

OCTOBER, 1914

VOL. XXVIII No. 7

THE OTTAWA NATURALIST

Published by The Ottawa Field-Naturalists' Club.

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VOL. XXVIII

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No. 7.

THE PROBLEM OF BIRD ENCOURAGEMENT.

By W. E. SAUNDERS, LONDON, ONT.

The question is, *How* to increase the number of our birds. Hardly anyone doubts the statement that "More birds would be a benefit to mankind," and the popularity of the efforts being made in that direction speaks volumes for the state of public sentiment; but "*How*" are we to do it?

The people to whom such encouragement will mean the greatest financial return are the farmers, and not only have they the best opportunity of producing an increase in bird numbers, but all the expense called for is the rental of an acre or two of ground, and the labor of fencing and planting it with the proper trees, shrubs and vines. From such an outlay, the revenue returned should be a good one, and the results are liable to be better if the planting is of the most attractive character than if it is done in a haphazard manner.

In a general way, the principle may be stated that most of our insectivorous birds like a little fruit at times, and the best way to provide this for them is to plant little shrubs bearing the native fruits in their little jungle, rather than to attract them to the orchard and there feed them with high-class grapes, English cherries, etc.

The size and location of such a bird reserve will vary according to the enthusiasm and ability of the owner. An acre or two would make a splendid jungle, and in southern Ontario would probably be used even by the quail, which is one of the most useful of all insect eaters.

In the bulletin on the chinch bug recently issued by the Division of Entomology, at Ottawa, the quail is given credit for being the only bird that is specially useful in fighting this particularly injurious insect. Those farmers near London, whose crops suffered so severely, in 1913, from this insect, would probably be willing to give serious consideration to the question

of bird reserves, realizing that such reserves would have meant money in pocket if they had been established years ago.

The area selected for the jungle should be well fenced, preferably with heavy netting at the bottom. Dogs, and if possible, cats should be excluded, as well as rabbits. The experience of the western sheepmen who fenced a large section of land to exclude coyotes, should be remembered; after the fence was completed they found they had fenced some coyotes in.

A few clear spaces among the planting are desirable, but the bulk of the ground might be thoroughly covered to good advantage. Shrubs and vines of rapid growth should be introduced even if they are not so desirable for permanent use most essential, however, is the planting of fruit-bearing trees and shrubs, which will be used as food by such species as desire it.

Almost every kind of tree has some features that are desirable from the standpoint of the birds; for instance, the foliage of basswood is subject to aphids, which makes it very attractive to warblers and other small insect eaters. As supply of insect food of some sort, however, is found on every tree and shrub, in these trees only those that are especially adapted in some way to the purpose of bird encouragement, are here recommended.

In the list should be a couple of hemlocks at good distances apart. These trees are the most attractive of all to the cross-bills in winter, hemlock seeds being their favorite food. Six Manitoba maples are recommended because the fruit hangs all winter, and when the rare Evening Grosbeak visits us it is very fond of it. This tree varies a great deal in its seed producing qualities, and for that reason six are recommended, but only two ought to be left and those two should be selected for their seed bearing qualities. A few mountain ash trees will provide berries for the late fall and winter birds, while mulberries and the native shadbush are needed for summer fruits.

In an investigation by the U. S. Biological Survey, Washington, a very few years ago, it was found that the berry which was most widely esteemed by the birds was the elder; therefore it would be well to plant a number of these. Thorn bushes make excellent bird covers and the fruits are used by some birds in the autumn. The native *Viburnums*, with berries varying from white to black, are also used by the thrushes and other birds. The wild blackberry should be planted for the purpose of making a tangle, which the birds delight

in, and as they have long been accustomed to it, it will be specially acceptable. The wild red raspberry is much frequented and desired by some birds. Currants, while not particularly desirable would doubtless add to the general attractiveness of the jungle. Then there should be climbers, particularly the two bitter sweets, the climbing bitter sweet and the annual one. But the best and most useful climber of all is the wild grape. Plant these beside a brush heap and they will soon cover it and make ideal protection for many of the seed eaters, and food for larger birds. Small willows are not only desirable as providers of insects, but also because of the ease with which they take root and grow.

