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THE OTTAWA NATURALIST.

VOL. XX. OTTAWA, DECEMBER, 1906. No. 9

THE CRYPTOGAMIC FLORA OF OTTAWA.*

By JOHN MACOUN, Naturalist, Geological Survey of Canada.

(Continued from THE OTTAWA NATURALIST, Vol. XXI, p. 100.)

MUSCI.

2. SPHAGNUM GIRGENSOHNII, var. HYGROPHILUM, Warnst.

In wet woods at Casselman, Sep. 16, 1898.

7. SPHAGNUM CUSPIDATUM, var. SUBMERSUM, Schpr.

Ditches in the Mer Bleue at Eastman's Springs, June 16, 1892; also at Blackburn Station, June 20, 1902.

17. WEISIA VIRIDULA becomes W. RUTILANS, Hedw.

And the references with it.

17*a*. WEISIA RUTILANS var. GANDERI, Juratzka.

On earth on old stumps subject to flood, by Lake Duchesne above Britannia, Oct. 27, 1900.

427. TREMATODON AMBIGUUS, Hedw.

On wet earth at Casselman and South Indian, June, 1898; in fine fruit on the road that passes along the north side of Beechwood Cemetery, Oct. 10, 1900.

428. DICRANELLA SQUARROSA, Starke.

In wet springy places south of the canal and along the railway west of Dow's swamp. July 6, 1900.

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† The numbers above 426 are in continuation of the list. The references under smaller numbers are to species already listed.

429. DICRANUM LONGIFOLIUM, Hedw.

On boulders at the head of Meach Lake, on the west side. Sept. 23, 1893.

430. DICRANUM DRUMMONDII, C. Muell.

In fine fruit in a cedar swamp a little east of Stittsville. June 10, 1903.

431. FISSIDENS ADIANTOIDES LINN. var. INSTATUS, Kindb.

On old stumps subject to flood along Lake Duchesne above Britannia. Oct 27, 1900.

432. FISSIDENS SUBBASILARIS, Hedw.

On cedar bark at the base of a tree in old woods at Carleton Place. May 12, 1900.

433. FISSIDENS GARBERI, Lesq. & James.

On earth on old stumps, subject to flood along Lake Duchesne above Britannia. Oct. 27, 1900.

434. BARBULA SUBULATA, (Linn.)

Crevices of limestone rocks near Governor's Bay, Rockcliffe Park. May 16, 1900.

435. GRIMMIA PSEUDO-RIVULARIS, Kindb.

Our rocks at the Cascades and at Paugan Falls on the Gatineau River.

435*a*. GRIMMIA PSEUDO-RIVULARIS, SUB. SP. LANCIFOLIA, Kindb.

On rocks at Meach Laké. Sept. 23, 1893.

436. GRIMMIA CONMUTATA, Hueben.

On rocks along the Gatineau River above the Cascade Rapids. June 22, 1900.

437. BARTRAMIA GLAUCO-VIRIDIS, C. M. & Kindb.

On Meach Lake, Que. Sept. 23, 1893.

72. PHILONOTIS FONTANA, Brid.

By springs along the railway, south of the railway and west of Dow's swamp, July 6, 1900; also in the swamp by the Beaver Meadow, Hull, Que. June 21, 1900.

438. WEBERA CRUDA, Schimp.

On rocks in cuttings of the Gatineau Railway above Chelsea ; on rocks at Cascade, Gatineau River. June 22, 1900.

439. BRYUM FERCHELII, Funck.

On rocks near the water above the old mill at Cascade, Gatineau River. June 23, 1900.

440. MNIUM GLABRESCENS, Kindb. var. CHLOROPHYLLOSUM, Kindb.

On wet rocks in a brook emptying into the west side of the north end of Meach Lake, 4 miles above Old Chelsea, Que. Sept. 23, 1893.

441. MNIUM RIPARIUM, Mitten.

On wet rocks by the small brook in Rockcliffe Park. April 16, 1899.

442. ATRICHUM ANGUSTATUM, Bruch & Schimp.

On sandy and damp earth by the roadside on the north side of Beechwood Cemetery. Nov. 2, 1899.

100. POGONATUM BREVICAULE, Beauv.

On a damp sandy bank on the north side of Beechwood Cemetery, in fine fruit. Oct. 10, 1900.

