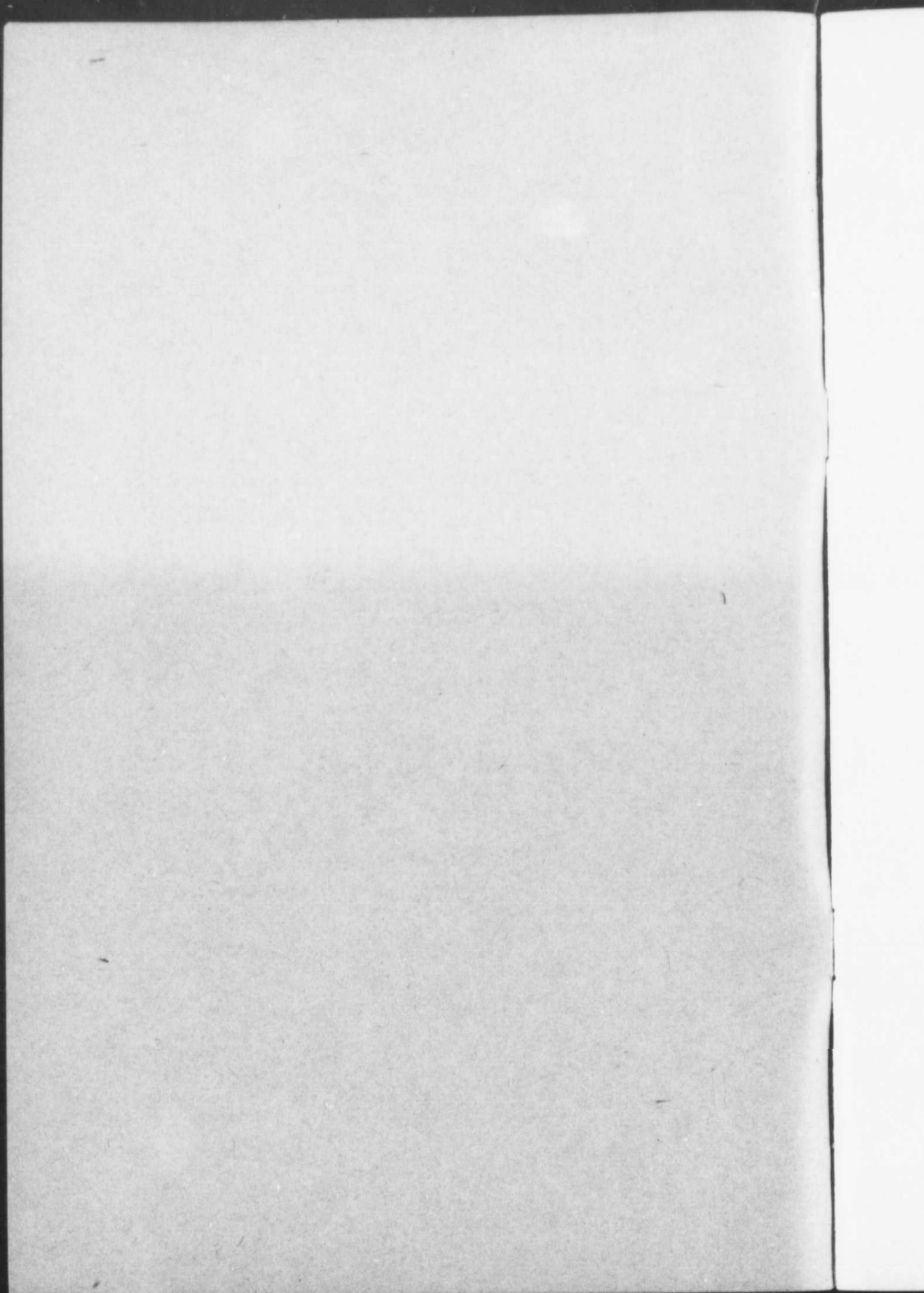


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Dominion Entomologist, Ottawa.



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It is the purpose of this address to discuss, first, the general question of the protection of birds and the reasons why this is necessary; secondly, the economic value of certain common birds which we desire to protect; and thirdly, a proposal for the protection of the native birds around Ottawa.

