

PROCEEDINGS
OF THE
Nova Scotian Institute of Science.

SESSION OF 1902-1903.

ANNUAL BUSINESS MEETING.

Legislative Council Chamber, Halifax, 24th November, 1902.

THE PRESIDENT, DR. A. H. MACKEY, in the chair.

PRESIDENTIAL ADDRESS.—BY A. H. MACKEY, LL. D., &c.

Gentlemen,—During the past year our Institute has been fortunate in losing none of its members. Our membership and funds have increased. The scientific work done by our members and affiliations appears to be extending, so that we have reason to expect more in the future than has been done in the past.

THE INSTITUTE'S WORK.

The work of last year commenced on the 7th of November, by a lecture on Roman Coins, by Mr. R. W. McLachlan, of the Numismatic and Antiquarian Society of Montreal, and an exhibition of the Roman Coins of our own Provincial Museum, by Mr. A. H. C. Prichard, of Brooklyn, New York, who studied and arranged the collection.

On the 9th of December, Professor Earnest Haycock, President of the Wolfville branch of the Institute, presented his report on the organization and work of the Wolfville Institute; and the members had the pleasure of studying an interesting variety of *Botrychium ternatum*, Swartz, (The Ternate Grape-Fern), collected at Blomidon, by Mrs. R. R. McLeod, of Brookfield, Queens County.

PROC. & TRANS. N. S. INST. SCI., VOL. XI.

PROC.—A.

On the 13th of January, Dr. R. W. Ellis, of the Geological Survey of Canada, presented a valuable paper on the Progress of Geological Investigation in Nova Scotia ; and we had the pleasure of inspecting a mounted collection of flowering plants, brought from Labrador in the months of July and August preceding, by Mr. Walter H. Prest.

On the 10th of February, Dr. H. M. Ami's paper on the Cambrian Age of the Dictyonema Slates of New Canaan and Kentville, opened up an interesting discussion in which Mr. H. S. Poole took a leading and most interesting part. Mr. Poole also exhibited a specimen of slate from near Green Bank, Point Pleasant, Halifax, showing curious markings like worm-trails.

Miss A. Louise Jagger, of California, prepared a provisional list of the flowering plants observed in Digby County, which was presented to the meeting. And Mr. T. C. Hebb, M. A.; of Dalhousie College, presented a valuable paper on the Determination of the Freezing-point Depression Constant for Electrolytes.

On the 10th of March, Mr. Walter H. Prest read a supplementary paper on Drift Ice as an Eroding Agent, exhibiting specimens of sand and pebbles carried on ice along the Labrador coast. Professor Davidson, of the University of New Brunswick, prepared an important and elaborate paper on Agricultural Credit, which was presented to this meeting. R. S. Boehner, B. Sc., of Dalhousie College, also presented a paper on the Standardization of Hydrochloric Acid with Borax ; and T. C. Hebb, M. A., of Dalhousie, presented a second paper, this time on the Determination of the Freezing-point Depression of Dilute Solutions of Electrolytes.

Owing to the impossibility of the completion of the remaining papers for presentation at the regular meetings subsequent, the Council authorized their publication in the forthcoming volume with those read before the Institute. These include the Phenological Observations made in the Public Schools of the Province, and by members of the Botanical Club of Canada ; which were summed up under the direction of your president, and contain interesting observations by Mr. C. B. Robinson, B. A., of the Pictou Academy, on the Early Intervale Flora of the North of Nova Scotia.

WORK OF AFFILIATED ORGANIZATIONS.

At the Wolfville local branch society, the attention of its members was engaged by Professor F. R. Haley, on Wireless Telegraphy ; by Mr. V. L. Q. Chittick, describing the Government drill and its work at Hantsport, illustrated by specimens of cores produced by the machine. Rev. F. G. Harrington exhibited Land and Water Shells from the Loo Choo Islands. Professor Haycock gave an outline of the Geological Structure of King's County. Professor F. C. Sears demonstrated the Habits of Mud Wasps, with examples. Professor Ernest W. Sawyer discussed the Habitat and Habits of certain land and water Mollusca of King's County, illustrated by a collection of some fifty varieties and species. Professor Haycock sketched the manner in which veins of Minerals are formed. Dr. E. N. Payzant made remarks on Concentrates from Home and Foreign Mines, illustrated by specimens. And Mr. A. H. Ruggles discussed the Parasites of the Cabbage Worm, with illustrations. This course in itself was a valuable one, even when considered from a Provincial point of view.