There is no good reason why some ornamental shrubs should not be used, particularly on the sides facing the house and road. Spirea Van Houtte, (the Bridal Wreath) Lilacs, Philadelphus or Mock Orange, Exochorda, and others, could be used with advantage and beautiful effect, moreover, many of these are already popular with the birds we are trying to attract. And while some objection may be raised to them on the score of expense, yet that objection does not apply to lilacs, which sucker freely; so that one can obtain a hundred small plants by digging and dividing a single old one.

Consideration should be paid to the future appearance from the farm house; the tallest growing plants should be farthest away, the height graduating down, with only very dwarf things on the side next the house. This plan will give a much more extended view from the house, than if high vegetation is placed on the side next the house.

All these trees and shrubs should be planted not closer together than ten feet, unless enthusiasm and opportunity are unusual, and if so planted, it will be five to ten years before any require to be taken out. When they grow into one another, it would be well to remove some of them, as by that time the birds would have ample cover.

At first there will appear to be a great deal of unused space, and such might be planted to millet and buckwheat. This would of course apply only to the first season as after that it should be left so that the shrubs could have their own way.

Two weeds whose seeds are very much admired by winter birds are ragweed and pigweed. If a patch of these weeds is planted, it should be on the house side and not closer than twenty or thirty feet from the edge of the jungle, so as to prevent the weeds from spreading into the neighboring cultivated land. When the first year's growth has taken place there is little danger of the spreading of such weeds over what will then be uncultivated ground.

The above list contains most of the plants that are specially suitable for the purpose, but while endeavoring to procure as many of them as possible, the planter will of course use largely the shrubs that happen to be most available, employing also such wild perennials as golden rod, aster, etc.

Old stumps will prove an attractive addition to the reserve and will be an attraction to the chickadees in the nesting season. If these birds can be induced to locate there, they may be easily held for the whole year by a little feeding in winter, and no bird is more useful in the orchard than this species.

For the first few years there will be no place in this plot where robins can rest. This lack will seldom be very noticeable, as most farms have already some old trees in which they may nest, but, if there is absolutely no opportunity for them the need may be easily supplied, by a piece of 2 x 4 scantling driven into the ground, with two cross pieces near the top, forming a suitable nest foundation, the whole to be covered with a collection of dead vines, etc., leaving space for the birds to enter. If some wild cucumber is planted at the base of this, it will cover the post after a few weeks of growth.

A few nesting boxes stuck up on posts or on large trees would serve to attract bluebirds, tree swallows and house wrens, but care must be taken to keep down the English sparrows by means of trap and gun, or else these native species that nest in cavities will be unduly harassed and prevented from breeding.

It is well worth while to put up on a pole a house for the Purple Martin. If these birds can be induced to come, they will form a very important addition to the ranks of insect destroyers.

On May 24, 1913, I saw a little home-made Martin house on a pole in a farm yard about 25 miles north-west of London, and it had three or four pairs of Martins domesticated in it. What one farmer has accomplished, another may do.

Red squirrels should be persistently destroyed. These animals are second only to the domestic cat as bird exterminators, and will devour every available brood of nestlings unless they are prevented.

A path winding through the jungle would be no detriment and may often be a convenience. It should go near the trees, and as these will prevent any thick growth coming beneath them, wild flowers can be added to the collection when they are partly grown.

During the first year or two, the occasional use of the hoe around the newly introduced plants will hasten growth, but during the season of bird nesting, from May 1st to July 1st, too frequent presence on the reserve is not desirable until the birds have become thoroughly at home.

A plot of ground set apart for a bird reserve and treated as described above ought to begin to show practical results in the second year, and it will be surprising what a tremendous difference in bird numbers can be made by a little attention to their needs.

That this attention will give a substantial return in dollars and cents cannot be gainsaid, while for those fortunate country residents who already love the birds, and desire their presence, the results will be a constant joy.

Personal inquiries on this subject are invited by the writer.

MYOSURUS IN CANADA—I.

BY EDWARD L. GREENE.

Throughout the whole of Eastern North America the genus *Myosurus* is very scantily and feebly represented, and that too, in as far as our knowledge goes by the single species, *M. minimus*, an old world plant and the type species of the genus; and this is so great a rarity here at the east as to have been observed hitherto in no more than two localities, east of the Ohio river. One of these stations is Belleville, in southeastern Ontario, the other Norfolk, in the extreme southeastern corner of Virginia. The two stations are about 500 hundred miles apart in linear distance. For none of the intervening states of New York, Pennsylvania, Maryland, or for any of those of New England or the Maritime Provinces of Canada, is there any record of *Myosurus*; and for further demonstration of the complete isolation of the plant at Belleville, let it be taken note of that from that point southwestward to south-central Illinois, where it occurs again, the distance is some 750 miles. Then measuring the distance westward and within the Dominion, to where it occurs again in Assiniboia, we have 950, if not a round 1000 miles.

