

Journal and Proceedings

OF THE

Hamilton Association

FOR SESSION OF 1898-99.

NUMBER XV.

AUTHORS OF PAPERS ARE ALONE RESPONSIBLE FOR STATEMENTS
MADE AND OPINIONS EXPRESSED THEREIN.

PRINTED FOR THE HAMILTON ASSOCIATION BY THE
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1899

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1860	Rev. W. Inglis, D. D.	T. McIlwraith	Rev. W. Ormiston, D.D.
1861	Rev. W. Ormiston, D.D.	J. B. Hurlburt, M. A., LL. D.	Rev. W. Inglis, D. D.
1871	W. Proudfoot	Judge Logie	Richard Bull
1872	Judge Logie	H. B. Witton, M. P.	Richard Bull
1873	H. B. Witton, M. P.	J. M. Buchan, M. A.	A. T. Freed
1874	H. B. Witton, M. P.	J. M. Buchan, M. A.	A. T. Freed
1875	H. B. Witton	J. M. Buchan, M. A.	W. H. Mills
1880	T. McIlwraith	Rev. W. P. Wright, M. A.	H. B. Witton
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1882	J. D. Macdonald, M. D.	B. E. Charlton	J. A. Mullin, M. D.
1883	J. D. Macdonald, M. D.	B. E. Charlton	H. B. Witton
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1887	Rev. S. Lyle, B. D.	B. E. Charlton	W. A. Childs, M. A.
1888	Rev. S. Lyle, B. D.	T. J. W. Burgess, M. B. F. R. S. C.	W. A. Childs, M. A.
1889	B. E. Charlton	T. J. W. Burgess, M. B. F. R. S. C.	J. Alston Moffat
1890	B. E. Charlton	J. Alston Moffat	A. T. Neill
1891	A. Alexander, F. S. Sc. .	A. T. Neill	S. Briggs
1892	A. Alexander, F. S. Sc. .	A. T. Neill	S. Briggs
1893	A. Alexander, F. S. Sc. .	A. T. Neill	T. W. Reynolds, M. D.
1894	S. Briggs	A. T. Neill	T. W. Reynolds, M. D.
1895	A. T. Neill	T. W. Reynolds, M. D.	A. E. Walker
1896	A. T. Neill	T. W. Reynolds, M. D.	A. E. Walker
1897	A. Alexander, F. S. Sc. .	T. W. Reynolds, M. D.	A. E. Walker
1898	T. W. Reynolds, M. D.	A. E. Walker	J. M. Dickson

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T. C. Keefer, C. E.	Wm. Craigie, M.D.	W. H. Park.....	A. Harvey.
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Geo. Dickson, M.A.	Geo. Dickson, M.A.	Richard Bull	T. McIlwraith.
Geo. Dickson, M.A.	Geo. Dickson, M.A.	A. Macallum, M.A.	T. McIlwraith.
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Geo. Dickson, M.A.	A. Alexander	Richard Bull	A. Gaviller.
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H. B. Witton, B. A.	A. Alexander	Richard Bull	A. Gaviller.
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Wm. C. Herriman, M. D.	S. A. Morgan, B.A., B. Paed.	P. L. Scriven.....	A. Gaviller and H. S. Moore.
Thos. Morris, Jr., F. S. Sc.	S. A. Morgan, B.A.	P. L. Scriven.....	A. Gaviller.

MEMBERS OF COUNCIL.

- 1857—Judge Logie; Geo. L. Reid, C. E.; A. Baird; C. Freeland.
- 1858—Judge Logie; C. Freeland; Rev. W. Inglis, D. D.; Adam Brown; C. Robb.
- 1859—Rev. D. Inglis, D. D.; Adam Brown; Judge Logie; C. Freeland; Richard Bull.
- 1860—J. B. Hurlburt, M. A., LL. D.; C. Freeland; Judge Logie; Richard Bull; Wm. Boulton; Dr. Laing.
- 1871—Geo. Lowe Reid, C. E.; Rev. W. P. Wright, M. A.; A. Macallum, M. A.; A. Strange, M. D.; Rev. A. B. Simpson.
- 1872—Judge Proudfoot; Rev. W. P. Wright, M. A.; John Seath, M. A.; H. D. Cameron; A. T. Freed.
- 1873—Judge Logie; T. McIlwraith; Rev. W. P. Wright, M. A.; A. Alexander; I. B. McQuesten, M. A.
- 1874—Judge Logie; T. McIlwraith; Rev. W. P. Wright, M. A.; A. Alexander; I. B. McQuesten, M. A.
- 1875—Judge Logie; T. McIlwraith; Rev. W. P. Wright, M. A.; A. Alexander; I. B. McQuesten, M. A.
- 1880—M. Leggat; I. B. McQuesten, M. A.; A. Alexander; Rev. A. Burns, M. A., LL. D., D. D.
- 1881—T. McIlwraith; H. B. Witton; A. T. Freed; Rev. W. P. Wright, M. A.; A. F. Forbes.
- 1882—T. McIlwraith; H. B. Witton; A. T. Freed; A. F. Forbes; Rev. C. H. Mockridge, M. A., D. D.
- 1883—A. Alexander; A. Gaviller; A. F. Forbes; T. McIlwraith; R. Hinchcliffe.
- 1884—A. Gaviller; A. F. Forbes; T. McIlwraith; R. Hinchcliffe; W. A. Robinson.
- 1885—W. A. Robinson; S. Briggs; G. M. Barton; J. Alston Moffat; A. F. Forbes.

- 1886—J. Alston Moffat ; Samuel Slater ; Wm. Milne ; James Leslie, M. D. ; C. S. Chittenden.
- 1887—J. Alston Moffat ; James Leslie, M. D. ; P. L. Scriven ; Wm. Milne ; C. S. Chittenden.
- 1888—J. Alston Moffat ; B. E. Charlton ; T. W. Reynolds, M. D. ; S. J. Ireland ; Wm. Kennedy.
- 1889—T. W. Reynolds, M. D. ; S. J. Ireland ; William Turnbull ; A. W. Hanham ; Lieut.-Col. Grant.
- 1890—Col. Grant ; A. W. Hanham ; W. A. Robinson ; A. E. Walker ; Thomas Morris, Jr.
- 1891—Col. Grant ; W. A. Robinson ; J. F. McLaughlin, B. A. ; T. W. Reynolds, M. D. ; Wm. Turnbull.
- 1892—T. W. Reynolds, M. D. ; W. A. Robinson ; P. L. Scriven ; Wm. Turnbull ; Wm. White.
- 1893—James Ferres ; A. E. Walker ; P. L. Scriven ; William White ; W. H. Elliott, Ph. B.
- 1894—James Ferres ; A. E. Walker ; P. L. Scriven ; J. H. Long, M. A., LL. B. ; W. H. Elliott, B. A., Ph. B.
- 1895—J. E. P. Aldous, B. A. ; Thomas Morris, Jr. ; W. H. Elliott, B. A., Ph. B. ; P. L. Scriven ; Major McLaren.
- 1896—J. E. P. Aldous, B. A. ; Thomas Morris, Jr. ; W. H. Elliott, B. A., Ph. B. ; George Black ; J. M. Burns.
- 1897—W. H. Elliott, B. A. ; Thos. Morris, Jr. ; Robt. Campbell ; J. R. Moodie ; Wm. White.
- 1898—W. H. Elliott, B. A. ; Robt. Campbell ; W. A. Childs, M. A. ; Wm. C. Herriman, M. D. ; W. A. Robinson.

ABSTRACT OF MINUTES

OF THE PROCEEDINGS OF THE

HAMILTON ASSOCIATION

DURING THE

SESSION OF 1898-99.

THURSDAY, NOVEMBER 17th, 1898.

OPENING MEETING.

The meeting was called to order by the retiring President, A. Alexander, F. S. Sc., who introduced to the members the newly elected President, Thos. W. Reynolds, M. D.

The President, after thanking the Association for the honor conferred upon him, delivered his inaugural address, in which he outlined the past history of the Association and briefly reviewed the work already accomplished in its various departments.

At the conclusion of his address, the President called on the Camera Section, who favored the members with an excellent series of views from St. Louis and Redlands.

The remainder of the evening was devoted to an informal display of the work of the various sections.

Attendance for the evening about two hundred and fifty.

THURSDAY, DECEMBER 8th, 1898.

The President, Thos. W. Reynolds, M. D., in the chair.

Minutes of the previous meeting were read and confirmed.

The President, on behalf of the Council, reported the result of the negotiations of that body with the officers of the Hamilton Y. W. C. A. re rental of rooms in their new building.

An application for membership was read from Mr. Fred. P. Clappison.

W. A. Logie, M. A., LL. B., then read a very instructive paper on "Public International Law." The lecturer gave a clear and logical explanation of the various departments of International Law, and of the regulations governing each.

An interesting discussion followed the reading of the paper.

THURSDAY, JANUARY 5th, 1899.

President Thos. W. Reynolds, M. D., in the chair.

Minutes of the last regular meeting were read and confirmed.

The report of the Biological Section *re* the distribution of prizes in connection with the botanical exhibit was read and adopted.

The Corresponding Secretary reported the usual exchanges, and outlined the programme for the remaining meetings of the Session.

Mr. Fred. P. Clappison was elected a member of the Association.

The President then called on the Recording Secretary, S. A. Morgan, B. A., B. Paed., who read a paper on "The Theory of Telepathy." Without seeking to advance or disprove the theory, the essayist set forth the phenomena which it claims to explain, and suggested the chief arguments for and against its acceptance.

A lengthy and interesting discussion followed the reading of the paper.

THURSDAY, FEBRUARY 2nd, 1899.

The President, Thos. W. Reynolds, was in the chair. Minutes of the last regular meeting were read and confirmed.

The attention of the Association was called to the proposed establishment of a Central Library of Reference at Toronto.

Wm. C. Herriman, M. D., then read the paper of the evening, which consisted of a series of Natural History notes from Mr. Wm. Yates, of Hatchley, and were written in Mr. Yates' usual interesting and instructive style.

A short discussion followed.

THE HAMILTON ASSOCIATION.

THURSDAY, MARCH 9th, 1899.

In the absence of the President, Vice-President J. M. Dickson occupied the chair.

Minutes of the previous meeting were read and confirmed.

The Recording Secretary read the Table of Contents of a work about to be published on The Bermudas, from the pen of Mr. H. B. Small.

Inspector J. H. Smith then read a very interesting paper on "Odd Characters Among the Early Settlers." The paper gave a carefully authenticated account of the lives and characters of a number of the early settlers of the district, and proved very instructive to the members.

A lengthy discussion followed.

Messrs. A. Alexander and H. B. Witton, Sr., spoke feelingly of the deep loss sustained by the Association through the death of the late J. A. Mullin, M. D., and paid a deserved eulogy to his learning and character.

THURSDAY, APRIL 13th, 1899.

President Thos. W. Reynolds in the chair.

Applications for membership were read from Messrs. J. Schuler, John E. Wodell, W. Toye and T. Cummings, M. D.

It was resolved that the several applications be received and balloted on at the present meeting.

Messrs. Schuler, Wodell, Toye and Cummings were elected members of the Association.

Prof. James Fletcher was appointed to represent the Association at the coming meeting of the Royal Society of Canada.

Mr. David Boyle, of Toronto, then read a paper entitled "Some Mental and Social Inheritances." This paper proved very interesting and instructive to the members, and an animated discussion followed.

THURSDAY, MAY 4th, 1899.

President Thos. W. Reynolds, M. D., in the chair.

Minutes of the last regular meeting were read and confirmed.

W. A. Childs, M. A., read an instructive and carefully written paper on "Poisonous Mushrooms and Edible Toadstools."

A series of "Natural History Notes," from Mr. William Yates, were also read.

The annual meeting was then held, and the following reports were read and adopted :

Report of the Council, by the Secretary.

" " Curator, by Alex. Gaviller.

" " Geological Section, by A. T. Neill.

" " Biological Section, by J. M. Dickson.

" " Photographic Section, by J. M. Eastwood.

" " Corresponding Secretary, by Thos. Morris, Jr.

" " Treasurer, by P. L. Scriven.

The following officers were elected for the ensuing year :

President, - - - Thos. W. Reynolds, M. D.

First Vice-President, - A. E. Walker.

Second Vice-President, J. M. Dickson.

Corresponding Secretary, Thos. Morris, Jr.

Recording Secretary, - S. A. Morgan, B. A., B. Paed.

Treasurer, - - - P. L. Scriven.

Curator, - - - Alex. Gaviller.

Auditors, - - - H. S. Moore and F. Hansel.

Council : W. A. Childs, M. A., W. H. Elliott, B. A., Wm. C. Herriman, M. D., Robert Campbell, W. A. Robinson.

REPORT OF THE COUNCIL.

Your Council take pleasure in submitting their report for the Session of 1898-99.

The Session just closed has been, on the whole, a successful one, both in the character of the work done and in the interest displayed by the members.

Seven general meetings of the Association have been held during the session, at which the following papers have been read, viz.:

1898.

NOV. 17th—"Inaugural Address"—President T. W. Reynolds, M. D.

DEC. 8th—"International Law"—W. A. Logie, M. A., LL. D.

1899.

JAN. 5th—"The Theory of Telepathy"—S. A. Morgan, B. A.,
B. Paed.

FEB. 2nd—"Natural History Notes"—Mr. Wm. Yates.

MAR. 9th—"Odd Characters Among the Early Settlers"—Inspector
J. H. Smith.

APRIL 13th—"Some Mental and Social Inheritances"—Mr. David
Boyle.

MAY 4th—"Poisonous Mushrooms and Edible Toadstools"—
W. A. Childs, M. A.

MAY 4th—"Natural History Notes"—Mr. William Yates.

We are pleased to be able to report an increased interest on the part of the public in the work of the local Museum, as evinced by the largely increased numbers who avail themselves of the opportunity of visiting it each Saturday afternoon. It has been especially encouraging to the Council to note that a large number of these are from the young people of the city, many of whom are thus becoming interested in the work of collecting local specimens.

We cannot close this report without referring to the death of two of the oldest and most valued members of the Association. Rev. W. Ormiston, D. D., was the first President of this Association, and it was largely to his efforts that the success which marks its early history must be attributed. The late John A. Mullin, M. D., was always deeply interested in the welfare of the Association, as in all other movements having for their object the bettering of mankind. Their noble characters and faithful devotion to duty are too well known to the members to require an extended eulogy.

All of which is respectfully submitted.

THOS. W. REYNOLDS,

President.

S. A. MORGAN,

Secretary.

INAUGURAL ADDRESS.

DELIVERED BY T. W. REYNOLDS, M. D., PRESIDENT,
NOV. 17TH, 1893.

Ladies and Gentlemen :

I would be very lacking indeed if I did not appreciate the honourable position in which I now find myself, that of President of this distinguished body, a position which has been held by fourteen others, all men who have done themselves and the Association credit by the manner in which they discharged the duties devolving upon them. Let me, therefore, before proceeding further, return my sincere thanks to my colleagues, the members of this Association, for their kindness in placing me in such a distinguished company. At the same time I can assure you all that while I appreciate the honour of this office, I am equally aware of the responsibilities attached, and particularly that of preparing a fitting introductory address.

This address, though at its outset imposes a very pleasing duty, that of welcoming our visitors, for we must admit that we cannot claim all present as members, much as we would like otherwise to do; however, we are always ready, on the one hand, to admit new members to our ranks, while, on the other, we are ever pleased to see visitors at any of our meetings.

I might take this opportunity of stating that we have different classes of meetings, each intended for special purposes. Of these we have, first, our open meeting, which, of late years, like to-night, has taken the form of a social function, in order to bring the members and visitors together in an informal way, while the latter are given some idea of what the Association and its members are really trying to accomplish, and of what their quarters contain. The second class of meetings are the general meetings, held at least once a month during the winter, for the transaction of business and the reading of papers. The third class are the section meetings for work proper, but I shall have more to say later on of both of these classes.

Let us all now, both members and visitors, consider the objects of the Association, by way of affording information to our visitors,

and reminding our members of some facts they may have lost sight of. To do this, I think it would be well to look back at our history. The Hamilton Association was instituted on November 2nd, 1857, and continued its meetings regularly to the close of the year 1860. Then there was an interregnum of irregular meetings till 1871, when what I shall call the 2nd epoch of our history ensued; it lasted for five years and was followed by another interregnum of four years. Since 1880 the Association has been in active operation. In the first volume of our Transactions, the fact is recorded that the annual meeting held in May, 1884, was the one hundredth meeting of the Association, and since that time we have had more than a hundred additional meetings. The Association was incorporated in the year 1883.

When the Association was instituted it was customary for the members to affix their names in a book to the by-laws, in token of their submission to the same, and the book, which is still in existence, therefore contains some valuable autographs. Unfortunately, of late years, this very laudable practice has fallen into disuse; as a matter of fact the last name, or last but one, is that of Thos. Wm. Reynolds, but I am thankful to say that many useful and hard working members have joined the Association in the thirteen years since that time. As this book shows, our membership from the very outset has been composed of those well known, not only in our own community, but in the Province, and in fact the Dominion; it will, therefore, perhaps not be out of place to refer to some of them, many of whom you will notice in the list of officers published at the front of the Proceedings. The Association, as I have already mentioned, has had 14 Presidents, and to the best of my knowledge 11 of them are still alive, most of them being still active members.

The first name in the Signature Book is that of the first President, and it has but to be mentioned to recall in the minds of many that sturdy old Scotchman, Rev. William Ormiston, D. D., who was so thrilling with energy that it seemed to affect even the tips of his hair, to judge from his appearance and the portraits of him to be seen in so many of our homes. His 1st Vice-President and successor in the presidential chair the following year was Dr. John Rae, so well known as the discoverer of Sir John Franklin's remains, and who only died within the last few years. On the resumption of the

meetings in 1871 the President was William Proudfoot, Esq., better known as Vice-Chancellor Proudfoot, though he has now retired from the Bench. His 1st Vice-President and successor in office the following year was the late Judge Logie, who was one of the original members of the Association. I may be pardoned for dwelling upon his name, because, apart from any personal private regard I may have for it, wherever Hamilton is mentioned amongst botanists they will at once speak of the work done by Judge Logie in Hamilton and its vicinity. The third era of our Association had for its first President one whose name is also familiar to all. I refer to Mr. Thos. McIlwraith, who was also one of the early members, and whose work on the "Birds of America," first published in our Transactions, has done much to bring the name of the Hamilton Association before the scientific world. Another name, that early appears amongst our list of past officers, should not be overlooked. I refer to that of Mr. H. B. Wittón, whose genial countenance is, we are all happy to say, still to be seen at nearly all our meetings, and one of whose contributions is to be found in our last Transactions. Of other worthy members I would fain speak, but time will not permit.

Having thus briefly referred to our past membership, I must remind you of what I intimated previously, that this gathering is intended to make you acquainted with our present members, and ere long I hope our future membership will include the names of many who may be only visitors to-night; and here let me inform you that ladies are equally as eligible for membership as gentlemen, and we would be very ungrateful if such were not the case, for many of our finest specimens have been contributed by ladies, notably by Mrs. Charlton, who is one of our honorary members, and Mrs. Carey, another of our honorary members, whose collection of shells forms such a valuable part of our museum. I would also remind our botanical members of the fact that Judge Logie received much assistance from his sister-in-law, Miss Kate Crooks, when preparing his valuable list of the Hamilton flora.

Let us now look at the objects of our Association. These, according to our Constitution, are "the cultivation of Science, Literature and Art, the formation of a Museum, Library and Art Gallery, and the illustration of the Physical Characteristics, Natural

"History and Antiquities of the country." It would not be expedient for me to dwell at any length on the value of the cultivation of Science, Literature and Art, for that has already been very fully done before by my predecessors in their inaugural addresses, but I will reiterate what has been said, that in this busy age of ours we are too often assailed with that question of expediency that is advanced as regards anything beyond mere money-grabbing by the average man or woman. For even our lady friends are too prone to let their peculiar cares become too pressing, whether they are engaged in business or feel themselves bound down by domestic ties. Humboldt in his *Cosmos* refers very aptly to the value of a study of the Arts and Sciences, and although written forty years ago his opinions are still pertinent; he says as follows:

"An equal appreciation of all branches of the mathematical, physical and natural sciences is a special requirement of the present age, in which the material wealth and the growing prosperity of nations are principally based upon a more enlightened employment of the products and forces of nature. Those States which take no active part in the general industrial movement, in the choice and preparation of natural substances, or in the application of mechanics and chemistry, and among whom this activity is not appreciated by all classes of society, will infallibly see their prosperity diminish in proportion as neighboring countries become strengthened and invigorated under the genial influence of arts and sciences."

But better, perhaps, even than these remarks, apt though they are, is a consideration of what we witnessed last year in the class of men who took part in the British Association meeting in Toronto, for what do we find? An array of business men who also take an interest in scientific matters, notably the President, Sir John Evans, a man without a university education as regards an ordinary arts course, but a member of many scientific societies, and so one of our visitors told us in Hamilton, the only man, or one of the few, who has read the *Encyclopaedia Britannica* through. Another good example is that of Sir John Lubbock, who, although an active member of the banking firm of Robarts, Lubbock & Co., is better known as a popular writer and lecturer, and of whom *Punch* used the following parody:

"How doth the busy banking bee
Improve each shining hour,"

in allusion to his investigations on the subject of Ants and Bees.

As regards the second set of objects of our Association, and to which we must now turn, viz., the formation of a Museum, Library and Art Gallery, I shall not say much, as my predecessor, Mr. Alexander, has already in a paper on Museums very exhaustively dealt with that phase, still we must not lose sight of the fact that we certainly have a good nucleus for a public museum, of which we are justly proud, but we need larger quarters so that our collections can be better displayed and more use made of them, and our museum be all the more attractive to visitors.

The Library feature is not so incumbent upon us, as the Public Library fills in a great measure the want so long felt. But here, also, I would refer to a mine of wealth in our possession that has been too much neglected! I mean our valuable collection of Transactions that are so well worthy of perusal. We receive publications from 122 societies in all parts of the world, so I think we should no longer delay in making arrangements for a systematic use of them.

The Art Gallery feature, though in a great measure lost sight of by us, is, I am happy to say, being looked after by other institutions in the city.

The last group of objects to which our attention is directed, viz., the illustration of the Physical Characteristics, Natural History and Antiquities of the country has been to a great measure undertaken by our Geological and Biological Sections, and it is proposed to establish an Archaeological Section, which will utilize our by no means small collection of antiquities.

Let us now see how we can best carry out these laudable objects to which I have alluded, and for this purpose I have intimated that we have two special classes of meetings—our general monthly and the several section meetings, the former being intended to be of more general interest, though not, perhaps, of such practical value.

The section meetings are intended to be the really practical working ones, and although they have done a great deal of valuable work, there is a wide field before them. Our old Constitution provided for seven sections, but at present we have only three really active ones, viz., the Geological, Biological and Camera Sections, to all of which we are much indebted. But here I would offer a word of caution, and that is that there is too much disposition in each

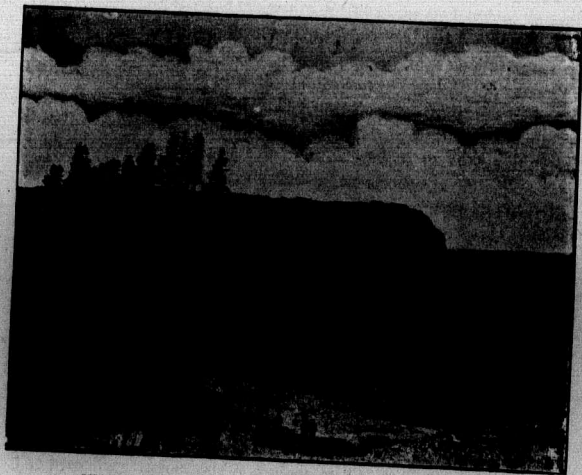
section to let a few members do all the work, for instance, in the Geological Section, our old and valued friend, Col. Grant, is a regular Atlas, who, in his enthusiasm, not only bears on his shoulders the ordinary work that may be prepared by others, but is heaping up much more of his own, even in the direction of the lost Atlantis, as our last Transactions show. It seems only fair, therefore, that some of the younger members should come to his assistance and relieve him.

Though these three sections are at present the most active ones, I am pleased to be able to state that in addition to the Archaeological one to which I have alluded, the Philological expects to open work vigorously at an early date, and I would also suggest that a Transaction section should be formed, the members of which would systematically examine all the exchanges and then call the attention of the several sections to those papers that would be of use to them, and also at each general meeting present a comprehensive summary so that the members would have their attention called to what is most of interest in these publications.

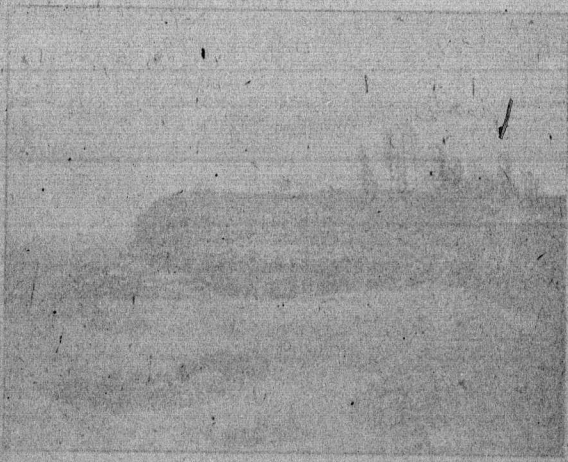
But now having said something about the work of our sections and the value of them, I am met by the objection from some members, "I am not a specialist in any branch, what am I to do?" To such a man I would say I pity you, for I was once of a similar opinion, but when the Biological Section was revived a few years ago I joined it as Secretary, thinking in that way I could do a little, but by dint of keeping my eyes open soon found plenty to occupy me, and work that was most pleasant. John Burroughs in his "Locusts and Wild Honey" says: "Noting how one eye seconds and reinforces the other, I have often amused myself by wondering what the effect would be if one could go on opening eye after eye to the number of say a dozen or more. What would he see? * * * This would require not so much more eyes as an eye constructed with more and different lenses; but would he not see with augmented power within the natural limits of vision. At any rate some persons seem to have opened more eyes than others. * * * How many eyes did Gilbert White open? how many did Henry Thoreau? how many did Audubon? Not outward eyes but inward. We open another eye whenever we see beyond the first general features or outlines of things." To these very pertinent queries I would add

these: How many eyes has John Burroughs himself opened, and how many has our friend Mr. William Yates? Cultivate, therefore, my friends, this opening of the eyes, and if you have no taste for any of our present established sections we have plenty of room for others. Thus by cultivating our various talents we will soon find our Association fulfilling the wishes of the founders, and instead of finding the study of Nature a trial we will be ready to say with the poet Wordsworth:

“ Therefore am I still
A lover of the meadows and the woods,
And mountains: and of all that we behold
From this green earth; of all the mighty world
Of eye and ear,—both what they half create,
And what perceive; well pleased to recognize
In nature and the language of the sense,
The anchor of my purest thoughts, the nurse,
The guide, the guardian of my heart and soul
Of all my moral being.”



