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The Steinhammer Club: Geology and a foundation for a natural history society in New Brunswick

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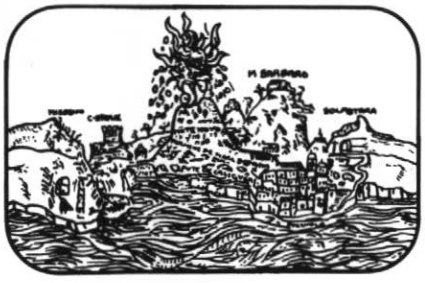
Article abstract

The Steinhammer Club, formed in Saint John, New Brunswick in 1857 was the direct precursor of the Natural History Society of New Brunswick which became a major influence in studies of natural science east of Montreal. Two club members, G.F. Matthew and CF. Hartt, became distinguished geologists in the North American geoscience community and contributed significantly to our understanding of the geology of eastern Canada. Matthew, a charter member of the Royal Society of Canada, published more than 200 scientific papers. Hartt, who later directed the Geological Survey of Brazil, gained early experience studying Carboniferous fossils near Saint John. Bothmen, along with fellow club members and their colleague L.W. Bailey, advanced pre-Confederation geology in New Brunswick and assisted work by the Geological Surveyof Canada through to the twentieth century.



History of Geology

The Steinhammer Club: Geology and a foundation for a natural history society in New Brunswick

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Summary
The Steinhammer Club, formed in Saint John, New Brunswick in 1857, was the direct precursor of the Natural History Society of New Brunswick which became a major influence in studies of natural science east of Montreal. Two club members, G.F. Matthew and C.F. Hartt, became distinguished geologists in the North American geoscience community and contributed significantly to our understanding of the geology of eastern Canada. Matthew, a charter member of the Royal Society of Canada, published more than 200 scientific papers. Hartt, who later directed the Geological Survey of Brazil, gained early experience studying Carboniferous fossils near Saint John. Both men, along with fellow club members and their colleague L.W. Bailey, advanced pre-Confederation geology in New Brunswick and assisted work by the Geological Survey of Canada through to the twentieth century.

Introduction
Systematic geological exploration in New Brunswick began with the appointment of a Nova Scotian, Dr. Abraham Gesner, as Provincial Geologist in 1838 by Sir John Harvey, Lieutenant Governor of New Brunswick (Barkhouse, 1980). During 1837, Gesner had worked as a geologist for a private company. His earliest observations were published as seven letters to Sir John Harvey in the *New Brunswick Courier*, a Saint John weekly newspaper (Sept. - Nov. 1837). Gesner acted as Provincial Geologist from 1838 until 1842 and produced five reports (1839, 1840, 1841, 1842, 1843) outlining the basic geology of New Brunswick. By 1842, the government no longer financially supported Gesner's geological survey, thus temporarily ending the systematic study of the regional geology.

Gesner, disappointed in the turn of events, opened a museum in Saint John in 1842 to exhibit his collections and earn an income. Gesner's Museum was the first of its kind in British North America. The original catalogue (Figure 1) listed 2,173 items, the first 1,596 being of geological interest. Unfortunately, income from admission fees to the museum was insufficient to solve Gesner's financial problem. Gesner's collections passed to his creditors who in turn donated them to the Saint John Mechanics' Institute which had been founded in 1838. Gesner, still in financial trouble, eventually moved back to his native Nova Scotia in 1843. Abraham Gesner is best known as the inventor of the process for refining kerosene and for a famous court case in 1852 (which he lost) to determine the origin of albertite (Barkhouse, 1980).

The departure of Gesner left New Brunswick with no geological survey in progress. James Robb, professor of Chemistry and Natural History at Kings College (University of New Brunswick) in Fredericton, published a geological map in 1850 (Johnston, 1850), but an obvious void had been left in the geological exploration of the province. Gesner's reports and his legacy of a unique museum collection at the Mechanics' Institute waited for future geologists to take up the challenge of continuing the geological exploration of the province.