101. POGONATUM ALPINUM, Roehl.

Crevices of rocks at Meach Lake, Sept. 23, 1893 ; also amongst rocks near Wakefield, Que. July 20, 1803.

443. FONTINALIS HYPNOIDES, Hartm.

On trees subject to flood along Lake Duchesne above Britannia. Oct. 27, 1900.

132. PTEROGONIUM BRACHYPTERUM, Mitt.

On ironwood trunks near Hemlock Lake, Beechwood. May 16, 1900.

444. ANOMODON PLATYPHYLLUS, Kindb.

On trees in the swamp west of Fairy Lake, Hull, Que. Oct. 20, 1902.

445. PYLAISIA POLYANTHA, Br. & Schimp, var. RUPESTRIS, Best.

On a boulder in woods on the east side of the Beaver Meadow, Hull, Que. May 3, 1902. New variety.

446. PYLAISIA PSEUDO-PLATYGYRIUM, Kindb.

On old logs at Leamy Lake, near Hull, Que. Nov. 9, 1896.

ENTODON MACOUNII, C. M. & Kindb.

On an elm log in swampy woods Billings' Bush (Rideau Park), April 28, 1900; on earth near Hogsback, Rideau River. May 2, 1897.

THUIDIUM VIRGINIANUM (Brid.) Lindb.

On old logs west of Hull, and east of Beaver Meadow, Que. April 30, 1902.

449. THUIDIUM PHILIBERTI, Limpricht.

On the bases of trees on the hills west of Cascade, Gatineau River. June 23, 1900.

450. THUIDIUM PSEUD-ABIETINUM, Kindb.

On earth on a swamp at Britannia. Sept. 11, 1890. Referred in No. 139 to *f. Blandowii.*

142. BRACHYTHECIUM DIGASTRUM, C. M. & Kindb.

On rocks by the Gatineau River above Cascade, Que. June 23, 1900.

451. BRACHYTHECIUM CYRTOPHYLLUM, Kindb.

In holes in elm trunks in old wood at Carleton Place. May 12, 1900.

452. BRACHYTHECIUM LÆVISETUM, Kindb.

On the bases of trees, Blueberry Point, Aylmer, Que. April 17, 1900.

453 BRACHYTHECIUM ALBICANS, Br. & Sch.

On earth in woods, by Leamy Lake, Hull, Que. Nov. 9, 1895.

454. BRACHYTHECIUM HARPIDIOIDES, C. M. & Kindb.

On earth in woods at the head of Hemlock Lake, near Beechwood Cemetery. May 16, 1900.

455. BRACHYTHECIUM HILLEBRANDI, Lesq.

On old logs in old woods, Carleton Place. May 12, 1900.

456. BRACHYTHECIUM BIVENTROSUM, Muell.

On old logs in old woods at Carleton Place. May 12, 1900.

457. BRACHYTHECIUM CALICAREUM, Kindb.

Abundant on flat limestone rocks in Rockcliffe Park, Oct., 1892; May, 1899 and June, 1900.

458. EURHYNCHIUM SUBSCABRIDUM, Kindb.

On limestone rocks on the west side of the Beaver Meadow. May 16, 1896.

211. PLAGIOTHECIUM BREVIPUNGENS, Kindb.

On old logs, Johnstone Lake, North Wakefield, Que., June 2, 1898; also on old logs, in old woods at Carleton Place. May 12, 1900.

459. AMBLYSTEGIUM PSEUDO-CONFERVOIDES, Kindb.

On flat limestone rocks north of the Experimental Farm, April 16, 1893; on limestone rocks west of the Beaver Meadow, Hull, Que., April 25, 1899; also on the same habitat along the railway a little south of Carleton Place. May 12, 1900.

460. HYPNUM LONGINERVE, Kindb.

In pools in woods, west of Victoria Park and north of the Parry Sound Railway. June 19, 1900.

461. HYPNUM PERICHÆTIALE, Br. Eur.

On boulders in woods near Hemlock Lake. Sept. 29 1891.

462. HYPNUM NEMOROSUM, Koch.

On earth by Leamy Lake, Hull, Que. Nov. 9, 1896.

212. HYPNUM RICHARDSONI (Mitt.) Lesq. & James.

In a bog, Johnstone Lake, near North Wakefield, Que. June 2, 1898.

