

PROCEEDINGS
OF THE
Nova Scotian Institute of Science.

SESSION OF 1890-91.

ANNUAL BUSINESS MEETING.

Halifax, 8th October, 1890.

PROF. J. G. MACGREGOR, *President*, in the chair.

The minutes of the last annual meeting were read and approved.

The PRESIDENT addressed the Institute as follows :—

Gentlemen,—I rejoice that one of the duties which is laid upon me by the regulations of the Institute to be performed at this meeting, viz, to give a sketch of the life and scientific work of members deceased during the year, is this year so very light. We have lost none of our members by death since last annual meeting.

The Institute has not only retained all its old members. It has also had an unusually large number of accessions. An addition of nine has been made to the list of our corresponding members, and there have been proposed and approved as ordinary members or associate members, thirty-four. A comparatively small number of the latter, not many more than half, have qualified for membership by payment of the annual fee. But I believe that is due to their not having received notice of the approval of their proposed membership by the council, through some defect in our arrangements. I am happy to say that among the new members there are quite a number who are likely to add very materially to the working strength of the Institute.

Though thus somewhat increased, our membership is nevertheless but little if any greater than it was in 1864, and it should be our aim to add to it to a very large extent. We ought to have on our list the name of every man in Nova Scotia who has the ability to make additions to our knowledge, and the names of all those besides, who, though they may not have the opportunity or the requisite preparatory training to enable them to advance science themselves, are willing to encourage others in their efforts by their interest and their annual fees.

So far as numbers of scientific communications are concerned, the past session has been a very successful one. Sixteen papers were submitted to the Institute, some of them of much interest and value. They were distributed as follows, four in the department of Geology, three in Zoology, one in Botany, one in Chemistry, four in Physics, one in Engineering and two of a biographical character.

It will thus be seen that the scope of the Institute's work has got beyond the range of the departments of science indicated by its name. And this fact applies to other recent sessions as well as that which terminates to-night. Thus in 1889-90 the following papers were communicated :—three in Geology, four in Zoology, two in Physics, and two in Archæology.

This tendency in our work to widen in its subject-matter has led us to consider the desirability of modifying our name so as to make it indicate the full scope of the Institute's exertions. The old name Institute of Natural Science had given rise to the impression that the society was intended to be a society of naturalists, and tended to repress the interest which men engaged in other departments of work might have taken in it. At the same time it was found to hamper us in our endeavour to secure by exchange the publications of other societies, societies of naturalists being always ready to exchange with us, but those devoted to departments not usually included under the term Natural Science requiring usually to have it specially explained to them that our work was wider than our name indicated. It was felt that as there was no other society in the Province of a scientific kind, our Institute ought to extend its field to all departments of science, pure and applied, and thus both encourage research in all such departments and build up, by exchange, a library for the use of those engaged in them. And, therefore, at a special meeting of the Institute, called for the purpose, during the past session, we resolved that our society should henceforth be known as the Nova Scotian Institute of Science. And we hope that while in the future those departments of natural science which we have cultivated in the past most assiduously, may be studied to a still greater extent, other departments for which we have so far done little or nothing, may also receive earnest attention. The number of our scientific workers in all departments is but small, and it cannot but be beneficial that we should be banded together and be enabled thereby to secure the stimulus which springs from a sympathetic, even though not a wholly intelligent, interest.

While we have been enlarging our membership and providing for the extension of the region of our activity, we have also been making exertions during the past year to provide our members with one of the most necessary means of research, viz., books. Since our last annual meeting, besides sending copies of our last issue of Transactions to the societies already on our exchange list, we have sent them to 300 other societies, museums, and other institutions, accompanied by circulars and letters, stating the nature and circumstances of our Institute and proposing an exchange of publications. In the case of the societies already on our list we have asked them to complete our sets of their publications, in order that we might bind them up and make them more readily available. And in the case of many of the other societies we have proposed an interchange of earlier publications as well as of those issued in future. This effort to add to our library a large portion of the most valuable part of scientific literature, the Transactions

of learned societies, has been exceedingly successful. Many of the societies which have been corresponding with us for many years have done what they could to complete our sets of their publications; so that we now possess many whole series of such publications, in some cases entirely, and in many practically perfect. Of the 300 new institutions requested to exchange with us, a large number have already complied, and additional acceptances of our proposal are being received by every foreign mail. Only three have refused, two being societies devoted to subjects which our former name seemed to exclude from the range of our activity, and one a society having no publications available for exchange. Many of these societies have sent us their publications for several years back as well as those for the current year, we, of course, sending them our back publications in exchange. The influx of publications has been so large that our bills for book-cases during the past year have been as great as in the whole past history of the Institute, and the work of receiving, registering and arranging has been a severe tax on the time of the members of the Council who have volunteered to do it.

