one egg had disappeared, but the buzzards were on hand and the remaining egg was warm.

May 12, an apparently newly hatched chick, yet too weak to stand, was in the nest and the parent birds were present protesting my intrusion. The nest was visited at frequent intervals until July 30, when the young buzzard was gone.

This indicates an incubation period of at least 33 days and a nest feeding period of about 79 days.

Certainly one pair, and probably two pairs of Horned Larks spent the spring and early summer in the fields across the road from Seward Forest headquarters where they nested last year. Although no nest was actually found there can be little doubt that they nested there again in the spring of 1943, as they were regularly present all through the nesting season.

I find the white-breasted nuthatch to be quite rare in this section. In fact it has not been seen at all in spring and summer. In winter a very few may be found in deciduous woods, mostly in stream lowgrounds. I have not seen them at all in pine forests, where the brown-headed nuthatch is most at home.

On July 24 last, a male vesper sparrow in full song was seen and heard in the tract of open land in front of Seward Forest headquarters. This is my only record for the species of this area.

Bear Trap Farm, near Mt. Solon, Virginia - I was told that the Golden eagle had nested in this vicinity this year, and that one had been shot and mounted; but I do not know whether this was in Virginia or over the border in nearby West Virginia.

I saw a black vulture on September 7th; and on September 16th, I noticed an egret standing in the water at Mossy Creek.

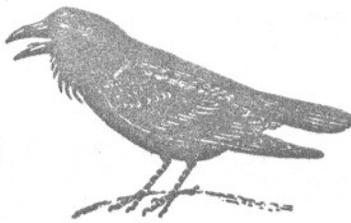
Austin H. Clark  
Washington, D. C.

NOTES

We should like to publish in the January issue of The Raven a complete list, with addresses of all V. S. O. men and women in the Service. Please check the last membership list (November-December issue, 1942), and give us any addresses which you may have.

Christmas Census. The dates this year are December 19 to 26 inclusive. We hope that there will be many reports sent to the Audubon Magazine, with copies to The Raven, or reports to The Raven, whether or not you are able to follow Audubon rules and send the report to New York. Study the rules in the September-October Audubon Magazine, pages 315-317.

Articles for The Raven are badly needed. Since it has not been practicable for the V. S. O. to keep up its annual meetings, it is all the more important that we make The Raven a more active organ of the Society. We need more news about the activities of the members; more articles like that which opens this issue, more local lists, and more stories of bird trips.



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## "WINGS TOWARD THE SOUTH"

By J. J. Murray

Over this room tonight while this paper is being read thousands of birds are flying, stretching their "wings", as the Creator of the birds said to Job (39:26), "toward the south". They have turned their backs upon winter's cold and hunger and are headed for the lands of sunshine and abundance. There will still be some brightly colored warblers in those flocks, even though most of their kind are already swinging through Georgia or crossing the Caribbean. There will be a few magnolia and Cape May Warblers, a few black-throated blues and black-polls, and many palm and pine and myrtle warblers. Flycatchers and swallows have long been gone, of course. The orioles left us a month ago, but their kin, the redwings and rusty blackbirds and purple grackles, are thronging the skies tonight. Robins and bluebirds and hermit thrushes are far to the south by now, as also are the catbirds and brown thrashers. Creepers and kinglets are in the group. Sparrows of many minds contribute to the caravan, vesper and chipping and swamp and white-throated and white-crowned sparrows; and with them the last of the towhees and the first of the purple finches. Far back in the mountains though we are at Lexington, there will be many water birds going over our heads tonight: pied-billed grebes and green and great blue herons; coots and snipe and woodcock; sora rails and yellow legs and certain sandpipers. If you were standing on the roof of this building the air above you would be filled with the voices of migrant birds. You might hear the sonorous honking of Canada geese or the shrill whistles of green-winged or blue-winged teal or of widgeon, or the hoarse quacks of mallards and black ducks. There would be the faint, sibilant whispers of little warblers, the harsh calls of the blackbirds, and clear 'peeps' of shore birds. The invisible air lanes of the sky are crowded every night now with tiny travelers, all moving southward under an irresistible urge to leave the land of their birth and to seek some far country where they may spend the winter in safety. Whence comes this age-old migration habit? What is the impulse which starts this movement twice each year with such unflinching regularity? What is the wisdom that guides them on this three hundred, or it may be three thousand, mile journey?

