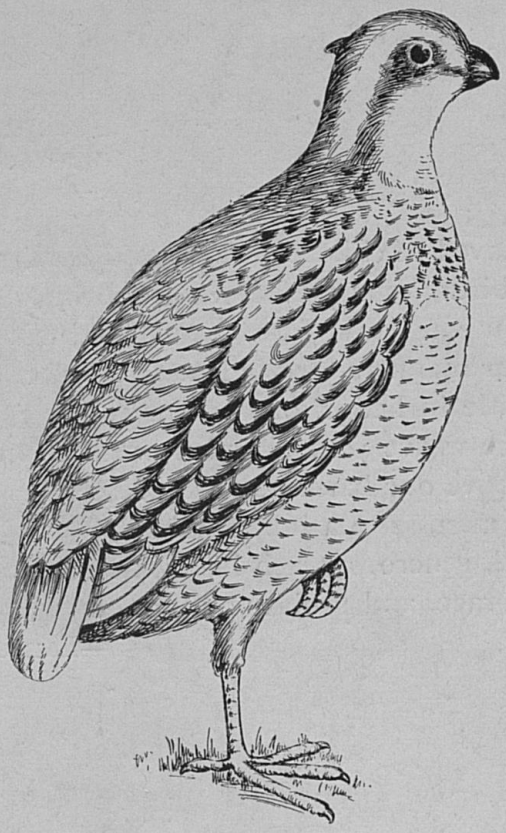
Suggestions for Bird Study For 4-H Clubs

CIRCULAR NO. 328



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Beloved of children, bards and Spring,
O birds, your perfect virtues bring,
Your song, your forms, your rhythmic flight
Your manners for the heart's delight,
Nestle in hedge, or barn or roof,
Here weave your chamber weather-proof,
Forgive our harms, and condescend
To man, as to a lubber friend,
And, generous, teach his awkward race
Courage, and probity and grace.

—EMERSON.

Circular No. 328

SUGGESTIONS FOR BIRD STUDY FOR 4-H CLUBS*

By W. D. FUNKHOUSER

KENTUCKY'S HERITAGE

A citizen of Kentucky, visiting in Europe, who shows an interest in birds, is likely to be greeted with the exclamation "Ah! You are from Kentucky. Then you have of course visited Henderson and Shelbyville and the Green River Valley, and you can tell us about Audubon and Wilson and Rafinesque!" Sometimes it is embarrassing for a Kentuckian to be forced to admit that he is not so familiar as he might be with those parts of the State which have been made famous thru their bird lore and does not know as much as he should about the great naturalists whose works in Kentucky have attracted so much interest thruout the world.

4-H Club members who begin the study of Kentucky birds will find not only that this is a wonderful state in which to carry on such a study but that much of the ornithological literature of the United States is based on the early work of pioneer bird students in this region and an appreciation of this fact will do much to stimulate interest in the subject and increase our justifiable pride in the part which Kentucky has played in American ornithology.

Kentucky's heritage in ornithology is indeed rich and it is unfortunate that more attention has not been paid to the fascinating background on which our more recent bird study is projected. This is particularly true in the case of John James Audubon, that best known and most beloved of all bird students, after whom hundreds of bird clubs have been named and who will always stand as Kentucky's pioneer in ornithology.

Audubon's life and work in the Ohio River Valley and particularly in Henderson and Louisville make up one of the most romantic and picturesque of all of the chapters in the annals of Kentucky's early days. His life, a curious blending of comedy and tragedy; his work, heroic and yet pathetic; his successes and failures; his loves

* Prepared under the direction of H. C. Brown for the use of the 4-H Clubs of Kentucky.

and his characteristic prejudices; all make a drama of unusual interest.

Until comparatively recent years the early life of Audubon was surrounded with mystery. Conflicting dates of his birth, rival claims as to his birthplace, speculations as to his parentage and early training, were common subjects of discussion and controversy. It was only with the careful and painstaking investigations of Professor Herrick that these questions were finally solved. Professor Herrick has apparently established the fact that Audubon was not born in New Orleans as tradition has assumed, but in San Domingo, and that he was the natural son of Jean Audubon, a Spaniard, and a woman known only by the name of "Mlle. Rabin," a creole of Santo Domingo. He was born on April 26, 1785, and the bill of the physician, Dr. Sanson of Les Cayes, who assisted at young Audubon's birth, has proved to be a highly interesting historical document. This bill, written and receipted in the doctor's own hand, and approved and signed by Audubon's father is rich in unique items, not the least of which is the primitive materia medica recorded. Most illuminating are the items referring to the nights of April twenty-fourth and twenty-fifth which the physician spent at Mlle. Rabin's bedside, and to the birth of her child on the twenty-sixth.

The story of Audubon's school days in France, his indulgent stepmother and the development of his love of nature are biographical treasures; his first visit to the United States, his "Mill Grove" experiences, his business ventures in New York, and his marriage to Lucy Blakewell, are matters of American history; his subsequent life in Louisville and later in Henderson, his erratic and usually unsuccessful attempts at business, his imprisonment for debt, his perseverance with his ornithological work in the face of discouragements and difficulties, and his final success—all interwoven as it is with the romance of the Ohio River a century ago—this is Kentucky's own story.

In a brief study outline it is impossible to do more than merely suggest some of the more interesting of the topics available for study in connection with Audubon's life, but it is believed that these topics are well worth the consideration of Kentucky students.

Hardly less interesting is the story of America's first real ornithologist, Alexander Wilson, since his contribution to the knowl-

edge of Kentucky birds cannot be ignored. The record of this Scotch weaver, itinerant peddler, poet and socialist, who wandered alone thru Kentucky, visiting Louisville, Shelbyville, Frankfort and Lexington, everywhere noting and recording the birds, is a remarkable chapter in the volume of scientific explorations of our country.

Wilson wrote the first real textbook on birds in this country. This was his "American Ornithology" published in 1810. It was Wilson who stood on the banks of Benson Creek near Frankfort and watched the multitudes of passenger pigeons flying overhead, and tried to estimate their numbers and the amount of food which they would require. It was Wilson, also, who first called the attention of the Europeans to the fact that the birds of the New World were the most beautiful and the most interesting of any in the world—and much of his information was secured in Kentucky.

