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Résumé de l'article

Saint John, New Brunswick, has a long history of popularization of geology dating back to lectures presented in the 1820s. The first lecture series that included geology and presented to a public audience in 1824 was followed by almost a century of public engagement and presentation of geology topics to a relatively small city of 20 000 to 30 000 people. Lectures were often very general about the science of geology, specific as to the nature of minerals and mining in New Brunswick, and leading edge concerning the first discoveries of significant fossils in the Province. Even though it was a relatively small community, Saint John had an abundance of knowledgeable people, and institutions for presentation and discussion at the Saint John Mechanics' Institute and the Natural History Society of New Brunswick.

19th to early 20th century geology lectures in Saint John, New Brunswick, Canada

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ABSTRACT

Saint John, New Brunswick, has a long history of popularization of geology dating back to lectures presented in the 1820s. The first lecture series that included geology and presented to a public audience in 1824 was followed by almost a century of public engagement and presentation of geology topics to a relatively small city of 20 000 to 30 000 people. Lectures were often very general about the science of geology, specific as to the nature of minerals and mining in New Brunswick, and leading edge concerning the first discoveries of significant fossils in the Province. Even though it was a relatively small community, Saint John had an abundance of knowledgeable people, and institutions for presentation and discussion at the Saint John Mechanics' Institute and the Natural History Society of New Brunswick.

RÉSUMÉ

La vulgarisation de la géologie à Saint John, au Nouveau-Brunswick, est une longue tradition qui remonte aux conférences données dans les années 1820. Après avoir assisté à une première série de conférences sur la géologie en 1824, le grand public a été présent pendant près d'un siècle aux exposés sur la géologie offerts dans cette petite ville de 20 000 à 30 000 personnes. Les conférences étaient souvent d'ordre très général en ce qui concerne l'aspect scientifique de la géologie, mais elles étaient spécifiques pour ce qui est de la nature des minéraux et de l'exploitation minière au Nouveau-Brunswick et d'avant-garde quant aux premières découvertes de fossiles importants dans la province. Saint John était une collectivité relativement petite, mais on y trouvait une abondance de gens cultivés, de même que des établissements qui se prêtaient aux conférences et aux discussions, notamment le Saint John Mechanics' Institute et la Société d'histoire naturelle du Nouveau-Brunswick.

[Traduit par la redaction]

INTRODUCTION

Public lectures were an important form of scientific communication during the 19th century in Britain (Inkster 1980; Lightman 2007) and North America (Rossiter 1971; Scott 1980). In Britain, Canada and the United States of America, mechanics' institutes, natural history societies, and other organizations popularized geology and other sciences for the public. Inkster (1975, p. 451) provided an interesting review of science education at mechanics' institutes in Britain, and noted a general agreement amongst researchers that the "*institutions plumbed the depths of failure as providers of scientific education and facilities*". While the mechanics' institutes may at times have been criticized for presenting lectures at too high a level for a general audience, lectures in Saint John were in demand and well attended by local audiences for almost a century at the Saint John Mechanics' Institute, and later at the Natural History Society of New Brunswick and other venues.

In the eastern USA communities of all sizes established lecture societies. Lecturers included local citizens, itinerant lecturers, and professionals like Benjamin Silliman (1779–1864) from Yale University who drew audiences of 2 000 at the Lowell Institute in Boston (Rossiter 1971). Public

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science lectures in the USA were mostly in New England. They began in the 1830s as free lectures, evolving to fee-based and society-sponsored events (Scott 1980). In the beginning lectures were mostly presented by local speakers. Later they developed into lecture circuits given by itinerant speakers who travelled to communities, providing practical knowledge and entertainment for the public. Lecturing was often a means to develop a professional career, a lecturer's success in part determined by attracting paying audiences.

Geological science has long been an important part of science culture in the Maritime Provinces of eastern Canada (Bogaard 1990; Williams and Fensome 2001; Miller and Buhay 2014), a region that produced some of the country's leading 19th century geologists including Sir William Dawson (Eakins and Eakins 1990). In the 19th century significant discoveries were made in Nova Scotia at places like Joggins (Falcon-Lang 2006) and in New Brunswick at localities including Green Head (Miller 2003) and Ratcliffe Brook (Miller and Buhay 1988). Popularization of science, including geology, was also part of Maritime Canada culture in the 1800s, although on a smaller scale than that seen in Great Britain and the USA. In New Brunswick local scientists contributed to scientific knowledge of citizens (MacNaughton 1947). Geology lectures in particular remained the purview of local professional geologists, knowledgeable amateurs, and even individuals with little geological training.

In Saint John, geology lectures for the public began as early as 1824 when Dr. William Hunt's lecture series was reported in the *New Brunswick Courier* (20 December 1823) "We understand Dr. Hunt purposes to give Six Lectures on Chemistry and Geology, premised with a short Dissertation on the modern nomenclature of the Materia Chemica. The Nitrous Oxide, or Exhilarating Gas to be exhibited, and its nature and properties explained, and during the course a number of experiments will be attempted illustrative of Chemical Phenomena. The arrangement and position of the Primary and Secondary Rocks, &c. will be illustrated by Drawings done expressly for the purpose. The whole intended to excite the …[?]... to useful study, to facilitate the approach to scientific knowledge as connected with the improvements of the arts. Tickets to Subscribers for the course will be Four Dollars. As an accommodation to persons who may wish to attend a particular Lecture they can be admitted by Tickets for the evening. Should it be found that Six Lectures are insufficient to finish the intended course, they will be continued till it is completed, without additional expense to Subscribers".

Hunt was a physician from the USA, but lived in Saint John for some time. He also worked as an artist and produced a well-known panoramic of the city in 1835, drawn from the bell tower of Trinity Church. Dr. Hunt delivered his last lecture on a Saturday evening as reported in the *City Gazette* (5 February 1824) "Communicated. – On Saturday evening next, Dr. Hunt will give his concluding Lecture. (Geology;) illustrated by Drawings of primitive and secondary formations. ""If the practical utility of Geology be questioned, nothing is more easily demonstrated; and it augers well that its pursuit in this respect is daily extending. To refer to two or three instances only, to mining, farming, and building"". That these Provinces contain valuable minerals there can be little doubt, and it requires but a small share of study, to acquire sufficient knowledge to form a judgement where the probability exists of their deposition; but when found it requires a further knowledge to ascertain whether the research or working, will be attended with profit or advantage, and this knowledge may be considered as altogether comprised in that of Chemistry." Although no reports have been found concerning the lectures, they were presumably a financial success for Hunt, as it appears he completed his lecture series.

Aside from Hunt, who spent only a short time in Saint John and returned to the USA, many of the popularizers of geology throughout the rest of the century were local citizens active in either the Saint John Mechanics' Institute (Acheson 1985; Hewitt 1988, 1990), or later as members of the Natural History Society of New Brunswick. Occasional visitors lectured about geology before the institute, but not as part of the regular "lecture circuit" common in New England. We suggest that Saint John, and to a lesser extent the University of New Brunswick in Fredericton, had such a local wealth of geoscientists, that "foreign" lecturers were not needed to fill the roster of geological lectures. Other topics did draw itinerant lecturers to speak on a variety of themes, so apparently the community was a financially successful stop for lecturers. One of the most famous visitors was playwright, poet, and author Oscar Wilde (1854–1900) who spoke to an audience at the Mechanics' Institute in 1882 (Soucoup 1997).

SCIENCE RESOURCES FOR THE PUBLIC

In the early 1800s publishers in Britain began to produce scientific literature for public consumption (Lightman 2007). In the USA magazines like *Popular Science Monthly* (New York) informed people about advances in science and technology. In New Brunswick these publications were available to wealthier citizens, but also to a wider public through the libraries of mechanics' institutes and natural history societies that had developed in larger communities. By far the largest institutions were located in Saint John where the Saint John Mechanics' Institute (1838–1890) and the Natural History Society of New Brunswick (1862–1932) developed libraries for their members and the public. Magazines and journals such as *The Canadian Naturalist and Geologist*, *Geographical Journal*, *Geological Magazine*, and *Science*, and bulletins of foreign societies like the Yorkshire Geological Society and the Essex Institute were available in reading rooms and for loan to members (Buhay and Miller 2010). In this paper we provide an overview of the geoscience lecture scene in Saint John during the 19th to early 20th century.

SAINT JOHN MECHANICS' INSTITUTE LECTURES

During the 1830s to 1850s the Saint John Mechanics' Institute was the primary institution hosting geological lectures in Saint John. In addition to providing library resources to the community, public lectures on various topics were an important part of the Institute founded in 1838 (Hewitt 1988, 1990). In 1840 the Institute opened a new building on Carleton Street (Fig. 1a) and when finished in 1841 the building had eight classrooms and a hall capable of seating 800 people (Acheson 1985). Early on geology became a staple of scientific instruction and lectures (Appendix 1), due in large part to Dr. Abraham Gesner (1797–1864), the first Provincial Geologist in New Brunswick and an active member of the Institute (Russell 1976; Miller and Buhay 2007a; Miller *et al*. 2012). Gesner must have been an inspiring presenter. In spite of his detractors, the newspaper wrote very favourable accounts of his lectures, *N.B. Courier* (6 April 1839) "Geology. – Dr. Gesner's Lectures on Geology continue to excite much interest. His day course is most respectably attended by ladies and gentlemen. The lecture delivered before the Mechanics' Institute on Monday evening last, on the origin of coal, evinced a perfect knowledge on the subject, on the part of the Lecturer; and the clear, animated, and eloquent manner in treating on this interesting topic, afforded the highest

Figure 1. (a) Mechanics' Institute building Carleton Street, Saint John, built in 1840. The building is to the left of the St. John Stone Church, NBM, Image No. 1996.44.26; (b) Natural History Society of New Brunswick building, Union Street, 1906, NBM, Image No. 13305(2).

satisfaction to his delighted audience. The next Lecture before the Institute will be given on Monday evening next". He was certainly popular enough that he returned to the institute numerous times, and presented entire series about geology to Saint John audiences as a paid lecturer, *N.B. Courier* (29 February 1840) and *Weekly Observer* (3 March 1840) "ADVERTISEMENT: Lectures on Geology. A course of Lectures on Geology will be commenced on Thursday next, the 5th of March, at Foster's Long Room, Germain Street, at 3 P.M., in which the Science will be ellucidated with sections, drawings, rocks, minerals, fossils, and other objects of Natural History. The Geology of New Brunswick will also be considered, and demonstrated by its own native rocks and remarkable organic remains. Family tickets, 20s.; single tickets, 10s. for the course; tickets for single lectures, 2s. 6d. - to be had at Messrs. V.H. Nelson & Co.'s Book Store. February 29th, 1840 A. Gesner". Other local lecturers included Robert Foulis (1796–1866), more an engineer and artist than geologist, he presented geology to the public at the Mechanics' Institute (MacKinnon 1976; Wright and Miller 1990), *Weekly Observer* (17 February 1852) "Mr. Foulis delivered an interesting lecture, last evening, at the Mechanics' Institute, on Geological Phenomena". During the 1830s to early 1840s these two men likely provided most of the geology-themed lectures at the institute (Fig. 2).

Figure 2. Mechanics' Institute lecture ticket, NBM Archives Brown & Marr-F103-7a.

At times the Institute was visited by other leading regional scientists like James Robb (1815–1861) from the University of New Brunswick (Bailey 1976) where he lectured on broad subjects of geology. In 1857 he spoke at Kings College in Fredericton about "Rocks constituting the Earth's crust"… "Minerals forming Rocks; Fossils, their nature and value; Petrifaction; Palaeontology; Classification of Rocks according to origin and age; Aqueous" among other basic principle of geology" (*Royal Gazette* – 11 February 1857). The newspaper advertised these lectures in Fredericton as daily at 1pm. It is likely that Robb spoke on similar topics to Saint John audiences. Bailey (1976) reported that the citizens of Saint John requested Robb deliver a course in mineralogy over the Christmas break of 1841.

