

PROCEEDINGS
OF THE
Nova Scotian Institute of Science.

SESSION OF 1907-1908.

ANNUAL BUSINESS MEETING.

*Assembly Room, Province Building, Halifax, 11th
November, 1907.*

THE PRESIDENT, F. W. W. DOANE, C. E., in the chair.

PRESIDENTIAL ADDRESS: (1) Deceased Members; (2) Technical Education.—By F. W. W. DOANE, C. E., City Engineer, Halifax.

GENTLEMEN,—In laying before you a brief review of the events of the past year, one must face the unpleasant duty of recording the losses, with especial reference to those who have answered the last summons.

Since the opening of the last session the Institute has lost some of its oldest members. The death-roll includes Dr. Edwin Gilpin, Hon. D. McN. Parker, Professor George T. Kennedy and Commander E. B. Tinling, R. N.

DR. EDWIN GILPIN, M. A., D. Sc., LL. D., F. G. S., F. R. S. C., C. I. S. O., who died at Halifax, July 10th, 1907, was the son of the Rev. Dean Gilpin. His mother was a daughter of the late Hon. T. C. Haliburton, the inimitable Nova Scotia humorist, "Sam Slick." Dr. Gilpin was born at Halifax on the 28th day of October, 1850. He attended the Halifax Grammar School, where he was prepared for entrance to

King's College under the able tuition of his father. He received his B. A. degree in 1871, after which he took a special course in mining, geology and chemistry, and received the degree of M. A. in 1873. At the same time he won the "Welsford," "General Williams" and "Alumni" prizes.

After leaving college he began the practical study of mining engineering in Nova Scotia, especially in the Albion collieries of the General Mining Association in Pictou county, and extended his observations in the leading mining districts of Great Britain.

On the 21st day of April, 1879, he was appointed inspector of mines by the government of Nova Scotia. In September 1881 he was appointed a member and made secretary of the board of examiners of colliery officials. In October, 1886, he succeeded to the office of deputy-commissioner of public works and mines.

By royal warrant, November 9th, 1903, Dr. Gilpin shared in the birthday honors conferred by His Majesty. In recognition of continuous, valuable and faithful service to his native province covering a period of one-quarter of a century he received the imperial service order, the presentation being made by the late Lieutenant-Governor Jones on March 23rd, 1904, before an assemblage of prominent citizens. This event was unique, as it was the first presentation of the order made in the province (Dr. Murphy having received his at Ottawa).

Dr. Gilpin claimed that he should be numbered among the oldest of those who have been interested in this Institute. At one of our meetings at which he was presiding he stated that he remembered being present and watching as a boy the initiatory meeting of the Institute in January, 1863, being the more interested as the late Dr. J. Bernard Gilpin, his uncle, who read the first paper in our proceedings, took an active part.

His name first appears in our transactions in the record of a meeting held March 10th, 1873, when he contributed a paper on the grouping of the Pictou coal-seams. At this time

he was proposed as an associate member, as he was not then living in Halifax. His uncle, then vice-president, was in the chair. He was elected April 11th, 1873, and became a member on his removal to Halifax in 1879. He was elected a member of council in 1881, and was re-elected at each annual meeting since that date. In 1894-5 he was vice-president, and in 1895-6 and 1896-7 he held the office of president. For twenty-five years, therefore, he was prominent in the management of the affairs of the Institute, while the period of his membership extended over thirty-four years. The value of his services to the society can be appreciated best by those members who were intimately associated with him in scientific work.

During his membership he communicated to the Institute twenty-six papers principally in the department of geology and mineralogy. While his work as published in our transactions covers a large field and contributes most valuable information regarding the mineral resources of the province, it by no means includes all the publications from his pen. He was the author of a popular work on the "Mines and Mineral Lands of Nova Scotia" published in 1883, and of able contributions to the transactions of several other societies including the North of England Institute of Mining Engineers. His exhaustive reports to the government of Nova Scotia attest the ability of the man in the work for which he was chosen. He was one of the original members of the Royal Society of Canada, was elected a fellow of the Geological Society of London, England, March 11th, 1874, and was a member of the American Institute of Mining Engineers and the Canadian Society of Civil Engineers. In the latter society he was a member of council in 1889.

The degree of D. Sc. was conferred upon him by King's College, and that of LL. D. by Dalhousie University. In the latter he was a member of the faculty of pure and applied science, and lecturer on coal mining.

The news of his death was received with general regret in his native city; in the province where through his life work

he was known widely, personally and professionally; and throughout Canada where his eminent knowledge made him intimate with many leading scientists. To the Institute the loss is a serious one, while to those amongst us who have been associated with him for years, who have known the kindly nature of the man, the quiet humor inherited from his grandfather and his readiness to advise and assist especially the younger workers, the loss is a personal one—that of a friend who had won our sinceré respect, esteem and affection.