463. HYPNUM CUSPIDATUM, Linn.

In a springy place along the railway south of the canal and west of Dow's swamp July 6, 1900.

HEPATICÆ.

260. PELLIA EPIPHYLLA, Corda.

On earth by a brook below South Indian. June, 8, 1900.

463. NARDIA CRENULATA (Smith) Lindb.

On earth by the discharge of Leamy Lake, Hull, Que. Sept. 16, 1883.

232. LOPHOZIA HELLERIANA, (Nees.)
Cephalozia divaricata. Dumort.

On old logs in a swamp north of the Experimental Farm. April 16, 1892.

463*a*. ODONTOSCHISMA DENUDATUM, (Nees.)

On an old log in woods at Navan Station. Apr. 17, 1902.

464. SCAPANIA IRRIGUA, (Nees.) Dumort.

In the north side of the Mer Bleue below Blackburn Station on the C.P.R. June 20, 1902.

465. PORELLA PINNATA, Linn.

On the bases of trees subject to flood, shore of Lake Duchesne above Britannia. Oct. 27, 1900.

222. COLOLEJEUNEA BIDDLECOMLÆ, (Aust.) Evans.
Lejeunea calcarea, Libert.

On the bark of white cedar in a swamp west of Fairy Lake, Beaver Meadow, Hull, Que. Oct. 20, 1902.

LICHENES.

466. RAMALINA CALICARIS, (Linn.) var. FRAXINEA, Fr.

On balsam fir at Stittsville. May 16, 1899.

467. PARMELIA CETRATA, Ach.

On an elm trunk in a swamp at Carleton Place. May 12, 1900.

468. PHYSCIA TRIBACIA, (Ach.) Tuckerm.

On black ash trees along Lake Duchesne above Britannia. Oct. 27, 1900.

469. PHYSCIA OBSCURA var. ENDOCHRYSEA, Nyl.

On black ash trees south of Cowley Farm. April 18, 1895.

470. LEPTOGIUM MYOCHROUM, Ehrh. Tuckerm.

On rocks, McKay's woods, April 16, 1891, and on King's Mountain. May 22, 1897.

471. PLACODIUM CERINUM var. PYRACEA, Nyl.

On old cedar trunks in Dow swamp. May 2, 1896.

472. PLACODIUM VITELLINUM var. OCTOSPORUM, Nyl.

On rocks near Hogsback, four miles from Ottawa, May 2, 1896; on bark of cedar rails south of Beechwood Cemetery. April 14, 1897.

473. LECANORA SUBFUSCA, var, DISTANS, Ach.

On bark of beech trees, McKay's woods, Ottawa. April 16, 1891.

474. LECANORA SUBFUSCA var. MINOR, BRANTH.

On limestone rocks near the Hogsback, four miles from Ottawa. May 2, 1896.

475. LECANORA VARIA var. POLYTROPA, Nyl.

On limestone rocks, Blueberry Point, Aylmer, Que. April 25, 1900.

476. LECANORA CENISIA, Ach.

On limestone rocks, along the Rideau River, near Hogsback, four miles from Ottawa. May 2, 1897.

477. LECANORA CINEREA, (Linn.) Sommerf.

On limestone rocks, along the Rideau River, near the Hogsback. May 2, 1897.

478. LECANORA GIBBOSA, Nyl.

On flat limestone rocks, Blueberry Point, Aylmer, Que. April 25, 1900

479. LECANORA CALCAREA, (Linn.) Sommerf.

On limestone rocks along the Rideau River below Hogsback. May 2, 1897.

480. LECANORA LAXA, Branth (Ms.)

On limestone rocks along the Rideau River below Hogsback. May 2, 1897.

481. LECANORA FUSCATA (Schrad.) Th. Fr.

On limestone rocks along the Rideau River at Hogsback. May 2, 1897.

482. RINODINA SOPHODES var. EXIGUA, Fr.

On limestone rocks in Rockcliffe Park, April 17, 1895; also along the Rideau River at Hogsback. May 2, 1897.

483. PERTUSARIA PUSTULATA, (Ach.) Nyl.

On old cedar rails on the road to Kingsmere north of Aylmer, Que. May, 22, 1897.

484. BIATORA COARCTATA, (Nyl.) Tuckerm.

On limestone rocks at Britannia. April 20, 1895.