Next to the recurrent passing of the four seasons, migration is, I suppose, the most striking of the natural phenomena to be observed in the temperate zones. The most careless observer, unless he be shut up within stone walls of some terrible and natura-less city, cannot miss it. The victory V of the baying wild geese; the flocking of the blackbirds in autumn; the annual return to our yards

of the robins and the house wrens; to these things no one can be indifferent.

Perhaps we should pause here to define this term which we are using so often. Migration, as used of birds, means a good deal more than 'movement'. In certain winters, particularly when there are heavy snows in the far north or when mice are scarce, great numbers of snowy owls move down from Canada into the northern United States. Such wanderings are not migratory movements at all. On the part of certain species of birds which never leave the Tropics there are wanderings for the purpose of keeping in touch with changing food supplies. Although there is real migration within tropical limits, this travel in search of food is a different thing. Our own crossbills, both red and white-winged, wander about in search of pine mast and breed wherever the nesting season finds them. None of these types of travel is real migration. Hans Gadow, in the article on 'Migration', in the eleventh edition of the Encyclopedia Britannica, defines migration as "the wandering of living creatures into another, usually distant, locality in order to breed there; this implies a return, and the double phenomenon is annual. All other changes of the abode are either sporadic, epidemic, or fluctuating within lesser limits". A simpler way of defining migration is to say that it is a biennial, rhythmic movement of animals between their breeding and winter homes. Where there is a certain amount of migration among mammals and fish and even among insects, birds are pre-eminent in the exhibition of this phenomenon.

Migration has been noticed and commented upon from very early days. Both the earliest migration record and the earliest recorded recognition of the migration seem to be found in the Bible. In Exodus 16:13 we are told that when the wandering Israelites were about to starve in the wilderness of Sin, near Sinai, "at even the quails came up, and covered the camp"; and later, in Numbers 11:31:32, we are told that when at Kibroth-hattaavah the people were weary of the manna that had been given them "there went forth a wind from the Lord, and brought quails from the sea, and let them fall by the camp, as it were a day's journey on this side, as as it were a day's journey on the other side, round about the camp, and as it were two cubits high upon the face of the earth. And the people stood up all that day, and all that night, and all the next day, and they gathered the quails: he that gathered least gathered ten homers". Hugh Gladstone estimates that they took 9,000,000 of the birds, which although astounding is not incredible, since 160,000 of these same birds have been netted in a single migration season on the small island of Capri. This great hunting experience of the Israelites took place some time in the Fifteenth Century, B. C., probably about 1445 B. C., the account of it having probably been written in the Eighth Century B. C. The earliest reference to the idea of migration in all literature is that in Jeremiah 8:7, late Eighth Century B. C., - "Yea, the stork in the heaven knoweth her appointed times; and the turtle and the crane and the swallow observe the time of their coming;" the prophet going on to point a moral with his natural history observations when he adds, "but my people know not the justice of the Lord". Job (39:26) has another reference, traditionally much earlier but probably considerably later than Jeremiah, the reference from which the title of our paper is taken, "Doth the hawk fly by thy wisdom, and stretch her wings toward the south?"

Aristotle, first and long foremost in many fields of science, was the pioneer in the gather of systematic information on migration and in the writing about it to any length. Much of his information was accurate, although he thought that swallows, doves, larks, and other birds became torpid and hibernated in the winter. In this as in many other fields the very magnificence of Aristotle's scientific achievements served to bind scientific effort for many centuries. His theory about

the hibernation of birds was held until comparatively recent times by many naturalists in Europe, lately enough even to be supported by some in America. A fantastic variant of this theory, widely held in the Middle Ages, was that many birds dived to the bottoms of lakes, there to hibernate in the mud. European peasants today believe that small birds gather along the shores of the Mediterranean to await passage to Africa on the hospitable backs of cranes and storks and other large birds. Old wives' tales are slow a-dying, the more particularly in the field of natural history; and I have even met this last one in the pages of American newspapers within the past year or so. One of the earliest field naturalists of modern times to take an intelligent interest in migration was the Reverend Gilbert White, whose "Natural History of Selborne" is a classic both of literature and of science. In spite of the proper skepticism which animated all his studies, Gilbert White was disposed to believe in the hibernation of swallows in the mud. The salutary skepticism kept him, however, from ever finding a case which satisfied him.

