

Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- Coloured covers/
Couverture de couleur
- Covers damaged/
Couverture endommagée
- Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée
- Cover title missing/
Le titre de couverture manque
- Coloured maps/
Cartes géographiques en couleur
- Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire)
- Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur
- Bound with other material/
Relié avec d'autres documents
- Tight binding may cause shadows or distortion
along interior margin/
La reliure serrée peut causer de l'ombre ou de la
distorsion le long de la marge intérieure
- Blank leaves added during restoration may appear
within the text. Whenever possible, these have
been omitted from filming/
Il se peut que certaines pages blanches ajoutées
lors d'une restauration apparaissent dans le texte,
mais, lorsque cela était possible, ces pages n'ont
pas été filmées.
- Additional comments: /
Commentaires supplémentaires:

- Coloured pages/
Pages de couleur
- Pages damaged/
Pages endommagées
- Pages restored and/or laminated/
Pages restaurées et/ou pelliculées
- Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées
- Pages detached/
Pages détachées
- Showthrough/
Transparence
- Quality of print varies/
Qualité inégale de l'impression
- Continuous pagination/
Pagination continue
- Includes index(es)/
Comprend un (des) index
- Title on header taken from: /
Le titre de l'en-tête provient:
- Title page of issue/
Page de titre de la livraison
- Caption of issue/
Titre de départ de la livraison
- Masthead/
Générique (périodiques) de la livraison

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	32X
						✓					

6011A/32/68 CAF1

NATIONAL LIBRARY
CANADA
BIBLIOTHEQUE NATIONALE

APRIL, 1899.
VOL XIII, No. 1.

THE

OTTAWA

NATURALIST.

Published by the Ottawa Field-Naturalists' Club

CONTENTS.

	PAGE.
1. O.F.N.C. Officers for 1898-1900.	3
2. List of Members.	4
3. Annual Report of O.F.N.C. Council.	7
4. Report of Twentieth Annual Meeting.	10
5. Report of the Treasurer.	12
6. The Mineral Resources of the Ottawa District, by R. W. Ells, L.L.D., F.R.S.C.	14
7. Report of the Librarian.	22
8. Botanical Notes.	22
9. Spring announcements, Mondy afternoon Lectures; Sub-excursions; Ottawa Horticultural Society.	24

SEE ANNOUNCEMENT OF LECTURES AND SUB-EXCURSIONS ON LAST PAGE.

OTTAWA, CANADA.
PRINTED AT THE OFFICE OF PAYNTER & ABBOTT,
48 RIDEAU STREET.

Entered at the Ottawa Post Office as second class matter

THOMAS LIGGETT HAS REMOVED HIS STOCK OF CARPETS, ETC., TO NEW PREMISES. 177 & 179 SPARKS STREET.

J. L. ORME & SON,
Pianos, Organs and Musical Instruments. 189 SPARKS ST.

A. ROSENTHAL,
Jeweller and Optician.
113-115 SPARKS ST.

J. & T. BALLANTYNE,
Best Grades of Hard and Soft Coal.
OFFICE, 42 ELGIN ST.
Telephones 586 and 579.

R. H. KENNY,
TAILOR,
170 SPARKS ST.

WELCH, MARGETSON & CO'S
Shirts, Collars and Cuffs.
R. MCGIFFIN,
106 SPARKS STREET.

A. J. STEPHENS & SON,
FINE SHOES.
187 SPARKS ST.
Boots and Shoes Made to Measure.

RUNS EASY!

Nothing to hold it back. Has neither faults of construction nor flaws of material. Goes "to the front" where it belongs.

It's the '98 "RED BIRD"

Ketchum & Co.

104 BANK ST.

J. G. BUTTERWORTH & Co.,
All-Rail Scranton Coal.
86 SPARKS STREET.

WM. HOWE,
Importer of Artists' Materials and Artistic Interior Decorations. Manufacturer of White Lead, Paints & Colors.
Howe's Block, - - OTTAWA.

C. H. THORBURN,
Books and Stationery,
FOUNTAIN PENS.
Views of Ottawa. 80 Sparks St.

TRY
BATE & CO'S
33 C.
English Blended Black Tea.

JAMES OGILVY, Bookseller, Stationer & Publisher,
87 SPARKS STREET.

1899.

VOL. XIII.

1900.

THE
OTTAWA NATURALIST,

Being VOL. XV of the

TRANSACTIONS

of the

OTTAWA FIELD-NATURALISTS' CLUB.

Organized March, 1879.

Incorporated March 1884.

OTTAWA, CANADA :
From the Press of Paynter & Abbott.
1899.

THE OTTAWA FIELD-NATURALISTS' CLUB, 1899-1900.

Patron:

THE RIGHT HONOURABLE THE EARL OF MINTO,
GOVERNOR-GENERAL OF CANADA.

President:

HENRY AMI, M.A., D. Sc., F.G.S., F.G.S.A.

Vice-Presidents

Prof. John Macoun, M.A., F.I.S., F.R.S.C. A. G. Kingston.

Librarian:

S. B. Sinclair, B.A.
(Normal School.)

Secretary:

W. J. Wilson, Ph. B.
(Geological Survey Dept.)

Treasurer:

Dr. James Fletcher.
(Central Experimental Farm.)

Committee:

W. H. Harrington.
W. S. Odell.
J. M. Macoun.

Miss M. Kee.
Miss G. Harmer.
Miss Marion Whyte.

Standing Committees of Council:

Publishing: J. Fletcher, J. M. Macoun, W. H. Harrington, W. J. Wilson, A. G. Kingston.

Excursions: S. B. Sinclair, John Macoun, J. Fletcher, W. S. Odell, Miss Kee, Miss Harmer, Miss Whyte.

Soirées: A. G. Kingston, J. M. Macoun, W. H. Harrington, W. J. Wilson, Miss Whyte, Miss Kee.

Leaders:

Geology: R. W. Ells, L. Lambe, W. J. Wilson, T. J. Pollock.
Botany: J. M. Macoun, R. B. Whyte, D. A. Campbell, R. H. Cowley.
Entomology: J. Fletcher, W. H. Harrington, C. H. Young.
Conchology: J. F. Whiteaves, F. R. Latchford, A. Halkett.
Ornithology: W. T. Macoun, A. G. Kingston, Miss Harmer.
Zoology: John Macoun, W. S. Odell, A. Halkett, A. E. Attwood.
Archæology: T. W. E. Sowter, H. B. Small, J. Ballantyne.

THE OTTAWA NATURALIST.

Editor:

JAMES M. MACOUN.

