THE FLICKER

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CONTENTS

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Insect Control by Birds

By Ralph W. Dawson

INSECT control by birds is an old subject. It would be a hackneyed subject were it not for the fact that our understanding and interpretation of insect control by birds is gradually undergoing a great change. The work of the birds is not to be depreciated, but rather to be put in an entirely new light.

The true scientist is not content that a conclusion shall be essentially correct, but he insists that the conclusion shall follow from unimpeachable data and facts, and that the reasoning employed shall be sound. In fact, the validity of the data and logic of the reasoning are dearer to his heart than are the conclusions to be drawn. Before beginning a critique of established opinion and the evidence supporting it, let us look back for a moment to gain a little perspective for our discussion.

Both current opinion and the bulk of an extensive literature are the sequel to a great need for bird protection. A generation or two ago the public at large had little interest in birds and almost no realization of their value. In general no thought was given to the genesis of bird populations or the possibility of their destruction and its consequences. For example, in my childhood days birds were a universal adornment for women's hats. Like all other women my mother wore birds on her hats, and she was an educated and thoughtful person. But it was the style of the day. That was what the birds were for. The slaughter was terrific —hummingbirds to gulls and herons—all were sacrificed to the milliner's trade. Women were not alone the cause of destruction. Almost every small boy of the nation went through the craze of bird-egg collecting. My oldest brother had a remarkable collection of eggs. Even I started one. My second brother, like many another boy, slaughtered birds with a slingshot for sport and practice in shooting. Men and boys in general considered this a legitimate sport and thought no harm was done.

A few men of talent and vision arose to the emergency and devoted their lives to the work of bird protection and the education of public opinion. Outstanding among these men were T. Gilbert Pearson, Wm. Dutcher, Frank Chapman, and Edward Forbush. They were all distinguished scholars and powerful writers and speakers. Through their untiring efforts they gradually turned the tide of public opinion and won the day for bird protection. But we must appreciate the great and immediate need for effective argument and plausible evidence to win this fight for the birds. The vast sum of money involved in the millinery trade was a great obstacle.

These men were not trained entomologists (there were few such animals in their day) and their arguments, though

sincere and convincing, were not scientifically sound. But their interpretations, widely supported by other distinguished biologists, still carry the weight of authority and sway public and scientific opinion today. I think we may read, in an interesting incident that happened about 1850, the inception of a widely heralded idea that the birds constituted a roving police force assigned by nature to the task of suppressing insect outbreaks. I recall in the lectures of dear old Professor Bruner of the University of Nebraska (whose memory grows sacred with the passing years) how he painted the picture in glowing terms: "By day swallows and swifts course the air for insects; by night whip-poor-wills and nighthawks take up the chase. Chickadees, nuthatches and woodpeckers search the tree trunks and limbs for dormant insects and their eggs. Sparrows and doves remove noxious weed seeds from the ground." One can never forget the picture he painted of the mobile police force of the air. This general conception was one of the obvious certainties in the minds of the past and passing generation. May I quote from *The Birds of Minnesota?* "Whenever, from any cause, there is a great local increase in insects, as in locust and caterpillar years, birds from far and near hasten to the feast and thus play their part in reestablishing the normal balance."

But let us return to the interesting incident of 1850, recorded in Forbush, *Useful Birds and Their Protection.* "When the Mormons first settled in Utah their crops were almost utterly destroyed by myriads of crickets that came down from the mountains. . . . The first year's crop having been destroyed, the Mormons had sowed seed the second year. The crop promised well, but when again the crickets appeared, the people were in danger of starvation. 'Black crickets came down by millions and destroyed our grain crops; promising fields of wheat in the morning were by evening as smooth as a man's hand,—devoured by the crickets. . . . At this juncture sea Gulls came by hundreds and thousands, and before the crops were entirely destroyed these Gulls devoured the insects, so that our fields were entirely freed from them. . . . The settlers at Salt Lake regarded the advent of the birds as a heaven-sent miracle.'" A Gull Monument on the grounds of the great temple in Salt Lake City today commemorates this "Miracle." It is almost in as bad taste to shoot your neighbor as one of these Mormon gulls.

The suggestion of a police force having thus been offered, great numbers of similar observations, partly true but largely imaginary, slipped into the literature, until some fanciful writers had the birds wandering about like bands of gypsies seeking insect outbreaks. This is far from a correct impression. Gulls, as well as other water birds, often feed over large territories. They are gregarious, and their appearance at Salt Lake was nothing unusual. Certain other birds, especially blackbirds, are gregarious in migration and are often attracted to swarms of insects. This is most of the evidence favoring the "police" idea. The great majority of species of birds are not wanderers. They travel definite paths of migration, almost as if there were invisible highways in the air. When they reach their destination they settle in a very limited and definite territory where they remain until nesting is over and often until fall migration takes them back again over the "invisible highways" of the air.

Some of the first concrete, scientific evidence for this fact comes from the work of Prentice Baldwin, (1919) from whom I quote: "Cardinal No. 16,486, female, was conspicuous for the trap habit, coming to the trap for all her meals and being released several times a day, until I moved the trap 100 yards in order to be free from her." In other words, 300 feet passed the bounds of her "staked-out" claim. Birds lay claim to territories just as people do and largely

stay on their own ground. The most modern theory of bird songs, for example, is the defense of territorial rights—not to charm the female.

Quoting from Baldwin again, "At Thomasville, Ga., in 1916 I faithfully kept a record of the exact location where each bird was taken, each time, this by lettering the stations and recording the letter each time with the date a bird was taken.

"With the four stations A, B, C, and D 100 yards apart, in a line, making a total length of field of 300 yards, it is interesting to note in retaking Brown Thrashers 28 times, only two were retaken as far away as the next station. White-at station A. Towhees retaken ten times were never so far away as the next station. Blue Jays had wandered to the next station in two cases out of four. Wood-throated Sparrows never occurred except peckers had strayed to the next station in three cases out of six. In the case of the flocks of Myrtle Warblers and Chipping Sparrows, we might expect more wandering, yet only a third of those retaken were so far away as the next station (on a count of 150 cases). These figures show a surprising limit of foraging range: the Thrashers, Towhees and White-throats within a 100-yard radius; Blue Jays and Woodpeckers further, but within 200 yard." These are all winter records, collected when nesting duties were over and definite territorial assignments were less to be expected.

The return of nesting birds to their exact home location has been observed by many people, and are fully substantiated by banding records. But exact pathways of migration for individual birds comes as a surprise. Again I quote from Baldwin, "Among the migrants, the White-throated Sparrows make up the most interesting group, and I have long ago decided that this is a definite neighborhood group, coming here each winter since I first found them in 1915, always at station A, in the shrubs about the base of the house. I have not in any year failed to take one or more birds of this group, from previous years, and this year again an old friend appeared to tie up with the past:

"White-throated Saprrow No. 38,160
1916 Banded March 5, retaken March 6, 7, 16.
1917 Retaken March 7, 19.
1920 Retaken February 25, 27, March 2, 3, 6, 22.
1921 Retaken March 17, 23, 24, 27.

"This bird is now at least six years old, and has made five trips to New England or Canada to nest since being banded at Thomasville, Georgia.

"Brown Thrasher No. 19,247
1915 Banded February 27, retaken March 13.
1916 Retaken March 4, 11, 17.
1917 Retaken March 11, 12, 13.
1918-19 No trapping.
1920 Retaken February 16, 20, March 8, 11.
1921 Not taken.
1922 Retaken March 28, 31, April 1, 2, 3, 4, 8."

Here is the same passing migrant taken in the same row of traps for eight years. He was not a wandering gypsy hunting insect outbreaks.

We may revise our conception of the winged police force, but there still remains the firm conviction that resident birds suppress insect outbreaks. Let us examine the evidence. I quote from Bruner's "Birds of Nebraska", "The stomach of a single Bob-white contained 101 potato beetles; and that of another upwards of 500 Chinch bugs. A Yellow-billed Cuckoo shot at six in the morning contained 43 tent caterpillars. The stomach of a Robin contained 175 larvae of *Bibio,* a common fly."

The literature is full of similar accounts. The U. S. Biological Survey has compiled volumes of records of the stomach contents of birds, always featuring the big counts as the most conclusive evidence of the value of birds. For one of the choice

examples of this mistake, I turn to Forbush again. He reports collecting four chickadees in a Massachusetts orchard that was heavily infested with cankerworms, and examining their stomach contents with a view of demonstrating their destruction of these pests. The four chickadees had eaten a total of 105 female cankerworm moths. The average number of eggs in these moths as determined by dissection was 185. Thus the chickadees at one meal had removed 19,425 prospective defoliating caterpillars. What better evidence do you want? Everybody has been pleased with this, and yet it is not proof of the value of the chickadees in suppressing outbreaks of cankerworms.

Let us suppose a special case (you may not like this, but it is theoretically possible), that there were enough cankerworms starting in the orchard in the spring to completely defoliate it before any of the worms were fully fed. Then the population would starve and be automatically overthrown. Now the chickadees enter the picture. They gorge themselves with cankerworms and make a wonderful showing. They so reduce the population that there is just enough food to carry the survivors through to maturity. Then great quantities of eggs are laid by the surviving insects and a defoliation for next year insured. Yes! It is too theoretical, let us come to earth with our calculations. What per cent of survival must obtain among the defoliating swarm of caterpillars to insure a full duplication of the injury the following year? With 200 eggs per female, about one per cent will do it. What about the other 99 per cent? We may rather aptly compare it to a buffer-salt solution. We add acid, drop by drop, and nothing happens to the color indicator, until suddenly when the buffer is exhausted the color changes. In a similar way we may subtract per cent after per cent from our "buffer" population of 99 per cent with no prospect of relief from the outbreak the following year, until we hit the last one or two per cent of the whole population. Only then does the outbreak collapse.

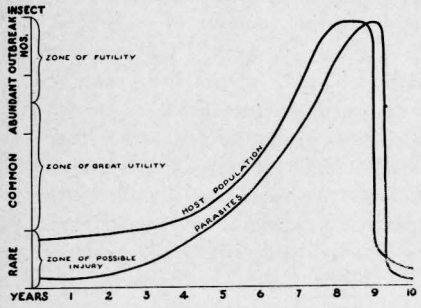
Birds are not the natural agency to reduce an enormous population of insects to such a level. The only agencies which can accomplish it are calamities of weather (from the insects' standpoint), complete failure of the food supply, epidemic disease, and insect predators and parasites. Other insects and disease germs are the only organisms which can multiply fast enough to overthrow an insect outbreak. Potential multiplication among insects is like a geometric progression: Grasshoppers: first year 2, second 100, third 5000, fourth 250,000; Variegated cutworm: four generations in one year, first 2, second 500, third 75,000, fourth 17,750,000. Do you think the birds could cope with that after it got under way in the third generation? The parasitic insects could. Wm. Cook while studying cutworms in Montana, raised 3,000 chalcids (parasitic Hymenoptera) from one cutworm. Most of these were females capable of parasitizing about 100 cutworms each. In addition, the eggs of the chalcids exhibit the phenomenon of polyembryony or the production of many embryos from a single egg. This sort of thing can reduce a cutworm population, but birds cannot do it.

Curiously enough birds may be definitely injurious by eating harmful insects. Tothill (1922), working in Canada on the fall web-worm, was one of the first to point out this possibility and to support it by critical scientific evidence. He studied an outbreak of web-worms, analyzed their inevitable downfall as their parasites overpowered them, and then saw the abundant red-eyed vireos annihilate the remaining population, parasites and all. A few years later an outbreak occurred some 200 miles distant. A favorable wind drifted moths over the cleared area, eggs were deposited, and another outbreak developed immediately because the parasites were not present to act as a check. One would seem justified in the

conclusion that the vireos were in part responsible for the second outbreak.

Balance, equilibrium, is what we want. When plants and animals have been in the process of mutual adjustment for geological ages, anything which interferes with the natural balance which has developed may be disastrous, and leave a long chain of adjustments to follow. In maintaining this equilibrium birds do a marvelous service. But when rendering this service, their stomachs are not full of specific, injurious insect pests, but rather moderately provided with a highly varied contents. It has been a difficult task to explain this to the public and even to the specialists, until recently.

GRAPH SHOWING THE RISE OF AN INSECT POPULATION, AND ITS OVERTHROW BY INSECT PARASITES



The verticle axis represents in a general way the number of insects present, and the horizontal axis, a series of years usually sufficient for great fluctuations in insect populations to occur.

In the zone of possible injury the birds theoretically may so reduce the already scant insect population as to exterminate the most important and specific parasites, thus clearing the way for a later outbreak, freed from the attack of parasites.

In the zone of great utility the birds are an important controlling factor in inhibiting the geometric progression which threatens to develop in the numbers of the insects then present.

In the zone of futility, no matter how many insects the birds eat they cannot overthrow the progression in numbers that has got under way. This last is the zone from which most of the spectacular records of insect destruction by birds has come.—*Dept. of Zoology, University of Minnesota, Minneapolis, Minnesota.*

Notes on a Winter Bird Feeding Station

By Milton D. Thompson

FOR our personal enjoyment, Mrs. Thompson and I maintained a feeding station outside our kitchen window during this past winter of 1941-42. The station was mounted on a pole, six feet from the house and on a level with the kitchen window sill. Our satisfaction in this station has been more than we have experienced in any other, for many birds were daily visitors. Some arrived before daylight, and they, or others, remained until it was nearly dark. Most of them became quite accustomed to our presence at the window and completely ignored us. Throughout the winter days Mrs. Thompson paused in her duties about the house to watch the activity at the feeding station. The following account includes excerpts from her notes.

Several kinds of food were used to attract the birds. Suet and tallow were used the most. The suet was first put through a meat grinder. In a coarse grinder it was diced with the tallow into quarter-inch cubes. These were served in suet baskets of hardware cloth which had three meshes to the inch.

Whole sunflower seeds were a favorite food with certain of the birds which were able to crack them. The large size of the seeds made them unsuitable for the English sparrows, and this helped prevent their over abundance. The seeds were served separately from a tray which was placed on the ground.

A special food-perch was made which could be easily attached to the station. It had many holes drilled in it and was thickly spread with peanut butter. Since the English sparrows relished the peanut butter this food-perch was not used regularly, as we wished to discourage too large a following of sparrows.

Cakes made by mixing melted suet, bird seed, and salt were hung from the station. These cakes became too hard for the birds during cold weather but attracted more partakers in mild weather. During the mild weather they were the favorite food of the red-breasted nuthatches.

The close proximity of the feeding birds made possible our observance of many details and idiosyncrasies exhibited by the various species. Each kind had its own set of habits in feeding. To many birds the sunflower seeds presented a definite problem. The smooth surface, large size, and tapering contour of each seed made it difficult to open. This problem was solved by each species in its own way.

At first we gained the impression that the chickadees and nuthatches threw the seeds from the tray. Closer observation, however, revealed that such an action was purely accidental. When a seed was insecurely held, it literally popped from the bird's bill. The apparent throwing motion was an attempt on the part of the bird to retrieve a slipping seed.

Different species held the seeds differently and employed individual methods of opening them. Five distinct positions in which the birds held the sunflower seeds were observed, as follows: 1. The seed was held entirely by the large end with the small end pointing straight ahead, (This method was used most by the white-breasted nuthatches which placed the seeds in cracks of the bark and opened them from the large end); 2. The chickadees held the seed sideways and pecked them open from the side; 3. The red-breasted nuthatches held the seeds in such a manner that they were able to open them at the small end; 4. A cardinal

always took a seed completely in its bill to crack it, (Usually the shell broke into three parts which were ejected from the mouth while the kernel was retained. If the cardinal chanced to drop the kernel, the English sparrows were apt to seize it before the cardinal could retrieve it); 5. The blue jays carried several seeds at a time from the tray to a tree where they dropped them on a large branch, and by holding them between their toes, pecked them open one at a time. The blue jays were able to carry a number of seeds in their mouths at one time. Of seven observations made, when counting was possible, the following numbers were noted; four trips with five seeds each, one trip with seven seeds, one with ten, and one with seventeen. English sparrows did not attempt to open the whole seeds.

From December 8, until February 26, the following birds were seen regularly at the station; robin (1), brown creeper (4), cardinal (7), flicker (1), white-breasted nuthatch (many), red-breasted nuthatch (2), chickadees (many), downy woodpecker (2), hairy woodpecker (1), blue jay (many), and a flock of 27 Bohemian waxwings which appeared on February 21, and remained in the vicinity for a week.—*Minneapolis Library Museum, Minneapolis, Minnesota.*

The annual meeting of the Minnesota Ornithologists' Union is being planned for Saturday and Sunday, May 16-17. The field trips on Saturday morning will center at the North Minneapolis Izaak Walton League cabin on the Mississippi River north of Minneapolis. This is located on Highway 169, the west river road, 7 miles southeast of Champlin and 6 miles north of Camden Station, Minneapolis. A placard will mark the grounds situated on the east side of the road. Local Union members will be on hand from 8 a.m. on to guide parties to suitable birding territories for the morning hikes. Lunch will be served on the Izaak Walton cabin grounds at noon and the afternoon session will be held in the cabin. The evening session of bird movies will be held in the auditorium of the Minnesota Museum of Natural History on the Minneapolis campus of the University of Minnesota.

A morning auto trip through the marsh and lake area about Centerville, north of St. Paul, is planned for those who can remain over until Sunday morning.

Members are urged to prepare papers for the afternoon session; and those planning to do so are asked to submit titles with brief descriptions of the papers, the type of projection equipment needed, and the time required for presentation to Dr. W. J. Breckenridge, Minnesota Museum of Natural History, University of Minnsota, Minneapolis, in order that the program can be properly arranged.

The presidents of the member groups are urged, if possible, to let the Union president, Milton Thompson, Public Library Museum, Minneapolis, know a few days in advance of the meeting approximately how many from their organizations plan to attend this meeting.

Winter Bird Census, 1941

By Charles B. Reif

IN KEEPING with the practice of past years, members from the various clubs in the Minnesota Ornithologists' Union went afield at Christmas time to make the winter bird census. When the Minnesota Bird Club was very young, its members always went south along the Mississippi River to Frontenac or Lanesboro. Occasionally some of them went to Duluth instead, lured there by reports of glaucous gulls, surf scoters, or old squaw ducks. The winter bird censuses as reported in early numbers of *The Flicker* were made almost entirely by this small but indefatigable band of ornithologists. A remnant of that group went to Frontenac again this December. Their findings, however, form but a portion of the report for the whole state. Equally enthusiastic groups of bird-seeking people from Minneapolis, St. Cloud, and Duluth conducted censuses in their respective regions. Each year the winter bird life in various parts of the state is being investigated more thoroughly. If the Minnesota Ornithologists' Union maintains the pace at which it has grown, soon there will be observers in all parts of the state. Then the winter bird census will be complete.

To native Minnesotans this winter has been a rather embarrassing one. The "snow-covered land of the north" has successfully vied with such sunny climes as Miami and Amarillo. Temperatures well above freezing with practically no precipitation have made this a very unusual winter. Not least among the winter activities affected by the mild weather has been winter-birding. The weather previous to the Christmas census was cold enough but not too cold. It is probable that the summer residents found sufficient reason for leaving our state on schedule, but the northern birds found equally good reason to stay where they were. Thus neither group of birds was especially well represented at Christmas.