HON. DANIEL McNEIL PARKER, M. D., who died at Dartmouth, November 4th, 1907, was the son of Francis Parker and Janet McNeil, descendants of Loyalist ancestry. He was born at Windsor, April 28th, 1822, and received his preparatory training at the Collegiate School, Windsor, and at Horton Academy. His preliminary medical studies were pursued with M. B. Almon, M. D., in Halifax. In 1841 he went to Edinburgh to complete his education. In 1845 he received his diploma from the Royal College of Surgeons, and a gold medal for surgery. In August of the same year he graduated M. D. from Edinburgh University.

On his return to his native province he began the practice of his profession, which continued for fifty years. To perfect his knowledge of surgery he spent two years—1871 and 1873—in Edinburgh. On his return he opened an office as consulting surgeon. It is claimed that he was the first surgeon in Halifax to perform an operation with the use of an anaesthetic, having first had it administered to himself to prove its safety. The first case in Halifax of the removal of ovarian tumors—which had counted their victims by hundreds and thousands—is said to have been performed by Dr. Parker, he having assisted Dr. Keith of Edinburgh, the distinguished specialist in such operations.

During his long and honorable career he was president of the Nova Scotia and Dominion Medical Associations, a member of most of the boards governing the charitable institutions of the city, the hospitals, Y. M. C. A., Industrial School, etc.

In no institution did he take more interest than in the School for the Deaf and Dumb. He was its president for thirty years. He was commissioner of schools, governor of Acadia College for twenty-five years, president of the Baptist Convention and held many other offices.

He was appointed commissioner to the London exhibition in 1851 by the Nova Scotia government, and received from the Prince Consort a commemoration medal. He was a member of the legislative council of his native province from 1867 to 1899, when failing health compelled him to resign.

He was a life member of the Institute, being elected during the session of 1870-71.

In all branches of the art and science of medicine great advances were made during the long period covered by his practice; but he was ever in touch with the times, a diligent student in progressive science.

He guarded zealously all legislation relating to the work of the medical profession, and with the late Dr. Edward Farrell, was behind the act which created the existing sanitary system of the city, and led to the great improvement that has been made in the sanitary condition of Halifax.

His kindness of heart and genial and courtly manner made him a general favorite, while his unquestioned integrity, energy, activity and devotion to duty, won for him the esteem, trust and honor of his fellow men.

PROFESSOR GEORGE THOMAS KENNEDY, M. A., D. Sc., F. G. S., died at Wolfville, March 1st, 1907. He was a son of the late William Kennedy of York, England. Dr. Kennedy was born in Montreal January 4th, 1845. He received the rudiments of his education at the Church Colonial School and McGill Model and High Schools. He then entered McGill University, and took his B. A. degree with first-class honors in natural science in 1868, M. A. in 1872, and B. Sc. in 1873.

In 1869-70 he attended the Sheffield Scientific School at Yale College, New Haven, where he took a select course of post graduate studies, including practical chemistry, miner-

alogy, mining, assaying, German, etc. On his return to Montreal he became assistant to Sir J. W. Dawson in the chemical laboratory and museum of McGill College, and later he entered the applied science department of that university from which position he retired to accept an appointment to the chair of chemistry and natural science in Acadia College, Wolfville. Resigning in 1881 he was appointed in the following year professor of chemistry and geology in King's College, Windsor. He was also for some years librarian and curator of the college museum and vice-president of the council.

Professor Kennedy has aided in the work of the Canadian Geological Survey in various ways and conducted for a number of years a series of interesting observations in reference to maritime life in the Gulf of St. Lawrence.

He has been an associate member of the Institute since November 9th, 1882, and was also an associate member of nearly all of the scientific societies in Canada, a member of the American and of the British Association for the Advancement of Science, and a fellow of the Geological Society of London, England. He received his honorary degree of D.Ss. from King's College in 1890. As a geologist, mineralogist and zoologist he occupied no inferior rank in the Dominion of Canada.

CAPTAIN E. B. TINLING died at Halifax December 22nd, 1906. He was born in 1849, and entered the British navy at an early age. After rising to the rank of commander he secured commutation of his service and retired, going to Winnipeg, where he purchased a farm. Later he commanded a passenger steamer on the Pacific, but forfeited that position when an act was passed providing that captains of United States passenger steamers should be citizens of that country. Later he received an appointment in the marine department, and for some time previous to his death was stationed in Halifax as nautical examiner. He had been a member of the Institute for a short time only.