Robb's successor Loring Woart Bailey (1839–1925) (Bailey 1925; Young 2005) continued the tradition as soon as he arrived in New Brunswick in 1860 and lectured to Saint John audiences in the middle of winter, *Morning Journal* (19 February 1860) "Professor Bailey's most admirable lecture is completed in our present issue. We need not point out to our intelligent readers how grand and elevating are the views of creation and of the primeval history of our own Province which it discloses, period after period, until it became fit for man's abode; nor how important it must be to the students of the University to receive such instructions - nor, lastly, how beneficial to us in a moral, scientific material and economic point of view, must be a thorough Geological survey, which can be carried on step by step, according to our means. It is quite too bad that no arrangements were made for having the work carried on last summer and fall as in previous years". In 1862 Professor Bailey delivered at least three geology lectures from January 6 to 13 (Appendix 1). William Bunting, recording secretary for the Institute, noted in his diary on 24 January 1862 acknowledgement of a receipt from Bailey for $40 paid to him by the Institute (NBM Archives S54a -4, Bunting, William Franklin, Diary Vol. 1, 1858–1864). Although Bunting does not say what the payment was for, we might assume it was compensation to Bailey for his lectures. Bailey continued to lecture to the Institute on occasion as evidenced by the report in the *Morning Journal* (23 December 1868) and *N.B. Reporter* (25 December 1868) "Prof. Bailey's elaborate and instructive lecture on ""Volcanoes"", at the Institute on Monday attracted a fine audience, who must have acquired a great deal of valuable information. It was illustrated by diagrams kindly furnished by the Lieutenant-Governor", however most of his lectures in later years were presented to the Natural History Society of New Brunswick.

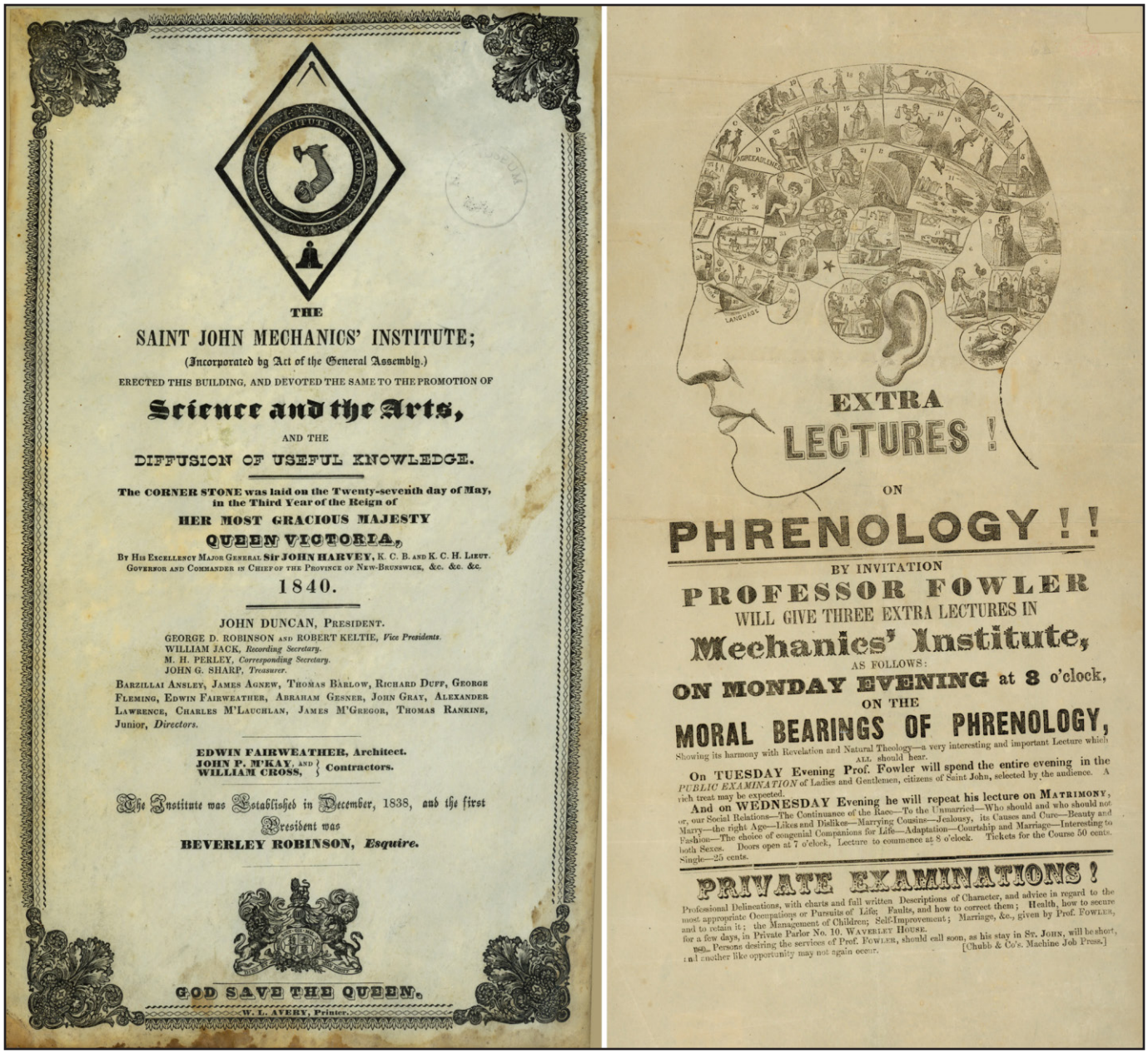
Bailey's rival Henry Youle Hind (1823–1908) conducted geological work for various surveys in western Canada and also for the Province of New Brunswick (Jarrell 1994). He too presented talks in Saint John, *Headquarters* (26 April 1865) "Geological Survey. – We publish from the Maine Press an article reviewing a lecture delivered by Professor Hind, in St. John, sometime in the beginning of this year, during the election excitement. Under different circumstances the lecture would, no doubt, have received the attention it merited. As the subject interests our Yankee neighbours as nearly as ourselves, it is not surprising that it should have attracted their attention. Professor Hind has made during the course of last year extensive explorations throughout the Province, and will lay the result of his labours before the House, in the shape of a preliminary report, giving a general view, in a systematic shape, of the geological features of the Province. It will be then for the House to determine whether they shall have, by a practical man, and a man of some note, and who can devote his whole time to the work, a thorough and practical survey. It is not a work that can be performed in a season, but will take several, and money will be well and judiciously expended in helping to execute such a work. We believe such a survey would be of the greatest possible benefit to the Province. It would give a correct view - and in the shape for reference - of the extent and value of its mineral resources, in which it is undoubtedly rich, and enable the Government to set a right value on the Crown lands of the Province, which are now disposed of utterly regardless of the unknown riches which may be buried under them. We are sure the subject will receive the unbiased attention its great importance demands".

Other science topics were presented by visitors like biologist Asa Gray (1810–1888) from Boston and the English agricultural scientist James Finlay Weir Johnston (1796–1855) (Wynn 1985). Other well-known geologists visited Saint John; Edouard de Verneuil (1805–1873) President de la Société Géologique de France saw Gesner's Museum collection in May 1846 (*Novascotian* – 24 May 1846), and Charles Lyell was in Saint John on September 9–10, 1852 (Miller and Buhay 2007b), but there is no evidence that either lectured at the Institute.

Ultimately lectures of a scientific nature proved to be controversial as the Mechanics' Institute focus was more on technical training of a practical nature for its members (Fig. 3). Although geology had become a regular part of scientific instruction, geology or perhaps Gesner, became a target for those members whose interests were elsewhere (Miller and Buhay 2007a). For years there had been turmoil between the executive of the Mechanics' Institute and the general membership. Part of the crisis concerned a disagreement about whether the institute should provide scientific or technical instruction (Acheson 1985), a debate not restricted to the Saint John Mechanics' Institute (Inkster 1975). Interestingly lecture topics including medicine, religion and those with more entertainment value like phrenology continued at the Institute while geology topics faded.

NATURAL HISTORY SOCIETY OF NEW BRUNSWICK LECTURES

Perhaps one reason for the apparent reduction of geology lectures at the Saint John Mechanics' Institute was the founding of the Natural History Society of New



THE
SAINT JOHN MECHANICS' INSTITUTE;
(Incorporated by Act of the General Assembly.)
ERECTED THIS BUILDING, AND DEVOTED THE SAME TO THE PROMOTION OF
Science and the Arts,
AND THE
DIFFUSION OF USEFUL KNOWLEDGE.
The CORNER STONE was laid on the Twenty-seventh day of May, in the Third Year of the Reign of
HER MOST GRACIOUS MAJESTY
QUEEN VICTORIA,
By His Excellency Major General Sir JOHN HARVEY, K. C. B. and K. C. H. Lieut. Governor and Commander in Chief of the Province of New-Brunswick, &c. &c. &c.
1840.
JOHN DUNCAN, President.
GEORGE D. ROBINSON and ROBERT KELTIE, Vice Presidents.
WILLIAM JACK, Recording Secretary.
M. H. PERLEY, Corresponding Secretary.
JOHN G. SHARP, Treasurer.
Barzillai Ansley, James Agnew, Thomas Barlow, Richard Duff, George Fleming, Edwin Fairweather, Abraham Gesner, John Gray, Alexander Lawrence, Charles M'Lauchlan, James M'Gregor, Thomas Rankine, Junior, Directors.
EDWIN FAIRWEATHER, Architect.
JOHN P. M'KAY, and WILLIAM CROSS, } Contractors.
The Institute was Established in December, 1838, and the first President was
BEVERLEY ROBINSON, Esquire.
GOD SAVE THE QUEEN.
W. L. AVERY, Printer.

EXTRA
LECTURES !
ON
PHRENOLOGY ! !
BY INVITATION
PROFESSOR FOWLER
WILL GIVE THREE EXTRA LECTURES IN
Mechanics' Institute,
AS FOLLOWS:
ON MONDAY EVENING at 8 o'clock,
ON THE
MORAL BEARINGS OF PHRENOLOGY,
Showing its harmony with Revelation and Natural Theology—a very interesting and important Lecture which ALL should hear.
On TUESDAY Evening Prof. Fowler will spend the entire evening in the PUBLIC EXAMINATION of Ladies and Gentlemen, citizens of Saint John, selected by the audience. A rich treat may be expected.
And on WEDNESDAY Evening he will repeat his lecture on Matrimony; or, our Social Relations—The Continuance of the Race—To the Unmarried—Who should and who should not Marry—the right Age—Likes and Dislikes—Marrying Cousins—Jealousy, its Causes and Cure—Beauty and Fashion—The choice of congenial Companions for Life—Adaptation—Courtship and Marriage—Interesting to both Sexes. Doors open at 7 o'clock, Lecture to commence at 8 o'clock. Tickets for the Course 50 cents. Single—25 cents.
PRIVATE EXAMINATIONS !
Professional Delineations, with charts and full written Descriptions of Character, and advice in regard to the most appropriate Occupations or Pursuits of Life; Faults, and how to correct them; Health, how to secure and to retain it; the Management of Children; Self-Improvement; Marriage, &c., given by Prof. Fowler, for a few days, in Private Parlor No. 10. Waverley House.
N.B. Persons desiring the services of Prof. Fowler, should call soon, as his stay in St. John, will be short, and another like opportunity may not again occur.
[Chubb & Co's. Machine Job Press.]

Figure 3. (a) Mechanics' Institute poster 1840, dedicating the new building and its purpose in promotion of "Science and the Arts, and the Diffusion of Useful Knowledge" NBM Archives MechInstitute-CBDOC-1; (b) Mechanics' Institute poster advertising lectures about phrenology, NBM Archives Printed Ephemera-F36-7.

