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THE VERTEBRATES OF THE OTTER LAKE REGION, DORSET, ONTARIO.

By A. H. Wright and S. E. R. Simpson.

I.—GENERAL ACCOUNT.

By A. H. Wright.

The district covered by these notes might well be termed the Lake of Bays region. More strictly they pertain to the extreme eastern part of Muskoka from the longitude of Portage (between Peninsula Lake and Lake of Bays) to that of Hollow lake (Lake Kawagama, or Kahweambelewgamat or Kahweamhegewagamag) in northwestern Haliburton. In latitude they relate of the region from Dorset on Trading lake (the eastern end of Lake of Bays navigation) northward to Algonquin Park Station in southwestern Nipissing. The center of activity is at Camp Otter (Professor C. V. P. Young, Cornell '99, Director) on Otter lake which is two miles north of Dorset. The waters and woodlands of the above roughly outlined district are more or less traversed each summer by councillors of this camp.

Camp Otter is now in its eleventh season. From its beginning Prof. and Mrs. C. V. P. Young, its directors, have been interested in various phases of animal and plant life. Early associated with them were Dr. and Mrs. S. A. Munford and later Dr. and Mrs. Abram T. Kerr, of Ithaca, N.Y. Besides those who have encouraged the study of natural history in this region, have been several students or associates of the senior author. Some of these resident naturalists have been Prof. Asa C. Chandler, Mr. Frank M. Kilburn, Prof. E. L. Palmer, Mr. G. M. O'Connell (several seasons), Dr. H. G. Bull, Mr. D. C. Gamble and Mr. S. E. R. Simpson. We have added some observations of Mrs. Julia Moesel Haber (Prof. of Zoology in Elmira College, Elmira, N.Y.) for Fox Point (1911). Several summers Mr. L. A. Fuertes, the bird artist, has spent varying periods in the camp.

These lists are presented with the idea of starting a permanent catalogue of animal and plant forms of the region.

Otter Lake is distinctly in the Canadian life zone. The coniferous evergreens are: larch, black spruce, balsam fir, arbor vitae, hemlock, white and red pines, and common juniper *(Juniperus communis)*. Back of camp in the deeper woods or undisturbed areas occur plenty of yellow and paper birches, sugar maples, mountain ash with undergrowth of mountain and striped maples, hobblebush, beaked hazel nut and hoary alder *(A. incana)*. In the more open places are quaking aspen, large toothed poplar and some balsam poplar.

Along the road southward to Dorset and Lake of Bays where sparse settlement begins, occur a few basswood, American elm, white ash, black birch, staghorn sumac, scarlet oak, choke cherry, alternate-leaved dogwood, thorn apple *(Crataegus* sp.*)*, and *(Diervilla Lonicera)*, unmistakable signs of the Transition Zone. No black walnuts, butternuts, nor hickories were recorded. On Rock Island of Otter lake and along some roads occur red oak, wild red cherry, june berry, Bebb's willow.

Along the road to Hardwood lake and at Hardwood lake a similar element we have, in some beeches among many maples and birches, plenty of wild black and red cherries, staghorn sumac, black elders, alternate-leaved dogwood and white ash.

Around or in peat bogs occur: leather leaf, bog rosemary, withe rod *(Viburnum cassinoides)*, blueberries *(Vaccinium pennsylvanicum, V. p. nigrum, V. canadense)*, black alder *(Ilex verticillata)*, skunk currant *(Ribes prostratum)* and mountain holly *(Nemopanthus mucronata)* the last being rare.

Around some of the lakes or in swampy edges were found sweet gale *(Myrica Gale)* red berried elder, glaucous willow, shining willow, meadow sweet and black ash.

Other trees and shrubs which proved uncommon about camp were red-osier dogwood, sheep laurel *(Kalmia angustifolia)*, American fly honeysuckle, hop hornbean *(Ostrya virginiana)*.

The herbaceous flora reveals a strong Canadian cast. Around the camp site are twin-flower *(Linnaea borealis)*, dwarf cornel *(C. canadensis)*, common wood sorrel *(Oxalis acetosella)*, pale corydalis *(Corydalis sempervirens)*, bristly sarsaparilla,

(Aralia hispida), enchanter's nightshade *(Circaea alpina)*, yellow Clintonia *(Clintonia borealis)*, painted trillium *(Trillium undulatum)*, large coral root *(Corallorhiza maculata)*, shin-leafs *(Pyrola elliptica, P. cholorantha, P. minor)*, false-lily of valley, *(Maianthemum canadense)* and twisted stalk *(Streptopus)*.