Since the beginning of the Nineteenth Century a vast amount of work has gone into the amassing of facts about migration; and since the beginning of the Twentieth experimentation has been added to field observation in the effort to understand the causes of migration. Two names stand out in this study of migration. One is that of a German, Heinrich Gatzke, who worked on the island of Heligoland in the North Sea and whose book, "Heligoland as an Ornithological Observatory", presents the fruitful results of fifty years of bird watching. The other name is that of an American, Prof. Wells W. Cooke, who in 1881 began to secure reports from observers in many different places in a cooperative effort to study bird migration in the Mississippi Valley. In the years which followed Prof. Cooke charted the migration routes of many species of birds and published a valuable series of bulletins. His work had another indirect result of great importance to biological science in America, for when Cooke's efforts were consolidated with the work of the Committee on Migration set up by the American Ornithologists' Union it led in 1885 to the organization of the Division of Economic Ornithology in the Department of Agriculture, which soon developed into the well-known Biological Survey, now called the Fish and Wildlife Service.

We may divide this study into two main sections: the Facts of Migration; and the Factors of Migration.

1. Possibly the best way to discuss the known Facts of Migration as well as to suggest some gaps in our knowledge is to ask and try to answer some of the questions which may be in your minds.

First of all, what proportion of our birds are affected by the migration habit? In our temperate latitudes practically all birds are migratory, although the distance traveled varies greatly with the species. In Rockbridge County we have been able to record some 243 different species and subspecies of birds. Of these 38 are either accidental in occurrence or so rare as not to have any particular significance, leaving 205 species which may be considered as our normal annual bird roll-call. Of these not over 15 species can be considered as permanent residents; that is, as species the individuals of which would spend their whole lives within the boundaries of our county. Such birds are the turkey and black vultures; screech-barred and great horned owls; bob-white, ruffed grouse and wild turkey; pileated and red-bellied woodpeckers; raven, mockingbird, carolina wren and cardinal. Possibly there are six or eight other species which might come in this category. The inability to make amore definite statement is the first indication of one of the gaps in our knowledge. All the other 185 or 190 species are more or less migratory. There are in addition to these 15 or 20 permanent residents, 25 or 30 other species which

may be classed as resident. That is, they are species individuals of which may be found in the county on any day of the year, but species in which the summer and winter individuals are different. For example, we always have song sparrows in abundance in Rockbridge; but our summer song sparrows winter in more southern states, while our winter song sparrows have come from Pennsylvania or Massachusetts. This is also true of our robins, with this additional interesting and complicating fact that our summer and winter birds belong in part at least to different subspecies or geographic races, the summer birds being of the paler southern race, while many of the winter birds are the brighter northern birds. Our bird list may be classified as follows: permanent residents, 15 or 20; our resident species, 25 or 30; summer residents, 65; winter residents or visitors, 22; transients in fall and spring, 73; rare or accidental or extinct, 38.

How far do our birds travel on their migrations? This depends upon several factors. As a rule insect-eating birds go much farther than seed-eaters, since insects are quite scarce in most of temperate United States in winter. Even among insect-eaters, however, there are certain birds, such as the nuthatches, titmice and chickadees, which, because they feed upon insect eggs and because they seek out their food in places where insects hibernate during the winter, are not forced to go such long distances. Food is probably not even the chief factor in the distance traveled by any species. Another factor is the locus of origin of the species. As a rule species of austral origin move farther south in the winter than species of boreal origin. Again, past geological conditions have undoubtedly had much to do with the distance now traveled by a species and the route which it follows.