Brunswick (1862–1932) in Saint John in 1862. The two organizations shared a building at various times (Buhay and Miller 2010) and had overlapping membership and audiences. The Society was a leading scientific organization of its time with international ties and a close relationship to the Geological Survey of Canada (Zaslow 1975). Several of its members moved to Ottawa to join the Survey. Many of its original members were geologists, although the Society studied and published in all areas of natural science and developed large collections in botany, geology and zoology and also cultural artifacts (McTavish 2013). The Society was founded on the work of young geologists who had formed the Steinhammer Club in 1857 (Miller and Buhay 1988). Sir John William Dawson (1820–1899), who was active with the Natural History Society of Montreal (Phillipson 1988; Sheets-Pyenson 1996; Eakins and Eakins 1990), encouraged Steinhammer Club members to form a similar society in Saint John. Dawson worked closely with them and, impressed with their geological work, he used the research of Charles Frederic Hartt (1840–1878) (Squires 1972; Brice 1994) and George Frederic Matthew (1837–1923) (Miller and Buhay 1988; Miller 2003, 2005) concerning Cambrian trilobites and Upper Carboniferous plants and insects in the second edition of *Acadian Geology*

(Dawson 1868; Miller and Buhay 1988; Falcon-Lang and Miller 2007). As an amateur society away from the major centres of science in Canada, the Society was both energetic and resourceful in developing its own research capabilities and in dissemination of scientific knowledge to the public. They developed their own library and collections (Buhay and Miller 2010) and often shared resources with the local Mechanics' Institute that had its own, library, museum and tradition of public lectures on a range of topics including science.

The geology component of the Mechanics' Institute museum was based largely on the "Gesner's Museum" collection established as one of the first public museums in Canada on 5 April 1842. The Institute collection was later acquired by the Natural History Society of New Brunswick in 1890 where the specimens became part of the larger collection of the Society (Miller and Buhay 2007a). In the early 1900s they purchased their own building in Uptown Saint John (Fig 1b). During its years of operation (1862–1932), the Natural History Society of New Brunswick had a bulletin to publish their scientific research papers and record their activities. Regular and Corresponding Society members had their papers read before meetings and the Society developed an active public "elementary" lecture program (Figs. 4, 5). Between 1862 and 1917 the

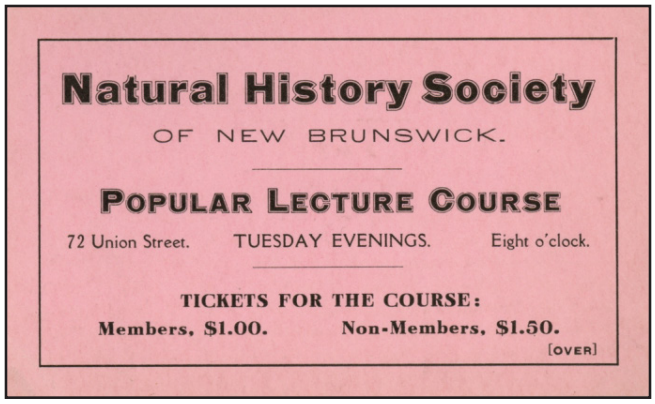
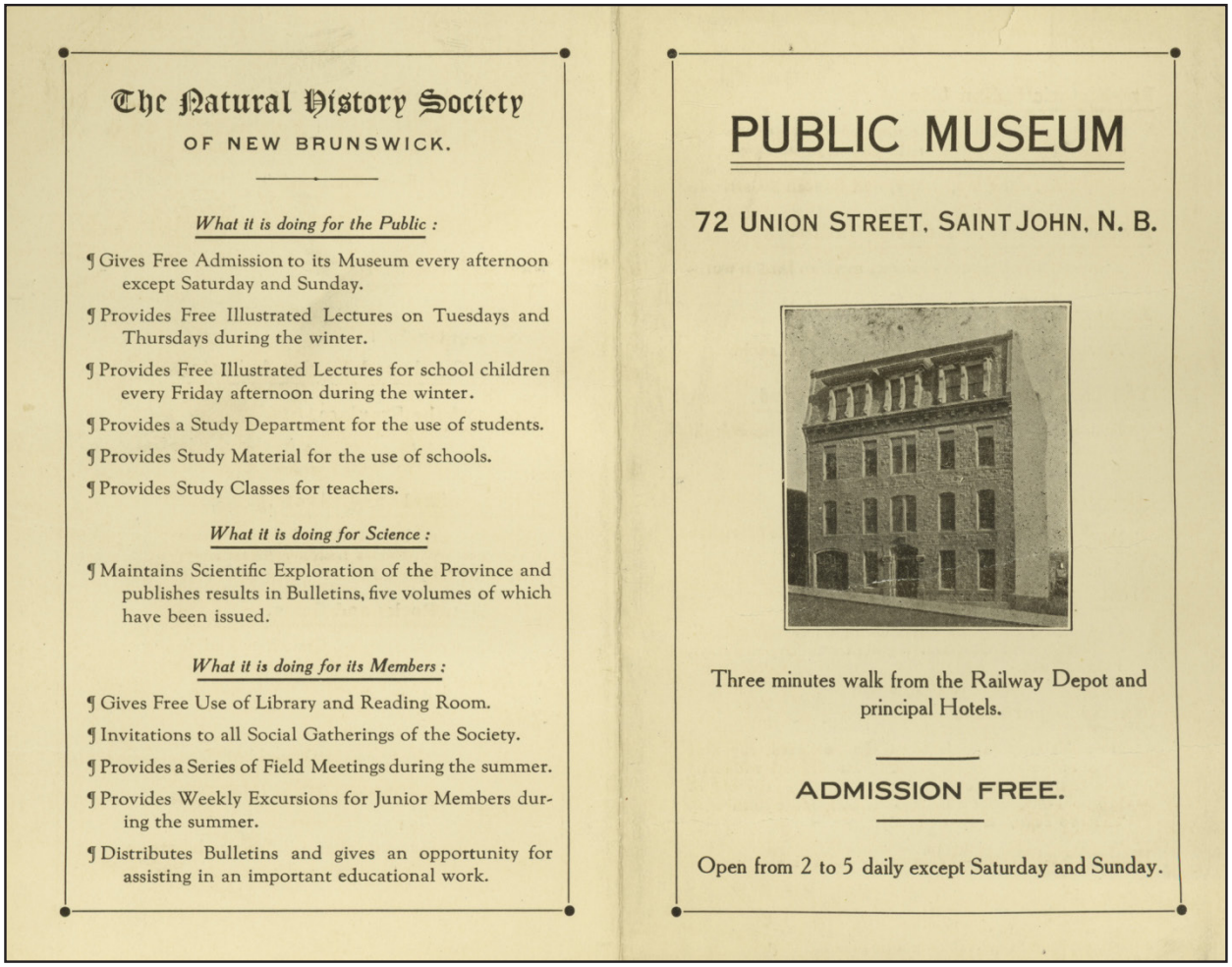

Natural History Society
OF NEW BRUNSWICK.
POPULAR LECTURE COURSE
72 Union Street. TUESDAY EVENINGS. Eight o'clock.
TICKETS FOR THE COURSE:
Members, $1.00. Non-Members, $1.50.
[OVER]

Figure 4. Natural History Society of New Brunswick lecture ticket, NBM Archives NHS-F128-3.

Figure 5. Natural History Society of New Brunswick pamphlet advertising the activities of the Society, NBM Archives NHS-F129-1(1).


The Natural History Society
OF NEW BRUNSWICK.

What it is doing for the Public :

¶ Gives Free Admission to its Museum every afternoon except Saturday and Sunday.

¶ Provides Free Illustrated Lectures on Tuesdays and Thursdays during the winter.

¶ Provides Free Illustrated Lectures for school children every Friday afternoon during the winter.

¶ Provides a Study Department for the use of students.

¶ Provides Study Material for the use of schools.

¶ Provides Study Classes for teachers.

What it is doing for Science :

¶ Maintains Scientific Exploration of the Province and publishes results in Bulletins, five volumes of which have been issued.

What it is doing for its Members :

¶ Gives Free Use of Library and Reading Room.

¶ Invitations to all Social Gatherings of the Society.

¶ Provides a Series of Field Meetings during the summer.

¶ Provides Weekly Excursions for Junior Members during the summer.

¶ Distributes Bulletins and gives an opportunity for assisting in an important educational work.

PUBLIC MUSEUM

72 UNION STREET, SAINT JOHN, N. B.

Three minutes walk from the Railway Depot and principal Hotels.

ADMISSION FREE.

Open from 2 to 5 daily except Saturday and Sunday.

Bulletin records 709 lectures read before the Society and 105 elementary lectures delivered to a broader audience (Appendix 1). Lectures, supported by the research activities of Society members, were often at the leading edge of scientific discovery. Although much of the member's research was related to the museum collection, especially in later years with Matthew's Cambrian palaeontology research, Society members also studied and reported on meteorology, physics, hydrogeology, sea level and tides, physiography, seismology, and provided observational data on plant and animal distribution.

The Society corresponded with scientific societies in Canada and the eastern United States, as well as in Europe. Among its other distinguished members were botanist George Upham Hay (1843–1913) (Clayden 1998), ornithologist Montague Chamberlain (1844–1924), geographer William Francis Ganong (1864–1941) (Wynn 1981), glacial geologist Robert J. Chalmers (1833–1908) (Brookes 2008), and palaeontologist William Diller Matthew (1871–1930), George Matthew's oldest son (Colbert 1992; Miller 1994). Member's papers appeared in such journals as the *Transactions of the Royal Society of Canada*, *Canadian Record of Science*, *American Journal of Science*, *Geological Magazine*, *Science* and the *Botanical Gazette*.

THE NHS OF NB - WHO LECTURED, AND ABOUT WHAT

Society members delivered lectures on a wide range of topics, most often in their area of expertise, but not always. Overall, topics fell into broad areas of Archaeology, Botany, Geology, Palaeontology, Physical Science, Zoology, Collections and other areas less focused on natural history (Fig. 6). Records for early lectures (1863–1881) are sparse, recorded in newspaper reports and in later summaries of the Natural History Society of New Brunswick's early days (Matthew 1913). Few transcripts exist. The first lecture presented before the Society was by Fred Hartt (Fig. 7) a graduate of Acadia College (Acadia University) in Wolfville, Nova Scotia (Brice 1994) where he studied geology. He spoke to the Society on 25 April 1862 about a topic from his time in Nova Scotia "*Gold, and a map of the gold fields of Nova Scotia*" (Matthew 1913). Hartt went on to become the first professor of geology at Cornell University and eventually was to direct a geological survey of Brazil begun by Louis Agassiz.

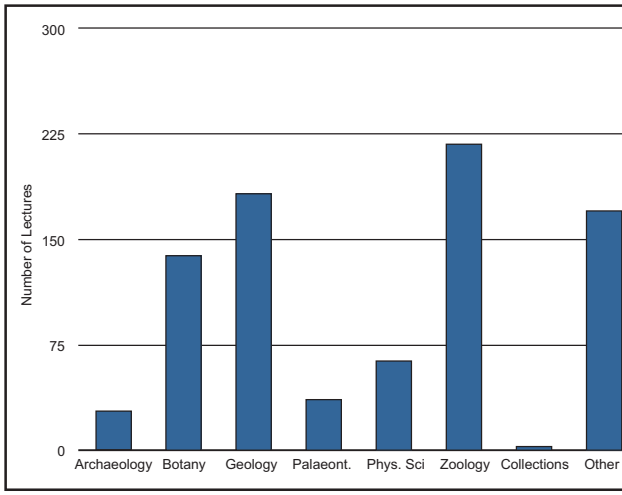


Figure 6. Graph comparing the number of natural science lectures topics recorded in the Bulletins of the Natural History Society of New Brunswick from 1881 to 1917.

Figure 7. Charles Frederic Hartt lecturing about Batrachians, c. 1870. NBM Archives William Francis Ganong Collection (1987.17.494).