The motives behind the widespread and increasing movement respecting the protection of our native birds may be included in two classes, namely, sentimental and practical. Most people, even in this material age, are sensible of feelings of affection towards our birds and are delighted when the return of the first spring migrants announces the termination of our long birdless winter. But the practical considerations underlying the movement are not so generally appreciated and for that reason æsthetic feelings will be assumed and the practical motives discussed.

Few people realize the place of insect pests in the general economy of life, but when it is understood that were it not for their controlling factors insects would in a few years destroy every form of vegetation, and consequently all animal life on the face of the globe, the significance of such controlling factors will be appreciated. In the United States it is estimated on a conservative basis that the annual loss on agricultural and forest products is about eight hundred million dollars (\$800,000,000). I have estimated that in Canada, on our field crops alone, the minimum annual loss due to injurious insects cannot be less than fifty million dollars; this does not take into account the enormous aggregate cost of controlling insect pests. And yet the most valuable insecticidal agencies we have are not only not encouraged but in many cases ruthlessly destroyed. Such a shortsighted and wasteful policy cannot and must not be continued.

*Abstract of an illustrated lecture delivered before the Ottawa Field-Naturalists' Club, 10th February, 1914.

We are endeavouring to increase the productiveness of the soil; birds will assist in doing this by destroying those agencies, namely, insect pests which decrease the amount produced.

The quantity of insect food consumed by birds is almost incomprehensible, but the facts set forth by various investigators on this continent and in Europe give us some idea of the extent to which insects go to make up the diets of birds. Insects constitute 65 per cent. of the total yearly food of woodpeckers, 96 per cent. of that of fly-catchers, and 95 per cent. of the yearly food of wrens. Upwards of 5000 insects have been found in a single bird's stomach. The value of the birds is increased by the fact that at the time when insects are most abundant birds are most active and require most food, especially animal food, to feed their young. A bird normally requires a large amount of food owing to its active habits and high temperature, all of which bodily functions demand a constant and plentiful supply of fuel in the shape of food. A young crow will eat twice its weight in food; a robin weighing three ounces was found by Nash to consume five and one-half ounces of cutworms in a day. It is calculated that a pair of tits and the young they rear will consume about 170 pounds of insect food during a year. These facts and others to be given later will indicate the enormous destruction of insect life that is accomplished by the presence of birds. They constitute one of the fortunate balances of nature. But man is constantly upsetting the balance. Woodlands are cut down and give place to open fields; snake fences give way to wire; subdivisions and town lots obliterate the waste places and often the swamps. All these circumstances tend to drive away the birds formerly resident and breeding in such localities. Then outbreaks of injurious insects occur and their depredations are increased and prolonged by reason of the absence of such important enemies. Therefore, our aim should be to restore the balance by attracting the birds back to our parks and natural reservations.

Not only do birds destroy insect pests, but they contribute to the destruction of weeds. Certain species of our native sparrows are large consumers of such weed seeds as bindweed, lamb's quarters, ragweed, amaranth, pigeon grass, etc. Judd records the result of the examination of over 4000 stomachs of twenty species of sparrows. It was found that for the entire year weed seeds form more than half their food, and during the colder months of the year these seeds constitute about four-fifths of the food of many species. A single bird will often be found to have eaten 300 seeds of pigeon grass or 500 seeds of lamb's quarters or pigweed. Beal estimated that the tree sparrow may consume one-quarter ounce of weed seed per day, and on that basis, in a state

the size of Iowa, this species would consume about 800 tons of seeds annually.

It is important to point out, however, that the weed-destroying power of graminivorous birds may be exaggerated if the question is not investigated with great thoroughness, for while the powerful gizzards of some birds may grind up the hardest coated seeds, in other cases seeds may be capable of germination after passing through the digestive tract, as Collinge has shown in a number of cases in English birds. In such instances the birds would act as disseminators of weed seeds. Then again, in the case of insectivorous birds, besides destroying noxious insects, they will destroy various kinds of insects which are useful by reason of their parasitic habits upon noxious insects. These facts indicate that the question of the economic status of a bird is not always an easy matter to determine and demands *thorough* investigation in each case.