Nor can the name of Rafinesque be disassociated from the names of Audubon and Wilson in this connection. The visit of the "Eccentric Naturalist" to Henderson and his discussions with Audubon have given rise to the popular story of the "odd fish" which may be fictitious but is certainly suggestive of the relationship between the two men. Rafinesque's professorship at Transylvania, his quarrel with its president and trustees, his writings and his ardent love of science, his vagaries and "inventions," his sad end, singular will, the ruthless disposition of his effects, as well as his final recognition by Kentuckians, are all a part of the history of this State.

Rafinesque was a contemporary of Audubon and Wilson. He spent most of his time in Lexington. While a professor at Transylvania he made many trips to little known parts of the State, collecting specimens and making interesting observations on the plants, animals and ecology of the area, the results of which he published in curious, out-of-the-way places. He even commented on the evidences of prehistoric life which he found and one of his "lost sites" was recently rediscovered in Logan County after over a hundred years. He died in poverty in Philadelphia but his remains now repose at Transylvania College.

Students of bird life in Kentucky have a wonderful heritage. May we more fully appreciate it.

KENTUCKY AS A BIRD REGION

The citizens of Kentucky may well be proud, not only of the heritage in ornithological research left them by such pioneers as Audubon, Wilson, and Rafinesque, but of the wonderful bird life represented within our boundaries.

It is difficult for us, who have been accustomed to seeing our birds all of our lives, to realize that we have the real songbirds of the world. Those persons who have read the beautiful descriptions of the skylark in poetry, song and story are usually much disappointed when they actually hear the bird for the first time; the nightingale has a great reputation for its voice but it is not in the class as singer with many of our thrushes and sparrows; in the tropical forests the brightly colored birds flash among the branches in gorgeous beauty, but no sound is heard save the occasional raucous squawk of a parrot. The really beautiful bird voices are in North America. Because we are so familiar with our birds and take them for granted, we are often surprised to hear foreigners express their amazement at our wealth of feathered musicians and the fact that we have not done more boasting about them.

The New World has the finest birds on earth; the United States has the finest birds in the New World; Kentucky has the finest birds in the United States; look for yourselves and see.

As a bird region Kentucky enjoys a most fortunate position geographically. Ornithologists divide the United States into five faunal zones, each having rather distinct types of bird life. Kentucky is so located that three of these faunal areas are represented in the State. Most of the State lies within the Upper Austral zone which includes the great northern area from Pennsylvania to Nebraska and from North Carolina to Kansas. Our eastern mountains, however, are part of the Transition zone, a faunal extension southward along the Appalachian range from the Canadian region, and in our mountains may be found birds not seen in other parts of the State. The southeastern corner of the State is well within the Lower Austral zone which extends northward from Louisiana, Mississippi and Tennessee. Thus within our State may be found birds representing three distinct faunal areas.

Not only this, but Kentucky represents a branching of the great

thorofare which the birds use in their migrations from the south. On the great migration routes followed by the birds in their journey from north to south and from south to north across the United States, one of the most important is the great Mississippi Valley highway. As the birds come up this thorofare from the south in the spring they stay largely together until they reach Kentucky. Then some continue northward into Ohio, Indiana and Illinois, many on their way to Canada. Others leave the main line of migration when they reach this State and go eastward and northward across the mountains to their summer homes in Pennsylvania, New York and the New England States. Still others discontinue their long journey when they have reached the sunshine of old Kentucky and remain with us as our guests for the summer. The bird student of Kentucky is therefore most fortunate in that he has the advantage of being in a most desirable region for observing a large number of the species of birds of eastern United States.

Kentucky lacks the sea birds and therefore our State list of birds is not as large as those of the states which border on the ocean, but our list of inland birds is unusually large.

Moreover, Kentucky is varied in its physiographical conditions. The Eastern Mountains the Bluegrass, the Knobs, the Western Coal Field, the Cavernous Limestone Area, the Purchase, the River Valleys and the interesting region between the Tennessee and Cumberland Rivers, sometimes called the "Coalings," are distinct not only geologically but physiographically and offer a wide variety of habitats for bird life so that many species of birds, each searching for conditions suitable to its own peculiar instincts and habits, may find satisfactory sites for homes and abundant food and protection within our boundaries.

The Eastern Highlands include the mountains and the conglomerate outcrops at their bases. This region represents the roughest and the most inaccessible portions of the State. Much of it is still quite primeval in character and is a paradise for migrating birds, especially the warblers. Here the forests provide homes and food for many of our permanent residents and here may yet be found an occasional wild turkey, grouse and pileated woodpecker in addition to multitudes of other forest-loving species.

The Coalings is a name locally applied to that very interesting strip of country between the Cumberland and Tennessee Rivers on account of the fact that at one time large amounts of timber were cut from this tract to supply wood for charcoal. It is rough, sparsely populated, has natural river barriers on both sides and furnishes excellent cover for game birds. The wild turkey still persists in this area which is destined, we hope, to become a beautiful State bird and game preserve.

The River Valleys are *par excellence* the home of birds because of the rich floral zones at the water's edge and because in many places the river banks are too high and precipitous to permit of cultivation and as a result are thickly covered with wild vegetation. We have secured more bird records in river valleys than in any other parts of the State.

The Purchase is the name given to the southwestern part of the State lying west of the Tennessee River. It is the most distinct faunal area in Kentucky and is quite different from other parts of the State in its geology and physiography. It is extremely interesting in having bird life which is characteristic of the lower Mississippi Valley. It is low in elevation and at its southern edge is Reelfoot Lake which is the best place in this area to study waterfowl.

The Southwestern Plateau includes all of Kentucky west of the Knobs and Mountains to the Cumberland River. It has no distinct natural faunal barriers within its boundaries and its bird life is very diversified. It is probably the best area in the State for quail and other gallinaceous forms. Part of this region has a very interesting history because in early days it was known as the "Barrens" on account of its lack of trees.

The Knobs extend in a semicircle around the Bluegrass and the country is in general rough, with considerable second-growth timber. It is a good bird region.

The Bluegrass is an intensively cultivated and thickly populated region in the north central part of the State which is the least interesting and least important of all of our faunal areas. Practically all of the forests have been destroyed, the native vegetation is almost gone and nothing is left to attract the birds. It is the poorest bird region in Kentucky.