At the time when the plant was first detected at Belleville its isolation there would have appeared still more pronounced if the matter of its very sparing occurrence in North America had been taken into consideration; for in 1378, when Professor John Macoun brought forward specimens from there, the Virginian habitat was not yet known, and the nearest known stations for it eastward and southward were as very far away as Georgia, Tennessee, and Kentucky. At Norfolk, Virginia, it was not detected until 1893, or fifteen years later than Professor Macoun's obtaining it at Belleville.

Mr. F. V. Coville, the discoverer of the Norfolk habitat, remarked that the plant had the appearance of a recent arrival there; but in the case of the station in Ontario, Professor Macoun registers no suspicion that it is other than indigenous there. Indeed, he took it to be native, as we shall see later; and in this he may have submitted to the opinion of authors within the United States, not one of whom, in writing of *M. minimus* as occurring with us here, and there southward and far westward, expresses a doubt about its being native. Accepting this doctrine, there was, with the discoverer of the Ontario station, no occasion to question how the plant came there, however strangely isolated it was. But here I must reproduce his very interesting first notes about it in the first volume of the Catalogue of the Plants of Canada, P. 15.

"On ground subject to overflow and on limestone shingle at the ferry house opposite Belleville, Ontario; rocky pastures west of Albert College, Belleville, Ontario."

Here are given as many as three different kinds of environment for the plant as it was found growing in the vicinity of Belleville, now almost forty years since; and I know of no other more recent mention of *Myosurus* as being there. Results of a diligent, renewed investigation of the locality after so long a lapse of time would be very interesting, whatever they might be. One thing, however, which the language of Professor Macoun suggests to me is the possibility of there being in the Belleville neighborhood more than one species of the genus. I refer to the different kinds of environment, in each of which he found the plant growing. The expression, "ground subject to overflow", though not very definite, implies the prevalence of a good degree of moisture; but whether some stretch of low plain be meant where a temporary pool is formed after every good rain, or whether it were a stream bank where waters rise and fall at intervals—all these are uncertainties. But the European plant is said to grow there nowhere but in low, moist lands. This is not, however, true of all the

several *Myosurus* species native to America in the Great Basin and on the Pacific slope of the continent; and when "limestone shingle" is named as another environment of the Belleville *Myosurus*, the mind of the widely travelled student of these plants is reminded of the habitat of certain far western members of the genus. So also does the Belleville rocky pasture locality; for that should mean on the rocks themselves, either in their seams and crevices or on top of them, where there is little depth of earth, and some considerable degree of aridity; for as far north as eastern Ontario, all, except the rocks of a pasture, is occupied by perennial grasses, into the sod of which no *Myosurus* or other annual finds a foothold. In a word, the whole story of the Ontario locality for these plants points to the derivation of this colony from the far westward. Moreover, between the northwestern shore of Lake Ontario and those far-away *Myosurus* stations of the Southern States, there is practically no commercial traffic at all; whereas, by means of the Canadian Pacific Railway System, there is a very direct and constant inter-communication between all British Columbia and even eastern Ontario.

Long after his having discovered that Belleville colony of these plants, Professor Macoun found *Myosurus* on Vancouver Island, and I find his remark on this also very interesting. It occurs in his supplement to the volume already quoted, page 479. Listing it there, still under the name *Myosurus minimus*, he says: "It is extremely probable that the British Columbia form is a distinct species." This is a plain intimation that while still regarding the eastern plant as the real original *M. minimus* and native there, he saw discrepancies between the two, and suspected the Vancouver Island plant to be really new and nameless. Into these matters the present writer intends making further and critical research, the results of which may be presented later.

THE GENUS *ANTENNARIA* IN GREENLAND.

BY MORTEN P. PORSILD.