In certain instances useful birds eat grain or fruit. The Horned Larks occasionally eat grain, vegetable food constituting about 80 per cent. of their total food. Six-sevenths of this total amount of vegetable food consists of the seeds of such weeds as foxtail, amaranth, ragweed, and bindweed. It surely is not too much to ask that, in view of the good they effect, a little injury shall be overlooked, especially as they make no charges for the good work they accomplish. It has sometimes seemed to me that in the case of those useful birds which sometimes take to fruit eating, it is cheaper to protect the fruit from the birds than from the insects. As insecticides, birds are the cheapest and most generally efficient that can be found.

The feeding habits of a few of our common species of birds which should be protected may now be considered. The Robin (*Planesticus migratorius*) probably comes first. Early in the year it feeds extensively on cutworms, those insidious enemies of our garden plants and crops; in March they constitute over a third of the robin's food. It is accused of fruit eating, and yet of all the vegetable matter it consumes a large proportion consists of wild fruits; 330 stomachs contained 58 per cent. vegetable matter, of which 47 per cent. consisted of wild fruits and 4 per cent. cultivated fruits.* The Bluebird (*Sialia sialis*) is not so common as formerly in the Ottawa district, having probably been driven away by the encroachments of man. Charming in its habits it responds readily to encouragement, building in hollow trunks and cavities. Insects such as grasshoppers, beetles and caterpillars constitute about 68 per cent. of its food.

*Except where it is specifically stated otherwise, these analyses of stomach contents are taken from the publications of the Biological Survey of the U. S. Department of Agriculture, to which the reader is referred for further details.

With the possible exception of the house wren, probably no other birds so readily take advantage of artificial nesting places as the Chickadees (*Parus atricapillus* and others) and Tits. Their unremitting search for insects on every branch, twig and leaf is a fascinating sight and the good they accomplish is difficult to conceive. A Blue Tit will destroy six and a half million insects in a year, and in bringing up a family of about twelve to sixteen young ones, about twenty-four million insects would ultimately be accounted for. Especially valuable are they in the destruction of the eggs of certain species of defoliating caterpillars, such as the canker worms and tent caterpillars, the moths of which deposit their eggs on twigs. Graf, in Switzerland, states that three blue-tits and three cole-tits consumed 8000 to 9000 insect eggs daily; three marsh tits, one cole-tit, a long-tailed tit and a golden crested wren consumed 600 caterpillars in 100 minutes. The pupae of the codling moth and the hibernating forms of plant lice do not escape the sharp eye of these small acrobats. The little White-breasted Nuthatch (*Sitta carolinensis*) which may be seen running not only upwards but also downwards on the trunks of trees, has somewhat similiar habits to the Chickadees. Over 50 per cent. of its food consists of insects. The House Wren (*Troglodytes aedon*) has suffered much by the inroads of the quarrelsome English sparrow which drives it out of its nesting places on every possible occasion. Nevertheless, this confiding little bird which charms us so much with its little bubbling song and exacts such a heavy toll on insect life will gladly accept a nesting box out of which the sparrows may be kept by hanging it rather low down, and having the entrance hole as small as possible.

The Purple Martin (*Progne subis*) formerly nested in hollow trees, but the advent of man encouraged it to nest about his domicile. In some parts of the country, I have noticed the fact particularly in certain sections of New Brunswick, one may see martin houses erected on poles and this form of encouragement is very successful, although the English sparrows are a constant source of trouble to the rightful owners. The value of the martins and swallows around the house and buildings as insect destroyers is appreciated by all who have encouraged them. The Tree Swallow (*Iridoprocne bicolor*), which nests in hollow trees, is not so abundant in certain sections of Ontario as formerly. Reporting the success of nesting boxes during 1913, Mr. W. E. Saunders, of London, Ont., writes: "Another lot of boxes which were put in place on an island in the Rideau Lakes were a source of actual competition among the tree swallows, there being more pairs than there were nests, and considering the fact that these

birds are almost extinct in south-western Ontario, where they were formerly tolerably common, it would seem an excellent policy to encourage them in the Ottawa district while you have them there".