In 1855, John William Dawson, one of Canada's foremost geologists, published the first edition of *Acadian Geology*. In this he outlined the geology of his native Nova Scotia, touching briefly on aspects of New Brunswick geology by summarizing the results of Gesner and Robb. Between 1855 and 1868, Dawson prepared an expanded second edition of *Acadian Geology* (1868) to include a more detailed account of New Brunswick. Dawson published a number of papers in the early 1860s as he developed his understanding of the geology of southern New Brunswick (1861, 1862, 1863). Much of Dawson's information came from the efforts of young geologists, amateurs, who had formed the "Steinhammer Club" for the purpose of learning about the geological formations around Saint John.

The Steinhammer Club
In 1857, a group of young men in Saint John, brought together by a common interest in geology, formed the Steinhammer Club. Together the members of the club explored the complex geology and paleontology around their native city. Using Charles Lyell's works and Gesner's reports as guides, they set about exploring and documenting the local geology in detail. Their work began to unravel some of the complex geological relationships near Saint John and along the

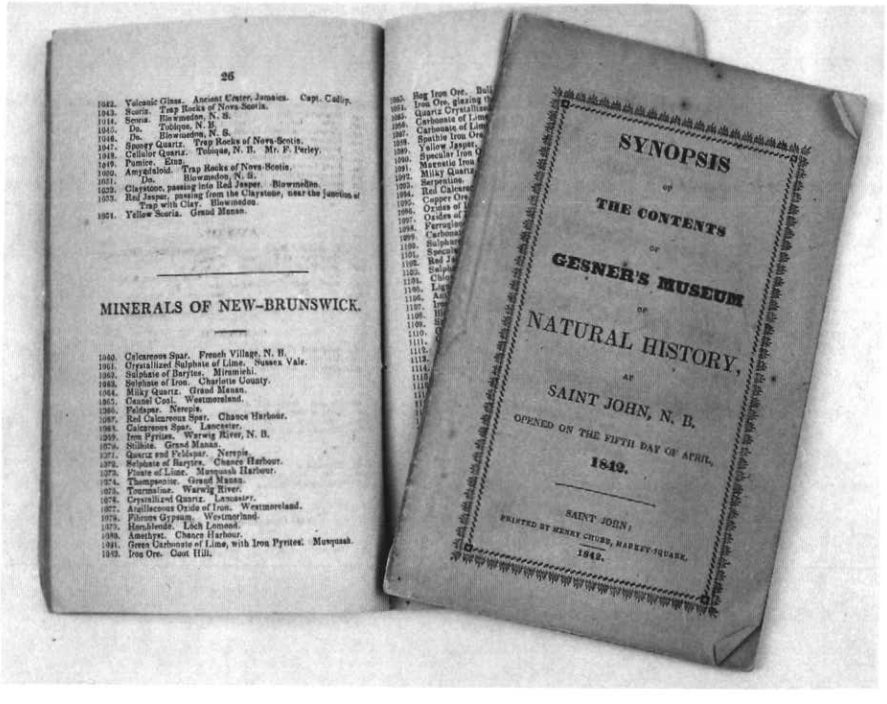

Figure 1 *Catalogue of Gesner's Museum which opened to the public in Saint John, New Brunswick in 1842.*

southern coast of New Brunswick, relationships that still create controversy (Currie, 1984). In 1862, the club evolved into a natural history society leaving few records of its activities as the Steinhammer Club.

Only five members are known from the original Steinhammer Club. James B. Hegan, William Lunn, George Frederic Matthew (Figure 2), William Robert Payne and Richard Peniston Starr (Figure 3) all lived in the area now known as Saint John. How they met or why they chose the name Steinhammer (translated from German as "rock hammer") for the club is not known, but the presence of Gesner's collections at the Mechanics' Institute Museum acted as a catalyst to spark their interest in geology. Matthew recalled that as young men they had "for working material the Gesner museum in the Mechanic's Institute" (Matthew, 1913). The earliest extant membership record for Mechanics' Institute members, dated 1865, lists G.F. Matthew and W.J. Starr, R.P. Starr's father, as Institute members. Matthew's first access to a library was at the Mechanics' Institute where he read geological reports and works on geology by Hitchcock, Lyell and Murchison (G.F. Matthew, undated notebook, NBM Library and Archives). Matthew and R.P. Starr grew up in merchant families. Starr, like his father, was a coal merchant. Matthew, a customs agent, began to collect rocks and fossils as a boy (Ganong, unpub. manuscript). Hegan was a "public works" engineer and had an office in the Custom House where Matthew worked.