In 1877 a devastating fire destroyed much of Saint John and although the collections of the Mechanics' Institute and Natural History Society survived, the records they kept provide little detail concerning their activities. By the early 1880s however the Society showed renewed vigor. They began to publish a Bulletin and provide better records of museum donations and lectures. The first lecture noted in the new Bulletin, was delivered 1 February 1881 by G.F. Matthew; "*Work done by geologists in the province during the past forty-two years*" (1882 NHS of NB Bull. No. 1, p. 5). Although he was a young member of the Society at its inception, Matthew grew to become the leader when it came to the geosciences. Even so, an examination of the list of lecturers indicates that many Society members had something to say on geological topics (Appendix 1). The second lecture was by Robert Chalmers, 1 March 1881;

"*Evidence of glacial action on the shores of the Baie de Chaleur*." (1882 NHS of NB Bull. No. 1, p. 5). In 1883 there was a Standing Committee for Lectures established and the early lectures in geology provided a firm foundation for a lasting legacy of the popularization of geology. Even though many of the lectures were presented before the Society, members came from all walks of life. This was not a case of geologists lecturing to other geologists, but rather a mix of geologists, scientists in other disciplines, businessmen, physicians, tradesmen, and their families. Both men and women presented lectures to the Society and public. Women were significant contributors to the Society, even though they had a separate category as 'associate' members (McTavish 2008; Buhay and Miller 2010). In 1887 the Society established a Summer School of Science and a course of lectures on science, to deliver public lectures to non-Society members in an attempt to reach a wider audience –"Another important work undertaken by the society, and now in progress, is the course of lectures on Elementary Natural Science. The series includes nineteen lectures on Chemistry, Mineralogy, Zoology and Botany, and thus far have been well attended." (1888, NHS of NB Bull. No. 7, p. 76). Geology lectures were often presented as a series, and although we have little specific information about them, the newspapers often mentioned the lectures. In 1862, the first year of the Natural History Society of New Brunswick, Bailey delivered a geology lecture series at the Mechanics' Institute (N.B. Courier – 11 January 1862; Appendix 1), in the same building where the new Natural History Society met. At the end of the century Society members like Matthew were still delivering geology lecture series, *Gazette* (26 January 1897) "Natural History Society. – Dr. Geo. F. Matthew will deliver the second lecture of his elementary course this evening. Subject – Geology from a railway train".

Lectures were not just presented at the Society. George Matthew spoke to public audiences elsewhere, *S.J. Daily Sun* (22 February 1881) "Surface Geology. - An interesting talk will be given by G.F. Matthew, Esq., this evening in the lecture room of the Young Men's Christian Association, the subject being Surface Geology. Any person wishing to attend can obtain tickets free by calling at the Secretary's office any time before the lecture." Loring Bailey gave an interesting lecture course at church, a venue not uncommon in England (Inkster 1975), *N.B. Reporter* (7 December 1889) "Our Earth. - The St. John Globe says that the first lecture of the Church of England Institute course was delivered Monday night in Trinity church school room by Prof. L.W. Bailey. The lecture was very instructive and entertaining, the subject being The Earth We Live On. A great number of views were shown with the magic lantern. Mr. Farren having charge of it. They included astronomical views and views of various parts of the earth, showing the glacial and carboniferous periods. Rev. Canon Brigstocke presided. The lecturer was tendered a hearty vote of thanks".

The *Daily Telegraph* (Mar. 3, 1892) reported on a lecture with a rather remarkable content presented as a "University Extension Course". – The lecture on geology last evening by Mr. G.F. Matthew was given to an account of the Devonian and carboniferous ages, and was prefaced by an outline of the classification of plants found on the earth at the present day. Of those that existed now, only certain types had appeared in the early times. The chief among these were representations of the club mosses, ferns, pines and horsetails. Some other striking types as the sigillaria and the cordaites were described. Besides this outline of plants, a sketch was given of the principal divisions of the fishes, of which all but the telcosts or cycloids (bony scaled fishes) were found in carboniferous and Devonian times. The coal measures were the most remarkable features of the carboniferous deposits in this country, and the Devonian is remarkable for its gigantic placid fishes, though in that neighbourhood it was not the fishes that made it remarkable, but the plants, of which many perfect specimens were found near St. John. The carboniferous was remarkable for large numbers of fishes with rhombic long scales. With the close of Cambrian time he passed to a new order of things, when reptiles, etc., were found, and the plants began to resemble more nearly those of modern times".

A week later the newspaper reported, *Evening Gazette* (Mar. 9, 1892) "This Evening. - The sixth lecture of the course in geology will begin at the Natural History society rooms this evening at eight o'clock; subject, History of the Secondary and Tertiary Ages of Geology".

A CONTRIBUTION TO GEOLOGY IN NEW BRUNSWICK

In this relatively small community, with a population of about 23 000 in the 1850s (Hewitt 1988), the Mechanics' Institute and the Natural History Society of New Brunswick had built a substantial resource of both infrastructure (lecture rooms, libraries, and museum collections) (Buhay and Miller 2010) and talented people. The teaching of geology to public audiences had begun at least by the 1820s, and was still active a century later. Lecturers were largely drawn from the local community and comprised professional geologists, very talented 'amateurs' and interested individuals. Geology lectures covered a variety of topics from the theoretical understanding of the Earth, to the practical nature of identification of minerals and rocks, to the application of geology to mining in New Brunswick, to the ground-breaking discovery of fossils by local geologists (Appendix 1). Although the majority of lectures were in Saint John they were not exclusive to the city. Fredericton, with its university where Robb and Bailey were professors, had public lectures in geology, as did St. Andrews, Bathurst, and Chatham. Some Society members like Geoffrey Stead (1872–1943) maintained their connection after they moved away from Saint John, and continued to contribute papers to Society meetings. Stead was a corresponding member from Chatham, New

Brunswick (Appendix 2), when in early 1905 he presented a lecture 'Notes on a grindstone quarry at Stonehaven, N.B' (Fig. 8). A longtime member of the Society, Stead was twice the president of the Association of Professional Engineers of New Brunswick (now the Association of Professional Engineers and Geoscientists of New Brunswick).

Figure 8. Finished Grindstones at Stonehaven, Gloucester County, New Brunswick, 1928, NBM Archives 1987-17-1142. Geoffrey Stead (inset) was a Natural History Society of New Brunswick corresponding member from Chatham, N.B. in the early 1905 when he presented a lecture 'Notes on a grindstone quarry at Stonehaven, N.B.'

It might be surprising to note how many influential scientists were associated with the Mechanics' Institute or the Natural History Society of New Brunswick (Appendix 2). Many were famous away from home, but had started their careers in Saint John, developed many of their skills as members of the Institute or Society, and maintained a long association with the organizations. Biographies of many of the people can be found in the *Dictionary of Canadian Biography*, *The Canadian Encyclopedia*, and in biographical works dedicated to individuals (see reference list); a testament to the importance they had in Canadian society and in international circles. Aside from Ottawa, Montreal and Toronto, where else in Canada was there such a congregation of pioneering geologists?

Were the lectures they delivered current with the geological science of the day? Unfortunately for most lectures transcripts do not exist. With the exception of lectures 'read before the society' at the Natural History Society of New Brunswick, little but the title is known. However we surmise that given the expertise of many of the lecturers (Appendix 2), the science was current. Newspaper stories, such as in the *Daily Telegraph* (Mar. 3, 1892) noted above provide some idea of the nature of the lectures. In the earlier days of the Mechanics' Institute Abraham Gesner was a regular lecturer. Like many geoscientists of his day, Gesner was a physician (Lewis 2009), and was trained by John Abernethy (1764–1831) at St. Bartholomew's Hospital in London in 1825. At the same time Abernethy had also mentored the English botanist and palaeontologist Richard Owen (1804–1892) known for coining the term Dinosauria and helping to establish the British Museum (Natural History). For a short period Gesner was in the circles of British geology in London before he returned to Canada. His lectures on geology at the Mechanics' Institute were given while he was mapping the geology of New Brunswick and his later experiments to develop kerosene and become a founder of the modern petroleum industry suggest he was well versed in geoscience (Miller and Buhay 2007a; Miller *et al*. 2012). Some of his lectures were reportedly entertaining and sensational, such as that recounted by Hewitt (1988) where Gesner, speaking on "Galvanism" passed an electric current through the head of recently dead ox before an audience of 900 people.

At the Natural History Society of New Brunswick people like George Matthew were not just leaders in the local community; they were at the forefront of geology. Matthew corresponded regularly with international scientists including C.D. Walcott (1850–1927) at the United States Geological Survey and J. Barrande (1799–1883) in Prague (Miller and Buhay 1990), and worked closely with the Geological Survey of Canada for many decades. Among his accomplishments Matthew was one of the first palaeontologists to describe 'small shelly fossils' at the base of Cambrian. Robert Chalmers was a Canadian pioneer in the study of surficial geology. In his 1885 report for the Geological Survey of Canada, concerning the ice age deposits of the Saint John River valley, he was the first geologist to use the term 'kames' in Canada (Brookes 2008). On May 4, 1886, his lecture to the Natural History Society was titled 'The Kames and Terraces of New Brunswick'. Another Society member Wilmer Duff presented only a few lectures leaning toward geophysics (Appendix 1). Duff's *A Textbook on Physics*, first published in 1908, was the leading physics textbook in American universities for 30 years.

Determining the impact lectures had on the community is difficult. Inkster (1980) argued that in the case of the United Kingdom the reception that lectures received by the audiences were based upon factors related to both the lecturers and the audience. He stated that for the audience these were intelligence, prior knowledge, motivation, sympathy, alternatives, social composition, and status. On the part of the lecturer pedagogic style and expertise, value of knowledge, and nature of the subject were important factors. Our conclusion that lectures resonated with the public and satisfied these factors is based largely on their success, as they continued to draw audiences from the 1840s to the early 1900s; the success of the Natural History Society as an organization; the regular newspaper coverage of the events; and the esteem with which the lecturers were often afforded in the community.

A point made in that same study (Inkster 1980), partly true in New Brunswick, is that audiences outside the formal education venue were often hearing from the same lecturers as university students. Perhaps public audiences were often treated to more current information as lectures

were not tied to a standard curriculum. We suggest it is not so dissimilar today since news media stories about new research may reach the public long before it can be incorporated into textbooks and curricula. In Saint John there was no other government institution or university conducting original scientific research so the work of the Natural History Society of New Brunswick reached the local audience first.

Scientific success

Aside from a series of papers edited by Bogaard (1990), we have encountered little data tracking the impact of public science literacy during the period the Natural History Society was active. Perhaps the most relevant information is that presented on scientific disciplines and volume of scientific publications in the Maritimes prior to 1914 (MacDonald 1990). MacDonald's data showed that from 1860 to 1905 geology led the sciences in the number of publications produced in the region and of the forty most prolific authors he counted, George Matthew of the Natural History Society of New Brunswick led the field. Even though the University of New Brunswick in Fredericton taught natural history, more science authors were located in Saint John. A turning point for number of publications in New Brunswick occurred in the mid-1880s following the reorganization of the Society. A major factor was the Natural History Society Bulletin that first appeared in 1882, at the same time the Society began to increase its public presence. Prior to 1880 there were a total of sixty-three scientific papers published in New Brunswick. Between 1880 and 1913 publications for each five-year interval never dropped below fifty-three and reached 100 for the period 1895–1899. Although papers were not written for a public audience it does suggest the Society was successful in its research endeavours. Many of the lectures presented to members and public came directly from the research activities of Society members, most of whom were successful scientists and engineers (Appendix 2). In 1890 Matthew (1890) presented a lecture concerning discovery of a Precambrian fossil from Saint John, now considered the first Precambrian stromatolite described in scientific literature and one of the first recognized authentic Precambrian fossils. No doubt the Saint John audience heard about this discovery long before it was taught in a university geology class.

