PROCEEDINGS

OF THE

Nova Scotian Institute of Science.

SESSION OF 1896-7.

ANNUAL BUSINESS MEETING.

Legislative Council Chamber, Halifax, 9th November, 1896.

The PRESIDENT, DR. GILPIN, in the chair.

The PRESIDENT addressed the Institute as follows :—

GENTLEMEN,—I have much pleasure in meeting you to-night. I present myself your representative to mark the close of another year of the existence of the Institute, and to inaugurate a new session.

In one sense, I may claim to be numbered among the oldest of those who have been interested in this Society. Although it is nearly a quarter of a century since I was allowed to read my first paper before you, there are a number of you who have been for a much longer period members.

I remember, however, being present and watching as a boy the initiatory meeting of the Institute, being the more interested as the late Dr. Gilpin, who read the first paper in our proceedings, took an active part. Almost all the original members have now ceased from work, but their record remains.

From its commencement, the Institute members have ranged over all the fields of science open to observers in this Province, and have recorded their opinions and deductions according to the lights of their days. Their arguments may now be displaced or amended in the focus of the science of to-day or to-morrow ; the facts they have accumulated

remain, and we may feel satisfied if we have contributed our quota of bricks to the daily increasing foundation of the sciences.

In every division of nature our deductions and laws remain good until rendered untenable by the unanswerable chill of fresh facts. The true student rejoices at the demolition of his fabric when he knows that the opportunity is offered of modelling it on a broader and surer foundation.

It is largely in the accumulation of facts that a useful future lies before us, and I would impress upon you the desirability of enrolling every person who can give careful and accurate observations upon the natural world surrounding us.

One discovery by one of our members of an important fact bearing on the protection of our agricultural products from the attacks of noxious insects, the introduction of a form of animal or vegetable life capable of anchorage here, and serving to our needs, or any similar discovery, would many times repay the money we have spent. We should have on our list every person willing to study in these or kindred branches, and to such substantial assistance should, I think, not be denied by you.

The transactions of the past session of the Institute will, I think, be considered, to say the least, quite up to the mark. Of most general interest will be found the portrait of our late friend, Dr. Lawson, and Prof. MacGregor's sketch of his busy and useful life. In addition to the regular papers, matters of interest were submitted at various meetings by Prof. MacGregor, Drs. MacKay and Somers. At a special meeting the Rev. G. Patterson read a valuable paper on "Newfoundland Folk Speech."

In the Transactions are two linked papers by Prof. MacGregor and D. McIntosh on the calculation of the conductivity of mixtures of electrolytes. The former showed by a graphical process, based on observations, the calculability of the conductivity of a series of mixtures of solutions of chloride of sodium and potassium. He found that the calculations agreed with the observations in dilute solutions, but not in stronger ones. The latter extended the observations in order to determine the differences between the observed and calculated values in the case of the stronger solutions, and the extent of agreement in the case of solutions of sodium chloride and hydrochloric acid which have ionic velocities differing more widely.

Among the geological papers is one on the unexplored coal fields of Nova Scotia by me, and an interesting note by Mr. T. C. Weston on a few new paleontological facts, and on the general similarity of the fossil faunas of the silurian of Canada and Newfoundland. Mr. Prest, in a paper on Glacial Succession in Lunenburg County, differs somewhat from the conclusions arrived at by the Geological Survey. Professors Bailey and Coldwell have referred in two papers to the Superficial Geology of Kings and Queens Counties, the former referring also to interesting exhibits of faulting, metamorphism, vein filling, contacts, etc. Dr. Somers has contributed a note on Juniperus Communis, from which it appears that instead of one variety, the most common, decumbent, being only found here, there is another less common having a shrubby form. I am pleased to be able to inform you that the Doctor has promised further contributions on botanical subjects.

Dr. MacKay has continued his important summaries of the reports of phenological observations made under the auspices of the Botanical Club of Canada.

The Transactions close with an interesting paper by Mr. Piers, our Recording Secretary, on the Orthoptera of Nova Scotia. I understand that he proposes to extend this paper, which embraces a study of much value to our agriculturists.