Associate Editors:

DR. R. W. ELLS, Geological Survey of Canada,—Department of *Geology*.
DR. H. M. AMI, Geological Survey of Canada,—Department of *Palæontology*.
MR. R. A. A. JOHNSTON, Geological Survey of Canada,—Department of *Mineralogy*.
MR. A. E. BARLOW, Geological Survey of Canada,—Department of *Petrography*.
DR. JAS. FLETCHER, Central Experimental Farm.—Department of *Botany*.
MR. F. R. LATCHFORD.—Department of *Conchology*.
MR. W. H. HARRINGTON, Post Office Department.—Department of *Entomology*.
MR. W. T. MACOUN, Central Experimental Farm.—Department of *Ornithology*.
PROF. E. E. PRINCE, Commissioner of Fisheries for Canada.—Department of *Biology*.
PROF. JOHN MACOUN, Geological Survey of Canada.—Department of *Zoology*.

Membership Fee to O.F.N.C., with "Ottawa Naturalist," \$1.00 per annum,

LIST OF MEMBERS

OF THE

Ottawa Field-Naturalists' Club,
April, 1899.

- Adams, Prof. F. D., *M.A. Sc., Ph. D.*
Alexander, L. H.
Allan, Hon. Geo. W., *D.C.L., F.R.G.S., F.L.S., P.C.* (Toronto.)
Ami, H. M., *M.A., D. Sc., F.G.S., F.G.S.A.*
Ami, Mrs. H. M.
Anderson, *Lieut.-Col. W. P., C. E., M.I.C.E.*
Attwood, A. E., *M.A.*
Ballantyne, James.
Barlow, A. E., *M.A., F.G.S.A.*
Bate, H. Gerald.
Bate, H. N.
Bell, E. B.
Bell, Robert, *B.App.Sc., M.D., LL.D., F.R.S., F.R.S.C., F.G.S., F.G.S.A.*
Belliveau, A. H.
Bethune, Rev. C. J. S., *M.A., D.C.L., F.R.S.C.* (Port Hope, Ont.)
Bigger, Howell.
Billings, W. R.
Bishop, Miss A. M.
Boardman, Wm. F.
Bolton, Miss Eliza.
Borden, Hon. F. W., *M.D., M.P.*
Bostock, Mrs. H. (Monte Creek, B.C.)
Bowen, Miss Alice. (Quebec.)
Bowerman, J. T., *B.A.*
Boyd, Miss M.
Brewster, W. (Cambridge, Mass., U.S.)
Brock, R. W.
Brown, Gerald H.
Brown, Mrs. R. D.
Breckenridge, R. Stuart.
Burgess, T. J. W., *M.D., F.R.S.C.* (Montreal).
Burland, J. H., *B.App.Sc.* (Montreal.)
Burland, Mrs. G. B. (Montreal.)
Burman, Rev. W. A. (Winnipeg.)
Campbell, D. A., *B.A.*
Campbell, A.M.
Campbell, R. H.
Charron, A. T.
Chubbuck, C. E. D.
Church, Clarence R. *M.D., C.M.*
Clarke, T. E.
Cobbold, Paul A. (Haileybury.)
Conklin, J. J.
Cornu, Félix, *M.D.* (Angers, Que.)
Coté, J. L.
Cousens, W. C., *M.D.*
Cowan, Miss E.
Cowley, R. H., *B.A.*
Craig, John. (Ames, Iowa.)
Dawson, G. M., *C.M.G., LL.D., F.R.S., D.S., Assoc. R.S.M., F.G.S., F.R.S.C.*
Dawson, S. E., *Lit. D.*
Denis, Theo. *B. A. Sc.*
Dewar, Colin.
Dimock, W. D., *B.A.* (Truro, N.S.)
Dingman, E. C.
Dixon, F. A.
Doherty, T. Keville.
Douglas, C. A.
Dowling, D. B., *B.A.Sc.*
Dresser, J. A., *M.A.* (Richmond, Que.)
Dulau & Co. (London, Eng.)
Dwight, Jonathan, Jr., *M.D.* (New York.)
Ells, R. W., *LL.D., F.G.S.A.*
Evans, Jno. D., *C.E.*, (Trenton, Ont.)
Ewart, D.
Ferrier, W. F., *B.A.Sc., F.G.S., F.G.S.A.*
Ferrier, Mrs. W. F. (Rossland, B.C.)
Fleck, A. W.
Fleming, Sir Sandford, *K.C.M.G., C.E., F.R.C.I., F.R.S.C.*
Fletcher, James, *LL.D., F.L.S., F.R.S.C.*
Forward, A. J.
Freel, Miss H. B.
Gérin, Léon, *B.A., F.R.S.C.*
Gilmour, T.
Glashan, J. C.
Gorman, M. J., *LL.B.*
Grant, Sir J. A., *K.C.M.G., M.D., F.R.C.S. Edin., F.R.S.C., F.G.S.*
Gridale, J. H., *B.Agr.*
Grist, Henry.
Grist, Miss Mary L.
Hardie, Miss Jessie.
Halkett, Andrew.
Harmer, Miss G. (Hintonburgh, Ont.)
Harmon, Miss A. Maria.
Harrington, W. Hague, *F.R.S.C.*