Society success

In addition to member and public lectures the Society reached out to public audiences in other ways. For many years through the late 1800s the library had been open to members on Tuesday evenings but by 1898 there was a desire to expand library access to the public. Society secretary Percy Hall wrote (Appendix, *Bulletin of the Natural History Society of New Brunswick* XVI (1898) p. 83), "A movement, originating, we need scarcely say, in the minds of the Associate Members [female members], is now on foot to open the rooms to the public three afternoons in the week. They propose to employ a lady librarian and curator, who will place and keep the museum in good order, and catalogue and re-arrange the library, under the direction of the regular officers of those departments. The necessary funds will be obtained by enlarging the membership and by special donations". The plan moved forward, and Miss McBeath was the "lady librarian and curator" hired for this position. In the Library report for the next year (Appendix, *Bulletin of the Natural History Society of New Brunswick* XVII (1899) p. 174) it was noted, "For the first time in several years we are in a position to announce real improvement in this department.

Hall, won over by the scheme, wrote (Appendix, *Bulletin of the Natural History Society of New Brunswick* XVII (1899) p. 176–177), "We have pleasure in announcing the complete success of the assistant librarian scheme. The requisite number of new members was found, and their fees amply covered all expenses. The assistant has been at her post on Tuesday, Thursday and Saturday afternoons, performing her duties in a manner that has given entire satisfaction. Nor have her duties been light, for a great increase of visitors has resulted. Formerly about one hundred and fifty persons registered in the course of a year; during the past year over eleven hundred names are entered, and as many as fifty persons (in this case mostly school children) have examined the [museum] collections in a single afternoon.

The Society was also active at Provincial and International Exhibitions, presenting displays of specimens of all kinds for the public to enjoy. Many reports of the exhibits are found in the Saint John newspapers. The *S.J. Daily Sun* (Oct. 7, 1880) wrote about one of the Provincial exhibitions reporting "Minerals No. 2. - Geological Sequence Collection of the N.H.S. [Natural History Society of New Brunswick] - Passing around to the northern side of the table where the mineral exhibits are placed another upright case comes into view, containing a collection of New Brunswick minerals, the property of the Natural History Society. They are chiefly for the instruction of the student and geologist, and with this object are arranged in geological sequence; that is, the minerals of each of the rock formations which exist in the Province are grouped together and so arranged that they present to the eye the natural succession of the formations in time, the oldest, or Laurentian, which from its position is called the fundamental or formation gneiss in Scotland, being represented by a row of minerals on the lower shelf - minerals which have been found mostly in the neighbourhood of St. John".

Popular personalities

One story that is perhaps telling of the popularity of local celebrity scientists concerns George Matthew's retirement. On Friday October 7, 1921, Matthew was invited to a

banquet held in his honour at the Union Club in Saint John. The Union Club was the place dignitaries were entertained. In 1919, just two years before Matthew's party, H. R. H. Prince Edward, Prince of Wales, visited the club. Matthew was retiring from a long career as customs agent, and leaving New Brunswick after a lifetime of service. In attendance were Mayor Schofield of Saint John; The Honourable Walter Foster, Premier of New Brunswick; and The Honourable William Pugsley, Lieutenant Governor of New Brunswick. They, and many others, were not there to just honour George Matthew the customs agent, but rather to recognize Dr. Matthew's achievements in science (Bailey 1925). His was an extraordinary career spanning six decades of geological exploration and research. The local newspaper reported the banquet as a "splendid testimonial … given by a representative gathering of men, distinguished in intellectual and business spheres of the province" (*Daily Telegraph Saturday 8 October, 1921, p. 5*).

CONCLUSIONS

New Brunswick, particularly Saint John, has a long history of popularization of geology dating to the 1820s when the first lecture series that included geology was presented to a public audience. For almost a century after the Saint John Mechanics' Institute and the Natural History Society of New Brunswick presented hundreds of lectures to audiences comprised of institutional members and the general public. Lectures ranged from general topics of geology to leading edge discoveries made in New Brunswick. In this relatively small community there was an abundance of knowledgeable people disseminating geosciences information to the public. In this century it is interesting to note some of the lecture topics. In 1863 G. Sinclair lectured on "*Certain Theories concerning the Origin of Species*" (Matthew 1913), just a few years after Darwin's *On the Origin of Species* in 1859. Robert Matthew's 1865 lecture "*Minerals, what we do with them and what we might do*" (Matthew 1913) could easily be a topic today. J.A.S. Henderson spoke about "*Natural Gas: Its Development and Possibilities*" (1914 NHS of NB Bull. No. 31, p. 80) in 1913 as part of a special lecture course, a topic very relevant today as New Brunswick considers its gas industry and hydraulic fracturing. One wonders if the citizens of 19th century Saint John could have been more Earth Science literate than they are today.

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REFERENCES

Acheson, T.W. 1985. Saint John. The making of a colonial urban community. University of Toronto Press, Toronto, 314 p.

Bailey, A.G. 1976. Robb, James. *In Dictionary of Canadian biography*, vol. 9, University of Toronto and Université Laval. URL <http://www.biographi.ca/en/bio/robb_james_9E.html> January 2015.

Bailey, J.W. 1925. Loring Woart Bailey. The story of a man of science. J&A MacMillan, Saint John, 141 p.

Bogaard, P. *(Editor)*. 1990. Profiles of science and society in the Maritimes prior to 1914. Acadiensis Press and Mount Allison University, 283 p.

Brice, W.R. 1994. Charles Frederic Hartt (1840–1878): the early years. Earth Sciences History, 13, pp. 160–167. http://dx.doi.org/10.17704/eshi.13.2.u817h0538w40p3v0

Brookes, I.A. 2008. Robert J. Chalmers: pioneer surficial geologist. Geoscience Canada, 35, pp. 127–136.

Buhay, D.N. and Miller, R.F. 2010. The Natural History Society of New Brunswick library: supporting geological science. Earth Sciences History, 29, pp. 146–170. http://dx.doi.org/10.17704/eshi.29.1.v58q7t8676308377

Clayden, S.R. 1998. Hay, George Upham. *In Dictionary of Canadian biography*, vol. 14, University of Toronto and Université Laval. URL <http://www.biographi.ca/en/bio/hay_george_upham_14E.html> January 2015.

Colbert, E.H. 1992. William Diller Matthew, paleontologist: the splendid drama observed. Columbia University Press, New York, 275 p.

Dawson, J.W. 1868. Acadian geology or the geological structure, organic remains, and mineral resources of Nova Scotia, New Brunswick and Prince Edward Island, 2nd edition. MacMillan & Company, London, 694 p. http://dx.doi.org/10.5962/bhl.title.38560

Eakins, P.R. and Eakins, J.S. 1990. Dawson, Sir John William. *In Dictionary of Canadian biography*, vol. 12, University of Toronto and Université Laval. URL <http://www.biographi.ca/en/bio/dawson_john_william_12E.html> January 2015.

Falcon-Lang, H. J. 2006. A history of research at the Joggins Fossil Cliffs of Nova Scotia, Canada, the world's finest Pennsylvanian section. Proceedings of the Geologists' Association, 117, pp. 377–392.

Falcon-Lang, H.J. and Miller, R.F. 2007. Palaeoenvironments and palaeoecology of the Early Pennsylvanian Lancaster Formation ("Fern Ledges") of Saint John, New Brunswick, Canada. Journal of the Geological Society, London, 164, pp. 945–957. http://dx.doi.org/10.1144/0016-76492006-189

Hewitt, M. 1988. Science as spectacle: popular culture in Saint John, New Brunswick, 1830–1850. Acadiensis, 18, pp. 91–119.

Hewitt, M. 1990. Science, popular culture, and the producer alliance in Saint John, N.B. *In* Profiles of Science and Technology in the Maritimes Prior to 1914. *Edited by* P.A. Bogaard. Acadiensis Press and Mount Allison University, pp. 243–275.

Inkster, I. 1975. Science and the Mechanics' Institutes, 1820–1850: the case of Sheffield. Annals of Science, 32, pp. 451–474. http://dx.doi.org/10.1080/00033797500200391

Inkster, I. 1980. The public lecture as an instrument of science education for adults – the case of Great Britain, c. 1750–1850. Paedagogica Historica, 20, pp. 80–107. http://dx.doi.org/10.1080/0030923800200104

Jarrell, R.A. 1994. Hind, Henry Youle. *In Dictionary of Canadian biography*, vol. 13, University of Toronto and Université Laval. URL <http://www.biographi.ca/en/bio/hind_henry_youle_13E.html> January 2015.

Lewis, C. L. 2009. Doctoring geology: the medical origins of the Geological Society. Geological Society, London, Special Publications, 317, 49–92. http://dx.doi.org/10.1144/SP317.2

Lightman, B. 2007. Victorian popularizers of science: designing nature for new audiences. University of Chicago Press, Chicago and London, 545 p. http://dx.doi.org/10.7208/chicago/9780226481173.001.0001

MacDonald, B.H. 1990. "Just a Little Better Than Other Sorts of Brains": A Profile of Science and Technology in the Maritimes Prior to 1914. *In* Profiles of Science and Technology in the Maritimes Prior to 1914. *Edited by* P.A. Bogaard. Acadiensis Press and Mount Alison University, pp. 27–47.

MacKinnon, C. 1976. Foulis, Robert. *In Dictionary of Canadian biography*, vol. 9, University of Toronto and Université Laval. URL <http://www.biographi.ca/en/bio/foulis_robert_9E.html> January 2015.

MacNaughton, K.F.C. 1947. The development of the theory and practice of education in New Brunswick 1784–1900. University of New Brunswick Historical Studies No. 1, Fredericton, 268 p.

Matthew, G.F. 1890. President's annual address, 3. On the existence of organisms in the pre-Cambrian rocks. Natural History Society of New Brunswick, Bulletin, 9, pp. 25–35.

Matthew, G.F. 1913. Sketch of the history of the Natural History Society of New Brunswick. Natural History Society of New Brunswick, Bulletin, 30, pp. 457–474.

McTavish, L. 2008. Strategic donations: women and museums in New Brunswick, 1862–1930. Journal of Canadian Studies, 42, pp. 93–116.

McTavish, L. 2013. Defining the modern museum: a case study of the challenges of exchange. University of Toronto Press, Toronto, 221 p.

Miller, R.F. 1994. Palaeontologist William Diller Matthew: early years in New Brunswick and the story of the giant trilobite. Geoscience Canada, 20, pp. 153–157.

Miller, R.F. 2003. George Frederic Matthew's contribution to Precambrian paleobiology. Geoscience Canada, 30, pp. 1–8.

Miller, R.F. 2005. Matthew, George Frederic. *In Dictionary of Canadian biography*, vol. 15, University of Toronto and Université Laval. URL <http://www.biographi.ca/en/bio/matthew_george_frederic_15E.html> January 2015.

Miller, R.F. and Buhay, D.N. 1988. The Steinhammer Club; geology and the foundation for a natural history society in New Brunswick. Geoscience Canada, 15, pp. 221–226.

Miller, R.F. and Buhay, D.N. 1990. Life and Letters of George Frederic Matthew. An annotated list of Matthew's geological correspondence in the Library and Archives of the New Brunswick Museum. Publications in Natural Science. No. 8, New Brunswick Museum, 89 p.

Miller, R.F. and Buhay, D.N. 2007a. Gesner's Museum of Natural History, an early Canadian geological collection. Geoscience Canada, 34, pp. 37–48.

