

PROCEEDINGS
OF THE
Nova Scotian Institute of Science.

SESSION OF 1908-1909

ANNUAL BUSINESS MEETING.

*Assembly Committee Room, Province Building, Halifax;
14th October, 1908.*

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

PRESIDENTIAL ADDRESS: (1) Progress of the Institute since 1890;
(2) Progress of Technical Education; (3) Technical
Education and Research; (4) The
Institute in the Public Service.

By PROFESSOR E. MACKAY, PH. D., Dalhousie College, Halifax.

In opening the present session of the Institute of Science, I wish at the outset to take the opportunity—the first that has presented itself— of expressing to the members of the Institute my appreciation of the honor which they conferred upon me one year ago in electing me to occupy the chair.

It has been the custom to make the opening meeting of each year an occasion for reviewing in its various aspects the work of the past, and especially that of the past year. In accordance with this usage we are to receive reports on our library and our finances, and it is my duty and privilege to present to you some report upon our present condition and activity as a scientific organization.

Progress of the Institute since 1890.

The Institute enters to-night upon the forty-seventh year of its existence. It is, therefore, old enough to permit us to indulge in the exercise of looking backward with some interest and not, I hope, without profit.

In 1890 the Nova Scotian Institute of Natural Science became incorporated under the title of the "Nova Scotian Institute of Science," thus proclaiming by its name what it had previously acknowledged by its practice, that it took the whole domain of science for its province. I shall select the date of this change as setting a convenient limit to a brief retrospective glance at the work of our society in the past. A survey of this period, covering nearly two decades, should furnish some help in answering the question which is always of vital interest to a live organization: Are we making progress? With this in view I have collected some statistics for the period mentioned showing (1) the number and length of the papers contributed each year and subsequently published in the Transactions, and (2) the total number of members for each year of the period.

First, then, as regards the papers, I find that for the sixteen years ending in May, 1906, the last for which complete data are available, there were 153 papers contributed, averaging about 13 pages in length. This gives an average annual contribution of rather less than 10 papers, or in the aggregate, about 131 pages: To show how these contributions have been distributed over the above period, I have plotted two curves, one showing the variation in the aggregate number of pages presented each year and the other the variation in the number of papers. It is seen that with the exception of a depression in 1892-3, and again in 1896-9, the number of papers keeps pretty uniformly in the neighborhood of 10. The curve of pages shows much greater variation. The minimum is reached in the first year of the present century, the maximum three years later, in 1904-5. If we divide the period of sixteen years for which the curve is drawn, into two equal parts of eight years each, it will be found that the average annual contribution for the last eight years is 155 pages, or about 50 pages more than the average for the first eight. We must not, of

course, infer too hastily on this account that real progress has been made; for knowledge is not always advanced in proportion to the number of pages published in the name of science. But whether to be taken as an index of progress or not, there can be no doubt that the papers published in the Transactions are gradually becoming longer. In an opening address to the Institute in 1888 Professor MacGregor stated that the average length of paper given to the Institute for the first quarter century of its existence was 9 pages. The average for the sixteen years previous to 1907 was, as we have seen, 13 pages, and for the last eight years of the same period $15 \frac{1}{2}$ pages.

During the past year eleven contributions were presented, of which four were biological, four chemical, and three related to geology and mineralogy. It is probable that in volume these will at least equal the average for recent years.

To turn now to statistics of membership, the Institute started in 1890 with a total membership of 91. This number rose to 134 in 1897 and to a maximum of 136 in 1899. It then fell somewhat abruptly to 110 in 1901, and remained at about this number until 1906, when it fell to 104. The rapid decline for the two years following 1899 is not to be considered a mark of decay. It merely signifies that inactive members had been dropped from the list.

It is pleasant to be able to report that during the past year our membership suffered no losses by death. One ordinary member resigned owing to his removal from the province. At the same time one corresponding and nine ordinary members were added to our number. This is a gratifying increase; but more gratifying still is the fact that from these new members came five papers or nearly half of the total contributions for the year.

Progress of Technical Education.

Viewing the present prospects of the Institute in the light of past achievement we find on the whole much encouragement to renewed effort in the future. Progress has not been rapid, but there is reason to think it has been real. So much is a fair inference from the facts that have just been presented. And if we look beyond the walls of the Institute we shall find in some

respects still greater cause for hopefulness. Take the recent progress of technical education for example. In reading the addresses to the Institute of eighteen years ago and of some succeeding years, one is struck with the spirit of hopeless resignation in which the question of technical education is discussed. The speakers, while realizing fully the need for industrial education, saw no prospect of adequate provision being made for it. In contrast with that outlook, we are now able to look forward with confidence to seeing in the early future fully developed courses of all grades in applied science placed within the reach of every deserving boy in Nova Scotia. Here, then, at least, we have progress gratifying in the highest degree to members of a scientific association such as this.

Technical Education and Research.