QUARRY, MOUNTAIN TOP, AT HEAD OF "JOLLEY CUT" ROAD.



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NOTES AND QUERIES ON NATURAL HISTORY.

Read before the Hamilton Association, February 2nd, 1899.

BY WM. YATES, ESQ.

Probably the old-time herbalists had some notions of modern bacteriologic theories and of germicides by giving such quaint names to plants as vermifuge, fleabane, pedicularium and bugbane—our modern pyrethrum, or insect powder, merely to come in contact with which or to touch, is death to such larval forms as the common cabbage butterfly caterpillar. The name catmint indicates perhaps that that labiate was eaten by domesticated felines as an anthelmintic; and even the mammoth felines, such as the lion and tiger, when caged in menageries, are known to manifest a liking for the nepeta cataria and other odoriferous herbs of the mint family; and the house cat's love for catmint and for the valerian herb is easily seen as they purr and lick and nibble over a leafy sprig, and to the malady of intestinal parasites the cat tribe are frequent victims, the epidemic being sometimes spoken of as the cat murrain, as a remedy for which ailment powdered areca nut has been recommended by newspapers.

A majority of species of the mint order of plants are inimical to the insect race, as the housewife's faith in the use of lavender, rosemary, thyme, hyssop, pennyroyal, when placed in clothes drawers and bureaus as a deterrent against moths, may sufficiently prove. The pyrethrum insecticide is a plant said to be of the same natural order, that is, the compositæ, as wormwood and tansy—*tanacetum vulgare*, and is said to be imported from the Balkan regions. If kept, that is, the dried stems and leaves sold in the drug stores as insect powder, slowly burning in a censor, the mild aromatic fumes immediately drive house flies and mosquitoes from a room.

The eating at certain seasons of acrid herb substances, such as the lobelia inflata and burdock, by horses and colts, may have a powerful sedative effect, as these two herbs grow abundantly in

many pastures, and are believed to cause copious salivation when eaten by equines, though the same effects are also attributed by some to the fondness for eating the blossoms of white clover, which horses evince, and the ripening seeds of which plant are thought to cause working farm teams to lose flesh in the latter summer months. An acquaintance near here thinks that the eating of the above nauseous herbs, and also the bitter sumach, is—as an item in natural pharmacy—as a prophylactic for “bots,” which are believed to be an insidious and frequently a fatal foe to the equine genus of farm animals; and another rural philanthropist, whose name one could mention, used to aver that tobacco juice was the proper and efficient destroyer of the typhoid bacillus, and he earnestly and persistently advised his rural confreres, at times of typhoid prevalence, to take abundant and frequent “chaws” of “Myrtle Navy” or other brands of the opiate weed, and, as was popularly believed, with beneficial results to such as could bear up against the heroic remedy.

This episode had a date before the era of pasteurism, or at least before those notions had obtained notoriety. The tobacco quack had a rough philosophical notion of the microbe-in-the-blood source of typhus, and of the serum method of treatment, and had unshaken faith in his method of immism, akin to the homœopathists combating evil by a lesser ill, or, as the politicians sometimes say, “fighting the devil with fire,” that is, “outlying the liars.”

Many farmers are made aware by experience that young lambs, and those, too, in a very thriving condition and fit for the butcher, are infested with tapeworms in the smaller intestines; said parasites do not seem detrimental for a time to the lambs' health, which are often in a state of extreme fatness, but about weaning time show a strong propensity to take bites of bitter shrubs, such as the wild cherry and sumach. This habit occasionally causes the death of the lamb from inflammation of the throat and salivary glands, ending in much swelling of the throat, and gangrene.

A rural Burford cowleech relied on logical analogies, and in his treatment of a sick cow or ox, cases of what he termed “embargo in the maniplus,” recommended to give a dose of half a pound of gunpowder in water solution. Sometimes the cure threatened by exaggeration worse dangers than the malady had done.

The cat plague breaks out at irregular periods in a locality and numbers die off in spasms and convulsions. About the time of cutting the adult teeth healthy cats brought from a distance into an infected district have been known to die in a day or two. An intelligent acquaintance thinks the cause is frequently, the felines are fed on unsterilized milk, that is, they attend at milking time in the cowbyres and get new milk, as from the udder and unstrained, in a saucer kept there for the purpose, and lung tubercles may possibly thereby result. Milk of ruminants seems a substituted food for cats, being specialized carnivores.

Scarcely any samples of the hermit thrush or even of the veery are around us this year, and fewer individuals, strictly wood birds, than ever before. Cause, perhaps, bush fires in later years and extensive draining and clearing of swamp thickets; yet the whippoorwills came in unthinned numbers to their time honored haunts, and were very demonstrative by their weird vociferation in the warm summer nights.

A neighbour raided a hawk's nest last week. The old pair had been making depredations on poultry near by. The nest contained four young ones of various ages. One was just entering the pin feather stage, with long waving white down on the head and neck; two others nearly ready to depart from the nest, which was situated in the main divide or bifurcation of a large red or swamp maple tree, and it was rather a dangerous climb for the boy to get at the raptores. Like the cuckoo, the female hawk is irregular in the time of laying her brood of eggs, and it would seem that the warmth of the earlier hatched young is utilized in lieu of the old ones constantly sitting to the full incubating period. About five species of hawk visit this district, that is, sharp skinned hawk, red tailed hawk, cooper's hawk (so termed), the goshawk; small sparrow hawk (*f. sparxerious*), and the kestrel, and occasionally the black hawk of the Western States, which is known by its louder outcries resembling the screams of a young pig when in difficulties.

An acquaintance in this vicinity took a young crane (*ardea herodias*) from the lofty nest in a tree in the midst of the herony, where, for many summers, the big waders had been accustomed to associate to the number of fifteen or more pairs in community for nesting purposes. Being well fed and kindly treated, the young

heron became fearless and tame, and in a month or less after capture would answer a call of its name, "Bill," given on its first frog feeding operations. The owner or his children, on finding a frog or lizard, mouse, crayfish, or young ophidian in the fields, even when a good distance intervened, would hold aloft a white handkerchief and shout "Bill" at the top of the voice, and the crane would fly straight to the objective point and gobble down the piscatorial or amphibian food. The bird would evince alarm on hearing the scream of the locomotive as a train passed on the near by railway, but when the steam engine of an itinerant gang of grain thrashers appeared and began its puff, puff, puffing near the roosting place by the barn, this, to heron ideas, partook too much of the marvellous, and the pet bird, esteeming itself an entire solecism, took flight to parts unknown and was seen no more by its erstwhile human associates. A similar going off, as to the abrupt manner of it, was recorded of a pet bittern that a Burford farmer of our acquaintance once tamed so as to associate in his poultry flock, and which would even walk into his kitchen and seize food from the dishes on the table if permitted. As the autumn came on no apprehensions were felt as to the pet proving a deserter from the seeming contentment and fraternization in the poultry yard, but one fine Indian summer-like afternoon, late in the month of October, (*betaurus lentiginosus*), being in the farm house, and the human inmates seated around, the door being wide open, suddenly seemed to hear a call none else could hear, and with a weird scream ran out of doors into mid garden, soon taking a high circling flight skyward, and presently getting his instinctive bearings steered off south-westwards, was soon a vanishing speck on the sky, and from that hour to this was seen nor heard of no more by Burfordites. Both the bittern and the crane above mentioned had been allowed a free range about the farms, and the difficulty of procuring them suitable food in winter induced an expectancy of their migration southward in the fall.

The autumn is proving a remarkably fine and warm one, and there is an abundant return for the labors of the farmers.

Frosts have been slight and infrequent, and many tender vegetables are still looking green and luxuriant. Until quite recently humming birds visited the morning glory flowers at the

west side of our dwelling, and also the nasturtions, hollyhocks and sunflower tribe. Less than or about two weeks ago one of the feathered gems, perhaps attracted by some potted flowers that were blooming on our window sill, flew through the partly open window into a front room and fluttered violently close to the ceiling, and at length fell exhausted to the floor and was soon afterwards picked up quite dead by my granddaughter, who is trying to preserve the feathered mite in a parcel of ground pepper. It was the hen bird, as indicated by the lack of the ruby brilliancy of the throat peculiar to that species that comes to Canada every summer. Many creatures besides birds seem unable to draw inferences. The ruby throat's instinct was to rise and soar aloft, the window of entrance being still open. Perhaps fright and nervous agitation paralyzes in part the ornithic intellect; yet bats and swallows, and even the wrens and phoebe fly catcher in similar quandaries, after a chance for second thought, descend to a broken pane or partly open door and so save their lives by regaining liberty in time. An intelligent acquaintance, whose opinion deserves consideration, is of opinion that humming birds rarely, if ever, succeed in raising a brood of their young so far north as Canada.

The man says that he has met with—he was born near here and is about forty years of age—many or quite a number of humming birds' nests, some of which contained eggs, but he never yet found a nest containing young ruby throats (*Trochilidae*) or ever even saw the old ones feeding their young or piloting or guarding or caring for the same. Hence his doubts, which are only jotted down for what they may be considered to be worth. It may be mentioned, however, that the man is an all round enthusiast on the subject of birds, and says he could give Mr. McIlwraith many pointers *re* the birds of Ontario. I may here mention that I, a short time ago, loaned Mr. John Scott, of Hatchley, Mr. McIlwraith's work on that theme.

October 2nd.—Robins were singing blithely to-day and feasting on the ripe grapes; song sparrows, too, are yet tuneful (two species); meadow larks and shore larks are about us, the former frequently piping their pensive refrain. Higholders, so called, and other pickadee, as well as numerous blue jays, find a feast on the abundant fruit of the elderberry bushes in the neglected fence corners.

Some of our neighbors are uttering threats against the owl tribe, which have begun to make more frequent marauding visits to the poultry roosts. A few evenings since, when house lamp had just been lit, we were somewhat startled by strange buffeting sounds that seemed to proceed from a barrel that stood just outside our kitchen door, and was about half full of water. On going out to investigate, lamp in hand, two round, big, glaring eyes and a hooked beak and a screech owl's beautifully mottled plumaged upper parts met our vision, but the strix unfortunate was unable to rise from the surface of the water. My son said to me, "Lift the bird out, it is dying." "Not without a pair of tongs," replied I. I would as soon handle poison sumach as that ill-omened visitor, which my son speedily jerked out of the water in a dead or last dying paroxysm. The owl had probably come to grief in the too eager pursuit of a big moth. A friend of mine writes from St Paul three days ago: "I and a friend went out to a lake about eleven miles from here the other morning. We arrived at the lake shore before sunrise in quest of wild ducks. All we obtained of that species of game was two teal, a whistling duck, and one jacksnipe. Just after sunrise, and whilst we were taking lunch under oak trees, we noticed a big hawk strike into the lake waters and saw it soon emerge with a fish, the raptore flying off to its mate, which we could see sitting on a branch of a dead tree some distance off, where, we believe, the two falconidae enjoyed an orthodox meal. One of the birds returned to the lake and repeated its former feat, and as we had hid in ambush one of us fired a shot and the fish fell from the hawk's claws; soon after the hawk came down with a mutilated wing. The bird was snow white in all; its under side parts and its extended wings measured more than I could stretch to with my arms extended to their uttermost."

NATURAL HISTORY NOTES.

Read before the Hamilton Association, May 4th, 1899.

BY WILLIAM YATES, ESQ.

A source of loss and regret to great numbers of Canadian landholders in the Province of Ontario was the rather sudden dying of the fine forests of black ash trees (*Fraxinus Sambucifolia*) about the year 1888. Immense areas were occupied in the early period of the colony by this fine and useful tree, as, in a majority of the annually flooded lowlands, this species held almost entire possession, these areas being generally known to the pioneer settlers by the term "black ash swales." The timber was of inestimable value to the land clearers as fencing material, by virtue of its free splitting qualities and durability.

From some not easily ascertainable cause (in a very extensive portion of Ontario) death overtook simultaneously the whole of these forests about eight or nine years ago. Various causes of the phenomenon were assigned. By some the loss was attributed to the clearing up of the enviroing dry lands; by others extensive draining operations were given as a reason, while others asserted that excessive cold during winter or else abnormal summer frosts suffered to bring about the effect. There was much conflicting opinion expressed, and the real cause seems still surrounded by mystery. As we heard of few or no insect depredations being concerned in the matter, and as the decadence was sudden and quite general, only a very small percentage of saplings being left as survivors, the cause seems to have been atmospheric changes as to moisture, or abnormalities in temperature and new cycles of growth. Since the change adverted to there has been a very general invasion in semi-cleared and neglected lands of the poplar, which was in the early days of Canadian settlement a tree quite of rare occurrence.

Allusion to the recent disappearance of the black ash forests, which appear to have lived out their appointed time (for it was a

matter of observation that young and vigorous individuals shared the same fate as the mature and senile instances of growth), like a displacement of "race" in higher planes of life, and a new departure. This allusion, as we above remarked, brings to mind a somewhat similar blight in forest growth, which was, in or about the year 1848, experienced over a rather extensive area in the Township of South Norwich, County of Oxford. In that year or the year following many hundred acres of thriftily growing pine trees were suddenly invaded by the larvæ of a moth. The resinous, needle-like foliage was consumed by the caterpillars, which were about three-fourths of an inch in length, and plumed with a waving growth of cotton down. The said pine tree leafed out no more, and over several thousand acres there was soon a dreary sight of withering dead trees, a source of immense loss to individuals, and perhaps to the community.

A curious coincidence was spoken of at the time, as the newspapers of the day contained promiscuous statements that a similar unwelcome insect visitation had just overtaken large strips of the Black Forest region in Germany with similar destructive results, as was then feared and was verified in the sequel.

And now owners of forest lands in this Township of Burford are asserting that what are left of our ancient beech areas are showing signs of speedy death from natural causes, and are being swiftly removed for fuel purposes ere total loss results from rapid timber decay. And probably the thinning of the beech groves for their conversion into wheat fields was a main cause or factor in the extinction of the myriads of wild pigeons, which were up to the year 1874 such an interesting feature in Canadian ornithology.

Arborists of experience now assert that the elm and the maple and the native pine are the kinds of trees that evince the best power of adaptability to changed environment, to which test the white ash may be added as a vigorous grower and a producer of valuable timber material, and that this tree is quite tenacious of life after transplantation some of us have had convincing personal experience.

In our primitive forests in the Burford timbered region (as distinguished from the Burford plains), as also in Oxford County and Middlesex, instances of large-sized butternut trees were not infrequent. Hickory growths were not uncommon, and also, but more

rarely, the black walnut incidentally was found of large size. The usual abundance of the nuts of the beech, as well as those of the hickory and of the two or three varieties of the oak tree, furnished an ample supply of food for the wild pigeons, and also for the flocks of wild turkeys which roamed about our hardwood forests, and not infrequently visited our buckwheat and wheat stubble fields in the autumn; certainly up to the year 1851, and more sparsely up to the year 1854 or 1855.

Quite a number of our neighbors and of our acquaintances, after the work of forest destruction for clearing purposes had been somewhat satiated, became inspired with the taste for transplanting evergreens from the swamps. The white cedar proves hardy, also the native pine. But the truly national representative (*Abies Canadensis*) of the Abietian family proved very difficult of successful removal. The spruce (*Abies Nigra*) was found more sure of growth on removal to well drained situations, but proved to have a habit of sending its main roots near the surface of the soil, and after twenty or thirty years of flourishing growth, and perhaps in consequence of its tall habit, was invariably uprooted by wind storms of occasional severity, but some that were planted in groups around dwellings and home shrubberies, by the mutual protection of their numbers, still survive, and give pleasure to the eye by the contrast in form and tint of their foliage to that of the other members of the Coniferae, particular to the cedars, whose tints in winter time give forth bronze reflections towards the showy landscape, and next, perhaps, to the native pine (*J. Occidentalis*).

The cedar seems to have the greatest capability of flourishing on either wet or dry land.

The hankering for prophecy and foreknowledge is rebuked in the 53rd and 54th verses of St. Luke's Gospel, and perhaps in other places in Scripture, but without straining ourselves by standing everlastingly as it were on the tip toe of expectation, and without abating our habitual trustfulness "by possessing our souls in patience and to await what may betide," there can be but little imprudence in looking ahead, for is not the future, especially in our youth, a sort of terra (terror) incognita. Yet the sages teach us that Intellēct annuls Fate. "So far as a man thinks he is free." "Fate is a name for

those causes which have not passed under the power of thought. — *Emerson*. So, perhaps, to be forewarned is to be forearmed, and it is often seen to be prudent to take in sail ere you are caught and cuffed by the gale. In support of the theory that shocks and bumps are not the usual order of nature, see how gently changes displace and glide into each other.

"Thief-like step of liberal hours,
Thawing snow drift into flowers."

The passing winter seems to have been characterized by frequent and by very abrupt changes, some of which have formed interesting themes for comment and discussion, one side maintaining that nature works by gradual and recognizable methods, rather than by shocks, cataclysms or violence.

Yet the immense local snowfall of last December, succeeding to mild temperature, has hardly been previously experienced by the present generation, and the immense snow drifts had more the appearance of a three months' winter accumulation than of the fantastic work of one or two days and nights. This was a surprise to all.

"At the conjuror's," it has been printed, "we detect the hair by which he moves his puppet, but we have no eyes sharp enough to descry the thread that ties cause and effect."

Yet one event exudes from, or grows from or on the same stem as another event, and we read in the scientific papers that the light-house keepers on the Eastern Atlantic coast of the United States affirm that those violent and destructive atmospheric commotions known as northeasterly hurricanes invariably give ample and unmistakable notice of their coming, even to an unscientific observer, very many hours previous to their onset, and that no one studious of his own safety and interest need be taken by surprise by those violent agitations.

Cloudforms frequently denote what is "brewing" in the atmosphere that surrounds us. The big snowfall of the 4th December last was ushered or heralded some evenings previous to its advent by a dense "anvil-edged" cloud, that seemed to stretch clear across the southern horizon, at or just after sunset two or three evenings before the storm eventuated. Traditions of early Canadian settlers always associated the above mentioned appearance as a presage of

snowfall, and there really is usually an index to the coming hour, which, perhaps, to read properly, requires a delicate impressionability, or a habit of contemplation and watchful observance. Has it not become an adage that "coming events cast their shadows before"? and co-ordination and co-relation seem hackneyed scientific terms, and poets, the most ancient as well as some of the more modern ones, have had faith in Nature's prophecies. (See In Memoriam, Canto XCI.):

"Yea, tho' it spake and bared to view
A fact within the coming year,
And tho' the months, revolving near,
Should prove the phantom-warning true."

"They might not seem thy prophecies,
But spiritual-presentiments,
And such refraction of events
As often rises ere they rise."

Old Chaucer tells (See Canterbury Tales):

"That Destiny warneth all, and some
Of every of their adventures
By previsions or figures,
But it is warn'd too darkly."

i. e., the hints are writ in too colossal character to be read, except in a just and appropriate mental perspective.

Wordsworth avers, in the poem on "Presentiments," that

"God instructs the brute to scent
All changes of the element."

"Blest times when mystery is laid bare,
Truth shows a glorious face,
While on the isthmus which commands
The councils of both worlds she stands."

"Tis said that warnings ye dispense,
Emboldened by a keener sense,
. . . And teach us to beware."

Storm centers gyrate and cycles revolve, but to discover when one's energy or influence has run its course and another is advancing to replace the spent force perhaps requires more than mortal acumen; but many among us try to read Nature's riddles. In daily phenomena the "Idea," the "Concept," the "Fiat," the decree

seems to precede. There is the "Storm Centre," the often invisible (to the eye) "focus of energy."

To illustrate the practical phase which perhaps may be claimed for such fantasies, the following notes and jottings may seem pertinent:—

On Monday, the 19th of December last, we had extreme frost, a clouded sky with north-easterly winds, when some woodcutters accosted the writer of this with questions as to the purport of peculiarities in the changes of level of the water in a small frozen-over rivulet near to where the two men had been working all day. On chopping through the 3-inch thick ice the water was observed at first to sink or recede two or three inches, so the men asserted, but soon afterwards more than regained the normal level, and in an hour or two overflowed the ice to the depth of an inch or more and remained at the level. Probably this indicated changes and perturbation in the elasticity of the atmosphere, but there was no barometrical instrument near to consult. However, we in the course of the confab alluded to the traditional belief of farmers that a sudden rise in springs of water or of spring-fed rivulets invariably betokened storms to be near at hand.

In the present case in a few hours there was a big rise of temperature and distant thunder was said to be heard. On the 20th December my diary records southerly winds and a foggy atmosphere and a general thaw setting in. The thick ice on ponds and rivers moans and upheaves and cracks, probably in response to the removal or lessening of atmospheric pressure on the upper surface of the ice, and it is often brought to the notice of foresters that after a spell of severe frosty weather and before there are any prominent indications of change the boles of large trees may be heard to give out loud snapping sounds, many of them resembling the explosion of a pistol or air gun, and which they really represent. This phenomenon must have an electric cause, as there is no abatement of the frost and usually a clear evening sky with strong radiation in the crystal clear air. Decided weather changes almost invariably follow these sylvan sounds (explosive). This list of incidents might be extended.

"Eterne alternation
Now follows, now flits,"

"The journeying atoms,
Primordial wholes,
Firmly draw, firmly drive,
By their animate poles."

"Open innumerable doors the heaven where unveiled Allah pours.
The flood of truth, the flood of good, the seraphs' and the cherubs' food;
Seek not beyond the cottage wall, redeemers that can yield thee all."

—Translation from Saadi.

In the alleged premonitory sinking of the water level, and in the case of a warning fall of the barometer or thermometer like what occurred on Sunday, 8th of January last, in the morning of which day the mercury rapidly rose from about 10° to 31° , some thought a thaw was imminent, but the rise proved a sort of *ruse de guerre*, shall we say a deceptive move, and was abruptly succeeded by a drop to 5 degrees below zero, and the frigidity lasted three or four days, or sixty hours.

This fake reminds one of the French phrase, *Reculer pour mieux sauter*, a sort of concentration of energy for an antagonistic effort.

As when in meteorology a cold wave treads on the heels of a warm one (or vice versa), there is crowding of the molecules at "the ragged edge" of contact, and in bucolic weather lore an unseasonably fine day is thought to be unreliable and termed a "weather breeder." In meteorology there seem from time to time fresh attitudes or "moods" or new grouping of the ruling conditions. The rationale of this perhaps is that if the design can be perceived in one region of physics, analogy would tolerate the assumption through the whole purview and range of human thought.

Occasionally during some of the recurring cold spells of mid-winter these parts are visited by small parties or squads of aquatic birds, such as the grebes and the loons or divers.

The grebes occasionally alight among the ducks or geese of the farmer's barnyard. A few incidents of this kind came to our notice one very severe spell in the month of February several years ago. About sunrise one clear morning, when the temperature was about 23° below zero, a grebe alighted in one of our fields, seemingly exhausted by a long flight and famine. At the base of the bird's

beak, near the nostril's apertures, icicles had formed from the congelation of the breath consequent on the intensity of the cold.

These wanderers seemed to have been attempting to escape from the rigor of northern regions, and we soon after heard that one or two individuals of the species were seen a day or two before the above narrated occurrence to alight in a limited area of open water, just in the rear of the water-wheel of one of our local grist mills. The squads of web-footed migrants were moving in a direction from northwest to southeast. On one or two of these wayward wanderers alighting near, attempts were made to feed and restore and refresh them, but with little success, as they died in a few days, probably from inaccessibility to appropriate food.

A week or ten days ago a small flock of similar aquatic birds of passage were noticed flying over head past our homestead and taking a southeasterly course. There were seven or eight in number, and they seemed as large as geese, but in their flight had more resemblance to loons. Their migration was just preceding the advent of the late spell of arctic weather, which it was conjectured had compelled the bird movement to more genial latitudes.

A few of the February larks have lately been noticed about here, about bare spots in the fields and also on well-travelled highways. This species usually appear here after a few days' thaw, about the first week of February, yet the weather has been almost abnormally cold since the 28th or 29th of January, and last night, February 11th, there was a rather bright display of *Aurora Borealis* from 7 to 10 o'clock, and fainter through the night.

SOME MENTAL AND SOCIAL INHERITANCES.

Read before the Hamilton Association, 13th April, 1899.

BY DAVID BOYLÉ.

If the time is not yet quite passed when it is unnecessary to address some audiences in a semi-apologetic manner on subjects more or less intimately associated with the development theory, the time certainly *is* passed when one need have any fear that by so doing he is likely to bring upon himself the condemnation, or, to put it more mildly, the displeasure of those whom he addresses. Neither need he entertain a doubt when thus treating his subject that he is in a measure aiming away above his mark, for now that biological science is studied on the basis of evolution by everybody, or that everybody has, to some extent, become acquainted with this tendency of thought, the popular mind is in a condition of receptivity rather than of antagonism. As a matter of course I use the term "everybody" in a qualified sense, for it is undoubted that there are still those whose prejudices, or whose timidity, place them in an attitude of defiance, or of defence, to the theory in question, just as for a long time there were numerous worthy souls who declaimed against the theory of gravitation. On this occasion my "everybody" embraces the members of the Hamilton Association.