The *Antennarias* of Greenland have for a long time—by Joh. Lange and later authors—been determined as (1) *A. alpina* (L.) Gaertn., (2) *A. alpina* var. *glabrata* J. Vahl, (3) *A. dioica* var. *hyperborea* Don, to which L. K. Rosenvinge has added (4) *A. alpina* var. *intermedia* Rosenv. A closer study

of the forms and their occurrence in the field has shown, that the last mentioned three are hereditary constant and hence probably distinct species, the hitherto called *A. dioica* var. *hyperborea* from Greenland being in some details different from all specimens seen by me of *A. dioica* from Europe or Asia. Having, however, a very restricted access to literature and a still lesser one to collections, I am at a loss to give full particulars concerning the synonymy and distribution of some of the species, and allow me to invite the attention of American botanists to them, as most likely one or another of the species here considered as new may also occur in the eastern parts of arctic or subarctic America.

A more detailed study of the species together with full diagnoses and figures will soon appear in the "Arbejder fra den Danske Arktiske Station paa Disko."

SYNONYMY AND DISTRIBUTION OF THE GREENLAND
SPECIES OF ANTENNARIA.

1. ANTENNARIA ALPINA (L.) GAERTN.

West-Greenland: common to about Disco Bay, hence becoming scarcer and confined to well exposed lowland stations, collected however at Cape York, 76° 07' and in Hayes Sound, on Grinnell Land, 79° 04'.

East-Greenland: from the south to about 72°, common in the better investigated places, but *not found in North-East Greenland*.

America: Arctic Archipelago up to Melville Island, arctic, subarctic and alpine continental North America, Rocky Mountains, American and Asiatic coasts of Behring Strait, arctic and subarctic East-Siberia to Lena River, whence it seems to be replaced by *A. carpathica*, Altai, reaching the coast again in arctic Russia, Kolgужew, arctic and alpine North-Europe, Iceland, *wanting* on Jan Mayen, Spitsbergen, Nova Zembla, Franz Josef Land and New Siberian Islands; in other words, an arctic alpine, nearly circumpolar species, however, not reaching the northernmost limits for plant-growth.

A. alpina var. *Frieseana* Trautvetter: Act. Hort. Petropol. VI. 1879, page 24. *A. monocephala* (DC.) Ledeb. Fl. Ross. II, page 611. *A. alpina* var. *monocephala* (DC.) Torr. & Gray: Fl. of North America II, page 430.

In East-Siberia the commonest form, but connected with the main form by numerous transitions; also found in Greenland and America.

2. ANTENNARIA GLABRATA (J. VAHL) PORSILD n. sp. Syn.: *A. alpina* var. *glabrata* J. Vahl: Flora Danica tab. 2786, fig. 4. Joh. Lange: Conspectus Florae Groenlandicae, Meddelelser om Grönland III. 1880, page 100.

West-Greenland: between 64° and 72° 20'.

East-Greenland: between 66° and 72°.

Not rare on Disco Island, although much rarer than the preceding. Probably often overlooked, although it is very conspicuous. Not found in the southernmost parts of Greenland by collectors knowing the plant very well (Vahl, Rosenvinge, Hartz, Kruuse).

3. ANTENNARIA GROENLANDICA PORSILD nom. nov. Syn.: *A. dioica* var. *hyperborea* Lange l. c. but probably not *A. hyperborea* Don: Edinburgh Philosophical Journal, 1834, (a paper not accessible to me), more probably—*A. hyperborea* Fernald & Sornborger: Some recent additions to the Flora of Labrador, THE OTTAWA NATURALIST, 1899, page 106.

West-Greenland: 60° and 67°, commonest in the South.

East-Greenland: twice collected, at 61° and 66°.

Labrador?

On Iceland neither is *A. groenlandica*, nor *A. dioica* nor any other of the nearest allies of this species found.

4. ANTENNARIA INTERMEDIA (ROSENVINGE) PORSILD n. sp. Syn.: *A. alpina* var. *intermedia* L. K. Rosenvinge: Andet Tillæg til Grönlands Fonerogamer og Karsporeplanter.. Meddelelser om Grönland III. Forts. 3. 1892, page 698. *A. alpina* δ Th. Holm. Beiträge zur Flora Westgrönlands, Engler's Bot. Jahrb. 8, 1887, page 310.

West-Greenland: hitherto only found a few times between 61° 45' and 70° 05'. On South Disco, near Godhaven, several stations are known to me. The plant flowers here much later than do *A. alpina* and *A. glabrata* on the same spots, whence I suppose that it here is near its northern limit and should be searched for in more southerly latitudes.