The Halifax Botanical Club, under the presidency of Principal W. H. Waddell, of Halifax, met fortnightly during the winter months, in the reading room of the Provincial Science Library. The marine algæ was the principal object of study, and Rev. Clarence MacKinnon and other members made valuable additions to the local lists. During the summer following, the Club met weekly in the City Hall, for the study of the local flowering plants. Towards the end of the season some progress was made in the special study of the local Solidagos and Asters, in which some of the members became specially interested, on account of the variability of the species. Some interest was also developed in the violets, of which there appear to be more forms than was hitherto suspected.

GENERAL PROVINCIAL WORK.

These institutions are more or less affiliated with the Institute. But as the leading scientific organization of the province, it is appropriate that we should take note of other work being done in the same field. During the last two years the Marine Biological Laboratory of Canada was stationed at Canso : and under the directorship of Professor R. Ramsay Wright, Dean of the Science Faculty of the

University of Toronto, the biological characters of that region, and especially of the marine waters of the neighborhood were being studied. It is to be regretted that there were so few biologists of our own province who were prepared to work at the station during these years—two only having put in some time at the station. Next year it is possible the station may be somewhere on the Northumberland Straits; but whether it be on the Nova Scotian or the Prince Edward Island side, it will be as accessible as it was during the past two years. The work of the station has been hampered by the lack of sufficient grant from the Dominion Government; but it is hoped that this defect will be remedied during the present winter.

Another advance in the facilities of scientific instruction which should be noted, is the Summer or Vacation School, which was opened for the first time in the new and well equipped science building of the Provincial Normal School, which functions also as the School of Agriculture in affiliation with the buildings, appliances and stock of the Provincial Farm at Truro. About sixty students took advantage of the five weeks of chemical, biological and agricultural courses given there in July and August.

When we find that the Summer School of Science for the Atlantic Provinces of Canada, which met on this occasion at St. Stephen, New Brunswick, was also very largely attended, and that our Colleges (Dalhousie with its new Mining School, especially), as well as high schools are enlarging their facilities for giving good scientific instruction; and that there is a general sentiment abroad that we should lay more stress upon the development of the power to discover truth and apply it in useful action, than on the power of imagining and its expression;—when we see these signs we have reason to believe that we are going to make more progress.

RECOMMENDATION.

To return to our Institute again, I beg to suggest, that we may be more useful if we make our monthly meetings more popular. The popular presentation of subjects might be more simple and elementary; and their function would be the inspiration of young members to commence a course of special investigation. Such presentations would not be published in our Transactions, of course; for the

publication department is for new knowledge. On the other hand, much of the new knowledge gathered up will be interesting only to those engaged in these departments ; so that the abstruse but valuable paper might be read merely by title, to be published for the careful reading of workers interested in these subjects throughout the world. Hitherto our audience has been world-wide, but not local. It may be more valuable, perhaps, to introduce the public into our local audiences for the purpose of stimulating a more rapid increase of local recruits, when we can so arrange it as not to interfere with the wider audiences, and the recording and publication of the new facts discovered in the survey of our own small corner of the universe.

IMPROVING FACILITIES.

I have to note the great advantages which the Provincial Government has conferred on the scientific public and on all the industries dependent on scientific knowledge and skill, by the equipment of the Provincial Science Library and its continued aid. The library has been increasing rapidly from the exchanges of the Institute with all the leading scientific societies of the world, from the co-operation of the Mining Society, and from the direct addition of the most essential books bearing on our provincial industries by the Government.

Under the indefatigable and intelligent direction of the librarian the library will soon be completely and most effectively catalogued. The undetermined material in the Provincial Museum has also been to a great extent examined, classified and labelled by the same individual, Mr. Harry Piers, who to the duties of librarian and secretary of our Institute adds that of the curator of the Museum. But not content with the curatorship alone, he is constantly making arrangements for the increase of the collections with a view of illustrating the natural history and industrial potentialities of the province as completely as possible. This work must go on for ever, of course ; but the advance made during the past year is very creditable to the energy and tact of our secretary.