- Harrison, Edward.
 Hay, George, Sr.
 Hay, G. U., *F.R.S.C.* (St. John, N.B.)
 Hayes, W. H.
 Honeyman, H. O., *B.A.* (Granby, Que.)
 Hope, J.
 House of Commons Reading Room.
 Hughes, Chas. (Montreal.)
 James, C. C., *M.A.* (Toronto.)
 Jenkins, S. J., *B.A.*
 Johnston, J. F. E., *C.E.*
 Johnston, Robt. A. A.
 Joly de Lotbinière. *Hon. Sir Henry.*
 Jones, C. J.
 Kearns, J. C.
 Kee, Miss Margaret.
 Keefer, Thos. C., *C.E.*, *F.R.S.C.*
 Keefer, T. (Jr.)
 Kéel, Joseph.
 Keeley, D. H.
 Kenny, Thos.
 Kingston, A. G.
 Klotz, Oskar.
 Kemp, E.
 Lambert, *Hon. O. H.*
 Lambe, L. M., *F.G.S.*, *F.G.S.A.*
 Latchford, F. R., *B.A.*
 Lee, Miss Katharine.
 Lees, Miss V.
 Lees, W. A. D.
 Lees, Mrs. W. A. D.
 Legg, A. B. Rowan-
 LeSueur, W. D., *B.A.*
 Library, Leg. Assembly (Quebec.)
 Library of Parliament.
 Lindsay, A.
 Living, Miss A. Marion.
 MacCabe, J. A., *LL.D.*, *F.R.S.C.*
 McCalla, W. C. (St. Catharines.)
 McConnell, R. G., *B.A.*, *F.G.S.A.*
 MacCraken, John I., *B.A.*
 McDougall, A. H., *B.A.*
 McElhinney, M. P.
 McEvoy, Jas., *B.A.Sc.*
 Macfarlane, *Rev. J. A.*
 Macfarlane, T., *M.E.*, *F.R.S.C.*
 McGill, A., *B.A.*, *B.Sc.*
 McInnes, Wm., *B.A.*, *F.G.S.A.*
 MacKay, A. H. *B.A.*, *B.Sc.*, *F.R.S.C.*
 (Halifax.)
 McLaughlin, S. (Los Angeles, Cal.)
 McLaughlin, T. J.
 MacLeod, H. A. F., *C.E.*
 McMorrin, R. M.
 McNab, Chas.
 McNab, *Rev. E.* (Mattawa).
 Macoun, *Prof. John, M.A.*, *F.L.S.*,
F.R.S.C.
- Macoun, J. M.
 Macoun, W. T.
 Marshall, John.
 Matheson, D.
 Mathews, Miss Annie L.
 May, *Dr. S. P.* (Toronto.)
 Mearns, *Dr. E. A.* (U.S.A.)
 Morris, Miss F.
 Meneilly, W. J. (Toronto.)
 O'Brien, S. E.
 Odell, W. S.
 Ogilvie, William, *D.L.S.* (Yukon Ter.)
 Poirier, *Hon. P. S.*, *M.A.* (Shédiac, N.B.)
 Pollock, T. J. (Aylmer, Que.)
 Porter, J. A., *B.A.*, *M.D.*
 Pratt, H. O. E., *B.A.*
 Prévost, L. C., *M.D.*
 Prince, *Prof. E. E.*, *B.A. F.L.S.*
 Prudhomme, O.E.
 Robertson, *Prof. J. W.*
 Robertson, N.
 Ross, *Hon. G. W.* (Toronto).
 Rothwell, Miss Lina.
 Sanson, N. B. (Banff, Alta.)
 Saunders, Fredk. A., *B.A.*
 Saunders, Wm., *LL.D.*, *F.L.S.*, *F.R.S.C.*,
F.C.S.
 Saunders, W. E. (London, Ont.)
 Scott, Fred. (Toronto.)
 Scott, Miss Mary McKay.
 Scott., P. J., *M.D.* (Southampton, Ont.)
 Scott, W.
 Scott, W., *B.A.* (Toronto.)
 Scott, W. L., *LL.B.*
 Senate of Canada, The.
 Shutt, F. T., *M.A.*, *F.I.C.*, *F.C.S.*
 Simpson, Willibert.
 Sinclair, S. B., *B.A.*
 Small, H. B.
 Small, H. Beaumont, *M.D.*
 Smith, *Capt. W. H.* (Halifax, N.S.)
 Sowter, T. W. E.
 Sparks, Miss A.
 Stevenson, Chas. (Montreal).
 St. Jean, *Dr. P.*
 Summerby, Wm. J., *M.A.* (Russell, Ont.)
 Sutherland, J. C. (Richmond, Que.)
 Sykes, W. J., *B.A.*
 Symes, P. B., *A.K.C.*
 Thompson, T. W.
 Thorburn, John, *M.A.*, *LL.D.*
 Topley, Mrs. W. J.
 Tufts, Harold. (Wolfville, N. S.)
 Tyndall, Miss A. (Cunawirres Bridge.)
 Tyrrell, J. B., *B.A.*, *B.Sc.*, *F.C.S.*,
F.G.S.A.
 Wetherburn, *Rev. A. C.* (St. John's, Nfld.)
 Watt, F. G., *B.A.*

Walker, B. E., <i>F.G.S.</i> (Toronto.)	Wickham, <i>Prof.</i> H. F. (Iowa City, Iowa.)
Walker, Bryant. (Detroit.)	Whyte, Miss Ethel.
Walsh, A. R.	Whyte, Miss Ida.
Walton, Mrs. J. L.	Whyte, Miss Isabella.
Warwick, F. W., <i>B. Sc.</i> (Buckingham, Que.)	Whyte, Miss Marion.
Watson, J. F.	Whyte, R. B.
Watters, Henry.	Wickham, H. F. (Iowa City, Iowa).
Werry, F. W. O.	Williams, Miss E.
Weston, T. C., <i>F. G. S. A.</i>	Willing, T. N. (Olds, N. W. T.)
Whelan, Peter.	Wilson, W. J., <i>Ph. B.</i>
Whelan, Miss A.	Wilson, Mrs. R.
White, George R.	Wood, <i>Hon.</i> Josiah, (Sackville, N. B.)
White, James. (Snelgrove, Ont.)	Woods, J. W.
Whiteaves, J. F., <i>F. G. S., F. R. S. C., F. G. S. A.</i>	Woods, Mrs. J. W.
Whitley, C. F., <i>B. S. A.</i>	Young, <i>Rev.</i> C. J. <i>M. A.</i> (Lansdowne, Ont.)
Whitley, Thos.	Young, C. H.

CORRESPONDING MEMBERS.

HILL, ALBERT J. *M. A., C. E.*, New Westminster, B. C.
 MERRIAM, DR. C. HART, Department of Agriculture, Washington, U. S.
 ORMEROD, MISS E. A., *F. R., Met., Soc.*, Torrington House, St. Albans, England.
 SMITH, PROF. JOHN B., *Sc. D.*, Rutgers' College, New Brunswick, N. J.
 TAYLOR, REV. G. W., *F. R. S. C., F. Z. S.* (Nanaimo, B. C.)

THE OTTAWA NATURALIST.

VOL. XIII.

OTTAWA, APRIL, 1899.

No 1.

ANNUAL REPORT OF THE OTTAWA FIELD NATURALISTS' CLUB, 1898-99.

The Council of the Ottawa Field Naturalists' Club herewith submits a summary of the work done by the Club during the year ending March 14th, 1899:—

The number of members now on the roll is about 250: twenty have been added since our last annual meeting, and about the same number have resigned during the year. Thirteen council meetings were held. At the first meeting, leaders in the different branches were chosen, also an Editor and Associate Editors of THE OTTAWA NATURALIST.

The President, Prof. Prince, was appointed to represent the Club at the annual meeting of the Royal Society of Canada held in this city in May, when a synopsis of the Club's work was presented by him to that Society.

Early in the year the Council arranged for short excursions on Saturday afternoons, under competent leaders, to different places within easy reach of the city. The first was to Rockliffe April, 16th. Those who attended spent a profitable afternoon. Early flowers were the chief attraction and eighteen different species were collected in bloom.

The second sub-excursion, to the Beaver Meadow, Hull, on April 23rd was attended by forty ladies and gentlemen.

The third was to Beechwood, April 30th, when between forty and fifty members and their friends were present.