Two of the woodpeckers may be attracted by the use of nesting boxes. The Flicker (*Colaptes auratus*), which occurs in and around Ottawa, feeds largely on ants; a single stomach has been found to contain over 5000 ants. In another instance 28 white grubs, one of our worst pests of grass land and certain crops, were found in the stomach of a flicker which feeds largely on the ground. It also feeds upon wild fruits, such as the wild black cherry. The Downy Woodpecker (*Dryobates pubescens*) is a most valuable ally, as it feeds largely on beetles that destroy trees by boring into the bark and timber. An examination of 723 stomachs showed that 76 per cent. of the diet was animal food, consisting chiefly of insects.

Reference has already been made to the weed-destroying habits of our native sparrows. One of the first birds to arrive in the spring, breaking the long winter silence with its welcome little song, is the Song Sparrow (*Melospiza melodia*), which is very domestic in its habits. About three-fourths of its food consist of weed seeds and one-fourth of insects. Beetles, especially weevils, form the greater portion of the insect food. A thick hedge, dense shrubs or piles of logs provide suitable nesting places for this most welcome of our sparrows. The Chipping Sparrow (*Spizella passerina*), whose confiding ways give it a warm place in our affection, has somewhat similar nesting habits to the former. It is, moreover, the most insectivorous of our sparrows. About 42 per cent. of its food consists of insects and spiders, and caterpillars make up the major portion of the insect food, especially when the young are being reared, when as many as 17 feedings per hour, on an average, for a brood of our nestlings have been recorded. The retiring and sombre Junco or Snow-bird (*Junco hyemalis*), destroys insects and feeds on weed seeds. An examination of 500 stomachs gave 23 per cent. animal food (caterpillars, bugs and beetles), and 77 per cent. vegetable food, of which over 61 per cent. consisted of weed seeds. In September the proportion of weed seeds may rise as high as 95 per cent. of the food.

Before discussing the details of the proposal for the protection of the Ottawa birds, it will be of interest to refer to the results of certain schemes of bird protection which have been adopted in other countries.

The greatest exponent of the practice of bird protection is undoubtedly Baron von Berlepsch, and to him we are indebted for the splendid example he has given at Seebach in Germany. His ideas have been adopted by various states in Germany and in the countries where the protection of birds and the provision of nesting boxes constitute an important and necessary adjunct of forestry methods. An instance, given by Baron von Berlepsch, of the practical value of bird encouragement may be quoted. The Hainich wood, south of Eisenach, which covers several square miles, was stripped entirely bare in the spring of 1905 by the caterpillars of the Oak Leaf-roller Moth (*Tortrix viridiana*). The wood of Baron von Berlepsch, in which there had long been nesting boxes, of which there are now more than 2,000, was untouched. It actually stood out among the remaining woods like a green oasis. At a distance of a little more than a quarter of a mile farther, the first traces of the plague were apparent, and at the same distance farther on still it was in full force. It was plain proof of the distance the tits and their companions had gone during the winter and after their breeding time. Similar observations were made during a plague of the same insect (*Tortrix viridiana*) in the Grand Duchy of Hesse, where the protection of birds has been carried on in a sensible and energetic fashion for over ten years. Of 9,300 boxes hung up by the Government in the State and Communal woods of the Grand Duchy of Hesse, 70 to 80 per cent. were occupied in the first year and in 1907 all were inhabited. On and near Baron von Berlepsch's Seebach estate, 90 per cent. of 2,000 nest boxes in one wood were occupied, and nearly all of 500 and 2,100 in other localities. In Hungary similar measures are taken largely owing to the admirable work of Otto Hermann, one of the foremost European advocates of bird protection.