The additions thus made to our library vary of course in value, but all are of some value, and some are of the very highest value as works of reference for the use of men engaged in research in the subjects of which they treat. The subjects are for the most part restricted to the natural and physical sciences, for we have not thought it wise to ask societies to exchange with us, which were devoted to subjects not represented in our Transactions. But already we have on our list societies devoted to such applied sciences as mining, engineering, mechanical arts generally, medicine and agriculture.

I am glad to have this opportunity of expressing our appreciation of the generosity with which British and foreign societies, but especially foreign societies, have responded to our appeal. Our own publication is a very modest one, but in exchange for it we receive, in a great many cases, works of far greater magnitude and cost and scientific value. They might fairly have replied that the exchange we proposed was an unfair one, that we could not give a *quid pro quo*, but with true liberality they send us their weighty volumes in the hope that they may aid in stimulating scientific research in our Province.

Encouraged by the success which has attended our efforts to build up a scientific library, we have become more ambitious during the year, and when the time came to make arrangements for the publication of the Proceedings and Transactions of the past session, the council decided to strike off 1000 copies, and to endeavour to effect exchange relations with all important societies everywhere. To carry out this scheme, however, our income was not sufficient. We accordingly laid our plans before the local government, pointing out the great importance of a scientific library to the development of the resources of the country, and asked an increase of our annual grant. We were met in the most liberal spirit. The members of the government shewed a keen appreciation of the importance of what we aimed at, and an addition of \$100 was made to our usual grant. Thus increased, we hope our income will be sufficient to enable us to make our own Transactions more valuable by the provision of lithographed plates when they are necessary for illustration, and to cover the cost of transmitting our publications to corresponding societies, and of binding up and rendering otherwise available for use what we may receive in return.

With our library thus rapidly growing, the unsatisfactory character of our present quarters has become more and more apparent. As we are at present situated it is impossible to make our library available for public use, and even our own members have great difficulty in gaining access to it. Accordingly, by resolution of the Institute, a number of its members have co-operated with the Directors of the School of Art and Design and other leading citizens, in an effort to secure a building to afford accommodation for the collections of the Provincial Museum, the class-rooms and collections of the Art School and the libraries of the Legislature, the city, and local societies. It is to be hoped that the effort may be successful. For the increased utility of our libraries which would result from their consolidation, the immense benefit which the museum, if properly arranged, would confer upon the public, and the enlarged efficiency which the Art School would derive from suitable class-rooms, all make this effort one to which all good citizens should lend a helping hand. But whether this scheme be carried out or not, it is certain that our library cannot remain where it is very much longer at its present rate of growth. We must very soon obtain accommodation for it somewhere else, unless, indeed, the books are to be packed away as they arrive to await a more convenient season for being used. Even if that had to be done it would be well for us to continue in our present course and secure them now when they may be had. But how much better it would be if we could deposit them on arrival where they would at once be available for the use both of our members and of the public generally.

In addressing you on a former occasion I pointed out the advisability of our organizing some forms of collective scientific work, which would be rendered possible, were we able to extend our membership to a sufficient extent and secure a corps of competent observers scattered over the Province, who would make observations on various matters to which their attention would be drawn by printed circulars, and would transmit their observations to our Secretary, to form the material for reports. It was my intention to address you this evening on the methods by which such forms of work are carried on in other societies, but as the subjects which may be investigated in this way, such as the migration of birds, the geographical distribution of species in the Province, &c., lie to a large extent outside the only department of science of which I have any knowledge, I concluded that it was wiser not to attempt to discuss any such subject myself. Accordingly I brought the matter to the notice of the Royal Society of Canada at its last meeting and secured the appointment of a Committee of Biologists and Geologists, with instructions to report on the subject, and to draw up schedules of questions to serve as guides in the making of observations of the kind referred to. This course has the manifest advantage that it secures uniformity of action on the part of our local societies throughout Canada. If the scheme is systematically carried out it will probably lead to the accumulation of a large mass of valuable information, which, when systematized and condensed, may lead to results of scientific importance. While we are waiting for the report of this Committee, we ought to be preparing to carrying out its recommendations by extending our membership so that we may have on our list all persons throughout the Province who are able and willing to make such simple observations as would be required. If our present members would send me the addresses of such persons

with whom they may be acquainted, I would gladly forward them copies of our Laws and endeavour to induce them to join our Institute.