The great range throughout the state of the observers taking part in the census somewhat obviated the meteorological difficulties. In all, 61 species of birds were seen. The records of these species have been arranged systematically into five regional columns as follows: the southern region including Hastings, Frontenac and St. Charles, listed under Frontenac; the general Twin Cities region listed under Minneapolis; the St. Cloud region including the Teachers College Islands; the Duluth region; and the Lake of the Woods and Red Lake region listed under Baudette. The total number of individuals of a species seen by all the observers in a region is given in the appropriate column. These figures do not include certain outstanding reports such as the tremendous flocks of red-winged, rusty, and Brewer's blackbirds seen near Savage by the Swedenborgs, the many reports of Bohemian waxwings that have come to the Museum of Natural History, or numerous other records that were not within the specified time limits. It is probable that the number of English sparrows reported for the Minneapolis area is an approximation.

Forty observers participated in the taking of the census. The most southern report was from St. Charles by Carol Webb. On December 30, Arnold Erickson, Nathan Mahon, Oscar Owre, Jr., Horace Paul, and James Struthers worked areas at Frontenac and Hastings. The Audubon Society sent two groups birding on December 22. Mrs. J. A. Thompson

and Mrs. R. H. Wells covered the wooded areas about Lake Harriet and Minnehaha Creek, while Miss Lulu May Aler, Mrs. E. S. Jensen, Mrs. I. A. Lupient and Mrs. C. R. Nelson worked the area from Glenwood Park to Lake of the Isles. The Minneapolis Bird Club took its traditional census along the Mississippi River near Fridley on December 27. Those cooperating were John S. D. Clark, Mrs. I. B. Gilbert, Paul Haglin, Preston Haglin, Byron Harrell, Severena Holmberg, Ruth Hopkins, Ruth Linder, William Longley, Florence Nelson, Milton Thompson and Helen Towle. On December 26, A. C. Rosenwinkel hiked from the St. Paul Indian Mounds to Pigs Eye Swamp and found several interesting birds. Byron Harrell, Brother Hubert Lewis, and William Longley took a census on December 28, from Fort Snelling to Cretin High School. On December 23, Harrell and Longley hiked from St. Paul to Inver Grove, Pine Bend and return.

Despite a disheartening scarcity of birds Professor George W. Friedrich, Nestor Hiemenz, Louis M. Moos, Richard Voth and Stanley Voth spent two days afield, December 26-27, working the islands and the banks of the Mississippi River south of St. Cloud. Kenneth Carlander made a trip to Washkish and Baudette during Christmas week. The date given for most of his records is December 28, 1941. The inclusion of Carlander's data extends the range of the census to the Canadian border.

A most amazing number of trips was made by members of the Duluth Bird Club. Hulda Adams, Mabel Adams, Alma Chesley, and Dr. Olga Lakela were out on six different days. On December 21, they visited Lester Park, Stony Point Lookout, Two Harbors Tourist Park, and Encampment River. On December 22, they worked the campus of the Duluth Teachers College. December 23, found them at Fond du Lac, and December 24, at Minnesota Point. On Christmas Day they hiked around Hunter's Park and Chester Park. The final records are from the College Campus on December 26. The Lakeview Branch of the Duluth Bird Club was represented by Richard Bateman, who on December 26, spent eight hours in the rain along Lester River and its adjacent fields.

	Frontenac	Mpls.	St. Cloud	Duluth	Baudette
Pied-billed Grebe		1			
Black-crowned Night Heron		1			
Mallard	3	110			
Green-winged Teal		2			
Shoveler		3			
Canvasback		4			
Lesser Scaup		3			
American Golden-eye	72	43	3	118	4
Hooded Merganser	1				
American Merganser	150		6		
Goshawk					1
Cooper's Hawk		1			
Red-tailed Hawk		1			
Red-shouldered Hawk		1			
American Rough-legged Hawk		2	2		
Bald Eagle	5				

	Frontenac	Mpls.	St. Cloud	Duluth	Baudette
Canada Spruce Grouse					1
Ruffed Grouse				1	abundant
Sharp-tailed Grouse					abundant
Pheasant	6	159	2		
Coot		2			
Wilson's Snipe		1			
Glaucous Gull				6	
Herring Gull		6		111	
Ring-billed Gull		1			
Snowy Owl		1		1	1
Barred Owl		4			
Belted Kingfisher		4			
Pileated Woodpecker	1	2		4	
Red-bellied Woodpecker	3	3			
Red-headed Woodpecker	3	3			
Hairy Woodpecker	5	37		6	
Downy Woodpecker	7	54	2	19	
Arctic 3-toed Woodpecker				1	1
Blue Jay	19	146	1	15	
Crow	3	10			
Black-capped Chickadee	70	177	6	79	common
White-breasted Nuthatch	29	54	4		common
Red-breasted Nuthatch		2		6	
Brown Creeper		27			
Robin		1			
Golden-crowned Kinglet		10		1	
Bohemian Waxwing		1	150	13	
Northern Shrike			2		1
Starling	53	296	1	39	
English Sparrow		1563	12	17	abundant
Red-winged Blackbird		22			
Rusty Blackbird		2			
Brewer's Blackbird	2				
Bronzed Grackle					1
Cardinal	10	40	5		
Evening Grosbeak	5			113	
Purple Finch		2			
Pine Grosbeak	2			39	
Redpoll	2	4	25	50	common
Pine Siskin					6
Goldfinch	50	75			
Slate-colored Junco		85	3		6
Tree Sparrow	30	119	6		
Snow Bunting					common

Minnesota Museum of Natural History, Minneapolis.

NOTES OF INTEREST

A NOTE ON THE MARBLED GODWIT IN NORTHWESTERN MINNESOTA.—While investigating the status of the prairie chicken in northwestern Minnesota during the spring and summer of 1941, I had an opportunity to make some interesting observations on the marbled godwit. This species first came to my attention in Norman County on April 19. During following weeks, godwits were frequently seen on unplowed prairie areas throughout the Red River Valley. They were nowhere abundant but almost every piece of grassland contained one or more of these conspicuous birds. The marbled godwit apparently prefers a grassland habitat with numerous shallow water areas, for few were seen in other types.

On the morning of May 5, at 7:15 a.m. copulation of the marbled godwit was witnessed. Particularly impressive was the fact that the female remained standing and contact lasted much longer than in such birds as the prairie chicken or ring-necked pheasant. So far as was discerned, no display either preceded or followed the act.

A nest containing three eggs was found in a blue-grass meadow on May 11. The nest was so well concealed that one could stand within inches of the location without seeing it or the incubating birds. Another examination on May 20, revealed that the nest had been destroyed by ground squirrels. At that time, down was just beginning to appear on the embryos. Meadows were traversed rather intensively during the early summer as a part of the prairie chicken investigation, and it was surprising that more godwit nests were not located. Often while walking through the meadows, I was vociferously assailed by a godwit and found myself the object of its displeasure. Its strident calls immediately attracted assistance from adjacent meadows, and within a very short time as many as ten or fifteen godwits were soaring above my head protesting my intrusion on their domain. On June 13, an immature godwit was seen in the company of two adults. The chick was easy to run down, for it crouched under the first available clump of vegetation. It was about one-third grown and its flight feathers were just beginning to develop. Several days later another immature godwit was seen. This one was almost fullgrown and capable of lengthy flight.

It was interesting to read in Dr. Roberts' *The Birds of Minnesota* that on a ten day trip taken in July, 1930, through the Red River Valley, he failed to see a single godwit. To account for the absence of the species he suggested that either godwits were absent from Minnesota that year or that both adults and young had moved to other feeding grounds. The following observation may explain why none was seen by Dr. Roberts in July, 1930. On June 22, I encountered a flock of 23 godwits on the edge of a temporary pond. Numerous angleworms, which had come to the surface after a recent rain, suggested the possible food choice at that time. A flock of 23 godwits was a rare sight, for on all previous occasions they occurred in twos or threes at best save when they were challenging an invader en masse. After June 22, I saw no more godwits in this region. It is my belief that as soon as the young are well-grown, this species flocks up and leaves the prairie for a different habitat, probably the larger water areas. *C. Edward Carlson, Division of Game and Fish, St. Paul, Minnesota.*

BIRD STUDY ON THE TUNDRA, SUMMER 1941.— Since P. A. Taverner, G. M. Sutton and others began an investigation of the birds of Churchill, Manitoba in 1930, this terminus of the Hudson Bay Railroad on the borderline between the Arctic and Hudsonian life zones has become somewhat of a mecca for ornithologists. Hardly a year has passed since 1930 when at least one party of ornithologists has not made a trip to Churchill.

Directly after our college year came to a close, we set out for Churchill to study and photograph birds. We arrived there on June 22, too late to observe birds that pass through Churchill in the spring migration to more northern nesting grounds, but nesting of summer residents was just well under way. Permanent camp was made at a little frame shack on Lake Rosabelle about two miles southeast of town. With the exception of occasional trips to the timbered regions south of camp and one three-day trip down the coast of Hudson Bay to the east, the area observed was the tundra within a radius of about two miles from camp, the harbor area, and the townsite slough. A search for nests was begun at once around the numerous tundra ponds and lakes. This resulted in such finds as the nests of the pintail, greater scaup, old-squaw, American eider, willow ptarmigan, Hudsonian curlew, and arctic terns. The latter nested in small colonies on islets in some of the lakes.

The shyness of the eider duck thwarted all attempts at photography, but the terns were easy subjects, although they defended their territories adeptly by "dive bombing" any intruders, including photographers and bird banders. They were often observed in hot pursuit of parasitic jaegers as well as an occasional herring gull. Due to the fact that most tundra ponds freeze to the bottom in winter, it has been believed that they contain no fish, and that thus the terns do all their fishing in Hudson Bay and the nearby Churchill river. However, we saw small "minnows" in one very shallow pond and in the small creek near the reservoir. Both places were frequently fished by the terns.

Young northern horned larks followed their parents around to beg for food just outside our door, while not far away were second brood nests of the same birds. Savannah sparrows, tree sparrows, Lapland longspurs and Smith's longspurs also nested nearby. The townsite and slough area were covered with nests. Among the ones noted at the slough were those of the semi-palmated plover, spotted sandpiper, least sandpiper, arctic tern, and yellow warbler. At various places around the townsite itself were nests of the killdeer, horned lark, robin, common redpoll, savannah sparrow, Harris' sparrow, and white-crowned sparrow. Robins had difficulty in finding acceptable nesting sites. One pair built a nest on the hot box of one of the freight cars during a weekend layover of the train.

As no nests of the American rough-legged hawk could be found close to Churchill, we set out, on July 12, for a trip eastward along the coast of Hudson Bay to look for some. After a ten-mile hike over marsh, beach and tide flat, we reached a wooden tower that was built on high rocks as a landmark for ships in the bay. Our hopes were fulfilled as we approached and saw a pair of rough-legs hovering over their stick nest on the platform of this forty-foot tower. The nest contained four downy young. On the following day we found a second nest containing three newly hatched young on a rock ledge across a small bay from the first nest. As we continued eastward along the shore, we came to a peninsula where the nests of pintails, old-squaws, and arctic terns were so numerous that we had to take care not to step on them. Soon after this bad weather forced us to return to our permanent camp.

We spent the last week of our stay at Churchill walking over the tundra each day, banding young birds, especially shore birds, that had left the nest. Soon these little fellows gained good use of their wings. It was thus that, a month after our

arrival at Churchill, we regretfully realized that the breeding season was coming to a close, and the time for our departure had arrived.

Following is a list of the birrds seen during our stay on the tundra. An asterisk indicates that nests or evidences of nesting in the form of young birds were found. Common loon, arctic loon, pied-billed grebe, Canada goose, baldpate, *pintail, *greater scaup, lesser scaup, *old-squaw, *American eider, white-winged Scoter, *American rough-legged hawk, marsh hawk, pigeon hawk, *willow ptarmigan, *semi-palmated plover, *killdeer, turnstone, *Hudsonian curlew, *spotted sandpiper, *lesser yellow-legs, *least sandpiper, dowitcher, stilt sandpiped, *semi-palmated sandpiper, *red-backed sandpiper, *northern phalarope, parasitic jaeger, *herring gull, Bonaparte's gull, *arctic tern, short-eared owl, flicker, *horned lark, tree swallow, Canada jay, *eastern robin, American pipit, Tennessee warbler, *yellow warbler, black-poll warbler, rusty blackbird, hoary redpoll, *common redpoll, *savannah sparrow, *tree sparrow, *Harris' sparrow, *white-crowned sparrow, *Lapland longspur, *Smith's longspur, and snow bunting. *Oscar Hawksley, Principia College and James A. Struthers, University of Minnesota.*

WINTER BIRDS AT DULUTH.—This winter (1941-42) the weather has been quite unseasonable in Duluth. Except for a few days in each of the months of December, January, and February, the temperature has been well above zero. On January 22, the thermometer registered 56°F., setting an all time high for this date. Temperatures in the thirties have been common. With this mild weather we have had very little snow, and much of the time the ground has been bare. There has been shifting ice in Lake Superior, but so far we have been able to see open water at Lester Park except for a few days around February 22.

In spite of the mild weather my records show the winter bird population to be quite normal, perhaps because of a lack of berries for food. Evening and pine grosbeaks and Bohemian waxwings have been with us all winter, and chickadees are more numerous than usual. The main robin migration was over by mid-October, and I saw no more of them until December 3, when I observed two. They were seen at intervals until January 2, but were not reported again until February 20. Richard Bateman saw a brown creeper at Lester Park on December 19, and I saw one in the same locality on January 15. On February 22, Susan Lovald and I were at Lester Park where we saw two chickadees which seemed browner than the black-capped chickadees with which they were associated. We also heard a different song. These chickadees were flitting among the spruces and cedars so much that we could not be sure of their identity, but we thought they were Hudsonian chickadees. This identification was later verified.

On February 27, Mrs. Thomas and I saw a flock of at least 100 old squaw ducks in Lake Superior. After watching for them for four years, it was a real thrill to find them. Their actions are quite different from those of the American golden-eye which is commonly seen here in the winter. They swam in a compact V formation or in a long compact drift. As if at a given signal every duck would dive, stay under the water what seemed to be a very long time, and then all come to the surface in the same formation that they were in when they dived. They gabbled a great deal while on the surface. These old squaw ducks were seen on February 27 and 28 by Mrs. Thomas, Dr. Lakela, S. Lovald, and myself. *Mrs. W. C. Olin, Duluth, Minnesota.*

Editor's note: In a letter dated November 26, 1941 Dr. W. P. Abbott of Grand Marais informed Dr. T. S. Roberts that he had observed a large flock of old squaw ducks near Grand Marais on October 27, and that in former years he had never seen them earlier than December or January.

WINTER RECORDS OF BIRDS, 1941-42.— Birds which are very unusual in winter and those known as half hardy were more common last winter than for several seasons past even though the cold weather began very early with snow falling on October 31. The months of November and December seemed to be more pleasant than they normally are. Near the end of November, however, rather cold weather set in for a few days, and this no doubt caused the migration of many birds that might well have stayed on into December at least. January, beginning with a sub-zero period, was disappointing to bird students even though the month was exceptionally warm and dry. The only snowfall occurred on New Year's Day. Few species of birds, except the normal winter residents, remained after the season's initial cold wave.

Following is an annotated list of the more surprising and unusual of our winter records. Some of the birds included here have not been reported in winter heretofore. Three November records are included in this list although they may not technically be classed as winter records.

Pied-billed grebe.—One was observed frequently in company with resident mallards at Fort Snelling until January 1. In 1940 a bird of this species remained until December 29.

Green-winged teal.—A pair was seen on December 28 with the Fort Snelling mallards. They may have been there earlier, for a small duck was noticed more than a week before but was not identified.

Shoveler.—A male shoveler was present throughout the winter at Fort Snelling. A bird of this species also remained during the winter of 1940-41.

Canvasback.—Two canvasbacks were seen below the Fridley dam on the Mississippi River when the Minneapolis Bird Club conducted its 1941 census of winter birds on December 27. Another was observed at the Izaak Walton fish pond near Fort Snelling on the following day. Although the duck allowed us to approach closely he did not appear to be injured and was well able to fly when we threatened him with missiles.

Lesser scaup.—Two males and a female were observed on the Mississippi River below the Fridley dam on the Minneapolis Bird Club census trip of December 27.

Red-shouldered hawk.—An especially tame red-shoulder passed the early part of the winter along the Mississippi River near the Fort Snelling Bridge. Later it was found a few miles up the Minnesota River.

Duck hawk.—On December 13 an immature duck hawk, apparently migrating southward, flew over us as we stood on the banks of the Mississippi River east of Fort Snelling.

Sparrow hawk.—A pair of these small falcons has been seen regularly in the vicinity of the State Capitol, and one was found in December in Highland Park, St. Paul. Sparrow hawks, like duck hawks, are becoming more common about large buildings in the cities.

Coot.—One wintered at the Fort Snelling Duck Pond this winter and last winter. It was probably the same bird.

Killdeer.—As late as November 15 a flock of 15 killdeers was still at the Izaak Walton ponds, and one, probably a member of this same flock, was last seen there on November 29.

Lesser yellowlegs.—A bird of this species was seen on November 11 and 15 at the Izaak Walton ponds.

Glaucous gull.—A strange, large gull, first seen on November 21 from the Fort Snelling Bridge, was identified as this species when seen again on the 29th. The bird flew very low over the bridge and all field characterictics were noted for a doubt-free

identification. Another glaucous gull was seen on March 14, near Gray Cloud Island, Washington County, by Brother Hubert Lewis and Byron Harrell.

Brown thrasher.—A brown thrasher was seen in Highland Park, St. Paul, in November and was last seen in the Park on December 6.

Nashville warbler.—The regular migration of the Nashville warbler ended on October 4, but on November 20 one was seen accompanying a troup of chickadees, white-breasted nuthatches, and brown creepers through a wooded ravine in Highland Park, St. Paul. Three days later snow covered the ground and the warbler was found moving sluggishly about a small stream in the same ravine feeding among the overhanging roots and grasses. It was there again on the 26th and was last seen on the 29th. The day was warm and the little bird flitted about in true warbler fashion, catching small insects on the wing.

Red-winged blackbird.—Flocks of red-wings were distributed far and wide over the state throughout December. Some 300 were seen on the 6th but only small groups were encountered in January.