The fourth was to Dow's Swamp, May 7th, when a small party made an interesting collection of plants.

The fifth to New Edinburgh, May 14th, was well attended.

At these excursions those desirous of gaining a knowledge of Natural History are brought into closest touch with nature

herself and are shown how they may most profitably pursue their studies. It is not the aim of the leaders to store the mind with scientific names of specimens or mere facts about them, but rather by suggestion to enable the students to find out facts for themselves, and thus become independent of teachers.

There were four general excursions. The first was on May 28th to Gilmour's Grove, Chelsea. It was attended by 175 members and their friends and was a complete success.

The second on June 25th to Chats Falls was largely attended and though the rather unfavorable weather prevented much work being done, all agreed that an enjoyable and profitable day was spent.

The third was to Aylmer, Sept. 24th, when a party of twenty-five attended. 75 species of Fungi were collected, and notwithstanding the lateness of the season twenty species of flowering plants were found.

The fourth and last excursion, Oct. 1st, to Chelsea was attended by about one hundred.

These general excursions are conducted in much the same way as the sub-excursions already described. The whole party however, usually assembles at some convenient spot an hour before leaving for home, when the leaders give short addresses on the salient features of the locality visited and the specimens collected.

During the winter the following papers and reports were read at the regular monthly soirées of the Club.

1898.

Dec. 14.—"Inaugural Address," by Prof. John Macoun, M.A., F.L.S.

"Notes on some Local Violets," by Mr. James M. Macoun.

Report of the Botanical Branch.

1899.

Jan. 10—"The Minerals of the Ottawa Valley," by R. W. Ells, LL.D., F.R.S.C.

"Notes on a herbivorous Dinosaur from the Cretaceous of Western Canada,"

by Mr. Lawrence M. Lambe, F.G.S.

Report of the Geological Branch.

Feb. 7—"Some Native Herbaceous Perennials worthy of cultivation," by Mr. W. T. Macoun.

"On the Burrowing Habits of *Cambarus*—the Cray-fish," by H. M. Ami, M.A., F.G.S.

- "Notes on Fresh-water Polyzoa," by Mr. Walter S. Odell.
Report of the Ornithological Branch.
- Feb. 21.—"The Archeology of Lake Deschenes," by Mr. T. W. E. Sowter.
"Extra-limital Insects Found at Ottawa," by Mr. W. H. Harrington.
F.R.S.C.
"Notes on the rearing of a Young Cow-bird," by Mr. A. G. Kingston.
Report of the Entomological Branch.
- Mar. 7.—"Life-history of the Salmon," by Prof. E. E. Prince, B.A., F.L.S.
"Natural History in Art," by Prof. James Mavor, Toronto University.
(Both papers illustrated by lime-light views.)
Report of the Zoological Branch.

At each meeting, various interesting objects belonging to different departments of science were exhibited,

A most successful conversazione was held in the Assembly Hall of the Normal School, when the Club was honored by the presence of our noble patron His Excellency, the Governor-General. A full report of this meeting was published in the February number of THE OTTAWA NATURALIST.

THE OTTAWA NATURALIST under the editorship of Dr. Ami and seven Associate Editors has been issued monthly. The volume just completed, No. XII, is the largest we have issued. It contains 270 pages and 9 plates. These latter add materially to the value of the papers and are of exceptional merit. Five plates of Canadian Violets were drawn specially for THE OTTAWA NATURALIST, by Mr. Theodor Holm of Washington; Mr. Barlow's plates were from photographs taken by himself.

Many valuable papers have been published during the year. These cover the whole range of subjects included in the scope of the Club. In addition to these, numerous accounts of excursions and soirées, reports of the different branches, book reviews, etc., have been printed.

The special work done by members of the Club has been included in the reports of the various branches and need not be particularly referred to here as these reports have already been published or will appear in an early number of THE OTTAWA NATURALIST.

Shortly after the arrival in Ottawa of His Excellency, the Governor-General, a committee of your Council interviewed him

with a view of obtaining his patronage. He was graciously pleased to accede to their request and has since evinced great interest in the work of the Club.

A grant has again been received from the Provincial Government at Toronto. Upon this grant depends in great measure the maintenance of the standard of excellence which has made THE OTTAWA NATURALIST the best medium in Central Canada for the prompt publication of original papers bearing on the Natural History and resources of Ontario and the adjoining provinces.

The thanks of the Club are due to the Young Men's Christian Association, which kindly put the Association Hall at its disposal for the lectures ; to Dr. J. A. MacCabe for the use of rooms in the Normal School for the monthly Council Meetings and for the library, also for the use of the large Assembly Hall for the Public Conversazione held on Jan. 24th ; to the Electric Light Co. for their generosity in gratuitously putting in wires and lamps for the microscopes on that occasion; to the daily press for inserting notices of all meetings and thus helping the Club considerably by bringing its work before the public.

W. J. WILSON
Secretary.

EDWARD E. PRINCE
President.

TWENTIETH ANNUAL MEETING OF THE OTTAWA FIELD-NATURALISTS' CLUB.

The Twentieth Annual Meeting of the Ottawa Field-Naturalists' Club was held in the Lecture Hall of the Y.M.C.A., Ottawa, on Tuesday evening March 14th, 1899. The following members and officers of the Club were present ; Prof. John Macoun, Dr. James Fletcher, W. H. Harrington, Colonel Wm. White, C.M.G., Dr. H. M. Ami, Dr. R. W. Ells, Mr. R. B. Whyte, Mr. W. R. Billings, Mr. F. T. Shutt, Mr. D. B. Dowling, Mr. J. M. Macoun, Mr. Andrew Halkett, Mr. S. J. Jenkins, Mr. A. H.

Belliveau, Mr. A. B. Rowan-Legg, Mr. R. W. Brock, Mr. D. A. Campbell, Mr. J. Ballantyne, Mr. W. S. Odell, Capt. and Mrs. McElhinney, Miss A. Shenick, Miss Marion Whyte, Miss Kee, Mr. W. J. Wilson.

In the absence of Prof. E. E. Prince, the president of the Club, Prof. Macoun occupied the chair. The minutes of the Nineteenth Annual Meeting having been read and confirmed, the Secretary was then requested to read the "Report of the Council" for the year just ended.

Dr. James Fletcher presented the Treasurer's report which shewed that the Club was in a prosperous condition; all debts were paid and there was a balance on hand of \$65.00.

Mr. S. B. Sinclair's report as Librarian was then read by the Secretary, and on motion was received and adopted. Similar resolutions were passed regarding the Report of Council and Treasurer's statement.

The Chair announced that the Librarian had prepared *thirty-two* complete sets of the *Transactions of the Ottawa Field-Naturalists' Club* including Vol. I—XII of THE OTTAWA NATURALIST, and that these could only be sold in complete sets.