ECONOMIC IMPORTANCE OF BIRDS

Many students of birds enjoy their studies purely because of the love which they have for their feathered friends. And it is well worth while for us to study the birds and attempt to keep them with us if it is only for their beauty, their music, and the joy which they bring into our lives. The value of our birds, however, is due to more than a mere ethical consideration and the scientific ornithologist regards them with great favor for a far more practical reason than that of sentiment. He considers them from the cold-blooded, economic standpoint of dollars and cents, and bases their worth on the way in which they affect our pocketbooks. Indeed, it is this aspect of bird values which gives us the greatest respect for their importance and is the chief incentive for bird study.

Undoubtedly the worst enemies of the farmer under modern agricultural conditions are the insects. The damage done by insect pests in this country is enormous and the figures given by entomologists as to the loss of crops from this source are startling. The gardener must be eternally vigilant if he expects a reward for his labors; the horticulturist must never relax his warfare on bug and beetle, on caterpillar and grub, if he would have the fruit in its season; the farmer must forever combat moth and army-worm, Hessian-fly and chinch bug, weevil and web-worm, if he would provide us with food; the florist is never free from the attacks of insect enemies.

It is estimated by reliable authorities that we lose every year, in the United States alone, over two billion dollars on account of the ravages of various crop-destroying and other insects. Over two hundred million dollars of damage is done to cereal crops alone, largely by the Hessian fly and grain louse on wheat and the chinch bug on corn; bugs, grubs and web-worms destroy over fifty million dollars' worth of hay; the boll weevil is responsible for a sixty million dollar loss in cotton; the tobacco worm costs us over five million dollars; truck crops suffer to the extent of about fifty million dollars; sugar is damaged to the extent of five million dollars; over twenty-five million dollars' worth of fruit is lost; farm woodlands are damaged to the extent of ten millions of dollars; nearly two hundred million dollars' worth of animal products are ruined; forest and forest products are destroyed to the amount of

one hundred million dollars; products in storage are reduced in value one hundred million dollars; the loss in miscellaneous crops is almost beyond computation—and these figures represent only the loss in *one year* in *this country* alone. Year after year the reports are the same.

Such figures are, of course, entirely beyond the easy comprehension of most of us, who do not count our dollars in millions and billions, yet they mean that we pay more to feed our bugs, caterpillars, beetles, grasshoppers, scale-insects, plant-lice, weevils and cutworms than we do to keep up our entire school system. They mean that we could pay our entire national debt in a comparatively short time with the money we lose on account of insect pests. Entomologists are constantly in greater and greater demand. Yearly the farmer pays more for chemicals, spraying machinery and labor, and the end is not yet. This problem is very serious in Kentucky where agriculture plays so prominent a part in the life of the people.

Our easiest solution of the problem is to encourage the natural enemies of the insects, especially when these enemies of the insects are the best friends of man. Foremost among these friends are our birds. The number of insects eaten by birds and the number of insect pests fed to the young birds during the nesting season is enormous. In the study of the stomach contents of birds it has been found, for example, that the stomach of one cedar-waxwing contained one hundred canker-worms; the stomach of a rain-crow contained over two hundred caterpillars; one chickadee had eaten nearly five hundred plant lice; one nighthawk had taken sixty grasshoppers at one meal; and one flicker had devoured a thousand chinchbugs. When it is remembered that digestion in birds is very rapid, it will be realized that the number of insects found in the stomach at any one time represents only a small proportion of the daily ration. One scarlet tanager has been seen to eat 630 gypsy-moth caterpillars in 18 minutes—or at the rate of over 2,000 an hour; one Maryland yellow-throat was found to eat 3,500 plant lice in 50 minutes; the breakfast of a wren consists of a most surprising collection of caterpillars, bugs, flies, beetles and grasshoppers.

We need much more information on this subject and one of the most important contributions which 4-H Club members could

make to our knowledge of the value of birds would be to keep records of their observations in the field, regarding the food of birds. What birds have you seen feeding? What were they eating? Where did they find their food? Could you tell what particular insects they were capturing? Were they swallowing the insects or were they carrying them to their nests to feed their young? If you happen to find a dead bird, open up its crop and report the contents, for actual stomach analysis is much better evidence than mere observation which may be misleading. Such studies give first-hand information regarding the food and feeding habits of birds which is very valuable and will certainly prove that our birds are worth consideration from a purely utilitarian standpoint.

BIRD LIFE

Bird Life—the habits and habitats, the migrations and nestings, food and shelter, the great variety of life-histories, the songs and calls, the wonderful instincts, the breeding and the care of the young, the ever widening panorama of activities—is a subject so broad in its scope, so tremendous in its importance and so fascinating in its diversifications that many a naturalist has devoted his life to its study with never ending pleasure. Such a subject can not be outlined in a few brief paragraphs. Certainly, however, in consideration of such a subject, a few topics stand out as being of especial importance to any group undertaking bird study.

Recognition of Birds. One of these topics must be the subject of the recognition of birds. It is inconceivable that any progress can be made in the study of bird life unless one has acquired the ability to distinguish at least most of our commoner species. This ability can come only with experience and perseverance in watching the birds in the field. In learning the birds it is of great advantage if one can have the companionship of someone who is able to point out the distinguishing characters of the birds and call attention to the chief points to be noted in recognition. There is not much advantage to be gained, however, from the so-called "bird walks" taken by a number of persons together. Birds are timid creatures and are very susceptible to sudden movements and to sounds. Moreover, birds have the sharpest eyesight of any of our animals and get a "bird's eye view" of the surrounding country so

that they are able to see a noisy, colorful group approaching and can make their escape before they are seen. The average group from a bird club, often consisting largely of women and children, the women for some unaccountable reason always wearing their brightest garments and *always talking*, and the children for a perfectly natural reason racing down the road ahead of the rest of the party, shouting and crying, has little chance to see the more timid and secretive of the birds. The way to see the birds is to go alone, dressed in somber clothing, and wait quietly in a secluded spot until the birds come to the observer, rather than for the observer to try to "run them down." A good bird guide or manual is indispensable and a pair of field glasses are of great advantage.

Habits. It will be noticed almost at once that each bird has habits which are as characteristic as appearance. In fact it is often possible to recognize a species from its peculiar method of flight, of perching, of feeding, or of running, even the plumage characters can not be seen. Indeed, a study of the habits of birds will lead to a far greater knowledge of bird life than will the mere ability to recognize species.

