Technical and Bibliographic Notes / Notes techniques et bibliographiques

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

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

☑ Coloured covers/
Couverture de couleur

☐ Covers damaged/
Couverture endommagée

☐ Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée

☐ Cover title missing/
Le titre de couverture manque

☐ Coloured maps/
Cartes géographiques en couleur

☑ Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire)

☐ Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur

☐ Bound with other material/
Relié avec d'autres documents

☑ Tight binding may cause shadows or distortion along interior margin/
La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure

☐ Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.

☐ Coloured pages/
Pages de couleur

☐ Pages damaged/
Pages endommagées

☐ Pages restored and/or laminated/
Pages restaurées et/ou pelliculées

☑ Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées

☐ Pages detached/
Pages détachées

☑ Showthrough/
Transparence

☑ Quality of print varies/
Qualité inégale de l'impression

☐ Continuous pagination/
Pagination continue

☐ Includes index(es)/
Comprend un (des) index

Title on header taken from:/
Le titre de l'en-tête provient:

☐ Title page of issue/
Page de titre de la livraison

☐ Caption of issue/
Titre de départ de la livraison

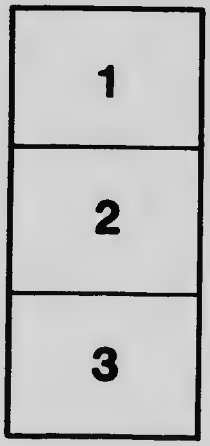
☐ Masthead/
Générique (périodiques) de la livraison

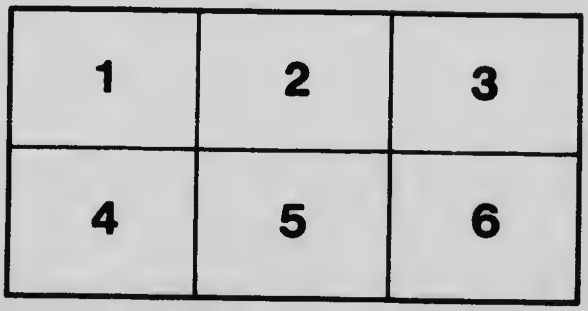
☐ Additional comments:/
Commentaires supplémentaires:

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

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

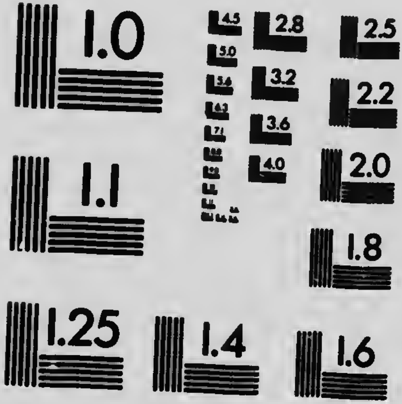

1
2
3


1
2
3


1
2
3
4
5
6

MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



FIFTIETH ANNIVERSARY

REV. W. ORMISTON, D.D.

First President, 1857-59-61

PROCEEDINGS

OF THE

Jubilee Celebration

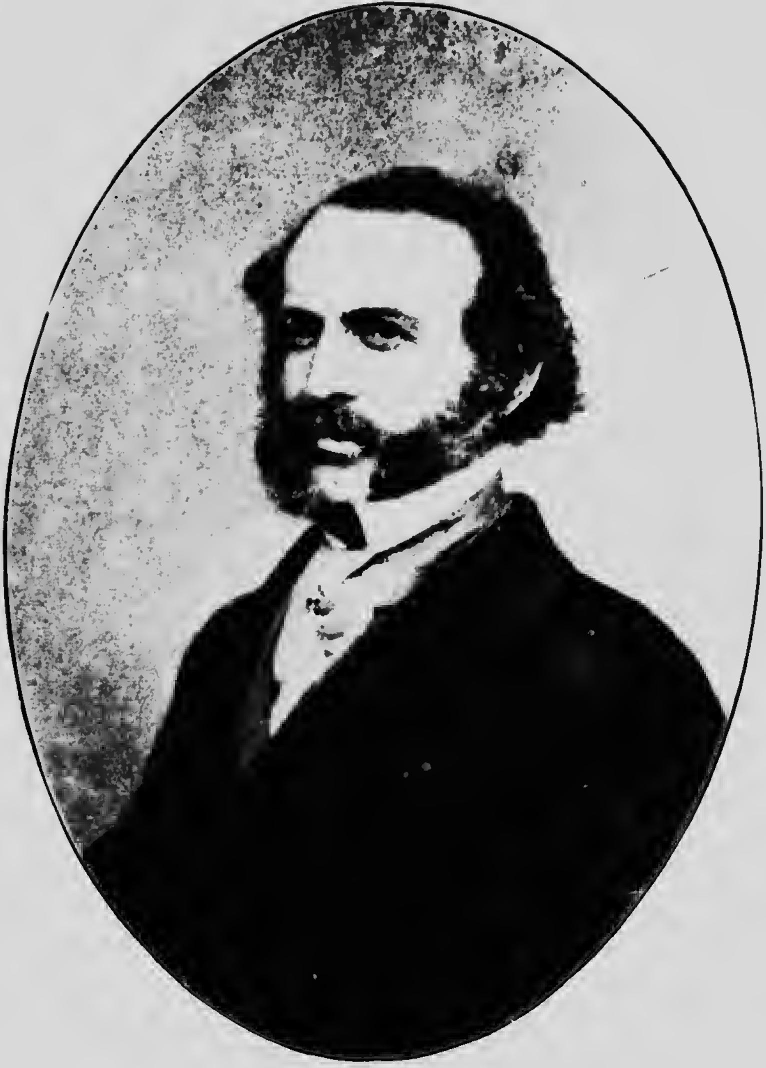
OF THE

Hamilton Scientific Association

HELD AT THE

HAMILTON CONSERVATORY OF MUSIC
NOVEMBER 8TH, 1907

1857-1907



JOHN RAE, M.D., F.R.G.S.

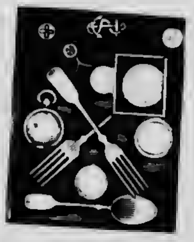
President, 1858

Franklins ships were in april. 1848
abandoned by the crew. 105 officers and men - 9 officers & 15
men had died in 1847/8. - I brought home first news of
their fate, for which my
party received reward of
$50,000

+ arctic relics
& Geogal society's Gold medal

Was on five Expeditions to the arctic in 1846/7 1848·1849
1850/1. and 1853/4 - On the last received the
news of the fate of the Franklin party who
had left England in 1845 and died in 1848

On these several Expeditions I explored
nearly 1800 miles of new coast line, and
searched some thousands of miles before explored
John Rae



+

PREFATORY

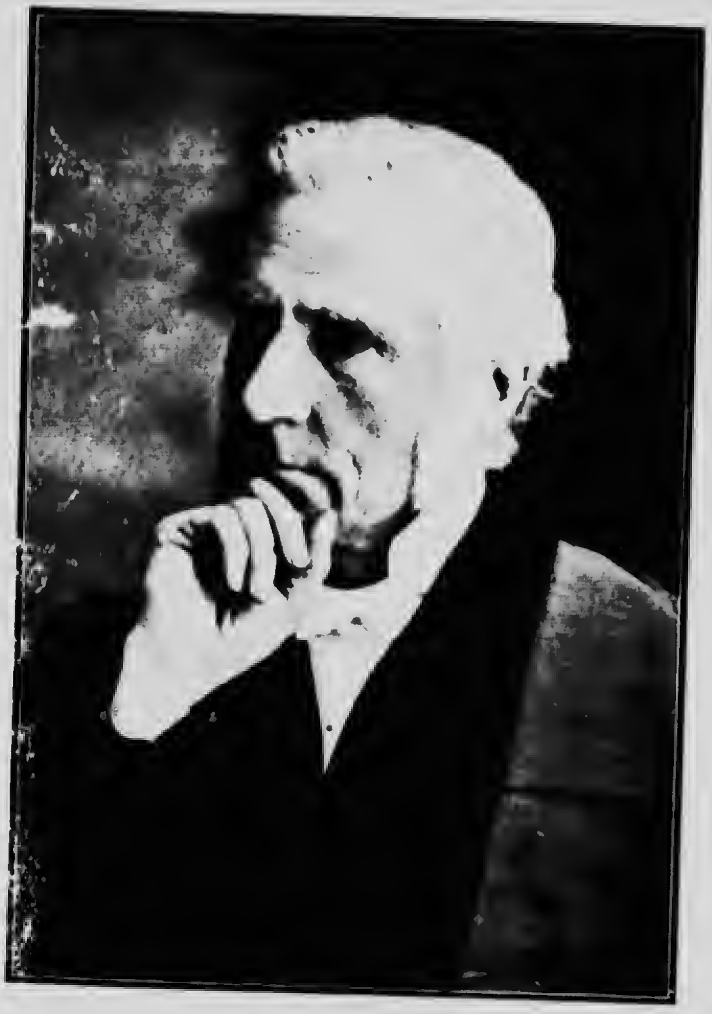
The Hamilton Association for the promotion of Science, in 1907 had been established just fifty years, being, in point of age, of equal rank with almost any of its kindred societies founded in Canada. At the instance of friends, the Society's Council suggested that the first meeting for the season of 1907-8 should be made the occasion of some befitting commemoration of the Association's fiftieth anniversary.

That proposal received general sanction, and was carried into effect at the meeting, held on November the 8th, 1907. That was a pleasant reunion of old associates; and from distant members interesting communications were received. Extracts from the minutes of the first meeting, held half a century before, were read; and short addresses by the president, and by other members, furnished piquant reminiscences as to the personnel of the founders of the Society, and of the work they set themselves to accomplish.