Caudex	(1) <i>A. dioica</i> (L.) GAERTN. from Europe and Asia. with rosulate clus- ters and with pros- trate, apically up- ward bent stolons	(2) <i>A. groenland- ica</i> PORSILD = 1. = 1, but smaller and narrower, 10- 24mm long, 2-5mm broad equally on both sides. Tomentum dense and thick, but with a faint gray-greenish tint, remining one of nappy, not worn cloth.*	(3) <i>A. intermedia</i> (ROSEN V.) PORSILD = 1 = 2 = 2 = 2	(4) <i>A. alpina</i> (L.) GAERTN. = 1, the stolons are, however, relatively shorter lanceolate - spathu- late, often without apiculus, 10-20mm long, 2-4mm broad varying much, near- ly always densely tomentous on the underside, often on both. Sometimes the felt is with interstices, flocc- ose, grayish white, not shining	(5) <i>A. glabrata</i> (VAHL) PORSILD cespitose, stolons wanting, with den- sely aggregated clusters of rosulate leaves narrow lanceolate, apiculus ordinarily distinct, 10-20 mm long, 1-3 mm broad ordinarily tomen- tum quite absent, with isolated ru- dimetary hairs, rarely with small isolated floccose tufts
Rosulate leaves	lanceolate - spathu- late, ordinarily with small apicu- lus, 15-30 (-45) mm long, 5-9 mm broad ordinarily only on the underside, in the var. <i>hyperborea</i> on both sides. Tomentum dense, but thin, snowy white, almost shin- ing, reminding one of napless, worn out cloth.*	10-16 (-20) cm high tomentous		5-12 (-18) cm high, tomentous	8-10 (-12) cm high, slen d e r., without hairs
Tomentum of rosulate leaves					
Flowering stems	12-20 (-25) cm high tomentous cymose with 3-7 brevipicellate heads, rarely cor- ymbiform (var. <i>corymbifera</i> HARTM.)				
Inflorescence			subglobose, heads 8-12 small nearly sessile	= 1, the var. <i>Frie- seana</i> only with 1-3 heads	ordinarily one large head seldom two.
Length of flower ing heads		6-8 mm	4-6 mm	6-8 mm	8-12 mm

Involucral bracts	obtuse, entire or faintly crenulate, the scarious parts bright purple or white, the basal parts tomentous	= 1	obtuse, entire or faintly crenulate the scarious parts dark greenish brown, basal parts tomentous	acute, irregularly lacerate the scarious parts with various tints of brown, European forms often redbrown, basal parts tomentous	acute, the scarious parts irregularly lacerate, dark greenish brown, basal parts green without tomentum
Flowers and propagation	dioicous, pistillate and staminate flowers, fertilization normal.	only with pistillate flowers, apogamic	= 2	= 2	= 2
Pappus bristles of pistillate flowers	slender, 20-30 μ thick, rather faintly denticulate	somewhat coarser, 30-40 μ thick, denticulate, teeth of upper parts faintly curved upwards	still coarser, 40-50 μ , basal parts squarely denticulate, teeth of upper parts larger, erect-patent	coarse, 50-60 μ , especially in the upper parts densely denticulate, teeth patent, up to 50 μ long	= 4

*Through the courtesy of the Botanical Museum of Copenhagen, I have had dried specimens of *A. dioica* and its variety *hyperborea* from some 18 different parts of Europe and Asia for examination. The localities range from Koginew to Southern France, and from Scandinavia to Western Siberia. Besides, I have seen a good deal of *A. alpina* from various parts of the world, and all the material of the genus from Greenland, preserved in the named Museum.

All species of *Antennaria* in Greenland produce well developed fruits having the power of germination. As staminate flowers are totally wanting, the propagation of all species must be apogamic, as for a long time such has been known to be the case with *A. alpina*. The *A. glabrata* and *A. intermedia*, as they are growing near my home, are without doubt hereditary constant. They often form extended pure patches, the form of which depends on the circumstances of local wind or the outlet of melting water in the spring.

If my understanding of the species be right, *A. alpina* must be regarded as an old species that found its way to Greenland after the glacial period, probably over Smith Sound, where the crossing may have taken place during an epoch with milder climate than now rules in Greenland. *A. groenlandica*, however, belongs to the large contingent of American plants of South Greenland, that cannot have immigrated by this way. *A. glabrata* and *A. intermedia* are undoubtedly young species, or perhaps species *in statu nascendi*, the former developed from *A. alpina*, the second from *A. groenlandica*.