Foods and Feeding. Closely related to the subject of habits and to the more utilitarian subject of economic importance, is the matter of the things which birds eat and their methods of feeding both themselves and their young. Birds take an enormous amount of food in proportion to their size. This is due to their extremely active lives which require an immense expenditure of energy and a consequent continued supply of nourishment. Animals whose method of locomotion requires that they must push against such a light medium as air must work much harder than those who can utilize a firmer medium such as the earth or even water. This hard work means a large food demand and the birds are for this reason enormous eaters. Moreover, birds store up very little food in their bodies but require a daily supply. Not only do the adult birds eat large amounts, but the young birds in the nest seem to have an insatiable appetite as can be vouched for by any one who has watched parent birds industriously bringing food all day long to the little gaping mouths which are always ready to receive it.

This explains why the birds are of such great benefit in destroying pests, since the destruction of each insect prevents that individ-

ual at least from laying its multitude of eggs and producing the resultant family of enemies to our farms and orchards.

Songs and Calls. Birds sing not only to express their joy of living but to accomplish many other purposes in the wonderful bird world. Some birds have remarkable vocabularies and each species has its characteristic notes. The scolding "meow" of the catbird, the danger signal of the robin, the love song of the wood thrush, the mating whistle of the quail, the tremulous cry of the screechowl, the planitive note of the dove, the sharp "do it" of the jay, and the evening hymn of thanksgiving of the vesper sparrow are as distinct and as easily recognized as the calls of human voices.

Migrations. To the lover of birds the spring and fall migrations are the outstanding periods of the year. At such times can be seen species not to be recorded for other seasons and the fact that the periods are short and the observer must be constantly on the lookout adds zest to the occupation of bidding "hail and farewell" to friends who pause with us only long enough to exchange greetings.

Birds may be classified as permanent residents, summer residents, winter residents, migrants and visitants and it is the last two groups which are so eagerly welcomed during the great migration season. In every locality bird students should keep lists of the birds which come thru on their long journeys and this is by no means an easy task since many literally "pass in the night." Moreover, many of them are birds which we seldom see and with which we are not very familiar so that they are a constant challenge to our powers of identification.

Bird Homes. Not less interesting are the nests which in many cases are so wonderfully constructed and which illustrate some of the most important of animal instincts. The elaborate pendent purse of that master weaver, the oriole; the exquisite lichen-covered fairy bower of the humming bird; the half nest of the swift, which tradition tells us is so built because when the Queen of the Fairies instructed the birds in nest building the impatient little swift waited for only half the lesson and can therefore build but half a nest to this day; the deep hole of the woodpecker, so dark that the woodpecker's eggs must be white in order to be seen; the peculiar home of the crested flycatcher which is always lined with cast-off

snake skins; the dainty cottage of the fearless little wren which is as likely to be found in a hat or on a wagon seat as in a more conventional place; these and hundreds of others are examples of homes which are a never-failing source of joy and interest to the student of birds.

Such are only a few of the fascinating subjects connected with bird life. Unfortunate indeed is the individual who goes thru life with his eyes closed to the wonders of the bird world which are everywhere around him.

Actual Observations. The joy in studying bird life, however, is not in reading good descriptions or beautiful poetry or in noting interesting experiences or records of field trips made by others, but in actually getting out in the fields and woods and seeing these things for one's self. On the average farm in Kentucky or in the average village, one should be able to see the activities of at least fifteen or twenty of our commoner birds in wood-lot, pasture, orchard or shade trees. A knowledge of the life histories of even this number of birds would make a good foundation for ornithological work. In fact, there are very few students of the age of 4-H Club members who can intelligently describe the appearance, songs, nests, movements and habits of a dozen of our commonest birds. Moreover, such a task is not as easy as it might appear. It requires time, perseverance, good eye-sight, close attention, careful recording and, above all, patience—attributes which are not possessed by all persons but which are the real test of the bird student.

DISAPPEARANCE OF OUR NATIVE BIRDS

With the birds as valuable as they undoubtedly are, and with the many reasons why they should be considered so desirable as companions of man on earth, it is most unfortunate that we should have to record the fact that our birds are decreasing in number very rapidly. This is true both as to number of species and number of individuals and holds for most other portions of our country as well as for Kentucky. Ornithologists all over the United States keep very careful records of the birds appearing in given localities each season and each succeeding bird census shows a smaller and smaller number of our feathered friends. Dr. Hornaday has com-

piled figures which would indicate that the United States has lost 46% of its birds in fifteen years, the records of the states showing a decrease of from 77% in Florida to 27% in Massachusetts with only four states—Kansas, Wyoming, Washington and Utah—showing an increase in bird life and only three—North Carolina, Oregon, and California—showing neither increase nor decrease. It has been estimated that Kentucky has lost fifty percent of its birds in the last twenty years. Few realize the significance of these figures. If we have lost half of our birds in the last twenty years and the same rate of decrease continues, how many will we have left at the end of the next twenty? Many of the finest birds of Kentucky are practically extinct or have left this part of the country. The wild pigeon has probably gone forever, altho many persons now living remember the vast flocks which Audubon so graphically described; the wild turkey, that most magnificent of American game birds, is making its last stand in the more thinly settled parts of the State but is doubtless doomed since the ignorant and selfish hunter still persists in its destruction; the paraquet, that gorgeous immigrant from the south which formerly bred as far north as Indianapolis, has deserted us; the quail are barely holding their own; even the friendly and trusting little bluebird seems never to have recovered from the severe winter of 1898-99 and is threatened with extinction. The chances are that the next generation of Kentucky boys and girls will know of these birds only thru history unless we can infuse into our school system and into the home training of these boys and girls the purpose to change this destructive process into one of increase in every city, town and farm in the State.

It is almost impossible for us to imagine the conditions which would confront us if our birds were gone, but perhaps Longfellow had the truest prophetic vision of the future when he wrote in his "Birds of Killingworth:"

> "The summer came and all the birds were dead;
> The days were like hot coals; the very ground
> Was burned to ashes; in the orchards fed
> Myriads of caterpillars, and around
> The cultivated fields and garden beds
> Hosts of devouring insects crawled, and found
> No foe to check their march, till they had made
> The land a desert without leaf or shade."

