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AMONG THE COFFIN-CARRIERS.

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Near at hand lay the nest-dotted green slopes of the island, stretches of rank grass alternating with thickets of raspberry and waving alder; farther back were the sparkling blue lake waters, with here and there flocks of great Gulls bedded upon them; and in the distance rose other islands, dark-green lumps, marked with numerous white spots proclaiming their winged inhabitants at home. The picture was most charming, but upon it the eye did not linger, for the centre of attraction was directly overhead, imperiously demanding attention. There, in the bright rays of the June sun, with the soft blue sky as a background, wheeled and circled, a hundred feet above me, a black and white cloud of six hundred Great Black-backed Gulls, the largest, the most magnificent, the most inspiring of our Sea-gulls. There was a scene which could not be duplicated!

Not in Labrador, not in Greenland were these Gulls gathered thus. The lake in which they make their home is bordered in part by farm lands, is within a mile or two of a railway, and within twelve miles of a town of seven thousand people. Although considered one of the wildest of Gulls, the Great Black-backed Gull (*Larus marinus*) or "Coffin-carrier" has established this colony, declared by Dr. C. W. Townsend to be "the largest breeding colony of this bird known, and the most southern one," in the midst of an accessible; agricultural country at Lake George, Yarmouth County, Nova Scotia.

Lake George is situated in the northwestern part of Yarmouth County, in latitude 44° N., longitude 66° 2' W., four miles from the Atlantic shore. It is four miles long and two miles wide, has a very irregular shore-line, and contains about a dozen islands, on seven of which, in the northern part of the lake, the Gulls nest. The greater part of its shore is wooded, but at no place are farm lands far distant, while for two or three miles they border directly upon the beach. The water-supply for the town of Yarmouth, twelve miles distant, is obtained from this lake.

I know of no generally recognized names for the islands occupied by the Gulls, but in order to make my records intelligible I have adopted for my own use names which are here given, together with sufficient information to render the islands identifiable. Big Gull Island is the largest island in the northern part of the lake, and has a larger number of nesting Gulls than has any other island. It is about a quarter of a mile long and half as wide, and rises some forty or fifty feet above the surrounding waters. The greater part of it is covered with alders and wild raspberry bushes, but there are some areas of open grassland, and a few spruce trees. Northern Gull Island lies north of Big Gull Island, to which it is similar, although smaller and with a larger wooded area. Bar Island is a low bar of rocks and gravel, of small extent, without trees or bushes. It lies south of Big Gull Island, and is elevated but one or two feet above the surface of the lake. Garnet Island lies south-east of Big Gull Island, near the eastern shore of the lake. It is small and narrow, and supports two or three living spruces and about a dozen dead ones. On its western side is a rather large area of coarse red sand, made up of small garnets. Catbrier Island, lying south of Garnet Island, is thickly wooded. A small thicket of Catbrier (*Smilax rotundifolia*), which is uncommon in Nova Scotia, grows among its trees. Southern Gull Island is another small wooded island, lying south of Catbrier Island. Round Island is fairly well wooded, and is more nearly circular than are the other islands named. It is near the western side of the lake, at some distance from the remainder of the Gull colony.

My latest visit to this thriving colony was made on June 16, 1920, when I spent about six hours there and landed on each of the islands on which the Gulls nest, and made in each case a short, rough survey, walking over as much of each island as was practicable and noting numbers of nests, eggs, and young birds. As the greater part of the nesting area is covered with a dense growth of

trees, bushes, or ferns, no doubt many nests, probably about one-third of the total number present, escaped my eye. A much larger proportion of the young birds, perhaps four-fifths, must have been passed unseen by me. Not long after hatching, these young Gulls are able to leave the nest, and at the approach of danger, to hide in the abundant cover. The skill with which they do this, and the very large proportion which in consequence are passed unnoticed are well shown by my experience in July, 1914, when banding young Gulls on Big

of which was already banded. In other words, less than 7% of the first lot of young birds could be found in the second search, while more than 95% of the second lot escaped observation at the time of the first search.

In addition to counting exactly the young birds, nests, and eggs seen, I made careful estimates of the number of grown-up Gulls belonging to each island. This was very difficult because, when I visited an island, Gulls from other islands would fly over, in greater or less numbers, to join the



A QUIET DOZE—TWO LAKE GEORGE COFFIN-CARRIERS RESTING ON THEIR NESTING-ISLAND.

Photo by Howard H. Cleaves; reproduced by permission—Cut by courtesy of Dominion Parks Branch.

Gull Island. A careful search of the island at that time revealed but 19 young Gulls, of which I banded 16, all that were large enough for the purpose. I then went to another island, and was there long enough to allow resumption of normal life and a general moving about on the part of the young Gulls on Big Gull Island. Then I returned to Big Gull Island and searched it a second time, finding 21 young Gulls large enough for banding, but one

actual residents of the island in protest. Nevertheless, I made repeated, careful estimates, with all the known conditions in view, and with the exercise of the strongest conservatism. A few Herring Gulls (*Larus argentatus*) are included in the colony, but they are almost lost in the clouds of Black-backs, in comparison with whose grandeur they, splendid birds though they are, seem small and very ordinary.

The results of my survey are shown in the accompanying table. The figures in the three columns at the right are estimates; all the other

figures in the table are the results of actual counts. The term "adult" in this table refers to all birds hatched prior to 1920.

Island	Empty Nests	Nests with 1 egg	Nests with 2 eggs	Nests with 3 eggs	Total Nests	Total Eggs	Young	Dead Young	Dead Adults	Adult Herring Gulls (Estim.)	Adult G. B. Gulls (Estim.)	Total Adults (Estim.)
Round -----	5	1	—	—	6	1	4	—	—	15	—	15
So. Gull -----	5	3	2	—	10	7	18	—	—	—	25	25
Catbrier -----	1	—	—	—	1	—	2	—	—	10	—	10
Garnet -----	11	8	3	1	23	17	21	—	—	—	50	50
Bar -----	4	1	2	2	9	11	1	—	—	—	25	25
Big Gull -----	124	32	14	9	179	87	155	6	2	10	590	600
No. Gull -----	80	24	5	4	113	46	52	3	1	—	225	225
Total -----	230	69	26	16	341	169	253	9	3	35	915	950

A conservative estimate would, I believe, place the total number of grown-up birds in the colony in 1920 at not less than 1,250, made up of about 1,700 Great Black-backed Gulls and 50 Herring Gulls. These figures may be arrived at in either of two ways.

The total number of nests seen is 341; if this was two-thirds of the total number present, the colony contained 511 nests, which would mean 1,022 breeding birds. That there were enough non-breeding grown-up Gulls in the colony to bring the total up to 1,250 is not improbable.

Again, the number of grown-up birds seen at the colony by me was most conservatively estimated, as shown by the tabulated figures, at 915 Great Black-backed Gulls and 35 Herring Gulls. To suppose that at least 285 of the former species and 15 of the latter were away from the colony, hunting for food, at the time of my visit seems very reasonable. Not only were Gulls to be seen flying to the lake at 9.00 a.m., when I approached it, and at 6.00 p.m., when I finally left its vicinity, but Great Black-backed Gulls, presumably from this colony, may be found daily in summer at practically every point along the seacoast for sixty miles in either direction.

These estimates are the best which I have been able to prepare, but, if any one considers them in error in any way, the actual counts and facts stated above may, of course, form a basis for any estimate preferred.

When one approaches an island in the colony, the Gulls able to fly gradually leave it and, for the most part, circle overhead, although some alight on the water not far away. The air becomes filled with a pandemonium of deep cries, of which I was

able to distinguish three kinds, a moderately loud *cuh-cuh-cuh*, a loud, bass *ow, ow*, and a roaring *rrr-rrr-rrr-rrr*. Most of the flying birds are in fully adult plumage, but some of them show traces of immaturity in brown markings here and there. By the time one lands on an island, all the Gulls able to fly have left it, and none of them return until the intruder has departed. As I walked over Big Gull Island, with fully six hundred Great Black-backed Gulls circling above me, I could not help thinking how little their fear was justified by the actual location of the power to harm. If those hundreds of tremendous birds had but realized their strength and willed to use it in effective coordination against the weaponless, shelterless human being intruding among their homes, they could with the greatest ease and speed have laid my bare skeleton to bleach upon the grass. But Great Black-backed Gulls are useful scavengers, naturally wild and shy, and I could not see that any of them at any time showed even especial solicitude for the particular nests or young near which I might be.

At the time of my visit, June 16, most of the young were recently hatched, but others were in the act of hatching. The newly-hatched young of the Great Black-backed Gull is a wet, spine-covered, ugly-looking dark object, sprawling helplessly, and uttering repeatedly a short, shrill whine. Soon, however, its spines burst into gray and black down, it gains the ability to walk and run about, and its cry changes to a rattling *ch-ch-ch*. The majority of the young which I saw on June 16 were in the downy stage. A small number showed feathers of the juvenal plumage in the wings and at the sides of the breast, and a very few of the

largest also had feathers of this plumage all across the breast and in the tail. Most of the young which are old enough to do so hide among ferns, bushes, grass, or rocks when the old birds leave an island at the approach of an intruder, but a few enter the water and swim rapidly away for a little distance. They are good swimmers, but can be overtaken easily by a rowboat. Those which hide usually remain quiet until they believe they are discovered, when they try to run, but they are slow and clumsy runners.