In 1860, a new member joined the club. He was Charles Frederick Hartt (Figure 4), a graduate of Acadia College in Nova Scotia,

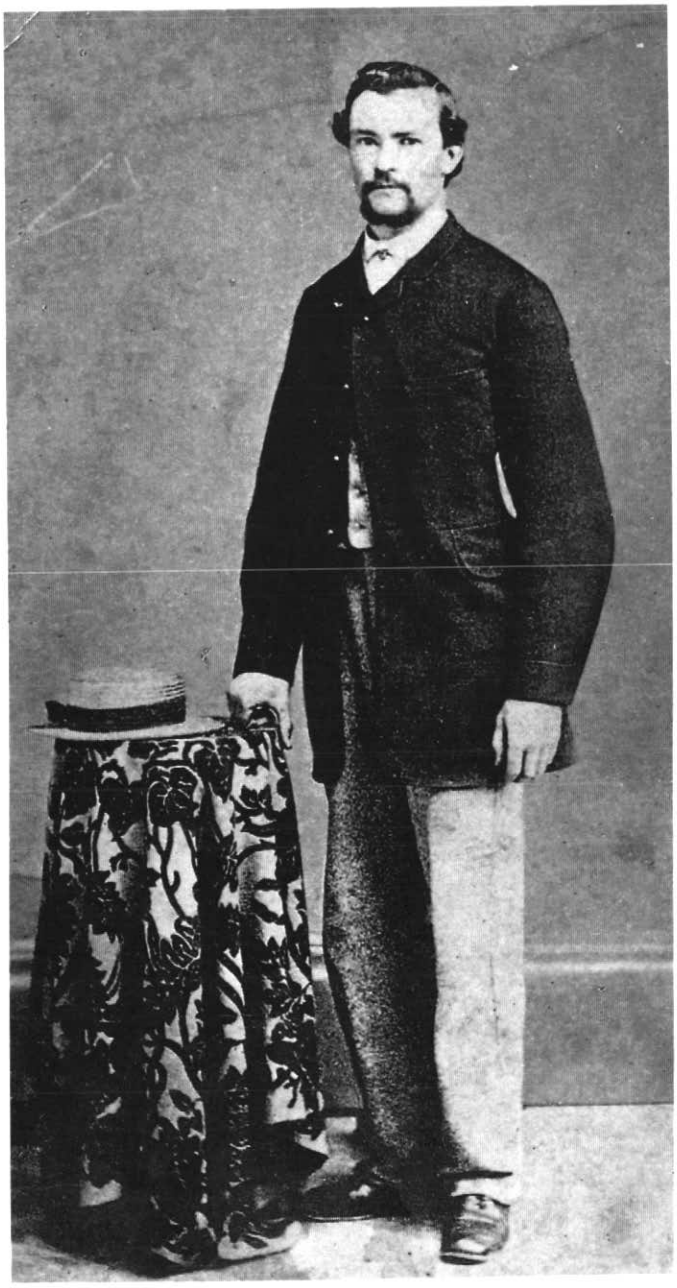

Figure 2 *George Frederic Matthew (1837-1923). Photograph taken in 1870.*

Figure 3 *Richard Peniston Starr (1834-1892) with his wife Mary and son Francis, circa 1871.*