A full report of that meeting will be found in the following pages. Many subjects of local interest are referred to. And apart from local questions, some may find it interesting to trace the story how a handful of busy men, favored by little factitious aid, diffidently, though persistently, strove to attain and diffuse some measure of scientific knowledge, and how they explored some secrets of the Natural History and Antiquities of the comparatively small area of this part of the lower lake district of Canada.

REV. W. INGLIS, D.D.

President, 1860



VICE-CHANCELLOR PROUDFOOT

President, 1871

Officers for 1907-1908.

President

R. J. HILL

1st Vice-President

J. M. WILLIAMS

2nd Vice-President

WM. ACHESON

Corresponding Secretary

S. A. MORGAN, B.A., D. Paed.

Recording Secretary

J. F. BALLARD

Treasurer

P. L. SCRIVEN

Curator

COL. C. C. GRANT

Assistant Curator

J. M. WILLIAMS

Auditors

E. H. DARLING

SINCLAIR G. RICHARDSON

Council

JAMES GADSBY

ROBERT CAMPBELL

LYMAN LEE, B.A.

C. G. MILNE, B.Sc.

A. H. BAKER

OFFICE-

	President.	First Vice-Pres.	Second Vice-Pres.
1857	Rev. W. Ormiston, D.D.	John Rae, M.D.,F.R.G.S.	J.B.Hulburt,M.A.,LL.D.
1858	John Rae, M.D.,F.R.G.S.	Rev. W. Ormiston, D.D.	J.B.Hulburt,M.A.,LL.D.
1859	Rev. W. Ormiston, D.D.	J. B. Hulburt,M.A.,LL.D	Charles Robb
1860	Rev. W. Inglis, D.D.	T. McIlwraith	Rev. W. Ormiston, D.D.
1861	Rev. W. Ormiston. D.D.	J. B. Hulburt,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
1881	J. D. McDonald, M.D.	R. B. Hare, Ph.D.	B. E. Charlton
1882	J. D. McDonald, M.D.	B. E. Charlton	J. A. Mullin, M.D.
1883	J. D. McDonald, M.D.	B. E. Charlton	H. B. Witton
1884	J. D. McDonald, M.D.	H. B. Witton	Rev. C. H. Mockridge, M.A., D.D.
1885	Rev. C. H. Mockridge, M.A., D.D.	Rev. S. Lyle	W. Kennedy
1886	Rev. C. H. Mockridge, M.A., D.D.	Rev. S. Lyle	Matthew Leggat
1887	Rev. S. Lyle, B.D.	B. E. Charlton	W. A. Child, M.A.
1888	Rev. S. Lyle, B.D.	T. J. W. Burgess, M.B., F.R.S.C.	W. A. Child, M.A.
1889	B. E. Charlton	T. J. W. Burgess. M.B., F.R.S.C.	J. Alston Moffat

BEARERS

Cor. Sec.	Rec. Sec.	Treas.	Lib. and Cur.
T. C. Keefer, C.E..	Wm. Craigie, M.D...	W. H. Park	A. Harvey
T. C. Keefer, C.E..	Wm. Craigie, M.D....	W. H. Park	A. Harvey
T. C. Keefer, C.E...	Wm. Craigie, M.D....	W. H. Park	A. Harvey
Wm. Craigie, M.D.	Wm. Craigie, M.D....	W. H. Park	Charles Robb
Wm. Craigie, M.D.	Wm. Craigie, M.D...	W. H. Park	T. McIlwraith
J. M. Buchan, M.A.	I.B.McQuesten,M.A..	W. G. Crawford .	T. McIlwraith
J. M. Buchan, M.A.	I.B.McQuesten,M.A..	W. G. Crawford .	T. McIlwraith
Geo. Dickson, M.A..	Geo. Dickson, M.A...	Richard Bull	T. McIlwraith
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
R. B. Hare, Ph.B..	Geo. Dickson, M.A...	Richard Bull	A. T. Freed
Geo. Dickson, M.A..	A. Robinson. M.D...	Richard Bull	W. H. Ballard, M. A.
Geo. Dickson, M.A..	Wm. Kennedy	Richard Bull	W. H. Ballard, M. A.
Geo. Dickson, M.A..	Wm. Kennedy	Richard Bull	W. H. Ballard, M. A.
Geo. Dickson, M.A..	A. Alexander.......	Richard Bull	Wm. Turnbull
Geo. Dickson, M.A..	A. Alexander	Richard Bull	A. Gaviller
Geo. Dickson, M.A..	A.Alexander,F.S.Sc..	Richard Bull	A. Gaviller
H. B. Witton, B.A..	A.Alexander,F.S.Sc..	Richard Bull	A. Gaviller
H. B. Witton, B.A..	A.Alexander,F.S.Sc..	Richard Bull	A. Gaviller
H. B. Witton, B.A..	A.Alexander,F.S.Sc..	Richard Bull	A. Gaviller

OFFICE

	President.	First Vice-Pres	Second Vice-Pres
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
1899	T. W. Reynolds, M.D.	A. E. Walker	J. M. Dickson
1900	S. A. Morgan, B.A., D. Pæd.	J. M. Dickson	Wm. C. Herriman, M.D.
1901	S. A. Morgan, B.A., D. Pæd.	J. M. Dickson	Robert Campbell
1902	J. M. Dickson	Robert Campbell	W. A. Child, M.A.
1903	J. M. Dickson	Rev. D. B. Marsh, Sc.D	W. A. Robinson
1904	G. L. Johnston, B.A.	Rev. D. B. Marsh, Sc.D.	R. A. Ptolemy
1905	G. L. Johnston, B.A.	Rev. D. B. Marsh, Sc.D.	James Gadsby
1906	R. J. Hill	Rev. D. B. Marsh, Sc.D.	James Gadsby
1907	R. J. Hill	J. M. Williams	Wm. Acheson

BEARERS

Cor. Sec.	Rec. Sec.	Treas.	Lib. and Cur.
H. B. Witton, B.A.	A. Alexander, F.S.Sc.	Richard Bull	A. Gaviller
Thomas S. Morris	A. W. Stratton, B.A.	Richard Bull	A. Gaviller and G. M. Leslie
Thomas S. Morris	C. R. McCullough	Richard Bull	A. Gaviller and G. M. Leslie
W. McG. Logan, B.A	S. A. Morgan, B.A.	Thomas S. Morris	A. Gaviller and W. Chapman
W. McG. Logan, B.A	S. A. Morgan, B.A.	Thomas S. Morris	A. Gaviller and W. Chapman
Rev. J. H. Long, M.A., LL.D.	S. A. Morgan, B.A.	J. M. Burns	A. Gaviller and W. Chapman
Rev. J. H. Long, M.A. LL.D.	S. A. Morgan, B.A. B. Pæd.	P. L. Scriven	A. Gaviller and H. S. Moore
F.F.Macpherson, B.A	S. A. Morgan, B.A. B. Pæd.	P. L. Scriven	A. Gaviller and H. S. Moore
Wm. C. Herriman, M. D.	S. A. Morgan, B.A., B. Pæd.	P. L. Scriven	A. Gaviller
Thomas S. Morris	S. A. Morgan, B.A. B. Pæd.	P. L. Scriven	A. Gaviller and J. Schuler
Thomas S. Morris	G. L. Johnston, B.A.	P. L. Scriven	A. Gaviller and J. Schuler
Thomas S. Morris	G. L. Johnston, B.A.	P. L. Scriven	A. Gaviller and J. Schuler
F.F.Macpherson, B.A.	G. L. Johnston, B.A.	P. L. Scriven	A. Gaviller and J. Schuler
R. J. Hill	G. L. Johnston, B.A.	P. L. Scriven	J. Schuler
R. J. Hill	J. F. Ballard	P. L. Scriven	Col. C. C. Grant
R. J. Hill	J. F. Ballard	P. L. Scriven	Col. C. C. Grant
G. Parry Jenkins, F.R.A.S.	J. F. Ballard	P. L. Scriven	Col. C. C. Grant and J. M. Williams
S. A. Morgan, B.A., D. Pæd.	J. F. Ballard	P. L. Scriven	Col. C. C. Grant and J. M. Williams

Members of Council

1857—Judge Logie, George L. Reid, C.E., A. Baird, C. Freeland.

1858—Judge Logie, C. Freeland, Rev. W. Inglis, D.D., Adam Brown, C. Robb.

1859—Rev. W. Inglis, D.D., Adam Brown, Judge Logie, C. Freeland, Richard Bull.

1860—J. B. Hulburt, M.A., LL.D., C. Freeland, Judge Logie, Richard Bull, Wm. Boultbee, 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. R. 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.

1882—A. Alexander, A. Gaviller, A. F. Forbes, T. Mc Ilwraith, R. Hinchcliffe.

JUDGE LOGIE
President, 1872

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, Wm. Turnbull, A. W. Hanham, Lieut.-Col. Grant.

1890—Col. Grant, A. W. Hanham, W. A. Robinson, A. E. Walker, Thos. S. Morris.

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, Wm. 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., Thos. S. Morris, W. H. Elliott, B.A., Ph.B., P .L. Scriven, Major McLaren.

1896—J. E. P. Aldous, B.A., Thos. S. Morris, W. H. Elliott, B.A., Ph.B., George Black, J. M. Burns.

1897—W. H. Elliott, B.A., Thos. S. Morris, 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.

1899—W. H. Elliott, B.A., Robt. Campbell, W. A. Childs, M,A., Wm. C. Herriman, M.D., W. A. Robinson, 1900—Robt. Campbell, W. A. Childs, M.A., George Black, J. F. Ballard, J. H. Long, M.A.,LL.B.

1901—W. A. Childs, M.A., Geo. Black, J. F. Ballard, J. H. Long, M.A., LL.B., J. R. Heddle.

