

PROCEEDINGS  
OF THE  
Nova Scotian Institute of Science.

---

SESSION OF 1905-1906

---

ANNUAL BUSINESS MEETING.

*Legislative Council Chamber, Halifax, 18th October, 1905.*

THE PRESIDENT, DR. HENRY S. POOLE, in the chair.

PRESIDENTIAL ADDRESS.—By HENRY S. POOLE, D. SC., F. R. S. C.

THE INSTITUTE'S WORK.

We are once more met together to hold an annual meeting, to receive reports, elect officers for the ensuing year, and open another session of this Institute. During the year that has closed, we suffered no loss of members, and the interest taken in the meetings remained at the standard customary of late.

The additional movement established a few years ago, viz. the popularizing of special meetings, has been continued with a gratifying attendance. Advantage was taken, through Mr. Jenney's kindness in placing his electric-lantern at the service of the Institute, the better to display the carefully prepared and attractive illustrations of volcanoes which Dr. Woodman was enabled to use at his lecture to an appreciative audience. It will be noted that half the papers read and submitted at the last session were more or less geological. This should create no surprise in a province so given over to mining, and possessed of so wide a range of strata well exposed for study. Of a different class was the paper of Mr. W. H. Prest on "Edible Wild Plants of Nova Scotia," which brought to

the meeting when it was read, many members of the Botanical Club of Halifax, and which led to a discussion of much interest, that showed that all had not been learned of the twigs, leaves, barks and roots, which in cases of emergency would be available to sustain life. The facts brought out at the discussion, in addition to those given by the author, suggest that much good would ensue at future meetings were the custom established of getting members and their guests to submit in writing, for publication with the primary paper, remarks thereon. Not only would a writer be gratified by the notice his article elicited, even when there was not entire agreement, but the subsequent reader of the paper would have also a knowledge of the measure of credence or endorsement given to the statements made at the time of presentation.

It was most unfortunate that the Kings County Branch of the Institute, at Wolfville, was unable to hold meetings during the year. This was due, however, to no lack of interest in the branch, which was organized in 1901.

The finances of the Institute have received the careful attention of the Treasurer, and his report will be submitted:

The Recording Secretary, I was on the point of writing, gave me invaluable assistance in the work of calling the meetings, preparing statements, keeping accounts and editing the transactions; but I am sorry to say I cannot truthfully do this, for it was not merely assistance that I got from him. The fact is, he was the head and front of the Institute the past three years, and saw to everything. We have taken so much as a matter of course the services he has given, that I fear we have not fully appreciated the sacrifices he has made, sacrifices which the Institute cannot expect to continue forever, especially as he has duties in other directions which are constantly growing. His is an interesting case of early training to a sense of moral obligation, that I am selfishly thankful extended to the end of my term of office, and I now would make all due acknowledgments.

#### SPECULATIVE THOUGHTS.

And now before giving place in this chair to a busy man of practical ideas, let me give utterance to a few vague speculations of idle moments.

When man wakes to consciousness in this material world, he finds himself one of many varied organisms, stamped with one general plan, automatic in part, and also in possession of a limited amount of free-will and action. As he becomes sensible of his position, and his bodily wants are met, he begins to realize he is not so very independent or all-powerful, and that he is living on a borderland of mysteries, surrounded by the inexplicable, and when considered from a purely personal point of view, by what seem malevolent as well as benign influences. The limitation to his powers meets him on every hand, and he finds his very existence depends on the range of the forces to which he is exposed being circumscribed. He finds, moreover, his consciousness of sensation also has its limits, as of sound proceeding from pulsations only within fixed amplitude and frequency, the limit of perception varying somewhat with the individual, in harmony with the variability of moderate degree everywhere observable in nature. Light and heat also have to be restricted in their range if they are to be utilized by man, while excess of the latter is made evident beyond doubt by destruction of tissue.

At times man glories in the freedom he possesses, and especially when he makes subservient to himself beings weaker or mentally less endowed, beings whose sum of animal existence is to eat and to be eaten, for few individuals in the ferine state escape the latter condition, and, as a matter of fact, few animals of any condition.