Miller, R.F. and Buhay, D.N. 2007b. Sir Charles Lyell's travels in New Brunswick, Canada in 1852. Atlantic Geology, 43, pp. 36–44. http://dx.doi.org/10.4138/4220

Miller, R.F. and Buhay, D.N. 2014. Turning a forgotten geological heritage into a geological park: developing Stonehammer Geopark. Geoheritage, 6, pp. 29–39. http://dx.doi.org/10.1007/s12371-013-0090-8

Miller, R.F., Buhay, D.N., and Hébert, M. 2012. Specimen collections from Abraham Gesner's Geological Survey of New Brunswick (1838 to 1842). Atlantic Geology, 48, pp. 86–96. http://dx.doi.org/10.4138/atlgeol.2012.005

Phillipson, D.J.C. 1988. Dawson, Sir John William. *In* Canadian Encyclopedia, Vol. 1. *Edited by* J.H. Marsh. Hurtig Publishers, Edmonton, p. 574.

Rossiter, M.W. 1971. Benjamin Silliman and the Lowell Institute: the popularization of science in nineteenth-century America. The New England Quarterly, 44, pp. 602–626. http://dx.doi.org/10.2307/364476

Russell, L.S. 1976. Gesner, Abraham. *In Dictionary of Canadian biography*, vol. 9, University of Toronto and Université Laval. URL <http://www.biographi.ca/en/bio/gesner_abraham_9E.html> January 2015.

Scott, D.M. 1980. The popular lecture and the creation of a public in mid-nineteenth-century America. The Journal of American History, 66, pp. 791–809. http://dx.doi.org/10.2307/1887637

Sheets-Pyenson, S. 1996. John William Dawson: hope, faith and science. McGill-Queen's University Press, Montreal, 274 p.

Soucoup, D. 1997. Historic New Brunswick. Pottersfield Press, Lawrencetown Beach, Nova Scotia, 255 p.

Squires, W.A. 1972. Hartt, Charles Frederick. *In Dictionary of Canadian biography*, vol. 10, University of Toronto and Université Laval. URL <http://www.biographi.ca/en/bio/hartt_charles_frederick_10E.html> January 2015.

Williams, G. and Fensome, R. 2001. The Last Billion Years. Atlantic Geoscience Society and Nimbus Publishing, Halifax, 212 p.

Wright, H.E. and Miller, R.F. 1990. Robert Foulis (1796–1866): New Brunswick inventor, entrepreneur and geologist. Geoscience Canada, 17, pp. 101–104.

Wynn, G. 1981. W.F. Ganong, A.H. Clark and the historical geography of Maritime Canada. Acadiensis, pp. 5-28.

Wynn, G. 1985. Johnston, James Finlay Weir. *In Dictionary of Canadian biography*, vol. 8, University of Toronto and Université Laval. URL <http://www.biographi.ca/en/bio/johnston_james_finlay_weir_8E.html> January 2015.

Young, C.M. 2005. Bailey, Loring Woart. *In Dictionary of Canadian biography*, vol. 15, University of Toronto and Université Laval. URL <http://www.biographi.ca/en/bio/bailey_loring_woart_15E.html> January 2015.

Zaslow, M. 1975. Reading the rocks: the story of the Geological Survey of Canada, 1842–1972. Macmillan, Toronto, 599 p.

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Appendix 1. Geology and Palaeontology lectures to the Mechanics' Institute; read before the Natural History Society of New Brunswick; and public lectures recorded in newspapers, the Bulletin of the Natural History Society of New Brunswick and Matthew (1913).

Lecturer	Year	Discipline	Title or Topic
Hunt, William	1824, February 7	Geology	Geology lecture
Gesner, Abraham Pineo	1838, December 10	Geology	Mechanics' Institute Introductory Lecture
Gesner, Abraham Pineo	1839, March 19	Geology	Mechanics' Institute 3rd Geology Lecture
Gesner, Abraham Pineo	1839, April 1	Geology	Mechanics' Institute Geology Lecture
Gesner, Abraham Pineo	1839, April 12	Geology	Mechanics' Institute Geology Lecture
Gesner, Abraham Pineo	1839, April 15	Geology	Mechanics' Institute Geology Lecture
Gesner, Abraham Pineo	1840, March 5	Geology	Mechanics' Institute Geology Lecture
Gesner, Abraham Pineo	1840, December 18	Geology	Mechanics' Institute Geology Lecture
Gesner, Abraham Pineo	1840, December 21	Geology	Mechanics' Institute Geology Lecture
Johnston, James F.W.	1849, December 22	Geology	Mechanics' Institute Agriculture Lecture
Foulis, Robert	1852, February 16	Geology	Mechanics' Institute Geological Phenomena
Foulis, Robert	1852, March 15	Geology	Mechanics' Institute Geological Phenomena
Foulis, Robert	1853, March 22	Geology	Mechanics' Institute Industrial Resources of the Province, 10th in series
Bailey, Loring Woart	1860, January-February (?)	Geology	Mechanics' Institute Geology Lecture (reported February 19th in the Morning Journal)
Bailey, Loring Woart	1862, January 6	Geology	Mechanics' Institute Geology Lecture Series
Bailey, Loring Woart	1862, January 9	Geology	Mechanics' Institute Geology Lecture Series
Bailey, Loring Woart	1862, January 13	Geology	Mechanics' Institute Geology Lecture Series
Hartt, Charles Frederick	1862, April 25	Geology	Gold, and a map of the gold fields of Nova Scotia
Allison, Edward	1862, December 12	Geology	The Copper of Simpson's Island
Matthew, George Frederic	1862, December 12	Geology	The Minerals of New Brunswick, published in city papers
Sinclair, George	1863, January 30	Palaeontology	Certain Theories concerning the Origin of Species
Sinclair, George	1863, February 13	Palaeontology	Certain Theories concerning the Origin of Species
Matthew, George Frederic	1863, April 10	Geology	Observations on the Geology of St. John County, New Brunswick.
Matthew, J. [of Halifax]	1864, January 15	Geology	Currents and their Effects on Islands Far-removed from Continents
Hartt, Charles Frederick [read by Hartt, J. W.]	1864, April 8	Geology	Geological Teachings
Perley, H. F. [read by Sinclair, G.]	1864, December 9	Geology	Gold Fields of Nova Scotia
Hind, Henry Youle	1865, month unknown (January to April)	Geology	Mechanics' Institute (?) Geology
Matthew, George Frederic	1865, February 3	Geology	Dunsinane Coal
Matthew, George Frederic	1865, February 3	Geology	Cupriferous Rocks of Southeastern New Brunswick
Matthew, George Frederic	1865, February 3	Geology	Geology of Charlotte County.
Hartt, Jarvis William	1865, March 10	Geology	Geology and Scenery of the Basin of Mines
Matthew, Robert	1865, March 10	Geology	Oliver's Cave (near St. John)
Jack, Issac Allen	1865, March 31	Palaeontology	Palaeontological and Historical Notes on New Brunswick
Matthew, Robert	1865, December 1	Geology	Minerals, what we do with them and what we might do [from New Brunswick]
Bailey, Loring Woart	1866, January 8	Geology	Mechanics' Institute Geology Lecture
Matthew, George Frederic	1866, March 9	Palaeontology	Earlier forms of Life as seen in the Menevian group at St. John and at St. David's in Wales
Matthew, Robert	1866, April 6	Geology	Geology of California.
Starr, Richard Penniston	1866, December 14	Geology	Gems, especially to the beautiful collection in the British Museum
Matthew, Robert	1867, January 11	Geology	Grand Lake, its Scenery, Geology and Mineralogy.
Morazain, Jules	1867, March 5	Geology	A trip to the Restauradora Copper Mine in the Argentine Republic
Dawson, John William [read by the Secretary]	1867, October 1	Geology	Icebergs and Glaciers, with reference to the Boulder Clay of Canada

Appendix 1. Continued.

Lecturer	Year	Discipline	Title or Topic
Jack, Edward	1867, November 5	Palaeontology	A description was sent of a "New Fossil Locality on the Nashwaak," a district where no fossils had hitherto been found
Agassiz, Louis [read by Fiske, C. K.]	1868, December 8	Palaeontology	Fossil Tooth of an Elephant from Japan [a small extinct species]
Bailey, Loring Woart	1868, December 21	Geology	Mechanics' Institute Volcanoes
Matthew, George Frederic	1869, April 13, 27	Botany Palaeontology	Arctic and Western Plants in Continental Acadia.
Matthew, George Frederic	1874, March 9	Geology	Surface Deposits of Acadia.
Taylor, T. L.	1874, April 7	Geology	The Tides
Manning, Edward	1874, May 5	Geology	The History, Geography and Geology of Ipswich (England)
Starr, Richard Penniston	1874, July 7	Geology	Springhill Coal Mine
Jack, Edward	1881, January 4	Geology	Antimony Mine at Prince William
Matthew, George Frederic	1881, February 1	Geology	Work done by geologists in the province during the past forty-two years.
Matthew, George Frederic	1881, February 22	Geology	YMCA Surface Geology
Chalmers, Robert	1881, March 1	Geology	Evidence of glacial action on the shores of the Baie de Chaleur.
Matthew, George Frederic	1881, July 5	Geology	Geology of Torryburn Lake District.
Chalmers, Robert	1882, March 7	Geology	Surface geology of the Bay of Chaleur Region
Matthew, George Frederic	1882, April 4	Palaeontology	*Paradoxides* of the St. John group
Matthew, George Frederic	1882, August 1	Geology	Lacustrine Formation of the Torryburn Valley
Bailey, Loring Woart	1882, September 5	Geology	Saint John River Valley
Allison, John C.	1883, March 6	Geology	Topographical Surveying and Contour
Panton, J. H.	1883, October 9	Geology	Gleanings from the Geology of the North-West
Reed, W. T. L.	1884, April 1	Geology	Lacustrine deposit at Fredericton
Chalmers, Robert	1884, May 6	Geology	Geology of Grand Falls
Matthew, George Frederic	1884, December 2	Palaeontology	Fossils of the Cambrian Rocks at St. John
Munro, A.	1885, February 3	Geology	Notes on the Isthmus of Chignecto
Bailey, Loring Woart	1885, April 7	Geology	A Visit to the Anthracite Regions of Pennsylvania
Matthew, George Frederic	1885, June 9	Geology	Description of the Apatite Mines of the Gatineau
Matthew, George Frederic	1885, October 6	Palaeontology	Pteropods (“Butterflies of the Sea”)
Chalmers, Robert	1886, May 4	Geology	The Kames and Terraces of New Brunswick
Matthew, George Frederic	1886, October 5	Palaeontology	Report of Field Meeting held first July, with Preliminary Notice of a New Genus of Silurian Fishes
Matthew, George Frederic	1886, December 7	Palaeontology	Giant Trilobite, found near St. John
Matthew, George Frederic	1887, November 1	Geology	A Basal Series of Cambrian Rocks in Acadia.
Matthew, George Frederic	1888, January 6	Palaeontology	Some characteristics of Molluscs
Matthew, George Frederic	1888, May 1	Palaeontology	History of fossil plants
Matthew, George Frederic	1888, November 6	Palaeontology	Earliest denizens of the land and air
Matthew, George Frederic	1889, February 5	Geology	Geology with experiments
Bailey, Loring Woart	1889, April 2	Geology	Notes on the Watershed between New Brunswick and Quebec
Matthew, George Frederic	1889, November 5	Geology	A Sketch of the Life of Prof. Chas. Fred Hartt
Bailey, Loring Woart	1889, December 2	Geology	Church of England Institute, Our Earth
Wilson, William J.	1890, March 4	Geology	Surface Geology
Bain, Francis	1890, April 20	Geology	The Red Sand-Stone of P. E. Island
Matthew, George Frederic	1890, May 6	Palaeontology	The Eophyton
Matthew, George Frederic	1890, May 6	Palaeontology	The Eophyton
Matthew, George Frederic	1890, October 7	Palaeontology	Archaeozoon acadiense
Stead, Geoffrey	1891, January 6	Geology	Post Pleiocene deposits at St. Martins, N.B.
Matthew, George Frederic	1891, December 1	Palaeontology	Dictyomena, or the Tread-net Bell of the Cambrian seas
Matthew, George Frederic	1892, March 2	Palaeontology	University Extension Course, Geology
Matthew, George Frederic	1892, March 9	Geology	NHS of NB History of the Secondary and Tertiary Ages of Geology, 6th in series

Appendix 1. Continued.

