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# The American Midland Naturalist

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## The Economic Value of Birds.

F. J. WENNINGER.

It is a matter of common observation that a great many of our birds are becoming more scarce each year, so much so that a few species are even now on the verge of extinction. Each succeeding year brings with it a new crop of eager sportsmen "anxious to kill and ambitious to make records." But the time has come when the small boy with his rifle and the hunter with his gun must be taught that henceforth all birds must be protected or they will be exterminated.

At the request of the New York Zoological Society, Mr. Wm. T. Hornaday, made a careful study of bird-life in the United States with special reference to its increase or decrease during the fifteen years ending with the year 1898. This was the result: only four states, Kansas, Wyoming, Utah and Washington, showed a slight increase in bird-life; thirty states showed decreases varying from ten per cent to ninety per cent, the general average decrease being forty-six per cent. In Indiana the decrease of bird-life was found to be sixty per cent. That was in 1896. Since then another inquiry has been made and, according to this last report, the volume of bird life has changed so slightly that in 1903, conditions were practically as they were in 1898. Indeed some investigators assert that during the past fifteen years the number of our common song birds has been reduced by one fourth. Another author † claims that "at the present rate, extermination of many species will occur during the lives of most of us. Already the passenger pigeon and Carolina parakeet, only a few years ago abundant, are practically exterminated."

This alarming decrease in the number of birds is due to various

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\* December 15, 1909.—Pages 105 to 144.

† Chester A. Reed in his Bird Guide.

causes such as winds, snow and wild or domestic animals. But by far the greatest number of birds is destroyed by man himself. Now it is not the purpose of this article to arraign mankind for its barbarity towards birds but merely to show the importance of some of our common birds in the economy of nature and thus point out a few reasons for their preservation.

The great utility of birds lies in their capacity for destroying insects. From time immemorial, man has but feebly combated the insect pest, and it is the birds alone that can check its ravages; hence, destroy the birds and insects will multiply enormously as history only too plainly proves. Much has been written about the destructiveness of insects and economic entomologists are constantly adding new species to the long list of pests that destroy our crops.

The first report of the entomologist of New York,\* contains a list of 176 species of insects that destroy apple trees, while the species that destroy plum, pear, peach, and cherry trees are hardly less numerous.

Kaltenbach gives an extensive list of insects that infest the trees of central Europe.† According to this authority, the oak is a prey to 537 species of insects; the elm to 107; the poplar to 264; willows to 386; birches to 297 and beeches to 154.

While the forest destroying insects of our country have not been studied as long as those of Europe some very astonishing discoveries have been made. Dr. Packard ‡ lists over 400 species which are destroying our oaks and expresses his belief that this number represents, perhaps, only one half of the species actually in existence. He places the number of species that attack the hickory at 140; those that ravage the maple at 85; the poplar at 72 and those that live on the pine at over 100 different kinds.

The species of insects which feed on grasses, cereals, field and garden crops are enormous in numbers and each succeeding year adds new names to the list. The loss occasioned by these pests reaches far into the millions of dollars annually. Packard says that "we lose annually by the attacks of insects on agricultural products not far from one hundred millions of dollars."

The Bulletin of the New York State Agricultural Society for the year 1854 shows a loss of fifteen million dollars through the rav-

\* Report of the Commissioner of Fisheries and Game for Ind. Page 980.

† Ibid.—Page 981.

‡ Packard, A. S. Entomology for Beginners. Pp. 191.

ages of the insignificant wheat midge, (*Diplosis tritici*) two years later, in one county of the same state, two thousand acres that would have yielded 60,000 bushels of wheat were destroyed by the same insect.

The Hessian Fly (*Cecidomyia destructor*) has also caused great devastation in the wheat belt. On the valuation of the crop of 1904, according to statistics furnished by Dr. Marlott, the loss occasioned by this fly alone amounted to almost fifty million dollars while four years previous to that date, the loss in the wheat growing states from this tiny midge approached one hundred million dollars.

Another pest which destroys many of the staple crops in the Mississippi valley is the cinch bug (*Blissus leucopterus*.) The last report of Z. T. Sweeney, commissioner of Fisheries and Game in Indiana, contains statistics of this insect compiled by Drs. Schimmer and Riley. According to this report, the loss caused by the cinch bug in one year, 1864, in the Mississippi valley was one hundred million dollars, while the loss in Illinois for that year reached seventy-five millions.