I think that it is now in order for me to thank you for your kindly consideration of the office of President during the past year. I feel that a good Council and a faithful staff of officers have combined not only to make his path easy, but to maintain and promote the progress of the Institute. To the Treasurer, the Librarian, and to the Secretaries, the thanks of the Institute are justly due. Having done so little myself, I can the more fairly estimate the value of their labors, and can honestly say, I believe, that if the members would treble their numbers they would so much the more willingly discharge their increased tasks.

It has occurred to me that a few remarks on the system of instruction and examination of mining officials instituted by the Government of this Province, may be of interest.

The Institute proceedings contain many papers upon geological and allied subjects, and any efforts tending to increase the observing and recording powers of those directing our mining operations cannot fail to be appreciated by you.

Wherever communities are engaged in a particular occupation, a certain average level of intelligence prevails. This standard never sinks below that essential to the earning of the wage paid, but it is with difficulty raised. The prominence of individuals due to their greater physical strength, or to the more practical application of their mental power to the subject of their work, excites envy rather than emulation. In such communities the first step upward is resistance against encroachments by the employer. Unions follow. In many cases this coalition of labor has no aims beyond the preservation of wages against reduction, and their increase at every opportunity. In some instances attempts have been made at boards of conciliation and arbitration, and sliding scales. These aspirations, however, are but the outcome of that experience of unionism which has shown that facts and natural laws must be considered, and may be called a selfish extension of the original scheme.

In Nova Scotia, the most powerful labor union is perhaps that of the coal miners. Its organization has given occasion for a conciliation and arbitration act, which promises well, altho' it has not yet undergone the ordeal of practical application. The outcome, however, of this organization, more interesting and ultimately useful, is that relating to education.

It was recognized by those who were mainly interested in the objects of the Provincial Workman's Association, and especially by the Hon. R. Drummond, the Grand Secretary, that the proper conduct of the business of the various lodges, the proper estimation of the social problems of politics, supply and demand, etc., thus suddenly presented, and the intelligent discussion of the labor and mining problems most directly affecting them, required that the intelligence and education of the members should be materially assisted. It soon became apparent that the better the members understood the problems of the miners' occupation the less liable were the different unions to be hurried passionately into ill-advised and half-considered conflicts with capital. It was also evident that the better the status of the subordinate officials about the mines the more the safety of the miners was secured. After some discussion it was agreed that the experiment should be tried of fixing a standard for underground managers and overmen. The necessary statutory power having been granted by the government, an order-in-council appointed a Board of Examiners tentatively. As experience was gained, changes were made until the present system, which has worked satisfactorily for some time, was established.

The Province, for the purpose of the Board, has been divided into three districts —Cumberland, Pictou, and Cape Breton. From each of these districts are appointed two men representing respectively the companies and the workmen, and a third, as far as possible, a mining engineer not interested in the operations of any company. The Inspector of Mines acts as Secretary and the representative of the Government on the Board. The questions are prepared by the Board at a full meeting; the examinations held simultaneously by the local divisions of the Board; and the answers considered at a full meeting of the Board.

It was soon found that many candidates were deficient in surveying and the knowledge of arithmetic, logarithms, geometry, etc., necessary for the solution of the problems of ventilation, etc. The most intelligent of the successful candidates, in many cases men who had unaided made themselves masters of these subjects, were appointed instructors for the candidates. In this way an annual course, some months in length, has been established at the principal collieries, about ten instructors being employed. The expenses of these schools are met by the Mines Department, and each teacher receives a fixed fee, contingent upon his presenting at least two candidates, in addition to a fee for each candidate that passes a successful examination.

The first certificate of competency was issued March 15th, 1883, and since that date 121 certificates have been issued to underground managers, 146 certificates to overmen, in addition to 32 certificates of service to those holding these positions at the time the law came into force. This system has established an ample supply of men for our own collieries, and those leaving our shores find their certificates a good passport to respectable positions abroad. The conditions of admission for a candidate are that he be at least twenty-one years of age, of good reputation, and have been employed at least five years underground. The readiness and precision of the answers of many of the candidates would do credit to examinations of a much more pretentious character.