1902—George Black, J. F. Ballard, J. H. Long, M.A., LL.B., J. R. Heddle, J. M. Williams.

1905 –J. M. Williams, George Black, James Gadsby, A. H. Baker, R. A. Ptolemy.

1904—Wm. Acheson, James Gadsby, J. M. Williams, Robt. Campbell, J. G. Cloke.

1905—Wm. Acheson, James Gadsby, J. M. Williams, Robt. Campbell, J. G. Cloke.

1906—Wm. Acheson, Robt. Campbell. A. H. Baker, Rev. Canon Henderson, Walter E. Hill.

1907—James Gadsby, Robt. Campbell, Lyman Lee, B.A., C. G. Milne, B.Sc., A. H. Baker.

THE LATE THOMAS McILWRAITH

President, 1880

1857-1907

Semi-Centennial Celebration
of the
Hamilton Scientific Association

PROGRAMME

Programme of the Conversazione to be held on
Friday Evening, November 8th, 1907
AT 8 O'CLOCK, P. M.
IN THE CONSERVATORY OF MUSIC

◆

1. Piano Solo - Miss I. J. S. Twoohy
2. President's Address - R. J. Hill
3. Replies from Absent Members, Adam Brown
4. Solo - - Miss Adeline Smith
5. Introductory Historical Sketch, A. T. Freed
6. Piano Solo - Miss I. J. S. Twoohy
7. Historical Sketch - H. B. Witton
8. Solo - - Miss Adeline Smith
8. Open Meeting

President's Address

Ladies and Gentlemen:—

It affords me much pleasure to welcome the members of the Association to this meeting in commemoration of the semi-centennial of the society. Fifty years ago, on the 16th of this month, the Hamilton Association was organized by a few enthusiastic members, in a private house in which the meetings were held for the first year. Very few of the organizers are now living, but we have with us to-night two of the charter members, Mr. Adam Brown, and Mr. H. B. Witton. It affords us all pleasure to welcome them to this meeting, and to congratulate them on still being so active, and so interested in our work. If more of our leading citizens would take sufficient interest in the society, its work would be much better known and appreciated by our citizens generally. Most of our papers are of a literary character, and would be of much interest to them.

Connected with the Association are several sections doing special work. Those interested will find the members willing, and pleased to render assistance and advice. I may mention the Astronomical section, the Biological section, the Camera section, and the Geological section, all holding regular meetings.

Interesting papers are read, and lectures delivered by university professors, and others, before the Association. All meetings are free to the public, and every person is cordially invited to attend.

The proceedings are printed and exchanged with other societies all over the world. Others will speak of the past history of the society, of its distinguished members, and of the great changes which have taken place since the

REV. C. H. MOCKRIDGE, M.A., D.D.

President, 1885 86

society was organized. I shall mention a few which have specially affected our own country.

Since the society was organized the older Canadian Provinces have been united under one federal government; the vast Hudson Bay Territory acquired, and new provinces formed therefrom, extending Canada from the Atlantic to the Pacific, and giving it the proud distinction of being the only country washed by three oceans. Canada with a small population has undertaken, and carried out enterprises worthy of a great nation. The St. Lawrence has been spanned by the noble Victoria bridge, which for a long time was a wonder to travellers. This has been widened and others built across the immense river. The Quebec bridge now under construction will have the longest single span of any bridge in the world. A transcontinental railway has been built from ocean to ocean, and we shall soon have two lines. Canals with immense locks have been built to overcome rapids, or falls. The Hydraulic lift-lock, on the Trent canal, being the largest of its kind, and the first on this continent.

The rapid development of our new provinces has been a surprise to every one. Where roamed the buffalo in immense herds are now countless acres of waving grain; the wigwam of the Indian has given place to the comfortable home of the thrifty settler, and the Hudson Bay trading posts have been supplanted by large and rapidly growing cities, with all modern conveniences, and their tall iron buildings, the construction of which was unknown when this Association was organized.

We can remember when the West was scarcely thought of. Less than thirty years ago no grain was shipped from Manitoba or the West; to-day Canada ranks third as a wheat producing country, shipping annually nearly two hundred million bushels of the finest grain in the world. Canada will soon occupy the first place as a grain producer, for not one-twentieth of our grain producing area is under cultivation. The great transcontinental railway has opened up this vast territory, and the second now under construction will lead to the still further development of our resources.

With our improved facilities for shipping, the fruit belts of Ontario and British Columbia are brought into close touch with the great cities, and fruit, which was a drug a few years ago, now finds a ready market, and the quantity has vastly and rapidly increased.

In the noble St. Lawrence Canada possesses the finest natural inland water system in the world. This has been improved by canals, and its falls and rapids furnish unlimited power for manufacturing, while within easy reach may be found raw material, both vegetable and mineral, of the most varied kind. The immense quantities of grain raised in the West pass by this route to the eastern market, and much of it is made into flour on the way. This great commercial highway was but little utilized a half century ago.

Perhaps in nothing has there been greater advances during the past half century, than in the modes of travelling. Steam and electricity have revolutionized this. In place of the old sailing vessel which crossed the Atlantic in five or six weeks, we have the turbine steamer, crossing in a little over four days. The ox-cart, stage-coach, and canoe, have given place to the locomotive, the trolley, and the automobile. A trip may now be made round the world in the time it formerly took to cross the Atlantic; one-sixth of the journey on Canadian territory, and two-thirds of the distance in vessels and trains owned by a Canadian company.

It is only about fifty years since the first cable was laid, and very much later before the Atlantic was crossed. Now all civilized countries are connected. Even this cumbrous system may soon be surpassed by wireless telegraphy, by which messages are already sent across the ocean, and vessels in the mid-ocean communicate with one another or with the land thousands of miles away. It is about thirty

REV. S. LYLE, D.D.

President, 1887-88

years since a Canadian invented the telephone. Perhaps no other invention ever sprang so quickly into general use. Soon every house will have its telephone.

Electric lighting is only about the same age. The dynamo, the electric motor and the transformer are the products of the present generation, and are completely changing the conditions of society. Our fathers viewed the telegraph with as much astonishment as we look at wireless telegraphy. I believe that we are only on the borderland of the application of electricity. Who can predict what the next half century will produce?

One of the greatest triumphs of the age is the power press. News is flashed to it from all parts by the telegraph; it is printed at a rate scarcely conceivable, and in an incredibly short space of time the papers are on fast trains and delivered to places hundreds of miles away to be read before the ink is completely dry.

In the science of chemistry, new elements have been discovered, and fresh uses for old ones, while its application to the arts and manufactures has made rapid advances. The waste products of a few years ago are utilized and yield valuable substances, among which are the beautiful aniline dyes.

Medical science has not been idle, and diseases which were dreaded, and considered almost incurable, now yield to the skilful application of science. In this, as in other departments, Canadians have taken a prominent place.

We believe in Canada for the Canadians. Our own sons and daughters, understanding the needs of the country, make our best citizens. It is therefore our duty to train them to occupy the very important positions furnished by the rapidly developing resources of our country. We hope soon to see established in Hamilton a Technical School and Arts College, so that our sons and daughters may be prepared for these positions, and that Hamilton may rank educationally, as she does in population and in manufacturing, as one of the first cities in the Dominion.

Remarks by Mr. Adam Brown

You have done me the honor of asking me to read the letters of congratulation from friends of the Association, who cannot be with us to-night. I have pleasure in doing so, and may make special reference to some of them as I read the letters.

Fifty years is a long period in a man's lifetime, and as I to-night recall the formation of this Association half a century ago, you can readily understand that memory becomes very busy. When I think of how many of those who were present at the birth of the Association, and who have since crossed the bar—the remembrance of those men, and of the friendships formed, which lasted through life, makes me in a very reminiscent mood. What changes since then! The population of Hamilton at that time was between 20,000 and 25,000. Now, I may safely say, it is over 70,000. Small as our numbers were fifty years ago, there were many men, and women too, who were ever ready to unite in whatever tended to educate and elevate the people, so this association at its start had strong support. Men of the highest intellectual attainments joined hands in its organization, which during all these long years has in so many ways, done so much real good. The founders, I dare say, did not dream that it would have had so long a life as it has had. Not a few of those who were members either on its birthday or very soon after became famous in the literary and scientific world. It may not be known to many here that one of the original members was Dr. Rae, the great Arctic explorer, who discovered the remains of Sir John Franklin, to say nothing of those who joined it because it was a Hamilton institution, and hailed the

B. E. CHARLTON

President, 1889 90

advent of any good thing which would help on our city.

When I came to Hamilton in 1850, I found men then, as there are now, who had great faith in Hamilton's future. One had only to look at the map and see its geographical position, to say nothing of its beauty of situation and healthfulness, to predict that one day it would become a great city. True, their faith has been long-tried, but it is a great city to-day, and nothing can now stop its advancement. Not many years after the opening of the Great Western Railway, the public spirit of the people, few in number though they were, decided on building waterworks, which is Hamilton's grand asset to-day, and its greatest blessing. Railways were built north and south, and it became an important railway centre, and later on the only thing needed to bring into full play all its great advantages was electrical power, which has been supplied by the Cataract Power Co. This gave an impetus to industries which has made Hamilton what it is to-day, and which the thinking people of Hamilton should not forget.

Going back for a moment to the work of the Association, I may just mention that at its meetings subjects of practical character were discussed. Well do I remember when the story reached us that somewhere between London and the St. Clair river there was a black earth that burned. All sorts of reports came to us about it, and at one of the meetings it was decided to send Mr. Charles Robb, Civil Engineer, who was then connected with the Great Western Railway, to inquire into this wonderful thing. When he returned a meeting was held in the old City Hall. He had this oily earth in a patent pail with him; it was exhibited to the members and he squeezed it and rolled it out into the shape of a torch, lit it, and it produced a flame and dense smoke. To make a long story short that was the first discovery by any scientific body of the oil region in Canada, now Petrolia. I remember his telling us of the hardships he had to undergo, as he went through the woods guided by an Indian to the spot where he found this oozing earth. But I must not detain you. May the Association long continue to flourish, and in the future, as in the past, may there always be men to take a deep interest in its welfare and direct its affairs.