Lecturer	Year	Discipline	Title or Topic
Matthew, George Frederic	1892, November 1	Geology	Dr. Gesner – his Life and Works
Stead, Geoffrey	1893, February 7	Geology	Geography and Natural History of the Tobique.
Matthew, George Frederic	1893, October 3	Geology Zoology Botany	Account of Summer Camp held in August at French Lake
Stead, Geoffrey	1893, November 7	Geology	Geology and Mines of Eastern Cape Breton.
Matthew, George Frederic	1894, January 9	Palaeontology	Scope and Purpose of the Science
Matthew, George Frederic	1894, January 23	Palaeontology	Trilobites of the St. John rocks
Matthew, George Frederic	1894, January 30	Palaeontology	Fossil Botany of the Palaeozoic Rocks, with special reference to the coal measures and plant bearing beds at St. John
Matthew, William Diller	1894, June 5	Geology	The Crystalline Rocks around St. John.
Fisher, Charles R.	1894, October 9	Geology	Some Evidences of a Glacial Epoch.
Matthew, George Frederic	1894, November 6	Geology	Post-Glacial Faulting at St. John.
Matthew, George Frederic	1894, November 13	Geology	Outlets of the St. John River.
Matthew, George Frederic	1895, January & February	Palaeontology	Geological History of the invertebrates
Bailey, Loring Woart	1895, January 2	Geology	The Mountain Systems of America – A Comparitive Study
Matthew, George Frederic	1895, January 15	Palaeontology	Recent Discoveries in the Pre-cambrian Rocks of Britany
Cox, Philip	1895, February 5	Palaeontology	The Geological History of the Vertebrates
Cox, Philip	1895, March	Palaeontology	Geological History of the Vertebrates
Bailey, Loring Woart	1895, April 2	Geology	Points in the Geology of the St. John River Valley
Chalmers, Robert	1895, April 2	Geology	The Outlets of the River St. John
Matthew, William Diller	1895, May 7	Geology	The Volcanic Rocks of the Maritime Province.
Matthew, George Frederic; Hay, George Upham; Ganong, William Francis	1895, October 9	Geology Botany Zoology	Report on Summer Camp held at Lepreau.
Gesner, George W.	1896, April 7	Geology	Life of Dr. Abraham Gesner.
Ganong, William Francis	1896, June 2	Geology	The Outlet-Delta of Lake Utopia.
Matthew, George Frederic	1896, June 2	Geology	On Artesian Wells
Matthew, George Frederic	1897	Geology	Geology from a Railway Train
Matthew, George Frederic	1897	Geology	Peat-Bogs
Ganong, William Francis	1897, January 5	Geology	Upon Temperature-Measurements with the Thermophone in Clear Lake
Matthew, George Frederic	1897, January 5	Palaeontology	The Oldest Siphonotreta
Matthew, George Frederic	1897, January 5	Geology	The Cambrian System in the Kennebecasis Valley
Duff, Alexander Wilmer	1897, February 2	Geology	Tidal Phenomena of the St. John River at Low Summer Level.
Matthew, George Frederic	1897, March 2	Geology	Address on Peat-Bogs
Matthew, George Frederic	1897, March 15	Geology	The Geology of England from a Railway Train
Ganong, William Francis	1897, April 6	Geology	Note "Upon the Heights of New Brunswick"
Matthew, George Frederic	1897, April 6	Geology	Address on the Geological Features of Quaco
Matthew, George Frederic	1897, May 4	Palaeontology	Address on "A New Palaeozoic Insect, with Notes on the Fauna in which it Occurs".
Hay, George Upham; Matthew, George Frederic; Hall, Percy G.	1897, October 4	Botany Geology Zoology	Report on the work of the Quaco Camp
Bailey, Loring Woart	1897, October 18	Geology	Niagara
Matthew, George Frederic	1897, November 2	Geology	Address on the History of Rockwood Bog
Bailey, Loring Woart	1897, November 22	Geology	The Face of the Earth
Ganong, William Francis.	1897, December 7	Geology	Note "Upon the Manner in which the Bay of Fundy Rivers of New Brunswick empty into the Sea"
Bailey, Loring Woart	1898, January 4	Geology	"Niagara"
Kain, Samuel Walker	1898, January 4	Geology	Canadian Earthquakes in 1897

Appendix 1. Continued.

Lecturer	Year	Discipline	Title or Topic
Matthew, George Frederic	1898, January 11, 25	Geology	Elementary Talks and Laboratory Work on Bog and Pond Deposits
Bailey, Loring Woart	1898, January 17	Geology	Rocks, and What They Tell Us
Bailey, Loring Woart	1898, February 21	Geology	Rock Ruins
Ganong, William Francis.	1898, March 1	Geology	Physiography of the Lepreau Basin
Shewen, Edward T. P.	1898, March 1	Geology	Mean Sea-level at St. John
Alward, W. A.	1898, April 2	Geology	An Ice Age
Ganong, William Francis	1898, October 4	Geology	Note on Lack and Cost of a Topographical Survey of New Brunswick
Matthew, George Frederic	1898, October 4	Geology	Geological and Topographical Features of Newfoundland
Bailey, Loring Woart	1898, October 17	Geology	Coal
Ganong, William Francis.	1898, November 1	Geology	Note upon Natural Pavements and their possible misinterpretation in Archaeology
Duff, Alexander Wilmer	1898, December 6	Geology	Note on the dip of the Magnetic Needle in New Brunswick
Ganong, William Francis	1898, December 6	Geology	Note on the Nature of the Mud in our many Mud Lakes
Bailey, Loring Woart	1898, December 19	Geology	The Mountain Systems of North America
Ganong, William Francis	1899, January 3	Geology	Note, Upon a Current Error as to the Location of (Nictor) Bald Mountain, Tobique
Matthew, George Frederic	1899, January 31	Geology	NHS of NB Heat as a factor in geology
May, Thomas	1899, February 21	Geology	Geological Reminiscences of Prince Edward Island
Newson, John	1899, April 4	Geology	Some geological evidences of the Nebular Hypothesis
Hunt, Rev. T. H.	1899, December 11	Geology	An introduction to the study of mineralogy
Bailey, Loring Woart	1900, February 12	Geology	Crystals, Gems and Precious Stones
Butler, W. S.	1900, March 6	Geology	How ice acts in large quantities
Ganong, William Francis	1900, March 6	Geology	Notes on the physiography of New Brunswick
Bailey, Loring Woart	1900, April 3	Geology	Mountains, Lakes and Rivers
Ganong, W. F.	1900, April 3	Geology	Notes on the Physiography of New Brunswick
Addy, H. George	1900, May 1	Geology	Mines and Mineral of Newfoundland
Bailey, Loring Woart	1900, May 14	Geology	Rivers, Lakes and Mountains
Kain, Samuel Walker	1900, October 2	Geology	Note on Local whirlwinds in New Brunswick.
Matthew, George Frederic	1900, October 2	Palaeontology	New Cambrian Fossils from Cape Breton
Ganong, William Francis	1900, November 6	Geology	The Physiography of the South Tobique Lake Basin
Ganong, William Francis	1901, January 8	Geology	Changes in the River Valleys of New Brunswick
Matthew, George Frederic	1901, January 22	Geology	Depths of the Ocean
Matthew, George Frederic	1901, January 29	Geology	Tides and Erosion of the Bay of Fundy
Bailey, Loring Woart	1901, March 5	Geology	Mountain, Lake, and River Scenery in New Brunswick
Ganong, William Francis	1901, April 2	Geology	Physiography of the Digdeguash Lake Basin
Duff, Alexander Wilmer	1901, June 4	Geology	Note on the Possibility of Developing Power by the Movement of Tides at the Falls
Ganong, William Francis	1901, June 4	Geology	Morphology of New Brunswick Water Falls
Matthew, George Frederic	1901, October 1	Palaeontology	(a) Random Notes on Cape Breton, (b) Additional Notes on the Cambrian of C. B., with description of new species
Bailey, Loring Woart	1901, November 5	Geology	Observations on a Summer's Work
Ganong, William Francis	1901, November 5	Geology	Notes on the Physiography of the Tu-a-dook (Little Southwest Miramichi) Lake Basin
Ganong, William Francis	1901, December 3	Geology	On the Physiography of the Tobique-Mirimichi Water Shed
Matthew, George Frederic	1902, January 14, 28 & February 11	Geology	Minerals and their Properties
Butler, W. S.	1902, March 4	Geology	On the Physiography of Goat Island, Grand Lake
Stead, Geoffrey	1902, March 4	Geology	On the Surface Geology of New Brunswick
Ganong, William Francis	1902, April 1	Geology	On the Types of River beds in New Brunswick
Ganong, William Francis	1902, April 1	Geology	On the Didgeguash Lake-Basin, accompanied with maps

Appendix 1. Continued.

Lecturer	Year	Discipline	Title or Topic
Matthew, George Frederic	1902, May 6	Geology	The Geology of the St. John Harbor
Bailey, Loring Woart	1902, September 5	Geology	Notes of a Summer's Outing, or Notes on the physiography and Geology of the Northern Highlands of New Brunswick
Matthew, George Frederic	1902, October 7	Palaeontology	Batrachians of the Carboniferous Age and their Tracks at the Joggins mines, N.S.
Bailey, Loring Woart	1902, December 2	Geology	Notes on the Geology of the Northern Highlands of New Brunswick
Bailey, Loring Woart	1902, December 8	Geology	Volcanoes, Foreign and Domestic
Babbitt, G. N.	1903, January 12	Geology	Volcanoes of the Moon, with lantern views
Matthew, George Frederic	1903, January 13	Geology	Volcanoes, their Origin and Effects
Matthew, George Frederic	1903, January 27	Geology	Water as an agent in modifying the Earth's Surface
Ganong, William Francis	1903, February 3	Geology	Notes on the Natural History and Physiography of N.B.
Ganong, William Francis	1903, October 6	Geology	The Highest Land in New Brunswick
Ganong, William Francis	1903, November 3	Geology	Two papers on the Physiography and Natural History of New Brunswick (read by title)
Matthew, George Frederic	1903, November 3	Palaeontology	(1) Fossil Foot Prints; (2) Genus Hylopus – Dawson
Bailey, Loring Woart	1903, December 1	Geology	Caverns, Caves and Cavitites
Clayton, Joshua P.	1904, January 5	Palaeontology	Describing the location of certain beds of fossil mussel shells
Ganong, William Francis	1904, January 5	Geology	The Physiography of the Northwest Miramichi
Matthew, George Frederic	1904, January 12	Geology	How hills and valleys are made (with special reference to those in our own vicinity)
Matthew, George Frederic	1904, January 26	Geology	Why sea shells are found on the mountains
Kain, Samuel Walker	1904, April 5	Geology	The Earthquake of March 21st, 1904. Also, a communication on the same subject from W. B. Hoyt.
Matthew, George Frederic	1904, April 5	Geology	On the Physical Aspect of the Cambrian System in Eastern Canada
Ganong, William Francis	1904, November 1	Geology	A Measure of the Rate of Recession of the Coastline of New Brunswick. New Aneroid Measurements in New Brunswick. The Physiographic Characteristics of the Renous River.
Butler, W. S.	1905, February 7	Geology	Physiography of Grand Lake and its Affluents
Ganong, William Francis	1905, March 7	Geology	On the Contour Map of New Brunswick
Stead, Geoffrey	1905, April 4	Geology	Notes on a Grindstone Quarry at Stonehaven, Gloucester Co., N.B.
Ganong, William Francis	1905, May 2	Geology	The Natural History and Physiography of New Brunswick
Bailey, Joseph Whitman	1905, May 8	Geology	The Hydrography of New Brunswick
Bailey, Joseph Whitman	1905, June 6	Geology	The Hydrography of New Brunswick
Matthew, George Frederic	1905, June 6	Geology	Geology of Rockwood Park
Matthew, George Frederic	1905, October 3	Geology	Vegetation of the Earth in remote times and its Relation to Climate
Bailey, Loring Woart	1905, October 9	Geology	The Gypsum Deposits of New Brunswick
Bailey, Loring Woart	1905, November 7	Geology	Gypsum Deposits of Albert Co.
Ganong, William Francis	1905, December 7	Geology Zoology	The Physiographic Characteristics of the Tracadie River; On the Height and other Characteristics of Wilkinson Mountain; On Walrus Bones from Miscou Island.
Bailey, Loring Woart; Babbitt, G. N.	1905, December 12	Geology	Lantern Views on Geology and Astronomy
Ganong, William Francis	1906, January 2	Geology	The Physiography of the North branch of the Little Southwest Miramichi
Ganong, William Francis.	1906, January 2	Geology	On the Recognition and Utilization of the Plateau structure of the interior of New Brunswick
Ganong, William Francis	1906, February 6	Geology	On the Physical Characteristics of the Sevogle River
Matthew, George Frederic	1906, February 6	Geology	Why is the Winter so Mild?
Matthew, George Frederic	1906, March 6	Palaeontology	Notes on Cambrian Faunas
Scammell, J. R.	1906, March 6	Geology	Tides
Ganong, William Francis	1906, May 1	Geology	The Physical Geography and Natural History of the North Shore beaches

Appendix 1. Continued.