Some years ago when investigating the depredations of the Larch Sawfly (*Nematus erichsonii*) in the English Lake district I was impressed with the value of birds as natural means of control, and as birds in the worst infested district, namely Thirlmere, were not so abundant as they should have been, it was recommended that they should be protected and encouraged by means of nesting boxes. The corporation of the city of Manchester owns Thirlmere, this lake being their water supply, and they distributed nesting boxes of the pattern which I devised and which is illustrated herewith. (Fig. 1). The advantage of this box was that it could be made out of the slabs or rejected outer portions of the lumber bearing the bark. Three equal lengths of the slab are nailed together to form three sides of a long box, the outside of which, bearing the bark,

was round and the inside square. The fourth side is made of a flat piece of wood forming the back of the box; this piece is longer than the other sides and projects above and below the box, thus providing means of attaching the box to the tree (see Fig. 2). The top and bottom of the box may be made of slab wood. Several holes should be bored in the bottom, which is nailed on, to keep the nest dry. The top is hinged to the back board and when in use is fastened down by means of a screw, which permits the lid to be opened for the purpose of cleaning out the old nests. By so utilizing waste lumber, these boxes were made very cheaply at the sawmill. A boy could readily make similar boxes. Plate XXI shows such a box in use. In the first year (1908) 60 boxes were distributed and 31 per cent. were occupied. The number of boxes was increased yearly until in 1911 there were 347 boxes, of which 66 per cent. were occupied.* I am informed that in 1913, 75 per cent. of the boxes were occupied. In addition to the provision of nesting boxes, feeding houses of the Hessian type (Plate XXII) were erected for the purpose of feeding the birds in the winter

In addition to the provision of nesting places for those birds nesting in cavities and hollow places, the protection of birds involves the carrying out of other measures also. For birds nesting on or near the ground piles of logs or brushwood may be left in sheltered places and thickets of closely growing shrubs and vines permitted to remain here and there. Piled logs will also provide shelter for many birds during inclement weather. While most of our birds leave us during the winter,



A.

FIG. 1

Nesting Box Made of Slab-wood,
Ready for Hanging.

*For further particulars and illustrations see Bul. 10, Second Series of the Experimental Farms, Dept., Agric., Canada, entitled "The Large Larch Saw Fly."

The Berlepsch Nesting Boxes in various sizes may be obtained from the Royal Society for the Protection of Birds, 23 Queen Anne's Gate, London, S.W., England, who will gladly furnish a price list; or from the manufacturer: Hermann Scheid, Bären, Westphalia, Germany.

except in certain places where the chickadees may be found, there are certain occasions where feeding may be adopted with advantage. Not infrequently after the arrival of certain of our early migrants in the spring a cold spell and snow occurs. On such occasions feeding can be resorted to with great advantage. The fact that birds require water is not so generally

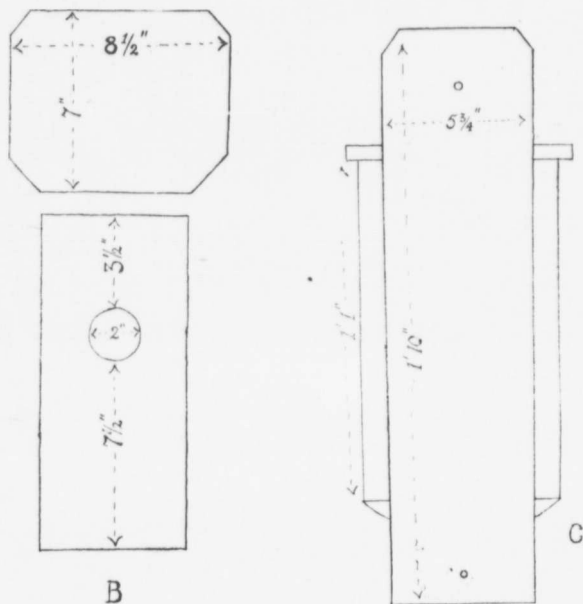


Fig. 2

Structural Details of Nesting Box Shown in Fig. 1 B.—Lid on Front of Box.
C.—View of Box from Back.

realized as one would wish. Especially is this the case during our hot summer months. One of the most attractive additions which can be made to a garden is a bird's drinking trough or fountain. This should be shallow enough to permit the birds to take a bath. The best type of artificial bird water supply for a garden is a shallow pool, two or three feet in diameter, and a few inches deep, in which a few reeds and water plants are

planted. If this is placed in a wooded corner of the garden or shrubbery it will be constantly visited by all kinds of small birds.