REPLIES FROM ABSENT MEMBERS.

Rockwood Hospital,
Kingston, Nov. 6th, 1907.

G. L. Johnston, Esq.,
Secretary Hamilton Scientific Association,
Hamilton, Ont.

Sir: It would have afforded me a keen satisfaction to have been with you in celebrating the Semi-Centennial. Not many of us will be on hand for the Centennial, but I trust they will have a gloriously satisfactory time who participate in it, and that they will be able to look back over another half-century even more profitable than the last.

Of one thing I am sure, however, that they will never number among their members more faithful or enthusiastic associates than the handful composing the "old guard" of our own day.

May prosperity wait upon the Hamilton Association.

Yours sincerely,

W. C. HERRIMAN.

Remarks by Mr. Brown:—Was on the Council at one time; was 2nd V. P. in 1900.

Hamilton, Ont., Nov. 6, 1907.

Mr. Leggat regrets very much he will have to deny himself the pleasure of attending the Semi-Centennial Celebration of the Hamilton Scientific Association on eighth instant.

Remarks by Mr. Brown:—Mr. Leggat was a charter member.

A. ALEXANDER, F.S.Sc.

President, 1891-93 97

Waterdown, Ont., Nov. 6, 1907.

G. L. Johnston, Esq.,
Hamilton, Ont.

Dear Sir:—Your communication re Semi-Centennial Celebration just to hand and regret very much that on account of previous engagements neither Mrs. Allison nor I can accept of your very kind invitation.

I am, dear sir, sincerely yours,

GEORGE ALLISON.

Remarks by Mr. Brown:—Mr. Allison has one of the finest collection of Indian relics in Ontario.

GEOLOGICAL SURVEY OF CANADA.

Department of Mines.

Ottawa, Nov. 6, 1907.

To the President and Members of the Hamilton Scientific Association.

Ladies and Gentlemen:—

I desire to offer you my hearty congratulations upon attaining this most respectable age, and reaching it in full vigour and promise of greater development. There are not many Scientific Societies in the Dominion of Canada, nor on this continent, for that matter, which can boast of being fifty years old. This is a very brief period for a geologist, but a long time for a human being. Just a few weeks ago we were celebrating the centenary of the foundation of the Geological Society of London, England, the first of its kind to organize. Practically every civilized nation in the world was represented, including the remotest portions of the British Empire. Not a word of boast or vaunting was made by the various delegates and representatives in view of the tremendous possibilities which lie before us, of the new horizons which, every year and every month, appear before those who investigate the truths of Science.

Science to-day runs the streets. The benefits and results of the Laboratory or Scientific work-shop may be seen at every turn. Mankind is the better, and more cheerfully enjoys the great gifts of the Supreme Ruler of the Universe now, than he ever did before. The more man investigates Nature and comes into touch with her—the more she reveals herself to him the simpler his life will be and the keener his appreciation of the Generous Spirit which pervades all.

The work which the Hamilton Scientific Association has been doing for the past fifty years is a noble one. Through adversity perhaps at times, and through necessity, that best of friends of progress and advancement, you have striven and occupy a place in the march onward to better things.

Ten centuries of constant search, diligent and patient toil in investigating truths of Science, dealing with things and the heart of things will reveal untold and beauteous stores to help mankind. Centuries of labour in years to come will not suffice in gathering the threads from which will be woven some day the fabric which will present in one delightful whole the harmony of events and their history.

Do not be discouraged in gathering facts one by one, little by little. Some day its rightful place in the economy and order or sequence of events will be found and revealed.

Now is a time for gathering, and this must go on for a long time yet. In so doing you will be adding your quota to the world's progress in your own sphere and centre of activity in your community in the delightfully charming and attractive section of this continent in which you live.

Your transactions are read the world over. The world of Science looks upon you, and your records are perused and the facts you present classified. Go on, investigate in each department and branch of Science, whatever it be; in doing so you will be assisting in building up the great Temple of Truth.

S. BRIGGS

President, 1894

I regret exceedingly not being able to be present on this occasion. As a corresponding member of your Association, I feel that I have done little towards helping you. In fact, I must confess that I have obtained more from you than I have, as yet, been able to give in return.

May your Association ever grow, from year to year, from century to century, and prove a source of light and centre of truth which shall shine and illumine the hearts and consciences of men.

H. M. AMI,
Corresponding Member Hamilton Scientific Association.

Remarks by Mr. Brown:—I am glad to count Mr. Ami among my friends. His able letter will well repay perusal.

GEOLOGICAL SURVEY OF CANADA.
A. P. Low, Deputy Head and Director.

Ottawa, Oct. 15, 1907.

Mr. G. L. Johnston,
Acting Corresponding Secretary,
Semi-Centeninal Celebration,
Hamilton Scientific Association.

Dear Sir:—

I have just received your invitation to the Semi-Centennial Celebration of the Hamilton Scientific Association. I regret sincerely that it is not in my power to attend the Conversazione of the 8th November. I endeavor through your publications and my correspondents to keep in touch with the work of your Association, and must congratulate you on what has been done during the last fifty years, and your bright prospects for good work in the future.

Very truly yours,
JOHN MACOUN,
Naturalist.

Remarks by Mr. Brown:—Prof. Macoun is connected with the geological survey of Canada and is a distinguished man. He ranks very high in his profession, and has rendered most valuable service to Canada as a naturalist and botanist.

Toronto, Ont., Nov. 8, 1907.

R. J. Hill,

President of Hamilton Scientific Association,
Hamilton, Ont.

The Royal Astronomical Society of Canada sends congratulations on your Semi-Centennial Celebration.

C. A. CHANT,
President.

Hatchley, Ont., Oct. 18, 1907.

Mr. G. L. Johnston,

Corresponding Secretary of Hamilton Scientific Association, Hamilton, Ont.

Dear Sir :—

Your kind and polite invitation to attend the Conversazione to take place at the Hamilton Conservatory of Music has been duly received. Many thanks for the honor of the invitation, and though it may not be possible for me to attend in person (or say convenient) on the occasion referred to, I have ventured to send a few jottings of local natural history, which it is hoped may prove of sufficient interest to be worth reading by way of affording variety to the intervals in the routine procedure.

When the regular meetings of the Association for the season 1907-8 have got under way I may be able (D. V.) to forward to you occasional brief papers or comments on topics suitable to the aims and desires of the assembled members in attendance—incidents are perpetually occurring as the seasons of Life "onward roll" that may serve as food for contemplation and perhaps suggestive of pleasant and of friendly cheering sentiments.

With sincerest good wishes,

WM. YATES.

Remarks by Mr. Brown :—Mr. Yates is a genius. His specialty is natural history. He knows all about the birds and flowers and is really a remarkable man. Mr. Alexander says his knowledge of all such things is wonderful. Mr. Yates is over eighty years of age.

A. T. NEILL

President, 1895-96

29 Douro St., Stratford, Ont., 7-11-'07.

G. L. Johnston, Esq.,
Secretary Hamilton Scientific Association,
Hamilton, Ont.

Dear Sir:—

Your kind invitation card for the Hamilton Scientific Association half-century celebration is just to hand. I regret that my engagements with the Shakespeare Clubs of Stratford and St. Mary's will prevent my being with you then. If one of the newspapers gives the proceedings in full I shall be glad to receive a copy.

With best wishes. Yours, etc.,

J. DAVIS BARNETT.

Remarks by Mr. Brown—Mr. Barnett has a private library of 26,000 volumes, 1,100 of which are on Shakespeare alone, being acknowledged the finest Shakespearian collection on the continent.

Bank of British North America,
Duncans, B.C., Oct. 22, 1907.

G. L. Johnston, Esq.,
Acting Corresponding Secretary,
Hamilton Scientific Association.

Dear Sir:—

I regret very much that distance prevents an acceptance of your very kind invitation for the 8th prox.

Hoping you may have a very large gathering and successful conversazione.

Yours faithfully,

A. W. HANHAM.

Remarks by Mr. Brown:—Mr. Hanham, while in the Bank of British North America in this city, was a warm friend of the Association. While well up in natural history, his specialty was fresh water shells.

ROYAL ASTRONOMICAL SOCIETY OF CANADA.
Peterborough Section.
Springvale, Ont., Nov. 5th, 1907.

R. J. Hill, Esq.,
President of Hamilton Scientific Association,
Hamilton, Ont.

My Dear Mr. Hill:—

Permit me to congratulate, through its President, the Hamilton Scientific Association in reaching its "semi-centennial period" in such good health and manhood. Let me congratulate Mr. Adam Brown, and with him any other charter members who may be yet spared to rejoice with you at this time. I feel highly honored to be yet its Vice-President, but my removal from Hamilton makes it necessary for the Association to put some one in my place. I desire to be a member of the Association as long as I live. The enclosed cheque will pay my fees till the expiration of 1910. The society has long since proven the necessity for its existence. It has done a noble work. Is it not high time for the City of Hamilton to show its appreciation by voting it a handsome yearly sum to assist in its support?

Yours very truly,

D. B. MARSH.

Remarks by Mr. Brown—Rev. D. B. Marsh, Ph.D., F.R.A.S., the President of the Astronomical Section of our Association, was chosen by the Royal Astronomical Society of Canada as one of its representatives on the Canadian Government Solar Eclipse Expedition to Labrador in 1905, and another of our members, Mr. G. Parry Jenkins, F.R. A.S., accompanied the expedition by request of the Canadian Government as a representative of the Hamilton Scientific Association.