Treasurer's Report

The removal of Mr. McCarthy from Halifax left us without a treasurer. He had reorganized and systematized the financial work and was making good progress in bringing it up to date. His books are submitted to-night and a financial statement can be given from them.

Technical Education.

In the rapid march of science no more important step has been noted during the year just closing nor in the annals of the Institute than the manly stride taken by the government of Nova Scotia in providing for the establishment of a Technical College and local technical schools. "The technical education act" was passed since our last annual meeting, and at this moment a technical school is being opened in the city of Halifax. So much has been said, written and published during the last two years in reference to the advantages to be gained by, and the necessity for, the establishment of such educational institutions, that a brief reference only must be permitted in these rambling remarks.

The members of the Institute will remember with pride that Prof. J. G. MacGregor, who held office in our society for years, strongly impressed upon the public the necessity for this important educational move. About a quarter of a century ago, before the rapid growth of correspondence schools had commenced, he pointed out the incompleteness of our educational system, the handicap suffered by our young men through lack of training in scientific methods and the loss to the country in consequence of the absence of modern methods in industrial occupations.

The purpose of the technical college at Halifax being to afford instruction and professional training in metallurgical, civil, mining, mechanical, chemical and electrical engineering and for scientific research, it cannot fail to stimulate the Institute, add to its membership, increase the value of its transactions, introduce new workers in the different departments of science and inject new life.

The central institution will have a corps of skilled scientific men, and thoroughly equipped laboratories in which can be solved the problems that perplex our local engineers, manufacturers, miners, metallurgists, etc. Building stones, woods, cements, iron and steel and all our local products that may be used in the construction of bridges, roads, buildings, piers, docks and other structures can be tested, and data of inestimable value furnished to the Nova Scotia engineer. Ores, coals, cokes, metallurgical processes can be tested and investigated to the profit of the owner and of the province.

In every branch of engineering, the practising engineer is too frequently confronted with the uncomfortable fact that basic data relating to many features of his work are either lacking altogether, or are existent in very meager and more or less intangible form. This unfortunate condition prevails to-day, not so much on account of a dearth of opportunity to acquire the information as for other reasons. These appear to be: first, that many engineers employed on works where data of extreme value can be procured are, or consider themselves to be, too busy to take advantage of their opportunities, continuing to depend upon the work of others; secondly, that a large volume of important information, gathered at the expense of much toil, but under very satisfactory circumstances, is kept for private use alone. Happily such a selfish spirit seems to be rapidly disappearing, and engineers to-day more frequently publish the facts gained privately from research, experiment and practice.

In the realm of theoretical hydraulics, for instance, there are many features of great importance which require accurate demonstration, but which are frequently beyond the province of the practising engineer. The field of research in this branch of engineering alone is a broad one, and the new school of science will have an opportunity to conduct trustworthy investigations the results of which should have a very real value for the profession at large.

We want to know among other things the percentage of rainfall lost by evaporation in Halifax, the run-off from water

sheds and the flow of streams; the precipitation during heavy showers; the best method of protecting cast iron pipes and valves from the effect of salt water; how to preserve cast iron pipes from tuberculation; the best method of preventing the formation of frazil ice; more information about water-hammer in distribution and power line systems; more specific information in reference to the effect of different kinds of water and different classes of sewage on pipes and channels of varying design and material; the best method of harnessing the Bay of Fundy tides; and numerous other facts and fundamental data relating to various branches of hydraulics and hydraulic engineering.

The aim of the old-time military engineer was destruction, the object of the modern engineer is construction, the function of the coming engineer is operation.

To the development of our natural resources we have applied a native energy, some capacity for organization and considerable genius for mechanical affairs. Some portions of the development are done on a great scale, but we often do it very badly. It is time for us to inquire whether the things that we are doing cannot be done better, if in fact others have not developed and put to use much better methods than we are employing.

Although the resources of a country form the basis of its prosperity, much depends on the manner in which these resources are utilized, or in other words on the industrial efficiency of the means and methods of production. We have developed and are developing great transportation systems, we handle raw material on a large scale, machinery has been applied even to the addressing of our letters and affixing stamps; but it remains true, nevertheless, that with a few conspicuous exceptions our manufacturing operations are carried forward in trustful ignorance and disregard of many of the factors upon which real industrial efficiency depends. This is shewn in the stupendous waste which sometimes accompanies the first crude preparation of the raw material; it is shewn in the general absence of a true selective economy in

the apportionment of that raw material among the different industries; and it is shewn again in the losses which attend nearly every step in the progress of the raw material towards the finished product. The absence of proper selective economy in the adaptation of raw material to use is everywhere, as when our railroads use untreated ties and poles, when coal tar is burned as fuel, crystal alum used for purifying water, or valuable publications printed on ground wood papers. We are still polluting our streams with wool grease, still wondering whether we can make alcohol from waste molasses, and still buying coal without reference to heating power.