There are many signs of increasing interest in the exploration of the natural history and resources of the province, not only in the usual quarters, but in connection with our public schools, which have already made contributions to science in connection with their elementary local

observations. And their initiative has been followed already in some portions of Canada and in Europe. Some of our high school teachers, and even of our common school teachers, are now doing very valuable local observation work; and if the spirit continues not only shall we be able to publish more original research in the future, but we will be able to develop our resources more effectively.

THE CHECKING OF MALARIA.

I attempted to illustrate the value of original research work such as we are endeavoring to stimulate here under our local conditions, by reference in my address of 1900 to the cumulation of the long series of scattered and unproductive work in the discovery of the true natural history of malaria, and in my address of 1901, to the still further utilitarian result of determining the probable nature and general manner of the communication of yellow fever. I am glad to be able to say that knowledge has proved in these cases to be power to do what millions of money and all of the beliefs of the world for the past ages were unable to effect. The manner in which human life was tortured and destroyed, in which business and commerce were upset, and in which valuable property was wasted by quarantine and other regulations based on a defective if not false theory of the natural facts, forms in the light of present developments an overwhelming testimonial to the ultimate value of the results of the long search after the truth and truth only.

In some of the leading malarial centres the sanitary regulations based on the new knowledge have promptly reduced this disease to a fraction of its former prevalence. And although the control of the mosquito nuisance is an admittedly tremendous contract, we can confidently expect from the success already attained the future extermination of malaria as one of the human ills.

THE EXTINCTION OF YELLOW FEVER.

Yellow fever may be considered to be already mastered, so completely have the experiments to which I last year alluded given the power of control to man.

Taking Havana, where for 130 years yellow fever has been constantly in the city, and near which the final experiments alluded to

were made, we find a most interesting illustration of my general argument. When the United States Government took charge of the city it was thoroughly cleaned and began to be supplied with the best modern sanitary appliances. But while these improvements advanced the general health of the city, yellow fever was not diminished at all. On the contrary it was argued that it had been increased. In 1899 there were 103 deaths from it, notwithstanding more than a year's application of the most stringent modern sanitary regulations. And in 1900 the death roll went over 300. The additional cleanliness of the city had no beneficial effect, for the patients became more numerous, especially among the well-to-do classes, who enjoyed all the advantages of science up to that date. In fact, this year one-half of the members of the Governor-General's staff were carried off by the disease.

How are affairs now since the theory that the fever is always distributed by the particular mosquito called *Stegomazia fasciata*, has been applied? Within two hours after a case is reported the patient is covered with a mosquito netting. The room and house is thoroughly fumigated so as to kill all mosquitos present. Adjacent houses are also fumigated. All open water in pools, cisterns or vessels that might act as breeding places for the larvae, are emptied, cleaned and carefully covered. Still water of any kind in or near the city is drained off or covered with a film of petroleum. No precautions are taken to keep the well from the sick. Mosquitoes alone are the only prohibited parties.

These measures were instituted towards the end of February, 1901. In January there had been seven deaths from the fever. In February there were five deaths. In March there were but one. None were reported in May and June. There was one in July and another case in September. Since then, for over a year, up until this present month, there has not been a single death from yellow fever in Havana, the native nest of the disease for 130 years. One of the most terrible scourges of humanity in the tropical regions of America has been captured, and can now be handed bound into perpetual imprisonment;—all through the study of the plodding devotees of science, who for years have been seeking for the truth of the little things about them, without which the present productive development could never have materialized, any more than there can be a harvest without the seed-time of spring.

Thanking the Institute for the high honor of my election to the presidency for the last three years, and regretting that I was not better able to fulfil the duties of so important a post, I now ask you to proceed with the regular work of our annual meeting.

The TREASURER'S report was presented, and having been audited and found correct, were received and adopted. The following is an analytical statement of the expenditure for 1901-1902 :

PUBLICATION OF TRANSACTIONS :—

Vol. X , Part 3, (1900-1901) :	
Engravings and expressage on same	\$ 20 85
Vol. X., Part 4, (1901-1902) :	
Engravings	1 04
	\$ 21 89

DISTRIBUTION OF TRANSACTIONS :—

Vol. X., Part 3 :	
Addressing and supervising distribution.. ..	15 00

LIBRARY EXPENSES :—

Self-inking stamps.....	\$ 4 00
Expressage on books.....	1 70
	5 70
Calling meetings.....	10 32
Chairs for meetings.....	2 50
Advertising Annual Meeting ..	9 50
Postage (Secretary's) ..	78
Telegram ..	35
Letter file ..	65
Typewriting report to Royal Society.....	50
Truckage on black-board	50
	\$ 67 69

The Report on the Library was presented by H. PIERS, and was received and adopted.