Dr. Ami presented a verbal report of the Editorial Staff of THE OTTAWA NATURALIST and stated that Vol. XII just completed, contained the largest number of original papers published in any one year by the Club, and that he had still on hand a number of very valuable manuscripts for the in-coming Editor.

Mr. R. B. Whyte spoke on Nova Scotia Bird-lists; Mr. Kingston, on reports of meetings and soirées for the press; Mr. Shutt, on the advisability of having a paid officer to assist the Secretary, Treasurer and Editor, in the clerical work of the Club; Dr. Ells and Mr. Kingston on responsibility of leaders. It was pointed out further that when leaders were appointed and held office—they were expected not only to prepare but also sign the reports presented to the Council and Club.

The Club then proceeded to the election of officers. The names of the new officers appear on the cover of this number of THE OTTAWA NATURALIST.

TREASURER'S REPORT FOR THE YEAR 1898-99.

To the President and Members of the Ottawa Field-Naturalists' Club:

The Treasurer begs to report that although the finances of the Club are in a satisfactory condition, as far as the balance is concerned, they are in a very unsatisfactory state with regard to the payment of subscriptions by members at the time they are due. By an expenditure of much time and labour, a large amount has been collected for arrears; but the payments on account of the current year's subscriptions are not at all what they ought to be. The Treasurer makes an earnest appeal to the members to pay in their subscriptions at the beginning of the Club year instead of waiting until the end. The printers must be paid month by month, and were all fees paid when due, the Council could carry out much good work which has to be left undone, owing to uncertainty as to when funds will be available. Further, owing to neglect on the part of members to pay their fees unsolicited, the Club is put to much extra expense for postage, and the work of the Treasurer is much more than doubled.

Another matter which the Treasurer considers it his duty to again bring prominently before the members of the Club, is the patronage of those firms who help the Club by advertising in the OTTAWA NATURALIST. These are all first-class houses who will supply goods, at least equal in quality to those to be obtained anywhere else, and it is only reasonable that they should expect to receive an increase of business from the members of the Club, whose interests they serve by advertising in the Club organ.

Your obedient servant,

JAMES FLETCHER

Treasurer.

OTTAWA FIELD-NATURALISTS' CLUB.

Treasurer's Statement for the Year Ending March 14th, 1899.

1898.	RECEIPTS.		EXPENDITURE.	
Mar. 11. Balance.....		\$ 69 90	Printing OTTAWA NATURALIST, including wrapping and postage, December 1897 to March 1899, (16 numbers).....	394 32
Subscriptions 1898-9.....	\$114		Less discount	17 47
Arrears.....	139			<u>376 85</u>
		253	Illustrations	60 45
Government grant.....		200		<u>437 30</u>
OTTAWA NATURALISTS sold		1 63	Printing Authors' extras	37 05
Authors' extras sold.....		18 75		<u>474 35</u>
Electrotype sold.....		50	Miscellaneous printing	30 90
Excursion profits.....		8 00	Expenses of Conversazione	24 70
Advertisements		62 10	Advertising.....	1 60
			Stationery	2 82
			Postage	12 18
			Balance	67 33
		<u>\$613 88</u>		<u>\$ 613 88</u>

Audited and found correct

J. BALLANTYNE, }
 R. B. WHYTE, } *Auditors.*

JAMES FLETCHER,
Treasurer.

March 28, 1899.

PROCEEDINGS OF THE NATURAL HISTORY
 ASSOCIATION OF MIRAMICHI.

The formation of a Natural History Society at Miramichi is another evidence of the fresh interest that is being taken in the Maritime Provinces in all branches of Natural History. The papers of greatest interest to Ottawa Naturalists in the first number of the Proceedings of the Association are: "The Anowra of New Brunswick," by Philip Cox Ph. D., "Our Winter Birds," by J. McGregor Baxter, M. D., and "The Moths of Miramichi," by J. D. B. F. MacKenzie.

THE MINERAL RESOURCES OF THE
OTTAWA DISTRICT.*

By R. W. ELLIS, LL.D., F.R.S.C.

In investigating the mineral wealth of any district, in order to proceed on a right basis, one should, first of all, carefully consider the geological conditions which prevail, and should ascertain, by a careful preliminary examination, whether such conditions are favorable for the occurrence, or otherwise, of mineral deposits, in quantity to be economically important. If this precaution is neglected there is often a very great possibility that large sums of money may be foolishly squandered in a vain search after the impossible.

In all such investigations it may safely be regarded as an established fact, that our mineral deposits are determined by certain active causes. The action of these causes and their influence upon the associated rock masses, it is largely the business of the geologist, mineralogist or mining engineer to investigate. Unfortunately in the history of mining in this country, as well as elsewhere, this principle has often been entirely disregarded. In the course of some twenty-five years wandering to and fro, in the service of the Geological Survey, it has been my fortune to encounter many such cases, and to witness the small savings of individuals, singly, or even the capital of large companies, wasted in a vain attempt to obtain from the bosom of old mother earth some small share of her buried treasures, simply because some person, often with a smattering only of a few scientific terms, but who was otherwise entirely lacking in all knowledge of the conditions which govern mineral deposits, had asserted that the conditions in certain localities were favorable to the attainment of mineral wealth.

Very often it is to be feared that such statements are made by the adventurer, simply on the chance of getting money easily from the inexperienced, and in such cases, the poor proprietor, after investing what money he could raise, has had his dearly bought experience for his trouble, with possibly the addition of

*Read by title before the Ottawa Field-Naturalists Club, Jan. 10th, 1899.

a fine large mortgage on his property, which probably he may never be able to lift. One need not go far from the province of Ontario for illustrations of this peculiar tendency on the part of certain persons to invest money in this reckless manner. Thus when we find men, otherwise shrewd enough in ordinary business matters throwing away thousands of dollars in an attempt to obtain oil by boring through the Laurentian granites and gneisses as has been done in the upper Rideau district not very long ago, even by people who should have known better, there is evidently a necessity for further enlightenment on these subjects, in order that the public may be better guided. Recently, I met a person who was endeavouring to obtain coal by sinking a shaft through the crystalline limestone in Lanark county, and in reply to my observations that he would not find it there, he stated that he knew he did not agree with the scientists on the subject, but he was convinced the coal was there, because he had smelled the gas in the shaft. His case was a hard one and difficult to deal with, for the reason that he would not be convinced on the ground of common sense and scientific knowledge; and his chances for success were scarcely equal to those of a man I once met in New Brunswick, who had a large farm composed principally of barren grey sandstone, but who knew that there was a large body of iron ore on his place because lightning had struck there twice in fifteen years.