The distance traveled on migration varies greatly. The song sparrows of the East have a short trip, birds that breed in Manitoba and Ontario going only to New England or to the Mid-Atlantic States, and birds breeding in Virginia and western North Carolina going on to Georgia and Florida. Thus it is only a small part of the summer range that is deserted in winter; and, vice versa, only a small part of the winter range which is not occupied in summer. On the other hand, of the 10 eastern species of the insect-eating flycatchers only one, the Phoebe, manages to winter as far north as Lexington; one, the crested flycatcher, has a few representatives in winter in Florida; while most of that species and all of the other 8 species move on to South America. The brightly-colored little warblers, insect-eaters all of them, vary very much in their travel distances as well as in their routes. The pine warbler, one of the few warblers confined in winter almost entirely to the United States, has the shortest of the warbler routes. Migration for this warbler means only the withdrawal of northern individuals from their summer homes and the massing of all the individuals of the species in the southern part of the range. The black-poll warbler, however, is one of the greatest travelers among the small birds. Few of them breed south of Canada; and all of them go to South America for the winter. Thus the shortest trip which any black-poll takes is 3,500 miles; while those which breed in Alaska probably winter in Brazil, 7,000 miles away. Of course no paper on migration could fail to mention that classic and oft-quoted example of long-distance migration, the Arctic Tern. It is so northern in its breeding preferences that the first nest to be discovered was within 450 miles of the North Pole. It breeds from Baffin Island and north Greenland south to the Massachusetts coast, and winters in the Ant-Arctic Ocean to Latitude 74. The Arctic Tern travels an air-line distance of 11,000 miles twice each year. Consequently it sees more daylight than any other living creature, spending as it does both summer and winter in the lands of the midnight sun, and enduring the darkness only in the few weeks of its migration trips. The Wilson's petrel, with a strange reverse migration, makes

almost as great a trip, since it breeds in the Antarctic and winters in our northern seas.

As has been mentioned above, there is a certain amount of migration among a few species in the Tropics where there is no change of season or in abundance of food. Most tropical birds are sedentary; some, like the snowy-white Cotinga, or Holy-Ghost-bird, and certain of the tanagers and hummingbirds undergo decided shifts with the shifting food supply; while still others, like the oropendulas, have a regular though primitive and short migration. Some of the pelicans, man-o'-war birds, tropic birds and boobies gather regularly on certain islands to breed, and then wander about after the breeding period.

In America we have an odd form of migration which may be called vertical migration. It secures in a measure the same results, but is a movement not of latitude but of altitude. Birds move down from the mountains to the valleys in winter, and go back from the valleys to the higher elevations in order to breed. The migration may be for only a few miles and may take only a few hours, but those few miles and hours may, in the San Francisco Mountains of Arizona, bring the birds from boreal conditions at the top of the mountain to tropic heat in the desert below. Naturally most of this vertical migration is to be observed in the west, where in short compass there are great variations in altitude and therefore in climate. Nevertheless we do have one example of such vertical migration right here in Rockbridge, where the Carolina Juncos, or 'snowbirds', which nest at the top of Thunder Hill come down to Arnold's Valley for the winter season.

Migration is a dangerous venture for birds. On the one hand, it is remarkable what ability for long flight is achieved by birds when the necessity arises. It is almost impossible to flush a sora in its nesting marsh; again, in winter the sora will scarcely rise above the marsh grass when the hunter comes near in his boat; yet in September it can make successfully the long flight from Canada or Northern Ohio to the shores of the James and of Chesapeake Bay. The tiny hummingbird, after feeding busily all day in the meadows of Louisiana coast, can then jump in one night the 500 miles of the Gulf of Mexico across th Yucatan. On the other hand, the toll of migrating birds when ice or wind or storm strikes them at the height of the movement must be beyond all computation. Birds must be in good condition for the migration flight, with the molt well advanced so that the feathers are sufficient and strong, and with plenty of energy-making fat lining the inside of their skins.

When do birds do their flying? Small birds do most of their traveling by night, when they are safer from their enemies, but there is also a slower, gradual movement during the day, the birds feeding as they go. Another reason for night flight for small birds is that they cannot afford to end a long and trying day's flight with a night before them in which there would be no chance to replace the lost energy by new food. Larger birds travel either by night or by day; hawks by day; geese and ducks mostly by day, but also to some extent at night.

How high do migrating birds fly: There was much guessing about this until observations could be made from airplanes. Now we know that most of them fly below 3,000 feet. Usually there is no particular advantage to the bird in high flight, although occasionally wind and weather conditions may favor it. Birds generally fly very low on foggy nights.