It is not to be expected that this extension of our educational system will produce any immediate effect in increasing the amount of research. For some time the whole energy of the new department will have to be expended in developing courses for mechanics and miners on the one hand and for engineers on the other. But when these initial difficulties have been overcome we may hope that neither men nor means will be wanting to undertake the solution of some of the problems in applied science of most importance to our provincial industries, to devise, for example, improved methods of treating certain of our native ores, to institute careful tests of our native woods, to investigate industrial processes with a view to effecting economies in them, and similar problems. The effect of such investigations would not be merely to benefit directly some particular industry. A much more important and far-reaching effect would be the gradual formation of a bond between scientific research and the industries which might perhaps develop into such an intimate relation as exists, for example, in Germany where the industries lean upon research and research is in turn vitalized by the industries. There is no doubt that a great deal of exceedingly valuable work is done where research has no intimate relation with industries at all. But there is also no doubt that it is in those countries where the most intimate relations between science and industry have been

established that research in both pure and applied science is most vigorous and is pursued with greatest enthusiasm. Whenever directors of industries begin to discover that research men whom they have been accustomed to think unpractical and visionary can, working in their laboratories, sometimes help them in ways that their practical shop-trained workmen were powerless to do, the first step on the road to a complete understanding will have been taken. I believe it is through the work of the technical college on problems having the most obvious practical bearing that there is the best chance of that first step being made possible. Then once the value of research work is appreciated in industrial circles there will no longer be difficulty in getting men to take an interest in scientific work, and our Institute, no longer obliged to go into the highways and hedges in order to compel men to come and fill up its programmes, will be embarrassed with the wealth of papers at its disposal.

There is one mistake which can do a great deal to retard the good understanding between science and industry, from which, if it came about, so much is to be expected. It is the mistake of underestimating the severity of the training required for effective research work in a physical science, and, in consequence overestimating the value of the half-trained student of science to an employer. The only kind of scientific man who can be of real service in industrial work—unless the service required is some comparatively simple routine analysis—is a man of the highest training. The training of the evening school or of the high school or of the ordinary college course in science is absolutely without value for this purpose.

The Institute in the Public Service.

Last year the Institute endeavoured with some success to arouse public interest in the problems that are embarrassing our fisheries. I would venture to hope that our society, without losing interest in the fisheries, would this year give a share of its attention to one of the most serious industrial problems facing the province—the conservation of our forests. A few weeks ago one of the leading lumbermen of the world, writing in the *London Times*, expressed the opinion, after careful study of the matter,

that at the present rate of destruction the lumber supply of the world would not last more than about thirty years. If that is the case it furnishes a strong additional reason for conserving our Nova Scotian forests. It is wholly unnecessary to tell the members of this Institute in what imminent peril the remnants of our forests are placed by the scourge of fire, and perhaps even more by reckless and wasteful methods of lumbering. This is not the place to suggest what steps should be taken in order to awaken public opinion, which must be first aroused if effective action in the matter is to be possible. I am only concerned at present in urging that where important natural resources are being wasted, it is the duty of a scientific society such as the Institute to do all in its power to arrest the evil. The Institute is the only scientific society in the province and as such should be the official exponent of scientific opinion. It should be able to create what may be called a scientific public opinion powerful enough to make itself felt. It is as true now as in the days of the wise king that "Where there is no vision the people perish." In such a case as the present it is for men of science to supply the lack of vision.

In conclusion let me express the fervent hope that the present session will excel all its predecessors in the value of its work for science and for the community.

In the absence of the Treasurer, the financial report was deferred to a future meeting.

The Librarian's report was presented by MR. PIERS, showing that 1781 books and pamphlets had been received by the Institute through its exchange-list during the year 1907; and 1261 had been received during the nine months of the present year, 1908, viz., January to September, inclusive. 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 1907, was 2510. The number of books borrowed in 1907, was 607, as against 661 in the previous year. The report was received and adopted.

It was resolved that the thanks of the society 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.

Attention was drawn to the approaching fiftieth anniversary of the foundation of the Institute, and it was resolved that the incoming council present at a future meeting a preliminary report on the subject of an appropriate celebration of such an anniversary.

The following were elected officers for the ensuing year (1908-1909):—

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

1st Vice-President,—PROFESSOR J. EDMUND WOODMAN, D. Sc.

2nd Vice-President,—WATSON L. BISHOP.

Treasurer,—MAYNARD BOWMAN, B. A.

Corresponding Secretary,—A. H. MACKAY, LL.D., F. R. S. C.

Recording Secretary and Librarian,—HARRY PIERS.

Councillors without office,—ALEXANDER MCKAY; PROFESSOR FREDERIC H. SEXTON, S. B.; H. W. JOHNSTON, C. E.; PROFESSOR A. STANLEY MACKENZIE, PH. D.; PHILIP A. FREEMAN; F. W. W. DOANE, C. E.; A. L. MCCALLUM, S. B.

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

FIRST ORDINARY MEETING.

Geological Lecture Room, Dalhousie College, Halifax; 16th November, 1908.

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

It was announced that F. H. McLEARN, Halifax, and W. S. STAPLETON, supervisor of public schools, Dartmouth, had been elected ordinary members.