485. BIATORA RIVULOSA, (Ach.) Fr.

On bark of living beech trees in Rockcliffe Park and at Billings' Bridge. April 19, 1898.

486. BIATORA ATROPURPUREA, (Mass.) Hepp.

On beech bark near Hemlock Lake, near Beechwood Cemetery. Sept. 6, 1891

487. BIATORA CYRTELLA, (Nyl.) Tuckerm.

On the bark of *Alnus incana* near Hogsback, May 2, 1897; on young maples in Billings' Bush, April 28, 1900.

488. BIATORA GLOBULOSA (Floerk.) Hepp.

On poplar bark in Stewart's Bush, Ottawa. April 13, 1895.

489. BIATORA MICROCOCCA, Koerb.

On old cedar rails (*Thuya occidentalis*) west of the old toll-gate, Aylmer Road, Hull, Que , Oct. 6, 1898.

490. BIATORA MELÆNA (Nyl.) Tuckerm.

On old and charred cedar rails along the Richmond Road, west of Ottawa, April 18, 1896.

491. BIATORA BECKHAUSII, (Koerb.)

On old fence-rails west of the old toll-gate on the Aylmer Road, west of Hull, Que., Oct. 6. 1898.

492. LECIDEA PRUINOSA (Smith) Flot.

Quite common on granite boulders in many places around Ottawa, April, 1897.

493. LECIDEA LAPICIDA (Ach) Nyl.

On limestone shingle near Hogsback by the Rideau River, May 7, 1897 ; quite common on limestone rocks everywhere around Ottawa.

494. LECIDEA CONTIGUA, Fr.

On limestone rocks, Blueberry Point, Aylmer, Que., April 25, 1900.

495. LECIDEA ENTEROLEUCA, Fr.

On small limestone pebbles at Britannia, April 25, 1895 ; also on pebbles, Blueberry Point, Aylmer, Que. April 25, 1900.

496. LECIDEA ENTEROLEUCA, Fr. var. PILULARIS, D C.

On limestone rocks along the Rideau River below Hogsback, May 2, 1897 ; on limestone shingle, Blueberry Point, Aylmer, Que. April 25, 1900.

497. LECIDEA PLANETICA var. PERFECTA, Eckfeldt.

On limestone shingle at Britannia, April 20, 1895.

498. BUELLIA SPURIA, (Schær.) Arn.

On limestone rocks in woods near Hull, Que. April 24, 1897.

499. BUELLIA PETRÆA (Flot.) Tuckerm.

On granite boulders near Governor's Bay, Rockcliffe Park, Ottawa, April 17, 1895.

500. BUELLIA OBSCURATA, (Ach.)

Quite common on limestone and other rocks around Ottawa; also at Blueberry Point, Aylmer, Que. April 25, 1900.

501. OPEGRAPHA VULGATA, Ach.

On ash bark near the Rideau River, at the Hogsback; also at Leamy Lake, Hull, Que. May 7, 1897.

502. GRAPHIS SCRIPTA, var. SERPENTINA, Ach.

On bark of *Juglans cinerea* in woods west of Hull, Que., April 24th, 1897.

503. CALICIUM PUSILLUM, Flœrke.

On old rails along the road leading from Aylmer to Kingsmere, Que. May 22, 1897.

504. SAGEDIA CESTRENSIS TUCKERM.

On the bark of young maples at Ottawa; also on Kings' Mountain above Chelsea, Que. May 22, 1897.

505. VERRUCARIA RUPESTRIS, Schrad.

On limestone rocks on the cliffs along the Ottawa, Rockcliffe Park, Nov. 11, 1896.

506. VERRUCARIA EPIDERMIDIS FORMA PUNCTIFORMIS, Branth.

On living alder stems along the Rideau River, near Hogsback, April 30, 1897.

507. PYRENULA PATELLARÆFORMIS, Eckfeldt.

On the bark of living black ash in Billings Bush, April 19, 1897.

508. PYRENULA LEUCOPLACA (Wallr.)

On bark of young maples in woods near Hull, Que., May 5, 1897.

509. PYCNIDES VERSIMILIDE, Branth.

On black ash bark in Billings Bush, April 19, 1897.

A VISIT TO DUCK ISLAND.