Gulls were the Black Duck (*Anas rubripes*), Spotted Sandpiper (*Actitis macularia*), Ruby-throated Hummingbird (*Archilochus colubris*), Purple Finch (*Carpodacus purpureus purpureus*), Song Sparrow (*Melospiza melodia melodia*), Yellow Warbler (*Dendroica aestiva aestiva*), and Maryland Yellow-throat (*Geothlypis trichas trichas*).

The colony of Gulls was first shown to me in June, 1912, by Mr. E. C. Allen, now of Halifax, N.S., who has given a brief account of it in his "Annotated List of Birds of Yarmouth and Vi-



THE CHALLENGE—A GREAT BLACK-BACKED GULL CALLING AT LAKE GEORGE.

Photo by Howard H. Cleaves; reproduced by permission—Cut by courtesy of Dominion Parks Branch.

On the gentle slopes of the islands the nests are mere hollows in the earth, generally with some lining of sticks and dead grass or *Usnea* lichen. Nests which are placed on piles of large boulders are much more substantial, as the character of the site necessitates, and are solidly built of grass, sticks, and rubbish. In some cases I noticed that the grass was still green. In one instance only did I find a nest lined with down, and, as that was on Round Island, it was probably a Herring Gull's nest.

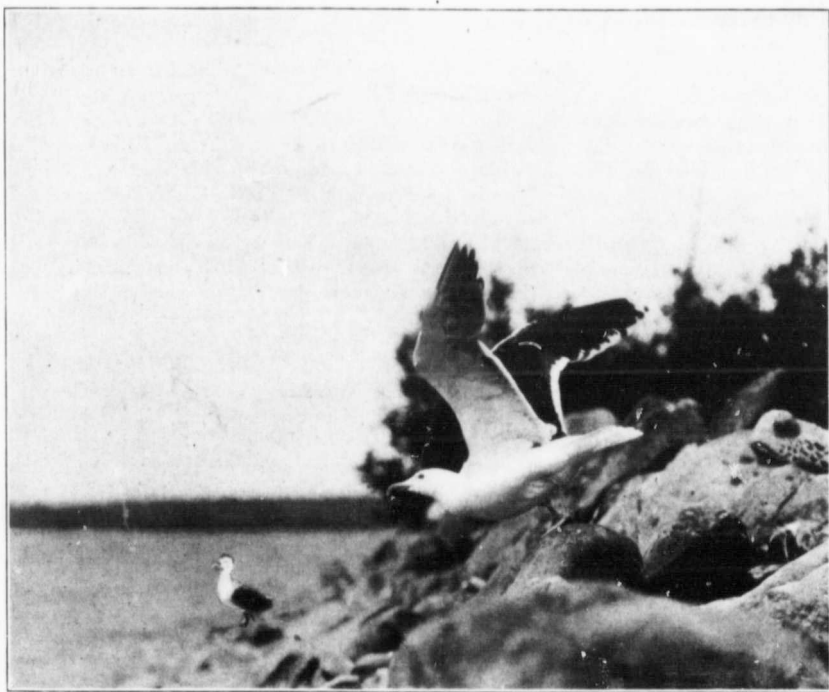
Other birds observed on the islands used by the

city, Southwestern Nova Scotia" (Trans. N.S. Inst. of Sci., Vol. XIV, Part 1, pp. 67-95, Jan. 5, 1916). A month later I again visited it, this time in company with Mr. Howard H. Cleaves, now of Albany, N.Y., who then made some splendid photographs of the gulls in their home, some of which were published in the 'National Geographic Magazine' for June, 1914, and some of which, by his kind permission, appear herewith. I visited the colony in July, 1913, and July, 1914, also. In those years there were not more than two-thirds

as many Gulls in the colony as I found there in 1920, so that it is evident that the colony is making encouraging growth.

It is earnestly hoped that, through the powers conferred by the Migratory Birds Convention Act, this colony of Gulls may be made a permanent reservation, and that the friends of bird protection in Canada may do everything possible to assist in bringing this about. Although all Gulls are protected by the Act, yet the general protection thus afforded must often, from force of circumstances, be insufficient, and to make this splendid colony a

jury to the colony becomes greater each year, and special protection should be given before any such harm, of which we have had too many sad examples elsewhere, is actually committed. No chances should be taken with such a colony as this, the largest and the most southern and accessible colony in the world of the greatest and grandest of our Gulls. The islands used by the Gulls are small, with small timber of negligible value, and are quite valueless for other purposes, for neither man nor domesticated animals can be allowed to live on them, because the waters surrounding them



PUSHING OFF—A GREAT BLACK-BACKED GULL IN THE ACT OF TAKING FLIGHT.

Photo by Howard H. Cleaves; reproduced by permission—Cut by courtesy of Dominion Parks Branch.

reservation, with a local warden during the breeding season, would add greatly to its chances of survival and growth. At present, although the wardens in the Maritime Provinces are alive to the situation and are doing their best, these Gulls must depend for protection largely on lack of widespread knowledge of their breeding at this place and on poor boating facilities on Lake George. As the country about the lake becomes more thickly settled, the chance of sudden irreparable in-

jury are a source of water-supply for Yarmouth town. On the other hand, such an eminent authority as C. W. Townsend, M.D., has stated to me that "the presence of these Gulls would have no effect on the potability of the water, or perhaps a beneficial one, as they would at once remove all dead fish or other animal matter that might otherwise pollute the lake." Although such a large number of Gulls must obtain the greater part of their food supply elsewhere than at the lake, yet they do not

neglect the lake, as some birds might do, but may be seen searching for food even in parts of it remote from their nesting-islands. There seems, therefore, to be every reason for taking action to

ensure the preservation at one and the same time of a unique and splendid bit of wild life and of a tireless band of scavengers and guardians of the health of a large town.

THE SPIDERS OF CANADA.

By J. H. EMERTON.

The writer recently published, in the *Transactions of the Canadian Institute*, Toronto, a catalogue of the known spiders of Canada, numbering 342 species. This seems small when compared with the numbers in countries where the fauna is better known, but spiders are hard to find and this number represents very well the larger and more common species. Many more will do no doubt be found, as more persons take up the study of these animals.

In 1846, John Blackwall, then the leading student of spiders in England, published in the *Annals and Magazine of Natural History* of London a "Notice of Spiders captured by Prof. Potter in Canada" a few years before in the neighborhood of Toronto. In 1871, he published in the same journal a "Notice of Spiders captured by Miss Hunter in Montreal." In 1875, T. Thorell published in the *Proceedings of the Boston Society of Natural History* "Descriptions of Spiders collected by A. S. Packard in Labrador." In 1876, the writer spent a short time in Montreal and collected a few spiders, which were described in a paper on New England *Therididae*, published by the Connecticut Academy in 1882. Between 1880 and 1890, J. B. Tyrrell collected spiders at Ottawa, in the Rocky Mountains and other parts of Canada, and at the same time T. E. Bean, in connection with his work on Lepidoptera, collected spiders around Laggan in the Rocky Mountains.

Since 1900, a considerable number of collectors have interested themselves in Canadian spiders. In 1905, the writer visited western Canada collecting at Vancouver, Lake Louise, Banff and Medicine Hat. The same year G. W. Peckham collected through the same region, especially at Vancouver, Glacier and Banff. In 1914, the writer again visited the Rocky Mountains, and collected in the Yoho Valley and Lake Louise, Banff and Jasper Park, and also at Edmonton, Athabasca Landing and Prince Albert. In 1915, he collected in the lower St. Lawrence Valley, and in 1917 at Le Pas and along the Hudson Bay Railway. The Canadian Arctic Expedition of 1913 to 1916 made a small collection of spiders on the Arctic coast of Canada and Alaska. The Crocker Land ex-

pedition also collected spiders on the west coast of Greenland in 1917. Messrs. E. M. Walker and T. B. Kurata of Toronto, collected spiders in 1913 at several points across Canada, and especially on Vancouver Island. Mr. N. B. Sanson of Banff, has collected spiders for several years in the surrounding country, especially on Sulphur Mountain. Mr. M. Taylor of Vancouver, has collected around that city and in the mountains north of it. Mr. Robert Matheson collected in Nova Scotia in 1913. Dr. C. W. Townsend of Boston, on his visit to "Audubon's Labrador" in 1915, collected spiders and extended the known range of several species. Spiders have also been collected in recent years by Mr. Norman Criddle in Manitoba, Mrs. J. H. Faull in Toronto, Mr. Charles Macnamara of Arnprior, Ontario; Mr. F. W. Waugh of Ottawa, Mrs. W. W. Hippiusley of Dauphin, Manitoba; Prof. A. B. Klugh of Kingston, Ontario; the late C. G. Hewitt, Mr. Arthur Gibson, and other correspondents of the Entomological Branch of the Department of Agriculture at Ottawa. New discoveries have been noted from year to year in the Entomological Record published annually in the reports of the Entomological Society of Ontario.