As consciousness develops, and with a mind free of anxiety for immediate wants, he seeks to know who and what he is in this world's economy, whence he has come, and whither will he go. His untrained perceptions failing him beyond the compass of self-preservation, he consults his fellows for their knowledge of these matters. He becomes a student and so far as his enquiries and experiments are systematic, a student of science.

Here, as in all cases of disturbance, whether physical or mental, opposition is met with, and the student of truth has to contend with errors of observation and assumption of conclusions unproved. The latter especially hampers him, for recognizing his seeming hopeless ignorance of much there is about him, he is only too ready

to accept the confident assertion of another individual grasping every opportunity for self aggrandizement.

As a student he has first to carefully confine his observations to that which is material and to oft trodden paths, to accept nothing as true which cannot be put to the test over and over again, since isolated cases, however suggestive of the truth of certain contentions, may mislead when all conditions of a problem have not been noted. Further than this faith in the teachings and reverence for the fathers of modern science are not inculcated to pass beyond respect. Their deductions of yesterday are subject to the cold criticism of to-day equally with the latest theory of the youngest tyro; and as for flights of fancy and the poet's glamour, they are not needed to enhance admiration, awe and wonder of the mysterious marvels that unfold themselves to his growing intelligence.

In the schools of chemistry and physics, natural phenomena have no sporadic mysteries, though their controlling source be obscure, and vast ignorance respecting them necessarily still prevails. Repeated proof is essential, since fortuitous concurrences mar the accuracy of findings based on solitary examples. The world is full of superstitions derived from hasty generalizations, and many have come down from pagan times and been engrafted with modern belief.

The teachings of the nursery, with its first and indelible impressions, have a lasting effect, and we grow up creatures largely of habit, indisposed to put aside pre-conceived opinions and even perhaps unable to dispassionately consider, on their merits, questions touching ourselves. This innate tendency of the mind to keep alive the lore impressed in childhood and clung to generation after generation, is in keeping with ancestral characteristics of the body which we note in ourselves and our neighbours, and which the breeder of choice strains of animals and plants is particular to propagate.

The unbiassed student will take the stand that the intelligence with which he is endowed calls for its exercise and growth; that he is warranted in searching into all that appertains to himself and his surroundings, although his powers are restricted and he is incapable of reducing to order a fraction of the mysteries about

him ; unable to grasp an idea either of creation or annihilation, or a condition preceding the one and succeeding the other, or of a beginning or ending of time or limitation of distance. While there is much that he cannot hope to understand, there are suppositions he cannot possibly accept, as that of birth without resultant death, nor can he conceive of mental sensations, as joy, love and hope, without crediting the converse possibilities. There would be for him no pleasure if there were no pain, no recognition of light without that of darkness, nor of heat without cold. The perception of the one necessarily demands the condition of the other. All nature teaches this to be a truth, analogy with cause and effect, is everywhere constant, whether it be among phenomena typified by the satisfying of an acid for its base, or among an entirely different group exemplified in the fatigue which follows strain.

Reverting for a moment to pain, to excruciating pain, which some people tell us they find hard to reconcile with their standard of faith, let us picture a stricken creature, the moment before stored with vitality, now the innocent victim of an accident which deprives his nervous energy of control, and lets loose the impulses which ordinarily are used only slowly as required for the well-being of the body. No longer under restraint, these become intensified with a correspondingly rapid exhaustion of vitality, and the dews of anguish mark that intensity as beyond endurance. It is like the burning of a candle at both ends in oxygen, the sum total of stored energy is there used up in a very short time.

When the student awoke to the value of classifying his observations and realized that order prevailed even among details apparently dissimilar, great advance was made, and he was then able to satisfy himself by repeated experiment that phenomena of nature were subject to fixed relation which could be expressed as laws, and he was also able to convince his fellows that, under similar treatment, like results would ensue in their hands.

Besides the phenomena he has systematized, he reasonably assumes by analogy that there are others equally amenable to elucidation, although efforts in many directions have so far met with but indifferent success.