Figure 4 *Charles Frederick Hartt (1840-1878).*

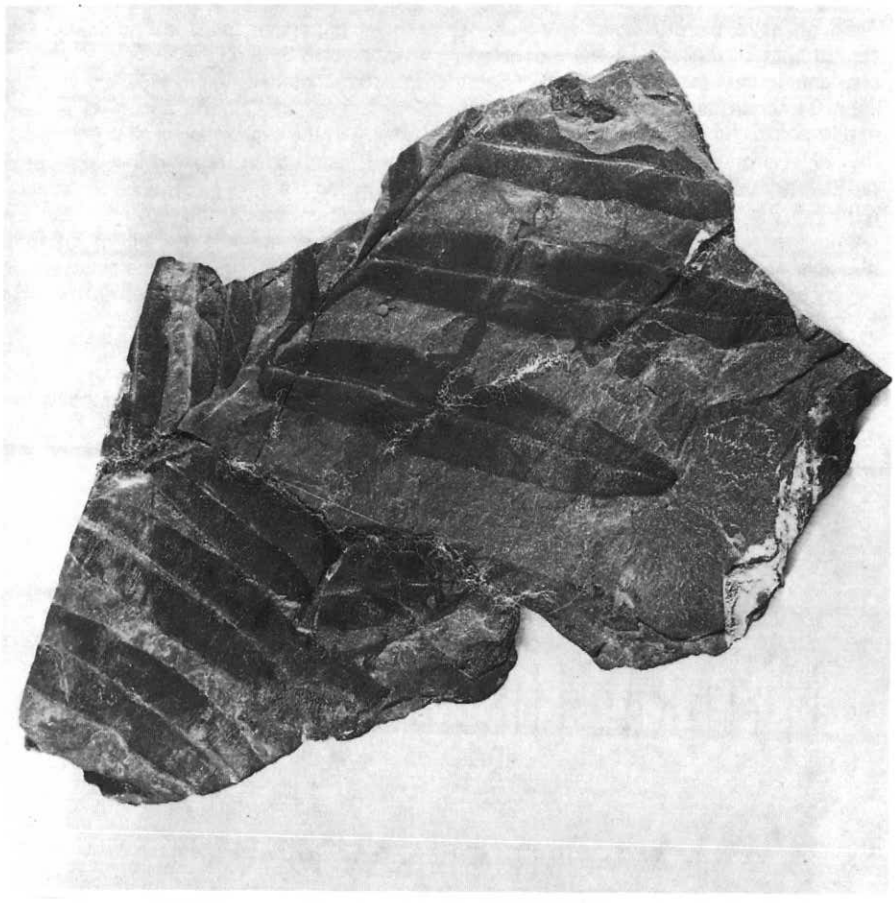

Figure 5 Alethopteris discrepens latus *Matthew from the Pennsylvanian "Fern Ledges" site. Specimen (NBMG 3395) from the old collections of the Natural History Society of New Brunswick. Specimen 11 cm long.*

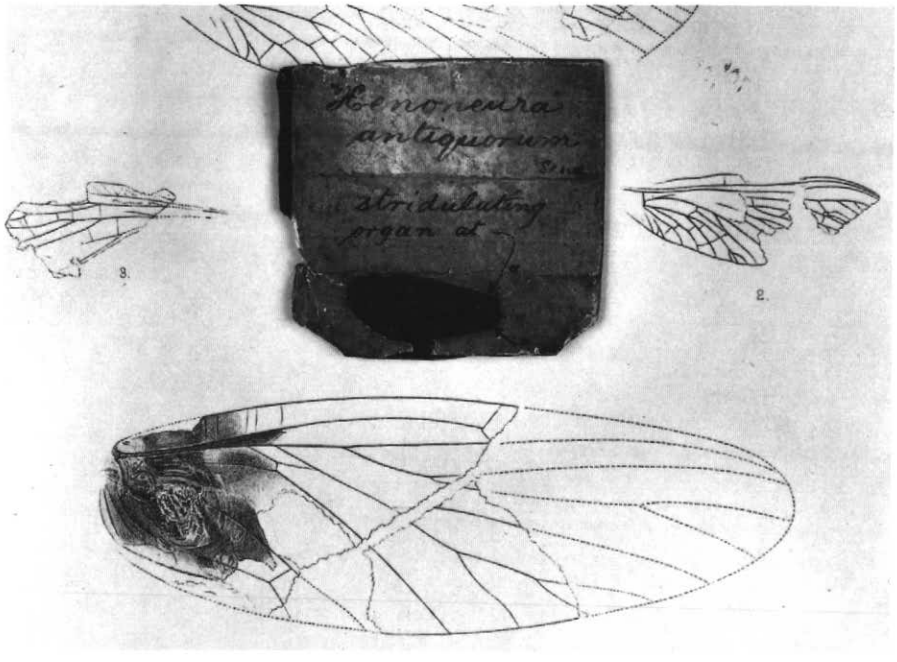

Figure 6 *Insect wing,* Xenoneura antiquorum *Scudder (NBMG 3018) collected by C.F. Hartt and his father in 1862-63 from the Pennsylvanian "Fern Ledges" site. Illustration from Scudder (1880). Wing 2.5 cm long.*