The spiders which Blackwall described cannot now be found and apparently no care was taken to preserve them after descriptions were published. The spiders collected by Packard in Labrador have also been lost, and some of their descriptions will never be certainly identified. The spiders collected by Tyrrell and his colleagues are in the collection of the Entomological Branch at Ottawa or in that of Harvard University. The collection at Ottawa has been much increased in the last few years and now contains probably 300 of the species catalogued. The Harvard collection is rich in Canadian spiders and contains most of the

The common spiders of Canada are described and illustrated in "Common Spiders of the United States," by J. H. Emerton, published in 1902, by Ginn & Co., Boston; "The Spider Book," by J. H. Comstock, published in 1912, by Doubleday, Page & Co. and "American Spiders and Their Spinning Work," by H. C. McCook, published by the author in Philadelphia, 1889 to 1893.

author's types and those described by Banks and Peckham. At Toronto there is a small collection with a large proportion of west coast species. The museum at Banff contains large numbers of the spiders living in the neighboring mountains.

The spiders of Canada fall naturally into several faunal groups. The house spiders with which we are most familiar are most of them introduced from Europe or from more southern parts of this continent. The common *Tegenaria derhami* of cellars and barns is a European species. The common round web spider of barns and bridges, *Epeira sericata* is also European, and is never found far from buildings. The still more common spider in houses of all kinds, *Theridion tepidariorum*, is found in caves and under cliffs farther south, but its original home is unknown. The same is true of the large gray *Epeira cavatica* found in barns and sheds through southern Ontario, Maine, and New Brunswick. The European *Epeira diademata*, a spider of gardens and the outside of houses, has been found at St. Johns, Newfoundland, and at Quebec.

The most distinct faunal group in Canada is the so-called Canadian fauna which occupies the part of Canada originally covered by forest consisting mostly of spruce. This comes to the coast in Maine and New Brunswick, and its southern border extends westward across Maine and Ontario north of the Great Lakes and the prairies to the Rocky Mountains. Several spiders have their southern limits along this border, as the author has shown in the report of the Entomological Society of Ontario for 1917. *Theridion zelotypum* is the most conspicuous of these, making large coarse webs between the spruce branches, with nests in which the female and her brood of young live together through the summer. *Linyphia limitanea* follows much the same range but a little farther north from Newfoundland to Manitoba, and has not been found beyond the Canadian boundary except in northern Maine. *Zilla montana* is another Canadian species that extends across the continent and south on mountain-tops to North Carolina. It lives in trees and on rocks, and settles readily on houses surrounded by forest. It lives also in Europe in the Alps. *Linyphia nearctica*, another species of this group, seems to be very sensitive to its surroundings. It is found usually on spruce trees near bogs from Labrador to the Rocky Mountains, and extends south in the upper forest of the mountains of New England and New York from an altitude of 2,500 feet up to the limit of trees. All these spiders live in trees well above the ground, but other species that live in moss close to the ground have similar distribution. One of these is *Theri-*

dion sexpunctatum, a pale spider with gray and white spots, and another, *Pedanstethus fusca*, a darker gray species resembling *P. riparius* of farther south. All the spiders of the Canadian fauna do not have this restricted range but extend much farther north and south. The species of *Pardosa* which live in open ground in bogs, along river banks and on mountain-tops, extend northward, some of them as far as animals of any kind have been found and also extend southward in bogs to the New England coast, New York and Ohio and on mountain-tops to Colorado. Some of the widely distributed Canadian species extend eastward by way of Greenland and Iceland, into Europe, or westward through Alaska into Siberia.

South of the spruce forest area, the country is occupied mainly by a fauna known as "transition" or "Alleghanian," containing many species of very wide distribution and closely related to the fauna of northern Europe. Through southern Ontario, Manitoba and Saskatchewan, the common spiders belong to this group. One of the most common and conspicuous by its cobwebs is *Agalena naevia*, which makes its large flat webs in grass fields, among low bushes, in dead trees and brush, and even in windows and doorways. These spiders lay their eggs late in the summer in flat cocoons partly covered with leaves and dirt, and adults all die before winter. The young hatch and sometimes leave the cocoon before cold weather, but for the most part wait until the next spring. The large *Epeira marmorea* and *Epeira trifolium* are conspicuous species, and also mature in the late summer and die before winter. In August and September their large round webs hang in large numbers in berry bushes and golden-rod, the brightly colored spiders hidden nearby in a nest of leaves fastened together and lined with silk. *Epeira patagiata* is another common spider of this fauna and extends far north into the Canadian area. It is colored in grays and browns like bark and wood. It makes its cobwebs after dark and leaves them at daylight, hiding in some sheltered place often several feet away. It establishes itself readily in barns and on the outside of houses, porches and fences, both in America and in Europe. The large white flower spider, *Misumena vatia*, lives among flowers all the way across Canada, eating flies and other insects that come to rest and feed on the flowers. Into this part of the fauna come many species of jumping spiders, *Attidae*, *Dendryphantes militaris* and *Dendryphantes flavipedes* live in great numbers on small trees and bushes, making no cobwebs but moving about constantly among the leaves, creeping close to resting insects and jumping upon them. They

are covered with hairs and scales, often brightly colored and iridescent, especially in the males. The common *Salicis scenicus* of both Europe and America lives on the outside of houses and is covered with a mixture of white, gray and yellow scales which give it the color of unpainted wood. It hunts and eats gnats and small insects of any kind. On the ground live several common *Lycosidae*, long-legged running spiders; in the woods, *Lycosa pratensis* and *Lycosa frondicola*, and in the open fields, several species of *Pardosa*. In midsummer the *Lycosidae* carry around their young enclosed in round cocoons attached behind to the spinnerets.

In the southern part of Canada come in a few spiders related to the more southern Carolinian fauna. The most conspicuous of these are the two species of *Argiope*, large spiders brightly marked with black, yellow, and silvery white. They make large, round webs in tall grass and low bushes, especially in low ground near brooks and ditches. Unlike the large *Epeira*, they hang in their webs through the day and so are more generally known. *Argiope aurantia* has been found at Toronto and *Argiope trifasciata* at Ottawa and Montreal. The large burrowing *Lycosa* which are so abundant in southern Manitoba belong to species that range southward as far as Texas. The habits of these burrowing spiders have been described by Mr. Criddle in the *Ottawa Naturalist* of April, 1918.

In the western part of Canada, a Pacific coast fauna extends north from California as far as Alaska, some of its species as far as the Klondike valley and eastward beyond the Rocky Mountains. *Brachybothrium pacificum*, the only Canadian representative of the tropical family *Aricularidae* occurs on Vancouver Island. *Epeira gemma* and *Linyphia litigiosa*, common in California, come north into British Columbia and eastward as far

as Medicine Hat. In British Columbia, *Agalena pacifica* partly replaces the eastern *Agalena naevia* and *Amaurobius pictus* replaces *Amaurobius beneti*. As yet, however, little is known about the spiders of western Canada and the Rocky Mountains.

North of the coniferous forest of Canada is a country little explored. Its spiders are known only from explorations of Labrador and the Arctic coast. Some of the most abundant species are the same which live in bogs and open spaces through the forest area and even south of it. The most widely distributed of these is *Pardosa glacialis*, which is abundant as far north as Greenland and Banks Land, and south into the United States. Hardly less diffused is *Pardosa greenlandica*, which extends along the coast as far south as Maine, is found at various points across Canada, and is abundant on all the mountains east and west above the trees. *Lycosa albohastata*, a small species brightly marked with black, white and orange, is found running on the sod just above the trees in the mountains of New Hampshire, in the Rocky Mountains, on the coast of Maine and Labrador, and along the Hudson Bay railway, so that it probably extends entirely across Canada near the northern limit of trees. Another arctic species is the variable and handsomely marked *Lycosa pictilis* that lives on the top of Mount Washington, on the coast of Labrador and Greenland and Alaska, and is probably identical with species described from arctic land farther north. *Erigone psychrophila* and other small species living among low plants near the ground are found at various points along the arctic coast from 60° to 80° north. As far as spiders are concerned, no faunal group corresponding to the "Hudsonian" of bird students has been noticed, but may be defined by a more thorough study of the northern border of the coniferous forest.



NOTES ON THE FAUNA AND FLORA OF EAST AND MIDDLE SISTER AND NORTH HARBOR ISLANDS, LAKE ERIE.

BY E. W. CALVERT, ARNER, ONT.

The following observations were made during a two days' trip to the islands, which are situated a few miles west of Pelee island in western Lake Erie. All have rocky shores with much shingle or coarse gravel and have a number of bays and shoals. Owing to a severe gale most of the time was spent on North Harbor island which contains but slightly over an acre in its area. The island is narrow and a ridge follows the centre. The following trees were found, being arranged in order of their abundance:—White Elm, Hackberry, Kentucky Coffee Tree, Sugar Maple, Chokecherry, Cottonwood, Staghorn Sumach and a shrubby willow. Along shore were observed several large stumps of the Red Cedar no doubt flourishing many years ago. Of the shrubs and vines the common elder (*Sambucus Canadensis*) is represented and Virginia Creeper; Climbing Bittersweet (*Celastrus*), Wild Grape and Poison Ivy abound. No attempt has been made to tabulate the herbaceous plants as a number were not familiar to the writer.