Other interesting birds observed this winter were mourning doves, Wilson's snipes, a robin, a bluebird, purple finches, and gold finches. *Wm. H. Longley and Byron Harrell, St. Paul, Minnesota.*

HERRING GULL ROOKERY.—On July 10, 1941, a perfect sunny day, Dr. Lakela, Catherine Vavra, Catherine Lieske, and I set forth by boat at 5 p.m. to investigate Knife Island in Lake Superior, just a quarter of a mile from the mouth of Knife River. It is a small island about one-fourth mile long and two hundred feet wide. The gulls took to the air with loud protests as we approached. The north side of the island, on which we landed, seemed to have no nests; therefore we crossed through a thicket of brush to the south side. The first young was spied in a nest amidst the brush. Most of the nests were made of grass with some feathers and were built in convenient hollows among the rocks. The total nests found occupied were 33, empty 40. We counted 33 eggs, 30 young in the downy plumage, and six in the juvenal plumage. Four eggs were hatching. One was far enough along so that with a little help on my part the chick began to emerge while C. Vavra took movies of his struggle to arrive. To keep him warm until his down dried out, I put one of his brothers beside him. Many of the young had left their nests, crowding their heads into rock crannies with the instinctive feeling that now they were hidden. The protective coloring of the juvenal plumage certainly made the birds look like their rock background. The dead numbered seven. Many gulls were out on the lake. We estimated three to four hundred. Among them were about 70 in the gray juvenal plumage. The smallest of these, we thought, were probably early-hatched young of the year. *Evelyn Jones, Duluth, Minnesota.*

OBSERVATIONS FROM CLOQUET— Word from Miss Mollie Korgen indicates that the Cloquet Bird Club has had an interesting winter. The largest bird list is that of Mr. A. B. Madden, made during the second week of February. He saw the following: Bohemian waxwing (12), evening grosbeak (3), golden-eye duck (50), pine grosbeak (50). Another list of 76 species was reported by Mr. and Mrs. A. B. Madden and Norman Nelson who drove from Duluth to Miami, Florida, during Christmas vacation. Many of the birds were not seen in Minnesota but to see certain of them would delight the heart of any ornithologist no matter where he observed them. A few of the more outstanding birds seen were the mocking bird, brown pelican, white pelican, Mississippi kite, water turkey, wood ibis, roseate spoonbill, glossy ibis,

man o' war bird, Audubon's caracara (in captivity), snowy egret, American egret, black vulture, fish crow, and barn owl.

Other members of the Cloquet Club who contributed lists were Marvin Gleason, Roger Peterson and Fern Zimmerman. *Edited by Chas. B. Reif, Museum of Natural History, Minneapolis.*

UNUSUAL ADDITIONS TO THE UNIVERSITY MUSEUM COLLECTION.— A number of noteworthy Minnesota bird specimens have been received in the last few months at the Minnesota Museum of Natural History on the University campus. Two additional specimens of the greater scaup have been received from Minnesota as well as one from Saskatchewan. It is an interesting coincidence that the two Minnesota records were secured on the same day, November 9, 1941. Mr. F. L. Ward took a greater scaup on Ten Mile Lake in Ottertail County, while Messrs. Steen and Elkins of the Fish and Wildlife Service teamed up in shooting the other on Sucker Bay in Leech Lake. They reported that a pair swung in toward their decoys but only the male came within range. They recognized the birds as differing from the lesser scaups even while on the wing. Six other Minnesota specimens of this species are in the collection of the museum, four of these having been taken since the first edition of Dr. Roberts' *Birds of Minnesota* which appeared in 1932, and two in 1937 after the second edition was published.

A newcomer in the state since Dr. Roberts' book appeared is the varied thrush. Dr. Lakela's article in the May, 1941, *Flicker* describes the appearance of a single male at the feeding station of Mrs. W. S. Telford in Duluth during February, 1941. Dr. Wm. P. Abbott on November 26, 1941, collected a bird that was entirely strange to him at his cabin near Grand Marais and rushed it to the museum where it arrived in time to be preserved. This proved to be an adult female varied thrush. These records indicate that rarely a few of these western robin-like thrushes do stray across the mountains and the prairies to visit northern Minnesota.

Another specimen received from Dr. Abbott taken near Grand Marais was a Hudsonian curlew shot from a flock of three on April 24, 1941. The new museum group depicting the waterbirds on Sand Point in Lake Pepin was in preparation at the time and this specimen was carefully prepared and is now one of the striking points of interest in that group.

Considerable publicity was given last fall to an albino ruffed grouse that a Conservation Officer shot during the open season near Grand Marais. This specimen was sent to the museum, but has been mounted and returned to the Minnesota Conservation Department. It was one of those odd-appearing partial albinos in which the normal colors and patterns are only suggested in faint tones on an otherwise white background color. Such specimens are apt to occur in any species, although they only rarely are observed or collected. The museum collection contains another ruffed grouse, almost a duplicate of this specimen, taken near Hinckley in 1932. Besides this specimen collection contains a screech owl, a killdeer, and a green-winged teal also showing this same faded, partially albinistic condition of the plumage. *W. J. Breckenridge, Minnesota Museum of Natural History, University of Minnesota.*

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CONTENTS

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Observations on a Captive Great Horned Owl

By Paul C. Lemon

On May 2, 1942, while on a field trip near Redwood Falls, Minnesota, I came upon a nestling owl in the forest along the Bluffs of the Minnesota River Valley. The bird seemed to be alone, huddled in a "form" near a small log; even when I searched later, about dusk, I was unable to find either the nest or any other members of the family. It had not been there long since only two droppings were nearby. The fact that plant materials were later found in its first pellets suggests that the bird may have been partially starved.

When the bird was taken it still had the downy covering of infancy. The pin feathers on the wings were just coming in but had not opened. It is probable that the owl was about three or four weeks old at this time. When the juvenal and adult plumage began to come in it was possible to identify the owl as *Bubo virginianus virginianus* (Gmelin).

DISPOSITION. The little owl was easy to handle from the moment it came into my possession. It seemed to be adaptable enough to be moved about considerably and to be fed various foods at irregular times. As it became older it developed a certain amount of temper and it would "fuss" and complain at certain inconveniences and disturbances. Yet it showed some ability to become used to new ways and later ceased to be disturbed by these inconveniences. At all times it was quick to recover from anger and readily became good-natured again.

As soon as the young owl began to move about voluntarily, it showed definite desires to be in the same room with a person rather than alone in another room. At the age of two months we exercised the owlet out-of-doors with a cord attached to one leg. We urged the bird to leave one of us and fly to another person's extended arm. This was done over and over and may have indicated an attraction to human beings. At the age of three months the owl, when it was allowed to move about freely in a room, would often perch on the shoulder or lap of a seated person. For that matter, the owl might move through two or three rooms to enjoy this privilege.

The sounds made by this owl were suggestive of its disposition and desires. Practically every noise uttered could be interpreted as to its meaning. Up to the age of about five months

every vocal sound was some modification of a sort of whistling chirp. The intensity and spacing of these sounds were varied according to the humor of the bird. When disturbed the bird made a rapid staccato chirping which increased to a scolding raucous sound if the disturbance continued. During a time when the owl was seemingly greatly interested in some task, such as catching its first rabbit, it made a very faint noise consisting of two or three chirps, produced without noticeably opening its beak. This sound was also made at different times when the bird was apparently asleep. When the bird was very hungry it made loud, hoarse, prolonged chirps, which came singly with long intervals between. Mild irritation sometimes caused the bird to hiss, much as an angry cat will do. In fact many aspects if its appearance and action suggested those of a house cat. In addition to these sounds, the bird clacked its beak vigorously in case of extreme irritation or fright. The bird had not yet hooted at the age of five months.

FOOD AND FEEDING HABITS. The owl was fed raw meat, egg shells, and live animals for the most part, but a large variety of unusual foods were ingested when offered to it. When it was necessary to buy food for the owl, we fed it beef kidney or pork liver rolled in pulverized egg shells. These market foods were fed cold directly from the refrigerator. A record was made of the food taken by the owl over a three months period, from the time it was captured. An average of approximately five ounces (moist weight) of food was eaten per day. This tended to be irregular since the owl would eat a large meal one day and perhaps a small one the day following, although an excess of food was offered to it. When satiated the bird usually backed away from the food with apparent disdain, or rarely hid it.

When I first fed the bird, it was necessary to give it morsels small enough to be swallowed whole. These had to be handed to it until it was about six weeks old when it began to pick up food from the floor. Two more weeks elapsed before the bird began to tear meat into pieces small enough to be swallowed. For convenience the feeding times were morning and evening at about a twelve-hour interval, although irregularities or even omissions of meals were not serious. The owl showed a preference for meats that were firm and could be torn into coherent bits and eaten, as against soft meats such as hamburger or beef brain. Several vegetable materials were eaten although they were not especially relished: bread and butter, cooked cereal, lettuce, tomatoes, and lima beans (lima beans were quite palatable).

The experiments in which live foods were offered to the owl were most interesting. The variety of animals used included insects, amphibians, reptiles, and mammals. These were turned loose within the confines of a room, sometimes dark or dimly lighted. The first trial, when the owl was about two months old, involved putting a house mouse and the owl together in a large box 21 inches square. The owl watched it for over an hour before attempting to catch it. Once a mouse or any other live food was in the owl's grasp it never regained its freedom. The second mouse, taken nine days later, was caught and eaten within two minutes. Gradually the owl became more proficient. The method usually employed did not include violent and continuous chase; instead the owl rapidly took up a position close to the prey and then, after a pause, it struck quickly with beak or talons. Occasionally when the captor approached prey, it ruffled its feathers and partially spread its wings like an angry mother hen. It is popularly believed that those predators which swallow their food whole always

ingest it head first. Although our owl swallowed the majority of animals head first, it did not always do so. The owl was able to catch and eat grasshoppers, tearing them apart during ingestion. It also caught beetles and moths that chanced to come into its outdoor cage.

Live tadpoles, with a total body length averaging two and one-fourth inches, were offered to the hungry owl in a pan containing about one inch of water. The bird seemed to take them under protest the first time, but the following day a total of 28 were caught in the beak and readily eaten. Adult frogs were caught and eaten with avidity. Toads were found to be almost totally unfit for owl food. Toad skins excrete an acrid and highly distasteful substance (verified by the author). The owl was allowed to become quite hungry and was then offered a toad. Repeated attempts by the owl to grasp the toad led to profuse watering at the mouth, violent shaking of the head, and gaping of the beak. I then gave the owl a skinned toad carcass which it systematically tore to bits, refusing every fragment, even the eggs. During this process the owl reacted as before to the extremely bitter taste. Finally two front legs were ingested, soon to be regurgitated. The following day another skinned carcass was prepared with great care and profuse washing. Evidences of extreme distaste were repeated, but the hungry bird finally ate the hind legs and probably digested them. The conclusion that an owl never eats a toad in nature seems warranted. This was the only kind of meat offered to the owl that it would not readily eat.

A live bull snake and garter snake were fed to the owl. With its talons the bird clasped loops of the snake and with its beak it crushed the bones in the head and body. It facilitated the eating by tearing the snake's body into sections. One part was swallowed tail last, still writhing. Another time the anterior end of the snake was swallowed with the head disappearing last. The owl enjoyed a rattlesnake carcass fed to it even though the toughness of the hide and boniness made eating difficult. A large bull snake, three feet eight inches long, frightened the owl and thereby escaped being attacked. A five inch chameleon and a two inch horned toad provided other meals.

Skinned carcasses of domestic chickens and red-winged blackbirds were readily eaten although no live birds were offered. The owl showed some tendency to attack a sparrow hawk that I was keeping at the same time. On the other hand, the owl was afraid of a western horned owl that I also had in captivity, but he showed much curiosity.

Some of the mammals taken by the owl have already been mentioned. White-footed mice (*Peromyscus*) were caught and eaten readily, sometimes in sections and at other times swallowed whole. In addition it ate the skinned carcass of a pocket gopher. A cottontail rabbit eight inches long was offered to the owl before the latter was three months old. The owl was hesitant, but finally it caught the rabbit by the ears and killed it while standing on its back. Then it pulled the rabbit's ears off and ate them. Much hair was ingested; for instance, the hair and skin of the tail were stripped off and eaten. As shown by pellet studies which I conducted later, many of the rabbit's bones were broken although the skull was almost intact, and one femur and a scapula were found whole in a pellet.

GROWTH. When the bird was captured on May 2, at the age of three or four weeks, it weighed one and three-quarters pounds. Two and one-half months later, July 18, it weighed three pounds, having gained an average of

about one-fourth ounce per day. Gain in weight during the early weeks of captivity was much more rapid than one-fourth ounce per day as evidenced by the fact that in two weeks following capture it gained ten ounces. The approximate mature size was attained at about three and one-half months of age, although the owl was not in full adult plumage.

Feather development was rapid, and changes in aspect took place quickly. At about the age of four weeks, the plumage changed from the downy stage to the juvenal plumage. The latter persisted from three weeks to a month, after which time part of the mature feathers began to come in. The stage of advancement of the feathers was different on various parts of the body. The order of development was as follows, passing from earliest to latest: face, wings, tail, breast, legs, and the head. For instance, at the age of two and one-half months the wing spread was almost at its maximum and the mature breast feathers were just beginning to develop. After another month the feathers of the top and back of the head, including the horns, and most of the leg feathers were still juvenal plumage. A number of measurements were made at weekly intervals, the most reliable of which are tabulated blow.

Growth of the great horned owl as indicated by weekly measurements (in inches).

Date	Approx. Age, Wks.	Wing Extension	Tail Lenght
May 5	4	28	2
12	5	32	2¼
19	6	37	4
26	7	41	4½
June 2	8	44	6
9	9	46	7
16	10	49½	8½
23	11	49½	9
30	12	50	9
July 7	13	51	9
17	14½	52	9
24	15½	52	9
Sept. 19	23½		9

At the age of four weeks the distance between the horns was two and one-fourth inches. After ten more weeks this was but two and one-half inches.

ACTIVITY. The bird was able to walk about when first taken, but it was reluctant to do so until it was considerably older. In addition to simple walking the bird began to make short jumps, with wings folded. Often the owlet would stand in one place and flap its wings vigorously. Later some of the hops were accompanied by flapping of the wings. Before the bird could fly it would sometimes climb by combined effort of legs, wings, and beak. The first deliberate flight was a short hop from the floor to the seat of a chair, when the bird was six weeks old. Two days later the bird made a second step by going from the seat to the back of a rocking chair. Two days after the bird flew a short distance from the back of one chair to the back of another. The next day the owl made a short lateral flight along the floor carrying a handkerchief in one foot. When it was seven weeks old, the owl flew a span of ten feet between two chairs. Two weeks later the bird could land on a precarious perch with accuracy and certainty. At ten weeks of age it made a flight of 15 yards horizontal distance and gained 15 yards in elevation at the same time. At 12 weeks of age the owl could easily make a flight of 25 yards, and in shorter trips it could carry a burden either in its talons, usually of one foot, or in its beak.

Like many young animals the owl played at capturing, killing or dismembering its prey. It seemed very catlike in some of its antics as it pranced

away and then back, then sideways around some real or imagined object. The owl would vigorously attack a paper sack or newspaper, tearing at it with both beak and talons, sometimes rolling sideways or even on its back and uttering a characteristic staccato chirping sound. Before actually making an "attack" the owl usually moved its head from side to side, up and down, with such energy that the whole body swayed about. When running the owl might intersperse hops and skips in a very mischievious fashion.

The owl took very good care of its feathers, preening them daily. The larger feathers were carefully drawn through the beak to smooth and clean them. Skin muscles lifted certain feather tracts, this being particularly noticeable in case of the breast feathers. They could be raised or lowered at will without any other body movement. In preparation to scratching the head the feathers on the head were raised as the skin was drawn forward. The horns stood up when the owl was excited or wary. Sometimes after drinking of water running from a tap it bathed. While bathing the owl raised its feathers and flapped its wings vigorously so that the entire body became wet. Then it spread its tail until it dried and carefully rearranged its feathers.

The owl was not confined to a strict periodicity of being active all night and asleep all day. It seemed that rest and activity alternated during both the day and night. Since the owl was influenced by the schedule of humans it tended to do more of its resting at night. During the day the owl often perched comfortably in various positions and rested without sleeping. During the first two months of life it often lay flat on the floor upon its breast, with its wings loosely spread and its legs extended on the floor behind. At other times, with legs flat on the floor as far back as the "heel", the bird rested its weight on heels and tail. While perching on a narrow board the owl would occasionally place the heel of one leg on the foot of the other, appearing to cross its legs, or it might rest one foot on top of the other. In perching in an erect position the talons were either closed about the support or spread out flat. For greater relaxation the owl sometimes allowed its wings to trail. Occasionally it peeped gently in its sleep, as if it might have some equivalent for dreams. The bird sometimes stretched a wing and leg on the same side of the body in a long, catlike stretch in which the talons were pushed through the wings primaries and the scalp was moved forward as if in a frown.

VISION. General observations seemed to show that the owl had very good eyesight. It readily noticed the movement of an ant on the opposite side of a room. The iris of the eye was almost instantaneous in adjusting for different light intensities, permitting the owl to see well in sunlight or in a room brightly lighted for photography as well as in an almost completely darkened room. Experiments with a flashlight showed that the two eyes adjusted independently for the light falling on them. Continued close observation failed to indicate any rotation or movement of the eyeball in its socket. It is believed that the eyes are held rigidly in place, all adjustment for direction being made by moving the head. The neck was extremely flexible, permitting the head to be rotated, in the horizontal plane, through 200° either to the right or left, a total arc of 400°. It could also be moved through a total of 270° in the vertical plane. When the owl was simply blinking, the opening of the eye was closed by the upper

lid, in addition to the inner lid. The two eyes were independent as to the timing of these blinks. When the owl was asleep the lower lid came up and covered the eyeball, the upper lid remaining about in the usual position.

Some tests were made to determine the efficiency of the owl's vision in a darkened room. The bird was allowed to become hungry and then offered live food. In one trial the owl was on a high perch in a room darkened so that two observers could not see the animal. The owl came down to the floor but seemed to be ineffective in catching the food. Finally more light was let in so that the two observers could barely see the outlines of the two animals. In this light the owl caught its prey. Repetitions of this type of experiment seemed to suggest that the owl could see and catch small animals in a light which permitted humans to see the animals in outline or silhouette. Any darker condition caused the owl to sometimes lose track of the prey.

In all, the bird has been very adaptable to confinement, has been sociable and very expressive, and a constant source of new and interesting experiences.—**University of Minnesota, Minneapolis, Minnesota.**

NEW ORNITHOLOGY CLUB FORMED

A new bird club was organized at St. Cloud on August 5th of this year. The group is composed almost entirely of St. Cloud citizens. Over 50 members attended the first meeting. Officers elected are President, Mrs. A. J. Trainor; Vice-President, Mr. Nestor Hiemenz; and Secretary-Treasurer, Mrs. George Lehrke. The program consisted of talks by Mr. Hiemenz on birds of the Mud and Thief Lakes area, Mr. H. Emmel on the habits of our local birds, and motion pictures by Mr. Richard Voth. The second meeting is scheduled for the early part of September. The club members will watch the "going to bed" of the Chimney Swifts in a chimney in the downtown section of St. Cloud. Many hundreds of them give this performance during the month of September.

Blue-Gray Gnatcatchers In A Minneapolis Public Park

By Lulu May Aler

That fascinating little sprite, the blue-gray gnatcatcher, has visited one of our Minneapolis public parks at least five out of the last seven summers and may easily have been an unrecorded transient the other two years. Possibly he may even be a regular summer resident, missed at times because of a nesting site off the beaten track of attentive humans. Such a tiny, fleet, soft-voiced, sky-gray, tree-top mite with a foraging range of only a hundred yards or so from the nest might conceivably escape detection.

The first record coming to my attention was of a lone gnatcatcher seen on August 4, 1936 by a careful bird student familiar with the species in its winter quarters. When I searched for it shortly afterwards, I found only the first redstarts and black and white warblers of the season and assumed it had passed through with some of these early migrants from outside our park.