CAUSES OF THE DECREASE OF OUR BIRDS

The realization of the dangers likely to confront us with the destruction of our native birds naturally raises the question as to the causes of this decrease in our bird population.

The abundance of any kind of animal depends largely on the number and abundance of its enemies and to answer the question concerning the birds we must seek for some information regarding their enemies.

Undoubtedly the bird's greatest and worst enemy is man himself. This enmity is in most cases unintentional and sometimes unavoidable but it is none the less deadly. One of the ways in which man is causing the destruction of the birds is by cutting off our forests. Our forefathers found Kentucky a paradise of wonderful timber; the pioneers of this State entered forests unsurpassed in size and beauty. Slowly at first, and then more rapidly these forests have disappeared with very little thought of replanting. The birds are absolutely dependent on the forests for homes, for shelter, for protection and for food, and thus as the forests were cut away, the birds were forced to leave or to starve. Moreover, the clean cultivation of our farms, the cleaning up of the roadsides and fence corners, and the eradication of weeds, all of which are necessary to successful agriculture, have nevertheless robbed the birds of their last food supply of native seeds, berries and fruits. Man is responsible also for the wanton shooting of birds, the killing of game birds out of season, rapacious egg collecting, the destruction of such birds as the egret for millinery, and the slaughter of certain valuable birds under the mistaken notion that they are harmful.

Next to man, probably the worst enemy of our native song birds is the domestic cat. This animal, which must be considered as a pest in many ways, has made it almost impossible for the birds to establish themselves in the shade trees in cities and around farms where they naturally tend to come to find a substitute for forest conditions. Professor Forbush has estimated that a mature cat in good hunting grounds will catch about fifty birds a year. Of course some cats will not get so many, while others will get more, but the average makes for a tremendous loss in our bird population. Cats usually hunt at night and so are not often seen at their nefarious work, but since they can climb trees, and since the fledgling bird

just learning to fly is helpless before their attacks, their depredations are most serious.

The third most dangerous enemy of our song birds is perhaps the common English sparrow. This bird, introduced into the United States in 1851, has become a serious pest. It is a thoro foreigner and seems to hate everything American. It has no song, does not destroy insects to any considerable extent, is noisy, quarrelsome, uncleanly in habits, and seems to have an inborn hatred for our native songsters. It tears up the nests of other birds, breaks the eggs, kills the young, preoccupies the bird-houses, and whenever possible drives off the adults. It has spread into all parts of Kentucky and since it stays in one locality the year round, is extremely hard to eradicate. A government report states: "The English sparrow is a curse of such virulence that it ought to be attacked and destroyed before it becomes necessary to deplete the public treasury for the purpose."

Unfavorable climatic conditions often play havoc with the birds now that we have robbed them of their native shelters and foods. Many birds are killed by sleet, heavy rains, snow and hailstorms. In times of great drouth, especially during the nesting season, many famish or die of thirst, even the old birds being loath to desert their nests to go to regions of plenty.

Birds have many trials and are faced with many problems. The above mentioned are only a few but will indicate some of the reasons why Kentucky is no longer a paradise for birds.

Along with the decrease of our birds in general should be noted the problem of preserving our game birds. Of course many of those which furnished the food of our pioneer ancestors are gone forever—they vanished with the long-barreled squirrel rifle with which they were secured for the woodsman's table—but we still have a few which can be saved. These are chiefly the ducks, of which we have a number of good species, and the gallinaceous birds. About the only wild gallinaceous birds that are left are the quail and the dove (which is considered a game bird in Kentucky altho it is not so considered in many states). With cover and food we should have no difficulty in keeping these birds with us. Of course they have many enemies and are subject to many dangers. They are caught by foxes and cats; their eggs and young are destroyed by rats and snakes;

their nests are demolished by farm machinery; but on the whole if we will give them good cover and a little food during parts of the winter, the hunter should still have good sport for many years. To be sure, there is always with us the occasional individual who is not a true sportsman, who hunts out of season, who takes doves at water holes, who shoots sitting birds and who is in general a law-breaker and a bad citizen, and these individuals are a menace particularly to our water-fowl when it comes to violating game laws. The ducks, in most respects, can take care of themselves fairly well and since they are with us chiefly as migrants need only the protection which is afforded by the game laws. In fact, if we were all good citizens and good sports and if we had a real love of Nature, the problem of saving our game birds would not be a serious one.

BIRDS OF OTHER YEARS

The first settlers in Kentucky found in this State a faunal paradise; a wilderness of dense forests undisturbed save by the trail of the Indian, the lair of the panther and the runway of the elk; beautiful water courses easy of traverse and teeming with fish, otter and beaver; rugged mountains harboring the bear and the wildcat; broad plains trampled by the buffalo and ranged by the deer; and above all the voices of birds resounding from woodland and prairie, from mountain and valley, from thicket and stream. Slowly these conditions changed. With the cutting off of the timber the larger animals retreated; clearings increased to become fertile farm lands; settlements were founded and trails thru the forests became roads over which the hardy pioneers brought their families, their household goods and their stock into the new land called "Kentucke." With the change in conditions came a change in animal life. Forest-loving species became scarcer; thicket- and plain-inhabiting forms doggedly persisted; river forms scattered to more remote waters, only the birds tried their best to remain our friends. Change followed change, slowly at first, then more rapidly, as the thousand and one alterations incident to the settling of a new country took place, each tending to affect the faunal life. These changes are still going on and our native animals are making their last stand against civilization; most of them are doomed and their extinction seems to be only a question of a few years; and still the birds are pleading

with us to be allowed to remain. Their pleading, however, seems to be in vain and already we are recognizing the loss of many of the "birds of other years."