The item of greatest biological interest however is a large colony of the Common Tern (*Sterna hirundo*) the estimated number of birds being 2,000 to 2,500. Some 800 occupied nests were counted over half of which contained three eggs, about one quarter containing two, a few with four and the remainder with one. The nests were situated on the shingle a few feet above the water. Some were somewhat concealed by foliage and driftwood, others were in plain view but blended rather well with the shingle, thus making it necessary to pick one's steps. Most of the nests were composed of broken reeds and bits of driftwood but in some green leaves were employed, while in still others there was merely a hollow in the shingle; these were exceptional however. The nests were often as close as two feet to one another and were most numerous in the troughs of shingle formed by the action of the waves. The ground color of the eggs is a pale greenish or yellowish buff with variable dark spots sometimes forming a ring at the larger end. The eggs vary greatly in color, even in the same nest very light and very dark examples being frequent. During our whole stay the birds kept up an incessant noise and seemed to treat our presence with great disapproval. While at this island only one bird had hatched this being found just previous to our departure on the 21st of June.

The bird population of the island other than tern was scant consisting of a Red-eyed Vireo and

a Song sparrow, a visiting (?) pair of Kingbirds, as well as several Bronzed Grackles and a Crow, present no doubt for nest robbing as the terns made a great noise during their presence. Several Herring Gulls and a Bank Swallow were also noted flying past.

The next island visited was East Sister and contains thirty or more acres, about ten of which is cleared and is planted to peach trees and garden crops chiefly. As might be surmised, owing to its much larger size all branches of the fauna and flora were represented by a larger number of species than was the island previously visited. In addition to the trees enumerated as found on North Harbor the following were found on East Sister:—Basswood, Shellbark Hickory, White Ash, Silver Maple, Aspen, Sycamore, Red Elm and a species of Dogwood. The most abundant bird on this island was the Bronzed Grackle but the House sparrow, Kingbird and Red-winged Blackbird were also well represented. The following were also noted in small numbers:—Crow, Red-eyed Vireo, Wood Pewee, Cedar Waxwing, Cowbird, Robin, Killdeer and Turkey Vulture. According to report the Cottontail is found here but no other mammal is known, but no doubt others occur.

The last island visited is somewhat isolated, being about ten miles from the others and about twelve from the mainland. It contains some eleven acres, all of which are densely wooded, and has high rocky banks. On the side facing east is a promontory of rock and on the opposite side great windrows of gravel where Common Terns nest in great numbers. The tern population of this island was estimated at some 8,000 and the occupied nests at 1,500 to 2,000. Apparently over half of these had been robbed earlier in the season as the unoccupied nests were quite as numerous as the occupied ones. On the day the island was visited (June 22nd) about twenty per cent. of the birds were hatched but probably these did not start to hatch before the 20th.

The trees found on this island were almost identical in species to those found on North Harbor, the Red Cedar being alive in this case and the Sumach absent. Other than the terns, the following birds were noted:—Indigo Bunting, Kingbird, Red-eyed Vireo, Carolina Wren and a flock of about 500 Herring Gulls which left the bar on our approach. A visit to the island on May 30 revealed the pres-

ence of a hatching Black Duck, the eggs of which had probably been laid for about three weeks. Down from the bird's breast was used to line the finely-constructed nest.

To those interested in the nesting of the Common Tern, I would refer them to an article in *Bird-Lore* for August, 1904, where the colonies on the Hen

and Chicken group of islands were studied, and to the *Wilson Bulletin* for March, 1916, where a colony off the coast of Massachusetts was studied. Photographs are supplied in both articles and it is interesting to note that in the ocean colony the nesting material is totally different from and more abundant than that employed in Lake Erie.

OBITUARY

JOHN MACOUN, 1831-1920.

ASSISTANT DIRECTOR AND NATURALIST TO THE GEOLOGICAL SURVEY OF CANADA.

Prof. John Macoun, one of the oldest members of the Ottawa Field-Naturalists' Club, died at Sidney, Vancouver Island, B.C., on July 18, 1920, in his 90th year. He was born at Maralin, Ireland, about twenty miles from Belfast, on April 17, 1831. Like many other families in Ireland, after the great depression through famine and rebellion between 1840 and 1850, his family emigrated to Canada in the latter year, and settled in Seymour Township, Northumberland County, Ontario. At that time much of this part of Ontario was heavily wooded, and John Macoun and his brothers, Frederick and James, with their mother, began to clear a farm. Profits were slow in coming, and in order to relieve the situation, John, who felt that his calling was in a different field, began to teach school, as many another bright young man has done in Canada. Teachers were much needed in the country, and soon he had charge of a small rural school. He felt, however, that to succeed as he desired, more knowledge was necessary, so he took a course in the Normal School in Toronto in 1859. Later he was in charge of one of the smaller schools in Belleville, then became head of the public schools there.

All this time his love of nature had led him to study her many forms, but in botany he took particular delight, and by 1874 he had made such a name for himself in this study, that he was appointed Professor of Botany and Geology in Albert College, Belleville, a position he filled with great ability and success until 1881, when, having been appointed Botanist to the Dominion Government, he severed his connection with the college to devote all his time to public service, although since 1872 he had been employed part of the time by the Dominion Government.

In 1872, Mr. Macoun was invited by the late Sir Sanford Fleming to be the botanist of a party on an expedition through the West to explore and to determine the line for the first transcontinental rail-

way, now known as the Canadian Pacific. Associated with the party was the late Principal Grant of Queen's University, who in his book "Ocean to Ocean" gave a description of the trip and the part John Macoun played in it.

In 1875, Mr. Macoun was appointed botanist to an expedition under the leadership of the late Dr. Alfred Selwyn, then Director of the Geological Survey, and assisted in exploring the Peace River and the Rocky Mountains; and in 1877 he was asked to write a report on the country he had visited, and it was this report which brought Mr. Macoun prominently before the public, for in it he was most enthusiastic over the possibilities of the West, claiming that there were immense areas suitable for wheat culture, and for settlement.

He again explored the prairies in 1879, 1880 and 1881, and in 1882 published his very valuable work "Manitoba and the Great North-West," an octavo volume of 687 pages, and still the most complete book on the West which has been published. This was a private enterprise, but the information contained in that book did much to open the eyes of Canadians and the people of other countries to the vast possibilities of the Canadian North-West. On page 213 he wrote: "Much might be written about the future, and calculations made regarding the wheat production of years to come, but such speculations are needless. In a very few years the crop will be limited by the means of export, and just as the carrying capacity of the roads increase, so will the crop."

In 1877, he was invited to write a report on the whole of the western country for the information of the Minister of Public Works in connection with the new railway, and was cautioned not to draw on his imagination. "In response to this I wrote as much truth about the country as I dared," he states in another part of his book, "for I saw that even yet my best friends believed me rather wild on

the 'illimitable possibilities' of the country. When summing up the various areas I reached the enormous figures 200,000,000 acres. I recoiled from their publication on the ground that their very immensity would deny me that amount of credence I desired, so as a salve to my conscience I kept to the large number of 200,000,000 acres, but said that there were 79,920,000 acres of arable land and 100,000,000 acres of pastures, swamps and lakes. My statements were looked upon as those of an honest, but crack-brained enthusiast and little at-

tention was paid to them." The sequel, however, has shown that he was a true prophet.

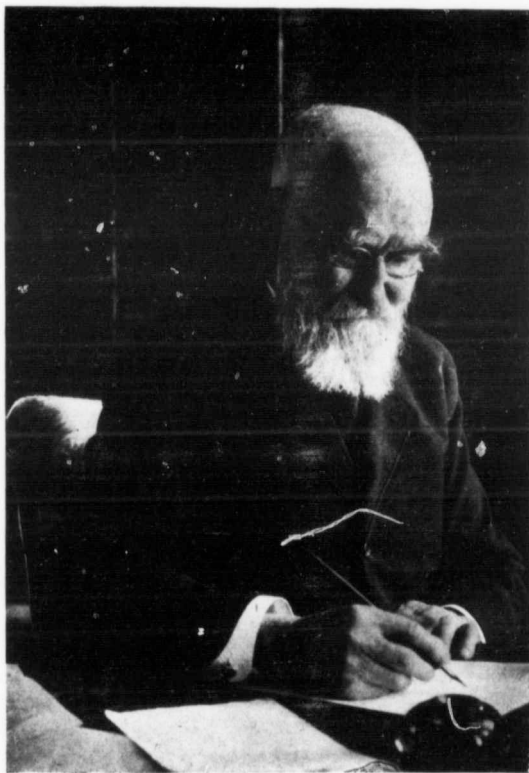
cultural Committee to give a description of the country, and after his address the following resolution was passed:

House of Commons,

Ottawa, 23rd Jan., 1906.

"Moved by Mr. Derbyshire,
Seconded by Mr. Wright, (Renfrew)

"That the thanks of this Committee be now tendered to Mr. John Macoun, Naturalist to the Geological Survey Department of Canada.



PROF. JOHN MACOUN.

for the valuable information laid by him before the Committee, on the natural capabilities of that large section of Western Canada extending from Edmonton to Portage la Prairie, on the occasion of his appearance before us, on this subject.

"The Committee desire also to record their appreciation of the valuable services Mr. Macoun has rendered to Canada in the past thirty years of his arduous official services as a

practical science officer of the Geological Survey of the Dominion; notably, are the following explorations of territory:—

"Prof. Macoun's first trip across the prairies was with Sir Sanford Fleming, in 1872. His glowing report of the country traversed caused him to be sent again in 1875, to explore the route that it was then intended that the Canadian Pacific would follow. When the present route was decided upon the Government sent him in 1879, 1880 and 1881 to report upon the country that would be opened up by the railway. Optimistic as his reports and prophecies were, they have all proved true. To these are to be added, Prof. Macoun's explorations in the Canadian Yukon Territory, in 1903, which revealed for the first time, that that far northern division of Canada also possesses agricultural resources of no mean order."