T. W. REYNOLDS, M.D.

President, 1898 99

Winterholme, Ottawa, Nov. 5, 1907.

Adam Brown, Esq.,
Hamilton Scientific Association,
Hamilton, Ont.

Dear Mr. Brown:—

I have the pleasure to receive an invitation to the Semi-Centennial Celebration of the Hamilton Scientific Association for the eighth of November. Unfortunately I am unable to be present on the occasion, but I am sure you will have a large gathering. Allow me to convey my very hearty congratulations, and to express the hope that the Association will long continue to do the good work it has for half a century been engaged in.

I am sending with this a copy of the Canadian Alpine Journal. Possibly it may find its way to the shelves of the library.

Believe me, yours very sincerely,

SANDFORD FLEMING.

Remarks by Mr. Brown:—Sir Sandford Fleming, throughout his useful and eventful life, has helped on everything within his reach for the advancement of Canada, and has been connected professionally with Canada's greatest undertakings. His great services rendered the trans-continental railway is a matter of Canadian history. In 1871 he was appointed Chief Engineer of that stupendous work—the Canadian Pacific Railway—and was present when the last spike was driven home. He is one of Canada's noblest men and the country is not only proud of him, but grateful for all he has done in the past and for what he is still doing in connection with Queen's University, Empire cables and other important objects for the good of the people of Canada and for the Empire. His life adorns the title so deservedly bestowed by his sovereign.

"His laurels ne'er will fade with years."

Protestant Hospital for the Insane,
Montreal, Que., Oct. 15, 1907.

G. L. Johnston, Esq.,
Hamilton, Ont.

Dear Sir:—

Please convey to the President and Council of the Hamilton Scientific Association my sincere regrets that I will be unable to be present at the Semi-Centennial celebration of the organization, and express to them my warmest wishes for a pleasant reunion and the continued prosperity of the Association.

Sincerely yours,

T. J. W. BURGESS.

Remarks by Mr. Brown:—Dr. Burgess, so well known to Hamilton people when he resided here, was a strong friend of the Association. He was associated with Mr. Alexander in starting the botanical section. They collected the native plants in this vicinity. He was botanist on the expedition fixing the 49th degree of latitude.

---

69 Tyrwhitt Road,
St. John's S. E., Oct. 24, 1907.

G. L. Johnston, Esq.,
Secretary Hamilton Scientific Association,
Hamilton, Ont.

Dear Sir:—

Will you please convey to the President and Council of the Hamilton Scientific Association the best thanks of my wife and myself for the great honour which they have bestowed upon us in electing us Honorary Members. The certificates duly reached us this morning.

We would thank you also for the invitations to attend the Conversazione on the occasion of the Semi-Centennial Celebration of your Association, and we greatly regret that distance prevents us accepting it.

Faithfully yours,

E. WALTER MAUNDER.

S. A. MORGAN, B.A., D. PAED.

President, 1900-01

Remarks by Mr. Brown:—Mr. Maunder is a director of Greenwich Observatory. Both he and Mrs. Maunder are famed astronomers. Both were sent out to Labrador by the British Government to make observations during the eclipse. The Canadian astronomers who were sent to make observations referred in high terms to both.

Rockcliffe Manor House,
Ottawa, Nov. 6, 1907.

Adam Brown, Esq.,
Hamilton.

My Dear Mr. Brown:—

I got your telegram, and have been looking for your Secretary's letter, which I have answered, because, from your wiring me, I am afraid I may be too late, as I do not remember the date of the Jubilee meeting. I passed my 86th birthday on Monday (4th Nov.), and for the last two years have not left Ottawa as, while able to go about, I find that home is a necessary place for me.

I have only pleasant memories of the Hamilton Association, but have forgotten the details of its formation, but think I was in at the beginning, but do not remember to whom belongs the credit of its foundation. I remember presenting some Australian exhibits which I hope are still to the fore, as they are now so much more valuable than they were then, and some may be (like the duck-billed platipus), unobtainable now. I authorize you to represent me, and say that I am proud of my early connection with the Association, and how gratified I am to know of its success, and that it has attained a Jubilee. As I only came to Hamilton to reside (I believe) in 1857, it is not probable that I could have done much work in connection with its birth.

I am very glad to hear from you and that you are able to represent me at the meeting, as I believe I am your junior. We have both of us reason to be very thankful that we are able to correspond with each other. I see by the press that all, or nearly all, of the Waterworks Commissioners have passed away except yourself. What a difference in Hamilton Debentures (with which we paid the most of our contractors for want of other means), now and then! Hendrie, who took his first contract with your commission, is gone, and there must be few, besides ourselves, who were connected with the waterworks in 1857 still living.

I am behind in my correspondence, having so many letters of congratulation on my birthday to acknowledge.

Believe me, sincerely yours,

THOS. C. KEEFER.

Remarks by Mr. Brown:—Thomas C. Keefer, C.E., C.M.G., may well be ranked high up among Canada's most eminent Civil Engineers. His name and fame have extended beyond the bounds of the Dominion. At the time he joined this Association, and he was one of the earliest members, he was Chief Engineer of the Hamilton Waterworks, an undertaking which reflected the highest credit to his skill and good judgment, and stamped him as a hydraulic engineer of the highest order. The condition of the works to-day bear out that statement. I was one of the first Waterworks Commissioners, and subsequently Chairman until their completion and opening by the then Prince of Wales, now our King Edward VII. It was my great honor to present the address to him on that occasion. It was my privilege to enjoy Mr. Keefer's friendship and confidence. No decoration could be more deserved than that conferred on Mr. Keefer by our late beloved Queen Victoria. Mr. Keefer, in his letter, refers to my being his senior. In that he is in error.

J. M. DICKSON

President, 1902-03

Address by A. T. Freed

It frequently happens that men are unconscious, or but dimly conscious, of the importance of events which take place around them. Great revolutions have taken place while the peoples chiefly affected have pursued the even tenor of their way; and only afterwards could their children look back and perceive that the condition of the world had changed. Sometimes, too, men have regarded with wonder and admiration certain contemporary events, which in the end have changed nothing, while other events, unnoted at the time, have been productive of great and lasting results. Humanity watched with wonder and terror the Napoleonic wars at the beginning of the last century, which sped their evil course and left the world as it had been; but the unnoted and almost unknown experiments of Patrick Miller and Symington on Dalswinton loch produced the steamboat and revolutionized water transportation. While Europe, with bated breath, saw the Spanish Armada flee before the shallops of Howard and Drake and Frobisher, and beat out its remaining life against the Scottish and Irish coasts, Francis Bacon, in the quiet of his study, was formulating that system of inductive philosophy which changed the current of the world's thought; and at the same time an unknown young man named William Shakespeare was journeying up from Warwickshire to London, where he was to make the greatest name that lives in the pages of literature. The soldier sweeps across the world's great stage, attended by ruin and terror, and then passes out, the record of his deeds remaining as a tale that is told, while the silent student, working in his laboratory or dreaming in his garret, produces something that lives through the ages, and makes the lives of men brighter.

The nineteenth was a revolutionary century—preeminently the revolutionary century in the world's history. The eighteenth century had done much. It had produced the spinning jenny, the power loom, and, above all, the steam-engine. But it remained for the nineteenth century to produce more and still more wonderful things; and most of these were the work of silent, thoughtful men of whom contemporary humanity took little note. Cooke and Wheatstone, Daniell and Grove and Sturgeon labored at what upon the surface appeared to be mere idle experiments; but one day in 1837 it was learned that the electrical telegraph was in existence, and that it was capable of sending messages over a wire for hundreds of miles in an instant of time; and in June of the year named a patent was granted to Cooke and Wheatstone by the British patent office. Four months later Mr. Morse entered his first caveat in the United States.

In the second decade of the last century John Quincy Adams recorded in his journal that, while in London, he went to see the new illuminant called gas. It was, he said, good for street lighting, but he thought it too dazzling, and feared that it would injure people's eyes.

About the middle of the century I listened to a very interesting lecture on electricity. The lecturer exhibited a miniature train of cars drawn by electricity, and an electric light of about one candle power. He said that, theoretically, it was possible to light our houses with electric lamps, and even to drive railway cars by electricity; but, unfortunately, owing to the great cost, these exhibitions of the capabilities of electricity must forever remain mere scientific experiments. How happily his predictions have been disproved by the logic of events it is unnecessary to say, for, in lighting our houses and our streets and in drawing carriages, electricity has only begun its labors in the service of man. Mighty rivers have the momentum of their falling waters converted into light and heat and power, so that the citizens of Hamilton ride in electric carriages and read their

G. L. JOHNSTON, B.A.

President, 1904-05

newspapers by the light of Decew falls. Electricity is the great magician of the age. It operates machinery, it carries messages, oral and written, it carries goods, it lights and warms houses, it cooks food, it keeps time, and all these marvels have been wrought out quietly by men almost unknown till the results of their labors were announced to the world. Where so many have labored to make electricity the general servant of man, it is impossible to name the host of workers who have contributed to the general result; but I may be permitted to say that perhaps to Lord Kelvin and Faraday is due the honor of being the world's foremost workers in this field of practical magic. And I think it was Lord Kelvin—then Sir William Thompson—who, when told that with his knowledge and ability he ought to be able to make a great deal of money, replied, "My dear sir, I am too busy: I have no time to make money." Even in this utilitarian age, there are rewards for the world's greatest men more precious than money.