It was finally decided that the provisions of the act should be extended to mine managers, and the powers of the Board were amplified. In all 41 certificates have been issued to managers. Quite a number of those holding manager's certificates are working miners who have successively passed the different examinations, one after the other, with intervals required to attain the additional knowledge. In one instance a foreigner, unable to speak or write in the English language when he

arrived a few years ago, has passed, not without failures, until he has been appointed a manager of a coal mine. This instance, perhaps the most extreme, illustrates the fact that the advantages offered by this scanty system of education are well received by the more ambitious and intelligent of our miners. In the end the lodges at the different collieries have profited as well as the mines, for I am informed no small percentage of their officials and leading men are holders of certificates. The fact that the miners recognize the fitness of such men to be their guides and advisors is a strong argument that moderation and wisdom will mark their deliberations.

As you know, at nearly all of our coal mines the men are raised from and lowered to the scene of their work by machinery. The drivers of these engines are always selected with much care, as they require to be reliable and steady men. It was decided that, in order to increase the margin of safety, these men should undergo examination as to their knowledge of boilers, machinery, etc. A Board of three mechanical engineers was appointed representing, as in the case of the Board I have already referred to, the three principal coal districts. The examinations are conducted in a similar manner, and already 74 certificates have been issued, including those certificates of service granted those engineers found worthily filling their positions at the time the law was passed. Whenever a class of candidates offers, mechanical instructors are appointed on the principle described already.

I may mention that the work of the instructors and boards has been facilitated by the provision made by law for the establishment of night schools in mining and other districts. Many candidates, as might be expected, however good their practical knowledge and experience may be, are deficient in the exact grounding required for examination. They can remedy this by attending the night schools, and the mining instructors are thus relieved of much drudgery and able to teach the essentially mining subjects with greater detail.

As is well known, the strength of a chain is precisely that of the weakest of the links composing it. In mining, however careful the overmen and watchmen may be, one ignorant or careless workman may nullify all their efforts and precautions, and in a moment lose his own or another's life, cause an explosion, or a fire. In order, therefore, that there might as far as possible be no lack of endeavor to make all safe, it

was determined that the miners themselves should be examined as to their practical experience and knowledge. This has been carried out, and I believe there is not a coal miner working to-day, except perhaps in a few mines open only a few months in the winter, who is not the holder of a certificate. After a certain period of employment under ground as loader, driver, etc., he is permitted to assist in cutting coal. The miner, however, in charge of the place in which he works and assists, is the holder of a superior certificate secured by examination. These examinations and the issue of certificates is effected through local boards appointed at each colliery and paid by a small fee.

These boards also examine applicants for the position of shot firers. These are men who are, under certain conditions of the mines, appointed to supervise the firing of the charges of gunpowder or other explosive used in blasting the coal. I may say these examinations of miners and shot firers are *vivâ voce*, all the others being by written answers.

While the business connected with these examinations has added materially to the work of the Inspector of Mines, it is a satisfaction to know that the results so far have been encouraging. The standard exacted from the candidates compares well with that required in other countries. The Government and people of Nova Scotia may feel pleased that in this respect we have gone ahead of other countries, and have made a successful attempt to place within the reach of every coal miner in the Province the means of his advance to a state of education, and an opportunity of fitting himself for responsible and respectable positions.

While explosives are permitted in coal mines, and while work is necessary in dangerous atmospheres with lamps liable to accident, even with the greatest care in manufacture and use, so long must the recurrence of disasters be expected. I will not dwell upon this subject, but wish to point out that the mining authority of the Province has taken every step possible to minimise these dangers by its examinations of men and officials.

The thanks of the Institute were presented to the PRESIDENT for his interesting address.

The report of the TREASURER was read and approved. The accounts had been audited by Messrs. Morton and O'Hearn and found correct.