How fast do they fly on migrations? This again has been much exaggerated. Twenty-five to thirty miles per hour, as I have checked them from automobiles, seems to be a good speed for small birds. Crows going to and from their roosts normally take a speed of 30 miles per hour. Starlings, which are very fast for their size, fly around 40 to 45 miles per hour. Larger birds naturally go faster: Ducks and geese from 45 to 60; falcons, 40 to 50, swifts around 70. All of these can accelerate with the need for higher speed. The duck hawk can probably go up to 100 miles per hour. The championship speed of homing pigeons is about 55 miles for 4 hours at a time. But very few birds fly continuously on migrations. Prof. Cooke estimated that the average rate of movement northward for species of small birds passing up the Mississippi Valley was 23 miles per day. As a species comes nearer its breeding grounds its rate of daily travel increases.

Some species go in flocks made up only of their own kind. Nighthawks and swifts, for obvious reasons, follow this practice; but for less obvious reasons crows, kingbirds, bobolinks and ibises do the same. Swallows, blackbirds, hawks, ducks, and warblers usually go in flocks of several related species. Bittern birds, waxwings and shorebirds travel in close-knit flocks; hawks, jays, bluebirds and warblers go in very loose and strung-out groups; while grebes, horned owls, shrikes, kingfishers and others travel singly. In some species the sexes travel separately, particularly in spring, when the males go ahead to choose the territory for nesting. This is true of robins, redwings, tanagers and song sparrows; while among ducks and shorebirds the sexes go together. In many cases the adults go south first in autumn, leaving the young to find the way alone. The golden plovers even have a different route in fall for adults and young.

Do birds follow regular lines of travel? In general there are certain fairly definite routes of migration. Dr. Alexander Wetmore has pointed out in his book, The Migration of Birds, which has been freely used in the preparation of this paper, that birds in migratory flights tend to follow lines of major topographic relief if these run in the right direction. Some of these lanes, particularly the coastal, are relatively narrow; others, particularly those over level inland areas, are broad and diffuse. Even inland, although migrants may be found everywhere, there are lines of greatest concentration. In the United States there are eight main lanes of travel for migrants. The first is directly across the Atlantic from Nova Scotia and Labrador, by way of Bermuda and the West Indies, to the mainland of South America. Only water birds use this route, and mainly adult golden plovers. The second is along the Atlantic Coast to Florida, thence splitting into three divisions: One across to Cuba and South America; another, a longer route to the east, through the Antilles to South America; and the last directly across the Gulf of Mexico to Yucatan. I once had the very interesting experience on the beach of Boca Chica Key, near Key West, of seeing a flock after flock of shorebirds make the landfall on United States soil after the flight across the sea from Cuba. A third lane of travel runs from Hudson Bay to the Great Lakes and to Chesapeake Bay. A fourth also starts from Hudson Bay and continues south along the Mississippi Valley. The fifth is a wide and poorly-defined lane across the plains. A sixth runs along the Rocky Mountains into the tableland of Mexico, only a few going farther than Guatemala, and practically none crossing the Isthmus of Panama. A seventh follows the western Rockies through the Sacramento and San Joaquin Valleys; while the eighth is along the Pacific Coast.

A few birds use different routes in spring and fall. The Connecticut Warbler, for example, goes north along the Mississippi Valley and is very rare east of the mountains in spring, while in the fall it passes south on the east side

of the Alleghanies, being very rare at that season along the Mississippi. The main line of the fall and spring movements of the golden plover are 1,500 miles apart.

How do birds find their way on these trips? They do follow their routes in most remarkable fashion. The golden plover crosses 2,400 miles of water, and the hummingbird crosses the 500 miles of the Gulf of Mexico without a landmark. Gulls, terns and gannets go 50 miles out to sea to their fishing grounds and return without difficulty to their nests through wind and rain and fog. Dr. J. B. Watson, the experimental psychologist, took three noddy and two sooty terns from their nests at Bird Key in the Dry Tortugas, carried them in boxes in the hold of the ship to a point twelve miles off Cape Hatteras, and then released them over a thousand miles by water from their nests. Five days later the two sooties were on their nests, and one of the noddies was seen several days later. How does this happen? It has been suggested that the young are led by the old birds. But how do the old birds find their way? And it happens in the cases of the cowbirds of Canada that the young are hatched by thirty or more species of foster-parents, which go to widely separated wintering places. Their true parents have gone ahead. Yet the young cowbirds reach their winter home to spend that season with their own parents rather than scattered through all the regions occupied by their foster-parents. Do birds set a course by sun and stars? Obviously this does not explain the ability to follow a course by night or in fog. Do they follow by memory a set of Landmarks? This would not explain the ability of the young to go alone over a route that they have never seen; nor the ability of penguins to migrate in and even under water. This does play a part. It is a help to homing pigeons; and it does explain the way in which your wrens, after having traveled a long distance, come back to the same nesting box after reaching familiar territory. Does the bird have a magnetic sense, by which it can recognize magnetic dip and declination? This has been advanced, but there is no known way in which this magnetic sense might operate. The fact it has not and probably cannot be disproved is no great argument in its favor. In answer to our question we can only assume a sense of direction, which is just a smoother way of saying that we do not know. There are probably two factors in the ability of a bird to find its way: a known factor, the sight and memory of topographic features, which explains some of the features in some of the cases; and an unknown factor, which seems to be the chief one.