In 1939, I had the thrilling opportunity to watch a nesting pair from June 4 to 30, in the same locality in which the first individual had been seen. They were just completing their exquisite lichen-adorned nest when discovered. On June 10, they began incubation, alternating so closely that I never saw the nest uncovered more than a few minutes, scarcely an instant in bad weather. Two weeks later they proclaimed the arrival of young; a more excited pair I never saw. Six days of incessant activity followed—feeding three nestlings whose bills were first visible above the rim on the fifth day, driving out every other bird that ventured near, and finally zipping repeatedly at a gray squirrel that nibbled acorns in the home-tree.

But on the seventh morning I found only appalling silence. As I watched and waited, hoping for some sign of life, the male, empty-billed, came dilatorily zigzagging his usual route to the nest, looked in, flitted away again, calling his high-pitched, vibrating, little *Tsin-ng* each step of the way. Later in the day I heard his notes several times a little beyond his customary foraging range—the last trace of our delightful gnatcatchers that summer despite a long-continued search.

In 1940, I glimpsed a gnatcatcher three times—May 6, 13, and 21—within a half mile of the previous year's nest but could locate no nesting pair. I saw no gnatcatchers in 1941, but other observers reported one in the huge warbler waves of August 22 and 26.

This summer, 1942, I enjoyed a few more bits of the gnatcatcher nesting cycle, complementing what I had seen before but again not a complete cycle. The first individual was reported on May 3, and two were seen together on May 6, when I caught my first glimpse. For two weeks one was noted occasionally in the same locality by various observers, but there was no further record of a pair until early June when I trailed a tiny voice from tree to tree and caught sight of its owner just as he and his mate launched an attack on a redwing, thereby revealing their secret. As they were carrying food by

June 6, and their young (I saw only two) left the nest on June 16 and 17, mid-May must have been nest-building time. But not necessarily the only one, I quickly learned!

On June 12, I had happened upon an exquisitely beautiful bit of courtship as the wee father, with the offer of a dainty morsel, sought to divert his busy mate from her swift course to the nest. For a few days he sang jubilantly in and near the home-tree, utterly unmindful of the attention he attracted. Then he took his joyous medley entirely out of hearing at the home site and centered it around another white oak about ten rods away. There I watched him on June 16—while his last fledgling was still taking wing exercises in the nest—tug with might and main to bind more securely the foundation he had already built for the second home!

Two days later the tireless parents were both working rapidly on the rising walls, with time out only for feeding their young, now parked in the trees nearest the new home-oak. By June 21, construction was completed and there remained only the more comfortably molding of the interior and adjusting of the rim. On June 26, they were incubating—taking turns on the nest—and still feeding their first young nearby. And then—the nest vanished! Not a shred remained!

For almost two weeks longer the little family stayed near enough the nesting sites to be easily located, although gradually extending their range in all directions. For another week I searched the area repeatedly to make sure there was no quiet incubation escaping my notice. But neither then nor during my frequent visits throughout the summer did I find them again; my last glimpse was on July 8.

The three nests under my observation, the one in 1939 and two in 1942, were all in white oaks about three or four feet from the extremities of slightly ascending upper branches, about 17 to 23 feet from the ground, and protected from above only by small twigs at the forks on which they were built. The first and third nesting trees were completely isolated from their neighbors, but the branches of the second intermingled with others on three sides, the nest-branch, however, extending out toward a wide open space as in the other instances. Although in an open park area, all were near dense, moist vegetation teeming with insect life.

The nests were built of fine hair-like plant fibers, tiny tendrils, bits of fuzz from new oak tips, and other plant down, felted together and bound to the branch for a distance of several inches with webs, and were decorated with particles of birch bark and lichen—lovely little cups as tall as they were broad, blending perfectly with both branch and occupants. In each case, one wall rose perpendicularly from the edge of the nesting branch while the opposite wall, an inch or so deeper, rose from a slightly lower forking twig which furnished a large share of the support. The exterior of the 1939 nest measured two and one-half inches across by two and one-half deep on the twig side and one and one-half deep on the branch side; the interior measured one and five-eighths by one and five-eighths inches.

The 1939 nest and the second of 1942, although canopied with the usual leafy twigs, were quite open to view from below, but the first one this season was well hidden in foliage—fortunately so, for it was over a much-traveled road at a point where people often pause for a lake view.

If the gnatcatchers could succeed in their nestings sufficiently to become firmly established, what a choice delight they would add to our summer birding!

Minneapolis, Minnesota.

Lake Traverse Bird Life in April

By W. J. Breckenridge

With 50,000 milling geese, 500 austere and deliberate white pelicans, 200 majestic whistling swans, and myriads of courting ducks making up the ornithological high spots and prairie chickens, pheasants, burrowing owls, Franklin's gulls, early shorebirds, and a host of others filling in the less exciting moments, the members of the Minnesota Museum of Natural History's Blue Goose Expedition to the Lake Traverse Area voted unanimously to record the trip in red letters in their field journals.

This exciting week for the expedition members resulted directly from the generosity of Mr. and Mrs. C. C. Bovey. Their son Martin's keen interest in wildlife has led him into the professional outdoor photographing and lecturing field. He has studied and photographed the blue geese at several points from Louisiana to James Bay, and the bird had become one of his prime favorites. When Dr. Roberts described to Mr. and Mrs. Bovey the spectacular concentrations of these birds right here in western Minnesota, they immediately proposed supplying the necessary funds for a huge new habitat group of the species in the Minnesota Museum of Natural History in honor of Martin. Francis Lee Jaques, American Museum of Natural History artist and former Minnesotan, was chosen to paint the background. Hence the trip by Martin Bovey, Lee Jaques, and the writer to this region in April of this year (1942) to collect materials for such an exhibit.

Jaques, with his pencil and keen appreciation of color and Martin and I with our color cameras all loaded for a "killing" naturally wanted the necessary shooting out of the way as soon as possible in order to give time for sketching and photography. First the state's very effective watchman of the geese, Arch Klawon, was contacted. (In Klawon the bird people have a staunch friend and one who is always ready to adjust his schedules to help parties who are anxious to enjoy the birds of this area.) With Klawon's help and armed with state and federal collecing permits, we spent the first three days in outwitting the geese by hiding in haystacks, stalking them in cornfields or spotting their evening flight lanes. In this we succeeded to the extent that we secured three snow and nine blue geese, as well as a drake mallard and two drakes and a hen pintail. These, together with nine blues and snows previously confiscated by wardens, gave us sufficient specimens for the exhibit. When permission is granted for the collecting of such wild life for scientific purposes, it is always our aim to utilize the material as completely as possible. Only recently the old controversy over whether or not the blue and snow geese are two separate species has again arisen. Previous to this trip the writer found a research worker in cytology who was interested in chromosome studies of birds. Chromosome counts of these two geese might shed some light on this question. Consequently the writer dissected out

and preserved the tissues best suited to such studies from every bird taken within a few minutes of its being shot. We hope we can have a report on this material before long from Dr. Johnson.

In securing data for the construction of the group foreground, Jaques and the writer poled, rowed and waded into the middle of the extensive swamp land called Mud Lake. The huge swarms ("flocks" is an entirely inadequate term in this case) of blue and snow geese stream out to feed in the cornfields at daybreak and usually return to rest in the swampy flats at midday. And it was midday when we invaded their resting grounds. What an experience to put up clouds of tens of thousands of these big waterfowl! We made no effort to stalk the birds on this particular trip and as we moved in toward the mass of resting geese the nearer birds craned their necks, then rose in a gabbling crowd. Then, like the domino row in reverse, the next farther birds arose, then the next and the next till the whole sky seemed full of wheeling wings. The whole movement gave one the impression of peeling up a huge net that had been lying on the ground. Perhaps 20 thousand birds were in the air at once, the white snows picking up the sun's rays, brilliantly spotting the dark swarm with flecks of white. Suddenly, when we had no thought but that the whole mass was in flight, the more distant quill reeds belched forth another cloud of geese and so for some time the masses rose, wheeled and settled and never were we sure that all the thousands of honking forms were in the air at any one time.

The last few days of our all too short stay we cooperated in the use of photographic blinds with our good friend and co-worker with the birds, Ralph Woolsey, official photographer with the Minnesota State Conservation Department, who was headquartering at the same hotel in Wheaton. He had just completed some whistling swan pictures and the crack of dawn the following morning found me settling in the blind which he had vacated while he occupied mine farther down the shore. Sonorous honks and gabblings from the darkness opposite the hideout told me that the swans were there in numbers, but I could see nothing of them. As the light slowly increased, I could gradually discern about 150 huge ghostly white shapes moving about in the open water not 75 yards away. I soon was able to see them plainly. What a picture! Then ensued for me a period of anything but patient waiting, for light that allows one to see plainly may be far too dim to allow a camera to see as well, especially when colored film is being used. Finally I concluded to start photographing. I ran off a short piece remaining of one reel and reached for my extra film. Where was it? A sudden severe chill ran down my spine—a chill of consternation, disappointment, and a mixture of other unpleasant sensations. In my rush to assemble my equipment in the semi-darkness, I had taken exposed film instead of fresh film! My film supply was in Martin's car which, according to our plans, was then miles away. There was but one thing to do and that was to get new film in town. The blind was in a closely cropped pasture. Besides the swans, canvasbacks, and teal were sitting about on exposed rocks less than 100 feet away, but there was nothing to do but to try to crawl the 200-300 yards to the road. Lying flat on my belly and inching along on my elbows and toes, I finally gained the slight protection of some rocks, then a haystack, and to the road without disturbing the birds. Then of all unexpected things to happen! here came Martin down the road in his car with

my film. He had decided to change his plans, and what a lucky change for me! A word of explanation, and with a horseshoe in my pocket and a rabbit's foot around my neck, so to speak, I made it back to the blind without flushing a bird. A short rest to quiet my aching muscles and jittery nerves, and in the next hour I had the time of my life with brilliant light, open water, and 150 swans, fighting among themselves, resting, preening, taking off, and volplaning back to the wind rippled water right in front of my blind —surely a highlight for any ornithologist's trip!

We all wanted pictures of the pelican flock. Ralph and Martin successsfully stalked and pictured at fairly close range that most deliberate, most philosophical, and most whimsical of all of Minnesota's large birds. Lee sat sketching the hills one evening, and Ralph and I intended staying with him to photograph the goose flight against the setting sun. On second thought, however, we decided to try for these shots a half mile down the lake. To our chagrin, Lee reported that, soon after we left, 60 pelicans came swimming up the channel to within 50 yards of him. On seeing him they calmly turned and, with chins still solemnly tucked in against their breasts, swam quietly back among the quill reeds. What a lost chance for pictures! We did see that evening, the long orderly lines these buoyant fliers maintained in flight. Each bird spaced exactly the same distance from the one ahead, made the flock look like a string of huge pearls against the dark eastern clouds near sunset. The leader would rise a hundred feet above the marsh then drop again to the reed tops, and every one in turn made the same rise and dip, as though they must have been the originators of the childrens' game of "follow the leader". Later from a high bluff we looked down on a moving line of pelicans, and here with their wings tips skimming the water, the line of huge birds wavered slowly from side to side each following in the "tracks", as it were, of the one immediately ahead and giving the line the movements of a huge white spotted snake crawling slowly across the lake.

Many more similar, intensely interesting, and some amusing incidents dotted our week at Traverse, but the trip, like this account, must end on schedule. Lee had acquired many sketches and many more indelible mental images; Martin, more excellent colored movies; and I, the birds, notes, and photographs necessary for my summer's work on the goose group. Martin's father, who joined the party for the last couple of days, keenly enjoyed his brief introduction to the spring goose flight and, like the rest of us, was reluctant to leave. Finally shaking hands with our guide helper, Arch Klawon, we rolled back toward Minneapolis and to our other duties most of which we agreed are certainly not so pleasant as our experiences at Traverse. **Museum Natural History, University of Minnesota.**

NOTES OF INTEREST

AMONG THE BIRDS IN NORTHWESTERN MINNESOTA.—After several weeks of planning, Mrs. Hiemenz, Marty Govednick, and I were at last ready to leave on a trip to Mud and Thief Lakes in eastern Marshall County in northwestern Minnesota. We had read many glowing accounts of the myriads of waterfowl that had once tennanted this area and that are now again returning with the advent of water restoration, but we really wanted to see for ourselves. Before the trip was over we visited not only Mud and Thief Lakes but also Twin Lakes in Kittson County and the extreme western edge of the state from the Canadian boundary to Lake Traverse.

Near Erskine, in Polk County, we stopped at a meadow where we saw three pairs of short-eared owls flying back and forth in pursuit of their early morning meal. After dragging the meadow twice with a hundred foot rope, we finally succeeded in locating a nest which contained a single young about two weeks old. There was no real nest, merely the flattened top of a small knoll. As we photographed the youngster, the anxious parents flew close around us trying to draw our attention from their offspring.

Driving north we arrived at Holt, the gateway to the Mud Lake area, where we stopped at the home of Mr. and Mrs. George Karvonen. In the company of Mr. Karvonen we drove to Mud and Thief Lakes. Despite the driving rain, we saw ducks, grebes, and coots in almost unbelievable numbers.

We encountered four species of grebes. Holboell's grebes were fairly common, and a nest containing six eggs was located. Not many horned grebes were seen, but we did manage to locate one nest with seven eggs. A lone western grebe swam about in full view only a short distance from us. The bird probably had a nest somewhere in a large area of cattails nearby, but we were unable to find it. Pied-billed grebes were extremely abundant, and so many nests were located that we soon stopped recording them.

Twelve species of ducks were seen. In addition we were informed that wood ducks were present and Canada geese were nesting here for the first time in many years. Mallards, pintails, blue-winged teals, shovelers, redheads, and ruddys were very common while gadwalls, baldpates, ring-necked ducks, canvasbacks, and lesser scaups were present in smaller numbers, and a pair of European widgeons was also seen. In many cases the ducks were still in pairs, indicating that nesting had not yet begun. A few mallards and pintails had begun nesting early; a brood of young of each species was seen. A nest of a redhead containing one egg was located, while in another clump of cattails we flushed a female canvas-back from her nest which contained eight eggs of her own and eight redhead's eggs. Ruddys had just begun nesting, and a nest in the process of construction was located. The presence of the European widgeons was rather surprising. Both a male and female sat on a dyke in full view. As we watched, the male ambled off into the surrounding vegetation while the female remained in the open. Two rather unusual hawks were seen in the Mud Lake Area, a

ferruginous rough-leg and a duck hawk. When first seen the roughleg was sitting on a fence post about 15 feet from the road. When we stopped the car the hawk flew about for several minutes and then alighted on another post giving us an even better view. It was a typical light-colored bird with a pale tail. As we stopped at one place to watch some ducks, we heard a rushing sound above us and looked up to see a duck hawk swooping down at the ducks. Either the hawk was merely playing or our presence scared it away, because it checked its downward rush about 25 feet above the water and then flew rapidly from sight.

Cliff swallows were very common, nesting under the concrete bridges. Most of the nests were just being built, but one held one egg. Even here the English sparrows, arch enemies of the cliff swallows, had usurped some of the swallows' nests. Another unusual bird recorded was a field sparrow heard repeatedly in an old bush-grown field.

The next day we drove to Twin Lakes. Here also we observed many waterfowl, and found nests of pintail, shoveler, and blue-winged teal. In addition we located six nests of horned grebes. Four nests were under construction, a fifth held four eggs, and a bird was incubating in the sixth. Each nest was in its own little area of scanty grass, and in each case both birds were nearby.

Driving south along the western border of the state we noted many short-eared owls. At Lake Traverse the water was so high that we were unable to hike into the marshes but we did see three western grebes. A piping plover's actions seemed to indicate that it had a nest along the gravelly road. Another unusual bird noted was a yellow rail which we finally saw after trampling an area between the road and the water to locate the source of the peculiar calls coming from the tangled vegetation. A total of 131 species and one additional subspecies of birds were recorded. —**Nester M. Hiemenz, St. Cloud, Minnesota**

LATE SUMMER SHORE BIRDS—The sandy beaches in the environs of Duluth are unusually attractive to shore birds. Here many species which nest only in the far north are met with during the summer months. Obviously these must be considered as non-breeding birds which lack the urge to return to their breeding grounds or were prevented from doing so by disease or injury. The Hudsonian curlew sighted by the State Teachers College Ornithology Class on the very late date of June 17, would probably be considered one of these, as also would the little flock of 8 lesser yellowlegs seen on the St. Louis River front on July 1, and the least sandpipers, sanderlings, and a single semipalmated plover observed in late July.

In August, however, the shore birds again appear in considerable numbers, the increase being due to the breeding birds returning from the north. The flocks of sanderlings are larger, for instance, and already the birds are in the winter plumage. On August 27, Miss Hulda Adams and the writer enjoyed watching such a flock feeding on the lake beach on Minnesota Point. Their bills and legs seemed blacker than ever in contrast to the glistening white of the plumage, as they restlessly searched the foam-splashed beach for drift-line insects. Among them were spotted sandpipers teetering in their characteristic manner, now spotless in their fall plumage. In the shallow ponds of the sandfills several Baird's sandpipers were observed, but only one black-bellied plover was seen. On August 29, after a heavy warm rain, the sanderlings were numerous in the surf-line of Lake Superior beach, and with them was a ruddy turnstone and one semipalmated plover.—**Olga Lakela, Duluth, Minnesota**

BREEDING GOSHAWKS—The good fortune of being able to check on three goshawk nesting attempts in the last 8 years has been the experience of this observer. All nests were located within 35 miles of the city of Duluth. Although my work has carried me over most of northern Minnesota since 1935, I have observed goshawks on only a few occasions. I am convinced, however, that their wariness and secretive habits probably make them appear to be much less common than they actually are.

My first meeting with breeding goshawks was in April, 1934, at the Cloquet Forest Experiment Station in Carlton County. A nest discovered by student foresters rested at least 20 feet high in the crotch of a jack pine. The surrounding cover was a dense stand of large jack pine. The nest contained four eggs, and I recall distinctly that the incubating bird was a first year adult with the typical streaked plumage. Its mate was a full-plumaged adult which dived at us repeatedly whenever we came to visit the nest. In May, 1935, I was fortunate to encounter a second breeding pair in the Cloquet Valley State Forest, St. Louis County, about 35 miles north of Duluth. This time the nest was situated roughly 25 feet high in the crotch of a white pine at the edge of a large white pine grove. One of the adults was killed by a local trapper, and the nest with several young was abandoned.