A report from PRESIDENT E. HAYCOCK, of the KING'S COUNTY BRANCH OF THE INSTITUTE, Wolfville, N. S., on the work done by the branch during its second session (1901-1902) was read by MR. PIERS.

PAPERS PRESENTED TO THE KING'S COUNTY BRANCH OF THE N. S.
INSTITUTE OF SCIENCE (SESSION OF 1901-1902.)

13th January, 1902.

1. Wireless Telegraphy ; illustrated by black-board diagrams.—By PROFESSOR F. R. HALEY, Acadia College.
2. Description of Government Drill and its work at Hantsport, N. S.; illustrated by specimens of core produced by the machine.—By V. L. O. CHITTICK.

10th February, 1902.

3. Exhibition of Land and Water Shells from Loo Choo Islands.—By REV. F. G. HARRINGTON.
4. Outline of Geological Structure of King's County, N. S.; illustrated by black-board diagrams.—By PROFESSOR ERNEST HAYCOCK, Acadia College.

17th March, 1902.

5. Habits of the Mud Wasp ; illustrated by specimens.—By PROF. F. C. SEARS, N. S. School of Horticulture.
6. Habitat and Habits of certain Land and Water Mollusca of King's County, N. S.; illustrated by a collection of some fifty species.—By PROFESSOR EVERETT W. SAWYER, Acadia College.
7. Wireless Telegraphy ; illustrated by working apparatus.—By PROF. F. R. HALEY, Acadia College.

22nd April, 1902.

8. Notes on Land and Fresh Water Mollusca of King's County, N. S.; illustrated with specimens.—By PROF. EVERETT W. SAWYER.
9. Sketch of Manner in which Veins of Minerals are formed ; illustrated by black-board diagrams.—By PROFESSOR E. HAYCOCK.
10. Remarks on Concentrates from Home and Foreign Mines ; illustrated by specimens.—By E. N. PAYZANT, M. D.
11. Parasites of the Cabbage Worm ; with black-board diagrams.—By A. H. RUGGLES, San Jose Scale Inspector.

The attendance at these meetings averaged about twenty-five. In addition to those who became members of the parent institution through the branch society, a number became associate members of the local branch, paying a fee of twenty-five cents.

The report was received and adopted.

The RECORDING SECRETARY laid on the table the Proceedings and Transactions of the Institute, Vol. X., Part 3, which had recently been published.

It was resolved that the thanks of the Institute be conveyed to the HON. SIR ROBERT BOAK and HIS WORSHIP THE MAYOR for their courtesy in granting the society the use of the Legislative and City Council Chambers as places of meeting, and to the SECRETARY OF THE SMITHSONIAN INSTITUTION for continuing to admit the Institute to the privileges of the Bureau of International Exchanges.

The following were elected officers for the ensuing year (1902-1903):

President.—HENRY SKEFFINGTON POOLE, A. R. S. M., F. G. S., F. R. S. C., *ex-officio* F. R. M. S.

Vice-Presidents—F. W. W. DOANE, C. E., and PROF EBENEZER MACKAY, PH. D.

Treasurer.—W. C. SILVER.

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, MARTIN MURPHY, D. SC., WILLIAM MCKERRON, PROF. STEPHEN M. DIXON, B. A., B. A. I., EDWIN GILPIN, JR., LL. D., F. R. S. C., ALEXANDER MACKAY.

Auditors—RODERICK MCCOLL, C. E., J. B. MCCARTHY, M. A., B. SC.

A vote of thanks was presented to the retiring President, DR. MACKAY, for the energy and zeal with which he had discharged the duties of president during his term of office, and also for this excellent presidential address.

FIRST ORDINARY MEETING.

Legislative Council Chamber, Halifax, 8th December, 1902.

THE PRESIDENT, H. S. POOLE, in the chair.