"Motion cordially adopted by Committee, and presented to Prof. Macoun, pro forma, by the Chair."

The Ottawa Field-Naturalists' Club was organized on March 19, 1879, and John Macoun, who at that time lived in Belleville, became that same year one of the corresponding members, and on March 11, 1881, came to Ottawa and delivered an address before the Club on "Capabilities of the Prairie Lands of the Great North-West as Shown by Their Fauna and Flora." He asserted that the botanical test was the only true criterion by which the agricultural status of any district should be judged. In the North-West every species of plant was found to have its particular habit as regards soil and moisture. He had found that even as far north as the Peace River a large number of plants occurred which were of the same general biological type as many Ontario plants, hence he concluded that about the same summer climatic conditions prevailed. He found that certain grasses ripened in the same number of days as wheat in Ontario and the same grasses ripened in about the same time in the North-West, hence the growing seasons were sufficiently alike to ensure the cultivation of wheat over a vast area.

Prof. Macoun moved to Ottawa from Belleville with his wife and family in the autumn of 1882, and lived continuously there until 1912, when he moved to British Columbia. He was President of the Ottawa Field-Naturalists' Club in 1886-7. He was promoted to the position of Assistant Director and Naturalist of the Geological Survey in 1887, which he held until his death. While his home was in Ottawa, he was exploring and collecting in some part of Canada nearly every summer.

It was during these thirty years that he, with the assistance of his son, James M. Macoun, built

up the greater part of the herbarium of over 100,000 specimens of Canadian plants, now in the Victoria Memorial Museum, Ottawa, although in the herbarium are many specimens which he collected sixty years ago. He made large collections also in Western Canada between 1872 and 1882. The first part of his "Catalogue of Canadian Plants" was published in 1883, and he continued to publish parts of this list until 1902, when the last number was issued. The parts appeared as follows:—Polypetalae, 1883; Gamopetalae, 1884; Apetalae, 1886; Endogens, 1888; Acrogens, 1890; Musci, 1892; Lichens and Hepaticae, 1902. The publication of this catalogue was a great undertaking, brought to a successful completion after years of close and personal work. There was a great demand for it, and it is now out of print.

Prof. Macoun began collecting bird skins for the Museum of the Geological Survey at Ottawa in 1879, and through his efforts a large number of skins were obtained from that time on, and before he left Ottawa he had the satisfaction of seeing a very fine collection of Canadian birds there mainly as the result of this work.

He published a Catalogue of Canadian Birds in three parts, the first in 1900, containing the Water Birds, Gallinaceous Birds and Pigeons; the second in 1903, of the Birds of Prey, Woodpeckers, Flycatchers, Crows, Jays, and Blackbirds; the third in 1904, of the Sparrows, Swallows, Vireos, Warblers, Wrens, Titmice and Thrushes. These proved very popular and useful, and it became necessary to re-publish them in one volume, which was done in 1909 with the assistance of his son, James M. Macoun. This Catalogue gives the name, range, and breeding habits of Canadian Birds.

He published many years ago a small text book on "Elementary Botany," and from time to time during his long life issued many valuable reports and lists.

He had in an advanced stage of preparation, before his death, an "Annotated List of the Flora of the Ottawa Region, an "Annotated List of the Flora of Nova Scotia," and an "Annotated List of the Flora of Vancouver Island."

He was interested in and loved all branches of natural history, and may be said to have been an all round naturalist, though it was as a botanist he was most known. He was one of the first Canadian Fellows of the Linnaean Society of London, Eng., and was a charter member of the Royal Society of Canada.

The town of Macoun, Sask., was named after him.

Prof. Macoun was a man of very strong vitality and was seldom ill. He had decided that he would spend his last years on Vancouver Island, where in

that mild climate he could be in the open air and collect specimens for most of the year, and had fixed on the spring of 1912 as the time when he would move to British Columbia. No doubt the rush and excitement of closing up his work at Ottawa had something to do with the paralysis which struck him down a few weeks before his intended departure. But, while the attack was a severe one, none of his faculties were affected, and though a few weeks later than the date he had decided upon, he left for British Columbia in April, 1912, with his right arm and right leg somewhat affected by his illness. His health continued to improve, and he was soon roaming the woods of Vancouver Island making collections. He had been collecting mosses since 1861, and when he had found and catalogued practically all the flowering plants in Canada, he devoted much time to the study of mosses, lichens, liverworts and fungi, and when he went to live on Vancouver Island his time was devoted mainly to cryptogams, and he gathered many specimens there.

The Government is often blamed for not showing appreciation of services rendered by members of the Civil Service, but in the case of Prof. Macoun this was not so. When at 81 years of age he decided to leave Ottawa in 1912, and spend the rest of his days in British Columbia, he knew that he might be superannuated as he was past the age limit and still on full salary, but the Government, considering his past record, treated him generously, and he received a copy of the following order-in-council, by which he retained his position in the Service until his death,—

"Privy Council, Canada,
9th June, 1913.

"The Committee of the Privy Council, on the recommendation of the Minister of Mines, advise that Prof. John Macoun, Naturalist and Botanist in the Geological Survey, who is over the prescribed age limit referred to in Rule 40 of the Treasury Board Minute, dated 11th November, 1870, be, in recognition of the worth of his past work, allowed to retain until further notice, his connection with the Department of Mines, outside of Ottawa; his living expenses while engaged on actual field duty only to be a charge against the Geological Survey appropriations."

Rodolph L. Boudreau,
Clerk of the Privy Council.

The Honourable
The Minister of Mines."

SPECIES NAMED AFTER JOHN MACOUN

Perhaps no better tribute to the work of John Macoun can be paid than the list of some of the

species of plants, etc., which have been named after him, most of which were discovered and collected by him but named by some other scientist. While there are 45 species in this list, it is not a complete one, but it indicates the large number of new and rare specimens collected by him. Few scientists have had as many species named in honour of them as John Macoun.

FLOWERING PLANTS.

Alopecurus Macounii, Vasey.
Calamagrostis Macouniana, Vasey.
Elymus Macounii, Vasey.
Ranunculus Macounii, Britton.
Lesquerella Macounii, Greene.
Draba Macouniana, Rydberg.
Arabis Macounii, S. Wats.
Potentilla Macounii, Rydberg.
Rosa Macounii, Greene.
Lupinus Macounii, Rydberg.
Astragalus Macounii, Rydberg.
Gentiana Macounii, Holm.
Oreocarya Macounii, Rydberg.
Antennaria Macounii, Greene.
Hymenoxys Macounii, Rydberg.
Arnica Macounii, Greene.
Bidens Macounii, Greene.
Sisyrinchium Macounii, Bickn.

MOSSES.

Andreaea Macounii, Kindb.
Distichium Macounii, C.M. & Kindb.
Encalypta Macounii, Aust.
Entodon Macounii, C.M. & Kindb.
Homalia Macounii, C.M. & Kindb.
Hypnum Macounii, Kindb.
Philonotis Macounii, Lesq. & James.
Pogonatum Macounii, Kindb.
Racomitrium Macounii, Kindb.
Cinclidium Macounii, Kindb.
Eurhynchium Macounii, Kindb.
Heterocladium Macounii, Best.
Neckera Macounii, C.M. & Kindb.
Timmia Macounii, Kindb.

LICHENS.

Biatora Macounii, Eckfeldt.
Pannaria Macounii, Tuckerm.

HEPATICEAE.

Anthoceros Macounii, Howe.
Cephalozia Macounii, Aust.
Cololejeunea Macounii, Spruce.
Fossombronina Macounii, Aust.
Lophocolea Macounii, Aust.
Odontoschisma Macounii, Aust.

ECHINODERMS—STARFISH.

Leptasterias macouni, Verrill.

MOLLUSKS.

Boreotrophon macouni, Dall and Bartsch.
Turbonilla (Pyrogolampros) macouni, Dall and Bartsch.

INSECTS—BUTTERFLY.

Oeneis macounii, Edwards.

FISH.

Chauliodus macouni, Bean.

Total, 45 species.

Until the year before he died he continued quite active, but his heart finally gave him trouble, and following a severe attack of whooping cough in the spring of 1920 his vitality was much lowered and after less than a week's confinement to the house he died at Sidney, Vancouver Island, on July 18. During the last few months of his life, when he could no longer go far from home, it was his delight, under the name of "Rambler," to name plants sent in for identification through the local paper, the Sidney Review. After his death the following tribute appeared in that paper: "Rambler" is dead. The beautiful flowers of the forest, which he loved so well, will never again receive the gentle touch of "Rambler." The flowers among which he spent the greater part of his life will miss him no less than those of our readers who took much interest and received great pleasure from this department of the Review. Professor John Macoun, ("Rambler"), died last Sunday morning."

He had many strong and outstanding personal characteristics. His determination and perseverance are marked through all his early explorations, and many accounts might be related where it was nothing but sheer determination that carried him safely through perilous and exhaustive situations. After his recovery from the paralytic stroke in 1912, which left his right hand in such condition that he could not write with it, he determined to write with his left, and from that time on did so in a very legible handwriting. He could never be idle and had nothing to regret in his old age over wasted days and nights, for he worked both night and day until a few years before his death, when he spent his evenings in reading. He was a very wide reader and kept himself well posted on the events of the world to the very last, and, having been a great reader for so many years, he was a veritable encyclopedia. He had a wonderfully retentive memory, and could give the year and the day of the month where he had been when anything out of the ordinary occurred in his personal experience apparently back to his childhood. He could give the scientific name on sight of thousands of flowering plants, mosses, lichens, liverworts, and fungi.