It is wonderful how some men get carried away on the subject of mines. I have known men of the highest standing in the legal world who were prepared to spend thousands of dollars in mining on the word of a travelling clairvoyant, whom they had consulted on the subject, and who, after going into a trance, declared he clearly saw a large body of rich ore three hundred feet below the surface. On the mere strength of such a statement a company went to work and sunk a shaft 500 feet, in which they dropped 50,000 dollars of capital, without finding the rich ore body so easily located. People in general will scarcely believe such instances of folly exist among those whom education should cause to know better, but at the same time

almost similar instances could be cited from many localities, did time permit.

If, however, we were to go on and relate many such cases, there would be but little time for the matter proper of this paper, and I will pass from the consideration of this subject by saying that with many men who become infected with the mining fever, so peculiar is their disposition, that in many cases the advice of a competent mining or geological expert is very apt to be disregarded, most people preferring probably to cure themselves of the disease in their own peculiar way.

With regard to the leading geological features of the mineral bearing areas of the Ottawa District it may be said that these are referable to two divisions of rocks, viz., the Palæozoic and the crystalline. Concerning the origin of the rocks of the former there is no great doubt. They are sedimentary, and contain in their mass the traces of organisms peculiar to the age in which they were deposited. All these fossiliferous deposits have been arranged in due order like the pages of a great book, by turning which a clear and comprehensive history of the growth and development of the earth's crust, for this portion of its history, can be obtained.

When we come to the question of the underlying crystalline rocks we have a different story. Formerly these were regarded by many as having originally the same origin as the newer rocks, that is, the greater part were also held to be sedimentary deposits. Recent studies, both in the field and in the laboratory, have however led to a marked change of opinion in this respect, and it is now very clearly established, that a very large proportion of the crystalline rocks have been produced without the agency of water in the ordinary sense, but are distinctly and directly igneous in their character. In this way we have come to regard many of the rock masses, with which our most important minerals are associated, as intrusive through the sedimentary deposits, and this peculiarity of intrusion has in many cases, had a very important bearing upon the development of the associated minerals.

The principal rocks of the crystalline series, which in Canada have been, for the most part, long regarded as

Laurentian or Huronian, and over the origin and relations of which many wordy battles have been waged, consist of granite, gneiss, limestone, greenstones, &c. The term gneiss does not apply of necessity to rocks of any special age, but has a general reference to structure only, though this distinction has often been lost sight of in discussions on the subject. A gneiss has been by some regarded as peculiar to the rocks of the Laurentian system, yet when we find a granite of comparatively recent age, as is the case of many of the masses which penetrate the sedimentary formations as recent as the Cretaceous, assuming a foliated structure, especially on the outer zone, a feature which may be due to pressure or other causes, it is also styled a gneiss, as readily as is its older brother of the Laurentian time.

The generally accepted idea at the present day, as to the structure and relations of these oldest rocks of our country may be briefly stated, as these points have a manifest bearing on the question of mineral deposits. The lowest, and presumably the oldest, since upon these all the others rest, is a reddish, or greyish granite gneiss but containing different coloured bands, and called for the purpose of distinction, the lower or sometimes the Ottawa gneiss. This rock may be held to represent the oldest known crust of the earth, though probably now in a form much modified or altered from its original condition, when this crust was first consolidated. It is, in so far as yet known, lacking in mineral deposits of economic importance.

Succeeding this in ascending order, are certain other gneisses of greyish or darker shades, some of which have been clearly shewn to owe their origin to aqueous action, though now in a highly metamorphic state. With these are associated bands of quartzite and limestone which sometimes form large areas. These last, with the upper gneisses, form what has been styled the Grenville and Hastings series of the Ottawa district. We thus have in the crystallines, rocks produced in two different ways.

Throughout the districts in which these rocks occur there are often great masses of granite, anorthosite, diorite and pyroxenic rocks, some of which also shew a gneissic structure ;

but as a rule these are of more recent date than the limestone and gneiss with which they are associated; and it is in connection with these later intrusive masses that, in our search for economic minerals, we are particularly interested, since in some of these our most important deposits occur, among which may be mentioned the several ores of iron, the gold of Hastings and the nickel of Sudbury.

The determination of these areas is therefore very important from the economic standpoint, and much time and study has been, and is still being, devoted to the study of this group of rocks by the officers of the Geological Survey. In connection with the upper gneisses also, or rather with the intrusive masses of pyroxenic rocks associated with these, are the great deposits of apatite, mica, &c. found both to the north and south of the Ottawa River. The asbestos of this district is associated with serpentines and generally with the crystalline limestone, and were it not for the enormous deposits found in the Eastern townships of Quebec, the occurrence of this mineral would be of much greater importance than is now the case.

For though mineral deposits may theoretically have the same value at different places and times, this value does not always hold in practice. Thus the apatite deposits which were at one time extensively mined and of great economic importance, have, since the development of the more easily obtained phosphates of the Southern States, become practically valueless, since they cannot now be mined at a figure to enable them to enter into successful competition with the cheaper output of the south. A somewhat similar case is afforded in the micas, though here the results are not so disastrous to the persons engaged in the industry. At one time the price of this material was governed, to a certain extent, by the size and colour of the crystals obtained, but the market value of the mineral, in regard to the largest sizes, has now greatly diminished, owing to the discovery of a process by which sheets of almost any required size can now be built up from small pieces, by a process of interlamination, cementing and pressure, so that the high prices once obtainable for large crystals cannot at present be realized,

and the profits from its mining are proportionately reduced.

In connection with the flat-lying deposits of the Palæozoic formations important mineral deposits are rarely found in this part of our country, with the exception of certain areas of Bog-iron ore, such as are seen near Vaudreuil; but the limestones and sandstones from the Potsdam to the Trenton furnish abundant supplies of building stones often of quite as much importance as sources of revenue as are the mineral deposits of the older crystalline rocks.