Most dramatic of the stories of bird extinction is that of the famous passenger pigeon or "wild pigeon" as it was known to the past generation. This bird is now extinct and yet it was probably at one time the most abundant bird in Kentucky and a few persons still living can recall the days when they were slaughtered in vast numbers. Kentucky was undoubtedly one of their most famous feeding and breeding grounds. The graphic descriptions of their "roosts" as given by Audubon and Wilson, which are entirely too extensive to be quoted in this brief outline, are almost unbelievable but are fully verified by those now living who witnessed in their childhood similar amazing phenomena. That the pigeons appeared in such vast multitudes as to break down giant forest trees with the weight of their bodies; that their dung covered the floor of the forest like blankets of snow; that their flight darkened the sun for days; that they were slaughtered in countless thousands; these facts are now historical records. The accounts of Aubudon and Wilson of the famous pigeon roosts along the Green River and near Shelbyville should be read by every Kentuckian; in no other way is it possible to realize the tragedy of the wild pigeon in this State. Moreover, a most valuable service may be rendered to science if organizd clubs will gather together the information which is still to be obtained regarding these birds from those who are now alive to impart it—for in a very short time the opportunity will be gone forever. It would be of great value to locate the sites of the old roosts in this State which are still unrecorded. In fact the whole subject of the passenger pigeon in Kentucky offers a field for research which is hardly to be duplicated.

The wild turkey will soon be added to the list of birds extinct in this State. Formerly the *piece de resistance* of the Thanksgiving dinner and the Christmas feast, now a rare trophy for the hunter, soon to be a memory only, the wild turkey is a theme for the historian as well as for the epicure. Records are greatly desired of the present appearance of this bird in Kentucky.

The wonderful ruffed grouse or "ruffled grouse" was *par excellence* the game bird of the pioneers, but its drumming is now rarely

heard. Like the wild turkey this beautiful denizen of our forests has been practically exterminated.

The paraquet has already been mentioned. No records have been obtained of this bird in the State for many years altho it formerly ranged as far north as the Great Lakes.

The egret, formerly abundant in Kentucky, has been sacrificed to satisfy the vanity of woman for the wonderful aigrette which the female bird wears during the nesting season. Since the slaughter of the parent bird meant that the nestlings were left to starve, it is not surprising that this bird was rapidly exterminated.

The great trumpeter swan is probably extinct. The beautiful ivory-billed woodpecker has been driven from Kentucky. There have been no records of the fork-tailed flycatcher, the blacked-headed goldfinch nor the Lapland long-spur since the days of Audubon. All of these are birds of the past.

It is very probable that many of the birds now with us will share the same fate and the day may not be far distant when we will look back on some of our best friends of today as "birds of other years."

BIRDS OF TODAY

The Water and Shore Birds

Altho Kentucky is far from the sea and is peculiar in not having a natural lake within its boundaries, we have an imposing list of water and shore birds native to the State. This is because our rivers and streams are so numerous, so uniform in flow and so well fitted for bird life that they attract a wide variety of species. Indeed Kentucky has probably as many miles of navigable streams as any state in the Union and many of these streams are unusual in their windings and unsurpassed in their beauty.

The diving birds are represented by the grebes which are still abundant and by the loons which are rare visitants.

Of the long-winged swimmers, several gulls occasionally visit Kentucky; at least two terms have been reported in the State and the water turkey has been seen in Ballard County.

The cormorant represents the totipalmate swimmers along our larger water courses and Audubon reported the beautiful white pelican in his day.

Our dominant order of water birds is however the Anseres and our list of ducks, geese and swans includes nearly thirty species of

this order which are known to visit Kentucky. Many of these are exceptionally fine game birds and sportsmen look forward with eager interest to their appearance on our streams. Incidentally these birds afford some of the most interesting studies in migrations and the great "V"-shaped formation of the wild geese in steady flight across the sky never fails to attract attention.

The heron group is represented by the ibises and bitterns as well as by the herons themselves, some of which, as for example the wonderful black-crowned night heron, challenge the wood-duck for the honor of being the most beautiful water bird in America.

The cranes and rails are still common along our rivers and the gallinules are occasionally seen.

Among the shore birds are many which always attract attention. Phalaropes, stilts and woodcocks are becoming scarce; snipe and sandpipers are abundant; yellow-legs and willets are sometimes recorded; the plover visits us during its migration; the beautiful little killdeer with his insistent, plaintive note is perhaps best known of all.

Altogether the birds of our streams are well worth knowing and the bird student who limits his observations to the trees, fields and roadsides misses much of the pleasure and information which ornithology affords.

The Land Birds

An enumeration of our land birds would be out of the question in a brief outline since of the two hundred and seventy-nine species of birds now recorded from Kentucky by far the larger proportion belong to this division.

Indeed it is difficult to suggest, as one surveys this vast assemblage of birds, any group or groups which are deserving of mention above others. As a matter of fact, the interest of the student of birds is not usually limited to any special group unless he be a specialist in systematic ornithology but is instead usually centered on the birds of his own locality, irrespective of the orders or families represented. And this is a commendable attitude for one must know the birds of his own neighborhood if he expects to establish that intimacy with the feathered tribe without which no bird study is worth while.

Every order of land birds found east of the Mississippi River is

found in Kentucky and for most of these orders many families are represented. In club studies of birds an attempt should certainly be made to compile as complete a list of the birds as possible, as well as to note what orders are represented and the more common of the species. For such studies it will be necessary to have a manual or guide, of which many excellent editions are now on the market, in order to identify the birds and properly classify them.

It is also of much interest to note which of these birds are "Permanent Residents," that is, those that remain in the same locality thruout the year; which are "Summer Residents," birds that come to the state from farther south in the spring, nest here, and return to the south in the fall; which are "Winter Residents" that spend the summer farther north but come to us in the winter; which are "Migrants" that pass thru the State only during the spring and fall migrations; and which are the "Visitants," the irregular and accidental transients which are only occasionally found out of their regular range.

One of the most valuable and interesting of the bird projects which a 4-H Club might sponsor is the keeping of a "Bird Census" —a large chart on which are recorded the names of all of the birds seen by the members with the dates on which they were seen and whether they were in pairs, in flocks or alone. Such a bird census, kept up for a year, is greatly desired for all regions by the Audubon Societies and other ornithological organizations.

As we have stated, it would be a difficult task to prepare a list of birds which should be particularly observed, since so many are well worthy of study. Yet at the risk of offending some of our feathered friends (and we hope that no bird will ever see this list and know that he is slighted) we would suggest that the following common forms will be sure to be observed by every club in Kentucky and that it might be well to make sure that none of them are neglected.

The Cardinal. Often called the "Kentucky Cardinal" because of James Lane Allen's famous story but not particularly characteristic of Kentucky and no more abundant in this State than in several others. One of the most brilliantly colored of all of our birds. A rather heavy and clumsy bird and something of an aristocrat in habits. An excellent singer and can be tamed as a cage bird. It can hold its own with the sparrows when they attempt depredations on its nest. Its clear whistle (which any boy should be able to imitate) is one of the most characteristic bird songs in Kenucky.