The foregoing discussion of the advantages and methods of bird protection leads me to the chief object of this lecture, namely, the outlining of a definite scheme for the protection and encouragement of the birds of Ottawa, which scheme, I am pleased to say, has been enthusiastically adopted by the Ottawa Field-Naturalists' Club. Those who have lived in Ottawa for a number of years will have observed with regret the destruction one by one of places which were the haunts of many wild birds. The rapid growth of the city and the outward march of the streets and houses have driven the birds from their former quarters. We are now witnessing the destruction of one of the most delightful of all nature spots around Ottawa, namely Beaver Meadow. The city is gaining in population and taxes at the expense of natural beauty. But as we cannot and should not wish to prevent such extension, we should take every means possible to offset the losses in natural beauty so occasioned.

There are within the city limits, but at present on the outskirts of the built-over districts, two areas unequalled by their natural beauty for the purpose we have in view. I refer to Rockcliffe Park and the grounds and Botanical Garden of the Dominion Government's Experimental Farm. The former, being a piece of woodland and forest rescued from the hand of the lumberman and builder, is one of the most beautiful natural parks in eastern Canada. The Experimental Farm, laid out and planted about twenty-six years ago, is even better suited to the purpose in view, owing to the abundance of trees and shrubs of all kinds, especially those bearing wild fruits. Since the establishment of the farm, efforts have been made to prevent the destruction of the birds and the robbing of their nests and Mr. W. T. Macoun, the Dominion Horticulturist, showed great zeal in this protection.

It is proposed to regard these two areas as bird sanctuaries in which steps shall be taken not only to prevent the destruction of the birds and the despoiling of their nests, but also to encourage their presence by providing those species which nest in holes and cavities with nesting boxes and sites. I am very pleased to say that the Ottawa Improvement Commission have consented to provide and distribute this spring two hundred and fifty nest boxes in Rockcliffe Park, and to constitute the same as a bird sanctuary. The Director of the Experimental Farms has agreed to the distribution in the spring of one hundred and sixty nesting boxes in the grounds of the Farm and the Botanical Garden, which will constitute a sanctuary. Apart from

the æsthetic motives, the practical value of the encouragement of birds in both these places is of inestimable importance, as they constitute the most efficient protective agencies of the trees that can be secured, and the cost of their assistance—the cost of the nesting boxes, etc.—regarded in the light of an insurance premium against insect depredations, is at the lowest rate imaginable.

The existence of two such bird sanctuaries will undoubtedly tend to prevent the gradual disappearance from the Ottawa district of a number of birds which are becoming less abundant than formerly. Further, it is reasonable to expect that when the northerly migrations are taking place in the spring, the encouragement we are arranging to offer will meet with a response, and birds which otherwise would have passed on will stay with us through the season to our profit in every way. The scheme will afford the best check that we can adopt in preventing, so far as is possible, the gradual departure of a number of our native birds from the Ottawa district.