His quickness in this respect was remarkable, but quickness was one of his strong characteristics both in his actions and in his speech. His repartee was so keen that he was seldom, if ever, cornered in an argument, and he delighted in discussing any matter of general or personal interest. He had an extremely logical mind and had great power of accurate deduction when given a few important facts. He was very emphatic in his statements, and his enthusiasm was so great that the combination of these two characteristics made his personality a striking one. With these two traits, however, went a very humorous disposition, and many an audience and individual went into bursts of laughter over his way of putting things. His honesty was proverbial and he was very frank and outspoken in regard to wrongdoing. He was kind and generous not only to his family and near friends but to those from whom he did not expect to receive anything in return. He believed that there was an Overruling Power, but that men had much to do in shaping their own destiny.

Perhaps the strongest trait in Professor Macoun's character was a sympathetic understanding of his fellow-men, one that made him hosts of friends and a much sought advisor in questions of doubt and difficulty. The honesty of his opinion and the straightforwardness with which his advice was given, in conjunction with his sympathetic manner of giving it, secured for him a respect and affection that lasted a lifetime. His wonderful magnetism and ready tact constituted him a leader of men, and had his great abilities turned to statesmanship he would have been a great power for the good of his country. He was a true Imperialist and a firm believer in the strength and integrity of the British Empire.

His dearest wish was to live until the termination of the Great War, every phase of which he studied with the most intense interest, and his fervent hope was that he might be spared to see a proper readjustment of subsequent world conditions, and a fulfilment of the high ideals that were at stake.

Prof. Macoun was a Presbyterian in religion, and was an elder in St. Andrew's Church, Ottawa, for many years previous to his departure for British Columbia in 1912.

He was married in 1862 to Miss Ellen Terrill, Wooler, Ont., who survives him. His children are: Mrs. A. O. Wheeler, Sidney, B.C.; Mrs. R. A. Kingman, Wallingford, Vt.; Mrs. W. M. Everall, Victoria, B.C.; and Mr. W. T. Macoun, Dominion Horticulturist, Experimental Farm, Ottawa, Ont. His eldest son, Mr. James M. Macoun, Chief of the Biological Division of the Geological Survey, predeceased him by a few months.

W.T.M.

BOOK REVIEW.

REPORT OF THE SECOND NORWEGIAN ARCTIC EXPEDITION IN THE "FRAM," 1898-1902, 4 volumes in 36 parts, large octavo, 1907-1919, 9 maps, 111 plates, and 2,071 pages of text. Published by the Society of Arts and Sciences of Kristiania (Videnskabs-Selskabet i Kristiania), at the expense of the Fridtjof Nansen Fund for the Advancement of Science.

The separate reports of what is sometimes known as the Sverdrup expedition have finally been completed and issued in collected form. The original papers have been published from time to time since the return of the expedition eighteen years ago, and well illustrate how the side lines or by-products of such an enterprise may show their value long after the more spectacular features have been more or less forgotten.

The First Norwegian Arctic expedition, under Dr. Fridtjof Nansen, had the attainment of the North Pole for its main object. After the return of this expedition, Captain Otto Sverdrup, who had been the navigating officer of the *Fram*, returned to the Arctic to explore and map portions of the American Arctic island archipelago. The lands explored by this expedition, Ellesmere island, and the later discovered Axel Heiberg island, Amund Ringnes island, and Ellef Ringnes island, are in the territory of the Dominion of Canada, and their history and resources should be of interest to Canadians. The ship *Fram* was furnished by the Norwegian government, and the remainder of the expense of the four years' expedition, about \$60,000, was borne by Consul Axel Heiberg and the Ringnes brothers of Kristiania, and their names are perpetuated in the new lands discovered. The expedition explored and mapped about 100,000 square miles, the greater part of which is new territory.

Captain Sverdrup was assisted by fifteen men. The scientific results were largely the work of G. I. Isachsen the cartographer, H. G. Simmons the botanist, Edward Bay the zoologist, and Per Schei the geologist. In reviewing their work, in *Science*, August, 1920, Prof. Charles Schuchert (Yale University) says: "A better fitted and a more loyal band of hard workers—both men of science and sailors—never explored unknown lands. . . . It is a source of regret that Per Schei did not live to see the final working up of his grand geologic collections, since all attest that this warm-hearted man of science collected a vast mass of material; in fact it may be said of him that he made accessible to paleontology and stratigraphy more information of an exact nature than all previous Arctic expeditions.

"These four volumes, together with Captain Sverdrup's popular account, entitled "New Land" (2 volumes, 1904), should be in every scientific library, not only because of their great intrinsic value, but because we owe it to our Norwegian friends thus to show our appreciation of their splendid achievement."

The astronomical and geodetic observations are worked up by G. I. Isachsen, (141 pages), terrestrial magnetism by A. S. Steen (82 pages), meteorology by H. Mohn (399 pages). The botanical collections by Dr. H. G. Simmons (University of Lund, Sweden) amounted to over 50,000 specimens, and are described in eight papers. Dr. Simmons described the vascular flora, about 190 species, showing that Ellesmere island has at least 115 flowering plants which in general are a continuation of the flora of Greenland although there is a strong American trait that has come from the west. E. Rostrup lists 80 forms of fungi. From over 7,000 specimens of lichens, O. V. Darbishire describes 161 forms. N. Bryhn describes 290 forms of mosses, of which 49 are new. F. Ingvarson identified samples of driftwood from the shores and elevated beach lines, and discusses their origin and source. 18 species of migrant water birds and 5 species of land birds are recorded, as well as 9 kinds of mammals (polar bear, wolf, fox, ermine, glutton, lemming, hare, muskox, and reindeer). Of the Crustacea, G. O. Sars describes 154 kinds, including copepods (71), amphipods (38), isopods (11), and ostracods (11). H. H. Gran discusses the phytoplankton, which form the bulk of animal subsistence. 53 species of Mollusca and one brachiopod are described by J. A. Grieg; about 50 kinds of bottom-living Foraminifera by H. Kiaer; and 77 species of bryozoans by O. Nordgaard. The Echinodermata are described by Grieg and include 2 crinoids, 6 starfish, 6 ophiurids, 4 holothurians, and 1 sea-urchin. The remainder of the marine fauna include 2 sponges, 4 actinians, 6 sea-squirts, 10 hydroids, 4 medusae, and 44 kinds of polychaete worms.

The very rich geologic results of Per Schei were remarkable for the abundance and variety of the fossils collected, and also for the record of the distribution of the various formations. These showed that the Archeozoic granites of Ellesmere island are overlain by about 14,000 feet of Paleozoic strata, beginning with Upper Cambrian, followed by basal Ordovician (Beekmantown), middle Ordovician, early and middle Silurian, and an extraordinary development of Devonian. The Carboniferous is known only in the highest Pennsylvanian rocks,

followed by marine Upper Triassic. Then there is no sedimentary record of any kind until the deposition of the Miocene fresh-water beds with lignites. As Per Schei died soon after the return of the expedition, the fossils are described by O. Hiltedahl. The land plants of the Upper Devonian and the very few from the Miocene are described by A. G. Nathorst; the Devonian fishes by J. Kiaer; the Devonian invertebrates by O. E. Mayer and S. Loewie; the Upper Carboniferous fauna by T. Tschernyschew and P. Stepanow; and the Triassic marine invertebrates by E. Kittl.

Points of interest to be noted are the richness of plant life in certain spots during the very short growing season. It was noted that flora was most abundant on granite lands and least developed on Paleozoic limestone. It was richest on bird grounds and around Eskimo habitations, and on the whole was sufficient to support the few land animals. The waters are alive with animal life, from minute forms to seals, walrus and whales. The marine fauna does not include a great variety of species, but makes up for this in the abundance of individuals.

R. M. ANDERSON.

NOTES AND OBSERVATIONS.

A PIGEON HAWK WINTERS AT OTTAWA—The past winter 1919-20 with its heavy snow and extreme cold could scarcely have been a worse one for any bird wintering north of its usual range. However that may be, a Pigeon Hawk (*Falco columbarius*) did spend part of the winter in Ottawa and was seen in Mr. E. G. White's garden from January 8th to February 4th, 1920. This sojourn gave an opportunity to study its food habits to a certain extent. It braved the great cold of January during which month the thermometer registered 29°F. below zero on at least one occasion.

Mr. White had many chances to observe it during that time and we both watched it through field glasses for about half an hour on February 2nd.

During its stay it often flew among Mr. White's pigeons, but apparently took no toll of them. It was observed eating a House sparrow on January 9th, and captured a Pine Grosbeak shortly before my visit on February 2nd, strewn its feathers about the garden. Chickadees were apparently beneath its notice, and on February 4th, it remained peacefully on its perch while a Ruffed Grouse budded the bare upper limbs of an adjacent crab-apple tree.

Consultation of some of the bird literature shows that this species occurs occasionally in Quebec and Ontario in winter, although its winter range extends to South America.