There can scarcely be a doubt that ever since the dawn of human reason, or, if this be too strong, ever since the observing faculties of man became worthy of the name, it was noted by some that this or the other person was marked by some quality or defect that characterized his father or his grandfather. Of a good runner it would be observed that his father was also one; and of a poor stone-thrower or bowman, that his son was no better. In primitive conditions of society it would be only along such lines that observations of this kind were made, because in these conditions man's attention was solely directed to the procuring of food.

With advanced conditions, mental traits would claim a share of

attention, but from the earliest times until our own day it has been impossible to adduce anything like philosophical reasons to account, not only for individual, but for racial peculiarities. Very glibly we could quote, "The fathers have eaten sour grapes and the children's teeth are set on edge," but the question always remained, why did the fathers eat the sour grapes in the first place?

This paper is written as an attempt to account in a measure for some human predilections by referring them to early conditions of society—to conditions that must have existed for many thousands of years, and which, notwithstanding the fact that for some hundreds of years such conditions have not existed, yet exhibit their persistency as a part of our being.

In a purely savage state it must needs be that the supply of food is both precarious and inconstant, and of savage people more than of any others it may be truly said, "They eat to live, and live to eat." In time they acquire tastes for various kinds of amusements and pastimes, but eating is the main business of life—it is not a means, it is an end—the end. It therefore behoves each member of the family, or of the tribe, to lose no opportunity of securing that which is necessary for the subsistence of himself and of his fellows. He runs his prey down, or he attacks it with missiles, or he shoots arrows at it, or he lays a trap for it, or he inveigles it into some place from which escape is impossible, but in any event his wit is always superior to brute faculties.

As population increases the supply of animal food diminishes, and man's mental resources are more largely drawn upon to circumvent the tactics of his prey, for the beasts themselves become more knowing.

Even when our suppositious savage is not actually engaged in hunting, he will not fail to avail himself of any chance that fortune may throw in his way to secure an animal. Even to him, habit has become second nature. He goes in chase sometimes merely for excitement; he kills because he loves to kill; hunting has become one of his pleasures. In other words, untold repetitions of such acts through many hundreds of generations have transmitted a tendency to slay the lower animals—a tendency which remains long after man has arrived at a stage of advancement when it is no longer necessary that he should kill at all, and we find accordingly a

betrayal of this tendency—of this murderous instinct—on the part of all and sundry, young and old, in civilized society.

The small boy delights in throwing stones at anything, or at nothing; it would appear that he *must* throw, and as he becomes less and less of a small boy he indulges himself with a catapult, a pea-shooter, a sling, a bow-and-arrow, a revolver, and at last a rifle. The hit-and-knock-down feeling is as strong in him as if it were a necessity of his existence.

Many older people gratify this predatory instinct in the pursuit of what they call *game*. Once, or oftener, a year, and with as much regularity as marks the course of nature in other respects, hard-headed business men become uneasy—they tell us they are getting “run down,” that they require “a whiff of country air,” “a smell of the pine woods,” and so on, and they are quite sincere, for the old-time instinct is simply re-asserting itself in this desire for a “run out-of-doors,” or “a spell in the bush,” but above all, in the case of the hunter, there is the desire to kill something. A deer is a prize, a bear is glory! So many brace of ducks or other game-fowl is something to boast about until next season—not that this kind of food is a necessity, but solely and simply on account of an indescribable pleasure experienced in the taking away of life!

In the not-long-ago when trans-continental travellers on the Pacific railways, in crossing the prairies, happened to see a buffalo within rifle range, shots were fired at the animal from the car windows to gratify a spirit of pure savagery, for there was no hope that should a buffalo be killed its carcase or its hide would reward the ah—the ah—the sportsman. Sportsman indeed! the savage rather, for what cared he though the poor brute should linger for days in agony before lying down to die?

Another class of so-called sportsmen to whom such opportunities are denied, indulge their manly tastes in the slaughter of pigeons released from traps, or they commit sad havoc among chipmunks, robins and other ferocious creatures that infest the woods near home.

In all ranks and conditions we find manifested the same spirit of slaughter, the same desire to inflict pain, and the same gratification consequent upon the practice of cruelty upon the brute creation. On no other theory than that of savage impulse does it seem possible

to account for the terrible atrocities inflicted by young people on the dumb beasts. With what ghoulish zest do they pluck the members of a fly! And how gleefully do they witness the contortions of the mutilated creature in its vain attempts at locomotion.

I knew a boy who once took a pair of callow Baltimore orioles from their beautiful nest, and, pinning them wing to wing, hung them across a branch, leaving them thus to perish while he stood by in gleeful admiration of the grief-stricken parents trying to entice the young ones back to their home. For this boy, at the time, I predicted nothing less than a termination of his career on the gallows, but he ultimately became a captain in the Salvation Army!

It is well for our race that with increasing years, that is to say, as we get beyond boyhood; that period of lifetime which is most pronouncedly savage, a change comes over the spirit that dictates such acts. But this not always. For the records of the police courts frequently bring to light many acts of almost incredible cruelty as inflicted by mature persons on children and on the lower animals. Such perpetrators are veritable savages, notwithstanding their existence among ourselves, and they should be made to feel the arguments of the law and of humanity, physically, for the simple reason that they are totally unable to understand what they owe to civilization by any other means.

Closely related to this phase of persistence in savagery is another inheritance affording pleasure of a low kind, namely, that which arises from the seeing of animals inflicting pain on one another, and this continues to afford enjoyment for a much longer period of the modern savage's life, and it is participated in by a vastly larger number of people. Hence cock-fights, dog-fights, bull-fights and man-fights, which are still ranked among the amusements of the populace.

If these things, or rather the desires which prompt them, are not savage inheritances, what are they? And that tens of thousands among us take a shocking delight in perusing accounts of how these things are done, is evident from the amount of space that is devoted to details in the columns of newspapers which regard themselves, and are regarded by us, as exponents of public opinion.

Games of chance are of religious origin, that is to say, they were at first employed for purposes of divination, but in course of

time as stakes were laid, or bets made on the possible results, the element of gambling found its way in, and there is no feature of primitive or savage life so universally prevalent as is this, and there is no inheritance from the long-ago which has clung to civilized men with more persistence than the spirit of gambling, which is neither more nor less than an unintelligent and wholly blind trust in luck, and it is notorious that among no class of people more than among confirmed gamblers is abject superstition so supreme, and superstition of every kind is an inheritance for which we have to thank our savage ancestry.

Games of skill may have originated as mimic combats in friendly guise. It would be difficult to name one which does not involve loss and defeat on the one hand with capture and victory on the other. They all appear to be modifications of old-time pugnacity—of the days when family feuds and tribal wars were maintained fully as much for the sake of gore and glory as for aggrandizement. Most of our popular games, whether indoor or outdoor, demand that something shall be hit, or some person or some place captured, and so persistent is the ancient idea of war involved in the playing of such games, that even in many of the quietest and most thoughtfully conducted ones, we speak of the pieces employed as "men," and as men whom it is a duty to "take" if possible.

In athletic sports, again, muscle is, of necessity, the chief prerequisite, and while it must be patent to everybody that although in these almost twentieth century days there is comparatively little need for the exercise of excessive brute force, we find many of our fellow-beings devoting their lives to the attainment of notoriety or of celebrity, as the case may be, in walking, running, wrestling and rowing, not for recreation or occasional diversion only, but as so-called "professionals," while those of us who for many reasons may be unable to practice such exercises ourselves, manifest a decidedly lively interest in the doings of these latter-day savages, even to the extent of betting heavy odds for or against a particular contestant, in this way laying ourselves alike open to the charge of exemplifying by inheritance an ancient savage predilection, for betting is but gambling, and all gambling operations are only the improved, refined, systemetized, *i. e.*, evolutionized forms of deity or fetish placation or cajolery, practised universally in the early days of human society, as I have already said.

We are too apt to consider the belief in luck, ghosts, fairies, witches, dreams, amulets, charms and premonitions as being entertained by ignorant people only. A very little inquiry will serve to dispel this too partial view. Superstition is apparently spiritualistic. It has been transmitted to us from a time when some reason had to be assigned for phenomena that were inexplicable on natural grounds, and it is really astonishing to what an extent it maintains its hold upon the minds of intelligent (or, shall I say, of otherwise intelligent?) people. The belief in dreams is, perhaps, most widely spread, and chiefly among women. Lucky and unlucky times and seasons influence the actions of many persons whom it would be a mistake to characterize as weak-minded, only in so far as this inheritance from savagery is concerned.

Powerfully occult influences have always been attributed by primitive man to the heavenly bodies, and especially so to the moon, and in this year of grace, one thousand eight hundred and ninety-nine, there are farmers all over the world who regulate their sowing and planting, their killing of cows and pigs, by her phases, just as their wives take these into account in the making of butter and in the weaning of their infants. Even the weather is popularly regarded as being regulated by Luna's influence, and so wise a man as Sir John Herschel actually prepared a tabular statement illustrative of his belief, but of course no possible use can be made of it by meteorologists of to-day. Sir John tried to square his acquired astronomical knowledge with his inherited tendency to the credulities of astrology.

One of the first indications given by the new-born infant that he is henceforth to be regarded as a member of society is the making of a noise, or as Shakespeare has it in *King Lear*:

"When we are born we cry, that we are come
To this great stage of fools,"

and elsewhere he says: "We came crying hither."

From this time forward it may be observed that noise of one kind or other, often merely for its own sake, enters largely into many of the relations and pursuits of life.

According to the theory on which this paper is based, the child exhibits much more of the savage than does the full-grown man, and

it may be said without a particle of exaggeration that *minus* noise a child is nowhere. So tacitly do parents recognize this as a fact, that they actually provide their children with the means of gratifying this propensity. Spoons, tin pans, drums and wind-instruments of "fearful and wonderful" construction occupy a place in every juvenile chorus. When a little more advanced in years the sweetest of music seems to have no charms for sturdy boyhood comparable to that produced by the rat-a-tat-tat of a stick drawn rapidly over the pickets of a fence or the bars of a window grating, the result being not unlike that from the favorite rattle of most primitive peoples.

To grown-up boys the production of loud and discordant sounds affords joy ineffable. I have listened with pleasure (not æsthetic, but scientific pleasure,) to a group of boys from ten to fourteen years of age, sitting on a pile of lumber during a summer evening, enjoying themselves to the full as they vied with each other in giving utterance to the most unearthly howls and yells.

During the periods of maturity and old age the noise producing proclivity is less noticeable only because it is more under control, for the exercise of thought is not calculated to encourage the making of unmeaning sounds, unless under emotional influences, when it can scarcely be held that the judgment is responsible. In connection with political triumphs, victories in war, celebrations, and popular rejoicings of every kind, nothing short of lusty cheers and the discharge of firearms seem to satisfy the average human being in his desire to testify gratification. On such occasions "three cheers and a tiger" indicate the highest attainable point of happiness.

In process of time we have harmonized the dissonant utterances of our ancient forefathers. We have formed a gamut of such notes as the voice is capable of producing. From the bow-string and the reed we have elaborated the piano and the organ, and just in so far as we are capable of appreciating refined vocal and instrumental utterances are we judged to possess musical culture, *i. e.*, are we reckoned to be above primitivism.

In the gentle rhythmical motion, or the rapid whirl of the "mazy dance," it is not difficult to guess shrewdly as to the sources.

When the original dance was not of a religious character it was either to anticipate or to celebrate victory in a fight, and in the civilized forms of this amusement, so far as the latter origin is con-

cerned, we observe evident traces of the advance, the attack, the capture and the retreat. We see the votaries of this art marching in single file round the room. They effect flank movements, they take ambush by devious routes, they seize their adversaries, they simulate a struggle, and eventually succeed in placing the captives (usually fair ones) in a place of safety. Single dances like Ghillie Callum and the jig may be interpreted with reference to recitals of individual prowess in presence of the foe, accompanied by expressions of contempt, and by ridicule of the enemy's valor.

Even in our more personal and domestic habits it seems easy to discover some intimate relations between ourselves and our far-removed forefathers. I may refer just by mere mention to the fondness of some for half-cooked or nearly raw meat, and to the not uncommon relish of others for animal food, especially fowl, in a condition that verges on what some would call putridity, but which is known to the *gourmets* as simply "gamey," and yet we shudder at the thought of a Sioux or of a Hottentot who regales himself on the decaying carcasses that fortune may throw in his way.

Again, many of us who think we can afford to pity those of such depraved taste, betray our own prehistorically acquired instincts in a manner scarcely less remarkable when we exhibit a fondness for rotten or rotting cheese. What a tit-bit is a lump of the rare old mitey article! And how appreciatively does the admirer of it smack his lips at what he calls its "nutty flavor!"

If I am not in error, vegetarians declaim respecting the use of flesh as food, not only because of what they declare to be its unfitness for this purpose, but on account of the cruelty and inhumanity that are involved in the necessary slaughter of the animals, which is equivalent to a declaration of these people's belief that the custom is a savage one, and yet one of the most highly prized vegetable preparations is thought to be edible only when it is far gone towards putrescence.

It is, indeed, not improbable that from the consumption of decayed, and consequently fermented vegetable substances, there has arisen in so many widely sundered portions of the world the desire to indulge in alcoholic intoxicants, although it is not always necessary that fermentation should take place, for the desired result sometimes follows from the consumption of a vegetable in its

original condition. In the northeastern part of Siberia there grows a somewhat rare mushroom, an average specimen of which, by means of an exceedingly peculiar and disgusting process, is capable of producing intoxication in all the members of a large family. Still, even in this case, it may be that the fungus is in a decayed state before it is eaten, so that it may be wrong to speak of it as being in its original or fresh condition.

Closely related to intoxicants are narcotics, and it would be hard to say which has claim to priority in use. Neither is it easy to divine why savages or any one else ever thought of such a ridiculous and apparently wholly unnatural process as that of smoking.

Perhaps they first chewed or snuffed the material, and the use of pipes may have been an after-thought for religious purposes, enabling the smoke to be whiffed as an offering to the cardinal points and to the sky. On any supposition the habit of smoking is purely a savage one; and although, so far as we are aware, our forebears knew of no such practice, it is amazing how kindly many of them took to the use of tobacco, quite as much so, indeed, as the Indian took to rum. In both cases it may have been that long dormant instincts were awakened. Who can say?

We all understand what is meant by savage finery, but do not we ourselves show some atavism in this respect? Do we not really enjoy a display of "fuss and feathers"? We do not pierce our noses and lips for rings, nor tattoo our faces, because it would be inconvenient so to do; but whenever a ring can be worn to advantage, whenever a chain of the precious metal can be displayed, wherever we can attach feathers, ribbons, tinsel or gew-gaws of any kind, we make the best possible use of our opportunities.

Members of the sterner sex may deny that there is any tendency on *their* part to go *very* far in this direction, but it would seem pretty plain that we are all, to a great extent, what are known as the "slaves of fashion;" that in this, as in so many other respects, we are "A' John Tamson's bairns," for if we but give the male portion of the community a chance to figure in the procession of some secret society, or in the ranks of a military display, at some high-class ball or levee, or in a grand civic demonstration, we find the "lords of creation" adorned in "full fig" with aprons, sashes, belts, gold lace, medals, badges and other regalia, in which they

strut about with fully as much consequence and pomposity as characterize the movements of an Indian chief when acting as Master of the Ceremonies at a big pow-wow on the prairie.

Even tattooing, to which exception has been made with respect to our faces, holds its ground to some extent, but chiefly among boys, sailors and lumbermen. Women seldom indulge this savage taste, probably owing chiefly to the fact that its consequences are too permanent. It admits of no compliance with changing fashion, so they prefer another not less savage, but more variable method, for the purpose of heightening their charms by means of color.

One of the pests, the manifestations of whose primitive predilections meet us almost at every turn, is the jack-knife sculptor, a modern savage who, in imitation of his ancient congener, makes his mark upon all available surfaces, as if either to remind himself on a future visit that he has "been there" before or to acquaint the other members of his tribe that he has travelled past this spot. He will even laboriously carve his initials or his "totem," which is often much more objectionable, in the hardest stone, and take his departure with the happy consciousness that he has performed a duty or fulfilled a mission, feeling at the same time perfectly ready to repeat the operation as opportunity presents itself. Other mediums sometimes take the place of the knife, but in any case the man who has inherited this low propensity is impelled by some means to indicate his presence, even to the spitting of tobacco juice on every painted or polished surface he passes by, and the whiter the surface the better is his object attained. He is a nineteenth century survival of the cave-man, and refrains from committing murder only because he has a wholesome regard for the terrors of the law.

The prevalence of crime is among the surest evidences of the savage strain which by its persistency continues to affect the life-blood of civilization. Only by an arousal of the baser passions can deeds of blood and plunder be perpetrated, and that these passions remain so capable of gaining complete mastery, goes to show in how many of us still rankle the aboriginal desires to waylay, to make war, to kill, and to increase our possessions by appropriating those of our neighbors.

In a very summary and imperfect manner I have thus touched upon a few of the social and mental qualities which, as they appear

to me, we have inherited from the long distant past ; but as we are all disposed to do some thinking on our own account, it is inevitable that we should disagree respecting one or more of the positions I have assumed. This, however, is a matter of small consequence ; the main point is that we do not fail to regard our highest moral, social, political, artistic and scientific achievements as intellectual developments which had their beginnings far away back in the stream of time, and these, too, chiefly in that most natural of all instincts, the instinct of self-preservation ; and we should value our acquirements the more and not the less on this account.

We esteem ripened fruit none the less because it retains well-marked evidences of the original bud from which it sprung, and we see no reason to despise an ingenious bit of mechanism on account of its production from crude materials.

That so many of our inherited proclivities bear such strong resemblances to savage ways is not only a proof of what is called the "Descent of Man," but they go to show how exceedingly brief has been his so-called civilized condition as compared with the endurance of his primeval state. The effect of habits practiced during a lifetime cannot be removed in a day, a month, or it may be a year ; neither need it be expected that all traces of customs and usages engendered and maintained during ages in a primitive state of society can be eradicated in the course of a few centuries in more advanced circumstances.

That the time will ever come in the history of our race when every tinge of the old life will be utterly removed is more than doubtful, even if it were desirable—indeed such a condition is inconceivable, for many of the supremest joys and pleasures of our being are inseparably connected with the gratification of tastes and desires engrafted upon our stock when hunting and fishing were necessities of individual, as warfare was of tribal, existence.

Our work is to modify, to refine, to elevate, to direct, and as may be found necessary for the common weal, to suppress old-time instincts.

In other words, civilization should be a process of natural growth—the result of small but steadily supplied increments to our knowledge, as a consequence of racial experiences.

REPORT OF THE GEOLOGICAL SECTION.

For the term ending May, 1899.

The Section submits with pleasure this, their annual report, feeling that a steady onward march has been maintained during the past year.

Although the Section cannot announce many new discoveries in this vicinity since our last report, yet it can assure the Association that substantial progress has been made in the collection of specimens, some of which reveal varieties of well-known species, exhibiting peculiarities which might lead the novice to believe that he had discovered a new species, and for which he would, as in duty bound, proceed to add another name to the already over-stocked nomenclature of the family.

Col. C. C. Grant, our indefatigable collector, sent to the late Dr. James Hall, State Geologist for New York, prior to his death, a collection of fossils. Among them was a *Lingula lamellata*, on which Dr. J. Hall discovered the fossilized ova adhering to the shell in precisely the same place as the ovum is deposited by the modern *Lingula*, thereby proving that through the countless ages this species has preserved not only the shape, color and habits of its palaeozoic ancestors, but also the same mode of propagating its species. The specimen was obtained from the Clinton formation here.

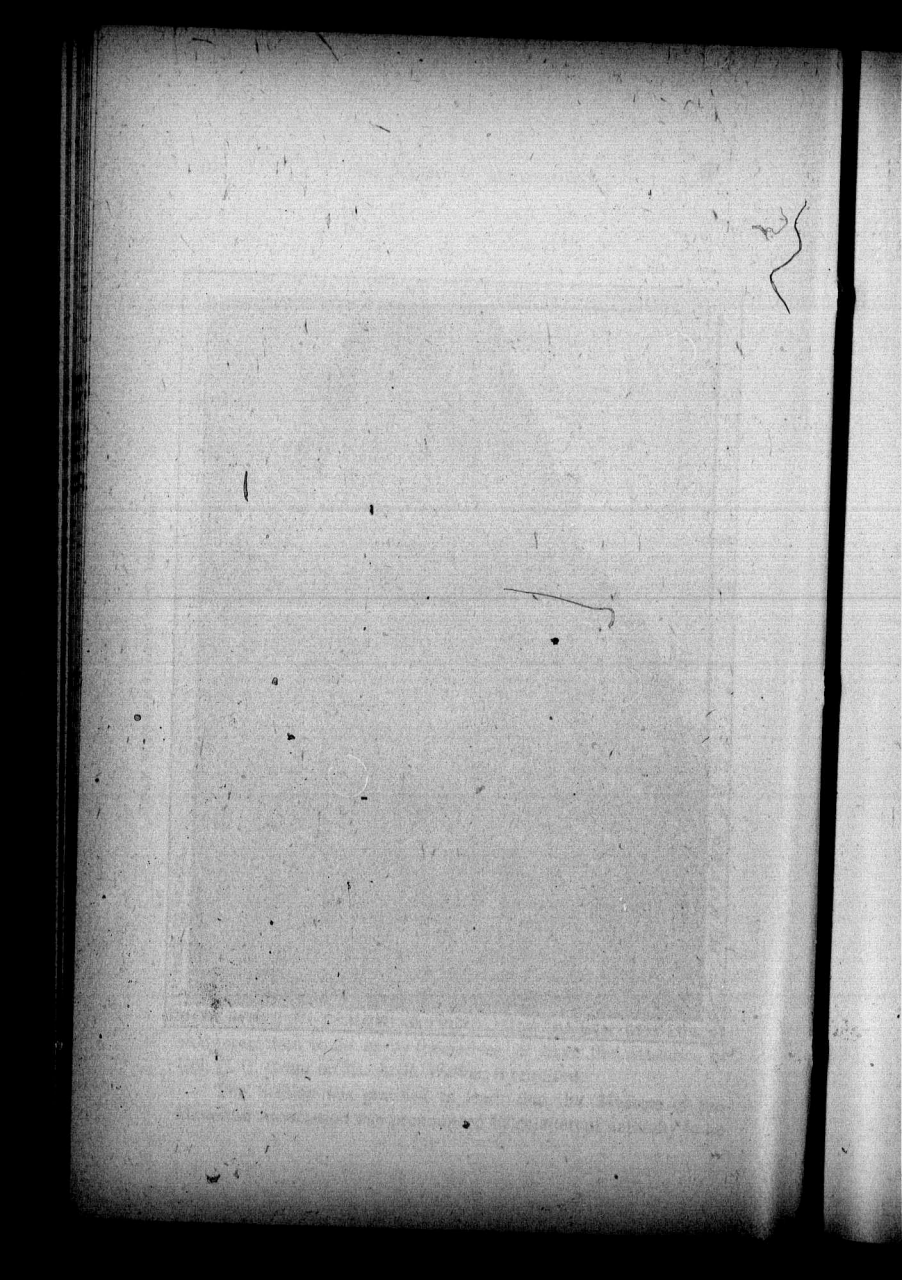
During the year many new specimens have been added to the Museum. The crowded condition of the cases does not afford any opportunity to display the newly acquired fossils to advantage.

During the year the Museum has been kept open to the public on Saturday afternoons, so that any persons desiring to avail themselves of the use of specimens in the Museum for comparison or study were free to do so by themselves, or have the assistance of Col. C. C. Grant or Mr. A. E. Walker, if required.

The Section was gratified to learn that the Museum of the Hamilton Association was pronounced by competent authority to be



ROCK EXPOSURE AT HIGH LEVEL RESERVOIR.



superior to anything of like nature in the Queen City of Toronto. When we consider that it is the result of volunteer effort by the lovers of natural history, it is all the more gratifying.

The Section hopes that ere long the necessary accommodation for the proper display of so important a collection will soon come. It is no doubt a reflection upon the citizens of Hamilton, who have so long neglected to evince any interest in a society which has labored so arduously to disseminate a knowledge of the natural history sciences, to which subjects the schools of to-day are directing their special attention.

Papers were read at all the meetings of the Section, three on geological topics and two on malacology. The latter were illustrated by specimens from the excellent collection of shells placed in the Museum by Mrs. Carey, also from the collection of Col. C. C. Grant.

Following are the dates of the meetings and the subjects of the papers read :

Nov. 25, 1898—Palæontological and Geological Notes of Winona and Grimsby, by Col. C. C. Grant.

Dec. 30, 1898—Palæontological and Geological Notes, by Col. C. C. Grant.

Feb. 4, 1899—Palæontological and Geological Notes, by Col. C. C. Grant.

March 31, 1899—Malacology.

April 28, 1899—Malacology.

All of which is respectfully submitted.

A. E. WALKER,

Chairman.

A. T. NEILL,

Secretary.

GEOLOGICAL NOTES.

Read at the opening meeting of the Geological Section, November 25th, 1898.

BY COL. C. C. GRANT.

Although it has been usual at our opening meeting in preceding years to bring to the notice of its members any fresh matter regarding the field geology of the district, I have, however, been requested to defer calling attention for a little while yet, for certain reasons, to this subject. The suppression of the matter is only temporary. The silence is enjoined on the writer's part for a brief period, until necessary arrangements are completed. (The foregoing refers to a recent discovery here of Bog Iron Ore.)