PROFESSOR J. EDMUND WOODMAN, D. Sc., Dalhousie College, read a paper on "Recent Iron and Limestone Investigations in Nova Scotia," the subject being illustrated by specimens, maps and photographs. The paper was discussed by the PRESIDENT, H. PIERS, PROFESSOR F. H. SEXTON, T. VARDY HILL and others.

SECOND ORDINARY MEETING.

Assembly Room, Province Building, Halifax; 14th December, 1908.

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

PROFESSOR J. G. MACGREGOR of Edinburgh University, was appointed delegate to represent the Institute at the public meeting of the Geological Society of Glasgow, to be held at Glasgow on 28th January, 1909.

A. L. MCCALLUM, B. Sc., Halifax, read a paper "On the Occurrence of Sheelite in Nova Scotia," describing the deposit lately discovered at Moose River gold district, Halifax county. (See Transactions, p. 250.) The paper was discussed by JOHN FORBES, DR. A. H. MACKAY, H. PIERS, DR. WOODMAN, and others.

In the absence of the author, DR. A. S. MACKENZIE read a paper by KENNETH MCINTOSH, of St. Peter's, C. B., "On the commonly accepted Axioms in Celestial Mechanics." The subject was discussed by DR. MACKENZIE, the PRESIDENT, DR. A. H. MACKAY, and DR. WOODMAN.

DR. WOODMAN exhibited a specimen of auriferous quartz with arsenopyrite from the Middle River gold mine, Inverness county.

The Treasurer, M. BOWMAN, presented his annual report for the past year, showing a balance of \$114.92, a reserve fund of \$214.95, and a permanent endowment fund of \$810.49. The report was received and adopted. It was resolved that the Treasurer prepare a statement of the financial condition of the Institute and the need of funds, and mail the same with a bill for dues to such members as are in arrears, such bills not to include arrears previous to the financial year 1907-8.

THIRD ORDINARY MEETING.

Assembly Room, Province Building, Halifax; 11th January, 1909.

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

It was announced that DONALD M. FERGUSSON, chemist of the Acadia Sugar Refining Company, Halifax, had been elected an ordinary member.

MR. PIERS drew attention to the map-sheets of Halifax and its vicinity just published by the Geological Survey of Canada, and exhibited the same.

DR. A. H. MACKAY read a paper by CLARENCE L. MOORE, M. A., supervisor of schools, Sydney, C. B., on "Some Nova Scotian Aquatic Fungi," illustrated by drawings of the species described. (See Transactions, p. 217). DR. MACKAY prefixed an account of the characters, etc., of the group to which they belong. The paper was discussed by DR. WOODMAN and W. L. BISHOP.

The Secretary was directed to write for particulars regarding the conditions governing the application of the Carnegie Research Fund, in order to ascertain if it was available for the purchase of books needed by investigators in this province.

FOURTH ORDINARY MEETING.

Committee Room, House of Assembly, Halifax; 15th February, 1909.

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

A paper by JOSEPH PERRIN of McNab's Island, Halifax, and JOHN RUSSELL of Digby, N. S., entitled "Catalogue of Butterflies and Moths, mostly collected in the neighborhood of Halifax and Digby, N. S.," was communicated by H. PIERS. (See Transactions, p. 258). A vote of thanks was passed to Messrs. Perrin and Russell for their excellent paper.

FIFTH ORDINARY MEETING.

Council Chamber, City Hall, Halifax; 8th March, 1909.

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

THOMAS J. MCKAVANAGH, chief electrician of the cable SS. "Minia," read a paper on "Water Purification by Ozone," which was experimentally illustrated. The paper was discussed by the PRESIDENT, W. L. BISHOP, F. W. W. DOANE, G. M. J. MACKAY, and REV. H. W. CUNNINGHAM. A vote of thanks was presented to the lecturer.

SIXTH ORDINARY MEETING.

House of Assembly, Province Building, Halifax; 24th April, 1909.

The FIRST VICE-PRESIDENT, DR. J. E. WOODMAN, in the chair.

The following papers were read:—

(1) "Geological Conditions affecting the Water Supply of Halifax." By H. CAVANAGH and D. STAIRS, Dalhousie College. Discussed by DR. A. H. MACKAY.

(2) "Weathering of Structural Stones in Halifax." By C. J. MACKENZIE and G. L. CRICHTON, Dalhousie College. Discussed by H. PIERS.

(3) "Cement Testing in the Engineering Laboratories of Dalhousie University." By H. W. FLEMMING, Dalhousie College. This paper which gave results of tests made of Sydney slag-cement, was discussed by W. L. BISHOP, A. L. MCCALLUM, T. V. HILL, DR. A. H. MACKAY, H. PIERS, and G. M. J. MACKAY.

(4) "Effects of Ice Action near Grand Lake, Cape Breton county." By W. S. BRODIE, B. A., Lunenburg, N. S. (See Transactions, p. 253). Discussed by DR. A. H. MACKAY.

(5) "The Influence of Aluminium Salts on the Estimation of Sulphates." By H. JERMAIN M. CREIGHTON, M. A., Birmingham University, Birmingham, England. (See Transactions, vol. xii, pt. 2, p. 207).

A vote of thanks was presented to the non-members who had presented papers.

HARRY PIERS,

Recording Secretary.