When wastes so obvious and so easily remedied are everywhere taking heavy toll from our manufacturers, it is not surprising that in all lines of productive effort subtle and elusive problems present themselves and still further lower our industrial efficiency. Steel rails break by thousands; trolley wires snap; boilers corrode; milk cans, wire fences and iron roofing rust; unsightly bloom appears on leather; cloth is stained; paints fail to protect the metal underneath.

In a large proportion of cases those who are confronted by the problem have neither the time, the training nor the equipment required for its solution, and yet such problems and thousands of others far more complex upon their face must be solved if our industrial efficiency is to be brought to its proper level.

No one at all conversant with the facts can doubt that our industrial salvation must be found in a closer alliance between the scientific worker and the actual agencies of production.

Since all material is subject to chemical laws, and its properties and behaviour are influenced or determined by these laws, it follows that a large number, probably by far the greater number of our industrial problems are problems in applied chemistry. No better field for the initiation of work intended to be directly effective in its bearing upon industrial efficiency could therefore be chosen.

In selecting problems, preference should always be given to those which promise in their solution to prove of greatest

benefit to the community. Among subjects which may be suggested for investigation may be mentioned the cause and the prevention of the corrosion of lead pipe, the breakage of steel rails, the waterproofing of cement structures, the utilization of wastes which now involve nuisance and the preservation of iron fences and sheet iron in our climate.

Nothing will convince the average man of the industrial value of research half so quickly as the actual solution of the particular problems by which the individual manufacturer is confronted and perplexed.

In conclusion, before vacating the presidential chair, allow me once more to thank you sincerely for the honor conferred upon me in again electing me to the highest office in the gift of the Institute.

I have much pleasure in opening the forty-sixth session.

It was announced that J. F. WHITEAVES, LL. D., F. G. S., F. R. S. C., etc., palæontologist, zoologist and assistant director of the Geological Survey of Canada, Ontario, had been elected a corresponding member.

The librarian's report was presented by MR. PIERS, showing that 1756 books and pamphlets had been received by the Institute through its exchange-list during the year 1906; and 1,440 had been received during the ten months (January to October) of the present year, 1907. The total number of books and pamphlets received by the Provincial Science Library (with which the books of the Institute are incorporated) during the year 1906, was 2,835. The number of books borrowed in 1906 was 661, as against 539 in the previous year. Reference was also made to the desirability of having restored to the library the annual grant which it had received from the government previous to 1905. The report was received and adopted.

The secretary reported that during the past year no meetings had been held by the King's County Branch of the Institute, and it would have to be considered as having ceased to exist.

It being here reported that probably a new director of the Geological Survey of Canada might be appointed in the near future, some discussion took place as to the desirability of having a man appointed who is familiar with the geology of eastern Canada. The matter was referred to the incoming council.

It was moved that the thanks of the Institute be conveyed to HIS HONOR THE SPEAKER OF THE HOUSE OF ASSEMBLY for his courtesy in permitting the use of the assembly room as a place of meeting.

The thanks of the society were presented to MR. PIERS for his services as secretary.

Discussion took place as to the method of collecting fees, and it was resolved the subject be taken up at the next ordinary meeting.

The following were elected officers for the ensuing year (1907-1908) :

President—PROFESSOR EBENEZER MACKAY, PH. D., *ex-officio* F. R. M. S.

Vice-Presidents—PROFESSOR J. EDMUND WOODMAN, D. Sc., and WATSON L. BISHOP.

Treasurer—MAYNARD BOWMAN, B. A.

Recording Secretary—HARRY PIERS.

Librarian—HARRY PIERS.

Councillors without office—ALEXANDER MCKAY; PROFESSOR FREDERIC H. SEXTON, B. S.; HENRY S. POOLE, D. Sc., F. R. S. C.; H. W. JOHNSTON, C. E.; PROFESSOR A. STANLEY MACKENZIE, Ph. D., F. R. S. C.; PHILIP A. FREEMAN; F. W. W. DOANE, C. E.

Auditors—RODERICK MCCOLL, C. E.; WILLIAM MCKERRON.

The thanks of the society were presented to the retiring president, MR. DOANE.

FIRST ORDINARY MEETING.

Assembly Room, Province Building, Halifax, December 9th, 1907.

THE PRESIDENT, DR. EBENEZER MACKAY, in the chair.