At the meeting of the Institute, during the last session, at which we decided to change our name, we resolved further to take steps to secure an Act of Incorporation. The Council accordingly had such an Act drawn up, and through the kindness of Dr. A. Haley, M. P. P., Chairman of the Committee on Private Bills, it was passed through the Legislature without expense to the Institute. According to that Act the members of the Institute are incorporated under the name of the Nova Scotian Institute of Science, and the incorporated Society is to hold its first meeting at the termination of the present meeting of the unincorporated Society. According to the Act it will be necessary for the unincorporated Institute to resolve formally to transfer all its property to the incorporated Institute; and a resolution to that effect will be submitted to you after the adoption of the usual reports. As this Act enables us to hold property in due legal form, let us hope that some of our public-spirited citizens may give us the opportunity of exercising our new powers, by establishing a Prize Fund to stimulate researches which would assist in developing the resources of the Province, or a Library Fund to enable us to purchase scientific works necessary for research which cannot be secured by exchange, or an Apparatus Fund to provide our observers with instruments which are too costly for individual workers to purchase for themselves. If we had even small funds for these purposes we might very much increase the working power of the Institute.

Even without them, however, we may hope that the present session will not lag behind its predecessors in the amount of the Institute's contribution to scientific knowledge. By doing what we can without such funds we shall establish our right to be entrusted with them.

The Treasurer submitted his report which was adopted.

On motion of Mr. A. McKay and Dr. Murphy the following resolution was passed:—

Resolved, That all the property and assets of the Nova Scotian Institute of Science, unincorporated, be transferred to the Nova Scotian Institute of Science, incorporated, and that all right and title to said property and assets be hereafter vested in said Nova Scotian Institute of Science, incorporated.

The Institute then adjourned *sine die*.

HALIFAX, 8th Oct., 1891.

The first meeting of the corporators of the Nova Scotian Institute of Science was held to-day, according to the provision of the Act of Incorporation. Prof. MacGregor was called to the chair and Mr. A. McKay appointed Secretary.

The chairman read the Act of Incorporation as follows:—

AN ACT TO INCORPORATE THE NOVA SCOTIAN INSTITUTE OF
SCIENCE.

(Passed the 15th day of April, A. D. 1890.)

Whereas, the society formerly known as the Nova Scotian Institute of Natural Science was organized in the year 1862;

And whereas, said society did in the present year, 1890, change its name to "The Nova Scotian Institute of Science ;"

And whereas, the members of said society are desirous of becoming incorporated under said name ;

Be it enacted by the Governor, Council, and Assembly, as follows :

1. The president and members of the society now known as the Nova Scotian Institute of Science, their successors and assigns, are created a body corporate by the name of "The Nova Scotian Institute of Science."

2. The object of said body shall be the promotion of scientific research, and it shall have power to buy, hold, lease or sell real estate to the value of \$50,000, and may borrow or lend money.

3. It shall also have power to make by-laws regulating its membership, officers, and the management of its business generally, provided such by-laws are not contrary to any general law of the province.

4. All the property of the society known as "The Nova Scotian Institute of Science," shall become the property of the body hereby incorporated, so soon as said society, at a meeting called for that purpose shall, by a two-thirds vote of its members present, pass a resolution approving of such transfer of its property.

5. The said corporators may hold their first meeting on the second Wednesday of October, 1890, on which day this Act shall come into force, and may transact at such meeting any business arising under the powers hereby conferred on them.

On motion of Messrs. A. McKay and M. Bowman, the Laws of the Nova Scotian Institute of Science (unincorporated) were adopted as the laws of this Institute.

The following were then elected members of Council for the ensuing year :—

President—PROF. J. G. MACGREGOR, D. Sc.

Vice-Presidents—MARTIN MURPHY, D. Sc., C. E., and J. SOMERS, M. D.

Corresponding Secretary—A. H. MACKAY, B. A., B. Sc.

Recording Secretary—ALEXANDER MCKAY.

Treasurer—WM. C. SILVER.

Librarian—M. BOWMAN.

Councillors without office :— Prof. G. Lawson, LL. D., E. Gilpin, Jr., A. M., F. G. S., F. W. W. Doane, C. E., R. J. Wilson, Augustus Allison, D. A. Campbell, M. D., and Principal O'Hearn.