We have thus in the Greenland species of *Antennaria* a new example of polymorphy in apogamic genera (cfr. *Alchimilla*, *Taraxacum*, *Hieracium*).

Disko, Greenland, Dec. 1913.

EXCURSIONS.

The third excursion of the season was held at Britannia, on the afternoon of Saturday, May 16th. The party walked to a wooded grove, and the time was mostly engaged in botanical observations. At the addresses leaders spoke of the plants, birds, insects, and batrachians observed or collected, and information along general lines of natural history was imparted.

The fourth excursion was held at Fairy Lake. This was on the afternoon of Saturday, May 23rd. After leaving the electric cars, the party walked for a distance, until this ideal spot, known as Fairy Lake, was reached. The excursion was of the nature of a saunter, and the usual addresses were purposely dispensed with, this leisurely walk homewards through the woods of the Beaver Meadow taking for this occasion their place.

The fifth excursion was held at Leamy's Lake, on the afternoon of Saturday, May 30th. Although there was only a party of nine, the occasion proved to be most enjoyable and profitable. Mr. Gibson, the President, drew attention to a carabid beetle devouring a tent caterpillar; a partridge's nest, containing a set of twelve eggs, was found, and the woods were profuse with flowers and ferns.

The sixth excursion was held at Ironsides, on Saturday afternoon, June 6th. The train left the Broad Street Station at 1.40 p.m., and, on arriving at the destination, the party walked along the railway track until reaching a woodland, where it dispersed its minor parties, according to the phase of nature each desired to study. Mr. Sladen gave his attention to bees and captured a goodly lot. A wood-chuck or ground-hog was seen by several persons, and as it remained all the time beside its burrow, a fine observation was had of it. At the short addresses, which were interrupted by the arrival of the homeward bound train, Mr. J. W. Gibson, whose new professional duties have called him to British Columbia, spoke a few appropriate and appreciative words in the interests of the Club.

The seventh and final excursion of the season was held at the Experimental Farm, on the afternoon of Saturday, June 13th, and was well attended. Mr. Arthur Gibson, the President, Mr. W. T. Macoun, and other representative officials of the Farm, escorted the party through the arboretum, the greenhouses and the insectary. The horticultural observations of the trees, hedges and flowers were inspiring. A number of the bird-nesting boxes placed on the trees were observed, and a few birds were seen. The display of grapes, tomatoes, cucumbers and melons seen in the greenhouses was an interesting sight, and the visit to the insectary was also interesting. Towards the close of the afternoon a visit was paid to the Entomological Museum, where Mr. Gibson exhibited a portion of the collection of mounted insects. This collection is so vast that a whole afternoon would require to be devoted to its inspection in order to get any adequate idea of its significance and value.

ANDREW HALKETT,

Chairman, Excursions Committee.

BOOK NOTICES.

BIRDS OF NEW YORK.—By Elon Howard Eaton. Part 2, General Chapters: Land Birds. New York State Museum, Albany, N.Y., Memoir 12.

In the June, 1910, issue of THE OTTAWA NATURALIST, we noted the appearance of Part 1, a volume of 390 pages, of the Birds of New York, which volume discussed the Water Birds and Game Birds. Part 2, as above mentioned treats of the Land Birds and is truly a magnificent contribution to American ornithology. It is a much larger volume, consisting of 543 pages. In Part 1, there are 42 full paged coloured plates, whereas in Part 2, there are no less than 106.

With the presentation of Part 2, the entire field of work as originally planned by the author is covered. Students of birds everywhere will be delighted at the completion of this exhaustive memoir. The coloured plates, which are from drawings by Mr. Louis Agassiz Fuertés, are indeed excellent in every way.