In and around the peat bog were *(Cypripedium acaule)* both normal pink, and albino yellow-petalled specimens, small greenwood orchis *(Habenaria clavellata)*, small northern bog orchis *(H. obtusata)*, rattlesnake plantain *(Epipactis pubescens)*, nodding ladies' tresses *(Spiranthes cernua)*, multitudes of grass pink *(Calopogon pulchellus)* and rose pogonia *(Pogonia ophioglossoides)*, goldthread *(Coptis trifolia)*, creeping snow-berry *(Chiogenes hispudula)*, dwarf raspberry *(Rubus triflorus)*, Dalibarda *(D. repens)*, both cranberries, three-leaved Solomon's seal *(Smilacina trifolia)*, arbutus *(E. repens)*, masses of horned bladderwort *(Utricularia cornuta)*, lance-leaved violet *(Viola lanceolata)*, naked bishop's cap *(Mitella nuda)*, Indian cucumber-root *(Medeola virginiana)* and *Aster junceus*, spatulate and round-leaved sundews *(Drosera intermedia* and *D. rotundifolia)*, and Canadian and marsh St. John's wort *(Hypericum canadense, Triadenum virginicum)*.

On the more open hillside opposite camp and toward Dorset were narrow-leaved gentians *(Gentiana linearis)* and the northern bed straw *(Galium boreale)*.

The mammals are decidedly of Canadian affinity, but with the rare appearance of wildcat, raccoon, black squirrel, transition zone influences enter.

In the birds more transitional forms appear rarely or sparingly, toward Dorset, southward and westward to wit: towhee, woodthrush, yellow-throated vireo, Baltimore oriole, catbird, whippoorwill, least flycatcher, indigobird, yellow warbler, parula warbler, red-headed woodpecker, Maryland yellow-throat.

Thus in trees, herbaceous under-cover, birds and mammals there is close agreement in the preponderance of Canadian forms. At Otter Lake and northward, the incursion of the transition element is not so pronounced as at Huntsville, where railroad and other civilized encroachments play a greater role. The ride from Huntsville to Dorset and thence by foot to Otter lake emphasizes this difference to the trained observer.

To such as might wish to know what ferns we casually observed the list is:

Woodsia Ilvensis
Osmunda Claytoniana
Onoclea sensibilis
Osmunda cinnanomea
Osmunda regalis
Dicksonia punctilobula
Polystichum acrostichoides
Aspidium noveboracense
Aspidium cristatum
Aspidium marginalis
Asplenium Filix-femina
Pteris aquilina
Polypodium vulgare
Phegopteris polypodioides
Phegopteris hexagonoptera
Phegopteris Dryopteris.

II.—THE FISH.

By A. H. WRIGHT.

The present list of sixteen species reveals the scanty variety of the Highlands of Ontario. Several of these are introduced species. Others are stock introduced to replenish the supply of the waning species in this series of lakes which are two hundred or more feet higher than the Muskoka group. The decided barriers do not permit incursions from the great variety of the Great Lakes. The region, however, abounds in individuals of the few game species it possesses. For comparison, we have employed Meek's[1] results in the Highlands of Ontario. He began at Hawkestone and Orillia on Lake Simcoe and followed the Grand Trunk railroad through Gravenhurst (Muskoka lakes) to Trout Creek and North Bay (Lake Nipissing). All the way northward the railroad bears away from Georgian bay and the stations he successively came to were successively farther away from it in barriers, etc. Lake Simcoe and the Muskoka lakes are much nearer Georgian bay and Lake Ontario than Lake of Bays or Otter lake. Hence the Great Lakes' complexion of Lake Simcoe with silversided minnow *(N. atherinoides)*, log perch *(Percina caprodes zebra)*, spot-tailed minnow *(Notropis hudsonius)*, silvery minnow *(Hybognathus nuchalis)*, trout-perch *(Percopsis omiscomaycus)* and long-nosed dace *(Rhinichthys cataractae)*, or Moon river just below Muskoka lake (Bala) with log perch, spot-tail minnow and silvery minnow. Such species are never to be expected in Otter lake unless introduced or unless it was geologically connected with the Great Lakes. Otter Lake seems more comparable to Trout Creek. The former has sucker, horned dace, red-bellied dace, fathead, Cope's minnow, shiner, brook trout, pumpkin seed; the latter has suckers, horned dace, red-bellied dace, fathead, blunthead, shiner, brook trout, brook stickleback, nine-spined stickleback and pumpkin seed,