Retrospection raises hope to pursue further investigation among the unexplained mysteries even of the organic world. Who a century ago would have thought it possible to harness lightning to a car, to prove a similarity of chemical elements in other worlds than ours, to see with ordinary vision through walls of common brick, to hear a whisper along one thousand miles of wire, or instantly communicate through the air far beyond the reach of sight and sound? The success the student has achieved in pushing back the fringe of the great unknown, has enabled him the better to realize he is subject to a reign of law, and it has elevated his perception of the infinite and the sublime.

At the same time it is equally true that that opposition to movement of whatever sort or kind which, as already has been stated, seems an essential corollary to it, is apt to lead in us, as individuals, to pride in the dominant position we hold on earth, and leads us to forget we are but as flies on the wheel, chips on the torrent, or grains of sand in the whorl of the cyclone: even to proclaim "We and God," when a coupling with the beast of the field would be more in keeping with man's worldly relations.

There is also a growing belief among naturalists, who have closely observed wild life at home and free of fear, that what in man are called the finer feelings—friendship, affection and sympathy, are exhibited in a marked degree by creatures of more humble circles.

The student, moreover, has reason to suspect that as in the material world law and order reign, so also among the spiritual influences affecting free will, system prevails. Further than that, as there is to the individual a birth, maturity and death, and to communities a racial or national rise, a period of prosperity and ultimate decay, so does it appear in the non-material region of thought that a cycle holds good; that there have been to religions an inception, a zealous purpose, an acceptance, and then decline; also to ideas in other directions there comes the inspiration, the spread of waves of intelligence throughout communities in sympathy, and then a subsidence of the particular impulse, like as it is with epidemics of pestilence and accident.

Views of this sort are not entirely new ; something of the kind was expressed by ancient writers, although it was left to modern times to more fully confirm the mastery of law and order, and the idea that activity meant the breaking away from harmonious quiescence. Later ideas have recognized a similarity of purpose in mundane interests which extends beyond a daily reawakening from unconsciousness to a state of bodily and mental activity with memory of previous periods of consciousness in the individual. It includes the replacement of units and the succession of dominant races. It goes even further and assumes the law of cycles to include in its grasp intangible impulses, the temperament of races, the family likeness and mental atavism ; embraces the reincarnation of ancestral traits of body, finding a homologue in the reappearance of mental characteristics. These when purely animal and of the automaton order, we call intuition. They direct the infant to cry, the sheep to eat grass, the wolf to devour the sheep and the bird to build a nest and migrate. Nor is this intuitive impulse confined to the animal world, it is observable in the vegetable, in the shrinking from touch and consequent tired feeling of the sensitive plant, in the night-folding flower of the *Enothera* and in the closing over on its victim of the *Drosera* leaf. Nor is it absent from the mineral world. Among growing crystals we detect it in the interlacing spicules of ice, in a network of cyanite where each crystal in its struggle to grow greater bends about to avoid its fellow crystal imbued with a similar purport. How these several attributes are maintained and stored in the germ, must remain forever a marvellous mystery, although constant repetition would indicate a governance by law.

Recognition has been made of the existence of influences, forces or impulses, which may, from the aspect of the individual organism, be malign. These the student contends are natural concomitants of life, for the interests of the unit necessarily become subordinate to the welfare of his community and his race in their competition and struggle for continuance on the face of the earth. We have to differentiate between Man, an order of beings, and 'man' an egotistical unit whose naturally selfish aspect is to regard the world as his oyster, and whose first instinct is self-preservation. Mal-

thusian views prevail. Utopia with perfect peace, continuous bliss, joy, and love for all, is necessarily an impossibility, and encouragement of any such idea a snare to the weak and emotional. The world cannot be otherwise than one of strife, both of brain and muscle, and the struggle must continue, of the weak with the strong and of the oppressed with the oppressor, however much we may disguise the unavoidable in euphonious terms.

While excess in all things is to be deprecated, and over-indulgence in speculations in matters of science is to be avoided, a generalization or two gives a fillip to enquiry and is helpful to the student. As a stimulus to observation it may for the moment be assumed there is no reason why the same systematic and orderly approach to the fields of the unknown, which method modern research inculcates, should not be adopted also to the realms of thought, nor why we should not assume that the energy of intelligence and the limitations to voluntary action may not also be under the dominion of law. If this be so, who shall say little is left in the field of science for the observer outside the walls of a college and a laboratory?