A few years ago a small pond (dry in autumn) was deepened and cleared out for the purpose of holding a sufficient supply of water for the cattle on the farm. In the muddy material thrown aside from the excavation were a few large boulders seemingly, which, on closer examination, proved to be Bog Iron.

From the limited extent of the swampy portion of the field the writer considered it was very doubtful if the deposit could ever be turned to profitable account.

The adjoining land has been cultivated for some time, and the natural depressions on the surface, partly filled in, he was unable to form a clear idea of the original extension of the swamp now drained. Near a slight surface depression a considerable heap of apparently Northern boulders—relics of the great Ice Age—had been noticed years ago. Only recently this heap, on closer examination, proved to be Iron Ore, which had been evidently mistaken for erratic rocks and placed there, as is customary here. About two cart loads of the material is now exposed. A more extensive chain of boggy land has been remarked in a forest adjoining. No doubt this contains the mineral also, yet this cannot be positively stated without its being tested. So we may be content to state there are undoubted indications of Bog Iron existing near Hamilton, close to a good stone road and railway.

I find in the Journal of Proceedings for 1882-83 a paper by a member of the Association, A. T. Freed, on Iron and Steel, in which he alludes to the forges established by the French in Quebec at Three Rivers. Bog iron was used in the foundry at the St. Maurice Forges for a century nearly. In a report to Parliament in March, 1879, he finds it stated: "St. Maurice's Forges, owned by F. McDougall & Sons, Three Rivers; using Bog ore; making a very fine iron with charcoal fuel."

At one period after its discovery about 250 men were employed, and large quantities of pig and bar iron were exported. Almost all the iron axes (or tomahawks) found either in Indian ossuaries or on the surface of ploughed fields in this Province were made at the St. Maurice Forges. The trade mark, you may notice, is a cross within a circle. Mr. Freed mentions when Franquet visited the foundry and forges in 1752, in accordance with instructions from the Intendant of New France (Bigot), the workmen, 180, were employed in stove moulding, and the iron was preferred to the Spanish ore.

WINONA AND GRIMSBY.

During the past summer a shorter time than usual was spent in collecting along the lake shore and at Grimsby. The residences at "the Park" were vacated at an earlier period than was expected. The Cambro-Silurian Shingle on the Beach presented a few fossils (undescribed as yet probably), and others recently found in Canada, but known previously as occurring in Ohio, U. S. A., described and figured in the States Geology by the late Dr. James Hall. One of the best preserved specimens of an "Orthodesma" I have seen was recently obtained by Mr. Bartlett, at Winona, who paid it a visit since I left the camp. The most interesting fossil obtained by the writer then was a large Patelloid shell, bearing a resemblance to a Crania. It is not Phosphates, so can hardly come under the Discinæ. It may perhaps belong to the Order *Atrémata* (Beecher) Super family, *Obolacea* (Schuchert). I have never seen anything like it figured. A small portion of the shell is concealed by the matrix, but the shape of the Valva can be readily distinguished and the ornamentation is well defined. Few Cambro-Silurian fossils from Lake Ontario's southern shore at Winona are in better preservation. As a general rule they are difficult to extract there. In the upper

case containing characteristic organic remains from lower Silurian drift, etc., I placed valves of a large *Modiolopsis*. On comparing it with "M. gesnere" Billings (which I thought it might be), it was found to differ in some small matters, and on comparing it with others I found the divergence still wider. It may be a new species, or at least new to Canada. An *Orthoceras*, or rather a fragment of one, was discovered also at Winona, which, if not new, must be very rare in the lake shore drift. In Dr. Nicholson's work, "Palæontology in Ontario," he informs his readers that he recognized "the *Endoceras* of Hall" by the cross striation of the shell. That is not characteristic solely of the Cephalopod. The Winona one is marked in the same way, but the striæ are closer. *Orthoceras Jamesi* is similarly ornamented.

A specimen of *Bucania* (*Bellerophon*) *expansa* Hall (Trenton) was found and placed in the Museum. This lower Silurian Gasteropod is very rare in our local drift between Hamilton and Grimsby. The greater part of the shingle along the lake shore was derived from the Upper Hudson River (Bala) beds; this may account for it. Also a wedge-shaped valve of a Lamellibranch (*Lyrodesma* post-striata), probably, the posterior striation not well displayed, so one cannot be positive regarding it. A "*Cypricardites*" (*Lyn. Cyrtodonto*) nearly allied, if not identical, with one described by Billings as occurring in Hudson River beds and in Anticosti, was also obtained, but in poor preservation. Indeed it was difficult to extract any limestone fossils at all at Winona, and I had to regret seeing two or more fine specimens, new to me, coming from the matrix as mere fragments, impossible to restore for description. One, an *Orthoceras*, closely reticulated, had a fragment of the shell adhering to the septæ.

BELLEROPHON EXPANSUS.

This well marked keeled Gasteropod (whose name, Miller states, was pre-occupied by Sowerby) seems rare in the drift of Ontario, and is not named as occurring in "The Trenton" or "Hudson River" rock series of the Province, by Nicholson. Another member of this family group which, perhaps, may be the *Bellerophon bilobata* of Sowerby, was found at Winona. (Without the originals for comparison, it would be rash positively to name specimens solely from description.)

Well preserved organic remains were discovered in some large flags, colored brownish purple, probably Trenton. This band is very fossiliferous, contains a very fine *Cyrtodonto*, resembling *C. Hindi* (Billings), which I failed to extract. The beak and part of the hinge line were concealed, so one could only judge from its general appearance. It would be well to ascertain the occurrence of the bed in situ, for I think it holds two or more fossils which appear to be "new species," in addition to many others rare in the drift here.

GRIMSBY, NIAGARA BEDS AND UPPER CLINTONS.

Before the writer refers to this locality, it may be necessary to state that he understands in some quarters remarks have been made regarding the possibility of a mistake having occurred regarding the horizon of the Fucoids in the now abandoned Gibson Quarries. There cannot be the slightest doubt in this matter, however unlike in mineral composition. In the Upper Clinton beds of Hamilton and Grimsby the strata are identical as regards the position of the rocks. The white and mottled sandstones at the latter occupy similar places to the Hamilton Upper Green and Leon Bands. It is also erroneous to suppose the Lower Clintons are not to be found at Grimsby. They are merely partly concealed measures there. The writer noted their occurrence in the ravine at several places, and also the Medina freestone and the capping Grey Band, from which he extracted the Gasteropod now in the Geological Survey Office, Ottawa. "It is probably a species of *Halopea*," remarks Prof. Whiteaves.

Very few fossiliferous slabs were displaced since last year, but many well preserved Fucoids and Niagara Shale Polyzoa were obtained by searching in the debris of the old workings. In a Pentamerus layer there, the writer noticed, on splitting it, quite a number of casts, which he considered represented a young stage of growth of the *Pentamerus oblongus* (Sowerby), if they did not represent dwarfed degenerate descendants of that Brachiopod. I have since discovered the shell has been figured and described as a variety from the Niagaras, Iowa, U. S. A., as *Pentamerus subrectus*.

In a letter received from the late Dr. James Hall, just a little before his death, after his return from "the Urals," in Russia, in acknowledging the receipt of a communication relative to finding

the Furoid (*Arthropycus*) in the Clinton beds at Grimsby and Hamilton, he states: "You have discovered for the plant a new "horizon. Now I want you, if possible, to get a photograph or "photographs of the Grimsby rocks referred to in your letter for me, "it would be more satisfactory." I furnished Dr. Hall with a few very fine slabs, one presenting on the surface the small *Arthropycus*, which, if not a new species, as the writer thinks, may be looked upon as a variety at least. They occur in distinct beds. This seems important.

THE HAMILTON NIAGARAS.

The local limestones lately presented quite unexpectedly some organic remains whose occurrence may well be recorded in our Proceedings, and which were revealed accidentally under the following circumstances: It was found necessary to break up these beds (used chiefly for building purposes) into small blocks for the city stone crusher. Although usually broken across, they are at times split along the line of bedding. It so happened the *Pentamerus* layer was so treated lately, and the quarryman remarked a very well preserved *Dictyonema* made its appearance on one part which was opened out by the sledge. He was not aware that the other portion had a like impression. I am inclined to think that none of the seven graptolites noted by the writer as occurring in the base of the Niagaras (the old Clinton limestones of Hall) belonged to the *Dictyonemas*, and this was the only one ever noticed in this layer.

In a few days after, on looking over a heap of broken flags prepared for the crusher, I noticed the slab from the same bed with the coral on an inner surface, and the one containing quite a number of rather obscure impressions, to which I called attention formerly. Hinge lines and muscular impressions seem wanting, if they should prove to be valves of a Mollusc.

The *Stricklandinia* bed is the second one below the thick limestone. The "Nigger Head," the intermediate layers between this and the base bed, are known to us as "the barren Niagaras" here. True, they were considered unfossiliferous, but they held the gigantic Cephalopod alluded to by Dr. Spencer, F. G. S. And recently a very large valve of a *Stricklandinia* (a new species or

variety probably) was found by a quarryman, while the writer secured a fragment of a still larger "Conularia" than the specimen described and figured in "The Niagara Fossils" of Dr. Spencer. The writer regrets at best it can be looked upon as merely a portion representing the existence of a great free-floating Pteropod still earlier than the time "the Chert beds" were deposited in the Silurian Sea. When I mentioned the discovery of the large well-preserved *Stricklandinia* in the city quarry recently, I stated it reminded me of a specimen in rather indifferent preservation from the adjacent Hancock Quarry. The fossil was not found in situ at the time, so perhaps I erroneously concluded it represented an extremely aged member of the family from the regular *Stricklandinia* limestone layer. On describing the *Brachiopod* to our Chairman, Mr. A. E. Walker, I ascertained he presented to Dr. James Hall, on one of his visits to Hamilton, a *Stricklandinia* also obtained under conditions similar to mine. He noticed the dimensions of the shell were considerably in excess of any he had extracted from the true *Stricklandinia* bed. On reference to Prof. Schuchert's able and interesting work on "The Fossil Brachiopoda, America," I find Hall and Cluke named one from Hamilton, Ont., *Stricklandinia Chapmani*. As we have not seen it figured or described, it is impossible to say whether this is the very large species or another one. The shell described by the above Palæontologists may be added any day to the latest published list in our Proceedings.

The *Pentamerus* bed holds, in addition to the fossils already mentioned, two distinct *Fucoids*, perhaps more. A third one seems rather doubtful. I think in a former paper it was stated the under surface of the layer resting on the upper green Clinton shale presented the appearance of blackened and crushed impressions of a plant, which rarely displays a grooved cylindrical surface. It does not branch like *Buthotrephis*, neither does it produce a tuft of branches like the *Licrophycus* of Billings. It is difficult to extract a tolerably well preserved specimen in a portable form, owing to the matrix. The writer remarked it may be found also on splitting the block in the interior, and he found such was the case. The flattened stalk was found in several instances. It has lost the bitumenous coloring inside, only possessing a stain-like impression, differing from the remainder of the surroundings. But in two or more cases a

green color, indicating iron (in solution probably), mineralized the plant. The greenish matter is not unusual in similar organic remains in the Niagara Chert beds, as you may see in the *Fucoids* here produced. It is so in the Clinton Iron Band also. While a few we possess were admired for their state of preservation by the late Drs. J. Hall and Newberry, they expressed regret that some of the plants described as discovered here had not been retained for our own Museum. For several years the writer has visited, during the collecting season, places where their occurrence had been noted previously; but merely a few were obtainable. The Medina Grey Band, east of the city, has been worked out as a paying quarry. Even the one near the Hamilton main reservoir, which held seven or eight distinct *Fucoids* in former times, for years has been abandoned. So we may conclude there is little chance of replacing the plants, etc., of the series which were sent from here formerly.

By examining the heaps of rubbish of the series left by the stone cutters, only a few well-known specimens were found, and nothing new turned up. An imperfect fragment of one of the branching cylindrical *Fucoids* mentioned by Dana as occurring in the States, is here represented also. The thread-like form which came under his observation may have been passed unnoticed, but an intermediate is certainly represented in the grey band of Hamilton, which probably has not been described or figured as yet. A small bushy plant was remarked some years since on a slab which had been exposed to weathering for some time before its removal from other, and was afterwards carried away for building purposes. Unfortunately some boys were looking on and saw me put it aside. On returning to extract it with the chisel the following day, I found the young rascals had in the meantime been up to mischief, as usual, and had completely destroyed the specimen, the only one of the kind I ever saw. We have quite a number of *Fucoids* about Hamilton which I think have never been described or figured. It is to be regretted this class of organic remains has been greatly neglected. One can merely form an opinion on it from outward general appearance. Many *Fucoids* have been forwarded from this to various Museums, but I doubt whether any Palaeontologist has described a single specimen yet, except a very fine one from the

Barton water-lime beds, near the Albion mills, now in the Redpath Museum, Montreal, figured and described by Sir W. Dawson.

Many of the *Fucoids* sent away from Hamilton formerly probably cannot be duplicated now.

THE CLINTON SERIES.

Although these beds presented nothing new recently in consequence of the non-removal of the shales since the freestone grey band was worked out, some interesting slabs, loosened by weathering, fell from the rock cutting off the escarpment in rear of the upper reservoir lately. One, a very large flag from the Iron Band, when split revealed an extraordinary number of impressions of single valves of the blue *Lingula*, *L. Clintoni* (*Vanuxem*) to *L. Oblonga*, *Conrad*. There can be little doubt but they represent an assemblage of dead shells, washed up at a time when the Clintons there were slowly undergoing submergence. The ridged-up wave mark of the shallow sea, plainly to be recognized in the layer, is sufficient evidence in proof, where it can be clearly shown that the succeeding upper green band of the Clintons also, which was deposited above it, displays even more pronounced and better examples of wave and ripple marks.

The Museum possesses a very fine slab from the grey band, Medina, displaying this characteristic impression, but we ought to have a larger and better Clinton flag also to show our visitors than the small specimen now in our case.

One may, however, hesitate to place it, even if obtainable, among many of the loose specimens now in our collection, which have been seriously injured by frequent removals from their places. We do not realize, unfortunately, that fossils require as careful handling as the botanist displays in the preservation of his plants. A chip or two knocked from a stone, or a few scratches perhaps added, may appear to be of little consequence in the eyes of men unable to comprehend the importance attached to the preservation of the cup-shaped summit of a coral, for instance, or the apex of a shell. Yet such seemingly small matters lead to correct classification.

The Clinton Iron Band at the upper reservoir here enables us to add *Lingula acutirostra* (Hall) to the list of Hamilton, Ontario,

fossils. It was noticed as occurring also in the upper green band of the series below the Mountain View Hotel formerly, but was not recorded. Independent of the sharp beak which points to a distinct species, as claimed by the United States Palæontologist, it appears to have been colored a deeper blue than *Lingula Clintoni* (*Vanuxem*). I do not think we have yet discovered the true horizon of either this *Brachiopod* or *Lingula glossina perovata*; they are so rare that probably we may infer they were placed accidentally among other species common in the Clinton iron band.

Completely debarred for many years for examining the most interesting portion of the series, viz., the bluff beyond the reservoir, by the action of the Grand Trunk Railway unfortunately, we are unable to procure for the Museum cases any of the rare organic remains, viz., Silurian star fish and colored shells, obtainable there. It has been stated that recently some of our members have not been interfered with while going along or crossing the railway track, so they concluded the rule regarding trespass on the part of naturalists is not now rigidly enforced. It may be so. Speaking personally, I am not at all likely to ascertain if such is the case, since I hold it derogatory in a Naturalist to accept as a favor individually what may be denied to others with similar claims to consideration. In marked contrast to the action of this Company, permit me to state I have been informed at the office of the T., H. & B. Railway that we may freely pursue our researches along that line without hindrance. I doubt if some of our city "dailies," which so bitterly denounced this "Yankee concern" in the interest of its rivals formerly, can now perceive what Company is entitled to thanks on our part for disinterested liberality.

In a Clinton layer, which apparently contained hitherto only *Heliopora fragilis* and *Rhynchonella neglecta*, I was surprised to find recently two new graptolites and numerous Bryozoons resembling *Retepora angulata* in different stages of growth. One of the graptolites was badly broken in extracting it; the other, a young species, was forwarded to the Geological Survey Office, Ottawa, and another from a lower green band of the series. From the latter also I extracted an indifferently preserved large *Lamellibranch*, too imperfect for description in this instance, but placed in the case until such time as a better may be had. In *The Natural History, New*

York, vol. 7, "Palæontology," by James Hall (received from the author some years ago), one sees figured groups of isolated annelid tubes cemented together (*Tentaculites*) and attached usually to other organisms of the Hudson River rocks. It may not be generally known this may be noticed here also. The groups of three cemented tubes are of frequent occurrence on the face of a large red Clinton flag, and also on a green one; but in no instance were they found attached to foreign bodies. It could not have been for want of material, for both flag contain very numerous specimens of *Orthis* (*Rhipedomella*) *Circulus* (Hall), as also a few of *Leptæna* (*Strophomena* *Rhomboidalis*). It appears strange that the *Tentaculites* of the Clinton here are never discovered cemented to shells or corals. A fine slab containing several characteristic fossils of the rock series was recently placed in an upper case of the Museum, but at best our local collection is sadly deficient, and rare fossils poorly represented, in a great measure owing to the limited extent of the exposure near the city, its abandoned quarries, and the action of the Grand Trunk Railway authorities in prohibiting researches along the track. It must be admitted also that large numbers were sent away from Hamilton before the Museum was finally established. The grass has long since grown over the heaps of shale, removed by the quarrymen to get at the Medina sandstone beds. They were particularly rich in lower Clinton remains, especially after heavy rains.

The discovery of the long curved coral, resembling *Zaphrentis* so low down in the Niagaras, reminds me of the well preserved specimens of *Halysites Catenulatus* (Linn) which I obtained formerly from the long since abandoned quarry, near the reservoir, in a mass of Clinton shale. On mentioning the matter to Mr. A. E. Walker, he informed me he also had secured a specimen of that coral, together with others (*Favosites*) from shales removed by quarry men when uncovering the Medina freestone. His description exactly agreed with the ones found by the writer. The individual corallites were smaller, the meshes of the network differing also somewhat from the coral so abundant in the limestones (*Niagara*) of Anticosti and Ontario. It appeared to be dwarfed by uncongenial surroundings; nothing else but a mere variety. One thing we learn from it, to which the writer already called attention, viz., that Silurian corals could exist and flourish under conditions which would be fatal to our modern reef-builders.

On referring to Dr. Nicholson's "Palæontology of Ontario," the chain pore coral is not recorded as having come under observation except in Niagara limestones. We may therefore add it to the Clinton organisms recently given as Hamilton, Ontario, fossils. We have much to learn yet regarding the Palæontology of the district, and the following fact is well calculated to stimulate further research: In a late communication from the able Palæontologist of the Dominion Geological Survey, in acknowledging the receipt of a small collection of fossils from Hamilton, he mentions it would be desirable to secure for the National Survey office a specimen of a *Cephalopod*, now in the British Museum, named *Trocholites Planorbiformis*, said to be obtained from Trenton (*Conrad*) limestones at Montmorenci, and three were obtained, adds Prof. Whiteaves, from near Grimsby, Ont., by a gentleman from Philadelphia, Mr. Ashmead. The professor indicates the drift on the lake shore at Winona and Grimsby as likely to furnish the specimens required. I think, from the description given, we may safely place it with other drift fossils found here.

During the past summer, while at Winona, on breaking up an exceedingly hard limestone flag, I discovered a few Trenton fossils inside, together with what I then supposed to be a crushed *Pleurotomaria*, which I failed to extract. The receipt of Prof. Whiteaves' communication leads me to recall a Barton *Cephalopod*, *Trochoceras Desplainense* (M. Chesney), now in the Redpath Museum at Montreal. Probably it bore a nearer resemblance to that than to the *Gasteropods*. The hoop-like form is preserved or indicated in both names—*Trocholites* and *Trochoceras*. The imperfect state of preservation may at least be accountable to some extent for the erroneous view at one time entertained. However, I feel satisfied that this, as well as other rare Cambro-silurian fossils, may be yet extracted from the lake shore shingle at Winona and Grimsby, while many of the upper Hudson River ones there, already known, may be found in better preservation than in the portions of the Ancient Lake Iroquois Beach, which recent improvements have placed already beyond the pale of investigation. Yearly we find the field contracted, but outside the city itself there remains to us still a wide extent of country opened up to us by the kind and considerate act of the T., H. & B. Railway authorities. To a certain extent it may be looked upon as

new hunting ground, and we may expect to find that the rock cutting on the line may throw a little light on the eastward extension of our local chert beds, a matter unknown hitherto. Independent of this, we need not feel surprised at discovering in the Niagara shales Crinoids, Star Fishes, Bryozoans, etc, such as occur at Grimsby.

While I was stopping at Winona Park during the past summer, a farmer in the neighborhood requested me to come and see a curious looking sandstone flag which had been brought from the Mountain (the escarpment) beyond. The specimen in question, on examination, proved to be a remarkably fine *Arthropycus*, clearly proving that the Grimsby plant of the upper Clinton beds existed there also, five miles off to the west. No doubt the small *Arthropycus* is represented also. The writer, in forwarding both specimens to the late Dr. Jas. Hall, of Albany, thought the latter was a distinctive species, or it may be a variety. The doctor's fatal illness occurring soon after the transmission of the parcel probably prevented him from corresponding on the subject. That the box containing the *Fucoids*, with other Hamilton fossils, was duly received, is assured.

OUR LOCAL CHERT BEDS

may not be the best material for road metal; they are, however, almost universally known here as our Macadamizing Niagara beds, inferior to the limestones for this purpose. Where the shales or, in plain terms, the hardened compressed mud has been honestly rejected, they are equal in resistance to pressure to some of the lake gravel sometimes used for the same purpose. On examining several places at the Beach and along the lake shore, I ascertained in many instances that the rounded material was chiefly shale, not derived from limestone pebbles or travelled boulders, as may be supposed. In other places it appeared to be a very fair road metal, inferior no doubt to such as can be obtained from granites, greenstones, etc., found elsewhere, but not to be rejected because such rocks are only found here scattered far apart, the travelled relics of the great Ice Age, which would cost a considerable amount to our City Fathers for conveyance, even if the farmers afforded assistance regarding their removal for city purposes.

However, the writer is more concerned in the Palæontology of the chert beds of the district, and undoubtedly they are exceedingly rich in silurian organic remains, some of which are remarkably well preserved, especially the phosphate shells, Graptolites and Hexactinellid sponges. To the chert in solution which encased them in some cases they owe their preservation. But on the other hand it too often fills in the poriferous surface of the latter, as also the cell mouths of the *Bryozoons*, thereby rendering it impossible to correctly classify the *Fenestellidæ* for example, in accordance with the recent sub-division of the family made by Palæontologists, who chiefly confined investigation to this particular class of fossils.

As regards the general appearance, the Niagara chert *Fenestellidæ* seems more perfect than any the writer has seen figured as yet, the fan-like forms proceeding from a single stock. The cup-shaped ones, like *Fenestella Acmea* (Hall), are well represented. All but the latter are, however, valueless for description in consequence of the concealment of the cell aperture. The *Fenestella Acmea* is rather rare with us, but from its peculiar appearance it cannot be easily mistaken for any other member of the family. The same shape at a like horizon has, however, been remarked in a *Lichenalea*, quite a distinct Bryozoon, perhaps undescribed. It may be a fragment only has been figured, and as such would hardly be recognized from the imperfect specimens under examination. The writer may, perhaps, take an unjustifiable liberty in calling your attention to the subdivision of these Palæozoic Bryozoons by Prof. Simpson, the best living authority on our *sea mosses* or mermaids' laces. I underscore this, for on a previous occasion I was credited quite erroneously through a printer's mistake with the discovery of a "sea moose," which led to some few sarcastic congratulations on the part of enquirers, and probably some unparliamentary language, which could scarcely escape censure by the parsons if introduced here.

A portion of the field near the corporation drain (the chief locality for glaciated chert fossils) was ploughed up in autumn and was expected to produce some rare specimens, only found as yet in these beds here. The *Cranidæ* family, from its great antiquity, is of considerable interest, independent of the Crania, possessing the singular property of adapting itself to the object to which it is cemented. Dr. James Hall has figured and described some so

attached from the States. In our local chert beds the flattened lower valve is almost unknown, indeed the writer can only recall one instance where both valves put in an appearance. The ornamentation of the upper (Dorsal) one is usually well preserved, the general features of the species showing no distortion. One looks in vain for indications of attachment to foreign bodies. This holds good also regarding the *Cornulites* and *Tentaculites* of the upper part of the chert or glaciated beds. I can quite understand the possibility of the decay of the objects to which they had been probably attached. Yet the writer is disposed to believe it was not so in very many instances under observation. Although but a short time occurred for collecting fossils from the part of the field adjoining the drain, the Section will find, notwithstanding past researches, the flint flake hunting ground continues unexhausted still, and may well repay a visit in spring, even under unfavorable circumstances. I collected then the greater part of the specimens now produced. A few are new species, probably; others rare or unrecorded as Canadian fossils. You will find among the lot the fragment of an *Orthoceras* retaining the cross striation similar to Hall's *O. Proteiforme*, and corresponding nearly, if not completely, with the description given of *Orthoceras Jamesi* from the Clintons of Ohio (Hall and Whitefield). In the absence of the original *Cephalopod* for comparison, Palæontologists may overlook the minor differences which amateurs are unable to detect, who unfortunately possess little scientific training. Professionals, too, frequently are mistaken, and perhaps we find it harder also to acknowledge mistakes. "Palæontology and Geology are alike progressive," was the remark made to the writer by the late Dr. James Hall, of Albany, "And while you regret your disadvantages as regards the scientific training of a geologist, such was my own case."