In the early part of the nineteenth century men in England realized that existing means of travel and traffic were inadequate to the needs of the country, and their thoughts turned to the possibility of harnessing steam locomotives to their carriages, and drawing them over iron rails. And the revolution was wrought—again by men almost unknown to the world. Here, too, I may be permitted to pick one name from the long roll of those who contributed to make the railway, and to say that to George Stephenson, the son of a humble colliery operative, and himself a colliery operative, is due a very large part of the credit for that great achievement. The English mind is naturally conservative and unbelieving; and there were not wanting those who doubted that a railway could be made to do that which its advocates said it would do. It was said that a train of cars, drawn at the frightful speed of fifteen miles an hour, would so shake the earth as to cause buildings to fall, and would even destroy the growing crops. "What would be the result," asked one member of Parliament, "if a cow should be on the track when this locomotive of yours should come along?" "Verra bad for the coo," replied Stephenson. In the end the dreamers and the students had their way, and the revolution in land carriage was accomplished.

Above all, the nineteenth century was an age of iron. I am afraid to say what was the world's production of iron at the beginning of the century. But I believe I am correct in saying that the city of Hamilton now produces more iron in one week than the whole world produced in a year at the beginning of that century. The great industries are so interwoven—so interdependent—that great reforms cannot be carried out in one direction without necessitating reforms in other directions. And as, in great political and social crises, the hour has always brought forth the inventive genius who could produce the article required by changed conditions. It was seen that, as steam first, and electricity next, were harnessed to the car of the world's progress, the new wand of the magician must be sought in the mine and not in the forest. The blast furnace was enlarged and improved, till its production was increased a hundred fold; and the number of furnaces was so increased that a thousand tons are now made where one sufficed for the needs of our fathers. And this was not enough. Sir Henry Bessemer conceived the idea of eliminating the surplus carbon from pig iron by a blast of air instead of by the slow process of the puddling furnace, and steel took the place of wrought iron. Others saw that new tools were needed; and Bramah, Maudesley, Whitworth and Nasmith set themselves at the work of creating those new iron-working tools—those implements of precision—by means of which the world's great iron industries are now operated.

A quiet, unknown druggist in Brantford labored for years in seclusion, and then the telephone came forth to supplement the telegraph and expedite modes of communication. A Canadian chemist, a native of Hamilton, was experimenting in his laboratory, and acetylene gas was added to our illuminants. A plain Virginia mechanic

R. J. HILL

President, 1906-07

looked at and pondered over some crude models of agricultural implements, and the reaper was evolved. The seed drill, the gang plow, the threshing-machine followed, and the cultivation of the great plains of America became possible. A Yankee mechanic dreamed out the cotton gin, and cotton growing was revolutionized. The time always found the man—the new necessity invariably brought forth the new discovery. That was the history of the nineteenth century. We can scarcely imagine what our civilization would be were the discoveries of that century taken from us. It is impossible to guess what the new century upon which have now entered may have in store. Let us content ourselves with the reflection that the intellect of man has not yet exhausted itself, and that all the secrets of nature have not been revealed.

I have tried in this paper to keep to the front the thought that the discoveries which have so greatly contributed to the welfare of humanity have been the work of men who have thought and wrought in quiet seclusion. The members of the Hamilton Association have thought and investigated quietly. I do not mean to say that they have made any revolutionary discoveries, or that at present they give promise of doing so. You shall hear from Mr. Witton something of what they have done. But sometimes unexpected results follow patient study: not infrequently men build better than they know, and better than the world dreams of at the time. The study of astrology led the way to the study of astronomy, with its brilliant and wonderful discoveries. The study of alchemy led the way to the study of chemistry, without which many of the world's greatest industries could not be carried on. And possibly unforeseen results may come from the patient labors and studies of the members of this association. However that may be, they have done much, they have given pleasure to many, and the members of this body have been not wholly unhonored co-workers with those more famous laborers who have given the world such splendid results of patient thought and scientific investigation.

Address by H. B. Witton, Sr.

In well-chosen words, reference has been made to this as the jubilee year of the Association, and our secretary has favored us with a sketch of the Society's history. Fifty years are indeed but an infinitesimal fraction of the past, the mere twinkling of an eye, in contrast with those cycles of change which make up the history of the world. But modern events speed on at an accelerated pace. Fifty years bring in their train countless evolutions; and short as their span is, it nevertheless is longer than the average time allotted to individual man upon the earth.

Fifty years ago a dozen citizens, deeming the time opportune for concerted action, met together and organized the Hamilton Association. The meetings of these foundation-men of our society were informal, and their doings were devoid of ostentation. But they were men who had high aims and their plans were comprehensive. It was decided that in process of time the chief work of the new-born Association should be to investigate the physical geography, geology, flora, fauna and antiquities of this district. Fairly optimistic, these men were confident that the trend of events favors human progress; and they had faith in the worth of intellectual culture. Like Matthew Arnold, they, too, were convinced that such culture depends on familiarity with the best that has been thought, said and done in the world; and in consonance with that conviction, they decided that from time to time each member should summarize for the Association choice selections from his studies and reading.

To men engrossed in business and of little leisure, active membership in our Association in its early days, evi-

ADAM BROWN

Charter Member

dently entailed somewhat exacting obligations. But though the program adopted at the initial meeting of the society maps out an imposing course of investigation, it in reality was little more than the sketch-map of a proposed scientific itinerary, designed to prevent loitering by the wayside, or straying into mazes of error: and served to make sure that the straight path should be entered without divergence to the right or to the left, at the outset of the journey.

The founders of our Society cared little for ceremony, but held to plainness of speech and simplicity of procedure. In this they followed—perhaps unwittingly—the method of Sir William Jones, who counselled for such a society, that its object of inquiry should be: "Whatever is done by man or brought forth by nature;" that for procedure but one rule is needed, namely: "To have no rules at all;" and that the sole requisite for membership should be: "Love of knowledge and zeal for its promotion."

To-night this Association closes the first half-century of its existence, and goes forward on another stage of the journey, toward what in human experience is designated the climacteric of life. At such a juncture it is seemly that our thoughts turn to the society's present status, to its record of work done, to remembrance of cherished names filed on its bead-roll, and to what are the auguries for its future usefulness.

From the first, work of the Association has been directed by a president, vice-president and advisory council; and for the tireless services of the gentlemen who have discharged the duties of these offices, unstinted thanks are due. Our roll of membership generally bears from 120 to 150 names; and for several years working sections have given special attention to astronomy, geology, biology and to photography.

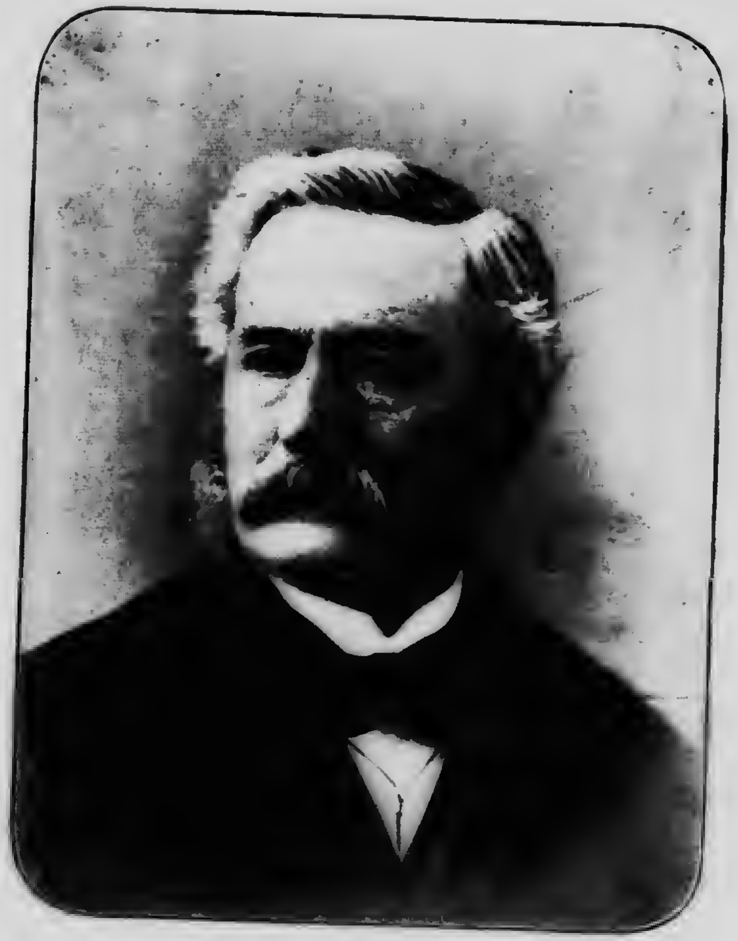
A scientific list of the timber grown in what was then Western Canada, was among the first important work done by the Association. Square timber for export, in those days was rafted in Hamilton bay, and was a traffic item of some importance for the newly opened Great Western Railway. An officer of the railway, Samuel Sharp, a member of our society, instructed by his company, had a goodly number of plain and polished samples prepared to illustrate our extensive list. Complete sets, each specimen bearing its botanical, and, when possible, its popular name, were sent for exhibition to London, and to Paris; and some of them, I think, still find place in our museum.

Soon after completion of this piece of practical work concerning Canadian forest trees, a list was prepared of the flora of the Niagara peninsula. The chief contributors to that service were Dr. Craigie, Judge Logie and William Craigie. The Association has been fortunate in always having expert botanists on its roll of membership; and that first consensus of opinion as to our local flora, several times since, has been revised and extended. Its second issue was under supervision of the late J. M. Buchan, M.A., whose frequent contributions on many subjects to our society, were widely read. Later revisions of this list have been the work of members happily still our associates; and a collection of pressed local floral specimens forming an herbarium or hortus siccus, has been mounted with a care that has received commendation from numerous botanists of taste and reputation. Many of these specimens were prepared by Dr. Burgess, now of Montreal, formerly one of the most active of our associates.