---

W. MCKERRON presented the treasurer's report, which having been audited and found correct, was received and adopted.

The report on the library was presented by H. PIERS, showing that 2,330 books and pamphlets had been received by the Institute through its exchange-list during the calendar year 1904, and 1,354 had been received during nine months of the present year (1905), viz., January to September. Increased use of the library was also reported as shown by the number of books borrowed during the year 1904, viz. 519, as against 296 in 1903. Particulars were also given of the total number of books and pamphlets received during the year 1904 by the Provincial Science Library with which the books of the Institute are incorporated. This number was 3,115, of which 2,330 were the society's exchanges as above-mentioned. The report was received and adopted.

The secretary reported that the KINGS COUNTY BRANCH OF THE INSTITUTE had not met during this session of 1904-5.



W. MCKERRON presented a report as delegate to the meeting of the Royal Society of Canada.

Votes of thanks were passed to HON. M. H. GOUDGE, President of the Legislative Council, for his courtesy in granting the society the use of the Council Chamber as a place of meeting during the past session; and to the SECRETARY OF THE SMITHSONIAN INSTITUTION, Washington, for courtesy in continuing to admit the Institute to the privileges of the Bureau of International Exchanges.

THE PRESIDENT brought to the notice of the meeting a note by R. RUEDEMANN, assistant state palæontologist, Albany, N. Y., on three specimens of *Dictyonema websteri* from New Canaan near Kentville, Kings Co., Nova Scotia, belonging to the Webster collection, Provincial Museum, Halifax. Mr. Ruedemann reports as follows regarding these specimens:

"*Dictyonema websteri* has been figured, but not described, by Dawson in Canadian Naturalist and Geologist, vol. v, 1860, p. 139, and again figured in Acadian Geology, 1891, p. 563, but not described. Thus this species is nowhere described. A careful comparison with authentic material of *D. retiforme*, Hall, from the Rochester (Niagaran) shale in New York, fails to show any differences sufficient for specific distinction, and it is, therefore, quite sure that *D. websteri* is identical with *D. retiforme*." He reports further that a lot of *Dictyonemas* from Benton and Monument Settlement, Carleton County, New Brunswick, and from Navy Island, St. John, N. B., labelled *Dictyonema sociale*, all belong to one species, *Dictyonema flabelliforme*, Eichwald (sp.) (= *Dictyonema sociale*, Salter [sp.], a Latin name). This species is characteristic of the closing stage of the Cambric age.

The following were elected officers for the ensuing year (1905-1906):

*President*—F. W. W. DOANE, C. E., *ex-officio* F. R. M. S.

*Vice-Presidents*—PROFESSOR EBENEZER MACKAY, PH. D., and PROFESSOR J. EDMUND WOODMAN, D. SC.

*Treasurer*—WILLIAM MCKERRON.

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

*Recording Secretary*—HARRY PIERS.

*Librarian*—HARRY PIERS.

*Councillors without Office*—MAYNARD BOWMAN, B. A.; WATSON L. BISHOP; EDWIN GILPIN, JR., LL. D., F. R. S. C., I. S. O.; ALEXANDER MCKAY; J. B. MCCARTHY, B. A., M. SC.; PROFESSOR FREDERIC H. SEXTON, B. SC.; HENRY S. POOLE, D. SC., F. R. S. C.

*Auditors*—PROFESSOR D. A. MURRAY, PH. D.; R. MCCOLL, C. E..

A vote of thanks was presented to the retiring President, DR. POOLE, for the very able manner in which he had filled the position during his term of office.

A vote of thanks was presented to H. PIERS for his work as secretary.

---

#### FIRST ORDINARY MEETING.

*Assembly Room, Province Building, Halifax, 13th Nov., 1905.*

THE PRESIDENT, MR. DOANE, in the chair.