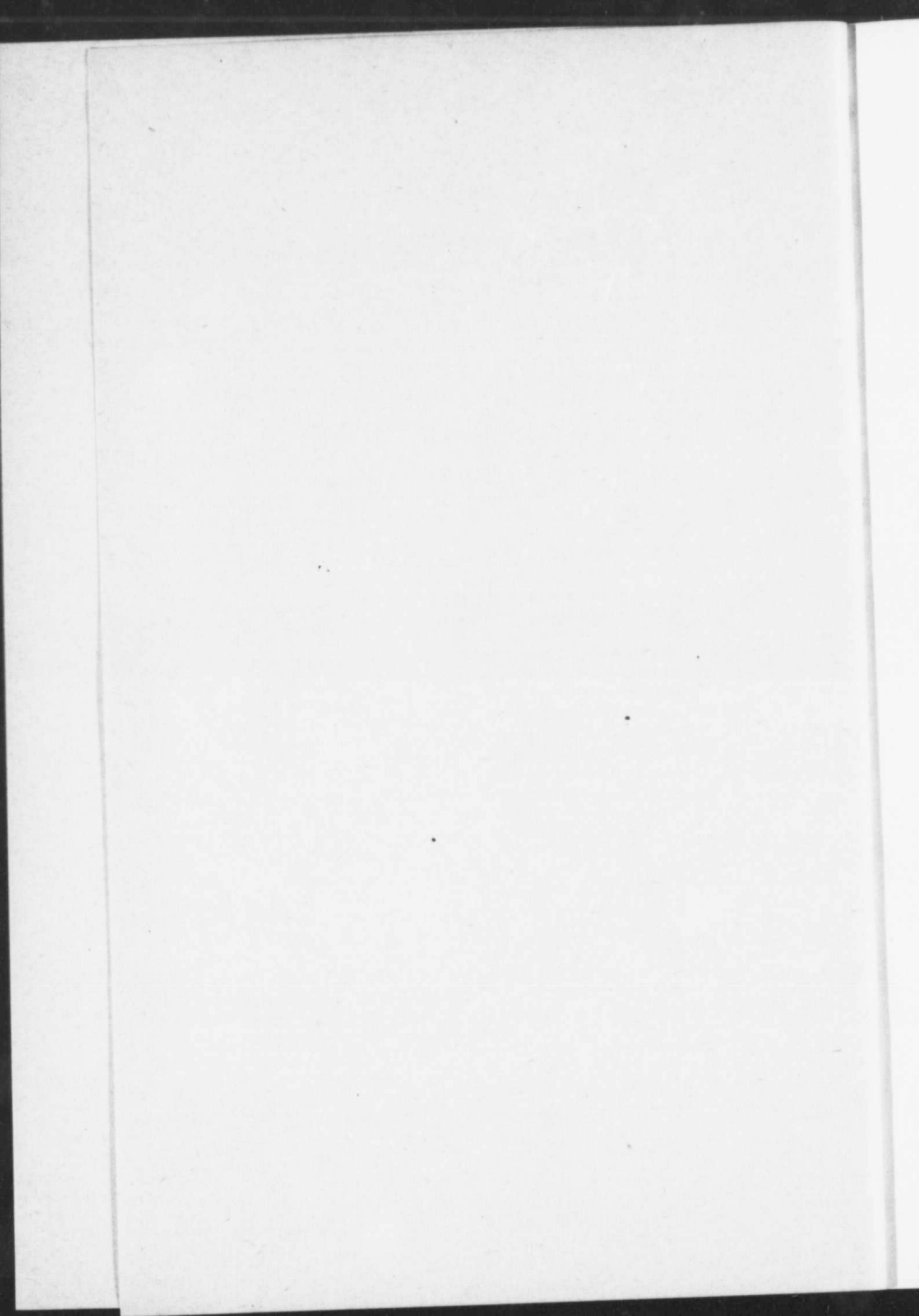
The successful carrying out of this scheme will require the sympathy and willing co-operation of all. The Field-Naturalists' Club is honoured by having as its patron H.R.H. the Duke of Connaught, Governor-General of Canada, who has requested me to express his warm sympathy and interest in this proposal. Mr. Borden, the Prime Minister, to whom I explained the scheme wrote: "It is needless to say that the proposal which you have in hand commands my entire sympathy." Sir Wilfrid Laurier has for some time urged the adoption of such a scheme. The Field-Naturalists' Club feels that it can rely upon the assistance of all those who have the preservation of the beauty and charm of our city and its surroundings at heart. With a view to assisting in the suppression of the wanton destruction of nests by robbing and birds by small rifle shooting on the part of boys in and around the city, the assistance of the Boy Scouts is being secured. Col. A. P. Sherwood, Commissioner of Dominion Police, writes: "I assure you that you could not have appealed to anybody more sympathetic in regard to the protection of our native birds, and I will certainly have this matter taken up at once by the Local Council of Boy Scouts". It seemed to me that as protectors of bird life and as policemen, the Boy Scouts would furnish an unrivalled auxiliary in this work. The idea is in accord with the spirit of the Boy Scout movement and the influence of such boys upon their more wayward and less enlightened brothers would undoubtedly be beneficial.