who had moved to Saint John to teach in a young ladies' high school run by his father (Simonds, 1897). Hartt had developed an early interest in geology and paleontology and evidently found good companions in the Steinhammer Club. During his first summer in Saint John, Hartt began collecting fossils in west Saint John, known then as Lancaster. Study of this locality, which became known as "Fern Ledges", became Hartt's principal work with the club. Fossils from east Saint John of similar age to those found at "Fern Ledges" had been described by Gesner almost twenty years before (Gesner, 1840). At Hartt's site, on the Bay of Fundy shore, black shales and sandstones stretch along the beach dipping 45° into the water. Between 1860 and 1863, Hartt and his friends quarried the shales to find abundant plant fossils (Figure 5). Along with plants, the site yielded reptile/amphibian tracks and arthropods, particularly insect remains, which attracted attention from geologists worldwide. At the time, the rocks were considered to be of Devonian age, making the insect assemblage the oldest known in the world. The presence of a supposed stridulating organ on an insect wing (*Xenoneura antiquorum*) described by S.H. Scudder (1880) added a new dimension to paleontology (Figure 6). For the first time, many geologists were able to imagine the Devonian woods alive with the sound of chirping insects. References to *Xenoneura antiquorum* appear in many geology texts of the middle nineteenth century including Charles Darwin's *Descent of Man* (1873);

> "lately found a fossil insect in the Devonian formation of New Brunswick, which is furnished with "the well-known tympanum or stridulating apparatus of the male Locustidae" "(p. 349)

In total about eight thousand specimens were collected from the original "Fern Ledges" site and Duck Cove, a kilometre farther west. Although most of the material was collected by Hartt, other Steinhammer Club members and friends contributed significantly. From Hartt's report in Dawson's *Acadian Geology* (1868):

> "Messrs Matthew, W.R. Payne, James Hegan, and Lunn, took part in the explorations which were carried on during the summer, Mr Matthew discovering, among other things, a new species of *Eurypteris*, *E. pulicaris*, Salter; while Mr. Payne secured a single specimen of a trilobite" (p. 515)

Concerning *Eurypteris pulicaris* Salter:

> "not more than four or five specimens having been found by Messrs Matthew, Payne and myself" (p. 518)

Concerning *Amphipeltis paradoxus* Salter:

> "Only one other specimen has since been obtained. It consists of two or more of the thoracid segments, and was collected by Mr Lunn." (p. 518)

J.W. Hartt (Charles' father) was also responsible for discoveries of plant and insect specimens.

Contributions to Geology in the 1860s

George Matthew and C. Fred Hartt were the two most active geologists in the club. Dawson obviously appreciated their efforts and recognized the leadership of Matthew and Hartt in directing the club's activities (Dawson, 1863).

> "It is only just to observe, that the completeness of the following list is due to the industrious labors of an association of young gentlemen of St. John, who, under the guidance of Messrs. Matthew and Hartt, have diligently explored every accessible spot within some distance of the city, and have liberally placed their collections at my disposal for the purposes of this paper". (p. 319)

Although the others participated in collecting specimens, it was Hartt and Matthew's information that was published by Dawson (1861, 1862, 1863) and Matthew (1863, 1865). Later, complete reports appeared in works by Bailey (1865) and Dawson (1868).

Hegan, Lunn, Payne and Starr eventually abandoned their active geological interest to attend to business matters (Matthew, 1913; Ganong, unpub. manuscript).

In 1861, a new geologist came to New Brunswick and soon became involved in expanding the activities of Matthew and Hartt. Loring Woart Bailey was appointed to Kings College, Fredericton, to fill the chair in Chemistry and Natural History left vacant by the recent death of James Robb. Bailey had graduated from Harvard University in 1859, where he was a student of the famous Swiss paleontologist and Quaternary geologist Louis Agassiz, professor of Zoology and Geology. Among Bailey's first friends in New Brunswick was George Matthew. It was this association that perhaps turned Bailey's attention toward geology and mineralogy and resulted in successful co-operation between Bailey, Hartt and Matthew.