It was announced that the following had been elected ordinary members: A. A. HAYWARD, Halifax; ARTHUR STANLEY MACKENZIE, PH. D., Professor of Physics, Dalhousie College, Halifax; ERNEST BRYDON-JACK, M. A., C. E., professor of civil engineering, Dalhousie College, Halifax; and that MONRO ARCHIBALD, B. A., B. SC., had been elected an associate member.

CAPTAIN J. H. BARBOUR, M. D., Royal Army Medical Corps, Halifax, read a paper, "On the Flora of McNab's Island, Halifax Harbour, N. S." (See Transactions, p. 553). The subject was discussed by DR. A. H. MACKAY, and a vote of thanks presented to CAPTAIN BARBOUR.

In the absence of the author, H. PIERS read a "Catalogue of the Birds of Prince Edward Island," prepared by JOHN MACSWAIN, of Charlottetown. (See Transactions, p. 570).

## SECOND ORDINARY MEETING.

*Assembly Room, Province Building, Halifax, 11th Dec., 1905.*

THE PRESIDENT, MR. DOANE, in the chair.

W. E. LISHMAN, M. A., M. I. M. E., of Durham, England, read a paper entitled, "Mining, Is it a Science?," in the course of which he said:

"It is safe to say that mining up to within recent years has stood in its own light. It has been regarded as essentially practical, the theoretical side of it being almost entirely ignored. It used to be a *sine qua non* for one holding an official position that he should be, to borrow an expression used in coal mining, "a good pitman." We will not quarrel with this, as it is very essential that a man who is to see to the actual working of a mine should be a really practical man, and so long as mining was carried on in a rule-of-thumb fashion and simply consisted in raising comparatively easily obtained and accessible minerals to the surface, such a man was the most suitable for the purpose. But now that in many countries the process of extracting and raising minerals, so far from being the simple affair it once was, has become one of the most complicated and far-reaching that man is called upon to perform, we may well question the policy of setting so much store by the purely practical man. And be it observed that it is just at the time when mining is making this marked advance forward, when, that is, methods are becoming more and more complicated, that scientific education on its part is making a like advance. The one is in fact complementary to the other. But such is the conservatism in human nature that in spite of the increasing complexity of mining operations on the one hand, and in spite of the impetus given to technical education on the other to meet this, yet those in authority are only now beginning to give up their predilections for the 'practical man' and to go in for one who by judicious training in practical and theoretical work should in all senses of the word prove more efficient for an official position than the former. It is for this reason that I say that mining has to a certain extent stood in its own light; but it is satisfactory to notice that a change is now taking place, as indeed it was bound to do, and the value of

the scientific man is becoming more and more recognized every day. This is still further emphasized in England by the recent parliamentary enactment providing that two years' study (with the necessary diploma) at an accredited college or institution, and three years' practical experience at a colliery, may take the place of the five years' practical work which previously constituted the qualification for sitting for the examination for colliery manager's certificate. In this connection, too, it may also be observed that the Durham College of Science, Newcastle, and other universities, have recently instituted degrees in mining, being I believe the first to adopt such a course. So that it is beginning to be recognized that mining should at least be regarded from a scientific stand-point. It remains for those interested in the subject to see that this stand-point is maintained, or if possible, improved upon. It is evident, too, that much more will be expected of the future mining engineer than has been the case in the past. And necessarily so, for as the more accessible and more easily worked seams and veins are approaching exhaustion, the need for more scientific and ingenious methods of reaching those less accessible will become more pressing, and will demand all the resources we are capable of rendering."

The subject was discussed by DR. A. H. MACKAY, PROFESSOR SEXTON and DR. WOODMAN, and a vote of thanks was presented to the lecturer.

DR. A. H. MACKAY read a paper entitled, "Fungi of Nova Scotia; first supplementary list," (see Transactions, vol. xii, pt. 1, p. 119), which was discussed by DR. H. H. READ, DR. E. MACKAY, DR. A. P. REID, W. L. BISHOP and H. PIERS.

---

#### THIRD ORDINARY MEETING.

*Assembly Room, Province Building, Halifax, 12th Feb., 1906.*

THE PRESIDENT, MR. DOANE, in the chair.