It was announced that the following had been elected corresponding members: GEORGE U. HAY, D. Sc., F. R. S. C., St. John, N. B.; JOHN McSWAIN, Charlottetown, P. E. I.; PHILIP COX, B. Sc., Ph. D., Chatham, N. B.; and E. R. FARIBAUT, B. A., B. Sc., Geological Survey of Canada, Ottawa; that PROF. J. EDMUND WOODMAN, M. A., D. Sc., Dalhousie School of Mining and Metallurgy, Halifax, had been elected an ordinary member; and that C. B. ROBINSON, B. A., Pictou, N. S., had been elected an associate member.

A paper by R. R. GATES, of Mount Allison University, entitled, "Middleton Fungi, with general remarks," was read by DR. A. H. MACKAY. (See Transactions, p. 115. The list of species is incorporated in Dr. MacKay's list of the Fungi of Nova Scotia, Transactions, p. 122).

A. H. MACKAY, LL. D., F. R. S. C., presented a paper on "Fungi of Nova Scotia," illustrating his remarks with dried specimens and microscopic preparations, as well as blackboard drawings. (See Transactions, p. 122).

SECOND ORDINARY MEETING.

Legislative Council Chamber, Halifax, 19th January, 1903.

THE PRESIDENT, H. S. POOLE, in the chair.

On motion of Dr. A. H. MACKAY and W. MCKERRON, it was resolved that officers of the garrison in Halifax, who intimate a desire to attend meetings of the Institute, be eligible for corresponding membership, while resident in the province.

MAJOR ENGLISH, R. A., delivered a lecture on "Guns and Gunnery, illustrated by models and diagrams."

The subject was discussed by the PRESIDENT, COL. F. H. OXLEY, 1st C. A., and COL. J. R. MACSHANE.

A vote of thanks was presented to MAJOR ENGLISH for his highly instructive lecture.

THIRD ORDINARY MEETING.

Legislative Council Chamber, Halifax, 9th February, 1903.

The PRESIDENT, H. S. POOLE, in the chair.

It was announced that the following had been elected ordinary members: PARKER R. COLPITT, city electrician, Halifax; RICHARD H. BROWN, M. E., Halifax; and that R. R. GATES, Mt. Allison University, Sackville, N. B., had been elected an associate member.

PROF. E. E. PRINCE, Commissioner and General Inspector of Fisheries, Ottawa, presented a paper entitled "The Swim Bladder of Fishes, a degenerate gland."*

PROF. PRINCE also delivered a lecture on the "Colours of Animals, their nature and meaning," illustrated with lantern-slides.

The subject was discussed by the PRESIDENT, DR. A. H. MACKAY, CHARLES ARCHIBALD, and ARTHUR P. SILVER; and a vote of thanks was presented to the lecturer.

The following paper was read by title:—"The Meso-Carboniferous Age of the Union and Riversdale Formations of Nova Scotia, and of their equivalents the Mispec and Lancaster Formations in New Brunswick," by HENRY M. AMI, D. Sc., of the Geological Survey of Canada.

FOURTH ORDINARY MEETING.

Provincial Science Library, Halifax, 9th March, 1903.

The PRESIDENT, H. S. POOLE, in the chair.

A communication was read from the Royal Society of Canada, requesting the Institute to appoint a delegate to attend the former society's meeting in May next. The matter was referred to the Council.

Attention was drawn to the recent death of the Institute's treasurer, WILLIAM CHAMBERLAIN SILVER, and a resolution of regret was unanimously adopted.

A resolution of regret was also passed on the death of A. CAMERON, principal of Yarmouth Academy, Yarmouth, an associate member of the Institute.

* This paper will appear in part 2 of this volume.

A paper entitled "The Mira Grant," by EDWIN GILPIN, JR., LL. D., F. R. S. C., Inspector of Mines, was read by title. (See Transactions, p. 89).

DR. E. MACKAY took the chair, while the PRESIDENT read a paper by HENRY M. AMI, D. SC., F. R. S. C., of the Geological Survey of Canada, entitled, "The Meso-Carboniferous Age of the Union and Riversdale Formations of Nova Scotia, and of their equivalents, the Mispec and Lancaster Formations in New Brunswick."

A paper entitled "Note on *Dictyonema websteri*," was read by the PRESIDENT, H. S. POOLE, F. R. S. C.

These papers were discussed by DRs. A. H. MACKAY and MURPHY, and H. PIERS.