The glorious sun of a September afternoon shone warmly on a group of club members who recently visited Duck Island, the metropolis in the vicinity of Ottawa of the elusive unionidae, vulgarily called clams. The weather was delightful. The water was very low and unruffled and collecting was consequently easy and rapid. The many sand bars which project from the centre of the island towards Templeton wharf yielded the first fruits in fine specimens of *Unio occidens* and *Unio borealis*. A little lower *U complanatus* was fouud in abundance. Few however of the specimens were of the very large, rayed form, for which the locality is particularly noted. But certain of the shells procured quite equalled the first found in 1881, which for a quarter of a century have increased in loveliness, and form the chief glories of the writer's cabinet. The heavy, inflated, unrayed form of *complanatus*, not occurring elsewhere than at the island, was very numerous, and some fine shells were selected from the thousands whose circular tracks furrowed the sand in every direction, always however with an uultimate trend to deep water. *U. ellipsis*, of small size was oommon, but there were few mature shells. This species is known in the Western States as "the nigger toe-nail", and is much used in the pearl button industry. Another shell of economic use, which occurred sparsely, is *U. rectus*, called by pearlers the "black sand-shell."

U. gibbosus was not uncommon, but not one afforded a mate for the fine pearl found six years ago in a shell of this species collected at the foot of the island. Several large *U. gracilis* were noticed, and a few shells of medium size saved. Of our only other winged shell, *U. alatus*, a single fine specimen was obtained. *U. alatus* and *U. rectus* are remarkable among North American unios for their extensive range—Quebec to Manitoba, and southward far into the Mississippi Valley—and for their constancy of form, under the widely differing conditions of their environments. A few specimens of *Anodonta undulata* were found, and a single fine *A. Benedictii*—the third living shell noted in more than twenty years. The others were found at the mouth of Brigham's Creek. Of the Margaritanas but one was noticed—*M. undulata*.

The shells of this species found at Duck Island are far more beautiful than any shells of the kind found elsewhere. But to *U. occidens* the prize of Paris must be given. Never probably in any place were so many beautiful fresh water shells obtained in the same brief time as were found on that September afternoon. There were thousands of *U. occidens* to select from, and many of those left to increase and multiply were abandoned with something of the regret one would feel who was compelled to leave fine pearls behind because one could not carry more away. Red occidens—huitres rouges—of our boatman, were very numerous, and from this deep and prized tint the changeful species ran the chromatic scale through every shade of orange, yellow and lemon, diversified always with deep green rays, now broad, now narrow, sometimes sparsely, oftener closely set.

The results for the day were upwards of six hundred selected shells of the following species:—

Unio complanatus, Sol.
U. borealis, A. F. Gray.
U. occidens, Lea.
U. ellipsis, Lea.
U. alatus, Say.
U. gracilis, Barnes.
U. rectus, Lamarck.
U. gibbosus, Barnes.
Margaraitana undulata, Say.
Anodonta undulata, Say.
A. Benedictii, Lea.

No attempt was made to secure *A. fluviatilis* from the pond on the island, nor were any of our smaller shells collected.

F. R. L.

THE FULVOUS TREE-DUCK.

In September, 1905, Mr. J. S. Rollins saw eleven fulvous tree-ducks, (*Dendrocygna autumnalis*) on the flats near New Alberni, Vancouver Island and shot five of them. One specimen is in the provincial museum at Victoria. This is the first record for this bird in Canada.

Victoria, B. C. W. SPREADBOROUGH.

AN ADDITION TO OUR MANITOBA WARBLERS.

While in the woods on the afternoon of October the 17th, on the lookout for the last individuals among birds moving south I observed a stranger which the white patches at the base of the primaries enabled me to recognize at once as a Black-throated blue warbler (*Dendroica cærulescens*) young male. It was flying about near the ground among tall aspens and was afterwards followed into thickish willows. In company with it were three golden-crowned kinglets and a couple of slender-billed nuthatches. This warbler was very active in spite of the coldness of the day and lateness of the season—it was also rather shy.

The black-throated blue warbler is not uncommon in most parts of eastern Canada where it breeds, but it has not hitherto been recorded for Manitoba, though from the bird observed being a young one it might be inferred that this species breeds in the province or further north.

In Chapman's "Color Key" the range of this species is given as "Eastern North America, breeds from northern Connecticut, mountains of Pennsylvania, southern Michigan and northern Minnesota, north to Labrador and Hudson Bay region; winters in Central and South America".

NORMAN CRIDDLE.