ORDINARY MEETING, Province Building, Halifax, 10th November, 1890.

The PRESIDENT *in the Chair*.

Inter alia.

The President read a paper by Prof. L. W. Bailey, Ph. D., entitled : Notes on the Surface Geology of South Western Nova Scotia. (See Transactions, p. 1.)

Rev. M. Maury, D. D., of Waltham, Mass., called attention to a new process in telegraphy and explained the nature of it.

ORDINARY MEETING, Province Building, 8th Dec., 1890.

The PRESIDENT *in the Chair*.

Inter alia.

Mr. E. Gilpin, Jr., communicated a memorandum of Experiments on Building Stone from Nova Scotia, made for Mr. H. G. C. Ketchum, of the Chignecto Ship Railway, by Mr. N. E. Cooper. The specimens of stone experimented on were two (Nos. 1 and 2) from Grindstone Quarry, near Joggins in Chignecto Bay, intended for use at Amherst Dock, and two (Nos. 3 and 4) from Gulf Shore, near Pugwash, Northumberland Strait, 6 to 8 miles from Port Philip, intended for use at Tidnish Dock, and being used at the 30 ft. arched bridge at Tidnish River. Nos. 1 and 2 had been rubbed with sand; Nos. 3 and 4 finished with the fine chisel only.

“The first piece of stone experimented upon was No. 3 from Gulf Shore Quarry. It was placed between pitch pine boards 1 inch thick, and the pressure in the large ram put on; when it had reached 34 tons per foot the stone cracked vertically $1\frac{1}{2}$ inches from the edge. Thinking that it might not have been put upon its natural bed, it was again put in with the face at right angles to the former uppermost, and, on applying the pressure of 34 tons per foot, it cracked on both sides parallel to the vertical faces at about the same distance from them as in the first case.

“In order to test whether there was any unequal strain upon the specimen a half brick was tested under precisely similar conditions. This cracked with a pressure of 53 tons per square foot and crushed at 150 tons per square foot.

“The appearance of the pitch pine board seemed to indicate unequal pressure. Similar pieces of yellow pine were then procured.

“The specimen No. 1 from Grindstone Quarry was then tried, with the result that at a pressure of 600 tons per sq. foot the corners began to chip, the yellow deal packing being reduced in thickness to about $\frac{1}{4}$ inch. The specimen was then removed as it appeared to be subject now to unequal strains.

“The companion specimen No. 4 to No. 3, from Gulf Shore first experimented upon was then tried between yellow pine boards, and failed by splintering on the edge, the pressure being 228 tons per sq. foot.

“Specimen No. 2, the companion to No. 1, was not tested.”

The President read a paper by Mr. D. W. Robb, of Amherst, N. S., on “Steam Boiler Tests as a means of determining the Calorific Value of Fuels.” (See Transactions, p. 9.)

The President read extracts from a letter received from Mr. R. Balfour Brown, of Yarmouth, as follows:—

“I send you two small boxes containing samples of ores from Port Gilbert, in Digby Co.

“Among the samples you will find some pieces of pudding stone, well spotted, and indeed *saturated* with paraffin tallow. A piece of the tallow, on having a blaze from a blowpipe applied to it, burned like a squib until it was consumed; it soon, however, loses its gaseous element and becomes much less inflammable.

“I presume sulphuric ether would decompose this substance, but I have attempted no test of itself or the gangue.

“Not having seen any mention made in any of the annual reports from Mr. Gilpin, I thought it might interest you should it prove to be rare.

“I have added to the above a sample or two from a sedimentary deposit of manganese, and a red sienna from a 12 inch vein running into the solid ledge at Gilbert's Point.

“The black oxide of manganese is covered by about three inches of soil, and in itself forms *two* strata with an *inter-stratum* about 4 inches thick of the yellow deposit, of which I send you a sample. The whole bed is nearly 3 ft. in thickness. By rubbing these substances between the finger and thumb, first moistening them, until the water evaporates, you will observe that they are completely saturated with a natural oil; and this I have little doubt is petroleum.

“While stopping a few days in August last at this locality I noticed that some of the wells were impregnated with this gaseous substance, and, indeed, under certain atmospheric conditions, the very air was tainted with the unmistakable odour of kerosene.”

The specimens referred to were exhibited.

ORDINARY MEETING, Province Building, 19th January, 1891.