The Report of the LIBRARIAN was presented by PROF. J. G. MACGREGOR. During the past year copies of the Transactions had been sent for the first time to 6 institutions in the United States, 3 in Canada, 2 in Germany, and 1 in England, and exchanges had been received for the first time from the following :—

Swedish Society for Anthropology and Geography, Stockholm.
Central Observatory, Xalapa, Mexico.
Natural Science Society, Carlsruhe.
Natural Science Society, Elberfeld.
Geographical Union of the North of France, Douai.
University of Vermont, Burlington, Vt.
Museum and Library of Filopenas, Filopenas.
Literary and Philosophical Society, Liverpool, G. B.
Royal Society of the Natural Sciences, Buda-Pest.

but few books had been bound owing to a lack of funds, consequent upon our having published in one year two annual Parts of the Transactions. Owing to lack of accommodation at the Post Office building it had been found necessary to remove the Canadian and Australian publications to the room courteously furnished at Dalhousie College by the Board of Governors. The only sections of the Library now at the Post Office building are the British and United States publications. The members had not made so much use of the Library as in other recent years, doubtless because of the increasing difficulty in gaining access to the books.

A vote of thanks was presented to MR. BOWMAN and PROF. MACGREGOR for their work in connection with the Library.

The following officers were elected for the ensuing year (1896-7) :—

President—E. GILPIN, JR., ESQ., LL.D., F.R.S.C.
Vice-Presidents—ALEXANDER MCKAY, ESQ., and A. H. MACKAY ESQ., LL.D., F.R.S.C.
Treasurer—W. C. SILVER, ESQ.
Corresponding Secretary—PROF. J. G. MACGREGOR.
Recording Secretary—HARRY PIERS, ESQ.
Librarian—MAYNARD BOWMAN, ESQ., B.A.
Councillors without office—MARTIN MURPHY, ESQ., D. SC. ; F., W. W. DOANE, ESQ., C.E. ; WILLIAM MCKERRON, ESQ. ; WATSON L. BISHOP, ESQ. ; S. A. MORTON, ESQ., M.A. ; P. O'HEARN, ESQ. ; RODERICK MCCOLL, ESQ., C.E.

It was resolved that the thanks of the Institute be conveyed to the HON. R. BOAK for his courtesy in permitting the use of the Legislative Council Chamber for the meetings of the Society. Also resolved that the thanks of the Institute be presented to the Secretary of the Smithsonian Institution, Washington, for his courtesy in granting the Institute the privileges of the Department of International Exchanges of the Institution.

FIRST ORDINARY MEETING.

Legislative Council Chamber, Halifax, 9th November, 1896.

The PRESIDENT in the chair.

PROFESSOR J. G. MACGREGOR, D. Sc., read a paper "On the Relation of the Physical Properties of Aqueous Solutions to their State of Ionization." (See Transactions, p. 219).

The paper was discussed by MR. A. MCKAY, DR. A. H. MACKAY, and others.

SECOND ORDINARY MEETING.

Legislative Council Chamber, Halifax, 14th December, 1896.

The PRESIDENT in the chair.

It was announced that the following gentlemen had been elected members of the Society :—LEE RUSSELL, ESQ., B. Sc., Normal School, Truro ; T. C. MCKAY, ESQ., B. A., Dartmouth ; REV. BROTHER PETER, La Salle Academy, Halifax ; CHARLES TWINING, ESQ., Halifax ; and C. C. JAMES, ESQ., Deputy Minister of Agriculture, Toronto.

PROFESSOR E. E. PRINCE, Commissioner and General Inspector of Fisheries for Canada, delivered a lecture on "Recent Discoveries regarding the Eggs and Young of Fishes." The lecture was illustrated by a number of lantern views.

Remarks upon the subject were made by DRS. REID, MACKAY, SOMERS, and MURPHY, and also by the Chief Game Commissioner, C. S. HARRINGTON, ESQ., Q. C.

THIRD ORDINARY MEETING.

Legislative Council Chamber, Halifax, 11th January, 1897.

The First Vice-President, MR. MCKAY, in the chair.

The Secretary announced that PROFESSOR E. E. PRINCE, Commissioner and General Inspector of Fisheries for Canada, Ottawa, had been elected a Corresponding Member.

PROFESSOR J. G. MACGREGOR, D. Sc., presented a paper "On the Relations of the Physical Properties of Solutions to their State of Ionization," second part. (See Transactions, p. 219).

The subject was discussed by PROFESSOR E. MACKAY and MR. J. FORBES.