Interesting is the fact that the general area where this latter nest occurred was kept under observation regularly until Dec. 1937. Though one or more goshawks inhabited the area during the winter of 1935-36, no further breeding was noted until March of this year, when a pair chose to nest within 250 feet of a Forest Ranger Station and the same distance from a well-travelled gravel highway. This nest, also in a white pine, was situated about 35 feet above ground. It had been constructed about mid-March when snow was still on the ground. The nest tree is one of a small grove of Norway and White Pine surrounded by aspen, birch, balsam, and spruce comprising a rather dense cover type. It is interesting to note that this third goshawk nest was located in the Cloquet Valley State Forest only three-quarters of a mile from the second nest described. The incubating bird was a full plumaged adult which persisted in diving at all intruders coming close to the nest. On May 10, the nest contained four young nearly half grown, which were photographed by Ralph Woolsey. On May 30, when James Struthers visited the nest to band the young, only three birds were present.—**Marius Morse, Minnesota Division of Game and Fish**

TWO UNUSUAL 1942 RECORDS FROM THE ST. CLOUD AREA—On February 22, a red-throated loon was seen in the open waters of the Mississippi River, just north of St. Cloud. It was with a group of American golden-eyes and American mergansers, and was diving freely. Contrary to the expected dull winter plumage, this bird was almost in full plumage with a red throat-patch. When the ducks flew up as I approached, the loon remained on the water. This is my second record for this vicinity, a bird also in full plumage having been seen on Clear Lake, ten miles south of St. Cloud, on April 22, 1936.

On March 29, a pair of old-squaw ducks was seen in a flock of redheads on Little Rock Lake, twelve miles north of St. Cloud. Their extreme whiteness made them stand apart from the other ducks. When I approached the flock, they were the first to leave. This is my first record for old-squaw ducks in Minnesota although I have seen them a number of times on Cayuga Lake at Ithaca, New York. —**Nestor M. Hiemenz, St. Cloud Teachers College, St. Cloud, Minnesota**

NOTES ON SPRING SHORE BIRDS AT DULUTH—Piping plovers arrived at Minnesota Point on April 23, 1942, several days earlier than last year. Three pairs were recorded by May as compared to six pairs in 1941. On June 13, two companions and I discovered a nest with four eggs. As we searched the sand ridges we were first attracted by the antics of the mother bird. Not finding the nest within a few minutes, we decided to sit quietly and watch. Soon the mother bird most obligingly ran to the nest and settled down. Two weeks later, on visiting the place, no trace of the egg shells or young could be seen, but the little ring of stones lining the depression was still intact. No other nests and no young were observed during the summer on Minnesota Point. It appears that the unsuccessful nesting of 1940 was repeated.

After six years of bird club wanderings, I had my first opportunity to observe a solitary sandpiper. On May 2, Dr. Olga Lakela and I set forth to find fairy shrimp and caddis fly cases. As we approached a pool in a wooded setting we flushed a bittern, but the solitary sandpiper that we found there also, merely fluttered a few feet and settled down to its wading and probing for food. So we kept each other company, much as expressed in Celia Thaxter's poem. I wonder what deserted nest of robin, waxwing, Canada jay, or blackbird the sandpiper occupied in Canada this summer, and if it will pass this way on its journey to South America or the islands.

White-rumped sandpipers are rarely seen on Minnesota Point, as their main route north, from the Mississippi River valley to the Arctic region, is through the western prairies of the state. On June 13, I saw what appeared to be spotted sandpipers flitting along the shore, but the white rump on two pairs distinguished them as unusual visitors. Later in the week Dr. Olga Lakela and the members of her bird class saw them.

Also on June 13, I saw a lone red-backed sandpiper and a black-bellied plover probing in the mud flats, the remnant of a large flock of these birds, which together with golden plover and killdeer had been on the open field by the turnaround on June 1. A long-billed dowitcher was also observed on the Oatka Beach Addition of the Point—a first experience for the author. Finally on June 27, I saw another pair of white-rumped sandpipers, a late migration date for this bird.—**Evelyn Jones, Duluth, Minnesota.**

CARDINAL RECORDS FROM NORTH CENTRAL MINNESOTA—After watching the cardinal along the Mississippi River at St. Cloud for the past ten years, especially during the winter months, local ornithologists were rewarded this year in finding a nest with three eggs and one young. Mrs. H. G. Morris reported to Mrs. A. J. Trainor the presence of the cardinal's nest in a lilac bush at her home. Nestor Hiemenz and Richard Voth on July 16, 1942, using a stepladder, investigated the nest and found the eggs and young.

Another St. Cloud resident reported this spring that she had had a pair of cardinals nesting in bushes on her lawn last year. She did not, however, draw the attention of the Ornithology Club to the nest at that time.

A former St. Cloud Teachers College ornithology student, Miss Gladys Tirrell, while teaching at the Menagha High School, stated that her students insisted that they had seen a cardinal at Menagha. She said that they were well acquainted with the common birds of the vicinity and that because of their positive attitude she believes that they may have seen this bird there. Miss Tirrell did not have the experience herself.—**George W. Friedrich, St. Cloud Teachers College.**

DUCK HAWKS OF THE MISSISSIPPI AND THE NORTH SHORE—Since the spring of 1940, we have studied the duck hawk migrations and nesting populations along both sides of the Mississippi River in southeastern Minnesota, below Red Wing. Reports of these studies have appeared in The Flicker for October 1940 and December 1941. This spring we continued this study and in addition made one trip to the North Shore of Lake Superior on June 19.

On March 18, on our first trip to the Mississippi River Bluffs, we saw a pair of falcons flying back and forth in front of a small cliff which was nearly hidden by trees. Farmers living in the vicinity of eyries have told us that the hawks are generally seen in February. Our observations lead us to believe that duck hawks winter in southern Minnesota in the vicinity of their eyries, for they have been seen there as late as the end of December.

On April 4, we located a nesting site on the Wisconsin side of the river. We released a pigeon under this eyrie, but the bird eluded the falcon which gave chase. On April 25 and 26, we made another trip to the Mississippi River Bluffs where we located a new eyrie on the Minnesota side of the River. The farmer who owns the bluff told us that hawks have nested there for at least the past 18 years. On this same trip we discovered a new eyrie on the Wisconsin side. Both the falcon and the tiercel, or male bird, were playing in front of the scarp, when a second tiercel came in and tried to win the falcon. After a spectacular fight, the first tiercel drove the intruder away. This pair probably did not succeed in raising young.

On May 2 and 3, we drove down the Wisconsin side of the river where we visited the eyrie which we had located on April 4. There were three small young and an infertile egg in the nest. On the same day we located another new eyrie and visited one which we had found in 1940. On May 24, we banded the three young which we had first seen on May 2. Here we saw a hawk, possibly one of the parent birds, try to pick up a crippled duck. On another cliff near by, as we were banding the solitary eyas in the nest, an intruding tiercel flew in and was met by the tiercel whose territory he invaded. The two birds mounted high into the air, clutched at one another, and fell together about 100 feet before separating. At this juncture the falcon joined the tiercel, and together they drove the intruder out. We made our last trip to the Mississippi Bluffs on June 6. Although the young hawks were beginning to leave the cliffs, we managed to capture and band two more.

The cliffs of Lake Superior differ greatly from those of the River Bluffs. The latter are situated some distance from the river, are of limestone, and the highest of them rise over five hundred feet above the river. Duck hawks generally nest in cracks or small caves in the more precipitous portions. The basalt scarps of the North Shore rise vertically from the water to a maximum height of nearly 200 feet. Duck hawks usually nest on ledges of these cliffs. The young are exposed to wind and rain, and damp, cold fogs. On June 19, we found our first North Shore eyrie, an unusual one in that the nest was under the roots of a dead pine on top of the cliff and not on a ledge. There was one downy young in the nest. The next morning we located another duck hawk cliff. It was overhung, and we were not able to determine whether young were present. On June 23, we found our last duck hawk nest of the year. It was situated 60 feet from the top of the cliff and held four young which we banded. Altogether, we banded eleven duck hawks in 1942: two on the Minnesota side of the Mississippi River; four on the Wisconsin side; and five on the North Shore.—**Dana R. Struthers and James A. Struthers, Minneapolis, Minnesota.**

Minnesota Ornithologists' Union

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Contents

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THE FLICKER

VOLUME 14 DECEMBER, 1942 NUMBER 4

Minnesota Nesting Records, 1942

By Byron E. Harrell

Since 1929, when Sam Grimes wrote the first annual compilation of Minnesota bird breeding records, a great deal of information has been accumulated. This year's report covers 110 species and approximately 1224 individual breeding records. The complete data is going to be filed at the University Museum. For various reasons there has been a decrease in the number of cooperators in recent years. It is now more important that observers will accurately record and report all nests or all obvious evidence of nesting found during the nesting season. Plans for a project to use all the nesting records are being developed now. Suggestions for reporting breeding records will be given in an article in the March issue.

The names of the more than 33 cooperators are scattered throughout the list. This year's leading nest finder is William Longley who found more than one-third of all the nests reported. Nests were reported from 17 of our 87 counties. The only new species recorded is the rock dove. Although many pigeons are wild, they are not for some reason regarded as feral by many observers. I contend that they are feral and deserve recognition by bird watchers.

The material is presented to give the most possible information per page. Efforts to vary wording to make the list more readable would have resulted in an obviously strained and annoying style.

LOON. Gustav Swanson reported finding a pair with half grown young at Lake Insula, St. Louis Co., July 14.

PIED-BILLED GREBE. Several nests with eggs, Diamond Lake, Minneapolis, by the Swedenborgs; another 8-egg nest, Heron Lake, (Jackson Co.) Dr. Swanson, May 30.

GREAT BLUE HERON. A nest on April 26, by Harrell and Longley and another with 2 large young on July 2, by Brother Hubert were at Long Meadow, Hennepin Co. Three nests on Pig's Eye Island, St. Paul, on April 25, had young on July 1, (Brother Hubert and others).

GREEN HERON. Nests in Hennepin Co. found by Longley and Harrell; one at Fort Snelling May 24, had 4, well incubated eggs, and two others had 4 and 5 large young each on July

4. Brother Hubert found a nest with eggs in Ramsey Co. on June 1.

BLACK-CROWNED NIGHTHERON Many birds were found at the Dale Street Colony (Ramsey Co.) by Dr. Roberts' University bird class on May 25; 13 nests examined specifically by Harrell on June 13, all had young.

AMERICAN BITTERN. A floating nest with 4 young (Harrell and Longley, Hennepin Co.), July 4.

LEAST BITTERN. Dr. Swanson, one nest with 3 eggs, Heron Lake, Jackson Co. and another, June 7, St. Paul, William Longley.

MALLARD. Eight nesting records in Hennepin Co. from Bill Pieper, the Swedenborgs, Brother Hubert, and Byron Harrell from May 2 to June 6. Two other records, Washington County (Brother Hubert—June 25) Heron Lake (Swanson—May 30).

BLUE-WING TEAL. An 8-egg nest at Heron Lake, May 30, (Dr. Swanson), and a 6-egg nest, June 13, Ramsey Co., Harrell; George Kutz reported 5 half grown young in Washington Co. July 18.

SHOVELER. Gustav Swanson, one nest 6 eggs, May 30, Heron Lake.

WOOD DUCK. Bill Pieper found a nest with eggs at Frontenac, Goodhue Co. May 10.

RING-NECK DUCK. Dr. Swanson reported a brood of 6 young on the Kawishiwi River (St. Louis Co.) on July 16.

GOLDEN-EYE. One brood had 10 young on July 16, also on the Kawishiwi River (Dr. Swanson).

RUDDY DUCK. The Swedenborgs found this duck nesting at several places around Minneapolis, one pair within the city limits had 4 very small young on July 4.

AMERICAN MERGANSER. A brood of 11 young was found on June 16, on the Kawishiwi River by Gustav Swanson.

RED-BREASTED MERGANSER. Miss Evelyn Jones found 8 young at the mouth of the Gooseberry River (Lake Co.) July 5, and Miss Lakela found 7 young in Lake Superior at Duluth, St. Louis Co. on July 12.

GOSHAWK. Marius Morse found a nest in St. Louis Co. (see **The Flicker,** 14:30).

COOPER'S HAWK. Dr. Roberts' bird class found a nest at Nine-mile Creek, Hennepin Co. on June 1. A nest with 4 tiny young in a dead tamarack on the edge of the Dale Street Night Heron Colony, June 13, Harrell.

RED-TAILED HAWK. The Prossers and the Swedenborgs found a nest with 2 young near Kent, Wilkin Co. on June 20.

RED-SHOULDERED HAWK. A 4-egg nest was found in Washington Co. on May 18, by Brother Hubert Lewis and others.

BALD EAGLE. Gustav Swanson found 2 nests with young; one at Ensign Lake, St. Louis Co. on July 18, and the other in Itasca Park, Clearwater Co. on July 29. Miss Lois Campbell reported 2 young on Sept. 11, on the Cloquet River, near Island Lake in St. Louis Co.

OSPREY. Dr Swanson found a fish hawk's nest with 2 young in Itasca Park on July 29.

DUCK HAWK. Dana and James Struthers found 3 nests on the North Shore and the Mississippi bluffs (see **The Flicker,** 14:32).

SPARROW HAWK. Brother Hubert reported 2 St. Paul nests on April 18, and young awing on July 9.

RUFFED GROUSE. Dr. Lakela and Dr. and Mrs. Gregg flushed 3 large young on July 4, at Holyoke, Carlton Co. A nest with 11 eggs, Cloquet (Carlton Co.) May 16, and a brood of 9 half-grown young, St. Louis Co., July 14, (Dr. Swanson).

HUNGARIAN PARTRIDGE. A nest of this exotic with 11 eggs, near Brushvale (Wilkin Co.) the Prossers and the Swedenborgs, June 20, 1942.

BOBWHITE. The Swedenborgs report large young quail near Minneapolis on June 14.

RING-NECKED PHEASANT. A nest with 4 eggs, April 18, near the Bass Pond, Hennepin Co., Bill Pieper. Another nest, with 11 eggs, May 17, Fort Snelling, Hennepin Co. (Brother Hubert and others).

VIRGINIA RAIL. William Longley reports 5 nests in St. Paul, June 7, with 11, 7, 8, 9, and no eggs respectively.

SORA. William Longley reported all the nests of this diminative marsh bird! Six nests in St. Paul, June 7, with 1, 1, 3, 11, 12, eggs, and 4 eggs and 3 young respectively; 2 others found at the same place on June 14, had 11 and 5 eggs each.

FLORIDA GALLINULE. A family of small young in Minneapolis was found on June 27, by the Swedenborgs.

COOT. A nest of 9 hatching eggs, Heron Lake, May 30, Swanson. The next day, May 31, nests with eggs and young out of nest, Diamond Lake, Minneapolis, the Swedenborgs.

PIPING PLOVER. The only nest of this small shorebird was found by Misses Catherine Lieski and Evelyn Jones at Duluth on June 13. It contained 4 eggs.

KILLDEER. The earliest nest, 4 eggs, Washington Co., April 19, George Kutz. The last in Hennepin Co., 2 eggs July 4, Harrell and Longley. Five other nests were reported by the Duluth Bird Club, Longley, and Harrell. In St. Louis and Ramsey Co's.

SPOTTED SANDPIPER. Two nests with 4 eggs each, June 14, Duluth, by Misses Catherine Dole, Evelyn Jones, and Anne Bichner. Brother Hubert found a nest with 4 eggs in St. Paul on May 20, which was flooded on May 28. Harrell and Longley found another 4 egg nest on the bottom of the drained Bass Pond on May 24.

HERRING GULL. Miss Olga Lakela found a colony at Knife Island, Lake Co., on June 27, with 35 nests with eggs (apparently fresh in 25 nests), 1 nest with 2 young, and 112 empty nests. There were 57 young among the rocks and others in the water.

FRANKLIN'S GULL. The Swedenborgs and the Prossers found a nest with eggs at Lake Traverse (Traverse Co.) on June 21.

FORSTER'S TERN. The only nest reported was one with eggs in a slough at Brownton, McLeod Co. by the Swedenborgs and Prossers on June 20.

BLACK TERN. The earliest nests were found by Dr. Swanson in Anoka Co., several nests with 1-3 eggs on May 21. The last record was one of 2 young being fed by an adult on Minnesota Point, July 27 (Duluth Bird Club). Eleven other nests were found: in Hennepin, Ramsey, and Washington Co's by the Swedenborgs, Brother Hubert, Harrell, and Longley.

ROCK DOVE. Wm. Longley reported 6 nests on the State Capitol on Jan. 22, all building and a 7th near there on March 19, with 2 young. Harrell found 2 nests with young on the Franklin Avenue Bridge in Minneapolis, on May 8 and Sept. 29. Miss Frances Andrews reported 2 young hatched the first week in December taking wing early in January '43. Chamber of Commerce Bldg., Minneapolis.

MOURNING DOVE. The first and last nests were found by William

Longley in St. Paul; first April 29, last August 18, both with 2 eggs. Forty-two other nests were found by Bill Pieper, the Swedenborgs, Harrell, and Longley in Ramsey and Hennepin Co's.

YELLOW- BILLED CUCKOO. Bill Pieper found a nest on May 24, that was a rebuilt old Robins nest, (Hennepin Co).

BLACK-BILLED CUCKOO. The first nest, 2 eggs, St. Paul, May 23, Byron Harrell. A nest, St. Paul, June 3, with 3 eggs, William Longley. One egg hatched on June 9, and another on June 13. He found other St. Paul nests on June 7, (1 egg) and August 21, (2 week-old young) and a nest at Fort Snelling with 2 fresh eggs on August 16.

GREAT HORNED OWL. George Kunz found a sick, full-fledged young on a sidewalk in Stillwater on May 25. It died the same day.

BURROWING OWL. The Prossers and the Swedenborgs were fortunate in finding a pair of adults at the entrance to their burrow at Benson, Swift Co.. on June 18.

NIGHTHAWK. William Longley found a 10-day old bird on the roof of a St. Paul school, on July 21. Another nest on the ground at Big Stone (Big Stone Co.), with 2 eggs on June 19, (The Prossers and Swedenborgs).

RUBY - THROATED HUMMING-BIRD. The nest of our smallest bird was found at the Lake Harriet Bridal Path, Minneapolis, on June 2, by the Swedenborgs.

BELTED KINGFISHER. The first nest April 12, Hennepin Co. (Harrell) the last June 9, Nine-mile Creek, Hennepin Co. (Pieper). Twelve other nests were found by Harrell, Longley, and Brother Hubert in Hennepin and Dakota Co's and St. Paul.

FLICKER. Nineteen nests were found from April 21-July 8, in Duluth by the Ornithology Class, in St. Paul by Brother Hubert, Harrell and Longley, and in Hennepin Co. by Bill Pieper, the Swedenborgs, Longley, and Harrell.

RED - HEADED WOODPECKER. Ten Ramsey Co. nests were found by Brother Hubert, Wm. Longley, and Byron Harrell from May 15 (excavating) to July 11. The Swedenborgs found 1 nest in Hennepin Co. on June 24. All the nests except the first had young.

YELLOW-BELLIED SAPSUCKER. A nest with eggs was found in Ramsey Co., Brother Hubert and others on May 16.

HAIRY WOODPECKER. Two widely separated nests were found, one with young St. Paul, May 7, (Wm. Longley) and the other a nest with young, June 20, near Kent (Wilkin Co.) the Prossers and Swedenborgs.

DOWNY WOODPECKER. Longley found the first nest (eggs) April 22, St. Paul; the lastest record of 2 young being fed, Duluth, July 12, Miss Lakela. Another nest with young, Hennepin Co. by the Swedenborgs.

EASTERN KINGBIRD. Two pairs building, St. Paul, May 30, Harrell and Longley. A very late nest, on August 16, in St. Paul had 4 large young (Longley). Twenty other nests were found by Brother Hubert, Harrell and Longley in Ramsey, Hennepin, and Crow Wing Co's.