Lecturer	Year	Discipline	Title or Topic
Ganong, William Francis	1906, June 5	Geology	The Natural History and Physiography of New Brunswick
Matthew, George Frederic; Leavitt, A. Gordon; MacIntosh, William	1906, October 2	Botany Geology Zoology	Results of the season's Field Meetings
Ganong, William Francis	1906, December 4	Geology	The Central Plateau of New Brunswick
Ganong, William Francis	1906, December 4	Geology	The square Forks of the Sevogle River
Matthew, George Frederic	1906, December 4	Palaeontology	Notes on *Archaeozoon*
Miss Pitcher	1907, January 31	Geology	The English Lakes
Burditt, W. F.	1907, February 5	Other Geology	Messengers from Outer Space and What They Have to Tell Us
Matthew, William Diller	1907, February 12	Palaeontology	Dinosaurs, The Reptiles of Past Ages
Ganong, William Francis	1907, November 5	Geology	Notes on the Natural History and Physiography of Fall Brook, Miramichi
Matthew, George Frederic ; Hay, George Upham; Leavitt, A. Gordon; MacIntosh, William; Banks, James W.	1907, November 5	Botany Geology Zoology	Results of Summer Field Meetings
Ganong, William Francis	1907, December 3	Geology	The Central Construction of the Central Highlands of New Brunswick
Matthew, George Frederic	1907, December 3	Geology	Physical Evolution of Acadia
Ganong, William Francis	1908, January 7	Geology	Physiographic Evolution of the Upper St. John and Restigouche Basins
The Leaders of Sections	1908, October 6	Geology Botany Zoology	Results of Summer Field Meetings
Ganong, William Francis	1908, November 3	Geology	On the Physical Geography of the South-west Miramichi; On the Physical Geography of the Muniac River
Matthew, George Frederic	1909, April 6	Geology	Physical Evolution of Acadia; Continental Phase
Matthew, George Frederic	1909, April 6	Geology	Phosphate Beds in South Carolina and New Brunswick
Bailey, Loring Woart	1909, May 4	Geology	Mines and Mining
Bailey, Loring Woart	1909, May 4	Geology	History of Currie's Mountain
Matthew, George Frederic	1909, October 5	Geology	Tides of the Bay of Fundy
Ganong, William Francis	1910, January 4	Geology	The Physiographic Characteristics of Cain's River, followed by Discussion on Some Results of Dr. Ganong's Work in NB
The Bickmore Course, McGill University	1910, January 11	Geology	The Waterways of Canada. [A lecture for teachers.]
Clawson, J. B.	1910, January 18	Geology	Swiss Lakes
Matthew, George Frederic	1910, December 6	Geology	The Physical Features
Library of McGill University, Montreal	1911, January 17	Geology	The River and Gulf of St. Lawrence
Bailey, Loring Woart	1911, March 21	Geology	What the Rocks have to tell us
Ganong, William Francis	1911, June 6	Geology	Physiographic Observations upon the Dungarvon and Bartholomew Rivers
McIntosh, William	1912, February 6	Geology	St. John River
Ganong, William Francis	1912, June 4	Geology	Natural History and Physiography of New Brunswick
Matthew, George Frederic	1912, October 1	Botany Geology Zoology	Results of Summer Outings
Bailey, Loring Woart	1912, November 5	Palaeontology	Foraminifera, Radiolaria and Sponges
Matthew, George Frederic	1913, January 7	Geology	Fifty Years Progress in Geology
Henderson, J. A. S.	1913, January 28	Geology	Natural Gas: Its Development and Possibilities
McDonald, Charles	1913, February 11	Geology	The Iron Industry
Ganong, William Francis	1913, June 3	Geology	Fifty Years Progress in Physiography of New Brunswick

Appendix 2. Notes concerning selected lecturers. See references cited for detailed biographical information.

Bailey, Loring Woart (1839–1925) Professor, Kings College, Fredericton

A student of Louis Agassiz at Harvard University, Bailey was appointed the Professor of Natural History and Chemistry after James Robb. Bailey was instrumental in mapping the geology of southern New Brunswick and in assessing the minerals and mining potential in the Province.

Chalmers, Robert J. (1833–1908) Member, Natural History Society of New Brunswick

Chalmers was born in northern New Brunswick. He moved to Saint John and was a key member in the reorganization of the Natural History Society after the Great Fire of 1877. In 1882 he moved to the Geological Survey of Canada in Ottawa where he is recognized for his pioneering work on the surficial geology of New Brunswick.

Duff, Wilmer (1864–1951) Member, Natural History Society of New Brunswick

In 1901 Duff received his D. Sci. from the University of Edinburgh. He was professor of physics at the University of Madras, India from 1889–1890; the University of New Brunswick from 1890–1893; Purdue University from 1893–1899; and at Worcester Polytechnic Institute where he was chair and professor of the physics department from 1893–1936. Robert Goddard was one his students from the class of 1908. Duff is most well known for his "A Textbook on Physics" first published in 1908 (with 8 subsequent editions) and the leading physics textbook for the next 30 years.

Foulis, Robert (1796–1866) Member, Saint John Mechanics' Institute

Foulis was born in Glasgow, Scotland and moved to Saint John in 1822. The Dictionary of Canadian Biography noted Foulis was a contemporary of the English scientist Michael Faraday, and that those who knew them both as young men considered Foulis the greater genius. Foulis opened New Brunswick's first iron foundry at Saint John in 1825, and the next year 1826 conducted a survey of the Saint John River from Fredericton to Grand Falls. He reportedly invented an apparatus to make illuminating gas from coal. In 1853 he developed an idea for a steam foghorn and in 1859 finally installed the world's first steam foghorn on Partridge Island in Saint John Harbour.

Ganong, William Francis (1864–1941) Member, Natural History Society of New Brunswick

Ganong was a geographer and botanist who worked at Smith College in Massachusetts for much of his academic career. All the while he maintained close connections with the Natural History Society of New Brunswick and published numerous papers in the Society bulletin. He named many of the landscape features in the Province, including the 'Geologist's Range' a series of low mountain peaks in northern New Brunswick named for geologists in the Natural History Society and the University of New Brunswick.

Gesner, Abraham Pineo (1797–1864) Member, Saint John Mechanics' Institute

Abraham Gesner was physician, geologist, and inventor, born in Cornwallis Township, Nova Scotia. He published the 'Remarks on the Geology and Mineralogy of Nova Scotia' in 1836 and moved to Saint John in 1838 where he was appointed the first government geologist in a British colony. He mapped the rocks of the Province from 1838 to 1842 and produced five reports of the geology New Brunswick. He is often described as the man that invented kerosene, saved the whales, and founded 'Gesner's Museum', one of the first public museums in Canada (now the New Brunswick Museum). Gesner may be best known for his work to develop a process for the distillation of kerosene and is considered a founder of the modern petroleum industry.

Hartt, Charles Frederic (1840–1878) Member, Natural History Society of New Brunswick

Hartt was educated in geology at Acadia College in Wolfville, Nova Scotia and moved to New Brunswick in 1860. He joined the Steinhammer Club and immediately began work on the Carboniferous plants and insects found at the 'Fern Ledges' fossil site in Saint John. Hartt collected the first Cambrian trilobites found in Canada with Bailey and Matthew in 1863. William Dawson used his work, almost verbatim in his second edition of Acadian Geology published in 1868. Hartt left Saint John to study at Harvard University with Louis Agassiz, moved to Cornell University as the first geology professor, and eventually directed a geological survey of Brazil in the footsteps of Agassiz.

Hind, Henry Youle (1823–1908)

A varied career that describes Hind as teacher, professor, journalist, geologist, explorer, and author, sums up his activities. In the 1850s as a professor in Toronto, Hind lectured on agricultural chemistry. In 1852 he became the first editor of Canadian Journal: a Repertory of Industry, Science and Art considered the first scientific periodical in Canada. He travelled northwest Canada in the Hudson's Bay Company lands where he acted as geologist and naturalist. Circumstance landed Hind in New Brunswick in 1864 where he undertook a government sponsored survey of the geology of the north of the Province. Conflicts with Loring Bailey ensued and Hind eventually left for Nova Scotia where he acted as a consulting geologist for the provincial government.

Appendix 2. Continued.

Matthew, George Frederic (1837–1923) Member, Natural History Society of New Brunswick

Matthew was a founding member of the Steinhammer Club in 1857, when he began studying the geology of southern New Brunswick. By the 1880s he was considered a Cambrian trilobite expert and by the early 1890s, George Matthew was well established as a member of the geoscience community in Canada. Laval University awarded him a doctorate of science in 1894, and the University of New Brunswick bestowed a honourary doctorate in 1897. A few years before he died, Matthew received the 1919 Murchison Medal from the Geological Society of London.

Matthew, William Diller (1871–1930) Member, Natural History Society of New Brunswick

Will Matthew was the son of George Frederic, a founder of the Natural History Society of New Brunswick. Will became a young member of the Society. He graduated from the University of New Brunswick as the "genius of `89", having finished university in two years under the guidance of Professor Bailey. Will attended Columbia School of Mines and took a position at the American Museum of Natural History as a vertebrate palaeontologist. He is well-known for his book Climate and Evolution published in 1915.

Robb, James (1815–1861) Professor, Kings College, Fredericton

Robb was appointed the University of New Brunswick's (Kings College) first professor of chemistry and natural history in 1837. He explored much of the Province soon after he arrived, studying the geology and botany. He developed a museum at Kings College using specimens of his own and those received from Abraham Gesner. Among his many pursuits Robb accompanied agricultural scientist, James Finlay Weir Johnston on a survey of the Province in about 1850 and prepared a geological map, updating and improving on the earlier work of provincial geologist Abraham Gesner.

Stead, Geoffrey (1872–1943) Member, Natural History Society of New Brunswick

A civil engineer, Stead was a long-time member of the Society. When he moved to Chatham he maintained his connection as a Corresponding Member and continued to contribute to collections and lectures. Stead was twice elected as President of the Association of Professional Engineers of New Brunswick in 1922 and 1936.

Wilson, William J. (c. 1852–1920) Member, Natural History Society of New Brunswick

A teacher and active member of the Society during its renewal in the 1880s, Wilson moved to Ottawa in 1891 to work for the Geological Survey of Canada. He worked in palaeobotany and returned to New Brunswick where he examined the Upper Carboniferous Fern Ledges site in Saint John, and collected the first plant fossils from the Albert Formation near Norton.