Some recorded winter occurrences are:

Fleming: *Auk*, Vol. XXIV, 1907, p. 73—Given in the Canadian Journal, 1, 1852-3, as a winter resident at Toronto in 1853.

Nash: Occasionally seen at Toronto in winter.

Terrell: *Ottawa Naturalist*, Vol. XXIV, 1910, p. 39—One seen at Compton County, Quebec, December 2—15, 1909; and *ibid*—seen at Montreal, Quebec, on December 9, 1908; January 2nd and January 30th, 1909.

HOYES LLOYD.

THE BIRDS OF THE WILDERNESS OF NOVA SCOTIA—On pp. 36 and 37 of *The Canadian Field-Naturalist*, Vol. XXXIV, No. 2, February, 1920, Mr. H. A. P. Smith, of Digby, N.S., tells of noticing an absence of birds, especially song birds, in the interior wilderness of Nova Scotia, and enumerates the ten species which he has found there, one of which, the Song sparrow, he has observed there but once.

It would appear that either Mr. Smith has been very unfortunate in the times and places of his journeys into the Nova Scotia wilds, or that in some way he has overlooked many birds ordinarily to be found there in the breeding season. On the open sphagnum bog, it is true, birds may be scarce, but if there are a few bushes and dead stubs, the White-throated sparrow, the Maryland Yellowthroat, and the Chestnut-sided warbler are almost certain to be present. Among the granite boulders the Nighthawk lays its eggs, at the numerous lakes Spotted Sandpipers, Loons, Great Blue Herons, Herring Gulls, and Great Black-backed Gulls frequently occur, and, where even a small area of woodland has escaped the fire and the axe, Hermit Thrushes, Magnolia Warblers, Chickadees, Redstarts, and a great variety of other woodland birds proclaim their presence.

I have had the pleasure of making a number of journeys into the interior of Nova Scotia, and while, unfortunately, I did not always make notes on the birds, especially the common birds, to be found there, yet I am able to state that I have observed at least fifty-nine species of birds in the Nova Scotia wilderness, the home of the moose and the wild-cat. As the avifauna of Nova Scotia is fairly well known, no attempt will be made to take up space here by enumerating these species (to which no doubt many more might be added) in detail, but the following resume of them may serve to prevent any impression that the interior of

Nova Scotia lacks bird songs in the season of song. The observations on which this summary is based were made in the counties of Yarmouth, Kings, and Halifax.

Loon, 2 Gulls, Great Blue Heron, 3 Snipe, Canada Ruffed Grouse, Barred Owl, Belted Kingfisher, 3 Woodpeckers, Nighthawk, Ruby-throated Hummingbird, 3 Flycatchers, 2 Jays, Northern Raven, Crow, Rusty Blackbird, 7 Finches, Tree Swallow, 2 Vireos, 18 Warblers, Winter Wren, Red-breasted Nuthatch, 2 Chickadees, Ruby-crowned Kinglet, 3 Thrushes.

HARRISON F. LEWIS, BERGERVILLE, P.Q.

PROSECUTIONS, MIGRATORY BIRDS CONVENTION ACT AND NORTHWEST GAME ACT BY OFFICERS OF THE DOMINION PARKS BRANCH AND ROYAL CANADIAN MOUNTED POLICE.

MIGRATORY BIRDS CONVENTION ACT.

George Albert Culbert, Boisevain, Manitoba, for having four live Blue-winged Teal—Fine \$10.00.

Fred Z. Boudreau, Boudreauville, Petit de Grat, Cape Breton, N.S., shooting one Red-breasted Merganser—Fine \$10.00.

Geoffrey Jeffries, Louldale, Richmond Co., Cape Breton, N.S., shooting one Red-breasted Merganser—Fine \$10.00.

Murray Wilson, New Waterford, Cape Breton, N.S., shooting a Black Guillemot—Fine \$10.00.

Frederick Mason, Tancook Islands, N.S., shooting Mergansers in P.E.I.—Fine \$10.00.

Marcus Schnare, Tancook Islands, N.S., shooting Mergansers in P.E.I.—Fine \$10.00.

Sabeen Allen, Upper Cape, Westmoreland Co., N.B., shooting a Merganser—case dismissed.

Lloyd Smith, Chebogue, Yarmouth Co., N.S., possession of Canada Geese—Fine \$40.00 and costs.

Harold Cain, Arcadia, Yarmouth Co., N.S., shooting at a Bittern—Fine \$10.00 and costs.

James Paynter, Clinton, P.E.I., selling Canada Geese—Fine \$10.00 and costs.

James Paynter, Clinton, P.E.I., possession of parts of Canada Geese—case dismissed.

Wesley Paynter, French River, P.E.I., possession of Canada Geese—Fine \$10.00 and costs.

Charles Paynter, Long River, P.E.I., possession of Canada Geese—case dismissed.

Robert Gibbles, Petite Lamec, Shippigan, N.B., serving Canada Goose at meals—case dismissed.

NORTHWEST GAME ACT.

Peter Alexey (Indian) Husky River, for killing Mountain Sheep—Penalty—7 sheep hides, 1 head and carcasses. Seized and forfeited.

ACCESSIONS TO THE MUSEUM OF THE GEOLOGICAL SURVEY, CANADA—The Museum of the Geological Survey, the *de facto* if not the *de jure* National Museum of Canada has received lately two donations of more than ordinary importance.

One is from Mr. W. E. Saunders, of London, Ont., well known as an enthusiastic and public spirited naturalist. It consists of duplicates which in a life-time's work he has naturally gathered in his private collecting and which he feels would fill a larger sphere of usefulness in the National collections. They number 922 bird and 103 mammal skins. The great value of this particular collection lies in the fact that it contains many specimens collected at comparatively early dates and represent conditions passed beyond recall and upon which we have little or no other data.

The other contribution was made by Mr. Ernest Thompson Seton, who is too well known to require particular personal mention here. It consists of some 102 bird skins and an important collection of zoological books and pamphlets. The former is more notable from the original and unique records it contains than for numbers and the latter includes many rare papers and the proceedings of some small or defunct learned societies that are difficult to obtain.

These donations form valuable additions to our National collections which constitute the basis of exact ornithological work in Canada and as such will be of assistance to all present and future ornithological workers in the Dominion.

P. A. TAVERNER.

THE NAME OF THE "ENGLISH SPARROW"—The House Sparrow, of Europe, since its introduction into America, has been so popularly called the "English Sparrow" that it hardly seems worth while to endeavor to return to the correct designation. Since the beginning of the war, however, there have been some suggestions of obvious intent, to call this undesirable citizen the "Prussian Sparrow." The proposal however is purely academic and there seems little chance that a name so firmly established can be changed in current usage even by the best intentions of the loyal friends of England. During the war, however, there have been some changes in the scientific name of this bird that are interesting to the general public as well as the nomenclaturist.

In *Falco*, No. 2, Dec. 2, 1905, Kleinschmidt, of obvious nationality, separated the bird of the British isles from the continental form under the name of *Passer hostilis* thus commemorating to some degree the Song of Hate in scientific nomenclature. H. C. Oberholser, *Auk*, 1917, 329, states that

whilst the British and the Continental forms may be distinct, the difference is only subspecific and hence the insular bird should stand as *Passer domesticus hostilis*. As undoubtedly our birds are descendants of English stock the same name applies to them. Thus though it does not seem that "Prussian Sparrow" can ever be substituted for "English Sparrow" in this country we really accomplish the same and by a sort of reflex action the opposite of the intention of the original describer, in calling it *hostilis*, the enemy.

P. A. TAVERNER.

LANTERN SLIDES FOR EDUCATIONAL PURPOSES.—

For some time the Biological Division of the Geological Survey of Canada has maintained a collection of lantern slides for free educational use. This collection covers about three hundred slides of various natural history subjects. They are mostly from original photographs taken by officers of the Survey though some have been kindly donated by other photographic naturalists. Most of them are unusually well colored and of great photographic as well as zoological interest. The series is still far from complete but it is being added to as rapidly as possible and already it is possible to illustrate a great number of subjects by its means. Birds are principally represented but mammals, amphibians and reptiles are also included in the series.

Collections of these slides are loaned freely to any responsible person or institution to be used for educational purposes and not for personal profit. The only conditions attached to their use are, that they be returned promptly with a report on the occasion of their use and that the borrower pays express charges, if any, and makes good losses not due to ordinary wear and tear.

It is regretted that distance makes it impossible to extend this service west in the prairie provinces, or to the Pacific coast at present, but plans are now being considered for having duplicate sets distributed from the branch offices of the Survey in Edmonton and Vancouver.

Any one desiring to use these slides should make written request to the Biological Division of the Geological Survey, Ottawa, stating his official position, if any, the subject of the lecture it is proposed to illustrate, the society, institution or audience to be addressed, or under whose auspices the gathering is to be held, the number and kind of slides desired and the date. The application should be made well in advance so that conflict of dates can be adjusted. The slides should be returned promptly that others who may be waiting for them and have dates already set may not be disappointed.

P. A. TAVERNER,

Ornithologist, Geological Survey, Ottawa, Ont.

BIRD MIGRATION.—In the May, 1919 number of THE CANADIAN FIELD-NATURALIST there is an article on the above subject by Mr. H. Mousley containing statements which can hardly be allowed to pass unchallenged.