CRESTED FLYCATCHER. Two nests were found in St. Paul, one, May 30, Harrell and Longley, and another, June 10, Longley. Bill Pieper reported a Hennepin Co. nest on June 7, and Breckenridge reported another with 5 eggs July 5.

PHOEBE. The first nest was found at the Bass Pond, Hennepin Co., April 18, Byron Harrell. The last nest had 3 large young July 29, St. Paul, (Wm. Longley). Three earlier nests of

the same pair were destroyed by boys. Nine other nests were found by Brother Hubert, Harrell, Longley, Pieper, Swanson, Helen Towle, Olga Lakela, and H. Doyle in Ramsey, Hennepin, Clearwater, St. Louis, and Crow Wing Co's.

LEAST FLYCATCHER. The earliest nest, being built, Fort Snelling, May 24, (Longley and Harrell). Two young off the nest, August 10, Duluth, Miss Lakela. Miss Lakela, Brother Hubert, Harrell, and Longley also found 5 other nests in Ramsey, Hennepin and St. Louis Co's.

WOOD PEWEE. Only one nest was reported this year, being built, Fort Snelling, July 4, (Harrell and Longley). A nest with 3 young, found by Henry Roberts at Duluth, on July 9, 1941 was accidentally omitted from last year's report.

HORNED LARK. There were two March nests in St. Paul, a nest being built, March 23, (Longley, young out 4/20); and a 3 egg nest, March 28, Harrell and Brother Hubert (empty March 30). Young with adults August 14, St. Paul, Longley. Two other nests found by Brother Hubert and 4 more found by Longley were in St. Paul. Harriet Larrabee found a nest with 3 young in Duluth on April 11.

TREE SWALLOW. The first 4 nests, April 25, Pigs Eye Island, St. Paul, Brother Hubert. The last record, 5 young being fed, Duluth, July 8, Olga Lakela. Other nests were found by Brother Hubert, Helen Towle, Harrell, and Longley in Ramsey, Hennepin, Washington, and Crow Wing Co's.

BANK SWALLOW. Many swallows at a colony, Dakota Co. May 23, Brother Hubert. The last 5 nests were in a colony in St. Paul, July 21, (Longley). Bill Pieper, George Kutz, Brother Hubert and Harrell and Longley found 68 other nests in Hennepin, Ramsey and Washington Co's.

ROUGH-WINGED SWALLOW. Brother Hubert and Byron Harrell found about 3 pairs of swallows using an iron drain pipe of a pump house at North St. Paul, Ramsey Co., on May 9. The last nests were in Kingfisher nests, June 18, Dakota Co., Brother Hubert. Thirteen other nests were found by Bill Cummings, Bill Pieper, Harrell and Longley in Crow Wing and Hennepin Co's.

BARN SWALLOW. Wm. Longley reported 3 nests in a barn in Ramsey Co, on July 25, and 2 on July 26. A second brood, August 2, Palo, St. Louis Co., Miss Lakela.

CLIFF SWALLOW. Three colonies were found in the state this year: many nests being built at Aitkin (Aitkin Co.) on June 15, (Wm. Cummings); young in 7 nests near North St. Paul (Washington Co.) on June 25, (Brother Hubert). A colony of 18 nests with young at Itasca Park on July 27, (Dr. Swanson).

PURPLE MARTIN. Young were found in bird houses at Itasca Park on July 27, by Gustav Swanson. Young in a nest, Ortonville (Big Stone Co.) June 18, the Swedenborgs and the Prossers.

BLUE JAY. William Longley found the first and last nests in St. Paul; a finished nest April 23, and a 3 egg nest, July 14. Five others were reported in St. Paul and Newport by Brother Hubert, Longley and Cummings.

CROW. A nest with 4 young near North St. Paul, Washington Co., Brother Hubert and Byron Harrell, on May 9. Another nest with 7 young, May 10, Frontenac, Goodhue Co., Bill Pieper.

BLACK-CAPPED CHICKADEE. Wm. Longley found two nests; the first being excavated, April 18, St. Paul; the other with eggs, April 19, Hennepin Co.

HUDSONIAN CHICKADEE. The only record was 2 full grown young with adults by Dr. Swanson on August 12, at Itasca Park.

WHITE-BREASTED NUTHATCH. Building, St. Paul, April 8, Wm. Longley. A nest with eggs, Dakota Co. April 18, Brother Hubert.

HOUSE WREN. The first nest of 4 eggs in a rotten fence post, May 24, Hennepin Co., Harrell and Longley. Miss Lakela found 3 young in Duluth, July 16. Wm. Longley found 3 large young in a nest, St. Paul, August 4.

LONG-BILLED MARSH WREN. Gustav Swanson found many empty nests at Heron Lake on May 30. Fourteen empty nests of 5 pairs, July 4, Hennepin Co., Harrell and Longley.

SHORT-BILLED MARSH WREN. A nest under construction, Longley and Harrell, July 4, Hennepin Co. Longley found a male building a nest in St. Paul, July 19.

CATBIRD. Building, St. Paul, May 19, Wm. Longley. The last nest had 2 eggs and 2 young July 7, St. Paul, Brother Hubert. Eight other nests were found by Brother Hubert, Longley, Harrell and Pieper in St. Paul, Minneapolis and rural Hennepin Co.

BROWN THRASHER. The first nest, under construction May 1, St. Paul, Wm. Longley. Miss Lakela found 3 young off the nest, July 3, Duluth. Brother Hubert, Harrell, Longley, the Duluth Ornithology class, and Miss Severna Holmberg reported 21 other nests in Duluth, Minneapolis, St. Paul and rural Hennepin Co.

ROBIN. Wm. Longley also found the first and last Robins nests in St. Paul, a pair building on April 7, and large young in a nest on July 14. Longley, Harrell, Bill Cummings, Bill Pieper, Miss Severna Holmberg, the Duluth Ornithology class, Miss Hulda R. Adams, Harold Eastman, George Kutz and Brother Hubert found 146 nests in Ramsey, Washington, Hennepin, St. Louis and Aitkin Co's.

WOOD THRUSH. The only nests, under construction, St. Paul on May 17, and May 20, Wm. Longley.

VEERY. Two nests were found in Duluth. The first was found by Miss Lena Kitts with a cowbird's egg and one of its own. The eggs disappeared later. The Duluth Ornithology Class found 3 young out on July 8.

BLUEBIRD. The first nest contained 1 egg, St. Paul, April 12, Harrell and Longley. Two records were reported for June 21, a nest with 4 eggs, St. Paul (Harrell) and a family of young at Newport, Washington Co. (Cummings). Eleven other nests were found in Ramsey, Hennepin, Washington and Dakota Co's., by Brother Hubert, Harrell, Longley and the Swedenborgs.

BLUE-GREY GNATCATCHER. Miss Lulu May Aler reported two nests in Hennepin Co. for June 3 and June 16. A complete report of these nests can be found in **The Flicker**, 14:33-34.

CEDAR WAXWING. The first two breeding records, Newport, June 30, one nest with 2 eggs and young out, Cummings. The last nest containing large young August 22, St. Paul, Harrell. Wm. Longley and Olga Lakela reported 2 other records from St. Paul and Duluth.

STARLING. The first nest at the University, April 29, Harrell. The last nest July 12, St. Paul, containing 5 large young, Longley. Cummings, Harrell and Longley reported 5 other nests in Newport and St. Paul.

YELLOW-THROATED VIREO. Brother Hubert found young being fed in a nest in St. Paul on June 13.

RED-EYED VIREO. A nest with 4 eggs was found on July 27 by Gustav Swanson in Itasca Park.

YELLOW WARBLER. The first nest with 3 eggs, May 17, St. Paul, Wm. Longley. The last nest, just finished, July 4, Hennepin Co., Longley and Harrell. Eighteen other nests were found by Brother Hubert, Harrell, Pieper, Helen Towle, and the Duluth Bird Club in Ramsey, Hennepin, Crow Wing, and St. Louis Co's.

YELLOW-THROAT. A nest May 25, the Dale Street Heronry, Ramsey Co., Dr. Roberts' Bird Class. Dr. Swanson found a cowbird being fed by a yellow-throat at Itasca Park on July 27.

ENGLISH SPARROW. The first nest, under construction on March 4, Wm. Longley. Five other nests, April 21 to May 11, Ramsey and Hennepin Co's. Byron Harrell.

BOBOLINK. Brother Hubert found 5 pair feeding young out of nests at Pigs Eye Island on June 24. A nest in St. Paul, July 12, contained young, 2 bobolinks and 1 cowbird (Wm. Longley).

EASTERN MEADOWLARK. A nest with 2 eggs, May 10, St. Paul, Wm. Longley. Young were out of a nest, Newport, June 30, William Cummings. The Duluth Taxonomy Class found a 4-egg nest on July 14.

WESTERN MEADOWLARK. The first and last nests, both 4-egg nests, St. Paul, May 1 and July 10, Brother Hubert. Bill Cummings, Bill Pieper, Wm. Longley and Brother Hubert found 4 other nests in Hennepin, Washington and Ramsey Co's.

YELLOW-HEADED BLACKBIRD. Gustav Swanson found many nests with 1 to 4 eggs and some with newly hatched young at Heron Lake on May 30.

RED-WINGED BLACKBIRD. The first 3 nests, May 10, Longley in Hennepin Co. The last nest, July 4, the last young was frightened from the nest, Hennepin Co., Harrell and Longley. More than 30 nests were reported by Longley, Harrell, Bill Pieper, Dr. Swanson, Brother Hubert, and Miss Lakela from Ramsey, Hennepin, Jackson and St. Louis Co's. Besides these Wm. Longley reported 106 separate nests in one marsh in St. Paul on June 7!

ORCHARD ORIOLE. Eight nests were found in St. Paul. May 30, building, Harrell and Longley. The last nest contained young, July 4, Longley and Harrell. Six other nests were found by Longley.

BALTIMORE ORIOLE. The first nest under construction St. Paul, May 15, Longley. The last, a nest with young, June 24, the Swedenborgs. Brother Hubert, the Duluth Ornithology class, Helen Towle, and Wm. Longley found 12 other nests in Ramsey, Dakota, St. Louis, and Crow Wing Co's.

BREWER'S BLACKBIRD. The first nests, 3 under construction in St. Paul, on April 30, (Harrell). The last nest in St. Paul contained 2 eggs, July 13 (Longley). Brother Hubert, Harrell, and Longley found 46 other nests in St. Paul; one in Hennepin Co., Bill Pieper.

BRONZED GRACKLE. A nest being built, St. Paul, May 1, (Longley). Two nests in St. Paul, May 5, Brother Hubert, Two nests in Minneapolis, May 3 and May 20, with 4 eggs each, Bill Pieper.

COWBIRD. Eighteen species were reported as hosts. The number of records is given for each species. Phoebe (3); brown thrasher (3); wood thrush (2); veery (1); bluebird (1); yellow warbler (6); yellow-throat (1); bobolink (1); western meadowlark (1); red-winged blackbird (2); Brewer's blackbird (11); rose-breasted grosbeak (1); indigo bunting (1); vesper sparrow (1); chipping sparrow (7); clay-colored sparrow (2); field sparrow

(1) and song sparrow (3). Nesting records from May 1, to August 10, were reported by William Longley, Brother Hubert, Byron Harrell, Olga Lakela, Lena Kitts, Dr. and Mrs. Prosser, Mr. and Mrs. Swedenborg, Gustav Swanson, Bill Cummings, and Bill Pieper in Big Stone, Clearwater, Hennepin, Ramsey, St. Louis, and Washington Co's.

CARDINAL. A nest with 3 eggs April 22, St. Paul, Wm. Longley. George Kutz found a nest with 2 eggs that had one young on June 3 (Washington Co.).

ROSE - BREASTED GROSBEAK. The first and last nests, under construction on May 10, and 4, young on July 20, Wm. Longley. Longley and Brother Hubert found 9 nests in Ramsey and Dakota Co's.

INDIGO BUNTING. The Swedenborgs found a nest with 4 cowbird eggs on June 24, in Hennepin Co. The pair deserted a few days later.

GOLDFINCH. The first 2 nests with 4 and 6 eggs, St. Paul, July 29, (Wm. Longley). The last nest with 4 young, Minneapolis, Sept. 13, (Donald H. DeMeules). Wm. Longley, Byron Harrell, and Bill Pieper reported 33 other nests in Ramsey and Hennepin Co's.

LARK BUNTING. The Prossers and the Swedenborgs found a colony of about 25 birds near Beardsley, Big Stone Co. and one nest with one egg on June 21.

GRASSHOPPER SPARROW. A nest of 3 small young near Benson, Swift Co., June 18, Prossers and Swedenborgs.

VESPER SPARROW. A nest at Newport, young ready to leave, June 21, William Cummings. A nest with 1 sparrow and 1 cowbird egg, Ortonville, Big Stone Co., June 22, Prossers and the Swedenborgs.

LARK SPARROW. Dr. Roberts' Bird Class found a nest in Hennepin Co. on May 18. Young out of the nest June 14, Hennepin County, The Swedenborgs.

CHIPPING SPARROW. The first and last nests in St. Paul, building on April 30, and 1 cowbird egg and 1 week-old cowbird on August 10, Wm. Longley. About 15 other nests were reported by Longley, Harrell, Brother Hubert, Bill Cummings, Bill Peiper, Gustav Swanson, and Olga Lakela in Ramsey, Hennepin, Washington, and St. Louis Co's.

CLAY-COLORED SPARROW. Three nests on May 17, May 23, and June 14, in St. Paul, Wm. Longley. The Duluth Ornithology Class found 5 young out, Duluth, July 8.

FIELD SPARROW. A St Paul nest found by Longley on May 7, was later Parasitized by a cowbird. Two nests on June 1 in St. Paul, Brother Hubert.

SONG SPARROW. A nest under construction on April 24, was the first nest (Wm. Longley). Song Sparrows feeding a cowbird out of the nest on July 15 in Duluth, Ornithology Class. Five other nests were found by Harrell, Longley, Brother Hubert, and the Swedenborgs in Ramsey and Hennepin Co's.

CHESTNUT-COLLARED LONGSPUR. The Prossers and Swedenborgs reported the only nest, 4 eggs on June 20, at Wolverton, Wilkin Co.

St. Paul, Minnesota.

The Hooded Warbler In Minneapolis

By Frances S. Davidson

In the spring of 1942, Minneapolis was honored by the visit of a hooded warbler. This is believed to be the first authentic record of the appearance of the bird in Minnesota; but if he had been a summer resident of long standing, he could not have shown greater wisdom in choosing a haven for rest and refreshment than the spot he selected. It is a paradise both for birds and bird students, and it is so easily accessible that all bird lovers who live in the city or chance to visit it occasionally should be familiar with it. The area is less than five miles from the loop and can be reached in twenty minutes either by motor or by one of two main car lines, which gives it a special appeal in these days of gas rationing.

It is a long narrow tract of Park property lying between King's Highway and Queen Avenue on the east and west with Lakewood Cemetery and Lake Harriet on the north and south, and it is known to its initiates as "The Bridle Path" because a bridle path traversed its length in days of yore. The path is still there as a tree and shrub-bordered trail winding through a small but enchanting stretch of territory so diversified that somewhere within its borders almost any species of bird found in Minnesota can find the haunt dearest to its heart. In fact 204 species of birds have been positively identified in the territory.

Through the sagacity of our Park Board a large section has been set aside as a bird sanctuary surrounded by a high animal-proof wire fence and left largely in its natural state. There is a gate at the east end where one enters from Lyndale Park and one at the west end where one enters from the picnic grounds, so that one may plan to follow the trail at any hour of the day with the sun at one's back.

Between the trail and Lake Harriet a once-on-a-time tamarack swamp has now become an open marsh whose "marshiness" depends upon the annual rainfall. It is overgrown with wild flowers and dotted with clumps of willow, alder, dog wood, and elderberry bushes, some of them almost choked by woodbine, wild grape, and wild cucumber vines. A few little streamlets meander through the marsh and it clasps to its bosom one or two shallow, half-stagnant pools of water bordered by cattails and beloved of red wings and mosquitoes. Two island knolls of hardwood growth are mistily tender in spring or flamingly glorious in autumn.

The entire area is very popular with the citizenry of all ages and sexes. None the less many of our rarest and shyest birds find sanctuary there during their long semi-annual pilgrimages. One might fill a volume with tales of the thrills that during the years have sent shivers of delight up and down the spines of the members of the Audubon Society, Dr. Roberts' ornithology classes from the University of Minnesota, and all the other groups in our city devoted to the study of birds.

One of these thrills was mine on May 17, 1942 at 9:30 o'clock on a glorious Sunday morning of Minnesota spring sunshine. I had not reached the protected area but was wandering along the trail near the eastern end of Lyndale Park when I heard a ringing

warbler song unknown to me. In quality and sprightliness it reminded me slightly of the voice of the Canada warbler or the northern yellowthroat, both of which were present in numbers. I could not find the singer, but a loudly-complaining wood thrush had attracted a convocation of various other protesting feathered folk, and as I forced my way into the thicket to put to route a hypothetical maurading cat, suddenly there popped up from the under growth a male hooded warbler in all his beauty. A brief pause, a flirt of the tail with its flashes of white, and he was gone. Either he took pity on my anguish or he had intended merely to choose a position designed to display his charms to better advantage, for he at once reappeared in a setting of the pink blossoms of a tall bush honeysuckle. There he bobbed and twitched and flirted and spread that eloquent tail; he caught flies to justify the bristles at the base of his bill; he assumed countless bewitching attitudes; but—he remained dumb as an oyster. Finally I tore myself away in search of kindred spirits to share my rapture. A few spirits I found, but the bird I lost, and only one of the group succeeded in catching a brief glimpse of him as he flitted from the ground into a clump of bushes.

Relentless duty called me home. There I telephoned my discovery to Dr. Roberts and Mr. and Mrs. Swedenborg. The latter kindly called a number of members of the Audubon Society. They then hastened to the centre of excitement and were rewarded with a brief glimpse of the bird not far from the scene of his latest appearance. By the time I returned a group of eight or ten were scouring the landscape for a sight of that hooded warbler. At about half past three, when we had almost begun to lose hope, suddenly there he was, casually perched in the wire fence between our path and the cemetery, and now he was as confiding as before he had been suspicious. He paid so little heed to us and confined his activities to so small an area that we seated ourselves comfortably in a comical row on our little birding stools and were not obliged to leave them throughout the show which lasted for nearly an hour.

In appearance he was charming. His satiny black hood and cape were worn over cheeks and underparts so richly yellow that they blended perfectly with the dandelions among which he fed occasionally. He looked as small and jaunty as a northern yellowthroat. His beak seemed rather long with the lower mandible a bit heavy and almost as long as the upper mandible. His tail too was long and when spread like a redstart's was rounded with the white inner veins of its feathers flashing conspicuously, and it was never still. No tail, not even that of a wren or a blue-gray gnatcatcher, could be more expressive, and no bird could be more of a jolly little rascal.

His bursts of song were almost continuous. They were loud, rapid, musical, and emphatic dominating all other warbler songs in the vicinity. Frank Chapman's translation "You must come to the woods or you won't see me," seemed with this bird to be shortened to "You must come to the woods to see me" with the "me" sometimes omitted. There was a slight pause between phrases and the syllables were run together smoothly and very rapidly. Personally I like Mathew's **Cheree, cheree chi-de-ee**, with "a drop of the voice at the end of the song."