Treesbank, Manitoba,
October 30th, 1906.

CECROPIA EMPEROR MOTH.

I have been shooting for many years at the "St. Clair Flats", Kent County, Ontario, but it was only about fourteen years ago that the cocoons of the above moth were first seen in great numbers at St. Ann's Shooting Preserve, which lies between the E'Carte and Johnston's Channels. A very few willow trees and bushes grow on the ridges out in the marsh and on some of these I found the cocoons. In one instance there were about fifty (50) on one willow, of about 14 inches diameter in the trunk and at another time I found about thirty-five on a small swamp willow bush about 6 feet high, and also attached to the marsh or prairie grass under or near said bush. Our club house is situated about

three miles out in the Marsh and surrounded by a grove of large willow trees but I have never been able to find a cocoon on any of them.

In 1900 they were particularly abundant and I sent to Ottawa a box of the large cocoons which were spun among the grasses around the base of a small willow tree. Regarding the food of Cecropia, neither I, nor my friend the late Mr. Warren, who used to accompany me on my shooting trips, could find any plants in the neighborhood with berries on them, such as we knew this caterpillar to feed upon, so we came to the conclusion that the food of the caterpillars must be the leaves of the willows and other small bushes in the neighborhood.

Since the time when I sent the cocoons, the insect seems to have deserted the locality altogether, for I have hunted the same places on the St. Clair Flats, and particularly on the willow trees but have been unable to secure even a single specimen.

I was much pleased with the interesting Nature Study article by Mr. Gibson in the October number of the OTTAWA NATURALIST. Such articles do much to draw the attention of many people who want to know about them, to these beautiful and common things which make excursions into the country so charming.

JOHN MAUGHAN, Toronto.

NOTE.—The cocoons sent by Mr. Maughan were of remarkable size. They were for the most part spun among the loose grasses at the base of the willows and many of them measured 4 inches long by 2 inches wide.—J. FLETCHER.

NOTE ON THE "TEAL WEED" OF ST. CLAIR FLATS.

By JOHN MAUGHAN, Toronto.

This plant which has been identified as the Common Floating Pond-weed, *Potomogeton natans*, is to be found in all sections of Ontario, and grows in large quantities in the bays, channels and ponds in the St Clair Flats, County of Kent, in water from six inches to six feet in depth. Among duck shooters this plant goes by the name of "Teal Weed" from the fact that the Green Winged Teal, *Anas Carolinensis*, the Blue Winged Teal, *Anas discors*, the

Baldpate, *Anas Americana* and the Pintail, *Dafila acuta*, all known as Marsh Ducks, feed on the seeds. The soft portion of this root and the small bulb which forms at the extremity of the roots of the Arrow-leaf (*Sagittaria*) are favorite foods of the Canvas-back, *Aythya vallisneria*, and of the Redhead, *Aythya Americana*. These ducks dive in quite deep water to get the roots and tubers they feed upon, for this reason they are known as River Ducks. The Redhead and Canvas back feed also on what we call the Black rush, by which I mean the round green rush that grows in deep water. They take hold of the rushes and pull them out, thus securing the ripe brown seeds. They then leave the rush without breaking it. In the fall season quite a lot of the remains of the weeds which the ducks have pulled up may be found floating about and lying against the adjacent shores, where portions are eaten by other ducks and water hens. The River Ducks seem to seek the Arrow-leaf roots just as eagerly as they do those of the so-called "Wild Celery" (*Vallisneria*), both being excellent food for the birds.

REVIEW.

STUDIES OF PLANT LIFE IN CANADA, by Catherine Parr Trail, pp. 219. William Briggs, Toronto, Ont., $2.00.

This long-expected re-print of Mrs. Trail's fascinating book was received too late for a full review in this issue of the OTTAWA NATURALIST, but its appropriateness as a Christmas remembrance from one Nature lover to another is such that the attention of our members should be drawn to it at this time. Mrs. Trail spent the greater part of a long life in the backwoods of Canada and, always a lover of flowers, she has included in her book a record of all that she found most interesting or attractive in them. Mrs. Chamberlain's exquisite drawings with which the work is illustrated in half-tone and color add much to its beauty and value. The original edition was revised and edited by Dr. James Fletcher, and in preparing the present edition for the press Mrs. Chamberlain has had advice from both Dr. Fletcher and Prof. Macoun.