H. Jermain M. Creighton, M. A., read a paper "On the Influence of Radium on the Decomposition of Hydriodic Acid." (See Transactions, vol. xii., pt. 1, p. 1). The paper was discussed by the PRESIDENT, DR. MACKENZIE, M. BOWMAN and DR. A. H. MACKAY.

SECOND ORDINARY MEETING.

Legislative Council Chamber, Halifax, 13th Jan., 1908.

THE PRESIDENT, DR. E. MACKAY, in the chair.

It was announced that the following had been elected ordinary members: H. JERMAIN M. CREIGHTON, M. A., Dartmouth; PROFESSOR MURRAY MCNEILL and PROFESSOR A. E. STONE, Dalhousie College, Halifax; A. L. MCCALLUM, B. Sc., analyst, Halifax; GEORGE B. BANCROFT, Halifax County Academy; and A. C. HARLOW, Halifax.

A paper by CLARENCE L. MOORE, M. A., supervisor of schools, Sydney, C. B., on "The Myxomycetes of Pictou County, N. S.," was read by Dr. A. H. MacKay, who supplemented the paper with observations of his own on the subject. (See Transactions, p. 165). The paper was discussed by the PRESIDENT, DR. H. H. READ, W. L. BISHOP and P. A. FREEMAN, and a vote of thanks was passed to Mr. Moore.

THIRD ORDINARY MEETING.

City Council Chamber, Halifax, 12th February, 1908.

THE PRESIDENT, DR. E. MACKAY, in the chair.

The secretary announced that the following had been selected members: ERNEST ROBINSON, B. A., Dartmouth (ordinary), and CLARENCE L. MOORE, M. A., supervisor of schools, Sydney, C. B. (associate).

H. PIERS was requested to interview those interested in order to ascertain what edition will probably be required of the geological survey's forthcoming map-sheets of Halifax.

A. L. McCALLUM, B. Sc., read a paper on "The Action of Organic Sulphur in Coal during the Coking Process." (See Transactions, p. 212). The subject was discussed by the PRESIDENT, DR. A. H. MACKAY, DR. WOODMAN, M. BOWMAN, P. A. FREEMAN, H. J. M. CREIGHTON, W. H. SOPER, and A. A. HAYWARD. A vote of thanks was presented to the lecturer.

FOURTH ORDINARY MEETING.

Church of England Institute, Halifax, 30th March, 1908.

THE PRESIDENT, DR. E. MACKAY, in the chair.

PROFESSOR E. E. PRINCE, Dominion fishery commissioner, Ottawa, read a paper on "The Fish-eating Habits of Medusæ" and also delivered an address on "The Present and Future of our Fisheries," illustrated by the electric projection lantern. The subject was discussed by S. Y. WILSON, A. H. WHITMAN, and DR. A. H. MACKAY. A vote of thanks was presented to the lecturer.

FIFTH ORDINARY MEETING.

City Council Chamber, Halifax, 13th April, 1908.

THE PRESIDENT, DR. E. MACKAY, in the chair.

H. JERMAIN M. CREIGHTON, M. A., read two papers: (1) "A Few Chemical Changes influenced by Radium: a new method for the detection of Amygdalin" (see Transactions, vol. xii, pt. 1, p. 34); (2) "The Behaviour of Solutions of Hydriodic Acid in Light in the Presence of Oxygen" (see Transactions, vol. xii, pt. 1, p. 49). The papers were discussed by the PRESIDENT, A. L. McCALLUM, D. M. FERGUSON, and DR. A. S. MACKENZIE.

SIXTH ORDINARY MEETING.

Assembly Room, Province Building, Halifax, 18th May, 1908.

THE PRESIDENT, DR. E. MACKAY, in the chair.

It was announced that H. B. Pickings, department of mines, Halifax, had been elected an ordinary member.

HARRY PIERS, curator of the Provincial Museum, Halifax, read a paper "On the Occurrence of Tin in Nova Scotia," illustrated by specimens. (See Transactions, p. 239). The subject was discussed by the PRESIDENT, DR. WOODMAN, W. L. BISHOP, and A. L. MCCALLUM.

WATSON L. BISHOP, superintendent of water-works, Dartmouth, presented a "Note on Eels in Water-pipes" (see Transactions, p. 640), which was discussed by F. W. W. DOANE and JOHN FORBES.

PROFESSOR J. E. WOODMAN, D. Sc., delivered a lecture on the "Economic Geology of Arisaig, N. S.," illustrated by specimens of iron-ore, maps, etc. The subject was discussed by the PRESIDENT, H. PIERS, and F. W. W. DOANE.

HARRY PIERS,
Recording Secretary.