(1) Meek, S. E. Field Columbian Museum Zoological Series, Volume I., No. 17., Publ. 41, November, 1899, pp. 307-311 and Volume III., No. 7, Publ. 67, July, 1902, pp. 131-140.

and in the blunthead and nine-spined stickleback shows slightly greatly affinity to the Great Lakes than Otter Lake. Most previous lists for Ontario[2] although of some help related too much to the ichthyologist's boundary paradises and reservoirs, namely: Lakes Ontario, Erie, Huron and Superior, to be of particular service in the study of the far inland lakes of the province.

Ameiurus nebulosus (Le Sueur). Catfish.

Common in the weedy edges of Otter lake where pickerel-weed, pipe-wort, watershield and other water plants abound. Also found in outlet of the Peat bog. We found no catfish in Fletcher lake.

Catostomus commersonii (Lacepede). Sucker.

Reported as common throughout the region. I secured it at Otter lake. Meek secured it at Gravenhurst and Trout creek.

Chrosomus erythrogaster Rafinesque. Red-bellied Dace.

The most common minnow of all these lakes. It is especially a minnow of quiet clear water, both lakes and streams. Every lake or pond visited if it had minnows at all harbored mainly red-bellied dace. Meek secured it at Muskoka lake and Trout creek. Also taken by Professor Macoun in Algonquin Park.

Pimephales promelas Rafinesque. Fat-head.

On August 11, 1913, we seined several "fat-heads" in a marshy place of Otter lake. Meek secured it at Trout Creek.

Notropis cayuga Meek. Cayuga Minnow.

In weedy shallows of Otter lake and its peat bog pond we found this species. I believe this the same as Meek's *N. muskoka* taken by him at Gravenhurst and other places.

Notropis cornutus (Mitchill). Shiner.

The shiner or redfin occurs in many of the lakes of the region. Taken by us in Otter, Harvey Jr., and other lakes.

Semotilus atromaculatus (Mitchill). Horned Dact. Creek Chub.

Widely distributed. It was found in Otter, Harvey Jr., Fletcher and other lakes. Meek had it from Gravenhurst and Trout Creek.

Leuciscus neogaeus (Cope). Cope's Minnow.

In weedy shallows of Otter Lake, we secured representatives of this form on July 29 and August 11, 1913, associated with red-bellied dace.

Esox lucius (Linnaeus). Pike.

So far as we could determine there are no native pike *(E. lucius)*, pickerel *(E. tridecemlineatus)* and lunge *(E. masquinongy)* in Lake of Bays, Hollow Lake, Fletcher Lake and other lakes of this region, and no one was found to report introduced fish of these three species. Meek reports the pike and lunge from Muskoka Lake.

Eupomotis gibbosus (Linnaeus). "Pumpkin Seed."

Common from Lake of Bays to Algonquin Park. The boys of camp brought us sunfish from Harvey Jr., Hardwood, Fletcher and other lakes and they were not uncommon in Otter Lake. Rock bass are not in these lakes but held by local fishermen to be in lower lakes although Meek stated there were no rock bass in the lakes of the Highlands of Ontario.

Micropterus dolomieu Lacepede. Small-mouthed Black Bass.

Not reported from Lake of Bays eastward or northward. Meek secured it on Muskoka Lake.

Perca flavescens (Mitchill). Perch.

Taken in several lakes in 1913. Common in Fletcher, Skin and Porridge lakes, but not very large. Held to be put in these lakes by the Dominion government twenty or more years before. The stock is supposed to have come from Orillia. Also taken in Lake of Bays. Meek secured them at Gravenhurst.

Cristivomer namaycush (Walbaum).

Common in many of the lakes of the region. Held by many residents to be native of Hollow, Kimball, Bear and some other lakes. In others like Hardwood they were held to be introduced about June, 1889. About Hollow Lake, Lake of Bays, and other lakes of the region they allude to larger gray trout with white flesh and smaller salmon trout with reddish flesh.

Salvelinus fontinalis (Mitchill.) "Speckled Trout." Brook Trout.

Common in lakes of the region. Taken in Otter, Fletcher and Harvey lakes and others more remote.

Coregonus clupeiformis (Mitchill). Whitefish.