II. Now we come to a section of the study of migration which is more difficult than the ascertaining of the external facts of migration, namely, the understanding of the Factors Involved in Migration.

Why did birds begin to migrate? It has been suggested that migration is just the natural outcome of the powers of flight. The ability to fly does make wandering a natural thing, but it in no way explains the development of the rhythmic movement which constitutes true migration. The power of flight only provides an essential condition for migratory movements. A more reasonable answer is that migration was necessitated by temperature changes, that birds were compelled to leave the north when it became too cold in the winter. Birds, however, can stand much more cold than they have to even in the north. Dr. William Rowan of Canada found that native birds could stand temperatures of minus 52 F. in outdoor aviaries without apparent harm; and that even canaries could take temperatures of minus 45 F., and would still sing at 30 degrees below zero. With sufficient

food birds are usually unharmed by very low temperatures. Temperature is clearly a factor in migration but only a secondary factor. Again, the failure or diminution of the food supply is a fundamental factor. Just when they need more food to build up a resistance to the cold, most birds cannot find it. The quantity of daylight enters in also, for just when birds need more daylight hours in which to find their food, they have fewer. Low temperatures do further affect the situation in that birds then become more lethargic, just at the time when they need more energy for collecting food. Another probable factor is the smaller amount of ultra-violet radiation in the north in winter. Birds need ultra-violet radiation both for its direct therapeutic value and the elaboration of vitamin D, which they get in part from diet and also in part from sunlight through the ergosterol in the preen glands. The farther from the equator a place is, the less this radiation takes place, because of the increased angle of the sun's rays and because of atmospheric absorption. This is true even in summer, but much more so in winter. The combination of these various factors, low temperature, lessened food, daylight and ultra-violet radiation, gives rise to the need for the migration habit.

But how did migration originate, and how did the present routes develop? The factors just discussed explain in some measure at least why birds could not continue to live the year round in the north, but they do not explain how birds have learned to make these regular bi-ennial trips back and forth. In fact, this cannot possibly be explained on the basis of present day conditions. Birds have been migrating for millions of years. The origin and more particularly the routes followed may have to be sought in influences of the past, some of which may no longer be potent. Dr. Rowan has illustrated this by the case of the Lappland longspur, a bright-marked sparrow of the far north. Its present breeding ground roughly covers northern Canada, while it winters through the north and central states and south to Texas. It is probable that this present winter range represents the original home of the bird in the middle of the Pliocene Period of the late Tertiary, when conditions in that region were much the same as now. The numbers of this species increased steadily; and consequently the pressure of competition tended to push the breeding area out in all directions. The birds moving northward to breed found favorable summer conditions, with an unlimited food supply and less competition, and so increased at a greater rate than their relatives to the south. But they found winter conditions intolerable. Only those that happened to wander southward escaped destruction. Again in summer the northward dispersal took place. Again the destruction of most of those wandering individuals and the survival only of those which wandered south again at the right time. Through a long continuance of such movements, stretching over a long period of time and at the cost of the lives of millions of birds, the present north and south migratory swing developed. On the other hand, many ornithologists argue that the ancestral home of migratory birds was in the north rather than in the south: That originally the north country was suitable for year-round living; but that the successive ice ages forced birds to the south, with a natural tendency toward return as often and as far as the ice would permit; and that thus the bi-ennial cycle was set up. These are both good guesses, the former probably better than the latter, but neither with any proven or hopefully provable basis. Either seems to involve that most dreadful of all assumptions to the modern biologist, the Lamarckian hypothesis of the inheritability of acquired characteristics. This question must apparently be left at present at least as one of the three riddles of migration: The other two being the question we have already discussed, how birds find their way, and the last question we are to consider, what it is that each season initiates in the individual bird the impulse to move southward or northward.