Some fine specimens of Hall's *Cladopora* were also found in the old hunting ground, near the corporation drain. One may notice considerable difference of opinion among Palæontologists regarding this family and the *Monticulipora* group. Millar places both among the *Favositidae*. Nicholson, in "The Palæontology of Ontario," seems inclined to classify the only two species of *Cladopora* he found under the same head; but in the list of fossils of the Province he implies doubt regarding the correctness of the classification.

Professor G. B. Simpson, who made the *Bryozoa* a special study, and who is considered the best authority on that class, includes one or more species of *Monticulipora*, adding, however, "Although in this work they have been placed with the *Bryozoa*, undoubtedly further study and investigation will show that some of the forms at least must be associated with the corals." Lindstrom, Rominger, and other Palæontologists favor classification with the *Palyzoa*, the former pointing out that certain of the *Monticuliperoids* pass through early stages of development of a distinctly *Bryozoan* type. But he may be mistaken, remarks Simpson, for reasons he assigns which we need not follow. It seems clear enough the matter remains unsettled, but it may remind us of what Billings asserted many years ago, viz., that many early organisms appear to have combined in themselves quite distinct features. The writer cannot find in any of the works he consulted the occurrence recorded in *Canadian Niagaras* of two *Gasteropods* recently obtained from the glaciated chert beds, viz., *Platyceras (Acroculea) Niagarensis*—Hall (which has been determined also by our chairman, Mr. A. E. Walker,) and *Platyceras (Acroculea) Angulatum*—Hall. The latter is merely an internal cast or filling of the shell, but we can add both to the list of Niagara fossils from local works. Another *Gasteropod* may be a new species; but unfortunately it is partly concealed and the aperture absent—broken off. It is better to preserve fossils in this condition when they admit of no determination. We cannot tell, but a missing part may turn up at any time quite unexpectedly. The glaciated chert beds presented since our report last published a few specimens of the *Crania* family group, which we felt inclined to consider may prove to be new to science. However, Professor Schuchert states: "This *Brachiopod* assumes not only the form, but nearly in all cases it partakes more or less of the ornamentation of its host." If such be the case—personally the writer is quite satisfied as to its correctness,—we may well hesitate to distinguish one species from another, unless they present themselves, as in the chert beds here, undisturbed. I have to submit also for the inspection of the Section a few species of *Annalids*. They are not found attached to foreign bodies here, as is often the case. The calcareous tubes have been replaced by chert. I don't know whether some have ever been described. The forms differ from ones figured by the late Dr. Jas. Hall.

Here we may be permitted to express our deep regret at the loss science has lately sustained by the death of the great Palaeontologist. We are all well aware of the deep interest he took in our local chert beds and their organic remains. He never paid us a visit here without imparting valuable information or offering useful suggestions. "You should never reject even the fragment of a shell until it has been carefully examined," he remarked on one occasion. "I noticed you spoke rather slightly of this imperfect valve, when handing me a more complete one of a similar *Brachiopod*. This fragment is of far more importance, since it displays the muscular impression of the interior while the other does not."

On the doctor's second visit to Hamilton we drove out along the brow of the escarpment to the rock cutting beyond the Reservoir. When passing over the bluff above the railway track I pointed it out as the place where the best colored *Lingula* were obtained, as also the Clinton (May Hill) star fishes. He questioned me rather closely regarding the former, and as to what led to their discovery. "Well, Dr. Hall, you may remember," was the reply, "in one of your earlier publications you mentioned you noticed a fragment of a *Brachiopod* in the New York Clinton rocks, which led you to believe that colored *Molluscs* may yet be detected even in the Silurian series. Here we have a complete exposure of the beds from the base of the Niagara to the grey band of the Medinas below, so it seemed quite natural to believe we may find confirmation of that view in our Clinton beds. A portion of a blue *Lingula* embedded in a fragment from the iron band was found, and close beside it a large red flag, of which it formed part. On splitting the latter numerous valves of a bright blue *Lingula* (*Lingula Clintoni*) presented an appearance in the interior; also a pink valve of *Lingula Oblata* lying within an inch of the brightest of the blue ones, while the small circular form of *Lingula Perovata* near an edge of the flag was brown, shading to blue at the apex. The latter is now known as *Glossina Perovata* (Hall). Is it possible these *Brachiopods* possessed in themselves the different coloring matter?" "'Tis a point for investigation," he added, as if thinking to himself.

The writer feels he need not apologize for recording the above anecdotes respecting one he looked upon as the greatest Palaeontologist of the age. You may find a man among scientists better

acquainted with some particular branch to which he had devoted special attention, but as a general Palæontologist he had no superior, James Hall, Albany: Royalty never conferred a higher honor than such a name as your own.

FAMILY FENESTELLIDÆ, BY PROF. SIMPSON.

Branches connected by dissepiments Infundibuliform.

- Fenestella—Cells in two ranges separated by Carinæ, or row of nodes.
- Polyoporella—Cell aperture in two or three ranges, branches carinated or not.
- Polypora—Cell apertures in three or more ranges, no Carina.
- Fenestralia—Cell apertures in four ranges, Median Carina.
- Fenestrapora—Cell apertures in two ranges, Carina prominent, reverse poriferous.
- Cycloporina—Cell apertures in two ranges, Carinæ with prominent semi-circular projections.
- Hemitypa—Cell apertures in two ranges, Carina prominent, connected by Scalæ meeting midway, Sendo-Carinæ.
- Unitypa—Cell apertures in two ranges, Carinæ prominent, connected by oblique thin plates.
- Isotrypa—Cell apertures in two ranges, Carinæ connected by bars, reverse face poriferous.
- Tectuliporella—Cell apertures in two ranges, Carinæ connected with bars, reverse face not poriferous.
- Tectulipora—Cell apertures in two ranges, branches and dissepiments carinated, Carinæ prominent, expanded at top and coalescing.
- Loculipora—Cells arranged in oval order around fenestralis, branches and dissepiments carinated, Carinæ prominent, expanded at top, coalescing.
- Phyllopora—Cell in two ranges, dissepiments celluliferous.
- Septopora—Cell apertures in two ranges, branches carinated, dissepiments celluliferous.
- Syncladia—Cell apertures in more than two ranges, dissepiments arcuate and celluliferous.

NOTES.

The singular property *Crania* possesses of adapting the shells to the objects upon which they are cemented have always been of much interest. You may well suppose this property adds considerably to our difficulty when endeavoring to compare a valve with one already described and figured. All the specimens found in the glaciated Niagara chert here were upper valves with a single exception, and even that flattened lower ventral valve was unattached like the rest which came under observation. In no instance was a valve contracted, elongated or distorted. Like the *Cornulites*, it is quite possible the *Brachiopods* were cemented to foreign substances which decayed and disappeared. The shells occasionally differ but little in shape from the *Orbiculoidea*, and are not phosphatic. A living one dredged from off the coast of Norway not very many years ago was described. It was stated to be black in color. This corresponds with one in the Clinton series, and was an omission on the writer's part when referring, at a late meeting of the Section, to some rare, little or unknown organic remains of the series. A specimen was placed in the upper case of the Museum, and a second was also obtained at the same place attached to a *Flustra* apparently.

Since our last meeting we forwarded by request to Prof. T. R. Jones, the well-known English Palæontologist, a box of the characteristic Silurian and Cambro-Sil. fossils of the district. A friend of his, Col. Taylor, who kindly conveyed the packages to London, states: "On my arrival in town I called on the Professor, who expressed himself as charmed with the collection." It contained some slabs from the ancient and modern beaches, with colonies of the minute *Crustacean Leperditia*.

A visitor to the Royal Museum in Ireland mentions that "the fossils from Hamilton, Ont., are separated, have a place by themselves, and are much admired." Smaller parcels of organic remains from this locality were also forwarded to the Dominion Geological Survey Office, Ottawa, or presented to Hamilton residents.

DISCOVERY OF THE EGGS OF A FOSSIL BRACHIOPOD OVA.

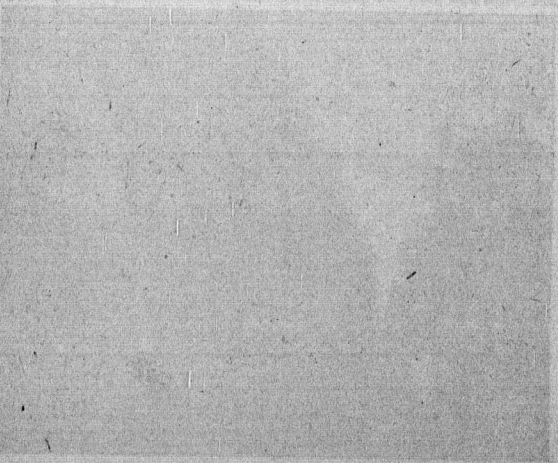
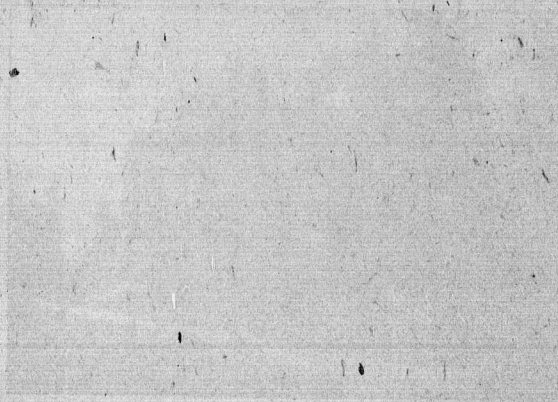
The late Dr. James Hall, State Director of the Geological Survey, New York, in the Report for 1891, at page 267, mentions the discovery of the Ova of *Lingula Lamellata*, now *L. Tentiola*, from Hamilton, Ont. "The palial cavity has been found filled with them," he adds. A German, Prof. Oehlert, detected Ova previously in a middle Devonian Brachiopod, *Stringocephalus*. The Hamilton specimen (Silurean) is from an earlier time, and the discovery is of considerable interest. Dr. Hall remarks: "There are at present no satisfactory means of separating the great majority of fossils passing under the name of *Lingula*. Internal casts bearing muscular and palial impressions quite similar to recent species have been found in rocks as old as the Trenton. Whenever traces of such internal markings are found there seems to be little difficulty in reconciling them with those of the 'living shells.'" In extinct forms the scars were deeper and the shells thicker than in species now extant and more calcareous. The writer regrets he was unable to procure a colored *Lingula* (*Glossina*) *Perovata* which Dr. Hall had never seen in New York State, and which seems to be confined to the bluff beyond the Reservoir.



RECKETT MOUNTAIN DRIVE, LOOKING WEST BELOW MRS. GOURLAY'S.



RECKETT MOUNTAIN DRIVE, LOOKING EAST BELOW "SOULDERWOOD,"
SUMMER RESIDENCE OF E. E. CHARLTON, ESQ.



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MALACOLOGY.

Read before the Geological Section, March 31st, 1899.

BY COL. C. C. GRANT.

It may be necessary to explain my reason for retaining the term Univalve, seldom used for the more modern "Gasteropod." I have heard visitors to the Museum say they possess copies of old works on Conchology, brought from the old country, and in several they may find this term employed without clearly understanding the meaning. That it was an objectionable one may be admitted, but the explanation seems necessary. The Gasteropods are known commonly as land, fresh water, or sea snails, a synonymous term.

It has been suggested, since so many of the modern Mollusca are found fossilized, and the fine collection of Mrs. Carey is here exhibited, many of its admirers might wish the writer to furnish a few additional remarks to the paper published in the Proceedings of the Hamilton Association for the years 1893-94, number X.

Now, since my knowledge of Conchology is extremely limited, I may well hesitate to comply with the request. Hanham and Leslie, who made a particular study of land snails and fresh water snails, are no longer with us to unfold the tale regarding their occupants. And Malachologists (members of the gentle science) would hardly consider a mere collector as holding a recognized place among Conchologists. Bearing this in mind, with considerable reluctance I venture a few remarks which may be of some little assistance in enabling a few of our visitors to classify in a general way the family groups to which their own acquired specimens belong.

On a late occasion a visitor remarked: "Why are shells so unlike as the ones you mention (*Mitres* and *Volutes*) classified in the same family group of *Univalves*?"

The former are a sub-genera of the latter, whose characteristics are, according to a well-known writer on the Mollusca, "A plaited pillar, effuse aperture" (and notched in front may be added). The simple rules of an old Conchologist may not exactly meet the views

of this generation; and while trifling omissions may be noted, we may find this definition fairly accurate of the following:

Cones—Aperture effuse, longitudinal, without teeth.

Cynea (*Cowrie*)—Aperture effuse, linear longitudinal, toothed on each side, except ovulum, inner lip smooth.

Murex—Aperture with small, straight canal.

Buccinum—Aperture with small canal leaning to the right.

Strombus—Aperture with small canal leaning to the left.

Trochus—Aperture contracted, somewhat square.

Turbo—Aperture contracted and orbicular.

Bulla—Aperture contracted a little and placed obliquely.

Argonauta—With one cell, spiral, involute.

Nautilus—With many cells, passage of connection or syphuncle.

Halyotis—With a row of openings along surface.

Nerita—Under this head the early Conchologists included two distinct families—the *Nerites* (hoof shells), as commonly known, and *Naticas*. The aperture of the former is contracted and semi-orbicular; in the latter it is globular, few whorled, spire small, obtuse, lip acute; a typical shell of each would readily point out the difference. The foregoing are spirals. The *Univalves* without a regular spire are:

Patella—Conic, aperture wide, basin-shaped.

Dentalium, or Tusk Shell—Slender, tapering, open at both ends.

Serpula (a worm, not a mollusc)—Shell hollow, often adhering to foreign bodies, serpentine.

Teredo—Shell thin, penetrating timber.

I would advise any one who intends shell collecting, in the first place to obtain a reliable work, such as "The Manual of the Mollusca," by Woodward. Some changes have been made since an edition was published in the 50's, but it contains a good deal of information. That the plates are not colored is certainly a drawback. Its author found, if he carried out his original intention, it must have made the work too expensive for general purposes. No matter how accurate the outlines of a shell, the writer finds by experience in many cases it is actually impossible to name a specimen correctly from an uncolored plate. Having lately received from Ceylon a collection of *Cones* and *Cowries*, he tried to name a few from the cheap edition of "Tryon's Systematic Conchology," and

failed except in a few cases. The colored edition of the work is very expensive, and probably the Public Library Board considered it was not justified in spending all at once the large sum required for the purchase when completed. In a communication from either the Author or the Publisher, Philadelphia, U. S., it was stated the intention was to publish it by numbers and family groups until completed. If so, perhaps it would have been better to appropriate a small sum annually for the purchase than to expend a trifling amount for the cheaper edition, which proves to be of little value for educational purposes. Ruskin's remark in his famous lecture, "Sesame and Lilies," or "King's Treasures," seems applicable in this case: "No book (especially on Conchology) is worth anything which is not worth much." Although rare shells no longer command the extravagant prices formerly obtained, the modern dealers' profits most certainly must be very great, judging from consignments the writer received from China and Ceylon recently. We have in the Museum case at the entrance three families of the Mollusca universally admired—the *Volutes*, *Cones* and *Cowries*. In the first are included the *Mitres* (about 500 species), which Ward, of Rochester, holds to be a distinct family, not a Subgenera as others suppose. He states they are recognized by an acute apex, well developed spire, and plicate Columella. The type is *Mitra Episcopalis* or *M. Rapalis*, Singapore (*Linneus*). One of the rarest *Volutes* formerly was *Aulica Junonica*. Its selling price was \$200. At present it may be purchased for from \$4 to \$6, according to size, state of preservation, etc.

Voluta Hebræa was also highly esteemed as a rarity in my younger days. It may be obtained for considerably less now, but I am unable to find the price paid for a very fine specimen in my possession, which may not be represented in Mrs. Carey's collection. I may be mistaken here, since I trust solely to memory in this instance, and a closer investigation may prove the assertion to be quite erroneous. On examining some lists received from the United States, I could not find the *Voluta Imperialis* mentioned. I imagine it must be very expensive. The figure representing the shell leads one to think the Royal name was not by any means ill-suited.

The type of the family is the well-known *Voluta Musica* (from

25 to 75 cents). Its range may well be looked upon as extraordinary—West Indies, Ceylon and New Zealand.

The *Volutidæ* have fossilized representatives in the Eocene rocks. The *Olives* (rice shells) now form a distinct family; formerly they were looked upon as *Volutes*. They have also been found in the Eocenes.

The Conidæ family, to which your attention is next called, are obconic shells with a long and narrow aperture, both lips parallel and without teeth. This merely applies to the habitation itself, as many collectors have found to their cost when carelessly handling living cones in shallows, inside coral reefs, in crevices or fissures. Their predatory habit alone may prove the animal's biting powers, if nothing else was needed to satisfy us on this point.

It is not very many years since the *Conus Ammiralis* here produced cost \$25; mine I got for \$3, and it may perhaps be purchased for less now.

Extravagant as the former price may appear to us now, how little it seems beside the sum recorded by Mawe, in the second edition of "Woodward's Conchology," for *Conus Cedo Nulli*, viz., 300 guineas. Tryon alleges this member of the family is not at all so exceedingly rare at present. I noticed since his work was published, a lucky Naturalist, on turning over a detached large piece of coral, was delighted to find no less than four specimens underneath. Even taking into account the reduced prices now obtainable, he must have been hard to please if dissatisfied with his day's work. I wonder if there can be a mistake on the part of the writers regarding this Mollusc—whether they do not confound it with *Conus Gloria Maris*, another of the family for which an Irish peer was offered the same amount. Only two specimens were dredged, I understand, in the Red Sea. One is said to be in France, the other belonged to Lord Montmorris. About 300 distinct species of cones are recognized by recent writers, sub-divided into many groups, which we need not enumerate, since it may seem to some of us unnecessary, and its tendency is not calculated to lead the student to the study of what has been quaintly called "the gentle science."

The knowledge acquired of the sea and its living wonders by the scientific expeditions of Europe and the United States can only be looked upon as yet as sealed books, open to the few alone who

are so fortunate as to possess "Golden Keys." Some pages only of the manuscripts ever reached the general public, but they are of intense interest to naturalists. The Mollusca, acquired by deep sea dredging of the Challenger, etc., may yet be issued in a less expensive form, with specimens correctly figured. The shells themselves so obtained, we need hardly remark, are altogether out of the reach of private individuals.

CYPRÆIDÆ—COWRIES.

These beautifully spotted and enamelled shells have so well defined an aperture that there seems no possibility of mistaking the family. The aperture is narrow, and both ends terminate in canals; the lips toothed at either side. Upwards of 300 species are now living, but many also put in an appearance in a fossilized state even so far back as when the Cretaceous (chalk beds) were deposited eons of ages ago. Perhaps the *Cowries* possess more attraction for ordinary visitors here to the Museum than any of the other family groups in the cases. This may be owing in some measure to the care taken in their selection. Dealers frequently endeavor to palm off what are called "dead shells" (received in large consignments) on people who cannot see they have lost a considerable part of the color, and are much inferior to "living shells," viz., such as are obtained alive by the hand or dredge of the collector.

We must not forget it is only when fully grown that the *Cowries* are furnished with teeth at both sides of the aperture, and that one branch of the family, commonly called the egg or white *Cowry*, is an exception. The teeth of this species is confined to the outer lip, and in the *Ovulum Volva* the canals are considerably prolonged at each end.

Visitors frequently express their surprise when informed that all specimens under this head, with one or two exceptions, are in the natural state, the fresh and bright appearance noticed only shows careful selection on the part of the purchaser.

The *Cypæa Moneta*, or Money Cowrey, is extensively imported from the Indo-Pacific Sea for the purpose of barter with the natives of Africa. No less than 300 tons entered Liverpool in 1849. Nearly half a century ago, as well as I recollect, a foreign Naturalist claimed that he dredged from the north-west of the African coast—

positive proof that Conchologists were quite mistaken in limiting its range to the Indo-Pacific. On investigation it was clearly proved the specimens formed part of the cargo of a vessel which had been wrecked there a few years before the Professor's wonderful discovery.

For educational purposes the author of "The Manual of the Mollusca" recommends the types of the respective families. As a further recommendation he could have added they can be obtained at a moderate price also. In a note he states the *Cypræa Umbilicata* (Tasmania) sold for £30 in 1850; it may be had now for \$6.

The *Orange Cowry* (worn as a badge of a Chieftain in the Friendly Islands) was formerly difficult to obtain and very expensive. It may be so yet. On looking over dealers' lists from the United States I cannot find even a specimen in stock for sale. In arranging a cabinet, some Conchologists think it better to show in pairs the back and aperture of each species. It seems unnecessary as regards either *Volutes* or *Cones*; but in some cases, where the *Cowries* for instance, possess a peculiar orifice, as in the *Ovulum* and *Cypræa pyrum* (Gmel), Algiers, it may be as well to display the coral lips also of the latter. In many succeeding families the suggestion meets with general approval.

Conchology appears to be particularly suitable for ladies. The collections of Mesdames Carey, Charlton and Beasley are here in evidence regarding taste in this direction, and it would be difficult to find shells in better preservation than some of the specimens exhibited in our cases, and their superiority may be attributed to personal selection. I fear, however, many are deterred by the nomenclature from taking greater interest in Malacology (study of shell-fish) by the Latin terms so hard to remember. The difficulty is not so considerable as it is imagined. Respectable dealers attach to each specimen the name and locality. Even if you possess a shell whose name is unknown or forgotten, that may be ascertained generally by a visit to a Museum. Few of us can tell names of species off hand without reference to writings and figures regarding them. The types of each family are few in number and can be had at a trifling cost. These are the keys to the science.

THE MURICES (ROCK SHELLS).

In the back corner of the case, near the entrance, of which

Murex tenui spina is the typical representative (and which may be purchased for half a dollar or less), early attracted the notice of the boldest navigators in existence more than 3,000 years ago, viz., the merchant princes of Tyre. These naturalists of a very early date are credited with the discovery of the famous Tyrian purple dye, by Plancus and Pliny, Roman Historians. The dying vats used by this ancient people were actually rediscovered by Sir W. Wyld half a century ago, when visiting the southern shores of the Mediterranean Sea. He recognized fragments of shells lying at the bottom which had resisted the weathering process for centuries. Historians assert, in addition to the *Purpura*, the dyers used in the vats a *Patella Limpet*. This seems erroneous. Probably the free floating violet was the Mollusc referred to.

The *Ianthina fragilis* is very common. When you handle a living one it exudes from the margin of the mantle a violet-colored fluid, as implied by the name. The shell is so fragile that it seems to have been impossible for Dr. Wyld to discover the smallest fragment in the cauldrons he examined. In a paper published in our Proceedings, No. VII., for the session 1890-91, entitled "The Irish Celts and their Relics," the writer alluded to some experiments made by Sir William, on his return from his travels to Dublin, on the *Purpura brandeis* of Ireland, a shell very closely related to the one he found in fragments, but yet easily recognizable. It seems here unnecessary to assert that while he undoubtedly succeeded in ascertaining that brilliant coloring may be extracted from the slimy creatures, the Royal Tyrian purple color evaded research. One important ingredient was not forthcoming. The ancient dyers probably jealously guarded the secrecy of their trade, no doubt, when they misled the Romans to suppose that the *Petella*, or Limpet, was also employed in the dying process. Stray *Ianthinas* are occasionally picked up on the shores of the south of England after a continuance of southern gales. In the open sea and coral zones they are said to be found in thousands. The aperture, independent of the violet color, is quite sufficient to distinguish them from other *Gasteropods*. Woodward classes the shell with the *Haliotide*, together with *Pluratomaria* and *Murchisonia* fossilized specimens. We may remark he considers the *Tritons*, the *Ranillas* (frogs), and *Fusida* (spindles) as belonging to the *Muricide*. Others

hold the former and latter entitled to the position of distinct families. *Turbinella pyrum*, the sacred shank-shell of the Cingalese, is also a *Murex*.

The *Magilus Antiquus*, of the Mauritius Red Sea, etc., a small Molusc, when young has a strange habit of anchoring itself in living coral. In order to prevent being entombed in the place it has selected by its growth, it prolongs the lips into a tube, and pushes up to the top filling the part it previously occupied with shelly material.

MALACOLOGY—Continued.

Read before the Geological Section, April 28th, 1899.

BY COL. C. C. GRANT.

STROMBODÆ (WING SHELLS).

As recent Conchologists have defined this family in accordance with Woodward, while adding an omission, perhaps it may be as well to give the modern definition here, as three at least of its members, unlike in appearance, come under the head lip expanded, deeply notched near canal, operculum claw-shaped. The adult *Pterocera* has the lip produced into claws, thereby differing from *Strombus*, and *Rostellaria* may be added. If we place before a young shell collector the large fountain shell of the Bahamas, or *Strombus pugilis*, together with *Rostellaria curta* and *Pterocera lambis*, China, he may well be puzzled to understand why the three so unlike in appearance came to be classified together. A little reflection shows they have characteristic features in common, when he goes back to the definition of the family.

The *Strombus gigas* of the West Indies is extensively imported into Europe for the manufacture of Cameos, but is said to be inferior to the *Cassida*, or Helmet shells, for the purpose. *Casses* are sub-genera of *Buccinidæ*, according to Woodward, who classifies the *Harps* and *Olives* also with the *Whelks* and *Trumpets*. *Fulgar Carica*, of the Atlantic coast, U. S. A., so frequently found in Indian ossuaries as *Wampum*, and *Buccinum undatum* may be considered as types. *Fulgar Canaliculata* (Atlantic) has been found as a fossil in the Miocene. The Claw or Scorpion (*Pterocera*) has several fossilized representatives, even as far back as the Lias and Chalk.

FAMILY OLIVIDÆ.

Whether modern Conchologists are justified or not in advancing these beautiful shells to family distinction is a matter we need not here state. I heard a lady visitor declare they merited any honor that could be conferred on them for their beauty alone,

if for nothing else. *Oliva Porphyryna* (the types) is one of the most exquisitely colored shells known, and Mrs. Carey's collection contains some very fine examples from Lower California.