Finally, we must remember that the results of our action along the lines I have indicated will not influence Ottawa alone.

The activities of the Capital are observed and recorded throughout the country, not always to our credit. The force of example in such a protective movement will surely have effect on other places. Those who have travelled throughout Canada know how lightly the protection of birds is regarded, especially by those to whom it is most essential. The Provincial Governments have their regulations governing the protection of birds, but it is only by education and example that any real progress will be made in this movement which has for its object the guarding of our allies in the protection of our crops and the preservation of the most beautiful forms of animal life.

LITERATURE WHICH MAY BE CONSULTED

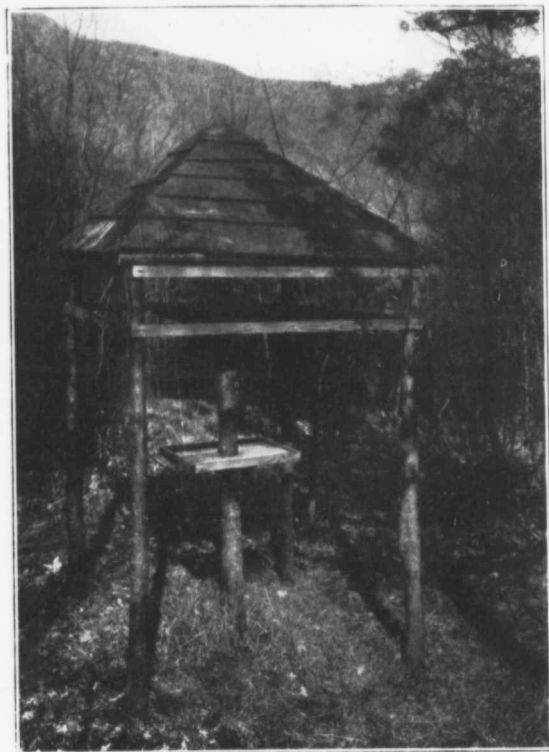
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Nesting Box in use at Thirlmere, Cumberland, England.



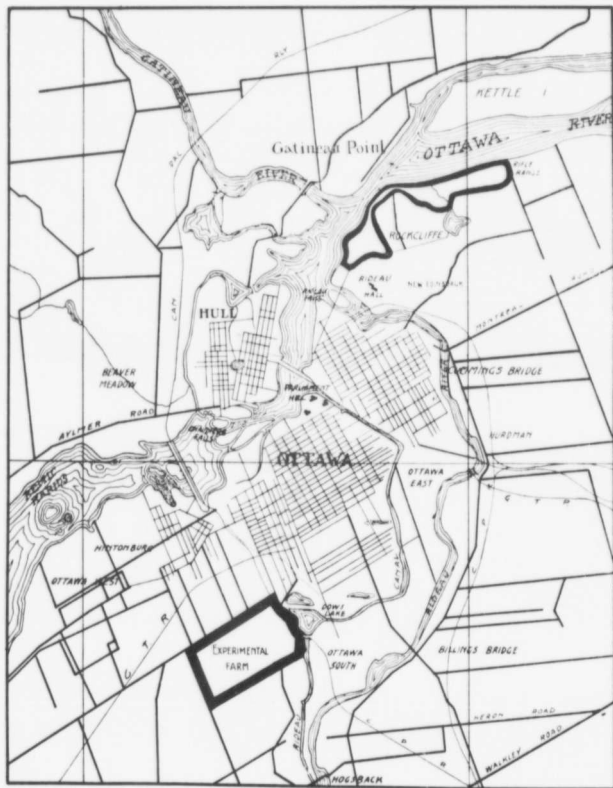


Hessian Food-house; One of a Number Erected on the Manchester Corporation Waterworks' Estate, Thirlmere, Cumberland, England for the Winter Feeding of Birds.

THE OTTA



Map of O



Map of Ottawa Showing the Location (Outlined in Black) of the two Bird Sanctuaries: Rockcliffe Park and the Experimental Farm.