HARRY PIERS, curator of the Provincial Museum, exhibited and described three abnormal zoological specimens recently received at the Museum:—

- (1) A moose skull (*Alce alces*) from Sheet Harbour, N. S., with unique cancerous development of the antlers.
- (2) A melanistic specimen of the Garter Snake (*Eutania sirtalis*) from Yarmouth, N. S.
- (3) An Abnormal Hare, taken at Stewiacke, N. S.

The subjects were discussed by DR. M. CHISHOLM, T. VARDY HILL, and others.

FIFTH ORDINARY MEETING.

Legislative Council Chamber, Halifax, 16th April, 1903.

The PRESIDENT, H. S. POOLE, in the chair.

It was announced that H. S. LAWRENCE, D. D. S., Wolfville, N. S., had been elected an associate member; and JOHN J. JENNEY, Halifax, an ordinary member.

It was announced that the Council had elected WILLIAM MCKERRON, Halifax, treasurer of the Institute, to succeed the late W. C. Silver.

A communication by C. B. ROBINSON, B. A., of Pictou Academy, entitled, "Note on a Lichen-mimicing Caterpillar," was read by H. PIERS, as follows:—

“ While walking through the woods near Pictou one afternoon, about the end of May or perhaps early in June, 1897, in company with W. A. Hickman, I saw upon his coat what seemed to be a piece of lichen. Picking it off with my fingers, I was surprised to find that it was a lichen-mimicing caterpillar. Mr. Hickman expressed a desire to keep it, and I took for granted that he would preserve it, and probably call attention to its existence. He, however, subsequently lost the specimen. In class one day at Cambridge, Prof. Newton showed us specimens from Madagascar, which to my recollection were almost identical with our form. The very fact that they are mimics would make it exceedingly doubtful, however, that there was any real affinity of species. In the intervening years I have searched again, especially at the season indicated, but totally without success.”

PROF. J. E. WOODMAN, D. SC., Dalhousie School of Mining and Metallurgy, gave a lecture on “Yellowstone National Park,” illustrated by lantern slides.

A vote of thanks was presented to the lecturer.

SIXTH ORDINARY MEETING.

Legislative Council Chamber, Halifax, 18th May, 1903.

VICE-PRESIDENT DOANE in the chair.

It was announced that W. F. JENNISON, of the Dominion Iron and Steel Co., Sydney, had been elected an associate member.

The following papers were read by title :—

- (1). Is there Coal beneath Prince Edward Island?—By HENRY S. POOLE, F. G. S., F. R. S. C. (See Transactions, p. 1).
- (2). Geology of Moose River Gold District, Halifax County, N. S.—By PROF. J. E. WOODMAN, D. SC., Dalhousie School of Mining and Metallurgy. (See Transactions, p. 18).
- (3). Sections and Analyses of Nova Scotian Coals.—By EDWIN GILPIN, JR., LL. D., F. R. S. C., Inspector of Mines. (See Transactions, p. 8).

(4). Phenological Observations, Canada, for 1902.—By A. H. MACKAY, LL. D., F. R. S. C., Superintendent of Education. (See Transactions, p. 144).

(5). Botanical Notes.—By A. H. MACKAY, LL. D.

(6). Distribution of *Fucus serratus* in Nova Scotia.—By C. B. ROBINSON, B. A., Pictou Academy.

C. I. PITTMAN described some "eskers" which he had observed in the south western part of the province. DR. A. H. MACKAY described similar formations that had come under his notice, and showed how they were probably formed by ice agency. J. H. TOWNSEND thought there was a ridge of a similar character in the vicinity of Salmon River, near Minesville, Lawrencetown, Halifax Co. N. S.

PARKER R. COLPITT, city electrician, read a paper on "Wireless Telegraphy," illustrated by apparatus in operation.

The subject was discussed by the CHAIRMAN, and DR. A. H. MACKAY, S. A. MORTON, A. M. HOARE, J. BURGoyNE, W. MCKERRON, and J. H. TOWNSEND; and a vote of thanks was presented to the lecturer.

The Council was authorized to receive as read by title, such papers as may be presented too late for this meeting.

HARRY PIERS,
Recording Secretary.

ERRATA.

Page 18, last line of foot-note, reference to Am. Geologist should read "vols. xxxiii and xxxiv."