Another type is *Oliva inflata* (Lamarck from Singapore). The common name for the former is the "Camp Olive," suggested by the white tent-like markings. It is said by Professor Ward, of Rochester, to resemble a multitude of pale mountain peaks rising from a deep brown mist.

Oliva incrassata is greatly admired also. Ward, of Rochester, a well-known experienced dealer, states: "It is a remarkable fact that *Oliva heatula*, of Panama, occurs also abundantly on the west coast of Africa." Now if there can be no mistake in the matter, it is of considerable importance from a Geological point of view. Darwin mentions in his journal, referring to *Purpura patula*, which is found both on the eastern and western coasts of America: "The dispersion of this coast shell may perhaps have taken place at the time when the channel of the River St. Cruz formed a strait joining the Atlantic and Pacific Oceans." Such a passage as this would probably influence the direction of the Gulf Stream. The author of "The Manual of the Mollusca" remarks: "If it is true that any number of living species are common to the Pacific and Atlantic shores, it becomes probable that some portion of the Isthmus of Darien has been submerged since the Eocene Tertiary period. Any opening of this barrier would allow the equatorial current to pass through into the Pacific; there would be no more Gulf Stream; the climate of Britain from this cause alone might become like that of Newfoundland at the present day."

TURBO (TOP SHELL)—TROCHUS (HOOP SHELL).

In accordance with the views of Woodward—and Mawe about the first quarter of the century,—Professor Ward considers the above are fairly entitled to family distinction. Woodward, on the other hand, includes both as *Turbinidae*. It must be admitted there is a slight difference in the apertures, and while *Turbo* possesses a solid calcareous operculum, *Trochus* has a horny multi-spiral one, and is also more conical in shape. The living occupants of the respective shells do not differ essentially. The nacreous lustre of the interior seems common to both. There are two members which

I may have overlooked in the cases (they are very small), known as the *Mineralogist* and *Conchologist*. The former by a process attaches to the outer surface of the shell small pebbles, sand, etc., which it collects; the latter minute molluscs, which it affixes in a similar fashion. They have a hard struggle against many enemies, and perhaps nature has kindly furnished them with this means of concealment.

The top shells are largely represented in a fossilized state from the lower Silurian Age. The rounded aperture of a few personally obtained at Ancaster and from local rocks here at Hamilton, independent of other considerations, led the writer to infer they represented members of the *Litorinidae* (Alga feeding shore shells). When Naturalists, as you may perceive, find so much difficulty in correctly classifying living Molluscs, we need scarcely feel surprised at the still greater difficulties the patient Palæontologist encounters when examining frequently mere casts or impressions of plants which perished eons of ages ago, and who thinks himself fortunate if he discovers, accidentally perhaps, the outlines of the aperture of a *Gasteropod* filled with shale or muddy sediment, with other parts of the shell concealed or embedded in hard limestone, which renders it difficult of extraction in an unbroken slab.

From the mountain limestone in the south of Ireland the writer has frequently obtained a *Gasteropod*, named *Enomphalus pentangulatus* by Sowerby. It is represented by a Devonian form in Ontario and in the calciferous (lower silurian) of Quebec, by *Ophileta Compacta*. The specimen from the Irish carboniferous was described as follows by the late Prof. Salter:

"Shell depressed or discoidal, whorls angular, aperture polygonal, umbilicus very large; operculum shelly, round, multi-spiral." It seems difficult to understand at first sight the reason why Woodward classified it as "a top shell," but reflection shows the leading characters.

PYRAMIDELLIDÆ.

"Owing to the circumstance that this family group, as a whole, may be regarded rather as appertaining to past ages than the present epoch," remarks Professor E. Forbes, Edinburgh, "they present subjects of much interest to the student of extinct Molluscs." Very

true. They are much more likely to attract attention from Palæontologists than from shell collectors. There is nothing very striking in their general appearance; they are frequently mistaken for Turrets or Screws also. We possess in this Dominion a fair share of fossil representatives from the lower silurian upwards, and Dr. Spencer, F. G. S., recognized Hall's *Loxonemaleda*, U. S. A., as also occurring in the local rocks of Hamilton.

Perhaps it would be better here to produce specimens of the spirals *Turriculetes cerites*, including the fresh water *Potamides* and *Melantias*, also inhabiting fresh water lakes and rivers in the warmer portions of the globe, than wearying my hearers by repeating descriptions not universally accepted. It may be because some minor point was omitted, by original investigation, or who boiled down the knowledge they acquired in a form which conveys all the information needed.

More closely related than the foregoing are the Limpets *Calyptra* (Bonnets) *Fessurellidæ* Key-holes and *Pattellidæ* (rock limpets). Cuming mentions that on the western coast of South America he found one of the latter a foot or 14 inches long, which was used by the natives as a dish. The writer collected half a dozen empty shells of an *Acmea*, a minute form of the family at Anticosti, the brightest known to him, exceedingly pretty. He thinks it must be well described already by Naturalists on this continent, although he has seen it figured. Over 100 species of rock limpets have been found fossilized. Some occur even in Lower Silurians.

The *Metoptoma* (Philips), classified by Woodward under the head of *Patella*, appears to be more closely allied to the branch called *Bonnets*. The late Prof. E. Billings, of the Dominion Geological Survey, figured and described several from Quebec and a few also from the Hudson River rocks, Anticosti. Professor Grey claimed a certain relationship existed between the limpet and coat-of-mail shell (*chiton*). The posterior plate of the latter he considered homologous with *Patella*. The other plates appear like portions of the anterior slope successively detached.

The *Dentalidæ*, tooth shells, are also of much interest to Palæontologists. The ribbed species, *D. Elephantinum*, of the Philippines, is regarded as the type. The family had fossil representatives even so far back as the Palæozoic Age, before the carbon-

iferous forests were converted into mineral coal, used in fires and furnaces to-day. Huxley's description of the shell itself conveys in a few words an excellent picture: "Shell elongated, conical, curved like an elephant's tusk, apex broken off, open at both ends."

CEPHALOPODA.

At the head of the Mollusca (last but not least) we may well place the *Argonitidæ* and *Nautilus*. Provided with eyes to see, arms to grasp, a parrot-like beak to tear and devour creatures even of a higher classification. There was an age in the far-off history of the globe when these, the fossilized forms, were apparently installed as "the lords of creation," and swarmed in every sea. In what was known to us as "the mineral quarry," on the Barton and Glanford road, now abandoned, I have frequently noticed groups of *Cephalopods* lying flattened across each other as if the shells had been subjected to great pressure. In "The Chain of Life," by Sir W. Dawson, you will find the representation of a Silurian *Cephalopod*, which resembles, except in the air chambers (septa), a specimen seen in Mr. Webber's quarry, near Hamilton, some years since.

There are only five species of the *Nautilus* living at the present time. Upwards of 600 existed formerly. It is difficult to understand what led the old world Naturalists to form such erroneous ideas regarding the habits of the *Nautilus*. Aristotle is credited, I believe, as the first who asserted "that it rises from the deep; spreads its arms and sails; and goes cruising on the surface, propelled by its tentacles, before the wind." Many centuries have passed since then, but in modern universities and colleges on the American continent, in Canada or the United States, I am told you may find not a few still inclined to accept the antiquated views of Naturalists of the olden time. The most reliable statement regarding the *Nautilus* was made by an old Dutch Naturalist, Rumphius, in a work published in 1705 on the Natural History of Amboyna, and the following extract met the approval of the late Sir R. Owen: "When the *Nautilus* floats on the water, he puts out his head and his tentacles and spreads them upon the water, with the poop of the shell above water; at the bottom he creeps in the reverse position, his boat above him, head and tentacles on the ground."

NOTE.—During the different stages of growth the outer margin

of the mantle cements to the growing edges of the shells the pebbles and minute mollusca found attached. The writer was informed by a Conchologist some years ago, in the old country, that in no instance did these closely related shells appropriate for conveyance or concealment their peculiar burthens. Why it should be so appears to be one of the many mysteries of Nature. Ward gives the shell a family name, *Onustidæ*, and has seen tubes of Annelids, a sponge, and cup coral attached to a *Conchologist*. He considers *Calyptrea fornicata*, Atlantic coast, as a *Bonnet* also.

ACKNOWLEDGMENTS OF GIFTS OF FOSSILS FORWARDED BY THE GEOLOGICAL SECTION.

(A number of these have been received since the close of the session)

GEOLOGICAL SURVEY OF CANADA,
GEORGE M. DAWSON, C.M.G., LL.D., F.R.S., Director.
Museum and Offices, Sussex St., Ottawa.

APRIL 28th, 1899.

To Col. C. C. Grant, Hamilton, Ont.

SIR: I beg to acknowledge the receipt of twenty-one fossils from the Niagara formation of Hamilton and Grimsby, and one fossil from the Clinton formation at Hamilton, as a donation to the Museum, and am instructed by the Director to convey to you his thanks for this mark of your consideration.

I have the honor to be, Sir,

Your obedient servant,

J. F. WHITEAVES,
Assistant Director.

JUNE 14th, 1899.

To Col. C. C. Grant, Hamilton, Ont.

SIR: I beg to acknowledge the receipt of forty-two specimens of fossils from the Niagara and Clinton formations of Ontario, as a donation to the Museum, and am instructed by the Director to convey to you his thanks for this mark of your consideration.

I have the honor to be, Sir,

Your obedient servant,

J. F. WHITEAVES,
Assistant Director.

JULY 29th, 1899.

To Col. C. C. Grant, Hamilton, Ont.

SIR: I beg to acknowledge the receipt of seventy-seven specimens of fossils from the drift at Winona, from the Niagara formation at Hamilton, etc., as a donation to the Museum, and am instructed by the Director to convey to you his thanks for this mark of your consideration.

I have the honor to be, sir,

Your obedient servant,

J. F. WHITEAVES,
Assistant Director.

BRITISH MUSEUM (NATURAL HISTORY.)
Cromwell Road, London, S. W.

JULY 14th, 1899.

*SIR: I am directed by the Trustees of the British Museum to convey to you the expression of their best thanks for the present of a collection of 43 Silurian Fossils from North America, named and localized, consisting of Brachiopods, Cephalopods, Sponges, Fucoïds, etc., which you have been pleased to make to them.

I have the honor to be, sir,

Your obedient servant,

E. RAY LANKESTER,
Director.

*This collection was forwarded by Col. C. C. Grant through the kindness of Col. L. Taylor.

INTERNATIONAL LAW.

Read before the Hamilton Association December 8th, 1898.

BY W. A. LOGIE, M. A. LL. B.

Upon being asked by your Secretary to give a paper upon "International Law," I felt some diffidence about the possibility of making such a paper interesting to a mixed audience. However, in the following pages I have endeavored to make it as light as the subject will allow; but the decided cases and illustrations would take up too much of our time, so you will pardon me if the paper is a trifle bald and the plagiarisms numerous. I assume that your Secretary meant me to lecture upon public international law as distinguished from private international law.

Public international law, then, consists in certain rules of conduct which modern civilized states regard as binding on them in their relation with one another with a force resembling that binding the moral person to obey the laws of his country, and which they also regard as being enforceable by appropriate means in case of infringement. International law, then, concerns itself with the affairs of nations, and a sovereign state is an individual with regard to it, just as we are all individuals with relation to our own laws, and just as private law is for the purpose of settling quarrels between individuals, so international law is for the purpose of settling quarrels between nations. A law-suit between individuals now-a-days takes the place of a duel, and the object of international law is that arbitration shall in like manner one day take the place of war.

The loftiest conception of international law is that laid down by Dr. Whewell, namely, that its aim should be to lay down such rules and suggest such measures as might tend to diminish the evils of war, and finally extinguish it among nations. The latter end appears indeed, at this time, impossible of attainment. Notwithstanding the Czar's message of peace, the open scorn with which it has been received, nay, the very preparations for war made by Russia herself show that the time is not yet when the war drums will beat no more and the battle flag be furled.

Let us then turn to the other alternative, namely, the diminishing of the evils of war.

The forces now employed in war are so enormous, the machinery so complicated and delicate (it has been estimated that one charge of powder and shot fired from the 100-ton guns of the present day costs more than one of the large guns with which England's great naval battles were fought at the beginning of the century) that the question of how they should be controlled or diminished by mere literary agency is one which might well interest millions of groaning taxpayers.

War appears to be as old as the race. The Rousseau school of thinkers would have us believe that the contrary was the case, but the romance of Paul and Virginia to the contrary notwithstanding, it would seem that peace is a comparatively modern invention. International law owes much of its growth to Roman law. The *jus gentium*, or natural law, is still the ground work of international law, and the treaty law of nations, which is the *lex scripta* of nations as opposed to the unwritten law, is built upon this foundation. During the pax Romana, not only did bloodshed practically cease, but the equality of the sexes and the mitigation of slavery appeared, and Christianity itself grew and flourished. Is it, then, too visionary to hope that the pax Britannica which now insures life and liberty to every one beneath the folds of the Union Jack may yet grow into an Anglo-Saxon peace which shall practically be the millenium?

States then, as we have seen, are to be considered as moral persons, capable and free to do right and wrong, and the law of nations consists of general principles of right and justice of a collection of usages, customs and opinions, the growth of civilization and commerce and a code of positive law.

The law of nations, so far as it is founded on the principles of natural justice, is equally binding upon all mankind, but the Christian nations of Europe and their descendants on this Continent by their vast superiority in arts and sciences, commerce and government, and above all by the influence of Christianity, have established a law peculiar to themselves. The term International Law is not an exact one. Law implies a law giver and a punishment—a tribunal capable of enforcing it and coercing those who break it. But there is no common law giver to sovereign states. The mere

term Sovereign State implies one not subject to any superior, and no tribunal has power to bind them by judgments or decrees, or coerce them if transgressors, and international law is only binding on States in the same way that the ten commandments are binding on a moral man.

We notice then, that although there is no penalty attaching to the breach of the law of nations, there has been created a law-abiding sentiment which is the sanction of international law. One of the first points which strikes the student is the principle of state sovereignty; this implies that it is nobody's vassal, but it also implies more, that it is entitled to do within its dominions whatever act it may think advisable to make it prosperous and strong, may adopt any means it pleases for its defence, may follow any commercial system it thinks most likely to promote its interest.

Before the recognition of this principle of state sovereignty, no act was more liable to cause war between nations than the erection of fortresses or the adoption of a hostile tariff, but since its acceptance as a principle of international law it follows that it is no concern of ours whether, for example, the United States adopts a Dingley Tariff or passes an Alien Labor Law, though these measures do not tend to promote friendliness between adjoining nations, because they are essentially measures which a sovereign state may adopt to further its interests. So, too, the defences at Halifax or Esquimalt are no concern of the United States Congress, they concern only the integrity of British possessions in America. So well established, indeed, is this principle, and so healthy its growth, that the mother country has freely allowed us to exercise a privilege once grudgingly conceded to independent states, namely to place a duty on goods manufactured in Great Britain.

Another rule of international law is that a sovereign state has unlimited power to occupy unappropriated territory. This is a very fertile source of dispute. We have seen war clouds form and disperse with such startling rapidity in the last few years that we have had this rule impressed upon us with a force which none other has attained.

Discovery used to be sufficient to found a valid claim of title, but now-a-days something more is required.

A cairn of stones erected by a Rhodes, or a flag planted by a

Kitchener, is now regarded as a good source of title. A question which affected the title to a great portion of the Dominion of Canada was founded on discovery, and seemed at first to be merely a dispute between rival fur companies.

Captain Gray, from whom the Americans claim title to a large portion of our North-west Territories and British Columbia, was the uncommissioned agent of a fur company, while Captain Vancouver, upon whose discoveries the British claim was based, assumed possession when he heard of Gray's doings. This question was settled by the treaty of Washington.

Granted, however, discovery and occupation, what area of land is affected by these acts? Questions of this kind are arising every day in Africa, where it is not the malarial coast settlement that is the bone of contention, but the trade of the rich Hinterland. It seems now to be generally admitted that the occupation of the coast carries with it a right to the whole territory drained by the rivers which empty their waters within its lines. This is the British claim to-day in China. "Spheres of influence" is the term used, and to-day the whole of China is practically partitioned between Russia and Great Britain, Germany and France. So far I have spoken only of jurisdiction over land. Let us now look at sovereign rights over water.

States claim sovereign authority over portions of seas, over lakes and rivers, and over the vessels belonging to them or their subjects. One of the most bitterly disputed questions of international law was the question of the *Mare Clausum*, or the *Mare Liberum*, sea open to all or under the dominion of a particular power.

It would be beyond the scope of a paper of this kind to trace the growth of the law on this point. Britain claimed jurisdiction from the North Sea to the Bay of Biscay. As early as the reign of King John, the ordinance of Hastings enacted that "if a lieutenant of the King do encounter upon the sea any ships that will not strike or veil their bonnets at his commandment, he will fight against them, take them, and forfeit their goods."

The Adriatic, the Gulf of Genoa, the North Sea, and the Baltic were, until recently, all closed and under authority, and no later than the other day do we hear of the United States claiming Behring Sea

as a *Mare Clausum*, a proposition which the Paris Board of Arbitration happily vetoed. The tendency in modern times seems to be towards the open sea.

Certain portions, however, of the sea are still subject to territorial jurisdiction; e.g., we hear of the three-mile limit. This was the distance which formerly was considered the limit of effective gun fire, and was accordingly assumed to be a harbor; so land in a state covered with water is subject to territorial rights, e.g., rivers and lakes; but where, as often happens, a river of great length, like the Rhine and formerly the Mississippi, passes through the territory of several states, each of those states has a right of navigation to the sea. This point is at present aptly exemplified by the dispute between the United States and ourselves with regard to the Stikine River, which empties into the Pacific in United States territory, upon which, even if we did not possess treaty rights of navigation, we would be entitled to navigate our ships to give us access to the Yukon district.

So, too, the St. Lawrence. In 1828 Great Britain, as owner of the territory near the mouth, claimed the right to close the St. Lawrence at pleasure, but the controversy ended in 1854 in much the same way as the disputes about the passage down the Rhine, and the principles then laid down were subsequently applied to the South American Rivers, the Parana, the Uruguay and the Amazon, each riparian owner assenting to the rights of the other.

Turning to the rights of States over their vessels, we find that a fiction of international law so dear to lawyers meets us. It is that a man in a foreign country or a ship in foreign waters is conceived as still within the limits of the State to which he or she belongs. This fiction has been the cause of many a slave regaining his freedom after the abolition of slavery by Great Britain, for, when once he placed his foot on a British ship he was on British territory, with all the might of the British Empire at his back, and it became the duty of the captain of that ship to place him in some spot where he would not again be reduced to slavery.

This doctrine of extritorial jurisdiction originally applied only to men-of-war, but in 1812 an extension to private ships was claimed by the United States. The war of 1814 between Great Britain and the United States arose by reason of British ships searching United

States vessels for men of British nationality. This right was stoutly denied by the United States, and although the question was not definitely settled by that war, it will not probably arise again, as Great Britain has abandoned the system of impressing men for the navy.

An interesting phase of the relation of sovereignty to the territory of a state is found in the law which relates to the person of a sovereign while within foreign territory. In his capacity of a sovereign, he is free from all local jurisdiction so long as he is there. He cannot be proceeded against either in ordinary or extraordinary civil or criminal courts; he is exempted from taxes; he is not subjected to police or other administrative regulation; his house cannot be entered by the authority of the state in which he is, and the members of his suite enjoy the same personal immunity as himself. If he commits acts against the safety or good order of the community, or permits them to be done by his attendants, the state can only expel him from his territory, putting him under such restraint as is necessary to do this. If a crime is committed by a member of his suite, the accused person cannot be tried and punished. Criminals belonging to his suite must be sent home to be tried, and civil actions must be equally reserved from the home courts. A sovereign, however, cannot protect an accused person, not a member of his suite, who takes refuge from the pursuit of the local authority. They cannot enter his house, but he is bound to surrender the refugee, and a refusal to give him up would justify the authorities in expelling the sovereign and in preventing the accused by force from being carried off in his retinue.

Sometimes, however, a sovereign has a double personality, that is to say, he may be for some purposes in the position of a private individual. Thus, if he enters the military service of a foreign country, he submits himself to its authority in his capacity of a military officer, and if he travels incognito he may be treated as the private individual he appears to be. Diplomatic agents possess a somewhat similar immunity.

Military forces entering the territory of a foreign state in amity with that to which they belong, either when crossing to and fro between the main part of their country and an isolated piece of it, or as allies, are also immune, but in these cases it is usual to con-

clude conventions, specifying the line of road to be followed and regulating their transit so as to make it as little onerous as possible to the population among which they are. A similar immunity is extended to ships of war and public ships of state. Merchant vessels lying in the ports of a foreign state enjoy a qualified immunity.

An interesting branch of sovereignty in relation to the subjects of a state is afforded by questions of naturalization. In Germany, Austria, Sweden, Norway and Switzerland, nationality follows parentage alone, and all these states claim the children of their subjects wherever they may be born. Other countries, while regarding the children of an alien, as an alien, give him the right, on attaining his majority, of electing to be a citizen of the country in which he resides. Except in the United States, the nationality of a wife is merged in that of her husband, so that when a woman marries a foreigner she loses her own nationality and acquires his, and a subsequent change of nationality on his part carries with it a like change on her side. By the exceptional practice of the United States a native woman marrying a foreigner remains a subject of her own state, though an alien woman marrying an American citizen becomes herself naturalized.

We may now consider maritime belligerency. The elements are simple. When two states go to war the ships, public and private of each, are so many chattels, and the capture of them is regulated by the same principles as the seizure on land of moveables by soldiers.

Prize courts are established to decide whether a ship is taken into possession of the enemy, as possession is the key-stone of the right to confiscate. This leads us to the consideration of neutrals and their goods.

The plenipotentiaries at Paris fixed certain principles, of which we heard much in the recent war with Spain. They are as follows :

1. Privateering is abolished.
2. A neutral flag covers enemy's goods, except those contraband of war.
3. Neutral goods, except contraband of war, are not liable to capture under the enemy's flags, and
4. Blockades, to be binding, must be effective.

The net result was free ships make free goods, but the converse that enemy's ships make enemy's goods was not adopted.

The United States was not a party to this declaration, but following the Christian tendency of the nation it did not adopt in the late war the system of privateering, which has rightly been considered by civilized nations only another name for piracy.

So many questions arose about the American filibustering expeditions prior to the recent war with Spain that it will be interesting to look at the cases in which the use of neutral territory by a belligerent forms a subject of complaint. There can be no question that had Spain been in a condition to fight she would have declared war long before the war actually broke out, by reason of acts in breach of neutrality, and she would unquestionably have been justified by international law, for one of the great questions is that a neutral State cannot allow its territory to become a scene of hostile operations to the disadvantage of one of two belligerents. An example of a filibustering expedition was the Fenian incursion into Canada, for which Great Britain was entitled to claim compensation, but refrained.

So, too, we see the operation of this rule when the United States fleet was ordered by the British Government to leave Hong Kong on the outbreak of the recent war, the rule being that supplies can only be meted out by neutrals to belligerents in accordance with the necessities in each case; but the law even goes further, and the intent of acts innocent separately, but culpable when combined, are within the neutral jurisdiction.

In accordance with this view it was contended on the part of the United States before the tribunal of arbitration at Geneva that the Alabama and Georgia, two vessels in the Confederate service, were in effect armed within British jurisdiction. The Alabama left Liverpool wholly unarmed on July 29th, 1862, and received her guns and ammunition at Terceira, partly from a vessel which cleared a fortnight later from Liverpool for Nassau, in the Bahamas, and partly from another vessel which started from London with a clearance for Demarara. In like manner the Georgia cleared from Glasgow for China and received her armament off the French coast from the vessel which sailed from New Haven, in Sussex. These acts, innocent separately, rendered Great Britain liable for the huge

damages done by the Alabama to the Northern commerce during the war of secession. England has also retained for many years on her statute books a foreign enlistment act, and she has recently strengthened its provisions. This act prevents the fitting out of war-like expeditions in Great Britain or her colonies to be used against powers with which Great Britain is at peace. It was under the provisions of this act that the Jamieson Raiders were tried and punished. Thus we see that from the rudimentary propositions of international law, which contemplate no other relations than those of war and peace, in which if hostilities broke out between two states, every other was an ally or an enemy. A third attitude has become recognized as possible and legitimate, namely, that of neutral.

Contraband of war was not covered by the declaration of Paris, nor was the case of ships endeavoring to obtain entrance to a blockaded port. This branch of international law is both complex and difficult, and much of its difficulty arises from the question as to what is or is not contraband of war. Indeed the test of what is contraband is not yet settled, but it may be generally stated that things which are *only* used for war are contraband, and things which are *both* useful for war *and* for peace may be *declared* contraband; e.g., coal was declared contraband by Great Britain in the recent war with Spain.

Let us now turn to the mitigation of war. The humane tendency of the present age cannot be denied. Take the case of the treatment of the wounded and the prisoners. At first they were tortured, then killed, as in a Roman triumph; then in mediaeval times there appears to have been rather ignorance and carelessness than actual cruelty; but it is only in modern times that friend and foe alike receive the care of the surgeon and the comfort of the hospital.

One reason of this humane tendency is that neutrals check belligerents. Manuals of rules and usages for the use of officers in the field have been compiled by England, Germany and France. The poisoning of water and food is absolutely forbidden, but the stoppage of supplies is still recognized. The use of poisoned weapons, or weapons calculated to produce unnecessary pain, e.g., a bursting bullet, is prohibited. Still nations verge on the rules laid

down in the declaration of St. Petersburg in 1868, and the Dum Dum bullet now used by British troops, with its softened point, very nearly trespasses upon the forbidden ground. The history of red-hot shot, and even of our familiar bayonet, is too long to be set out here, but the wonder is that torpedoes, *et hoc genus omne*, has not been met with harsher criticism than they have. Presently we shall hear of a declaration pronouncing illegal the recent alleged invention of Tesla, who proposes to launch a stream of electricity against the enemy's fleet which shall render forever useless the employment of iron-clads. The general rule then of modern warfare is that the mode of carrying on the war shall cause no greater harm to the enemy than the necessity requires for bringing him to time.