The PRESIDENT *in the Chair*.

Inter alia.

Rev. G. Patterson, D. D., read a paper on “The Magdalene Islands.” (See Transactions, p. 31.)

In the discussion on this paper, Principal A. H. MacKay referred to a holiday natural history exploration of the Magdalene Islands made in July and August, 1878, by himself and his brother, the late John H. MacKay, with geological hammer and knapsack, botanical vasculum and gun. Nearly all the coast line of the islands, Amherst, Grindstone, Alright, Coffin, Old Harry Head, Northeast Cape, North Cape, Grosse, and Wolf, with most of their connecting sand bars were tramped on foot; and several excursions were taken through the interiors. He recognised the graphic word pictures of Dr. Patterson, and referred to a few additional interesting points. About one hundred and seventy phænogamous, with a large number of cryptogamous plants, were observed. Among interesting ones, *Rubus chamæmorus*, on a transformed sand bar, near Wolf Island, *Par-nassia*, on a rocky islet near Coffin Land, *Habenaria orbiculata*, in a fair hill-sidewood, might be mentioned—perhaps chiefly on account of the dramatic interest of the occasions of the discoveries.

Geographically, these islands were practically in three groups, forming a chain running northeasterly as was described. The southern, Amherst, running east and west about nine miles, south to north, three or four miles, was apparently on a due east and west anticlinal of gypsiferous rock, through which ridges and conical elevations of igneous (doleritic) rocks rose, forming Demoiselle Hill abutting on the coast nearly 300 feet high, and rising in the interior to nearly double that altitude. These were considered to be of lower carboniferous age. On each side of this anticlinal the dip was respectively north and south, first reddish and grayish strata of various sandstones, then on the south and north coast a redder sand-

stone like the Permian or Triassic. Near the Demoiselle hills we saw splendid demonstrations of the manner in which pits are produced in gypsum regions. Veins were found running out to the coast. By the solution of these in water, cavities were formed, and eventually the superincumbent earth fell in. We saw natural trenches thus made, apparently showing each spring's work, and we investigated some quite fresh falls, on lines going pretty far inland. At this fine exposure of the igneous rocks the jointed and crumbling rocks show in many places coatings of small crystals of silica, but some were nearly an inch long and a half inch in diameter, perfectly hexagonal, but more or less ferruginous. The crystals were commonly mingled with or replaced by beautiful glistening crystals of specular iron. In the same region also fragments of stone with manganese deposits were noticed. Gypsum was found sometimes crystallized as pure selenite, often as white, orange, grey, banded and party-colored gypsum; but most often as fibrous gypsum, the fibres running from one wall of the vein to the other. Amherst island sends out northeasterly two huge armlike sand bars seven or eight miles long, enclosing a salt lagoon three or four miles broad in some places, which clasp Grindstone island by its two southern red sand stone ears. Through this island a similar anticlinal runs nearly parallel to the former, but nearer the northern coast than the southern. The doleritic knolls and ridges rise in the interior to over 600 feet probably. The gypsum bearing rocks are closely associated, then the coarse and variegated sandstones, and farther off still, red soft sand stone rises in perpendicular and picturesquely scored cliffs over the sea, in some places perhaps a hundred feet high. Towards the anticlinal some impure limestone bands were observed, and crops of calcite crystals were knocked off some rocks. Grindstone island, like its southern neighbor Amherst, tried to extend its two arms of sand bars 20 or 25 miles to the northern group. But the eastern arm is broken at the beginning by the entrance to House Harbor, and the part cut off is a respectable island—Alright, with high sandstone cliffs to the sea, with the doleritic knolls and gypsiferous surroundings which form a part of the system of the neighboring island. From Alright the arm extends to the northern entrance to the long, shallow, bar-bounded sea, and ends opposite Coffin island. The western bar extends in a straight line for nearly twelve miles to the red-sandstone cliffed Wolfe's islet, which is like a sesamoid bone in the middle of a muscle of sand nearly 24 miles long—connecting Grindstone with Grosse Isle, and the chain similarly connected sweeping around the north to Coffin's Land. In this northern group, the higher red sandstone was observed, and the lower sandstones, and at one place signs of gypsum deposits; and at the northern capes strata of some impure limestones which were not higher than the gypsum beds probably were observed. Between Old Harry Point, where Neptune often raises the old man in columns of thundering spray spouting up the channeled sandstone cliffs, and East Cape, the ocean in full swing falls upon a regular bay-like curve of several miles, where the beach is of the most beautiful sand, sloping up gently and evenly from the pounding surf for about 80 yards. Then there is a nearly perpendicular wall of sand averaging perhaps 20 feet in height, then a second rampart 5 or more feet high, from which there is a rapid slope inland to a low region of undulating sand hills covered with *Empetrum*, *Vaccinium*, *Hudsonia*, *Spartina*, &c., and stunted bushes. This wall, extending for miles, looked

as distinctly mural and regular as if it were the work of man. Here was a great Chinese wall of sand, with the proof before us that the builders were known only to the sea, the wind, and the rush-like grasses.