The cotton industry has a powerful enemy in the ordinary cotton worm (*Alabama argillacea*) which has been known and feared for more than a century. The report of the Massachusetts Board of Agriculture for 1906 says in regard to this pest; "The average loss in the cotton states from this caterpillar for fourteen years following the Civil War was estimated at fifteen million dollars per year.

These are but a few of the striking examples of destruction occasioned by ordinary pests which our birds are destroying. The reports of our boards of agriculture contain numerous cases of insect ravages, not as great as these, perhaps, but still alarmingly large and calculated to make men consider the question of preserving the birds.

When these startling losses are considered it is readily seen how birds operate to prevent injury to our crops. Of course to accomplish this it is necessary that birds be present in sufficient numbers; and yet these numbers need not be very large in proportion to the insects for each bird devours an incredible number of insects. Chester A. Reed says, "It has been found by observation and dissection that a cuckoo consumes daily from fifty to four hundred caterpillars while a chickadee will eat from two hundred to five hun-

dred insects, or up to four thousand insect or worm eggs." The same author has undertaken a very careful study of bird life in Massachusetts and his conclusion is that there are about five insect eating birds per acre in that state. The daily consumption of insects by these 25,600,000 birds, is 2,560,000,000. To the average reader, these figures contain little more than an idea of vastness and for that reason Reed has translated them into simpler language. He says, "About 120,000 insects fill a bushel measure. This means that the daily consumption of chiefly obnoxious insects in Massachusetts is 21,000 bushels. This estimate is good for about five months in the year."

The common meadow lark (*Sturnella magna*) has been studied with reference to its capacity for destroying injurious insects and the result has been surprising. The investigation which furnished evidence for the bird's usefulness consisted of a laboratory examination of "two hundred and thirty-eight stomachs collected in twenty-four states, the District of Columbia and Canada." Insect food was found to be 71.7 per cent as compared with 26.5 per cent of vegetable food. In other words, almost three-fourths of this bird's food for the entire year consists of insects. Grasshoppers, locusts and crickets appear to be the usual diet of the lark, the average amount consumed during the year being about 29 per cent of all food. An interesting chapter might be written about the lark as a destroyer of injurious grasshoppers. Here is a calculation from Dr. Fisher. He states that "the weight of an average grasshopper is 15.4 grains and its daily consumption of food equals its own weight. It is safe to assume that fifty grasshoppers are eaten each day. Now if the number of birds breeding in one square mile of meadow land is estimated at five pairs, and the number of young that reach maturity at only ten in all, there will be twenty birds on the square mile during the grasshopper season. On this basis the birds would destroy 30,000 grasshoppers in one month. Assuming that each grasshopper if left alone would have lived thirty days, the thousand grasshoppers eaten by the larks each day, represent a saving of sixty-six pounds of forage a month. If the value of this forage is estimated at ten dollars per ton the value of the crops saved by meadow larks on a township of thirty-six square miles each month during the grasshopper season, would be about three hundred and fifty-six dollars.

But grasshoppers are not the only insects eaten by the lark.

Beetles constitute about 18 per cent of the animal food of this bird. Among the most important of these are the May beetle, (*Scarabaeidae*) a family which contains some of our most injurious insects. In the month of May, 21 per cent of all the food of the Lark consists of these beetles.

Bugs, (*Hemiptera*) and especially those belonging to the family of Stink bugs (*Pentatomidae*) are eaten throughout the year, constituting about 4 per cent of all the food; yet, in May this percentage rises to fourteen.

From the foregoing it will be seen that this bird is pre-eminently an insect eater and hence an important factor in the preservation of our crops. For this reason it should be protected.

The meadow lark is only one of the great army of insect destroyers; other birds are just as useful in this capacity. Even in the apparently destructive career of the crow there are compensations. It is a great feeder on May beetles the larvae of which, known as white grubs, burrow in the ground and devastate grass lands and injure the roots of trees and plants. Robins feed largely on cut worms as well as on the white grub of the May beetle. Blue Jays are extremely efficient as caterpillar hunters; warblers, titmice and vireos are hardly less expert. And so on down the long list, we find that each bird has some part in the economy of nature.

The great question is, how can we protect the birds? The game laws of the states are good but the difficulty lies in enforcing them. The remedy lies in education. People must be educated to realize the economic value of the birds. This knowledge, more than anything else, will materially lessen the desire to destroy birds and will preserve one of our nation's most valuable assets.

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## Priority of Names of Certain Families of Plants.

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J. A. NIEUWLAND.

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It seems to be understood that historical priority has become the rule for the acceptance of the names of plant families at least since the year 1753. Some botanical works have begun to mention