What is the immediate stimulus to migration? Last week the catbirds left Rockbridge County; tomorrow or the next day or very soon, the chimney swifts will follow their example. Why do they pick this particular week? It is not due to failure of the food supply, even though it may be beginning now to get scarcer. It would not do for birds to wait for that, as they might then have days or weeks of travel over scanty country before they come to good food supplies again. The flycatchers, except for the Phoebe, are very early migrants. They, as well as the swallows, leave in late August or early September, just when their insect food is at its very height.

Here is a problem for the solution of which more than the accumulation of field data is needed, or even its careful classification and coordination. Among ornithologists there is now a revolt against purely field and observational work, and a recognition that the laboratory method must be brought in to supplement field data by controlled experiments. In the study of migration there is special need for this kind of work; and at present much of it is being done. Dr. William Rowan of Canada is a pioneer in this field. His book, "The Riddle of Migration", embodies his work on juncos and crows.

Disregarding temperature changes, failure in food supply, changes in barometric pressure or in ultra-violet radiation as key factors in the external stimulus toward migratory movement, he settled on the hypothesis that increasing daylight in spring and, conversely, decreasing daylight in autumn was the important factor. In order to test the widely-held view that the development of the gonads, or sex glands, in spring was due to the effect of rising temperature, and also to test the resistance of birds to cold, he kept groups of juncos and crows in open and unheated aviaries. The birds were divided into two groups, one to be experimented upon and the other to be left under natural conditions as a control group. The control cages received only the normal amount of daylight. While the experimental birds were given artificial light. Beginning at the first of November, when the sex organs of the birds had reached their winter minimum, he found that by giving the birds a daily increase of about five minutes of daylight he could control the development of the gonads. By January 9th they had attained their spring maximum. Then, by reducing the lighting in regular daily amounts, the gonads were by February 5th returned to their winter condition. The birds were then put in cages with normally increasing daylight, and by May 30th were again in full breeding condition. Further experiments showed that the effective influence in these gonadal changes was not the daylight itself but the greater or lesser amount of time spent in the exercise of food gathering.

While Dr. Rowan's and other similar experiments are by no means conclusive they have thrown some light on the way in which migration mechanism functions. Increasing daylight in the spring means longer daylight activity on the part of the bird. This activity stimulates the development of the gonads, whereupon in turn the interstitial cells of the gonads elaborate a gonadal hormone. This hormone sets up a restlessness in the bird, which finally sets out on a flight, the direction and distance of which follows the past experience of its ancestors. Now all this is by no means proven as yet. It can only be looked on as a rather likely hypothesis, the best at present available hypothesis to account for the facts. Like all other hypotheses about the origin and mechanism of migration it stumbles on the problems of tropical migration, for in that region there is no changing daylight. Again it does not tell us why some of our birds, such as the Upland plover, which breed

in the northern summer and winter in the Argentine in the southern summer, start both ends of their migration in a dying season.

In our travels tonight with the migrating birds we have found that we know a good deal about the 'what' of their movements, but very little about the 'how' and 'why'. We have faced three major questions: Why birds began long ago the migration habit; why each bird begins any particular seasonal migration; and how birds find their way. About the first two we can begin to make guesses; about the last we know nothing. Someday we may know more about all of these, for man's restless mind will never stop asking questions. Possibly we shall never know the answer to all. In this our questions tonight are but typical of man's ignorance and inadequacy in the face of his universe. At the last we can only listen again with Job while the Eternal who created both birds and man says to him: "Gavest thou the goodly wings unto the peacock? or wings and feathers to the ostrich?.....Will the unicorn be willing to serve thee, or abide by thy crib? Doth the eagle mount at they command, and make her nest on high? Doth the hawk fly by thy wisdom, and stretch her wings toward the south?"

(This paper was read to the Fortnightly Club, of Lexington, Virginia, on October 22, 1943, which accounts for some of the local allusions.)

Lexington, Virginia.

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