Mr. Mousley rejects as "one of the fairy tales of science" the theory that birds during migration find their way by the sense of sight. He states that "in pure nature there is no such thing as self-consciousness, or the power of reasoning," yet he admits that these faculties are found in man. If man is not a part of "pure nature" then we are forced to the conclusion that he must be regarded as super-natural, a conclusion with which I think few scientific men will agree. Further this statement is not in accord with carefully conducted observations and experiments on the higher animals. Mr. Mousley goes on to say that some of the higher animals, such as dogs, horses, etc., from long and intimate association with man, no doubt at times display traces of it, that is, of self-consciousness or reason. This statement again is contrary to all the data furnished by the study of animal psychology, since no entirely new type of mental process, such as reason, can possibly be evolved by association with man, and all that man can do in the training of animals is to make use of, and develop more fully, faculties already possessed by the animals in question.

Mr. Mousley continues: "All wild birds and animals, however, I believe, are subconscious, and therein lies the secret of their making no mistakes." The onus of proof that wild animals "make no mistakes" is upon Mr. Mousley. If this were true it would be most fortunate for them, but I fancy any close observer of wild life can recall cases in which wild animals have made mistakes, mistakes which in many instances have cost them their lives.

The next statement is: "To understand this more fully one must be prepared to accept the fact that telepathy (now recognized by science) pervades and is general throughout the entire animal kingdom. It is a potential faculty (working on an astral plane unknown to us at present) which interconnects subconscious mind, and permits silent intercourse to be established." I would venture to suggest that telepathy is far from being recognized by the majority of scientific men, that the idea of "astral planes" is regarded by most biologists as a phantasy, and that there is absolutely no proof that any mind can communicate with any other mind, save through the medium of the senses of hearing, sight, touch or smell.

But Mr. Mousley goes even further than relying on telepathy to account for the directing of migra-

tion and brings in "telaesthesia," which he defines as "power of vision passing the limits of time and space." One can readily see what a very useful power this would be, a power more wonderful than all the gifts of prophecy and fairy wands, but one must be allowed to express a slight doubt as to its existence.

If birds are possessed of this miraculous power it is rather hard to account for the fact of their becoming lost in a fog when migrating. A fog certainly might cause them to lose direction if they depended on the sense of sight, but it should have no influence on a purely mental attribute, such as "telaesthesia" is assumed to be.

In conclusion I would suggest that if the guiding of migration by the sense of sight is to be regarded as one of "the fairy-tales of science" that Mr. Mousley's theory may be regarded as "fairy-talaesthesia."

A BROOKER KLUGH.

A DOPED BUTTERFLY?—Early in September last year in woods on the shore of Lake Missanog, Frontenac County, Ontario, I came across a patch of very large specimens of the poisonous Fly Agaric, *Amanita muscaria*. On the pileus of one of the specimens was a Camberwell Beauty, *Eu Vanessa antiopa*. It did not take flight when I touched it but merely wobbled weakly from side to side. I picked it up and let it go in the air, but it fell to the ground with closed wings. I then placed it on the trunk of a tree, to which it clung for a few minutes, and then fluttered back to the same fungus, where I left it.

It would seem as if this butterfly had been poisoned by muscarine, the extremely toxic alkaloid found in *Amanita muscaria*, though no absolute conclusion on this point can be drawn from this single instance. Its behaviour in returning to its poisonous repast is interesting, but here again no definite conclusions can be drawn from a single instance. I should be glad to hear of any other observations on the relations of insects to this fungus.

A. BROOKER KLUGH.

MORCHELLA BISPORA IN CANADA. Mr. W. S. Odell's note in a recent number of *The Canadian Field-Naturalist*, apparently constitutes the first published record of the finding of *M. bispora*. The Division of Botany, Central Experimental Farm, some years ago (1912) studied some Morels collected by Mr. J. W. Eastham, B.Sc., near Billings Bridge; among them Mr. Eastham showed me *Morchella bispora*, and I well remember the charac-

teristic ascus containing the two large hyaline spores. There is no doubt in my mind that the species then examined is the same as that recorded by Mr. Odell.

H. T. GUSSOW.

MORCHELLA BISPORA IN CANADA.—I was interested in the article "A Rare Fungus New to Canada," by Mr. W. S. Odell in the January number of *The Canadian Field-Naturalist* in which he records *Morchella bispora* from Chelsea, Quebec, and from the vicinity of Ottawa, but I beg to point out that his statement that "There is no record of its having been previously found in Canada," requires modification. In the Ontario Natural Science Bulletin, No. 6, 1910, I first recorded this species from Canada and I reproduce below the original note:—

"*Morchella bispora* is a very common fungus on the Bruce Peninsula, Ontario. It grows abundantly in damp woods, appearing in May, and lasting till early in June. Some of the sporophores attain a very large size. As an edible species it ranks high, as it is tender and of excellent flavour. Dr. Dearness informs me that this species has not been previously recorded from Canada."

The fact that records of the occurrence of species of plants and animals in Canada can be easily overlooked shows the need of some central authority for each group. Such an authority should not be a worker in the group but should be willing to receive and keep on file all records of the distribution of species in his group. I would suggest that the Ottawa Field-Naturalists' Club try and make such arrangements for as many groups as possible, and publish the names of the authorities, so that anyone wishing information on the distribution of species in a certain group can appeal to the proper authority. In this connection I should be extremely glad to receive records of all species of Cyanophyceae (Blue-green Algae), Chlorophyceae (Green Algae) and fresh-water Protozoa of Canada.

A. BROOKER KLUGH.

RUSTY BLACKBIRDS WINTERING IN ALBERTA.—A flock of eleven Rusty Blackbirds have remained in Camrose, Alberta, throughout the past winter. The winter of 1919 and 1920 has been as severe, and perhaps longer than any since the settlement of this portion of the west. The ground was frozen several inches deep by October 10th, and on the 18th of that month eight inches of snow covered the ground. On November 6th the thermometer registered 24 below zero, on which day a flock of Evening Grosbeaks began their residence in Cam-

rose for three months. There were several breaks in the weather before the New Year, but by the middle of January it became very severe, and the thermometer showed 55 below zero for several days towards the end of the month.

The winter came on with such suddenness that many birds must have perished, likely more from want of food than from the terrible cold. On November 4th, tree sparrows and juncos were very plentiful, and seemed to be in an excited condition of mind, being more restless than the chickadees that were with them. On the 10th of the month some boys brought me a Richardson's Owl that they had taken from the limb of a small poplar, even he, seemed to be chilled to the bone and did not resist capture. Before Christmas the snow was 20 inches deep on the level, and a month later I measured it in the woods and found it to be over 30 inches.

Late in January I happened to be at the stockyards one afternoon, and was very much surprised to hear the note of a blackbird, and on looking around saw a flock of eleven Rusty Blackbirds. Most of them were feeding on a stack of oat sheaves, while a few were sitting on the high fence that surrounds the yards. On enquiry I was told that they had been there since the first cold spell, and that on fine days they generally made a flight out to the neighboring farms, always returning before evening. None of the men could say where the birds spent the night, but thought they must have crawled into the stacks or the many crannies around the buildings.

On several occasions after, I visited the yards to see how the birds were wintering, and always found them in the very best of spirits. On very cold days they seemed to be occupied mostly in keeping their feet covered from the frost, this was done by squatting down and spreading out their feathers very much like the way the Horned lark acts while on the ground. Warm afternoons seemed to brighten them up, and feeble attempts were made at chorus singing, but not with the same vigor as is shown by them in the fall before leaving for the South. At this date (March 26th) the flock is seen daily flying to various parts of the town in search of different foods, and there are indications of their mating, six are males and five females. Their plumage is commencing to assume the lustre of spring birds.

Now the question must arise, why have these birds remained through such a long cold winter?

Camrose is on the 53rd Meridian, nearly three hundred miles north of the Montana and Dakota lines.

Did they know that this great distance separated them from a more congenial clime, and would not take the chance of a flight that might necessitate a stop where feed and shelter were uncertain? Something told them they had remained too long last fall, and that it would be best for them to accept the hospitality of the stockyards, rather than make an effort to cross several hundred miles of uncharted snow covered plains!

FRANK L. FARLEY.

A UNIQUE ENTOMOLOGICAL EXPERIENCE.—

While in camp at Lake Missanag, Ontario, during September, I collected a specimen of *Pedicia albivittata*, a large Crane-fly with black markings on the wings. I placed the specimen in the cyanide bottle fully expecting that, after the usual manner of Crane-flies, it would shed several of its long and loosely-attached legs, and my anticipations were fulfilled by its losing three of these appendages. I removed it from the cyanide bottle, pinned it, and proceeded to stick the three lost legs on with LePage's glue. In this process, which was one of some difficulty and demanded considerable accuracy of manipulation, one of the legs broke at the tibio-femoral joint, but I succeeded in joining it together again and attaching it to the body.

Half an hour after I looked at the specimen to see if all the appendages were still secure, when I observed, to my intense astonishment, that *the leg which had been broken in two was waving up and down*. None of the other appendages were moving and upon touching the abdomen the insect showed no signs of life. This leg continued to wave about for an hour or so, and early next morning it was still moving, and continued to do so intermittently until noon.

The only explanation of this peculiar episode which I can suggest is that some substance, possibly acetic acid in the glue, acted on the muscles of the leg, causing them to contract, and the broken leg moved because it had received a double dose of this substance.

A. BROOKER KLUGH.