The introductory charter of Part 2 discusses Bird Ecology (pp. 5-46.) This is followed by a chapter on The Economic Value of Birds (pp. 46-51.) In the author's own words "the main value of birds is in holding tree and crop enemies in check. Modern methods of fighting injurious insects seem, in some cases, to render the aid of birds unnecessary, but the special value of the bird's work consists in attacking insect pests which are not reached by poison spray and at seasons of the year when spraying is not practised, thereby preventing outbreaks which otherwise would cause great destruction and expense." In this chapter the value of birds as weed seed destroyers is also discussed. Other chapters which follow are "The Status of our Bird Laws," "Special Measures for Increasing Bird Life," "Bird Refugees" and "Private Preserves." These are all of extreme interest. Then follows the main portion of the work, viz., the description of genera and species of the land birds. This occupies pages 61-541. Many text figures appear in this part. The Birds of Prey are first treated of. Each species is discussed under sub-headings, such as description, distribution, habits, etc. These are followed by an account of the Paroquet, the Cuckoos, Kingfishers, etc., the Woodpeckers, the Swifts, etc., etc., until a complete treatment of the land birds is given.

Canadian students will indeed welcome the final part of this magnificent work on the Birds of New York. The New York State Museum is to be congratulated in issuing such a beautiful and useful memoir. To the author every credit is due for the final appearance in such delightful form of years of labour. The plates by the well known artist, Mr. Fuertés, will certainly be admired by all bird lovers. The cost of issuing such volumes is, of course, extremely high and for this reason personal copies will be expensive and possibly difficult to obtain. The chief public libraries, however, in Canada should endeavor to obtain these two volumes for use in their reference reading rooms. Owing to the large number of persons interested in our native birds there would undoubtedly be many applications for the use of the books.

A. G.

HANDBOOK OF THE ROCKY MOUNTAINS PARK MUSEUM.—By Harlan I. Smith. Canada, Department of the Interior, Dominion Parks Branch.

This very useful handbook of 126 pages has recently been received. It has been prepared with the intention of giving to the public now a reference guide to the natural history of the whole region in and around the Rocky Mountains Park, at Banff, Alta. In Chapter 1, on the "Geography of the Rocky Mountains Park, a list of the important mountains, with their altitude is given, as well as a list of the living animals in the Zoo and the Paddock. Under Chapter 2 on Mammals," the different species are discussed in an interesting manner. Chapter 3 treats of the Birds, Chapter 4 the Fishes; Chapters 5, 6, 7 and 8 discuss Reptiles, Amphibians, Shellfish and Insects. These latter chapters are brief and do not mention any of the species. Chapter 9 describes many of the Trees found in the Park. Chapter 10, on "Minerals," 11, on "Rocks," and 12, on "Fossils" are also brief. Chapter 13 is on "Weather," 14 on "Antiquities," 15 on "Indians" 16 on "History" and 17 on "Literature of the Rocky Mountains Park."

The handbook will doubtless be well received by many visitors to the Banff Museum and Park.

A. G.

THE BURDOCK GELECHIID

AN INSECT SEED-DESTROYER.

A very common but useful little insect which occurs in eastern Canada is the Burdock Seed Gelechiid, *Metzneria lappella* L. In the Ottawa district there is no difficulty whatever in finding in autumn and during the winter months, the curious little larvæ snugly concealed in the seed heads of the Lesser Burdock, *Arctium minus*. So abundant has the insect become that it is the exception to find a seed head in which the small caterpillar is not wintering. Oftentimes two larvæ are found in the same head. If a seed head is examined several of the seeds will be found to be fastened together and if these are separated the white larva, with a brown head, will be seen in its hibernaculum. It is a short, plump caterpillar and when mature is about three-sixteenths of an inch long. In spring it transforms to the pupal state and the moth emerges towards the end of May or during June. On one occasion I reared from a small handful of heads, nearly one hundred of the moths. The moth is a delicate little species, expanding when the wings are spread about half an inch, the females being slightly larger than the males. The front wings are pale brownish, with darker markings of brown; the hind wings are of a slate-colour and bear long fringes.

The Burdock Gelechiid, a native of Europe and Asia, was first discovered in Canada by the Rev. Dr. Fyles, at Levis, Que., in September, 1898. Since, it has spread considerably throughout the Provinces of Quebec and Ontario. The species is abundant at Toronto, where Dr. A. Cosens has noticed the larvæ since 1904.

Regarding the introduction of the insect into Canada, Dr. Fyles, in the Annual Report of the Entomological Society of Ontario, 1899, states: "It may well be asked, How was this European insect advanced to Canada?" This probably is the correct answer: at Point Levi there is a quarantine station for cattle; and old country hay and straw are often landed with the cattle; and burs containing larvæ of the species have, at some time, been landed with the fodder. The Burdock is plentiful on all our roads."

ARTHUR GIBSON.

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