His feeding range extended from the ground to the lower branches of the smaller trees. He was incessantly active, incessantly tuneful, and incessantly bubbling over with the joy of living. If I can say such a thing of a bird, he impressed me as having considerable

character and very attractive personality.

As I have said, he stayed with us for almost an hour. Then suddenly he flew to the lowest branch of a large tree in the cemetery and vanished instantly and completely. Search as we would both that day and the next no one could find him again. He had favored us beyond our dreams, but when he was through he was through and there were no responses to encores.

Sad as we felt at losing him we could not complain for he had spared us nearly a day of his precious time and that when detouring from his regular route. Perhaps amid the marvelous waves of warblers that last spring brought to us here in Minneapolis, he had lost his bearing and had made a wrong turn to the west when his kind went east. But this did not seen to dampen his spirits in the least. He was a small packet of gaiety and confiding deference to our yearning wish to know him intimately. I hope he was rewarded by a safe passage to his nesting grounds, perhaps in southern Wisconsin or Michigan, and that there he found a mate worthy of his charms to aid him in successfully rearing a large family as joyous and beautiful as himself. *Minneapolis, Minnesota.*

Book Reviews

Kortright, Francis H. 1942. "The Ducks, Geese and Swans of North America." American Wildlife Institute, Washington, D. C. pp. i-vii; 1-476; illus. $4.50.

Mr. Kortright is described by the publishers as a sportsman who was dissatisfied with the available books on identifying waterfowl, especially in the fall, when the sportsman is most interested in them. The confusing plumages of this season are usually not illustrated in the average bird book, and often are inadequately described. In filling the gap which he felt existed in the literature on water fowl Mr. Kortright has done very well indeed. Certainly there is no other book available which is so well designed to help the sportsman identify his birds, and learn something about them. This book is of great value to every student of birds as well as to sportsman, because it includes the results of much research on waterfowl which was hitherto unavailable, at least in modestly priced volumes. Here are some of the contributions not readily accessible elsewhere:

1 - Methods for determining the age and sex of a specimen are summarized under the 9 headings known at present. The author has secured the aid of H. A. Hochbaum here, with his extensive studies on the plumages and cloacal morphology.

2 - Maps showing the present knowledge of distribution of all North American waterfowl are included. They are much more detailed and up to date than any such maps published previously, and are based on U. S. Fish and Wildlife Service records.

3 - A summary of the known weights of all species of American waterfowl occurs in an appendix. This will help to settle many an argument amongst sportsmen.

4 - The colored plates show more of the plumages than are available in color in any other book except the sumptuous and rare works by J. G. Millais on British ducks. The 36 color plates show juvenile, downy, winter, and autumn plumages for almost all species.

(Continued on Page 56)

Notes On An Expedition Into North And South Dakotas

By Wesley R. Hiller

In these days of gasoline rationing, shredded tires, and increasing taxes we are apt to lose sight of the beauties of nature. Nevertheless, last summer Monroe P. Killy and I made an expedition into the Dakota country to observe Indians, birds, and the out-of-doors. At 4 A.M. on June 23, 1942, we left Minneapolis for Ponsford, Minnesota to visit some of our Ojibwa friends. From thence to Fargo, we proceeded to Jamestown, North Dakota. Without stopping for dinner we pushed ahead north to Edmunds, which is not very far from Arrowwood Lake, where we expected to meet Harry L. Rognlie, the Refuge Manager of the Arrowwood and Chase Lake National Wildlife Refuges. When but a short distance out from Edmunds, we stopped by a large rush-covered roadside pond for our first observation of waterfowl on a large scale. Among those present were western and pied-billed grebes, mallard, pintail, blue-winged teal, shoveler, redhead, canvas back, ruddy duck and numerous coots, many with young. Practically all ducks seen were males except the ruddies. Driving a few more miles we entered the valley of Arrowwood Lake, and a short time later reached the lake itself which is really a widening of the James River. The water is impounded by a dam at the lower end of the lake. On a rocky island not far offshore, we viewed our first white pelicans—300 strong. The end of the island on which most of the pelicans were resting in the late rays of the sun was literally white. A few other birds were scattered here and there, some quite close to shore.

After a little search we found Mr. Rognlie, the Refuge Manager at Arrowwood Lake, who offered us a trip around the lake to observe birds and to chase pelicans for flight photographs. Before our outboard motor trip was complete, we skirted the entire lake, chased pelicans back and forth several times, and visited the dam at one end of the lake—a trip of about 40-50 miles. Leaving the dock in an outboard motor boat, we headed straight for the rocky island off-shore. When we were 75 yards from the island, the island suddenly seemed to take wing as a white cloud of pelicans rose into the air en masse. As the birds gained altitude they broke up into straight and diagonal lines some of which passed directly overhead. These huge white birds with black wing tips, their heads pulled in close to their bodies with their immense yellow bills pointing forward and their yellow feet pulled up close to the body, floated over us with slow, easy sweeps of their large wings. Harry Rognlie called these dignified looking senators of the air—dive bombers. The birds flew overhead at no great distance and then dropped onto the water feet lowered, with a splash, just beyond danger's point. As we caught up with them again, they rose rather slowly from the water, but soon gained momentum, until once again they were drifting about against a background of white and blue. We noticed that in arising from the surface their huge wings seemed to jerk them into the air, the tips of their feet still touching the water as though the birds were jumping. Through binoculars we noted that a few of the pelicans seem-

ed to be much larger than the rest. Some of the birds had the knob on the top of the bill while others did not. Some not yet fully mature, were gray on top of the head instead of immaculate white. In touring the lake we chased up several black-crowned night herons and a few pairs of baldpates. At all times the air was filled with the incessant chatter of herring and California gulls and Forster's and common terns. At several places along the shore, huge hawks dropped from their perches in dead trees and flew away. As evening approached we arrived at the dam where the pelicans spent their feeding hours fishing for minnows by merely scooping them up as they were washed over the dam. On Arrowwood Lake itself there is no breeding site for pelicans, but at Chase Lake, which we planned to visit on the morrow, there is a breeding site where pelicans have reared their young for many years past. Just off the back end of the boat a male ruddy duck appeared all spruced up in his wedding clothes and with the little dandy was his demure little female. They were feeding so close to the boat that their images blurred in the binoculars. As darkness was now upon us we motored back to the buildings to get directions for reaching Chase Lake to observe the nesting pelican colony.

After a night's rest in Jamestown we headed for Chase Lake northeast of Crystal Springs. We finally negotiated the covered wagon trail of six miles over virgin prairie and out onto a gravel point of the lake beyond which lay the pelican breeding island. But to our utter disgust the water was so much above normal that there was no chance to wade to the rocky island where about 900 pelicans were rearing their broods. We had to be content to watch them at a distance of 100 yards through the mist and light rain which had set in. Two patches of white on the rocks marked the areas where the birds were crouching low over their young and eggs in order to protect them from the rain. Not one pelican was in the air although avocets, gulls and terns rent the air with their screams. Along the shore we found the bones of dead pelicans and several dead shore birds and waterfowl. No fish are present in alkaline Chase Lake which is too shallow to carry them over winter. The pelicans must go to other water to feed.

Another interesting bird observed from the gravel point was the avocet—not one but many—a very obvious bird if any are in the neighborhood. Their oft-repeated sharp call note, large size, marked coloration of black, white, and pink, long upturned bill, and apparent lack of fear of man impressed them very definitely on my mind. About 75 avocets were seen. They seemed to be flying all about us and along the shore of the narrow point. Occasionally they alighted on the shore ahead of us, made a short run, and then flew low over the water. At one place three young avocets ran out into the water as far as possible and then swam; they were soon joined by their parent which flew low and dropped onto the water to swim with them. We wished to remain and observe the avocets, but rain forced us back to the highway and none too soon. The grass trail was the only thing that saved us from spending the night on the prairie, for in gumbo soil a car is quickly bogged down.

Along the highway towards Bismarck near Crystal Springs we drove past the edge of a small shallow alkali lake. The first evidence of water birds again were the avocets that hovered over the road and grassy slope above it. As the rain had slackened we scouted for more birds. On the lake itself we counted about 150 shovelers and pintails, all males, one western willet, (only one seen during entire trip), approximately

25 avocets, and two white pelicans flying past in their dignified manner. A train went by the opposite end of the lake and flushed two huge flocks of small sandpipers too high to identify. As we were ready to leave, a flock of 33 marbled godwits swept past and landed in the shallow water just off-shore. They were still feeding and wading unconcernedly 15 minutes later when we departed. Just outside Bismarck at the Menoken Indian Site we stopped long enough to see a male dickcissel on a fence and to identify a black-billed cuckoo that tried to hide in a clump of bush on the prairie.

In investigating the sites of old Mandan villages about Mandan and Bismarck, we saw our first lazuli buntings in the trees of a farmyard. Lark sparrows and field sparrows were also numerous. We had been hunting for about three hours among the plowed up ruins of an earth lodge when suddenly I discovered a small white, speckled object partially buried in a furrow. Picking it up and brushing off the dirt, I was surprised to see a small egg. Looking around, I saw another partly buried egg in an adjacent furrow. A few inches beyond lay an overturned grass nest alongside of which were two eggs still warm. About this time a lark sparrow was seen 15 feet from the nest. We departed to the other end of the field to await developments. In about 10 minutes the bird returned to the eggs, nestled them into her feathers, and settled down to incubate completely at ease. When we left the field an hour later, the bird was still sitting on the eggs on the bare ground. The overturned nest lay about four inches away.

Our next stop was Elbowoods on the Ft. Berthold Indian Reservation. Here we noted two turkey vultures feeding on a dead rabbit in the road; we stopped and watched the birds launch into the air and circle about in easy sailing flight. We saw lazuli buntings in numbers and plenty of magpies in the coulees on the reservation. The abundant arctic towhees, however, gave us our greatest thrill. During our stay on the reservation an arctic towhee woke us each morning with his song. One evening on the edge of town near a group of Hidatsa Indian cabins we paused to listen to the singing of about a dozen of these birds.

After leaving Elbowoods we traveled back towards Bismarck. On the way we stopped off above Dodge to visit the Schiltz brown flint or chalcedony quarries where the Indians secured flint for knives, scrapers, and projectile points. A few miles south of the quarries the Indians frequently stopped along a creek on a high point of ground to work their quarried flint into pieces which would be easier to bring back to camp. Hunting for specimens here we crossed the creek and explored along the top of a ridge. Suddenly Killy, who was behind me, called "Hurry up and look! I think we've found what you wanted to see!" I looked down the slope just in time to see a number of prairie dogs disappear into their burrows and to receive a scolding from the rest of the village. Near one hole we saw an adult and four half-grown young. As we walked about their town, which covered several acres in the pasture, the prairie dogs fartherest away would stay out and chirp at us while those nearby dove into their tunnels. When we got to the other end of the town, those dogs behind us were out scolding again. At this place we also saw two burrowing owls sitting on fence posts giving vent to their shudder-like calls. Later in the evening as we drove towards Mobridge, South Dakota, we saw about 50 short-eared owls flying from the road. It is probable that birds and gophers killed by cars during the day attracted these owls at dusk.

During our stop at Cheyenne Indian Agency we had a good opportunity to secure a few Teton Sioux names of birds. It was the fourth of July, and Mato Hota (Bear Roan) invited us to remain and paticipate in a dog feast given for his Indian friends. We accepted the chief's hospitality and stayed for the day. In the afternoon we visited with the Sioux men who attended the feast. As we sat in the shade of the cabin I asked the men the Sioux names of various common birds that we saw. As an aid to pronunciation of Sioux bird names the following table is given: *a* as in far; *c* as ch in chin; *e* as in they; *h* as ch in German ach; *i* as in machine; *n* a nasal sound nearly similar to *n* in ink; *s* as sh in she; *u* as oo in ooze; others same as in English. Red winged blackbird (wablu sa) shoulder red, referring to the red epaulets carried on the wings by the adult males. Horned lark, also called snowbird by the whites, (ista nica tanka) eyes, to have none of, big, in other words no eyes. Why the name no one knew. Lark bunting (wablu ska) shoulder white, referring to the large white wing-patches in the adult male. Whites call it summer black bird. Cow bird (wahpa hota) hang around stock, gray, due to its habit.

A complete list of the birds seen on our trip is given herewith: Pied-billed grebe, western grebe, white pelican, double crested cormorant, black-crowned night heron, bittern, mallard, baldpate, pintail, blue-winged teal, shoveler, redhead, canvas-back, ruddy duck, turkey vulture, marsh hawk, sparrow hawk, ruffed grouse, prairie chicken, sharptailed grouse, European partridge, pheasant, coot, piping plover, killdeer, avocet, upland plover, western willet, marbled godwit, Wilson's phalarope, herring gull, California gull, Franklin's gull, Forster's tern, common tern, black tern, mourning dove, black-billed cuckoo, burrowing owl, short-eared owl, nighthawk, flicker, red-headed woodpecker, kingbird, Arkansas kingbird, horned lark, barn swallow, crow, magpie, brown thrasher, robin, migrant shrike, red-eyed vireo, oven-bird (by note), northern yellow-thoat, bobolink, western meadowlark, yellow-headed blackbird, red-winged blackbird, Baltimore oriole, Brewer's blackbird, cowbird, dickcissel, goldfinch, arctic towhee, lark bunting, grasshopper sparrow, lark sparrow, field sparrow, chestnut-collored longspur, lazuli bunting. *Minneapolis, Minnesota.*

MAGAZINE ARTICLES THAT BIRD HOBBYISTS SHOULD READ

"A Modern Audubon in Mexico" by George Midsch Sutton, Natural History, Vol. L, No. 3, October, 1942, Illustrated.

At long last you can read from the printed page about the four-man Cornell University-Carleton College expedition to Mexico. Read about the Brown Jay with a curious little bag on its chest that is inflated with air when the bird screams, and makes a sound like a hiccup; the Green Jay that dislikes the owls; Merrill's Pauraque that looks a good deal like an owl; the courting of the Faisano or Mexican Curassow; the wild Muscovy Duck, as big as a goose; the gorgeous Alta Mira Orioles and the Hooded Orioles; the Coppery-tailed Trogan; the Ivory-billed Woodpecker; the Brown Woodhewer, and many others. You will find out, too, that painting and photographing birds isn't just a pleasure trip; it's 98 per cent perspiration. *Reviewed by Severena C. Holmberg, The Minneapolis Bird Club.*

NOTES OF INTEREST

THE SONG OF THE SWAMP ANGEL.—The voice of the hermit thrush or swamp angel as it is sometimes called, is not often heard, for it seldom sings on migration. During the nesting season when it sings a great deal, it dwells in the loveliest parts of our northern forests.

Last summer I spent the week beginning July 20, 1942 at Lutsen on the North Shore. It is a very promising place for the observation of warblers, thrushes, sparrows and other birds that migrate to northern Minnesota to nest. One day I walked some miles up an abandoned, grass-grown logging trail, which went through a dense forest where the pines grew so closely together that the sun's rays never touched the ground. Deer trails leading down to Lake Superior crossed the old road in many places. I saw several deer, and rounding a bend I was stunned almost breathless by coming upon an enormous moose. At least he looked enormous, I was that scared. He stepped quietly into the forest with an air that made me think that I was very small potatoes to him.

Near the top of a high hill the forest became more open and the trees were not all pines. Suddenly at some little distance a bird sang beautifully. It was a thrush and I knew it must be the hermit, for I am acquainted with the songs of the other thrushes. The tone had something of the pitch and quality of the wood thrush, but not so loud and ringing though clear. He sang in unhurried phrases, each phrase containing several notes, which were so sweet and mellow, one could imagine that fairy bells were ringing in the quietness of the woods. There were no other songs though I could see small birds flitting about feeding their young, too busy to sing.

I stood listening a long time, in the lovely day around me. The sun was brilliant in a clear sky and the cool pine-scented breeze flowed past me to shake the leaves of the birches on the top of the hill. It didn't seem real, that on this earth there could be a bird voice such as the one I was listening to. The realization came to me all at once that I hadn't seen the bird, and I must be sure that I was really listening to the hermit. I walked toward the sound, but the bird instantly stopped singing. I then went to the spot where I thought the bird should be, and sat on a log. The forest here was much more open; it had been cleared a long time ago. After nearly half an hour, I heard the song again, indescribably beautiful, serene and flutelike. It came nearer, I was afraid to breathe, and then I saw its author perched half way up on a birch. The thrush sang for some minutes before he flew away. It was the last hour of my stay at Lutsen; regretfully I found the trail and returned to the hotel, thankful that a glimpse of Heaven had been brought to me by the gloriously beautiful day, the quiet and friendly forest, and the voice of the swamp angel. **Mary Lupient, Minneapolis, Minnesota.**

RAVENS SEEN NEAR GRAND RAPIDS.—On July 10, 1942, on a small gravel road about 15 miles north of Grand Rapids, Minnesota, we saw three ravens feeding on a porcupine carcass. The birds flew when we were about 50 yards from them. They returned shortly and circled low above the road so that we were able to study them through binoculars. The rounded tail and the ruff of feathers

hanging from the throat were noted. Dr. T. S. Roberts (1932) credits Lawrence Loftstrom with seeing several ravens near Grand Rapids in August, 1915. **Arnold B. Erickson and C. Edward Carlson, Division Entomology, University Minnesota, and Division of Game and Fish, Minnesota Dept. Conservation.**

NOTES ON THE NESTING BARN SWALLOWS.—On August 4, 1942 the writer observed a nest of three nearly fully feathered young barn swallows at the Kilpela Farm, Palo, St. Louis Co. The nest was plastered on a low beam inside the barn. Near it was another nest but it was empty. Mrs. Anna Kilpela who had observed the swallows furnished the following information.

In early June the pair of swallows had repaired the nest of the previous summer. Three eggs were laid and incubated. While one parent was incubating and later caring for the young, the other parent built a new nest in which also three eggs were laid. These were incubated and hatched about the time the first brood was ready to leave the nest. The young seen by the writer were those of the second brood. It appears that the parent birds staggered their nesting duties to shorten the nesting period, and to mature the young earlier. **—Olga Lakela, Duluth, Minnesota.**

TRIPLE-DECKED NEST OF YELLOW WARBLER.—We first noticed the nest about June 1st. The female yellow warbler looked cozy and peaceful sitting on it almost completely concealed by the pink honeysuckle blossoms. The male was solicitous and helpful, and no one would have thought there had almost been a tragedy there a short while before.

The nest was so placed that it could be seen only from the house and was too high for us to look into until the painter came with his ladders and told us there were three baby birds. They left the nest June 29th and spent the day in the lower branches of some spruce trees learning to fly while their anxious parents watched over them.

It was not until a couple of weeks later we discovered the near tragedy. When looking at the nest we thought it was deeper than the average yellow warbler nest, and on investigation found it was a two story nest with a cowbird's egg on the lower floor. Later another examination revealed that it was a three story nest with a cowbird's egg in the second story also.