FOURTH ORDINARY MEETING.

Provincial Museum, Halifax, 8th February, 1897.

The Second Vice-President, DR. MACKAY, in the chair.

REV. BROTHER PETER, of La Salle Academy, exhibited a number of Dried Plants, which he had collected in the vicinity of Halifax, and made remarks thereon.

In the absence of the author, a paper entitled, "Measurements of two Beothuk Skulls," by W. H. PREST, ESQ., was read by the Secretary :—

"Having been asked to give the measurements of two Beothuk skulls taken while at the Museum at St. John's, Newfoundland, I submit the following :

In order to more fully explain these measurements. I may say that the term brachy-cephalic, or round-headed, is used to denote skull forms where the proportion of the breadth to the length is as 80 and upwards to 100. The term dolicho-cephalic, or long-headed, denotes proportions of from 75 and downward to 100. All intermediate proportions are termed meso-cephalic.

No. 1. Adult skull marked No. 6 in the St. John's Museum Collection:

	Inches.
Glabella to occipital point	7.425
Greatest width of skull	5.825
Bregma to occipital condyle	6.075
Resulting index, meso-cephalic	78.45

No. 2. Adult Female (?):

	Inches.
Glabella to occipital point	6.825
Greatest width of skull	5.600
Bregma to occipital condyle	5.700
Resulting index, brachy-cephalic verging on meso-cephalic	80.20

The measurements in the above instances, although taken without any very elaborate instruments, can not be in error more than $\frac{1}{80}$ of an inch. Another skull and skeleton, almost perfect, want of time prevented me from measuring. It, however, showed features of a decidedly lower type than the others, particularly in the enormous supercilliary ridges and narrow retreating forehead. The nose was extremely aquiline, as were those of the other skulls. It appears to approach the long-headed type more nearly than the others, but measurements of such a limited number of skulls cannot be considered as settling or even approximating the question of tribal index. Our chief hope, therefore, lies in the expectation of future explorations of Beothuk burying grounds. That the above skulls are genuine Beothuk remains, I give as authority Mr. Howley, Director of the Geological Survey of Newfoundland, through whose care all the relics of this interesting race are preserved. For further evidence as to their authenticity, I would give the name of Rev. M. Harvey, who discovered skull No. 1 at Pilley's Island, Notre Dame Bay, Newfoundland, under circumstances which leave no doubt that it was Beothuk.

Another Beothuk skull, which I do not think has been measured, is to be seen at McGill University, Montreal. It was found in 1847 by Rev. Mr. Blackmore, Rural Dean of Conception Bay, on a small island called Rencontre, one of the Lower Burgeo group, on the southern coast of Newfoundland.

In order to show more fully the position the Beothuks occupied in North America, I may say that the Indians are brachy-cephalic while the Esquimaux are dolicho-cephalic. These are the nearest races the

boundaries between which lie in the neighbourhood of that part of Labrador nearest Newfoundland. The long-headed races seem to have belonged to an ancient type inferior as a rule to their round-headed brethren. And since paleolithic times they have been gradually pushed to the outlying parts of the earth. Therefore, the occurrence of an apparently intermediate form in Newfoundland is what we might expect from its position near the junction of two such different types."

The preceding notes are given in the hope that they may lead to systematic investigation of this now extinct race by some one more competent than myself. I am more desirous of this, as I have made a mistake in taking measurements for the vertical index from the bregma to the occipital condyle instead of to the basion. Scarcely within modern times has it been that a tribe has been so completely annihilated that even of its language hardly a remnant remains. The story of the persecution and slaughter of the Beothuks by the white man is a sad one. The history of Newfoundland contains a page—marked with blood and darkened with disgrace—a page that tells of inhuman slaughter and cruelty that makes the blood of every true man boil—the ruthless extermination of a harmless and despairing race."

A number of interesting remarks upon the subject were made by REV. DR. PATTERSON, of New Glasgow.

CHARLES TWINING, ESQ., then gave an account of some "New Arrangements in Sailing Gear." The subject was discussed by a number of those present.

FIFTH ORDINARY MEETING.