However, it was not until 1863, the year after the Steinhammer Club had evolved into a larger society, that the three men collaborated in their first field expedition. Following Bailey's survey of mines and minerals in New Brunswick (Bailey, 1864) the provincial government authorized him to conduct a geological survey of southern New Brunswick. For this he enlisted the aid of his friends.

> "My next expedition was made with the assistance of the Provincial Government. I say "assistance", for, though the expenses were provided, no salary was attached. It was purely a labour of love, the pleasure of exploration in a field practically unexplored... I had as companions and assistants Mr...George F. Matthew and Mr...Charles Frederick Hartt". (Bailey, 1925, p. 95)

Although they explored the width of southern New Brunswick, their most important discovery came at their first stop just east of Saint John. Cambrian fossils, later studied by Hartt and Professor Agassiz, proved to "belong to the oldest formation which either in America or Europe contains undoubted animal remains" (Bailey, 1925, p. 97). Professor J.D. Dana, the well-known mineralogist and geologist at Yale University, praised their discovery as "one full of interest to America and Europe" (Bailey, 1925, p. 97).

The Steinhammer Club had provided basic information and talent that began a new era in the geological exploration of New Brunswick. Their studies were the framework for half a dozen papers, maps and contributions to major works through the 1860s.

After Confederation in 1867, the Geological Survey of Canada assumed responsibility for the exploration of New Brunswick. Sir William Logan retained the services of Bailey and Matthew to continue the study of the southern part of the province. Matthew, who worked as a government customs agent, was temporarily transferred to the Geological Survey of Canada at various times. Although Matthew never became a full-time geologist, he published more than 200 papers (Landing and Miller, 1988) and continued to work on contract to the Survey until 1901 (Miller, 1988).

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1897.

Figure 7 *The emblem of the Natural History Society of New Brunswick reflects the society's origin as a geology club. A trilobite from the Saint John Group is surrounded by fossil plants from "Fern Ledges". A mounted bird recognizes the work of the ornithological committee.*

Natural History Society of New Brunswick

In 1862, at J.W. Dawson's suggestion, the members of the Steinhammer Club initiated the formation of the Natural History Society of New Brunswick. The purpose of the new society was outlined at the first meeting on January 29, 1862, chaired by Dr. L.B. Botsford, who became the first president, when a motion was made that "a special aim of the Society should be to form in connection with it such a collection of specimens in the different branches of scientific research as shall fully illustrate the Natural History of this province, and so far as possible that of other countries" (Matthew, 1913). Dr. Dawson was elected an honorary member on March 7, 1862.

All the known members of the Steinhammer Club became charter members of the Society except William Lunn whose duties had taken him away from Saint John (G.F. Matthew, undated notebook, NBM Library and Archives). R.P. Starr became the recording secretary, G.F. Matthew was appropriately appointed curator and C.F. Hartt became a member of Council. Club members presented their cabinets of minerals and fossils to the Society on February 27, 1863 and Hartt, Hegan, Matthew, Payne and Starr were all made life members of the Society. The earlier work of the Steinhammer Club contributed to many of the papers read before the society during its early years (Matthew, 1913).

Among one of the Society's first acquisitions to develop its museum was the purchase in November of 1863 of Hartt's "Fern Ledges" collection (Matthew, 1913), thus providing Hartt with the financial means to attend Harvard as a student of Professor Agassiz. Although Hartt returned to Saint John for several summers to continue work with Bailey and Matthew, his connection with New Brunswick faded as he went on to work at Cornell University and led expeditions to Brazil in later years (Simonds, 1897).

The Society delved into all aspects of the study of natural science and developed large collections in geology, zoology and botany that formed the basis for the present New Brunswick Museum. During its years of operation (1862-1932), the Natural History Society of New Brunswick published a respected journal of its activities as well as scientific research papers of high quality. The Society was connected with scientific societies in Canada and the eastern United States, as well as in Europe. Among its distinguished members were botanist George Hay, ornithologists Montague Chamberlain and Gordon Leavitt, geographer William Ganong and paleontologist William Diller Matthew, George Matthew's oldest son. Members' 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*.