We saw no whitefish. One informant said there was a whitefish caught in the shallows of Hollow lake during the fall and winter. Others state that there is a whitefish in Lake of Bays. Whether these are true whitefishes or ciscos remains to be discovered. Some of the rangers assert there are whitefish lower down at Orillia, Peterboro, etc., but not here.

Lota maculosa (LeSueur). Ling.

This species is reported as very common in Lake of Bays, and Hollow lake where they are caught on night lines.

III.—THE BATRACHIANS AND THE REPTILES.

By A. H. Wright and S. E. R. Simpson.

The Salamanders.

Nash (1908) gives ten species of salamanders

(2) Nash, C. W., Checklist of the Fish of Ontario. Dept. of Education, Toronto, 1908. Also, "Fishes of Toronto" in "The Natural History of Toronto Region, Ontario, Canada, pp. 249-371.

for Ontario; Piersol (1913) seven for the Toronto region; and Patch (1918) six from Ottawa. Our list should include *Ambystoma maculatum, Eurycea bislineata, Notophthalmus v. viridescens, Ambystoma jeffersonianum,* and *Plethodon cinereus.* As yet we have recorded at Otter Lake or in its environs (within 10 miles) only the last three, the same species which Meek (1899, 1900) took in Gravenhurst or Trout Creek. Little effort has been made for their search except in the summer of 1913.

Notophthalmus v. viridescens (Rafinesque). Common Newt.

Two or three records of this form were made in the summer of 1913. It is, however, rare. Meek took one near Gravenhurst, September, 1899.

Ambystoma jeffersonianum (Green). Jefferson's Salamander.

Recorded only once in 1913 at Otter Lake. Meek and Clark (1900) secured two specimens from Trout Creek to the northward.

Plethodon cinereus (Green). Red-backed Salamander.

Rather uncommon about Otter Lake. Taken at three different times in 1913 by Messrs. C. V. P. Young and E. Bennett. All the material was of the red-backed phase. Inasmuch as these records were within the species' breeding season, all were found in rotting logs.

THE FROGS.

Bufo americanus Holbrook. American Toad.

Abundant. Between June 29-July 3, 1913, we found numerous transforming and transformed toads in the trails and roads. In August, 1919, they were found just transformed in some places. Most of the adults are much spotted below.

Hyla crucifer Wied. Spring Peeper.

Meek found this form common in September, 1899, near Gravenhurst but scarce in June 1900. It is solely a question of voice records. In 1913 lone peepers were heard from June 28-July 6. Throughout most of July they were quiet, except for a few at the very end of the month. By August 10, 1913, stray peepers began to call and from then onward into September they were not uncommonly heard. We recorded them at Lake of Bays, Gem, Hardwood, Crozier, Fletcher and Otter lakes. We took them in midsummer in the woods, in dried up swampy areas, and around the edges of the lakes.

Hyla v. versicolor Le Conte. Tree Toad.

Not commonly found during midsummer after the breeding seasons of late May-July. Heard in late June or early July (9th) in 1913. In 1919 heard occasionally throughout the summer. Sometimes in midsummer we find them amongst the moist leaves around the lakes or in swampy areas.

Rana catesbeiana Shaw. Bullfrog.

Meek found it abundant at Gravenhurst and Bala and so it is at Otter Lake. The boys of this camp frequently catch them for food. By day they often club them with a paddle or with a stick, catch them by hand or with red flannel and hook. In the last of June and early July the bullfrog chorus is quite pronounced. After the middle of July, or July 20th, a few males are heard at night. Egg laying may rarely extend to August 1, some females taken on July 25, 1913, being unspent.

Rana clamitans Latreille. Green Frog.

Meek found it very abundant at Gravenhurst and at Bala. Very common in the Otter lake region. This species normally transforms in June and July but in August 25, 1919, newly transformed specimens were found.

Rana palustris Le Conte.

Scarce. In the summer of 1913 all of our records of this species came between July 14 and 25. Then only isolated specimens were discovered.

Rana pipiens (Schreber.) Leopard Frog.

The most abundant frog of the region.

Rana septentrionalis Baird. Mink Frog.

Not uncommon in the Otter lake region. They were heard croaking from July 7-16, 1913, in a small peaty lake near Otter lake. Later on July 24, 1913 (in Ten Mile creek) between Lake of Bays and Otter lake we found them common among lily pads, also at Porridge lake, July 28, 1913 and on Fletcher lake, September 1, 1913. In 1919 in the middle and last of August sixty or more were taken with a net from the lily pads.

Rana sylvatica Le Conte. Wood Frog.