The old mythologies clung to an idea that in the golden age the bright-eyed flowers lived, moved and spake; and these cherished fancies are known to us in fables of the hyacinth and narcissus, two of our loveliest flowers. But swing of the pendulum, in more recent days, touched other concepts; and Emerson complains of certain modern botanists who:

> "Love not the flower they pluck, and know it not,
> For all their botany is Latin names."

Huxley once said that "He who knows nothing of natural history passes through life as does a man through a



THOS. C. KEEFER, C.E.

Charter Member

grand picture gallery in which nine-tenths of the pictures have their faces turned to the wall."

Our botanists, luckily, have so often and so aptly discoursed to us concerning the nature, beauty and development of plants, and the part plants play in the history of the world, that they have turned to our view many of the fairest pictures, creation treasures, and have in some measure taught us to appreciate their glorious beauty.

In botany, as in other branches of natural history, the late Thomas McIlwraith rendered our society good service. Nearly thirty years ago he was president of the Association; and for several years served it as curator and librarian. Catholic in his love and study of nature in her many guises, his favorite, life-long pursuit was the study of bird-life. At our early meetings he read ornithological papers, notable both at home and abroad. For many years his services were sought after by United States naturalists. He took part in forming the American Ornithologists Union, and in revision of some branches of ornithological nomenclature. His book of more than 300 pages entitled The Birds of Ontario, an important contribution to the knowledge of Canadian bird-life, was first published by our Association.

No department of ornithology was foreign to Mr. McIlwraith. It was pleasant to hear him discourse on any branch of his favorite subject. Even his exposition of the technical terms used in describing birds lost its dryness; and to hear his papers explaining the structure of birds, and their homologies in form and function compared with those of other classes of animals, was a treat not to be forgotten. But it was as a field ornithologist that his equal was hard to find. Audubon and Wilson, in this regard, had no worthier disciple than Thomas McIlwraith, for nothing pertaining to the life-history, song, habits, plumage and migration of birds was hidden from him. Blessed with a keen sense of humor himself, he delighted to trace all manifestation of humor in animals. Perhaps no man ever better enjoyed the refined satirical wit of the ancient playwright

Aristophanes, who—in Freres Version—makes the birds in chorus cry in mock pity for mortals:

> " Ye children of man, whose life is a span
> Protracted with sorrow from day to day,
> Naked and featherless, feeble and querulous,
> Sickly, calamitous creatures of clay."

In entomology, the branch of natural history relating to insects, J. Alston Moffatt for several years rendered the association much service. Rightly enough Pope calls these aerial hordes of living creatures "the wandering nations of a summer's day," for they out-number the rest of the animal kingdom, and by late authorities their species are estimated at a quarter of a million. Their influence, too, is almost as remarkable as is their number. For ages they have furnished the world with silk, honey and wax. They are food for countless other living things, are pollen-carriers that fertilize barren plants; and they are the common scavengers of the world. As malign agents they are but too well known; for to counteract their noxious attacks on cultivated plants, taxes the alertness of a trained army of specialists in various parts of the civilized world.

The papers of Sir John Lubbock—now Lord Avebury—concerning ants, and those of older date by Huber, on honey-bees, show how interesting is the story of insect life when rightly told. In such monographs and in standard entomological literature Mr. Moffatt was well read, and he took pains to keep in touch with the best current serial literature devoted to whatever branch of insect life engaged his attention. His papers prepared for the Association evince scrupulous care, wide reading and keen observation; and our museum shows his industry in the collection and his skill in the classification and preservation of many insects of this district.

In all study of living things, microscopic aid is helpful; and in its early days the Association paid some attention to microscopy.

CHAS. ROBB, C.E.

Charter Member

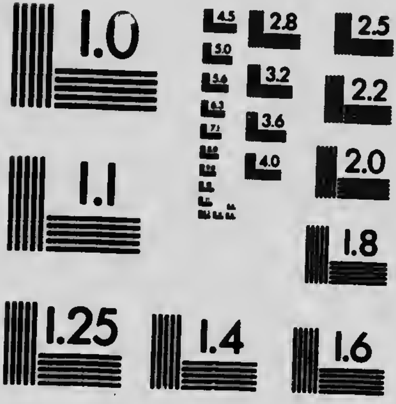
It is pleasing to bear in mind the biological truths brought to light by men whose keen vision had but little adventitious aid; for the imperfect microscopes of other days were not superseded by modern achromatic lenses till near the close of the first quarter of the nineteenth century. Ehrenberg's great work describing the Infusorial Animalcula dates only from the year 1838. In a second title that work was justly called: "A view of Nature's more profound organic life."

Ehrenberg was indeed the prime discoverer of the denizens—living and dead, recent and fossil—of a nearly unknown world; a world marvelous for the number, organization, diversity, minuteness and strange beauty of its indwellers. Other writers soon followed in his steps, extending and specializing Ehrenberg's lists of these newly found hordes of minute life, and skilfully engraving their peculiarities of form. But no picture, however good, can excite in the beholder the wonder and admiration that result from watching under a microscope these tiny atoms in life and motion. To performance of original microscopic zoological work, this society makes little or no pretension. But in comparing with authoritative descriptive lists the diatoms, desmids and animalcula common to this district, and in helping to promote a right conception of the profuse life that surrounds us—life unseen by unaided vision—the society has striven to subserve the purpose for which it was established.

From the first, geology received from our Association a goodly share of the notice mother earth claims from her children. The realities to which she compels attention do not vary; though the fancies of their expounders sometimes require a large personal equation to be allowed for. When shells were found in the Alps, Sir Charles Lyall tells, the explanation of one authority was: they are freaks of nature; another said: they are a residuum of the deluge, and yet another that they were eastern shells dropped there by pilgrims returning from Syria. But William Smith, put-

MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



APPLIED IMAGE Inc
1653 East Main Street
Rochester, New York 14609 USA
(716) 482 – 0300 – Phone
(716) 288 – 5989 – Fax

ting aside such fancies, about 1815 constructed the first geological map of England; and by his keen perception of truth, and by his industry, earned the name of father of English geology. A canal surveyor, with no special advantages but his own force of character, from observation and reasoning he learned that the stratified rocks were in groups; that their order of succession was never inverted; and though their outcrop might be in places far apart, they could always be distinguished by their fossils. His map, the product of fifteen years' hard work, confirms these views, and able followers hastened to do him honor, and to adopt his methods.

Among the earliest on this side the Atlantic to work on similar lines were William Maclure and Amos Eaton. Mr. Eaton made a geological survey of Albany county, in the State of New York, as early as 1830. With the report of his survey, was the best of the early American geological maps, for showing rock strata in situ. From that beginning, twenty states in as many years after, entrusted surveys to geologists, several of whom became famous. In Canada, numerous amateurs made valuable collections of minerals and fossils, and Bayfield's maps of the St. Lawrence and Great Lakes also contained geological notes of great value. But these services excepted, no geological work of importance was accomplished till institution, in 1843, by act of Parliament, of the geological survey of Canada.

The reports of Sir William Logan, chief of the survey, and those of his colleagues, Murray, Hunt and Billings, extended popular interest in Canadian geology. For this district these first reports had special value; as in them the Medina, Clinton and Niagara formations exposed near Hamilton are minutely described, with illustrations of their characteristic fossils. In these reports, two of our early members, Charles Robb and T. C. Keefer, are repeatedly thanked for information regarding the surface geology of this district. One of these reports gives a description of Burlington Heights, and of the cutting through them for the Desjardins canal, where seventy feet above the lake

GEORGE LOWE REID, C.E.

Charter Member

were found fossil bones and the tusk of a mammoth, and where seven feet higher the horns of a wapiti were found.

Our members who were pioneers in geology have not lacked followers. That is evinced by the geological reports and cabinets of the association. Apart from minerals collected, our cases contain representative fossils from the Potsdam sandstone to the Erie clay; that is from the lowest to the highest palaeozoic Canadian rock formations. Our collected fossils from the group of rocks exposed in the Hamilton escarpment, for their completeness and their methodical arrangement, long since won for the geological section of the society commendation from the late Dr. James Hall, the eminent palaeontologist of New York. Of these local collections, the fossil sponges, and the graptolites are among the most interesting. The graptolites, as their name implies, are minute, feathery, quill-pen like fossils of the Polyp class. In structure they bear points of resemblance to living forms of hydrozoa; and as they must have lived under somewhat like conditions to existing similar forms of life, graptolites throw a faint gleam of light over the ancient Silurian waters in which they lived ages and ages ago. Both graptolites and fossil sponges are sought after for museums alike in America and in Europe.

Many helpers who have aided to promote the geological work of this Association deserve thanks from their co-workers. Few have rendered more efficient service than the late A. E. Walker, who for some years was president of the geological section. In justice I must also further add: It is mainly due to the generosity, scientific ability and labors of our veteran associate, Colonel Grant, that the geological branch of the Hamilton Association has accomplished the work it has done. It is unseemly for one member of a society to eulogize or venture to appraise the services of a living fellow-member of the same society. That is a rule rarely to be infringed. But this must be the exception proving validity of the rule, and if excuse were needed, my plea should be: I speak for all who know what Colonel Grant has done for the Hamilton Association.

The photographic and astronomical sections of the society have a goodly number of enthusiastic supporters, and both have earned esteem of the public. Many subjects, in addition to those specified, have engaged attention of the council, and it would require a classified list of the papers read rightly to show the numerous subjects of interest brought into public notice at the instance of our Association.

By the generosity of members and friends, valuable gifts from time to time have been made to the society's museum. Such presentations are duly recorded, and are specified in the cases where they are placed. The Association gradually collected a library of considerable value, a part of which, by mutual consent, was put in temporary custody of the Hamilton Public Library authorities, when that institution was established. A valuable exchange list of publications enables members to follow the trend of scientific investigation in every quarter of the globe.