Legislative Council Chamber, Halifax, 8th March, 1897.

The Second Vice-President, DR. MACKAY, in the chair.

It was announced that JAMES FLETCHER, ESQ., LL.D., F. R. S. C.' F. L. S., Entomologist and Botanist, Central Experimental Farm, Ottawa, had been elected a Corresponding Member.

MR. PIERS was appointed delegate to represent the Institute at the June meeting of the Royal Society of Canada.

A paper by DR. GILPIN, on "Some Analyses of Nova Scotia Coals and other Minerals," was read by DR. MACKAY in the absence of the author. (See Transactions, p. 246).

Sixth Ordinary Meeting.

Legislative Council Chamber, Halifax, 12th April, 1897.

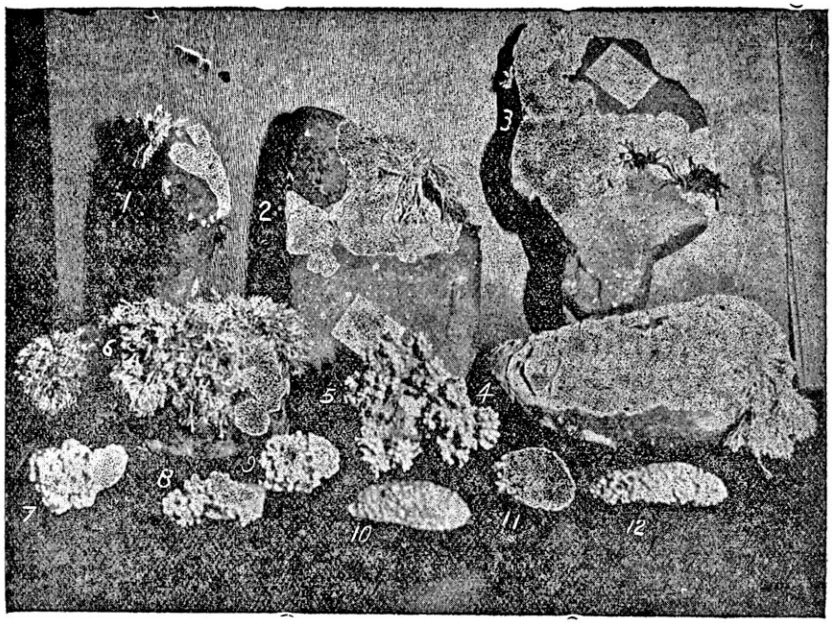
The President in the chair.

A communication was read from the Royal Society of London announcing that at a recent meeting of that body it had been unanimously resolved that a fund, to be called the Victoria Research Fund, be established, to be administered by representatives of the various scientific societies, for the encouragement of research in all branches of science. The Society wished to know if the scheme met with the approval of the Institute.

Resolved, That this Institute, having heard the communication of the 22nd February, addressed to its President by the President of the Royal Society of London, in reference to the proposal to establish a Research Fund in commemoratian of the present sixtieth year of the reign of Her Gracious Majesty the Queen, express its cordial approval of the proposal.

Resolved, further, That while the Institute is of opinion that no large contribution to the proposed fund can be expected from the Province of Nova Scotia, whose men of science are few, and whose industries have not yet reached the stage in which the advantages of scientific research become manifest, the Institute will be glad to co-operate with other scientific societies in Canada in bringing the claims of the proposed fund to the notice both of their members and of other citizens who may be expected to become contributors.

CALCAREOUS ALGÆ.



(Reduced to nearly one-fifth of actual diameter).

DR. A. H. MACKAY presented specimens of calcareous algæ for general examination, such as the incrustations shown on the stones at 1, 2, 3, 4, and 6 (above), which came from low water at Cranberry Head, near Yarmouth. Tufts of *Corallina officinalis*, L. were growing conspicuously from some parts of these; 5, 7, 8, 9 and 11 were more or less tuberculose or branching incrustations of *Lithothamnion* on stones as a base, while 10 and 12 were incrusting mussel shells. His discussion of the group was preliminary to further work, and the exhibition of the specimens was to enlist the fellowship of additional collectors of these species. The *Corallineæ*, or calcareous algæ, which he was showing, came principally from Point Pleasant, within and opposite the mouth of Halifax harbor, although he had specimens all the way from Brier Island to Cape Breton. The *Corallineæ* belonged to the *Florideæ*, or red sea-weeds.