H. W. JOHNSTON, C. E., assistant city engineer, Halifax, read a paper on the "Halifax Water Works." (See Transactions, vol. xii, pt. 1, p. 72). The subject was discussed by the PRESIDENT, PROFESSOR JACK, W. L. BISHOP, DR. A. H. MACKAY, T. V. HILL, and DR. E. MACKAY; and a vote of thanks was presented to the lecturer.

## FOURTH ORDINARY MEETING.

*City Council Chamber, Halifax, 12th March, 1906.*

THE PRESIDENT, MR. DOANE, in the chair.

In the absence of the author, DR. POOLE read a paper by R. W. ELLS, LL. D., F. R. S. C., of the Geological Survey of Canada, on "The Oil-fields of Eastern Canada." (See Transactions, p. 598). Specimens illustrating the paper were shown from the collection of DR. POOLE. The paper was discussed by the PRESIDENT, and DRs. WOODMAN and POOLE.

---

## FIFTH ORDINARY MEETING.

*City Council Chamber, Halifax, 9th April, 1906.*

THE PRESIDENT, MR. DOANE, in the chair.

DR. POOLE read a letter received by the curator of the Provincial Museum, from LAURENCE M. LAMBE, of the Geological Survey of Canada, relative to amphibian-like remains found by Dr. Poole at the Joggins, Cumberland Co., N. S., and now in the Provincial Museum. The specimen, Mr. Lambe states, does not supply the information necessary for its determination.

DR. POOLE took the chair, while the PRESIDENT read a paper on "The Frost and Drought of 1905." (See Transactions, p. 623).

It was resolved that the question as to the desirability of having a self-recording rain-gauge placed by the meteorological department at Halifax, be referred to the council to take action if it sees fit.

WATSON L. BISHOP, superintendent of water works, Dartmouth, read a paper on "Eels in Water Pipes and Their Migration." (See Transactions, p. 640). The subject was discussed by the PRESIDENT, DR. A. H. MACKAY, R. H. BROWN and H. PIERS.

DR. A. H. MACKAY communicated a paper by FRANK H. REID, entitled, "Notes on Protective Colouring," which was discussed by DR. MACKAY, W. L. BISHOP and H. PIERS; and a vote of thanks was presented to MR. REID.

The following papers were read by title: "The Grignard Synthesis: Action of Phenyl Magnesium Bromide on Camphor," by H. JERMAIN M. CREIGHTON, Dartmouth, (see Transactions, p. 593); and "Contributions to the Study of Hydroxylamine," by G. M. JOHNSTONE MACKAY, B. A., Dartmouth, (see Transactions, vol. xi, pt. 2, p. 324).

---

SIXTH ORDINARY MEETING.

*Room of Mining Society of N. S., Halifax, 21st May, 1906.*

THE PRESIDENT, MR. DOANE, in the chair.

WATSON L. BISHOP, Dartmouth, brought to the notice of the Institute the occurrence of Star-nosed Moles (*C. cristata*) and a shrew in a submerged eel trap at the Dartmouth water-supply lake.

In the absence of the author, H. W. JOHNSTON read a paper by W. G. YORSTON, C. E., city engineer of Sydney, C. B., on "Water Powers of the Mersey River, Nova Scotia." (See Transactions, p. 651). The paper was discussed by the PRESIDENT, R. MCCOLL, A. A. HAYWARD, W. L. BISHOP, DR. H. H. READ, and DR. A. H. MACKAY.

RODERICK MCCOLL, C. E., provincial engineer, Halifax, presented a paper "On the Damage Done to Timber by *Toredo navalis* and *Limnoria lignorum*." The subject was discussed by the PRESIDENT, DR. A. H. MACKAY, W. L. BISHOP, and H. PIERS.

A. H. MACKAY, LL. D., F. R. S. C., superintendent of education, Halifax, presented a paper entitled, "Phenological Observations, Canada, 1905"; and also a paper on "Water-rolled Weed-balls." (See Transactions, p. 667).

A vote of thanks was passed to PRESIDENT HAYWARD and the Mining Society of Nova Scotia for their courtesy in permitting the use of their room as a place of meeting.

HARRY PIERS,  
*Recording Secretary.*