The Geneva convention of 1864 is the farthest as well as the most recent point of advance reached by a convention of nations, unless, indeed, the conference to be held at The Hague results in some definite scheme of arbitration to mitigate the sufferings of war. Space will not permit me to say much about prisoners and the mode in which captured enemies receive quarter, nor can I do more than touch upon spies, though a chapter might be written upon the fine distinction between ordinary spies, double spies, spies of distinction, and spies by compulsion, and the measure of punishment awarded to each. Suffice it to say that it is legitimate to employ spies, but to be a spy is regarded as dishonorable, and if caught he may be punished with the ignominious death of hanging.

A strong inclination was shown by the Germans during the war of 1870 to treat as spies persons passing over the German lines in balloons, but the essence of secrecy or disguise was not here present, and accordingly we find that their treatment as spies was forbidden in the proposed declaration of Brussels, and that their right to be treated as prisoners of war is affirmed in the French official manual for the use of military officers. War balloons proved such a disastrous failure at the siege of Santiago that their use will probably be now confined to making observation out of reach of the enemy's fire.

The mitigation of war also appears in the treatment of the innocent inhabitants of belligerent towns. Formerly they were put to death irrespective of sex or age; nowadays such a course would raise a storm of indignation, and we were accordingly somewhat amused by the terror of the American seaport towns which, though

without fortifications, feared that they would be bombarded by a hostile Spanish fleet. This fear was, of course, groundless.

Disputes between nations can be amicably settled either by direct agreement between the parties, by agreement under the mediation of another power, or by reference to arbitration. When two states refer a disputed matter to arbitration, the scope and conditions of the reference are usually settled by a treaty, and rules and principles are laid down upon which the arbitrators are to proceed. There are two measures falling short of war which it is permissible to take, namely, retorsion and reprisal. Retorsion consists in treating the subjects of the state giving provocation in an identical or closely analogous way with that in which the subjects of the state using retorsion are treated. Thus if the productions of Canada are discouraged or kept out of the United States by differential import duties, it is an act of retorsion to put on similar duties on United States goods coming into Canada; so our Alien Labor law is an exact copy *mutatis mutandis* with that of the United States. Reprisals are resorted to when a specific wrong has been committed, and they consist in the seizure and confiscation of property belonging to the offending state, or its subjects, by way of compensation in value for the wrong; or it may consist in suspending the operation of treaties. Thus, for example, when Holland, in 1780, repudiated the treaty obligation under which she lay to succor England when attacked, the British Government exercised reprisals by suspending the commercial treaties between Holland and Great Britain. Such measures, however, are *prima facie* acts of war and are resorted to to throw the onus of declaring war on the party first offending. A very common form of reprisal is an embargo of such ships belonging to the offending states as may be lying in the ports of the state making the reprisal. A recent case, combining seizure and embargo, is that of England against the two Sicillies in 1839. The justification of reprisals is that they are the means of avoiding the graver alternative of war. Another means of constraint short of war is called a pacific blockade, the first instance of which occurred in 1827, when the coasts of Greece were blockaded by the English, French and Russian fleets, while still professing to be at peace with Turkey.

When all means of preserving peace have failed, the right to

commence hostilities immediately accrues. We all read last summer of the discussion which took place with reference to the declaration of war between Spain and the United States. It was then discussed at great length whether the seizure of Spanish vessels, the handing in of the passports of the resident ambassadors of both countries, was a sufficient declaration of war; but the conclusions arrived at by the jurists of the present century is that it is not necessary that notice must be given to an enemy before entering upon war, although the war of 1870 was commenced by a declaration handed to Count Bismarck by the French Charge d'Affaires; and in 1877, between Russia and Turkey, a formal dispatch was handed to the Turkish Charge d'Affaires at St. Petersburg.

We may now consider the end of wars. Treaties of peace put an end to the war and absolutely abolish the subject of it. We are now hearing daily of the negotiations between Spain and America in Paris. When these are concluded the cause of the war will have been put to an end. An armistice is a sort of partial truce. A peace is always preceded by an armistice, and an armistice by a suspension of arms, which is only a shorter armistice. I cannot enlarge upon the many forms of truces, cartels, safe conducts, passports, safe guards, etc., as the time approaches when I must close; but this paper would be incomplete were I not to mention some of the proposals to abate war. War is irreconcilable with Christianity, its belief and practices. The Prince of Peace has forbidden war, and Christians therefore earnestly desire arbitration as a means of settling disputes. Nations, however, like individuals, are singularly human, and where their view of disputed points clashes with the view of another nation, pride, more than real interest, often brings about war. We have had an example of this in the recent Fashoda incident. The want of coercive power is the chief drawback, though there are others which interfere with this end and distinguishes international arbitrations from private ones. An example of this lack of power was evident in the Behring Sea dispute when, although compensation was ordered to be paid to the owners of captured sealers, some four years ago, it is only to-day that the money is being paid over, and that more through a change in sentiment than for any other reason. About twelve years ago an eminent Frenchman, De Molinair, published a proposal for what he called a league of

neutral powers. His theory was that neutrals, though not always the same, are, when combined, irresistible; and his proposition was that the outbreak of war between any two powers should be a *casus belli* as regards the rest, and to embody this principle in a treaty. This scheme, perhaps because it was too ambitious, failed to command the attention it deserved. The combination of the three Emperors, the dual alliance, are all efforts in the same direction. War has often been compared to a huge conflagration, and like it. Eventually De Molinair's plan of isolation may bring with it the millennium, when men shall beat their swords into plow-shares and their spears into pruning-hooks.

BIOLOGICAL REPORT FOR THE SESSION

1898-1899.

The work of the Biological Section has been almost wholly confined to botany during the last session. A few new species have been added to our list, but, with the necessary time at the disposal of our more active members, much could be accomplished in the study of forms scarcely known to us. The past winter, owing to the very light snowfall, has been an exceptionally severe one throughout Ontario and adjoining provinces and states, many cultivated trees, shrubs and herbaceous perennials, usually considered hardy, succumbing to the abnormal conditions. Wild plants also seem to have suffered to some extent, *Cypripedium acaula*, for instance, being comparatively scarce compared with the number noted in 1898. Toads, so commonly found in our gardens and under electric lamps on the streets, seem almost to have disappeared. A few young ones only have been seen at edges of pools. Have the adults perished from frost?

The additions to local flora are:

- Draba verna*—L.
- Viola cucullata*—Ait.
- “ *populifolia*—Greene.
- “ *Dicksonii*—Greene.
- “ *vagula*—Greene.
- Stellaria graminea*—L.

Convolvulus spithameus—L. The plant listed by us under this title is, according to Dr. Greene, *Convolvulus stans*—Michx.

Nasturtium sylvestre—R. Br. This plant, which can be found in low meadows near the town of Dundas, taken and listed about 20 years ago by J. M. Buchan, has recently been collected at Ball's Mills, Lincoln Co., Ont., but it can scarcely be considered “new to Canada.”

J. M. DICKSON,
Chairman.

H. S. MOORE,
Secretary.

SOME NEW VIOLETS.

BY J. M. DICKSON.

For some years it has been strongly impressed upon field workers that the title *Viola palmata* var. *cucullata*, as generally applied, covered a somewhat wide diversity of forms, but not having access to specialists, or monographs covering the genus, we were compelled to allow several seemingly distinct forms of acaulescent violets to remain under this extremely variable variety. Desiring more light, we sent several specimens to Mr. J. M. Macoun, Assistant Naturalist, Geological Survey, Ottawa, who forwarded the material to Dr. E. L. Greene, Professor of Botany at the Catholic University, Washington, D. C., U. S. From the plants collected at Hamilton and at Ottawa by Mr. Macoun, Dr. Greene has described at least eight distinct species, seven of which are new.

The Hamilton species, so far as known to the writer, are:

**Viola cucullata*, Ait. ; Greene, *Pittonia*, Vol. III., 143.

"This is a very glabrous plant, of tender and succulent herbage, decidedly cucullate leaves, light green in color, flowers very pale blue, the petals with a spot of darker violet just above the white basal part or claw. The cleistogamous flowers are borne on greatly elongated very slender peduncles which are strictly erect, both the growing and full grown ovaries being a half-foot or more above ground among the leaf-blades. The capsules are very long and quite prismatic, *i. e.*, of equal thickness from one end to the other, and distinctly though obtusely trigonous." Common in bog meadows.

**Viola populifolia*, Greene ; *Pittonia*, Vol. III., 337.

"An acaulescent blue-flowered woodland violet akin to *V. cuspidata*, but smaller, the petioles of the early leaves densely villous-hirsute, the blade from broad-cordate in the very earliest, and smallest, to deltoid or deltoid-reniform in those accompanying the

*Illustrated by J. M. Macoun in "Notes on Some Ottawa Violets."

petaliferous flowers, notably broader than long, both surfaces, but more conspicuously the lower, hirsute-pubescent, especially along the veins: corollas large, rather light blue, all the petals broad and obtuse, the odd one like the others but a little longer; sepals of the petaliferous flowers oblong, obtuse, hispidulous below, especially the auricles: apetalous flowers of summer and autumn very short-peduncled and horizontal or partly buried, but the peduncles slender; sepals small, glabrous; pods triquetrous-ovoid, finely dotted, 4 or 5 lines long: late foliage nearly glabrous, but rather fleshy." Newly cleared ground near Brown's wharf.

Viola Dicksonii, Greene; *Pittonia*, Vol. IV., 65.

"Allied to *V. cuspidata*, but the herbage light-green, the pubescence more sparse and hispidulous, the petaliferous flowers on nearly terete peduncles about equalling the leaves and bibracteolate near the base: sepals lanceolate, either naked or ciliolate: corolla about $\frac{3}{4}$ inch long, of a fine lavender-blue, the paired petals, especially the two uppermost, obovate-rhomboidal, the laterals white at base and strongly bearded with indistinctly clavellate hairs, the keel-petal shorter and narrower than the others, more or less conduplicate or convolute especially at apex, white at base, and purple-veined above the white: summer foliage less broad in proportion to its length than in *V. cuspidata* and more apt to be cucullate: apetalous flowers on short but nearly or altogether hypogeous peduncles."

Viola vagula, Greene; *Pittonia*, Vol. IV., 67.

"Dark-green glabrous rather notably fleshy herbage; leaves at time of petaliferous flowering about an inch in diameter, somewhat deltoid-cordate, the length equalling or surpassing the breadth, the margin lightly crenate: peduncles surpassing the leaves, obscurely angled or semiterete, bibracteolate in about the middle, the rather obtuse bractlets with a few obscure glandular teeth: sepals oblong, obtuse: corolla nearly an inch in diameter, the breadth commonly greater than the length; petals deep violet, at base darkly venulose on a white ground, all obovate-spatulate, obtuse or notched, the odd one especially broad and often obcordate, the pair next to it bearing each a dense tuft of rather long and slender not in the least clavellate hairs: style not prolonged beyond the anthers: apetalous

summer flowers aerial, but their peduncles short and more or less horizontal; their capsules short and thick, not dotted.

We have no doubt but that this list would be extended if the necessary time could be spared for more careful examination of our flora.

—

TRILLIUM GRANDIFLORUM, Salisb.

A few years ago several green-flowered Trilliums were observed growing in a flat piece of woods on the banks of the Waterdown Creek, near this city. To see if they were persistent and not merely sports of a season, I visited the locality during the latter part of May, 1897, and, upon a close inspection, found several remarkable forms not previously noted. Some of these may be described as below:—

1st. Several with white edgings and markings on sepals. The most remarkable of these had one sepal green, one half green and half white and the third pure white, while both sepals and petals were inserted in a distinct spiral on the axis; the leaves were normal.

2nd. Leaves and sepals normal. Petals marked with green lines or bands toward the base.

3rd. Leaves and sepals normal. Petals green, with a narrow white margin.

4th. Leaves distinctly petiolate. Petioles one to three inches long; sepals white, with a green stripe down the midrib. Petals narrowed, lanceolate, white, with broad green band in centre, running from base, and terminating near the apex.

5th. Leaves as in No. 4. Sepals normal. Petals obovate. Apiculate long clawed, with broad green centres and white margins.

6th. Leaves ovate, long acuminate, petioled. Petioles ascending, widely spreading, seven inches long, inserted about two inches above the root stock and six or seven inches below the flower. Sepals normal. Petals green, with white margins.

All the flowers seem to be perfect, some having a sterile filament, which might be due to accident.

THE STUDY OF MUSHROOMS.

Read before the Hamilton Association, May 4th, 1899.

BY W. A. CHILD, PH.B., M. A.

In presenting a paper on Mushrooms to this Association, I do not do so with any thought of bringing forward new scientific knowledge, or of presenting any facts that cannot be found in many books on the subject; I only wish to call your attention to a branch of Biology that has been much neglected. If I can excite a little interest in the subject, and induce a few observers to direct their attention to it, I will have attained my end. I wish also to call your attention to the practical value of the study.

How many tons or hundred of tons of the finest food go to waste every year simply for ignorance of its value? No spot is too worthless to produce its harvest of fungi—on rubbish heaps, manure piles, roads, lawns, meadows, pastures, waste fields, woods and swamps—everywhere nature produces these her greatest delicacies, which man in his ignorance despises. Some of the finest mushrooms grow in coal bins and along the sides of railroad tracks. The brakemen and section men take great delight in kicking them. I think no railroad man ever passes a clump of Coprini without bestowing a kick upon it, and the pleasure thus afforded (I believe it is a great and genuine pleasure) seems to be the only good this really delicious mushroom does.

I know of a village near Toronto where, a few years ago, the people were in the greatest distress on account of the financial depression and the collapse of a recent land boom. Many of these people were living from day to day mostly on hope, and often were in great want. All around them were growing in great abundance tons of the finest food equal to the best of meat. There were many kinds of mushroom, and some of the gigantic puff balls as big as a man's head. At current prices in Toronto many families could have made a good living by collecting and selling these, but this would have presupposed a knowledge of their value on the part

of Toronto people, which unfortunately did not exist. These poor people could have themselves subsisted on this bounty of nature, but they too were afraid to touch them, though I daresay if they had run across a deadly *Amanita* they would have eaten it without hesitation, because it resembled the common meadow mushroom.

We are told that on the Continent of Europe the people understand the value of mushrooms much better. In many sections they form one of the principal articles of diet to the peasants; in fact they dry and preserve for winter the summer's abundance. Many of the *Boletus* family are thus dried, including, I believe, some that are generally considered poisonous in this country, and are so rated in our books.

Badham states that in parts of Italy they had a Government-inspector of fungi at the market places, but the mushrooms that he rejected were those in common use in England, while he passed as being beyond suspicion many that are considered deadly in that country. However this may be, it is certain that the prevailing ideas on the subject of mushrooms would be very laughable if they were not so vexatious. Many times, while gathering some particularly attractive clump of the inky mushroom, I have been greeted by the ubiquitous small boy with the remark: "Say, Mister, them's toad-stools!" "I know it." "You ain't goin' to eat 'em, are you?" "Yes." "They'll kill you, sure."

Of all vegetable foods the fungi approach nearest to the animal foods. As animals live on plants or other animals—that is, taking already prepared organic tissues and reworking them for their own use, or storing them up for future consumption—so fungi use the organic matter already prepared for them. Sometimes they get this in the shape of rotten wood, or grass, or sometimes as manure. In this respect they take the same place as animals in nature's economy, and likewise the tissues of fungi are like the flesh of animals in the amount of nitrogeneous matter they contain. Rollrausch & Siegel (as quoted by Taylor) state the nitrogeneous values of different foods as follows: Protein calculated for 100 parts of bread, 8.03; of oatmeal, 9.74; of barley bread, 6.39; of leguminous fruits, 27.05; of potatoes, 4.85; of mushrooms, 33.0.

From a scientific point of view this subject must be particularly interesting. I know of no branch of natural science in which there

is such an opening for original work. Every day new species are being found, or species known in Europe are being, for the first time, found on this continent. Think of the excitement of a botanist that discovered a new species of flower. He would think that such a find rewarded him amply for years of labor.

The whole study of mycology is in a state of chaos. There is room for a great deal of profitable work in finding new fungi, and in more correctly classifying those already found. Years of good work might be spent on each of a great many different genera. The classification of well-known fungi is being continually changed as a result of further investigation.

I know of no complete works on the fungi of this continent or of this district. We depend for systematic classification almost entirely on European authorities.

The mushrooms of this country are nearly identical with those of Europe, so that European works on the subject apply to our specimens more nearly than we would have expected. But there are differences, and descriptions of mushrooms in Europe require revision to cover the same species here.

The father of the study of mycology in Europe was Elias Fries, who published his great work in Latin in 1874. Probably the next best work on the subject is Stevenson's *British Fungi*, 1886, which is based largely on Fries. Berkeley has also written a useful book on the subject, which is widely known.

We are indebted to Mr. Worthington Smith for a key to the classification of the *Hymenomycetes*. The old genus *Agaricus* is generally made to include a great number of sub-genera. The tendency is now, I believe, to elevate these sub-genera to the standing of genera. In this I understand that *Saccardo* is taking the lead. Many mushrooms that were formerly called separate species are now called only varieties, and the old classifications are being changed in many other ways. In this country I know of no complete systematic classification. We have a great many books giving descriptions of a great many different species.

Mr. Peck, of the University of New York, has published, perhaps, the most valuable work on the subject, which is unfortunately out of print. (I have here a copy that I obtained through the courtesy of Mr. Griswold, the Law Librarian at Albany.)

Mr. C. G. Lloyd, of Cincinnati, is doing very valuable work. His pamphlet on the *Volvae* is, I think, the very best work on the subject. He is publishing a series of photographs of mushrooms that is a valuable aid to all students of the subject. Mr. Knox, of Cleveland, is publishing a series of lithographs, colored by hand, in water colors, that is in many respects the best series of drawings of fungi that I have seen.

The Latin word *Fungus* has been adopted to apply to the whole of that class of cryptogams to which mushrooms belong. *Fungus* has by some dreary-minded scoffers been derived from *Funus* (a funeral), but we indignantly reject this derivation as only proceeding from a diseased imagination.

Mushroom is probably derived from the French *Mousseron*, the name used to designate the *Agaricus Prunulus*, a particularly delicious species. *Mousseron* from *Mousse Moss*, so named because it seldom grows in moss.

Much study has been applied to the etymology of Toadstool. One favorite derivation is from the German *Tod* (death) and *Stuhl* (chair)—a most suitable and picturesque origin for the word, all the more attractive that it is probably not the true etymology. How narrow and unscientific must be the mind of one who would reject such an etymology simply because it was not the real history of a word! Then there is "toad" and "stool." A chair for toads! Who ever saw a toad sitting on a toadstool now-a-days? Yet if this derivation be the correct one, there must at one time have been a species of toad that used such a chair. Now, if we accept this derivation, we prove the survival of the hardy species of toads that needed no chairs, and so add one more unassailable link to the chain of evidence of the survival of the fittest.

And there is yet another consideration. Everyone has seen the fairy rings of mushrooms—the *Marasmius Oreades* (they are very numerous on the golf grounds). Now, it is understood that the fairies dance within these rings while the fairy spectators sit perched upon the surrounding mushrooms. Among these mushrooms, but generally a little outside, like chairs drawn into the background, are poisonous toadstools; on these the toads must sit, a little withdrawn from the society circle, on the mushrooms of the fairy ring. The beauty of this derivation is that it establishes the existence of fairies, a point that I always wanted settled.

As these two derivations are totally different and inconsistent with each other, we unhesitatingly adopt them both, to show that we have no narrow prejudices.

When one speaks of mushrooms, the first question always is: "How can you tell the edible from the poisonous mushrooms?" The answer is simple: there is no rule to distinguish them. It is necessary to know each species before eating any quantity of it. You should know the edible species just as you would know an apple or a potato. We hear many rules to distinguish the wholesome from the poisonous, but I think they would all exclude many of the best species, and many such rules would include some of the deadly poisonous ones. I repeat you must know each species before eating largely of it. The deadly *Amanita* is one of the most attractive looking of all the mushrooms; it has no bad odor or taste. There are no bad effects immediately following the eating of it, but in about twelve hours its poison begins to work, and then it is often too late for an antidote. Atropine is supposed to be an antidote for this poison, but I have no ambition to eat any of the *Amanita* for the sake of testing its efficacy.

I believe I am correct in saying that by far the greatest number of mushrooms are edible, or at least not poisonous. There are some that are so tough that they are obviously unfitted for food. Some are acrid or nauseous to taste. I believe that the great majority of the species that are not edible are not at all dangerous. They might produce a slight indigestion, but nothing more.

Fully half of the species, although described botanically, have not been tested as to their food value, and all considered dangerous because unknown. It is, however, quite feasible to try them without danger. After, of course, eliminating the species that are known to be poisonous, an unknown variety may be tested; if not disagreeable to the taste a small quantity may be eaten. After waiting twelve hours, if there are no bad results, a larger quantity could be tried. I have often tested mushrooms this way without any bad effects. Most of the poisonous mushrooms grow in the woods, and the greater part of the mushrooms growing in the open air are edible.

As this has no pretence of being a scientific paper, I will not attempt to describe the classification of mushrooms, except to say that the gill-bearing mushrooms are generally divided into classes,

according to the color of their spores. This is a very convenient classification, and the color of the spores seem to be a much more distinctive feature than the colors in flowering plants.

I will describe a few of the commonest species.

AMANITA—Of all the gill-bearing mushrooms, the Amanita may be taken as a type. They are among the most beautiful, the most shapely and the most typical. They include some of the best of the edible, and alas! they include also the most deadly poisonous.

The spores and gills are white.

The most distinctive feature of the genus is the volva or sack. This is a membrane that covers the whole mushroom at first, as the shell covers the young chicken. As the pileus (or top) expands this membrane tears in two, leaving a few patches generally adhered to the pileus, but often falling off later. The part of the volva left in the ground incloses the end of the stem like a cup. This is the most noticeable characteristic of the genus, although in some species it is inconspicuous or almost wanting. This cup is generally left in the ground when the mushroom is pulled up so that nothing is left to distinguish it from such edible species as the *Lepiota Naucinoides*.

The *Amanita Phalloides* and its variety the *Amanita Verna* are well called the "destroying angels."

They are among the most beautiful of mushrooms and by far the most deadly. I believe the great majority of cases of mushroom poisoning is due to this species. The bad character of this one mushroom has cast suspicion on all the mushroom family.

The *Amanita Muscaria*, or *Fly* mushroom is also poisonous, but not so deadly as its malevolent sister the *Verna*. It has a beautiful scarlet or orange cap with a somewhat sticky cuticle. It is very showy. The name comes from the fact that it has been used as a fly poison. In Siberia the natives use it to produce intoxication. The result of eating a small quantity of it is similar to that produced by an excess of alcoholic drink, and the Siberian natives become very dissipated with the use of it. Fortunately it is rare around Hamilton, or else those who know where to find it wish to keep the knowledge to themselves, a theory not at all in keeping with the well known convivial character of Hamiltonians.

We now come to the King (or I should say, more correctly), the Emperor of Mushrooms, the *Amanita Caesarea*.

It is dressed in royal scarlet or orange, and has always moved in the best circles, having associated with the Roman Emperors thousands of years ago. This was probably the species referred to as the *Boletus*, although this name is now applied to one of the *Polyporei*.

When the good Agrippina wished to make way with her husband Claudius, it was this mushroom, prepared by the skillful *Locusta*, that was given him. Nero called it the food of the gods, for had not the Senate declared Claudius a god. Perhaps it was on account of its relationship with the deadly *Verna* that this species was so dear to the Roman Empress.

The Emperor Jovian is also said, by some, to have been killed by eating mushrooms; possibly he mistook a *Verna* for the *Caesarea*.

Subgenus Lepiota is characterized more especially by a cuticle torn into fringes, somewhat as in the *Coprinus Comatus*. The cuticle is concrete with the substance of the pileus and is not like the volva of the *Amanita* that leaves loose patches of skin on the upper surface of the pileus.

In the *Lepiota* there is no volva. The ring is generally loose and slips up and down on the stem. The stem is generally bulbous and has a hollow in the center stuffed with loose fibres. Spores white. Stem distinct in a socket; gills free. The type of this subgenus is the *Lepiota-Procera*. This is, I think, one of the most beautiful and graceful of all the mushrooms. It is called the umbrella mushroom or parasol mushroom, and it resembles wonderfully a miniature parasol covered with rows of delicate lace fringe right to the top and hanging from the margin. The center is slightly raised or umbonate, and dark brown with the unbroken cuticle that is torn away from the pileus to make the fringes below. The stem is mottled with brown, bulbous and with a large loose ring. On being bruised this fungus turns from white to an orange or rust color. I found a basket full at one time which were a cream white when picked, but the jarring of carrying them home in the basket turned them nearly all to a bright orange color. When cooked they become reddish brown; they had quite a distinct flavor, different from most other mushrooms.

Lepiota Naucinoidea is quite different from the *Procera*. It has no scales or fringes on the pileus. A loose ring, bulbous stem,

stuffed, distinct from the pileus, to which it is attached with a sort of socket. Cuticle smooth, like kid, and the color of a biscuit. This looks almost the same as the common meadow mushroom, except that the gills are a creamy or pinkish white, and the spores are white, never purple or brown. This species is very common on our lawn and in the fields around Hamilton.

Stevenson describes a species similar to this in England, *Ag. Lepiota Naucinus*. It seems to be nearly the same, except that the cuticle breaks into granules, and the ring is described as tender. Taylor states that some of the American species have a slight granulation. The difference is probably one of those slight differences that characterize members of the same species on different sides of the ocean.