Of members passed to their rest, some won reputations outstretching the limits of Canada. Of such men was Dr. John Rae, one of the founders of this society. A member of the first land expedition in search of Sir John Franklin, he afterwards commanded the search party which brought back news of Franklin's fate; a service for which he received the British Government reward of ten thousand pounds. Among our treasures is a map of the Arctic regions, drawn by his own hand. This was presented by Dr. Rae to the Hamilton Association.

Worthy of mention with Dr. Rae is Dr. A. W. Stratton, formerly secretary of our Association. In 1899 Dr. Stratton received appointment to the position, in India, of principal of the government Oriental college in Lahore. That honorable, though laborious post, he most acceptably filled for three years, till stricken with fever, his work came to an end, and his sun set before it was noon. The Messrs. Constable, London, England, have in press at the present time a memoir of Dr. Stratton's short but brilliant career. Besides the above-mentioned members, on our bead-roll are

MATTHEW LEGGATT

Charter Member

many names. We refer here to but a few involuntarily remembered: Dr. Ormiston, Dr. Hurlburt, Prof. Wright, Judge Proudfoot, Judge Logie, Dr. McDonald, R. Bull, Mr. and Mrs. B. E. Charlton, Dr. Chittenden, A. Gaviller, Dr. Reynolds. And these names, in turn, bring to remembrance other names and many voices heard in our councils —voices now hushed in death.

The Provincial government makes the Hamilton Association a yearly grant of $400. This sum suffices to pay items of rent, light and printing. The university extension lecture system has operated favorably in aiding to provide a yearly course of lectures free to the public. The society is thus enabled to serve the public better than otherwise would be possible; and these aids are therefore gratefully accepted. This, apart from first to last the work of the Hamilton Association has been to its members a labor of love, done without fee or reward.

But while individual service claims our remembrance, we must not forget that our Association, with many of like purpose, was but the outcome of that desire for acquisition and promotion of knowledge which marked the early years of the nineteenth century. That was a period of intellectual renaissance, as noticeable in its way as was the religious awakening of society by Wesley and his friends a century earlier.

During the fifty years over which we to-night take a backward glance "the thoughts of men have widened by the process of the suns." By spectroscopic and other methods of putting nature to the test, physics and chemistry have renewed the vigor of their youth. Instruments of precision have brought into being a new biology and a new pathology. Application of science to industrial purposes is everywhere changing the old order of things. And although evils enough are rampant to remind us that the golden age is still far distant, the standard of rational enjoyment has been heightened, social studies command more earnest attention than ever before, and all sorts and conditions of men realize that the science of political economy in future must concern itself with the distribution of wealth as seriously as with its production.

Moreover, it is now more widely acknowledged than in other days that man cannot live by bread alone, that the emotional side of man's nature calls for no less careful training than does his intellect. And greatest of all, it is also widely recognized that within every heart are the rudiments of a moral nature as profoundly mysterious and as ennobling to contemplate as are the wonders of the heavens above us.

With such fields to cultivate, who can doubt that this society will have a brighter and more useful future than its past? In the course of nature the workman dies, but the work goes on. And it is safe to predict that we whose tasks are well nigh done will shortly be replaced by men of equal zeal and greater ability, whose efforts to do good will be favored by advantages non-existent in former days. For it is gratifying to know that by government provision, by pious gifts, and by private munificence, institutions are springing up on every side, each of which after its own fashion is a center of education, and a focus whence instruction radiates throughout the entire commonwealth.

Of this harvest, Hamilton has gathered but a scanty gleaning. So far, from untoward circumstances she has not been enabled, within her own limits, to provide for her sons as complete an educational equipment for winning life's prizes as her sister cities have at their command. But time remedies misfortunes. As the old Maerchen has it: With the hour comes the appreciative man, and all neglect of Aschenbroedel, the less cared for sister of the family, is brushed away. And some day a man of keen discernment will arise, who will secure for Hamilton a school of science or technology worthy of the name, one not a mere appanage of some better school, but one in keeping with the industrial importance of this city, and for usefulness comparable with the great technical schools that have done so much for other cities distinguished for their industries.

A. W. STRATTON, B.A.

NOTES OF THE OPEN MEETING, NOV. 8th, 1907.

Mr. A. T. Neill—It is a great pleasure to be here on this the Jubilee meeting of our society. I have been closely associated with it for more than twenty-five years; I have been Secretary of the Geological section, and also President, and have taken an active part in it ever since its organization. However, I have not expressed myself in regard to the interest taken in our Geological section. There are many who, I believe, have a love for science who are beginning to take an interest in this particular branch of research. Those who become acquainted with science begin to feel their own littleness, to feel that they are but an atom in the universe and that the more closely we study Nature the more fully we realize our insignificance. At the same time our minds are expanding and becoming more appreciative, and we think it a good world to live in. We sit and enjoy papers prepared by others, but in order to fully appreciate we must enter into activity and then the enjoyment becomes part of our being. I must say that I am pleased to be present on this occasion. I cannot expect to see the next fifty years, because that would be expecting too much. However, I wish for the Society still greater prosperity.

Rev. Father Brady—I must add my voice to that of Mr. Neill in expressing my very great pleasure in being present this evening. I have deep respect for all the aged fathers of this Association, and I would not have missed being here this evening for a great deal. It is indeed well understood that science sheds light into our minds. I think we have reason to feel gratified at the progress of our society. Most of us can remember when the telegraph and electricity were first brought before the public, and we are indeed proud of the wonderful progress science is making and of the new theories that are being brought forward. We have seen the men who went before us, and have been benefited by their discoveries: what may we not expect fifty or a hundred years hence. It is well to have resting-spots where we can look back on what has been done and look forward to those who are with us accomplishing still greater things in the future.

Mr. C. R. McCullough: When I noted that Messrs. Witton and Freed were to contribute toward this evening's programme, I promised myself most thoughtful and interesting addresses, and I have not, Mr. President, been disappointed.

We do well to show our deep appreciation in these somewhat degenerate days of the good work done by the old-time members of this Association.

I recall with deep regard for his lovable character and profound scholarship, the work done in the Philological section of the Association by the late A. W. Stratton, B.A., whom I succeeded as Recording Secretary in 1892. Mr., afterwards Dr. Stratton's love for the glorious literature of the opulent east, led him to accept the Presidency of a college in India, where in the prime of manhood he fell a victim to disease, but not before he had made for himself a name that the Association does well to record on its roll of honor.

I must also refer to Mr. W. H. Schofield, B.A., who was a member of our Association and Section some sixteen or seventeen years ago. Dr. Schofield has made great strides in the field of Philology, and was chosen by Columbia College, New York, to represent it in the exchange of professors with the University of Berlin, Germany, some months ago. I would like to name others, but time forbids.

Periodical lapses in public interest occur in the history of such an Association as this, but I sincerely trust that

COL. C. C. GRANT

Geologist

notwithstanding the many forms of unsubstantial entertainment participated in so largely by the younger generation about us, that the Association will continue undeterred in its splendid mission to diffuse knowledge, and show to young and impressionable minds the glories of the hidden domains of science and the beauties of the manifold creations of God and man.

Mr. Alexander: I feel that I must express my pleasure in being present at this meeting, especially in hearing from my friends, Messrs. Freed and Witton, when they referred to the older members. One of the very best meetings which I remember was in 1873, when we had a splendid paper on "The Lower Forms of Life in Burlington Bay." It was illustrated by a fine microscope. From that day down to our present meeting the Association has been constant in providing interesting lectures, and I feel that I have gotten a great deal of benefit from them. One great difficulty in our way is that we are not growing rapidly enough. I cannot but think of our genial treasurer, Mr. R. Bull, who used to button-hole every acquaintance he met on the street, and ask them to come to our meetings. However, we are very pleased to-night, as old members of the Association, that we are starting out on a second fifty years. What we want most is young men to come in and do some original research work.

Mr. Dickson—I did not expect to say anything to the meeting. The hour is getting late and I am only taking up time. I have long been a member of the Association, and I am pleased to see some gentlemen here to-night who have belonged much longer, and who have been much more faithful to it.

I think all the great discoveries are in the beginning the thought of one man alone, and finally some person has struck upon the finishing touch necessary to make the discovery a great success. I am glad to-night to see some of our old friends here, and should like to say something in their praise, but as this is a meeting where we refer only to the merits of the absent I must desist.

Mr. Lyman Lee said—I am sure we have all been delighted with the addresses of Messrs. H. B. Witton and A. T. Freed, and with the proceedings generally in connection with the celebration of the fiftieth anniversary of the Hamilton Scientific Association. I sincerely trust that the result of this celebration will be that the public of Hamilton generally will more fully appreciate the worth of this Association. We ought to have a much larger membership. Indeed we should have a membership of five hundred in a city as large as Hamilton. This historical occasion ought, I should think, to create a greater interest in our work and in the benefits of the Association, and I sincerely trust that our membership may, as a result, be very largely increased and the Association in every way greatly benefited thereby.

G. Parry Jenkins—On such a historic occasion as we are now celebrating we naturally take a retrospective view, and when one looks down the long list of illustrious names who have fanned the flame of scientific knowledge in this rapidly growing city of ours since its early days, we are to-night justly proud of our society; and every one of those present feel it a great honor to belong to a purely local society which has been in existence in our midst for half a century. The citizens of Hamilton at large also feel proud of the work our society has accomplished during these long years, for it has been the means of spreading the fame of Hamilton to every part of the globe. As Corresponding Secretary of our Society, and having sent our Annual Journal and Proceedings to the various scientific bodies in different lands, I speak with authority when I say the Hamilton Scientific Association stands to-day in the highest esteem among its sister societies of the world.

R. J. HILL, President.
J. F. BALLARD, Rec. Secretary.