Before taking up the question of the distribution of the ore deposits in the older rocks it may not be out of place to say a few words in reference to the development of a new industry which in some localities has already been entered upon with good prospects of remunerative returns. Unfortunately for this at the present day, the glamour which surrounds our mining areas in the west tends to draw away attention from possible fields for profitable investment nearer home. I refer to the utilization of our peat bogs, which form a conspicuous feature over many miles of our generally level country between the Ottawa and the St. Lawrence. As much as thirty years ago the question of utilizing these peat bogs was brought prominently forward in the country east of the St. Lawrence, and a large quantity of the material was extracted and prepared for fuel, principally for use on the Grand Trunk railway. The operations in this direction were carried on at three principal points, viz., 1st., on the line of the Three Rivers branch railway, 2nd., in the great bog lying between the city of St. Johns and Farnham, and 3rd., on the St. Lawrence River, near the village of Port Louis, in the county of Huntingdon. A good demand arose for the fuel and tests made by the Grand Trunk railway were apparently satisfactory to the company, who were quite prepared to adopt it for the work of their road. The great objection however to its use at the time was its bulky nature, and the industry, which at one time promised to assume great proportions, was allowed to dwindle away. Recent experiments have, however, shewed that, by a proper system of compression, a really excellent fuel can be made, having a density nearly equal to that of

ordinary coal, while in calorific power the tests already made have shewn it to be quite as valuable as that substance. While, however, the experimental stages have been quite satisfactory, it was found that in the manufacture, through some defect in the machinery, its commercial output has hitherto, not been such as to contribute largely to our mineral wealth. From the satisfactory nature of the work done lately however it may be taken as assured that the commercial aspect of this question will be shortly settled and a compressed peat, which will replace coal for all purposes, both in our houses and factories, as well as on many of our lines of railway, will yet be an accomplished fact, especially in view of the statement of those who have already engaged in the work, that such a fuel can be produced at a cost, at least half of that which we now pay for coal. This material has for years been successfully produced in Germany, where the industry of compressed peat has assumed large proportions and where a most excellent fuel is prepared at a cost of less than two dollars per ton.

But there is also another aspect of the question which is already receiving much attention by the persons interested in the exploitation of our peat deposits. For a number of years there has been sent to the markets of the leading American cities a substance known as moss-litter, which finds a ready sale at remunerative rates, and for which there is an ever increasing demand. This industry is now being carried on in the Welland district where the peat bogs along the line of the canal are being utilized.

In practice the working of a peat bog should embrace both the preparation of the moss-litter and the manufacture of compressed peat. The substance of a good peat bog is divisible into three portions or strata, viz., the upper or green growing surface, of which but little use can be made and which must first be removed in order to reach the lower and economically available portions.

This second part has a thickness of three to four feet, and passes gradually downward into the black and unctuous portion which is best suited for fuel purposes. In the economic working of a peat bog therefore, due attention must be paid to this order

of succession, and it was doubtless to a lack of this separation, that much of the failure experienced in the attempt to obtain a first rate fuel in the early days of the industry can be attributed.

In the preparation of the litter after the living green surface with its tangled mass of shrubs has been taken off, the next three feet or so is removed, teased out and dried in the sun or by the application of artificial heat, then carefully baled and is ready for the market. The price of this varies from five to ten dollars per ton, and it is now used in all the largest and best conducted stables in the principal cities in England and in the United States. The great merits of the material for this purpose are that, in the first place it is a wonderful absorbent of all the liquid matters found in the stable, a perfect deodorizer, cleanly, and when it has served its purpose in this capacity provides a large quantity of a most excellent fertilizer for the farm, for which it also is in great demand. As there are in the country between the Ottawa and the St. Lawrence several important areas of this raw material, as well as on the east of the latter river, we have at our very doors an almost inexhaustible supply of mineral wealth, which at no very distant day, will doubtless be largely utilized, that is, after our people have become alive to the fact that there is money in its exploitation. Then when the bogs have been carefully drained and the machinery for the proper compression of the rich underlying peat has been perfected, or introduced after the model of the German machines, which should only be a matter of time and experiment, there is no apparent reason why the fuel supply of eastern Canada should not be supplied from these home localities. What that means, in view of the great extension of our railway systems and the constantly increasing demand for coal for domestic consumption and for our factories, is very clear to any enquiring mind, so that though it is true that all is not gold that glitters, it is equally true that there is gold in certain substances that do not glitter at all. It is interesting to know that within the last few months there have been many enquiries as to the extent and location of these deposits, and there is evidently a growing intention to utilize their hidden stores of wealth.

(To be continued.)

REPORT OF THE LIBRARIAN

During the year numerous exchanges and other publications have been received and placed in proper position. Thirty two complete sets of back numbers of "THE NATURALIST" from the time of its inception, 1879, to the present time have been arranged and stored in a cupboard easy of access. This exhausts all copies of certain months but leaves a large number of copies of other months. By this arrangement considerable new space will be secured in the Library room.

For a number of years no apportionment has been made for the binding of publications. I beg to suggest that it would be wise to revive this custom as regards the most valuable exchanges. It might also be well in view of the limited number of back copies of "THE NATURALIST" to formulate a more careful plan of distribution than in the past.

All of which is respectfully submitted.

S. B. SINCLAIR.

Ottawa, Mar. 14th, 1899.

Librarian.

 BOTANICAL NOTES.

Edited by DR. JAS. FLETCHER.

GENTIANA SERRATA.—In the autumn of 1897 several specimens of this interesting plant were found and identified by Miss Mary Nagle, teacher of School Section No. 6, Huntley, to whom belongs the credit of being first to locate the plant in the Ottawa district.

While travelling from Stittsville toward Ashton on Sept. 14th, 1898, the writer discovered a colony of many hundred specimens growing near the roadside in wet sandy soil, a congenial habitat for this plant. The rich blue and the ciliate fringed margins of the corolla render the "fringed gentian" one of the loveliest of our native plants.

VERBASCUM BLATTARIA.—In the summer of 1891 a small colony of Moth Mullein was noted in an old pasture on Lot 33, Ottawa Front about half a mile west of Mechanicsville. Though

this locality has been visited regularly every summer the above-mentioned plant has not been observed since 1891 until last summer when several sturdy colonies, some of them hundreds of yards apart, were found in an excellent state of bloom. The flowers were the pale yellow variety with purple markings. The best specimens were about four feet high.

INTRODUCED PLANTS. Three plants evidently introduced from the North West, *Helianthus rigidus*, *Lepachy's columnaris*, and *Grindelia squarrosa*, were reported by the Botanical Section in 1891, as having been found near the old Eddy Mill-sight at Birchton. Only the last of the three appears to have persisted. Since 1891 *Grindelia squarrosa* has spread over a considerable area. The bright yellow flowers and a profuse resinous, viscid coating are conspicuous features of this thrifty plant.

ARALIA QUINQUEFOLIA.—On October 7th, 1898, several fine plants of this species were obtained near an old roadway on the Chats Island, but in all cases the fruit had already disappeared. In the Autumn of 1897 a party of Indians sold about sixteen pounds of the roots of this Ginseng in Fitzroy Harbor. They stated that they obtained a considerable quantity of them on the Chats Island.—R. H. COWLEY.

VIOLA CUCULLATA.—Our knowledge of the local distribution of the six species of the *V. cucullata* group enumerated in the January number of *THE OTTAWA NATURALIST* is yet far from complete. The admirable illustrations, which were published at the same time, will enable the youngest amateur botanist to determine the several species providing care be taken to collect flowers and summer fruit from the same locality, and so carefully as to preclude the possibility of mistakes. Three of the species are known from but one locality while the other three are of more general distribution.—J. M. M.