I have always avoided the *Naucinoides* on account of its resemblance to the *Amanita Verna*, and I have counselled others to avoid it for that reason. The most notable difference is that the *Verna* has a volva and the *Naucinoides* has not, but as the volva is generally left in the ground when the *Verna* is gathered, this is not to be depended upon as a distinguishing mark if mushrooms are picked by any one but an expert. The *Verna* grows in the woods and the *Naucinoides* in the open, but as they may meet on common ground at the edge of a wood, this also is not to be depended on.

The *Verna* being the most deadly of all the fungi, I have rejected all that resemble it, unless I could see them growing and gather them myself, though I am aware that many people eat the *Naucinoides*, taking it for the common meadow mushroom. They know nothing about the deadly *Amanita*. It is only their good luck that saves them. The same people would look with horror on a Coprin or a puff ball, and would think it sudden and sure death, although these could not possibly be mistaken for any poisonous species.

Coprinus—One of the commonest genus is the *Coprinus*. It is also one of the most useful to know, comprizing as it does, several esculent species that are easily distinguished.

The distinctive feature of this genus is that these mushrooms have dark spores, and after a few days exposure they turn to ink, and run away leaving only a black spot where they had been.

I had this well illustrated about a year ago. Some one kindly

brought me a species (new to me) for examination. After cutting off the stem I laid it, gills down, in a box to take the color of the spores. I forgot it next day, and when I did come to look at it, I found only a black smudge where once a mushroom had been. Clearly it was a *Coprinus*. One of our commonest fungi is the *Coprinus Canatus*, or shaggy, maned mushroom. It is common on our lawns and boulevards, and it thrives equally in lanes and vacant fields and pastures. The pileus is about the shape and size of an egg. Stem white and fibrous, and somewhat bulbous below. The ring slight and easily separated. Gills at first greyish white then becoming black, as it runs away in ink. The cuticle tears away from the pileus in delicate lace-like fringes, brown outside and showing the white substance of the pileus beneath.

It grows on decaying wood or manure, and is a common ornament on our lawns. What flower could be more graceful than this oval pileus with its delicate lacework.

Although few people know that this mushroom is edible, consumers esteem it among the very best.

Coprinus Atramentarius, or Inky Mushroom, is a plebeian fungus, but notwithstanding its democratic instincts, I esteem it among the best. It grows on rotten wood in old coal bins, and on the railroad tracks. It might be called the railroad mushroom, as it has a peculiar fondness for railroad tracks, just outside the rail, where the oil drops from the axle boxes. Among oil, coal and general blackness it particularly flourishes. It is often found on our lawns, but then it is pale and crowded together as if ashamed of being out of its proper place. Around factories and railroads it most rejoices. I have found enough for a fine meal in the Toronto Union Station. Beside a rail, in the opening left for the wheel flange, the poor fungi were vainly seeking room for their proper development between a three inch plank and an eighty pound steel rail.

The *Atramentarius* is totally devoid of a sense of humor; to see a bunch of these mushrooms smashing their soft bodies in a vain endeavor to lift a steel rail is fairly laughable, but they never learn better. These mushrooms are easily distinguished, and impossible to mistake for any other species. They have a drab pileus and gills when young, and as they grow old the edge of the pileus expands, splits and drops its inky fluid. No ring, but a distinct

mark on the stem where the pileus separates from it on expanding. The cuticle will not peel off, and is moist, or rather slimy—stem stout and fibrous.

These mushrooms come up so thickly crowded that they press each other all out of shape, so that they are frequently triangular, square or octagon, some grow under others, so that they are in one dense mass.

ANNUAL REPORT OF THE PHOTOGRAPHIC SECTION
OF THE HAMILTON ASSOCIATION, 1898-99.

During the past year this section has met 16 times, and 11 members have been added to the roll.

A new electric projecting lantern was purchased from Thompson, Boston, and was used for the first time on May, 31, 1898, when the Hamilton Canadian Interchange set of slides was shown. The lantern proved very satisfactory, giving a strong white light; and as the intensity of the light can be varied to suit the density of the slide being used, very good results can be obtained.

An enlarging camera with electric light and 10-inch condenser has been fitted up in the dark room. This apparatus has been very popular among the members, and some creditable work has been produced with it.

For some time the members of the section have been agitating for better dark room accommodation, and a committee was appointed to consider ways and means to attain some improvement. If this were remedied, and a larger and better fitted dark room constructed, it would be a great boon to the members of the section, and would certainly benefit the Association materially and financially.

The American Interchange sets of slides have been shown at intervals through the winter months. These exhibitions have been entirely free of charge, and, as there is considerable expense incurred by the section in connection with these open meetings, it is hoped that the Association will see its way to help on the work financially by voting a liberal grant to the Photographic Section.

All the open meetings have been well attended and much appreciated, and the section feels gratified that so many members of the other sections of the Association have attended the meetings.

All the sets of slides shown this season have been above the average, both in technique and in artistic quality.

An additional interest was added to these exhibitions by the

criticism given by J. S. Gordon, to whom the section is much indebted for kindly advice and hints given whenever wanted.

An exhibition of the members' work was given at the opening of the Hamilton Association, which was very highly appreciated. The section will endeavor to make this an annual feature.

An illustrated lecture on "The Cathedrals of England" was given under the auspices of the Photographic Section by Mr. Pearce. The lecture was well attended, every available seat being occupied, and an interesting and enjoyable evening was spent.

The section is also indebted to Mr. A. M. Cunningham, who has always been ready to lend a helping hand, and who, on several occasions, gave interesting and instructive demonstrations.

J. M. EASTWOOD,
Chairman.

J. R. HEDDLE,
Secretary.

DONATIONS TO THE HAMILTON ASSOCIATION
MUSEUM, SESSION OF 1898 TO 1899.

The head of a large sturgeon. The sturgeon and gar pike of the Canadian Lakes are living representatives of the ancient Ganoids. Donor, Col. C. C. Grant.

A singular stone arrow point, made out of cliff stone to the south of the City of Hamilton. It is the only specimen from that kind of stone the donor (Col. C. C. Grant) has ever seen or known to be found.

Specimen of carborundum, lately produced and placed on the market for grinding wheels and other purposes, the same as emery and corundum. Donor, Mr. S. Briggs.

Specimen of salt, from Mrs. S. E. Carry.

Mrs. Carry's and other friends' large collection of shells, corals, etc., prove very attractive.

Donation from Mr. A. E. Walker to the Geological collection is as follows :

STROMATOPORIDÆ.

GUELPH FORMATION.

Cœnostroma (Eloraence)	- - - -	At Durham.
Stromatora (Substriatella)	- - - -	"
New Specimen (not named)	- - - -	"
Clathrodictyræ (Ostiolatum)	- - - -	"
Stromatopora (Mammillata)	- - - -	"
Clathrodictyra (Fastigatum)	- - - -	"
Cœnostroma (Galtence)	- - - -	"
Syringastroma (Columnare)	- - - -	"

NIAGARA.

Stromatopora (Antigua)	- - - -	At Thorold.
Cœnostroma (Botryoideum)	- - - -	At Hamilton.
Cœnostroma (Constellatum)	- - - -	"
Clathrodictyon (Vasiculatum)	- - - -	"
Caunopora (Walkereri)	- - - -	"

DEVONIAN.

Stromatopora (Granulater)	- - - - -	At Hagersville.
Cœnostroma (Densum)	- - - - -	At Sandwich.
One not named	- - - - -	At London.
Cœnostroma (Pustuliferum)	- - - - -	At Hagersville.
Stromatira (Substriatella)	- - - - -	At Marble Head.

TRENTON.

Stromatocerium (Rugosum)	- - - - -	At Trenton.
Strephochetus	- - - - -	At Simcoe.
Stromatopora (Pappilatta)	- - - - -	"
Beatricea (Undulata)	- - - - -	Anticosti.

(This species is placed by S. A. Miller with these forms.)

Each one of these forms has been highly polished, so that the structure can be distinctly seen.

The Museum has been kept open every Saturday afternoon from half-past 2 to 5 o'clock throughout the year, and a large number of friends from all parts of the Province have visited it, also a great number of the city school pupils.

ALEX. GAVILLER,
Curator.

HAMILTON ASSOCIATION.

Statement of Receipts and Disbursements for the year ending May, 1899.

RECEIPTS.

Cash balance, 1898.....	4.....	\$ 67 20
Government Grant.....		400 00
Members' subscriptions.....		98 00
Horticultural Society Rent.....		11 00
Wentworth Historical Society Rent.....		1 50
Gas Company (refund).....		48
		<hr/>
		\$578 18

DISBURSEMENTS.

Rent of Museum.....		\$105 50
Rent of Dark Room, Photographic Section.....		12 00
Caretaker (9 months).....		31 50
Caretaker, extra help, etc.....		12 15
Insurance.....		20 00
Gas Accounts.....		14 04
Competition Prize, Botanical Section.....		5 00
Printing.....		8 25
Postage and Stationery.....		20 24
Journal and Proceedings.....		133 75
Grant to Photographic Section.....		59 70
Sundry Accounts.....		8 20
		<hr/>
		\$430 33
Balance on hand.....		147 85
		<hr/>
		\$578 18

We have examined the vouchers and found them correct.

H. S. MOORE,	} Auditors.
F. HANSEL,	

REPORT OF THE CORRESPONDING SECRETARY FOR
THE SESSION OF 1898-1899.

To the Officers and Members of the Hamilton Association :

Your Corresponding Secretary for the year 1898-1899 begs leave to report that :

1. He has carried on the ordinary correspondence of the Association.
2. He has received and acknowledged the exchanges in accordance with the subjoined list of institutions and societies, and these various bodies have also been furnished with copies of our last annual "Journal and Proceedings."

THOMAS MORRIS, JR.

LIST OF EXCHANGES.

I.—AMERICA.

(1) Canada.

Astronomical and Physical Society.....	Toronto.
Canadian Institute.....	Toronto.
Natural History Society of Toronto.....	Toronto.
Department of Agriculture.....	Toronto.
Library of the University.....	Toronto.
Public Library.....	Toronto.
Geological Survey of Canada.....	Ottawa.
Ottawa Field Naturalists' Club.....	Ottawa.
Ottawa Literary and Scientific Society.....	Ottawa.
Royal Society of Canada.....	Ottawa.
Department of Agriculture.....	Ottawa.
Entomological Society.....	London.
Kentville Naturalists' Club.....	Kentville, N. S.
Murchison Scientific Society.....	Belleville.
Natural History Society.....	Montreal.
Library of McGill University.....	Montreal.
Nova Scotia Institute of Natural Science.....	Halifax.
Literary and Historical Society of Quebec....	Quebec.
L'Institut Canadien de Quebec.....	Quebec.
Natural History Society of New Brunswick....	St. John.
Manitoba Historical and Scientific Society....	Winnipeg.
Guelph Scientific Association.....	Guelph.
Queen's University.....	Kingston.
Niagara Historical Society.....	Niagara.

(2) United States.

Kansas Academy of Science.....	Topeka, Kan.
Kansas University Quarterly.....	Lawrence, Kan.
American Academy of Arts and Sciences.....	Boston, Mass.
Psyche.....	Cambridge, Mass.
Library of Oberlin College.....	Oberlin, Ohio.

American Association for Advancement of Science.....	Salem, Mass.
Museum of Comparative Zoology.....	Cambridge, Mass.
American Dialect Society.....	Cambridge, Mass.
United States Department of Agriculture.....	Washington, D. C.
Biological Society of Washington.....	Washington, D. C.
Philosophical Society of Washington.....	Washington, D. C.
Smithsonian Institution.....	Washington, D. C.
United States Geological Survey.....	Washington, D. C.
American Society of Microscopists.....	Buffalo, N. Y.
Buffalo Society of Natural Sciences.....	Buffalo, N. Y.
California Academy of Sciences.....	San Francisco, Cal.
California State Geological Society.....	San Francisco, Cal.
Santa Barbara Society of Natural History.....	San Francisco, Cal.
University of California.....	Berkley, Cal.
Minnesota Academy of Natural Sciences.....	Minneapolis, Minn.
Academy Natural Sciences.....	Philadelphia, Pa.
Academy of Sciences.....	St. Louis, Mo.
Missouri Botanical Gardens.....	St. Louis, Mo.
American Chemical Society.....	New York City.
New York Microscopical Society.....	New York City.
The Linnean Society.....	New York City.
American Astronomical Society.....	New York City.
American Geographical Society.....	New York City.
New York Academy of Science.....	New York City.
Terry Botanical Club.....	New York City.
Central Park Menagerie.....	New York City.
American Museum of Natural History.....	New York City.
Scientific Alliance.....	New York City.
Cornell Natural History Society.....	Ithaca, N. Y.
Johns Hopkins University.....	Baltimore, Md.
Kansas City Scientist.....	Kansas City, Mo.
Wisconsin Academy of Science, Arts, and Letters.....	Madison, Wis.
Society of Alaskan Natural History and Ethnology.....	Sitka, Alaska.
University of Penn.....	Philadelphia, Pa.
Franklin Institute.....	Philadelphia, Pa.

War Department.....	Washington.
Field Columbian Museum.....	Chicago.
Academy of Sciences.....	Chicago.
Agricultural College.....	Lansing, Mich.
Colorado Scientific Society.....	Denver, Col.
Museum of Natural History.....	Albany, N. Y.
State Geologist.....	Albany, N. Y.
Rochester Academy of Sciences.....	Rochester, N. Y.
Indiana Academy of Sciences.....	Indianapolis, Ind.
Davenport Academy of Natural Sciences.....	Davenport, Iowa.
Pasadena Academy of Sciences.....	Pasadena, Cal.

(3) West Indies.

Institute of Jamaica.....	Kingston, Jamaica.
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(4) South America.

The Royal Agricultural and Commercial Society of British Guiana.....	Georgetown.
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II.—EUROPE.

(1) Great Britain and Ireland.

England.

British Naturalists' Club.....	Bristol.
Literary and Philosophical Society of Leeds...	Leeds.
Conchological Society.....	Leeds.
Royal Society.....	London.
Royal Colonial Institute.....	London.
Society of Science, Literature and Art.....	London.
Geological Society.....	London.
Manchester Geological Society.....	Manchester.
Mining Association and Institute of Cornwall..	Camborne.
Cardiff Photographic Society.....	Cardiff.
Owens College, Conchological Society.....	Manchester.

Scotland.

Glasgow Geographical Society.....	Glasgow.
Philosophical Society.....	Glasgow.

Ireland.

- Royal Irish Academy Dublin.
 Royal Geological Society of Ireland Dublin.
 Naturalists' Field Club Belfast.

(2) Austria-Hungary.

- Anthropologische Gesellschaft Vienna.
 K. K. Geologische Reichsanstalt Vienna.
 Trencsin Scientific Society Trencsin.

(3) Belgium.

- Societe Geologique de Belgique Liege.

(4) Denmark.

- Societe Royal des Antiquaires du Nord Copenhagen.

(5) France.

- Academie Nationale des Sciences, Belles Lettres
 et Arts Bordeaux.
 Academie Nationale des Sciences, Arts et Belles
 Lettres Caen.
 Academie des Nationale Science, Arts et Belles
 Lettres Dijon.
 Societe Geologique du Nord Lille.
 Societe Geologique de France Paris.

(6) Germany.

- Naturwissenschaftlicher Verein Bremen.
 Naturwissenschaftlicher Verein Carlsruhe.

(7) Russia.

- Comite Geologique St. Petersburg.
 Russisch-Kaiserliche Mineralogische Gesell-
 schaft St. Petersburg.

III.—ASIA.

(1) India.

- Asiatic Societies of Bombay and Ceylon.
 Asiatic Society of Bengal..... Calcutta.
 Geological Survey of India..... Calcutta.

(2) Straits Settlements.

- The Straits Branch of the Royal Asiatic
 Society..... Singapore.

(3) Japan.

- Asiatic Society of Japan..... Tokyo.

IV.—AFRICA.

(1) Cape Colony.

- South African Philosophical Society..... Capetown.

V.—AUSTRALIA.

(1) Australia.

- The Australian Museum..... Sydney.
 Royal Society of New South Wales..... Sydney.
 Linnean Society of New South Wales..... Sydney.
 Australian Natural History Museum..... Melbourne.
 Public Library of Victoria..... Melbourne.
 Royal Society of Queensland..... Brisbane.
 Queensland Museum..... Brisbane.

(2) New Zealand.

- New Zealand Institute..... Wellington.

(3) Tasmania.

- Royal Society of Tasmania..... Hobartown.

LIST OF MEMBERS

OF THE HAMILTON ASSOCIATION.

HONORARY.

- 1881 Grant, Lt.-Col. C. C., Hamilton.
1882 Macoun, John, M. A., Ottawa.
1885 Dawson, Sir Wm., F. R. S., F. G. S., F. R. C. S., Montreal.
1885 Fleming, Sanford, C. E., C. M. G., Ottawa.
1885 Farmer, William, C. E., New York.
1886 Small, H. B., Ottawa.
1887 Charlton, Mrs. B. E., Hamilton.
1887 Dee, Robert, M. D., New York.
1887 Keefer, Thomas C., C. E., Ottawa.
1890 Burgess, T. J. W., M. D., F. R. S. C., Montreal.
1891 Moffat, J. Alston, London.
1898 Carry, Mrs. S. E., Hamilton.

CORRESPONDING.

- 1871 Seath, John, M. A., Toronto.
1881 Clark, Chas. K., M. D., Kingston.
1881 Spencer, J. W., B. Sc., Ph. D., F. G. S., Savannah, Ga.
1882 Lawson, A. C., M. A., California.
1884 Bull, Rev. Geo. A., M. A., Niagara Falls South.
1885 Froot, T., Sudbury.
1889 Yates, Wm., Hatchley.
1889 Kennedy, Wm., Austin, Tex.
1891 Hanham, A. W., Quebec.
1891 Woolverton, L., M. A., Grimsby.

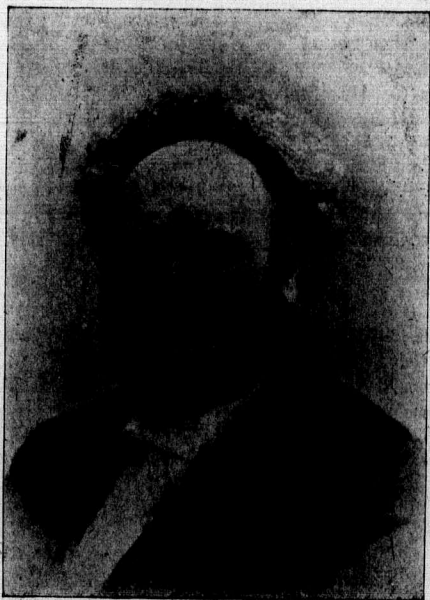
LIFE.

- 1885 Proudfoot, Hon. Wm., Q. C., Toronto.

ORDINARY.

- Alexander, A., F. S. Sc.
Aldous, J. E. P., B. A.
Adam, Jno.
Aitcheson, W. J.
Appleton, L. G.
Ballard, W. H., M. A.
Ballard, John F.
Baby, W. A. D.
Baker, A. H.
Bale, F. J.
Baldwin, T. O.
Barton, Geo.
Beasley, Thos.
Beasley, Mrs. Thos.
Beckett, H.
Bertram, Jas. B.
Bicknell, H. H.
Birrell, Wm.
Black, Geo.
Briggs, Samuel.
Burkholder, J. G. Y.
Burns, J. M.
Charlton, B. E.
Campbell, D. J.
Campbell, Robt.
Clark, D., D. D. S.
Crawford, J. T., B. A.
Crawford, A.
Childs, W. A., M. A.
Clappison, Fred. P.
Coburn, H. P.
Cummer, Albert.
Cummings, S., M. D.
Davidson, Mrs. M.
Dickson, J. M.
Eastwood, John M.
Eager, F. O.
Edwards, W. H.
Elliott, W. H., B. A.
Fearman, F. W.
Fearman, R. C.
Findlay, W. F.
Gadsby, J.
Gaviller, Alex.
Gaviller, E. A., M. D.
Garrett, A.
Graham, C. O.
Grant, W. J.
Grant, A. R.
Greene, Joseph
Grossman, Julius
Hansel, Franklin, D. D. S.
Hedde, J. R.
Hemming, A. H. H., O. S. A.
Herriman, W. C., M. D.
Holcroft, C. J.
Hore, J. G.
Husband, Geo.
Jones, C. J.
Lancefield, R. T.
Land, J. H.
Lee, Lyman, B. A.
Lees, Geo.
Leaney, C. A.
Leggat, Matthew
Linger, Jesse
Logan, W. F.
Logan, W. McG., M. A.
Lottridge, Murray
Marshall, Wm.
Mills, Edwin
Mitchell, W. M.

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| Morgan, S. A., B. A., D. Paed. | Schuler, J. |
| Moodie, J. R. | Scriven, P. L. |
| Moodie, Jas. | Sero, J. O. Brant |
| Moore, H. S. | Souter, D. A. |
| Morris, Thos., Jr. | Strathy, Stuart |
| Mullin, Arch. | Thompson, R. A., B. A. |
| McIlwraith, Thos. | Thompson, W. C. |
| McInnes, Hon. Donald | Tøye, Walter |
| McLagan, Alex. | Trigge, H. H. |
| McLaren, Col. Hy. | Tuckett, Geo. E. |
| McKenzie, Ian | Turnbull, A. C. |
| McKenzie, A. M. | Turnbull, J. D. |
| McPherson, F. F., B. A. | Turner, J. B., B. A. |
| Neill, A. T. | Tyrrell, J. B., C. E. |
| Pothier, C. A. | Vernon, Elias, M. D. |
| Pottenger, John | Walker, A. E. |
| Patterson, P. | Wallace, W. |
| Powis, A. | White, Wm. |
| Randell, D. | Wilson, T. |
| Reynolds, T. W., M. D. | Wilson, Wm. |
| Roach, Geo. | Witton, H. B. |
| Robertson, R. A. | Witton, H. B., Jr., B. A. |
| Robinson, W. A. | Witton, W. |
| Rutherford, Geo. | Woddell, J. E. |
| Sanford, Hon. W. E. | Young, J. M. |



THE LATE REV. WM. ORMISTON, D. D., LL.D.

Obituary.

The late Rev. Wm. Ormiston, D. D., LL.D.

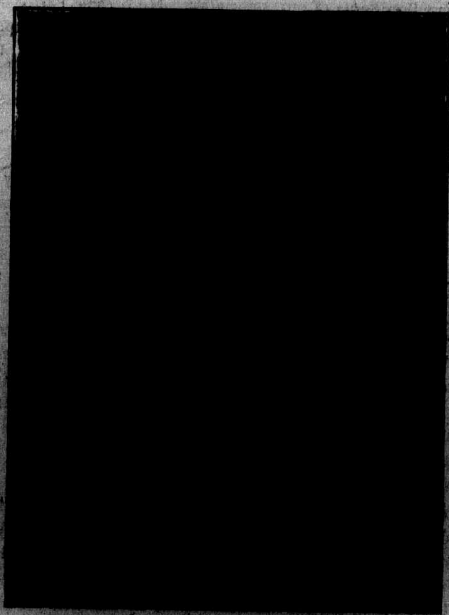
DR. ORMISTON, whose death took place in April last, was one of the earliest Presidents of our Association. He became Pastor of the Central Presbyterian Church of this city in 1857, and was a prominent factor in the religious, intellectual and scientific life of the city until 1870, when he removed to New York, where he entered upon that distinguished career which made his name a household word all over this continent.

Previous to coming to Hamilton he had been for 4 years Mathematical Master and Lecturer in Natural Philosophy and Chemistry at the Normal School, Toronto. We are not surprised, therefore, to find that, as soon as he settled in this city, he connected himself with the Hamilton Association and took a very active interest in its welfare, and contributed in no small degree to its success.

He had all the necessary qualifications for this. His versatile scholarship and scientific tastes, combined with his strong natural character and pure sympathy, revealed themselves in the scientific or literary meeting as well as in his pulpit ministrations. He was pre-eminently a man of genial manner, and all his utterances in the meetings of the Association, while marked by logical force, emphasis and fervor, were nevertheless gentle withal.

He was an Honorary Member of the Association, and contributed a paper on "The Natural History of California" after his removal to California in 1890, he having to resign his charge in New York in that year on account of ill-health. The greater portion of the late years of his life has been spent in California, where he died about the end of March this year.

Though so few of the present members of this Association had the pleasure of his friendship, yet we mourn his loss, for it is the breaking of another link, uniting us of the present with the past eminent men who founded and sent down to us our organization with the inspiration of their names and deeds.



THE LATE JOHN ALEXANDER MULLAN, M. D.

Obituary.

John Alexander Mullin, M. D.,

a past Vice-President of the Hamilton Association, died February the 21st, 1899. Dr. Mullin was born June 10th, 1835, in the City of New York, U. S., but his parents, in his early childhood, removed to Upper Canada, and settled on an uncleared farm in the vicinity of Hamilton. His early youth was spent on his father's farm, and after the necessary preparatory training at the common and grammar schools of that day, it was decided that he should study medicine under the well known Dr. Rolph. That decision was carried into effect, and young Mullin, under Dr. Rolph's tuition, graduated in medicine at Victoria University College in 1859, and the next year became a licentiate of the Ontario Medical faculty. After professional hospital experience in New York, he entered on the practice of medicine in Hamilton, where he had a large clientage, and where he died. For nearly thirty years he was an active medical advisor of the Canada Life Assurance Company, a position of trust and responsibility.

In his youth Dr. Mullin imbibed a love for literature, which nothing in after years impaired, but which waxed fresher and more vigorous to the end of life. Assiduously devoted to the exacting duties of his profession, he strove to keep abreast of the biological discoveries of the time, and watched with keenness those modern experiments which have thrown light on the life history of microscopic organisms.

Dr. Mullin was endowed with an acute intellect, and a sincere sympathetic nature which endeared him to a large circle of friends. Tolerant of the opinions of others, he was not indifferent to maintenance of his own convictions, which by tongue and pen he had the faculty to expound and defend with fluency, precision, and grace.