In 1913, we secured only two newly transformed specimens on July 8 and July 24, and three adults, July 25. All were lost and we are unable to identify them positively as *R. sylvatica.* It is a woodland form in midsummer, very seldom seen.

THE SNAKES.

Nash gives 17 species of snakes for Ontario. J. B. Williams finds 9 species in the Toronto region, Meek, 3 species in Muskoka country and Patch, 2 species in the vicinity of Ottawa. We have five species in our list. Three more may be later reported by subsequent writers. We found no clue to the riband snake at all. The natives described two other snakes, one apparently the milk snake *(Lampropeltis triangulum triangulum)* and another the spreading adder *(Heterodon contortrix)* from the region somewhat south of Lake of Bays.

Diadophis punctatus (Linné.) Ring-necked snake.

In the summer of 1913 we recorded six specimens of this species, mainly along the road to Dorset and on the cliff to the west of camp. In 1919 one was found in mid-August between Otter lake and Dorset.

Liopeltis vernalis (Harlan.) Green Snake.

Meek secured one at Gravenhurst and G. S. Miller, Jr., Aug. 6, 1896, saw a green snake at this same place. Several of the natives voluntarily described a "grass green snake not very common." We have not yet taken it.

Natrix sipedon sipedon (Linné.) Water Snake.

Meek took one specimen at Gravenhurst and the species is uncommon in the Lake of the Bays region. Many of the natives call it a "black snake."

Storeria occipito-maculata (Storer.) Red-bellied Snake.

This and the ring-necked snake are of about equal occurrence in the region. Through 1913 and in August, 1919 we recorded four specimens of this species.

Thamnophis sirtalis sirtalis (Linné.). Garter Snake.

Abundant; the snake of the region. On August 11, 1913 one of our captive garters gave birth to 19 young.

THE TURTLES.

Chelydra serpentina (Linné.). Snapping Turtle.

Uncommon. Found more in muddy creeks and ponds than in the open lake. We took one July 23, 1913, in Fletcher lake with a carapace length of 18-20 inches. On the road to Dorset in the last of August, 1919, another specimen was taken with head width of three inches. Sometimes called "Black-turtle" in this region.

Chrysemys marginata marginata (Agassiz.) Western Painted Turtle.

We have not seen this form in this region but the natives describe a small mud turtle other than the snapper and the description accords well with this species.

(To be continued.)

THE LARGER FRESHWATER-CRUSTACEA FROM CANADA AND ALASKA.

By FRITS JOHANSEN.

(Continued from Vol. XXXIV, page 132)

II.—ISOPODA.

This order of crustacea has a great number of representatives in the sea, some of which live parasitically on fishes, other crustacea, etc., and are correspondingly deformed, especially the females. Three families are known from freshwater on this continent.

They have the following characters in common with the amphipods; a many segmented body, no carapace, but the head and first thoracic segment united, and the eyes, when present, sessile. While the body of an amphipod is compressed that of an isopod is depressed thus making the latter a less capable swimmer, but admirably suited for dodging under stones, etc., and attaching itself to moving animals. It is true that certain of the marine forms (*Mesidothea* sp.) are good swimmers (using their legs), and live almost a pelagic life when they are very young (just after leaving the brood-pouch), but they soon change this for crawling over or burrowing in the sea bottom, the typical life for most of the isopods. The eggs are carried by the females on the underside of the body in a brood-pouch,* as in the amphipods, and the young ones also remain inside the pouch some time after hatching. The newborn young are practically like their parents though different in color and the proportional size of the various parts of the body, and the embryonal development inside the egg is said to be not quite so complete as with the amphipods. A popular name for the isopods is "sow-bugs," and it is well known that certain of them (*Oniscus*, etc.) live on land under bark or stones, etc. The marine and terrestrial forms are predacious, while those in freshwater feed upon decaying vegetable matter. Owing to their more hidden habit the freshwater forms are not quite so important an item in the food of fishes, birds, etc., though the marine or brackish water forms are decidedly so. Among the latter is the large interesting species *Mesidothea entomon*, which has a circumpolar distribution and also is found as a glacial marine relict in the large lakes of Sweden and in the Baltic. In the arctic it is a littoral form and one of the most characteristic and commonest invertebrates along the coast west of Hudson Bay. I have observed (arctic Alaska) how it will enter the estuaries of rivers or smaller water courses at high tide, remain there in quiet

*Formed by lamellae from the thoracic legs.