SPRING ANNOUNCEMENT.

The Council of the Club has arranged a series of seven afternoon lectures for the spring weeks. These lectures will be of an elementary character and are designed to excite a wider interest in popular science. They will be delivered in one of the Normal School lecture rooms at 4.15 p. m. on Mondays as follows:

April 10th—Geology, Dr. H. M. Ami; April 17th—Botany, Mr. R. B. Whyte; April 24th—Entomology, Dr. Jas. Fletcher; May 1st—Conchology, Mr. F. R. Latchford; May 8th—Ornithology, Mr. A. G. Kingston; May 15th—Zoology, Prof. John Macoun and Mr. W. S. Odell; May 22nd—Planting and care of Forest Trees, Sir Henri Joly de Lotbinière.

Members of the Club are requested to bring these lectures to the notice of their friends.

SUB-EXCURSIONS.

Sub-excursions will this season be made a special feature of the Club's work. The attendance of leaders in each of the principal departments of natural science is assured and the student can find no better means of acquiring knowledge than these sub-excursions. These first visits to the woods are a perennial pleasure to the older members of the Club and this notice is especially intended for those who usually restrict their attendance to the general excursions.

Those who attend the sub-excursions will rendezvous at 3 p.m. at the point on the Electric railway nearest to the locality chosen for investigation. The April excursions will be:—

April 15, Rockcliffe; April 23, Hull; April 30, Beechwood.

OTTAWA HORTICULTURAL SOCIETY.

The Horticultural Society is this year offering an exceptionally fine lot of premiums of which members may select ten upon payment of the small annual fee of \$1.00.

The usual monthly meetings will be held during the year, when in addition to the exhibits of seasonable flowers, addresses will be delivered by leading Horticulturists. Nearly \$400.00 in prizes will be offered for all of which members may compete. In order to obtain the premiums subscriptions must be sent to the Secretary by April 15th. Address Mr. J. F. Watson, Experimental Farm.

J. HOPE & SONS,

Manufacturing Stationers, Booksellers, Bookbinders and Printers.
Depository Ottawa Auxillary Bible Society. 45, 47, 49 Sparks and
Importers of Winsor & Newton Artists' Materials. 26 Elgin St., Ottawa, Can.

Olmsted & Hurdman, Diamonds, Watches, Jewellery, 67 Sparks St., Ottawa, Telephone 75.

HENRY WATTERS,

Chemist and Druggist,

Corner Sparks and Bank Sts.

OTTAWA.

JOHN MURPHY & CO.,

Every Department is now replete, with a full assortment of high-class Novelties for the present season.

66 and 68 Sparks Street,
OTTAWA.



**THE
Russell House,**

OTTAWA.

F. X. ST. JACQUES,

Proprietor.

GRAHAM BROS.

Seedsmen and Florists,

29 Sparks St., Ottawa.

Seeds Bulbs, Plants, Cut Flowers,
Floral Designs.

Catalogue on Application.

G. M. HOLBROOK,

102 Sparks Street,

OTTAWA.

Trouser Stretchers, 50c. per pair.

N. HAY.

54 SPARKS STREET.

SHELF AND GENERAL HARDWARE.

R. A. McCORMICK,

Prescription Druggist,

75 SPARKS STREET,

Phone 159. Ottawa.

C. C. RAY & CO.,

COAL,

53 Sparks Street, Ottawa.

Telephone 461.

M. M. Pyke, Men's Outfitter and Proprietor of Pyke's Steam Laundry.

J. & R. CRAIG, Tailors, 105 Sparks St., Ottawa.

NOV 1 3 1898

THE OTTAWA FIELD-NATURALISTS' CLUB, 1899-1900.

Patron:

THE RIGHT HONOURABLE THE EARL OF MINTO,
GOVERNOR-GENERAL OF CANADA.

President:

HENRY AMI, M.A., D. Sc., F.G.S., F.G.S.A.

Vice-presidents

Prof. John Macoun, M.A., F.L.S., F.R.S.C. A. G. Kingston.

Librarian:

S. B. Sinclair, B.A.
(Normal School.)

Secretary:

W. J. Wilson, Ph. B.
(Geological Survey Dept.)

Treasurer:

Dr. James Fletcher.
(Central Experimental Farm.)

Committee:

W. H. Harrington.
W. S. Odell.
J. M. Macoun.

Miss M. Kee.
Miss G. Harmer.
Miss Marion Whyte.

Standing Committees of Council:

Publishing: J. Fletcher, J. M. Macoun, W. H. Harrington, W. J. Wilson, A. G. Kingston.

Excursions: S. B. Sinclair, John Macoun, J. Fletcher, W. S. Odell, Miss Kee, Miss Harmer, Miss Whyte.

Soirées: A. G. Kingston, J. M. Macoun, W. H. Harrington, W. J. Wilson, Miss Whyte, Miss Kee.

Readers:

Geology: R. W. Ells, L. Lambe, W. J. Wilson, T. J. Pollock.
Botany: J. M. Macoun, R. B. Whyte, D. A. Campbell, R. H. Cowley.
Entomology: J. Fletcher, W. H. Harrington, C. H. Young.
Conchology: J. F. Whiteaves, F. R. Latchford, A. Halkett.
Ornithology: W. T. Macoun, A. G. Kingston, Miss Harmer.
Zoology: John Macoun, W. S. Odell, A. Halkett, A. E. Attwood.
Archæology: T. W. E. Sowter, H. B. Small, J. Ballantyne.

THE OTTAWA NATURALIST.

Editor:

JAMES M. MACOUN.

Associate Editors:

DR. R. W. ELLS, Geological Survey of Canada.—Department of *Geology*.
DR. H. M. AMI, Geological Survey of Canada.—Department of *Paleontology*.
MR. R. A. A. JOHNSTON, Geological Survey of Canada.—Department of *Mineralogy*.
MR. A. E. BARLOW, Geological Survey of Canada.—Department of *Petrography*.
DR. JAS. FLETCHER, Central Experimental Farm.—Department of *Botany*.
MR. F. R. LATCHFORD.—Department of *Conchology*.
MR. W. H. HARRINGTON, Post Office Department.—Department of *Entomology*.
MR. W. T. MACOUN, Central Experimental Farm.—Department of *Ornithology*.
PROF. E. E. PRINCE, Commissioner of Fisheries for Canada.—Department of *Biology*.
PROF. JOHN MACOUN, Geological Survey of Canada.—Department of *Zoology*.

Membership Fee to O.F.N.C., with "Ottawa Naturalist," \$1.00 per annum.