The Catbird. Altho its best known call is the familiar imitaton of a cat, which gives the catbird its popular name, it is really an excellent singer when it chooses to perform. In addition, it has a famous "whispering song," very faint and low and usually heard only in the late fall when it is bidding us "good-bye." It is one of the most intelligent of our song-birds and quite at home in cities and towns. Like the mockingbird, it is an excellent mimic of other birds and is much given to droll pranks and ridiculous actions. It is a very active, alert and restless bird but is very friendly and apparently enjoys human society. In appearance the catbird is a veritable Dr. Jeckyl and Mr. Hyde—one of the best groomed of birds when it wants to show off its slender beauty, but can ruffle up its feathers and look like a ruffian and a villian.

The Robin. Our commonest native wild bird. It has held its own well against cats and English sparrows and has not diminished in numbers in recent years. About half its food is animal and half vegetable matter. Of the former, earthworms and noxious insects make up the bulk of its diet; of the latter, seeds and wild fruits are the chief items, with enough cherries during the cherry season to make it considerable of a nuisance. It must be said, however, that cultivated fruits represent only about 4 percent of its food for the entire year. The robin has an extensive vocabulary and can express satisfaction, happiness, alarm, anger and suspicion in unmistakable bird language. Its song shows so much variation that it is often mistaken for other birds. The robin is a permanent resident in Kentucky.

The Bluebird. One of the friendliest and most domestic of our native birds. "With the sky on its back and the earth on its breast" it is a constant delight around our homes, gardens and orchards. It feeds almost entirely on insects and is an extremely valuable bird. Unfortunately its trusting disposition and friendly habits and its fondness for building its nest close to the habitations of man, make it an easy prey for cats and sparrows. It is fast disappearing and should have special encouragement and protection.

The Mockingbird. Probably the most famous bird in the United States on account of its place in song and story. It is certainly one of our finest singers and is a wonderful mimic. Mr. L. M. Loomis is quoted as having heard a mockingbird imitate the songs of thirty-two different species of birds in ten minutes. The mockingbird is abundant in most parts of Kentucky and is easily recognized by its large size, the brown wings with white markings and the gray breast and belly.

The Crow. The economic status of the crow is still a matter of dispute. It undoubtedly does much damage to corn, to other birds, and to young chickens; it steals eggs and has been accused of spreading hog cholera. On the other hand, it eats enormous numbers of mice, grasshoppers, noxious beetles, white grubs, cutworms, caterpillars and tobacco worms and is an excellent scavenger. Whenever its case is tried, the jury is generally hung. It is certainly one of our smartest birds; in fact, it is one of the four birds which are now candidates for the honor of being the most intelligent bird in America.

The Wrens. Six species of wren may be found in Kentucky. Of these, the Carolina wren is the largest and probably the commonest; Bewick's wren is very friendly and common about dwellings and is a wonderful singer; the House wren, with its very short tail and its habit of building its nest in all sorts of curious places, is a rare migrant; the Winter wren is a

common migrant and occasional winter resident; the two species of Marsh wrens are rare and are seen only around swamps and marshes. All wrens are easily identified by their small size, their nervous, restless actions, and their habit of keeping their tails erect. All are excellent singers and all are valuable because they feed almost entirely on insects.

The Blackbirds. The blackbird family includes the grackles, the bobolink, the orioles, the cowbirds, the true blackbirds and the meadow lark. Of these, the grackles are the commonest and are the birds generally called "blackbirds" in this State. The grackles are often more or less of a nuisance because they congregate in large flocks, are very noisy, and often a pest in shade trees in cities. They are omnivorous feeders and probably do more good than harm.

The orioles are of course famous for their beautiful calls and their marvelous, pendent, woven nests.

The cowbirds are notorious because of their habit of laying eggs in the nests of other birds and allowing these birds to care for their young. Over 90 species of other birds have been recorded in whose nests the eggs of cowbirds have been found. Cowbirds are most generally found in flocks in pastures, often near cattle, hence the popular name. It is believed that these birds formerly accompanied the bison in their wanderings and thus had no time to build a nest or rear a family.

The clear, piercing whistle of the meadowlark is one of the sweetest sounds of spring. The meadowlark is a very beneficial and popular bird but its nests and young are often destroyed by early mowings and the eggs and fledglings are devoured in large numbers by mice, rats and snakes.

The Woodpeckers. We have nine different kinds of woodpecker in Kentucky of which the flicker and the red-head woodpecker are the commonest. All the woodpeckers are climbing birds which have stiff, pointed tailfeathers which fit them for this habit, and stout, pointed beaks which enable them to bore into the bark of trees for the insects and larvae on which they feed. Most of them show white, black and some red in their plumage. All are valuable.

The Dove. The sad, sweet, plaintive call of the male turtle dove (which is the only dove we have in Kentucky) has given the bird the name of "mourning" dove. Of its notes Chapman says: "they are uttered slowly and tenderly and with such apparent depth of feeling that one might easily imagine the bird was mourning the loss of its mate instead of singing a love song to her." Doves are generally seen in small flocks and fly rapidly with a whistling sound. They are commonly hunted as game birds in Kentucky and their flesh is excellent.

The Hawks. There are seven species of hawk in this State, all but two of which are beneficial birds since they feed almost entirely on insects, mice and other pests but unfortunately many ignorant persons think that all hawks are destructive and should be shot at sight. The sharp-shinned hawk and Cooper's hawk feed largely on poultry, game birds and song birds and deserve no mercy, but all others should be protected. The different kinds of hawks are not difficult to distinguish and one of the most worthwhile tasks which a 4-H Club member could set for himself would be to learn how to tell the hawks apart and be able to discuss intelligently their various habits.

The Owls. What we have said of the hawks applies also in a general way to the owls. It is surprising how many silly superstitions exit regarding these interesting birds. Of course any bird with nocturnal habits, dusky plumage, noiseless flight and a weird voice lends itself well to such beliefs. The truth is that most owls, like most hawks, do a great deal of good in destroying pests. Owls are easily recognizable by their voices. Listen to the hoot-owl who constantly asks: "Who-cooks-for-you-all?"; to the weird, wailing, tremulous, melancholy cry of the little screech-owl; to the loud, maniacal, piercing, blood-curdling scream of the great horned owl; all examples of extremely interesting bird calls.