The nest has been placed in the Duluth State Teacher College nest collection. **Hulda R. Adams, Duluth, Minnesota.**

FALL BIRD NOTES FROM LESTER PARK.—After a summer which was much cooler than normal with much cloudy wet weather, there was a killing frost on September 22, 13 days earlier than average and 33 days earlier than in 1941, according to official weather reports. After the cold snap in late September, we had beautiful weather for three weeks, with a maximum temperature in the 60's and 70's and minimums in the high 30's and 40's.

On Sunday, October 25, we awoke to find snow on the ground. During the late afternoon it snowed and blew hard and the streets were icy. I had several reports of geese flying over during the day but was not fortunate enough to see them myself. Some of these were reported to have been snow geese.

During the afternoon of October 26, with snow still on the ground, and a hard wind blowing, I went to Lester Park. This is a natural park quite heavily wooded with spruce, balsam, white cedar, white pine, birch, poplar, and mountain

ash and contains the lower parts of both the East and West branches of the Lester River, which empties into Lake Superior just below the Park. In the park, I saw 21 species of birds, many of them apparently having sought shelter there from the storm. Many hawks (Buteos) were flying. Of these I identified only the red-tailed and the broad-winged. There were flocks of crows, chickadees, robins, bluebirds, golden-crowned kinglets, rusty blackbirds, purple finches, pine siskins, juncos, and fox sparrows. I also saw one partridge, several herring gulls, some bluejays, one shrike, two tree sparrows, three downies, and much to my surprise, a female redstart, an olive-blacked thrush, which I identified by the light eye ring, and another bird, which I am quite sure was a wood thrush. When I first saw it I thought it was a fox sparrow, but I noticed that it did not have a gray cheek. I had only a glimpse then, but later I had a good look at it. It was larger than the olive-backed, had a more heavily spotted breast, a red-brown head and back and was more robin-like in general appearance than the other thrushes, but was smaller than a robin. I have never seen a wood thrush before. It is quite a rarity for Duluth. I went to the park the next morning hoping to see it again, but I did not see either it or the redstart. The olive-backed thrush was still around, and in addition to seeing most of the birds I had seen the day before, I saw a red-breasted nuthatch, a pin grosbeak (male) and four Lapland longspurs.

On October 29, Mrs. Wernowsky and I saw flocks of robins, bluebirds, juncos, fox sparrows, purple finches, and cedar waxwings. On November 6, and again on November 7, I saw my first red crossbills. They were feeding on the seeds of the white pine cones.

Some late dates for migrants include a blackduck on November 15; brown creeper, November 11; robins, November 13; bluebirds, November 22; golden and ruby crowned kinglets, November 11; cedar waxwings, November 16. Some of our winter residents arrived quite early. Among them were the Bohemiam waxwings, November 12; evening grosbeaks, October 12; and pine grosbeaks, October 27.

A golden-crowned kinglet was seen again on December 6, by Miss Mary Elwell in the Park. Since then it has come quite regularly to feed on some suet tied to a tree in the Park. While taking the Christmas bird census, Richard Bateman saw two seven miles north of Duluth and Dr. Lakela saw one, and perhaps two, at Fond du Lac on January 1, 1943. The fact that they have been seen over a wide area may indicate that they are a more common winter resident than is generally supposed.

We are starting the winter with an abundance of Mountain Ash beeries, seeds of the spruce, pine, and white cedar. The winter birds should find plenty to eat, unless the food is eaten by the large flocks of starlings which have been around lately. —**Mrs Walter C. Olin, Duluth, Minnesota**

A STUDY OF POPULATIONS IN A MARSH BIRD COMMUNITY.—The pioneer conditions of a developing plant community on Oatka Beach Addition on Minnesota Point, Duluth were made clear by Dr. Olga Lakela, **Ecology** 20: 544-552. 1939. In correlation a study of the animal life, notably the birds, in the same area was presented by the author in *The Flicker* 10 (3,4): 1-3. 1938. Since populations in new areas are subject to changes it was deemed desirable to follow the preliminary study by continued observations and to place them on record.

The author's interest in Oatka Beach bird life carries through the last five years. There has been a drastic decline in populations. The nests of the red-

winged blackbird were reduced from 69 to nine; those of Sora rail, from seven to two in 1940, its last known occurrence in the community. Virginia rail nests appeared only in 1938. Black terns first appeared in 1940 with one nest of two eggs. Due to the density of the vegetation it became impractical to follow the records of song sparrows and yellow warblers. As the open places on the beach were over-run with willows, the killdeer and spotted sandpiper deserted the community.

Data for each year are presented below:

1938. See *The Flicker* loc, cit.

1939. Red-winged blackbird with 57 nests, 199 eggs and young; sora, 2 nests, 19 eggs; song sparrow 1 nest, 4 eggs. Muskrat houses appeared in the area for the first time to compete with the numerous meadow mice.

1940. Red-winged blackbird, 28 nests with 98 eggs and young; sora, 2 nests with 6 eggs and 3 young; spotted sandpiper, 1 nest with four eggs; black tern, 1 nest with 2 eggs; yellow warbler, nest of 2 eggs plus 2 cowbird's eggs. One egg of each species hatched; the young yellow warbler met the usual fate, being trampled to death by the cowbird young. A noticeable increase in muskrat houses.

1941. The area was nearly dry due to the control of the water supply at the St. Louis River Dam. However, on June 9, 27 nests of the red-winged blackbird, with 44 eggs plus 4 cowbird's eggs and 32 young were counted. No other species nesting in the area were observed.

1942. The fluctuating water level and erosion by wave action are causing many changes in the character of the marsh. The willows are dominating the cat-tails. Leafy bulrushes and marsh grasses are also supplanting the cat-tails. Perhaps due to the lack of suitable nesting sites the red-winged blackbirds preferred to go elsewhere. Only 9 nests were observed. On June 29, they were empty, except one with 3 eggs; and another with one feathered young. Off the nests were observed 8 young. A pair of blue-winged teal was flushed from the marsh but no nest could be found. The higher waterlevel of 1942 may have a pronounced effect on the plant and animal life of the community in another year. —**Casimir S. Hero, Duluth, Minnesota.**

THE CHICKADEES BUILD A NEST.—Legally speaking, it was an Act of God that was the real beginning of my story. One night late in the fall of 1941, a bitter cold rain soaked the garden. By morning everything was covered with ice as the temperature had dropped during the night to below freezing. Wires sagged with the weight of the ice, and trees gradually bowed nearly to the ground. We were wakened by the sound of wires snapping and trees crashing. The garden was fairyland, and while we exclaimed about its beauty, a birch tree could stand the burden of ice no longer and fell with a crash, leaving a stump about four feet high. In the spring before Louie, the gardener, had found time to take out the stump, the most amazing thing happened.

One day Dad came in to ask what in the world the chickadees were doing around that stump. We went to the window to see, and there they were taking little particle of pulp in their bills and flying away. This continued from dawn to dark for about ten days. When they had time to eat was a mystery to us. Louie was careful not to disturb them and was as interested in the industrious little fellows as we were. Then for a couple of days we did not see them at all. On the third

day, thinking they were either through with their excavating project or that something had happened to them, Dad decided to investigate. He came hurrying in to tell me that they had made a hole in the stump so deep that he couldn't see the bottom, and if that were going to be their nest, Mrs. Chickadee would drown in the first rain storm. There were no overhanging branches to protect the hole, and he thought seriously of putting a roof on the stump. My curiosity finally got the best of me so I went to look too.

The top of the stump was about seven inches in diameter. The hole appeared to start in the center and slope toward the side nearest the house. I put my face near the top of the hole to try to see the bottom; but just as I moved to one side to get the light on the hole, I saw a shiny eye looking up at me. Then a hissing sound frightened me so much that I nearly knocked the stump over in my haste to move away. Hearing a chickadee call, I looked up and there on the nearest tree sat Mr. chickee. He burst into song. You see, we were old friends; all winter I had fed him and he had learned to call if the food was all gone when he came to the feeding station. Surely, I thought, if he is sitting there watching that hole, Mrs. Chickadee must have been the snake that hissed at me.

Time passed, and as usual in the spring we had rain. In spite of Dad's willingness to build a roof for the stump, we were afraid the little chickadee would not appreciate it, so many days she must have been very wet. Next we had hot weather which we were sure would be much worse. But then there was more activity around the stump. Mr. Chickadee began pecking on the outside nearest the house, and soon we could see that he had made a perfect circle about eight inches from the top. He removed layer after layer of bark, and finally he stopped. From a distance we could see that there was another layer left, so once again we investigated. There was a layer of bark there, but it was full of little ventilating holes. Now we were satisfied that Mrs. Chickadee wouldn't suffocate.

Our next worry was how the babies were going to fly up to get out of the nest. We needn't have worried; after all the Chickadees had been smarter than we all the time. On day the hole on the side of the stump was finished, and the babies had gone away. —**Julia H. Lenning, Duluth, Minnesota.**

THE FRED A. BARKER COLLECTION OF BIRDS—Recently I had the interesting experience of trying to classify the series of 42 red-tailed hawks from this collection. There is an endless variation in color from very light, almost white, immature birds, to individuals that are almost all black with no white in the plumage. For comparison there were 3 western red-tails from California, and one from Fairmont, North Dakota.

The series is made up of 27 adult birds and 15 immatures. It is impossible to draw any distinct line between the birds and all the borderline cases have been referred to the common or eastern red-tail. Taking the dark color and mottled tail as characteristic of the Harlan's hawk and the reddish-brown color with barred tibial flags and tail as characteristic of the western red-tail, the birds were classified as follows: Western red-tail, 6 specimens including 3 from California and 1 from North Dakota; Harlan's Hawk, 2 specimens; eastern red-tail, 34 specimens. Among the birds classed as eastern red-tails are three light colored immature birds which may be Krider's hawks, although they certainly are not typical.

A large series of horned owls and horned larks are also included in this collection. In each case they show great variation in color. One would be tempted to divide them into their subspecies yet there are many intermediate forms present. It is hardly possible to determine where one species ends and another begins. When looking at them one wonders to what extent the factors of heredity determine the color variations and to what extent the variations are due to the environment.

Professor George W. Friedrich of the St. Cloud State Teachers College acquired the Fred A. Barker Collection of birds in March, 1941. It consists of about 1700 birds' skins and mounts. The major portion was collected by Mr. Baker in Ottertail County, Minnesota. Other birds were taken in western America, Alaska, Mexico, South America, Africa and Great Britain. A limited number of the skins and mounts are being sold by Professor Friedrich at very nominal prices for classroom and museum purposes in high schools, colleges, and universities.—**Walter F. Fischer, St. Cloud Teachers College, St. Cloud, Minn.**

DUCK HAWK STRIKES DECOYS.—While I was hunting ducks with Francais Leekley on the Mississippi River just south of Wabasha on the opening day of the season, September 26, 1942, a duck hawk struck one of our wooden decoys. He rose about 100 feet and stooped twice more, but did not come within three feet of the decoys either time. After the third stoop, I fired three shots into the air to scare the hawk. Although the shots drove him away, he appeared to go reluctantly, and did not hurry or try to gain altitude as hawks usually do when they hear a gun. —**James A. Struthers, Mpls., Minn.**

NOTES ON THE DISTRIBUTION OF THE WESTERN GREBE IN MINNESOTA—While making waterfowl brood counts in Minnesota during 1941 and 1942, what may be an eastward extension of the breeding range of the western grebe was observed. On July 31, 1941, four adults and two young were seen on Lake Christina, Douglas County. According to Fred Johnson, game warden, this was the first time he had ever seen this grebe on Christina in over 40 years. This was the only lake, other than Mud Lake, Traverse County, on which this species of grebe was found last year.

During the summer of 1942, another brood count was conducted and the western grebe was evidently nesting on four lakes in the state: Mud Lake, Traverse County; Lake Christina, Douglas County, Mud Lake National Wildlife Refuge and on the Thief Lake Refuge, both in Marshall County. All of these lakes apparently have certain things in common. They are all large, shallow, open bodies of water with a moderate amount of emergent and a large amount of submerged vegetation.

It is hoped that this is a true extension of this bird's breeding range, for the beautiful western grebe is a welcome addition to the bird life on the more easterly of the prairie lakes.—**J. Donald Smith, Division of Game and Fish, St. Paul.**

ADOPTION OF BROWNIE—On the morning of July 1, 1942, the members of the Ornithology Class of the Duluth State Teachers College found a deserted baby brown thrasher on the Skyline Parkway, shivering in the shelter of a boulder and calling ravenously. To still its cries members of the class procured earthworms which were eagerly accepted.

A pair of nestling brown thrashers had been observed at Enger Tower picnic grounds some two miles distant. After a brief consultation it was decided to offer the supposedly orphaned young to this pair for adoption. On our return to Enger Tower, the young was placed on a picnic table. Its chirping soon attracted the nesting pair from the underbrush. Each adult bird lighted on the table to look over the chirping young, in a sort of silent wonder. A few moments passed; the breathless audience watched, waited and hoped for some sign of avian altruism, but in vain. The prospective foster parents soon disappeared into the underbrush, without further interest in the abandoned young, although they were carrying food to their own young. It was later found that there was a considerable difference between the ages of the birds' own young and the orphaned bird. After this experiment, there was no alternative. The members of the class adopted the bird, and it was brought to the college. During the day earthworms were fed to the bird, two or three being required every fifteen or twenty minutes in order to still its hunger cries. At night it slept with its head tucked under a wing, but as soon as daylight entered the room, the little bird began its hungry chirping. It was fed at five, six, and seven o'clock, and at eight thirty it was taken to school. Each member of the class made donations of earthworms to help feed the bird. We named it Brownie, and placed it in a cage with a leafy branch for a perch. A change in growth of feathers was noticeable after the first day, and on July 2, the bird weighed 42.5 grams. As each day progressed, its tail became longer and its wing bars more distinct.

Thrashers belong to the family Mimidae and are frequently called the mocking birds of the north due to their ability as singers and mimics. Our bird's vocalization was full of promise until July 6, when it contracted a cold and became silent. Its chirps were only whispers. At this time we added flies, other insects, and halibut liver oil to its diet of earthworms. Although its feathers seemed to develop normally, it remained silent. On July 7, its weight dropped to 35 grams, increased to 38.6 grams on July 9, and then dropped a gram the next day. On July 11, it lost its desire for food and died without recovering its voice. **—Gertrude Dole, Duluth, Minnesota.**

Bird Study and the War

An Editorial

The question has arisen in the minds of many of us during the past year, whether one is justified in continuing his study and interest of birds during the war period. It is often quite hard to see how ornithological pursuits can even be justified while the country is engaged in a all-out effort toward winning the war. One could say with much truth that such activities have a zero rating in furnishing training and materials to bring defeat to Hitler and his partners. The job clearly before us is to kill and kill more and ever more of our enemies. It is by this process alone that we can hope to achieve our ends in this great conflict.

While wholesale destruction of human life is both necessary and unavoidable, belief in the worth-whileness of all living things must still be cultivated in the hearts of this and coming generations. Here the lover of animal and bird life can make his best contribution. Students of conservation and professional men, too, have been perturbed over the relative unimportance of their work during the war period. The necessary haste and unprecedented use to which our resources are put seem often to negate many of the better principles for which conservationists have long fought. Our obligation is clear and definite; we must keep the torch of the sanctity of life burning, though feebly, and pass it to the next generation even as the Arabians, Turks, and priests of the monasteries did the spirit of learing during the troublous periods of the Middle Ages.

With our thoughts reverting continually to the great world conflict and our efforts as civilians to take part in the winning of it, we get a better perspective if occasionally we follow a lane that leads to a flock of red polls. Nothing puts the will to do into a person as does the courageous singing of a chickadee on a blustery winter day. Watching a bird in flight takes nothing from the war effort, yet it strengthens our spirit of persistence. One can work all day at the local Red Cross rooms and on the way home be cheered by a tiny flock of juncos or the tap-tap-tap of a downy woodpecker. Unaware almost of its cause, our morale is lifted. We need optimism, faith, courage and hope for the present and future. Association now and then with members of the feathered tribe will boost waning spirits and give courage to see the war through to a successful conclusion. —George W. Friedrich, St. Cloud, Minnesota.

The St. Cloud City Bird Club meets regularly each month at the Central Junior High School. Films of bird life from the Museum of Natural History, University of Minnesota, were shown on January 13. *Films from the Minnesota Department of Conservation which depict the life of Minnesota birds will be shown at the February meeting.* —Mrs. A. J. Trainor

Book Reviews

(Continued from Page 48)

5 - The wings of water fowl form a very valuable basis for identification, and the color plates show the spread wing of each species, an unusually valuable feature.

The line drawings, of which there are 214, illustrate a great many features far better than words could do. Many characteristics of habit, form, and coloration, become very real in these fine drawings. A great many details are illustrated which are not shown so well in any other publication. The colored plates and the line drawing as well, both by T. M. Shortt, are a very important contribution to the book's success.

There are omissions which each reader will decry, perhaps, but if it is admitted that one small book can not cover as large a group as waterfowl completely, and that this work is primarily an aid to the identification of waterfowl, in all plumages, these omissions will seem insignificant. It is not a treatise on conservation or management of waterfowl. If it were, the sections on botulism, lead poisoning, and other mortality factors would need considerable enlargement. I note a number of omissions from the bibliography including Roberts' "Birds of Minnesota", Phillips & Lincoln's "American Waterfowl", and the "Handbook of British Birds" which must have been unintentional. The binding of the volume is not worthy of the laudable quality of the text and illustrations. But with all these minor faults the book is assured of being the most practical volume available to the duck hunter who wishes to know his birds, and something about them. The bird student and general wildlife student, too, will find it an necessity. Publishers, author, and artist are all to be congratulated on the appearance of this book. —*Gustav Swanson, Division of Entomology, University of Minnesota.*

"Bird Sanctuary in a Metropolis" by Khyber Forrester, **Travel**, Vol. 78, No. 5, March, 1942, Illustrated.

An interesting article on the Biological Survey's bird banding station at Lake Merritt in the heart of the city of Oakland, California, where 1000's of ducks spend the winter. Bands have been sent back by duck hunters all the way from Alaska to British Honduras. Some have been found on strings around the necks of Indians in Mexico; after eating the ducks they used the bands to make personal ornaments. —*Reviewed by Severena C. Holmberg, The Minneapolis Bird Club.*

Minnesota Ornithologists' Union
Affiliated Societies

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Meetings are held the first Friday of each month at 2:00 p.m. at the Walker Branch Library. Field Trips during April and May on Tuesdays, Wednesdays, and Fridays.

MINNEAPOLIS BIRD CLUB

Officers: President, Miss Severena C. Holmberg; Vice-President, John S. D. Clark; Treasurer, Miss Helen Towle; Secretary, Miss Amy Chambers.

Meetings are held the first and third Tuesdays of each month at 7:30 p.m. at the Minnneapolis Public Library.

MINNESOTA BIRD CLUB

Officers: President, Arnold B. Erickson; Vice-President, Kenneth Carlander; Secretary-Treasurer, W. J. Breckenridge.

Meetings are held the second Thursday of each month, except in June, July, August, and September, at 8:00 p.m. at the Minnesota Museum of Natural History.

T. S. ROBERTS ORNITHOLOGICAL CLUB

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Meetings are held bi-monthly during February, March, April, and May, at the St. Cloud State Teachers College.