THE OTTAWA FIELD NATURALISTS' CLUB

PROGRAMME OF WINTER SOIRÉES, 1906-7.

1906.

Dec. 6th—The President's Address.

Address by Dr. J. F. White, Principal of the Normal School.

An Entomological Excursion in the Selkirk Mountains—by J. Chester Bradley, Berkeley, Cal., presented by Dr. James Fletcher, (illustrated by lantern slides).

Demonstration Exhibition—in Zoology, Ornithology, Entomology, Botany, and Geology, in charge of Prof. Prince, Rev. C. G. Eifrig, Dr. James Fletcher, Prof. John Macoun, Dr. H. M. Ami, and others. (In the Normal School).

1907.

Jan. 8—*Demonstration on the Physics of the Atmosphere*—By D. A. Campbell, B. A. (In the Hall of the Carnegie Library).

Jan. 22—*The Relation of Climate to Health*—By Dr. P. H. Bryce, Chief Medical Officer of the Department of the Interior. (In the Hall of the Carnegie Library).

Feb. 12—*The Physical Conditions of Life in the Deep Seas*—By Dr. R. A. Daly. (In the Hall of the Carnegie Library).

Feb. 26—*The Macdonald College*—By Dr. James W. Robertson. (In the Normal School).

Mar. 12—*The Forestry Problem in Canada*—By Elihu Stewart, Esq., Superintendent of Forestry. (In the Normal School). Illustrated.

Mar. 19—**Annual Meeting**

Reports of Branches. Election of Officers and transaction of business. (In the Hall of the Carnegie Library).

All the Lectures are Free and Open to the Public.

NATURE-STUDY No. XXXIX.

AGENCIES FOR THE PROMOTION OF NATURE-STUDY IN CANADA.

By Prof. W. LOCHHEAD, Ste. Anne de Bellevue, Que.

It may appear strange to some that the Nature-Study Movement should be able within a few years to gather the strength and take the hold that it now has in many of the provinces. While there are many persons opposed to assigning to Nature-Study the most prominent place in the time-table of the junior classes in our public schools, there are but few who oppose the study of nature by the children.

It may be truly said in the first place that the time was ripe for such a movement. For generations the natural sympathies of the child towards nature were smothered ; and as a result he saw but little that was beautifu' in the world about him. For generations the child was educated as a thing apart from his surroundings. Educationists had forgotten, or were ignorant of, several pedagogic principles, viz:—the senses are the avenues to the mind, and the sense perceptions give rise to definite knowledge in the mind—*Nihil in intellectu quod non prius in sensu*—new thoughts can be comprehended only by the help of old thoughts ; the greater the stock of ideas possessed by the child, the greater the progress the child will make in the acquisition of knowledge or new ideas ; the best development is self-development, by the encouragement of the activities of the child in the investigations of the problems presented to it ; and education does not consist in the imparting of information by the teacher and its reception by the pupil. According to the modern idea it is all important that the child should have clear percepts of the things that constitute its environment, for these percepts form the basis for thought and further educational development.

But, while the schools were doing unsatisfactory work, there were several agencies in operation, which, unconsciously in some instances, were performing important educational service by encouraging many to undertake the study of natural history. The first of these were the Natural History and Field Naturalist Societies—the Montreal, Ottawa, Hamilton, Wellington, being perhaps

the most energetic,—and the Entomological Society of Ontario, with its branches in Montreal, Quebec, Toronto, Guelph and Vancouver. The influence of these Societies was quite marked, as many of the members were persons of note in their respective districts, and many young men received their first impetus to study nature at their meetings. Besides, the annual reports of some of these Societies, containing illustrated articles, were distributed freely throughout the country, diffusing much useful nature knowledge among the people.

While the Natural History Societies were quietly diffusing useful knowledge among the masses, and inspiring many person with a desire for the study of nature, the Science teachers of the High Schools and Academies were also opening the eyes of their pupils to the wonderful things of Nature. For many years, it is true, the biology course as laid down in the syllabus for high schools did not tend to make nature students; but in later years the courses were more rational, and many young persons were roused to take an interest in natural history. The great majority of the Science teachers are enthusiastic nature students, and are doing much to encourage the newer movement by their personal work and influence.