The Starling. A new bird, the European Starling, has appeared in Kentucky in recent years. A single starling was first reported from Winchester about 1920 but no other specimen was seen until 1925 when the species was again discovered in Clark county. It was seen in Lexington and in Henderson the same year and in Versailles, Nicholasville and Louisville the year following. It has now spread to all parts of the state. The status of this bird is in doubt. Some authorities claim that it is destined to become as great a pest as the English sparrow while others believe that it may prove of economic value in destroying insects.

CARING FOR THE BIRDS

Methods of protecting birds are naturally suggested by the facts regarding their needs and their enemies. Audubon Societies, Bird Clubs and 4-H Clubs can do much to stimulate interest in birds, to encourage educational programs and to work for necessary legislation. Kentucky has been criticized because of its lack of suitable laws for bird conservation, particularly the protection of ducks during the spring migration, the exporting of game birds (which only three other states in the Union allow), the sale of game birds, the limit to the number of birds killed at one time by one hunter, and other forms of conservation. Reducing the number of cats—particularly the stray, half-wild and homeless ones—and the extermination of the English sparrow, can be brought about only by educating the coming generation as to the desirability for these conditions and the eventual passing of city ordinances and State laws tending toward these ends. Meanwhile feeding the birds in winter, building bird houses, erection of bird baths and feeding stations, and provision of bird-sanctuaries—which if boy and cat tight are most desirable institutions—will all aid in the conservation program.

Certainly the importance of caring for the birds is not fully realized or we should have more interest in the subject. On the average there are only two birds to the acre in the United States, yet some farmers, by attracting the birds, have increased this to one

hundred. Always they are more than repaid for their trouble, for the birds immediately become the guardians of farm, orchard and garden. If the farmer would appreciate the fact that the army-worm has 43 different bird enemies, the chinchbug 24, billbugs 67, codling moth 36, cutworms 98, tent-caterpillars 43, potato beetles 25, cucumber beetles 28, white grubs 67 and wireworms 168, he would not hesitate to make friends with nature's feathered entomologists. Bird sanctuaries may be established by any farmer or landowner by setting aside a certain piece of woodland and cooperating with schools, bird clubs or boy scouts. Birds sanctuaries, however, are not limited to the country. Anywhere where natural conditions are suitable and public sentiment exists, these refuges may be maintained. The prime necessities are first, protection against enemies, second, plenty of nesting sites, third, abundance of food and fourth, a water supply. City reservoirs make excellent sites for sanctuaries because they are always guarded to prevent contamination, are usually surrounded by vegetation, and furnish abundant water. Cemeteries are always regarded as good places for birds, not only because they are secluded and free from the disturbance of hunters, playing children and noisy crowds, but also because they are sure to contain shrubs and trees and usually some water.

One of the best ways of attracting birds is planting such vegetation as will provide them with food and shelter. The idea of clean cultivation and the removal of all vegetation from roadsides and farm boundaries, with the thought that it prevents insect pests, has been carried to such an extent that many of our highways are now desolate stretches of barren, dusty road without a tree or bush to gladden the eye. This is fatal to bird life. There are plenty of trees and shrubs which may be used for shade and hedges which in no way interfere with agriculture and are of great benefit to birds. Owners of large estates, custodians of city parks, and, we regret to admit, even those in charge of school and college grounds, are in many cases persuaded that they should have formal plantings of rare foreign trees and shrubs, under the mistaken notion that these exotic plants are more beautiful and desirable than our native flora. We submit that such formal gardens with rows of closely trimmed shrubbery are no more attractive than natural growths, as they are certainly less beneficial to our birds. Public school playgrounds are

often bare, uninviting places, altho nothing is more desirable for the contentment of students than trees and flowers, and nothing more instructive for nature study work than the birds which these attract. City parks, fair grounds, and the like, are all too often geometrical horrors with formal flower-beds in circles, squares and triangles, hedges and shrubbery trimmed with mathematical exactness, and not a natural growth of foliage to be seen. Yet we have in this State a large variety of native trees, shrubs and vines, many of which are entirely suitable for the purpose of the landscape gardener and all of which provide berries, seeds, nuts, haws, or other fruits for birds. Some of the most desirable of these are the red cedar, bayberry, rose, spicebush, raspberry, blackberry, wild cherry, sumac, wild grape, dogwood, elderberry, honeysuckle and Virginia creeper. In addition to these wild forms there are the cultivated fruit trees which may be planted for artistic effect, for shade and for the birds, even if the fruits themselves are not of prime importance. Roadsides, railroad rights of way, farm lots, parks, grounds, campuses, boulevards and reservoirs may well be beautified by intelligent planting of such vegetation as will not only attract the birds but will serve as boundary lines, wind brakes and soil retainers.

All the foregoing suggestions for caring for the birds have been for rather sordid and economic reasons. Is there not something to be said from an ethical standpoint? Does not the sight of the chickadee at the feeding station on your windowsill give you a glow of the satisfaction of service? Does not the cardinal, tapping at your pane for his breakfast, inspire a feeling of fellowship? Is not the sight of the catbird bringing her babies to your drinking fountain worth the slight labor involved in providing such comforts? Does not the wren's clear note bring some joy into your life? If not, there must be something lacking in your make-up.

Think every morning when the sun peeps through
The dim, leaf-latticed windows of the grove,
How jubilant the happy birds renew
Their old, melodious madrigals of love.
And when you think of this, remember too
'Tis always morning somewhere, and above.
The awakening continents, from shore to shore,
Somewhere the birds are singing evermore.

—Longfellow.

BOOKS FOR REFERENCE

Audubon the Naturalist, Vol. I—F. H. Herrick ..... Appleton
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Some Common Birds Useful to the Farmer ..... U. S. D. A. Farmers' Bulletin No. 630
Homes for Birds ..... U. S. D. A. Farmers' Bulletin No. 1456
Food of Some Well-Known Birds of Forest, Farm and Garden ..... U. S. D. A. Farmers' Bulletin No. 506
How to Attract Birds in the East Central States ..... U. S. D. A. Farmers' Bulletin No. 912
The Migration of North American Birds ..... U. S. D. A. Circular No. 363

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