In January of 1868, it was announced that an account of Hartt's "Fern Ledges" collection would be published in Dawson's *Acadian Geology*. The Society would receive the first classified set of fossils, while Dawson would keep the second. One week later, the Society ordered a case for the Hartt collection, which had been returned to the museum. The Society sent duplicate material from Hartt's collection to the Smithsonian Institution, the Academy of Natural Sciences in Philadelphia, the Academy of Sciences, Chicago, the Boston Society of Natural History, the University of New Brunswick, the British Museum and to institutions in Paris, Berlin and Vienna (Matthew, 1913).

Matthew and Starr remained active members of the society. Both contributed to meetings and read papers before the members until the great fire of June 20, 1877 destroyed much of Saint John. Although the museum narrowly escaped destruction, the Society suffered, since people had little time for leisure. In 1880, as the Society reorganized, Matthew and Starr attended the first meeting. Matthew again took a leading role. In 1882, he paid for the printing of the second number of the *Bulletin* at his own expense and he became Society president in 1889. In 1890, the Society purchased the museum of the Mechanics' Institute, including the Gesner museum collection.

A letter received in 1895 by S.W. Kain, the Society's secretary, is of interest as indicating the Society's position in the scientific community (NBM Library and Archives).

293 University St.,
Montreal,
Jany, 10/95

My Dear Sir,

On occasion of the thirty-third annual meeting of the Natural History Society of New Brunswick, of which you kindly inform me, permit me to congratulate my friend Mr. Matthew, your President, and the members of the Society, on its continued prosperity and usefulness. I believe that no local Society in the Dominion has done more or better original work; or has had more able labourers in Geology and Natural History in its ranks. I have referred to this in a work recently published, and hope to send you copies of a paper now in the press, in which I have occasion to refer to the discoveries of members of your Society in the rich Devonian and Cambrian beds in the vicinity of St. John.

I trust that the Society will continue to receive the public countenance which it merits, and to pursue unchecked the objects at which it aims.

With kind regards and good wishes for the New Year, believe me,

Yours sincerely

J.W. Dawson.

The early influence of the Steinhammer Club on the Society was expressed in the corporate seal of the Natural History Society of New Brunswick, adopted in 1884 (Figure 7). The centre of the seal displayed a trilobite of the Cambrian Period from Saint John that resembled *Paradoxides regina*, the very large trilobite found by Matthew and his son William. On either side of the trilobite were found characteristic fossil plants from the Carboniferous Period at "Fern Ledges" in Saint John. The upper part of the emblem contained a bird mounted for exhibition to recognize the work of the ornithological committee.

Acknowledgements

We would like to thank Mr. W.M. Matthew, Mrs. M. Matthew Colbert and Dr. E.H. Colbert, and Mr. W.P. Starr, Sr. for discussions and for making photographs of their ancestors available for reproduction and Mr. and Mrs. J.E. Hegan for sharing family knowledge. Harold Wright freely provided his files on the Mechanics' Institute of Saint John. Finally, thanks to the staff of the Library and Archives at the museum for helping, whenever they could, to track down information.

H.W. van de Poll and W.A.S. Sarjeant provided helpful comments in their reviews thereby improving the manuscript.

Brief Biographies

Hartt, Charles Frederick (August 23, 1840 - 1876) teacher, geologist. Charter Member, Natural History Society of New Brunswick, 1862. Student of Prof. Agassiz, Harvard University, first professor of geology, Cornell University

Hegan, James B. (1830s ? > 1913) engineer, Department of Public Works. Charter Member, Natural History Society of New Brunswick, 1862, Member, Mechanics' Institute, 1865

Lunn, William (?)"English" land surveyor

Matthew, George Frederic (August 12, 1837 - April 14, 1923) custom agent, Saint John Custom House. Curator and Charter Member, Natural History Society of New Brunswick, 1862 Member, Mechanics' Institute, 1865

Payne, William Robert (1831 - ?) cartman. Charter Member, Natural History Society of New Brunswick, 1862

Starr, R. Peniston (Feb. 6, 1834 - 1892) coal merchant, R.P. and W.F. Starr Limited, Wholesale and Retail Coal, est. 1864. Recording Secretary and Charter Member, Natural History Society of New Brunswick, 1862

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