The Normal Schools have for many years given courses in Science, but perhaps with too little emphasis on the biological side, with the result that the teachers on graduation were but slightly interested in the great nature-world around them. For the last five or six years, however, more attention has been given to Nature-Study, and most of the new teachers now begin their work with a high opinion of its educational value. To such men as Dearness, Elliott, Scott, Sinclair, and Brittain of the Normal Schools we are indebted for the development of the pedagogical side of Nature-Study, and for their efforts in demanding the rightful place for Nature-Study on the school curriculum.

One of the most potent agencies for the spread of the Nature-Study idea throughout the country was the Ontario Agricultural College. For more than 30 years it has stood for a careful study of Nature and Nature's processes as an essential factor in successful agriculture, and it has strenuously insisted that such a study is one of the very best foundations for general culture. The

course of study there not only developed the intelligence, stimulated the imagination, widened the outlook, and gave the students scientific, practical and sympathetic interest in the world about them, but it also made them, as free citizens of a rising nation, take greater interest in civic affairs, and showed them the value of co-eperation and collective action.

The Macdonald Institute at the Ontario Agricultural College, which stands for Nature-Study, Manual Training, and Domestic Science, as an integral part of the education of every child, should claim much credit for the evangelistic work it has accomplished during the past four years under the leadership of Muldrew aud McCready. Its class-rooms have been thronged summer and winter by teachers from all parts of Canada anxious to learn more about the things of nature, so that they might better direct the children how to study the simple commonplace things that lie at their door.

Directly also, the College, by means of bulletins on many topics of general interest, set the people reading and thinking about the wonderful secrets of nature and the importance of a knowledge of these secrets; so that when the Nature-Study Movement was started the people were responsive. Indirectly, the Farmers' Institutes, which were really an extension system of the Agricultural College, did much to interest the farmer in improved methods of dealing with the soil, plants and animals, injurious insects and noxious weeds. By means of the Institutes scientific knowledge was popularized and applied to practical agriculture.

Nature-Study has no better champions and advocates than the staff of the Central Experimental Farm, Ottawa. Dr. James Fletcher has done as much probably as any man in Canada to further the movement. His public addresses and articles are most admirable and always carry conviction.

In some counties the Inspectors of Public Schoels encouraged the teachers under their charge to undertake nature work, and brought the matter to the attention of the School Boards of their inspectorate. By appeals and helpful suggestions to teachers the Nature-Study Movement got a start before it was officially recognised by the Education Departments.

In some of the provinces the Superintendents of Education were men of scientific attainments, who saw the importance of the study of nature as a means of maintaining and developing that sympathetic attitude towards nature that characterizes the child before he attends school, of fostering the habit of close observation, and of creating that scientific spirit of enquiry in the effort to get at the truth. The influence of such men as Dr. MacKay in Nova Scotia, and Dr. Seath in Ontario, at the heads of the Departments of Education, did a great deal to pave the way for the new Movement in their respective provinces, at a time when their ideas were in advance of legislative opinion.

The last agency to which I shall refer, is the Macdonald Rural Schools Fund, supplied by Sir William C. Macdonald of Montreal, and administered by Dr. James W. Robertson, now of the Macdonald College, Ste. Anne de Bellevue, Quebec. The improvement of rural schools was the main object of this Fnnd. The means adopted were : (1) The building and maintenance of a large consolidated school in each of the four eastern provinces, as object lessons ; (2) The training of a certain number of teachers in Nature-Study, Manual Training, and Domestic Science for service in rural schools ; and (3) The maintenance of a group of school-gardens in each of the five eastern provinces, with a travelling instructor for each group, and all in perfect harmony with the education Departments of the provinces concerned.

The school-garden is now recognised as a most potent factor in the education of the young by begetting habits of close observation, thoughtfulness and carefulness. Properly used, the garden is "a means to an end, not the end itself,—the end being the symmetrical education of the child. The school-garden seeks education through utility and utility through education".

The teachers trained at the Macdonald Institute, Guelph, on their return to their schools have preached strenuously the doctrines of the new Movement.

Besides these direct results of the Macdonaid Rural Schools Fund, the indirect results have been very marked. While many persons have been unable to see the Macdonald Consolidated Schools and school-gardens, there are very few persons who have not read about them and learned the object of their establishment. The object of the Fund has been achieved both directly and indirectly. The Consolidated Schools have performed most excellent service in showing better types of school buildings and in providing more efficient teachers and more effective teaching for rural life.

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