A. P. Reid, M. D., Superintendent of the N. S. Hospital for the Insane, read a paper entitled : "Poverty Superseded, or a new Political Economy."

ORDINARY MEETING, Province Building, 9th Feb., 1891.

The PRESIDENT *in the Chair*.

Inter alia.

Prof. G. Lawson read a paper entitled : Notes for a Flora of Nova Scotia, Part I. (See Transactions, p. 84.)

Mr. John Forbes read a paper entitled : Remarks upon the coating of iron with magnetic oxide, and a suggestion of a probably new method of producing it. (See Transactions, p. 27.)

ORDINARY MEETING, Province Building, 9th March, 1891.

The PRESIDENT *in the Chair*.

Inter alia.

The President read a paper by Mr. E. Gilpin, Jr., entitled : Analyses of Nova Scotia Coals and other minerals. (See Transactions, p. 19.)

The President read a paper by Mr. W. B. McKenzie, C. E., entitled : Notes on Railroad Location and Construction in Eastern Canada. (See Transactions, p. 111.)

On motion of Principal MacKay and Mr. M. Bowman, the following resolution was passed :

Whereas, we learn that the Geological Survey of the counties of Antigonish and Pictou has been completed in such detail as cannot be adequately represented on maps drawn to the proposed scale of four miles to an inch ;

Resolved, that the Council be instructed to petition the Government to publish the maps of these counties as soon as possible, and on a scale of not less than one mile to an inch, the scale on which the survey of the Cape Breton counties has been published.

ORDINARY MEETING, Provincial Museum, 13th April, 1891.

The PRESIDENT *in the Chair*.

Inter alia.

Prof. H. W. Smith read a paper entitled : Fertilizers on Sandy Soil. (See Transactions, p. 122.)

The President communicated a paper by Mr. A. M. Morrison, entitled : On the variation with concentration of the density of dilute solutions of Cobalt and Nickel Sulphates. (See Transactions, p. 132.)

The President read a paper entitled : On some lecture experiments illustrating properties of saline solutions. (See Transactions, p. 71.)

ORDINARY MEETING, Provincial Museum, 18th May, 1891.

The PRESIDENT *in the Chair*.

Inter alia.

Principal A. H. MacKay read a paper entitled : Pictou Island. (See Transactions, p. 76.)

The President read a paper entitled : A simple proof of the completeness of the differential, dH/T , in thermodynamics.

Mr. E. Gilpin, Jr., read a paper entitled : Notes on some explosions in Nova Scotian Coal Mines. (See Transactions, p 58.)

Mr. E. Gilpin also communicated a memorandum by Mr. H. G. C. Ketchum, of the specific gravities and percentages of absorption of specimens of building stone supplied to the Chignecto Ship Railway, as follows :—

CHIGNECTO MARINE TRANSPORT RAILWAY.

Specific Gravities, &c., of Building Stone.

NAME OF STONE.	Weight in Air.	Weight in Water.	Specific Gravity.	Weight in Air when Saturated.	Percentage of Absorption.
Joggins, N. S.	540	324	2.50	562	4.07
Seaman, Joggins, N. S.	644	383	2.47	673	4.50
A. E. Beaton, 6 m. from Tidnish..	254	155	2.56	263	3.54
McKelvey, Dorchester, N. B.	598	366	2.58	617	3.16
Hagun's Cape, Maranquin, N. B..	955	564	2.44	972	1.80
Port Philip, N. S.	870	535	2.60	889	2.18
“	750	450	2.50	768	2.4
Wallace, N. S.	805	478	2.46	834	3.60
Joggins (High) N. S.	832	493	2.45	866	4.09
Springhill, N. S.	753	446	2.45	785	4.25
Curran, N. S.	844	500	2.45	883	4.62

ALEXANDER MCKAY,
Recording Secretary.