The genus *Corallina* grows in feather-like tufts composed of short articulations when examined closely. When growing, these fronds are of a darkish or light red color like that of the *dulse* and other red algæ.

They are soon bleached white by exposure to light, and after being dried become very brittle, the articulations falling apart. In addition to the red coloring matter there is a large amount of lime laid up with the tissue of each articulation, so that we have here plants which secrete lime from the sea water as the coral does among animals. Dilute hydrochloric acid applied to a portion of one of these fronds well covered with glass to protect the microscope, will show under a low power a rapid evolution of carbonic acid gas until the articulations of the frond become translucent, when all the lime is dissolved out of the vegetable tissue.

The genus *Melobesia* appears as small, thin, more or less circular incrustations of lime filled tissue on other algæ, generally. Thin incrustations on stones taken for *Melobesia Lenormandii* of Farlow are, probably, forms of *Lithothamnion compactum.*

The genus *Lithothamnion* forms larger incrustations, of a red or purple color before they are bleached, some of the species rising into minute nodules or tubercles, and others rising even into rudely branching coral-like masses. The name, from *lithos* a stone and *thamnion* a little bush, was suggested by the latter habit. The reproductive organs of all these are in conceptacles, small spherical cavities, either immersed in the general frond or rising out of it. They are difficult to section for microscopic examination, for if the calcium carbonate is dissolved out of the tissue by, say, dilute hydrochloric acid, no matter how gently it is done, the tissue is more or less disorganized so as not to show the minute parts distinctly. And the sectioning of the undecalcified plants is very severe on the razor or other cutting apparatus.

The two species of Farlow's Marine Algæ of New England, *L. polymorphum* and *L. fasiculatum*, the tubercular or lobular, and the branching species respectively, 5 above being the most distinctive of the latter, are found all along the coast. But from the studies of M. Foslie, of Trondhjem, Norway, these two general forms may be found to cover several distinct species. Probably the following more exact species are represented under these forms :—

Lithothamnion fruticulosum, (Kutz.) Foslie, f. *typica*, Foslie, the most conspicuous branching form. Next to it comes

L. colliculosum, Foslie. Then comes

L. glaciale, Kellm.

L. compactum, Kellm. And possibly,

L. conscriptum.

As these algæ have been very little studied hitherto, he hoped those having an opportunity to collect specimens, or who could get specimens which might be brought up in fishermen's nets, would bring them to the Museum of the Institute.

DR. SOMERS made some remarks on the subject.

HARRY PIERS, ESQ., then read a paper entitled, "Notes on Nova Scotian Zoology: No. 4." (See Transactions, p. 255).

The paper was discussed by DR. SOMERS, MR. BISHOP, and DR. REID.

SEVENTH ORDINARY MEETING.

Legislative Council Chamber, Halifax, 10th May, 1897.

The First Vice-President, MR. MCKAY, in the chair.

A paper entitled, "A Supplementary Note on Venus," by PRINCIPAL CAMERON, of Yarmouth Academy, was read by DR. MACKAY. (See Transactions, p. 275).

The paper was discussed by DR. REID and the CHAIRMAN.

A. H. MACKAY, ESQ., LL. D., F. R. S. C, read a paper entitled, "Phenological Observations for 1896." (See Transactions, p. 268).

The subject was discussed by PROFESSOR MACGREGOR and the CHAIRMAN.

A paper on the "Rainfall of 1896," was then read by MR. DOANE. (See Transactions, p. 279).

DR. MURPHY, DR. MACKAY, and others, took part in the discussion which followed.

The following papers were then read by title :—

"On the Tides of the Bay of Fundy" (second paper). By MARTIN MURPHY, ESQ., D. SC., Provincial Engineer.

"On the Water Supply of the Towns of Nova Scotia." By PROEESSOR W. R. BUTLER, M. E., King's College, Windsor.

HARRY PIERS,
Recording Secretary.