TWENTY-EIGHTH ANNUAL REPORT

OF THE

Natural History Society

OF MONTREAL,

DELIVERED BY THE LATE COUNCIL,

AND

READ AT THE ANNUAL MEETING OF THE SOCIETY,

19TH MAY, 1856.

MONTREAL:

PRINTED BY HENRY ROSE, GREAT SAINT JAMES STREET.

1856.

OFFICE BEARERS AND COUNCIL

FOR THE YEAR 1856-7.

President.....Mr. Principal Dawson.

First Vice-President.....L. A. H. Latour, Esq.

Second Vice-President.....W. H. A. Davies, Esq.

Third Vice-President.....Rev. A. D. Campbell, M.A.

Treasurer.....Dr. Workman.

Corresponding Secretary.....Dr. Hingston.

Recording Secretary.....A. N. Rennie, Esq.

Curator and Librarian.....Dr. Barnston.

Council....Rev. Canon Leach, D.C.L., Rev. A. Kemp, Dr. R. P. Howard, J. T. Dutton, Esq., Dr. Fraser.

Library Committee..Dr. McCallum, Dr. Jones, Dr. Wright, Dr. Scott, Rev. Canon Gilson, M.A.

TWENTY-EIGHTH
ANNUAL REPORT.

At the Annual General Meeting of the Natural History Society, held in the Museum on Monday May 19th, 1856, Present, — The Lord Bishop of Montreal, President of the Society in the Chair; Rev. A. D. Campbell, Rev. A. Kemp, Drs. Fraser, Workman, Wright, Scott, McCallum, Jones, Kingdom, Hingston, Barnston, Fenwick, Principal Dawson, Messrs. Davis, Latour, Rennie, Dutton, Commissary General Ibbetson, Brown, Himsworth.

The minutes of the last Annual General Meeting were read over and confirmed.

And after the transaction of some routine business the following Report from the Council was read by Dr. Hingston, and submitted for approval:—

To the Natural History Society of Montreal.

The Council of the Natural History Society of Montreal, in obedience to custom and constitutional requirement, respectfully submit to the Members, their Report of the progress of the Institution, during the past year.

In this Report, your Council will state such facts as may appear to be necessary to a connected history of the Institution, and offer such suggestions as may seem important to its future management.

In the first place, however, they deem it advisable to give a short and general *résumé* of the history of the Society since its foundation, so as to prove of interest to the members generally — more especially to those who have lately joined the Society; and for this purpose, they avail themselves largely of the industry of a former President of this Society — Major Lachlan.

The Natural History Society was founded in the year 1827, — its first patron being the Earl of Dalhousie, and its first president, Stephen Sewell, Esq.

It was incorporated by an Act of the Provincial Parliament, (12 Will. IV. c. 15.) in 1832, which received the Royal Sanction in February, 1833.

At its foundation it numbered 26 members, of whom only one is now connected with the Society, namely, Dr. Holmes, to whom we owe the catalogue of our mineralogical and geological cabinet.

At the date of its incorporation there were about 100 ordainary members, of whom about thirteen are still connected with the Institution.

In 1835, it was proposed to have essays read before the Society "On the physical history of Rivers in general and the St. Lawrence in particular," and "On the circumstances affecting climate in general and Canada in particular."

In 1836, the Society purchased its present residence; and subsequently many valuable donations were made to the Museum and Library.

Circulars were addressed to the various corresponding members and to the Governor of the Hudson's Bay Territory, inviting attention to the subject of Meteorology in British North America.

To the Council of the same year is due the honour of having first drawn the attention of Government, to the advantages calculated to result from a Geological survey of the Province.

By an ordinance of 1841, the Government contemplated the merging of this Society, the Mechanics' Institute, and Montreal Library, into one Institution, to be called "The Montreal Institution of Literature, Science and Art," having its site in the Bonsecours Market Building, with the privilege of an annual donation of £300 from the city. But this comprehensive Scheme was never carried into effect.

In 1845, the Rev. Mr. Somerville laid the foundation for a regular course of lectures before the Society by a generous donation of £1000.

In 1846, the Museum was thrown open to the public at a trifling charge.

During the following year, under the patronage of Lord Elgin, it was resolved to publish such approved Essays as were in possession of the Society.

The fee for life membership, which had been £10 up to this time, was now reduced to £5.

In 1848, it was proposed to grant three medals for the best Essays on subjects connected with natural history. The number of members this year was 144.

The past year has not been unproductive of benefit. The Society's building has undergone complete repair; the roof has been newly covered; the Library and Council room have been transformed into a large and handsome apartment. The lecture room has undergone transition from a small room on the ground

floor, to a spacious Hall on the third story of the building, which is disposed with great advantage to both lecturer and audience, whilst around the walls are a series of spaces for the reception of stuffed animals, glass cases, &c.

These improvements have been effected under the able superintendence of George Brown, Esq. They have occasioned a considerable addition to the usual annual expenses, and it was in consequence found necessary to effect a loan of £400, for three years, at six per cent.

The Edifice is now better suited to the purposes which it is intended. The first story consists of two rooms, one of which is devoted to the library, and the other to the geological department. The second story is divided into two spaces, one occupied by the ornithological collection, the other by the entomological department.

The third story forms the new lecture room capable of comfortably seating 250 persons.

The Council have the pleasure of announcing a larger increase to the list of members than usual, there being no less than seven corresponding and twenty-one ordinary ones during the year, making a total of 165 active members.

The losses by death and other causes, since the last annual meeting, though not numerous, have been severely felt; and your Council are sorry to include the name of one of their former presidents — the late Dr. Crawford, whose zeal has in no small degree contributed to the advancement of our Society's interest; and by whose liberality the Museum has been enriched with many of its valuable specimens.

They regret to be called upon to record the demise of the Rev. Zadock Thompson of Burlington, Vermont, a corresponding member of the Society, and the departure from among them of Lieut.-General W. Rowan for England. We have still however the benefit of his assistance as a corresponding member of the Society.

With these exceptions there is little in the form of loss to record.

The Annual Course of Lectures delivered under the auspices of the Society commenced on Tuesday the 12th day of February of the present year, and were unusually successful.

The introductory lecture was given by His Lordship the Anglican Bishop of Montreal, President of the Society; subject— "The connection between Literature and Science—with some general remarks upon the study of Natural History."

The course was continued in the following order:—

February 27th. By J. W. Dawson, F. G. S., Principal of

McGill College; Subject—"Physical Geography of the Lower Provinces."

March 4th. By James Barnston, M. D.; Subject—"Coleridge's Philosophy of Life."

March 11th. By W. H. Hingston, M. D.; Subject—"Circulation of the Blood."

March 18th. By Ass.-Com.-Gen. Ibbetson; Subject—"Entomology."

April 8th. Concluding lecture, by B. Workman, M. D.; Subject—"Wonders of Geology,"

The Council are deeply indebted to these Gentlemen for their very able efforts in their favour. They congratulate the Society on the large attendance at these lectures, and the increased interest manifested in them. Your Council trust, that, during the ensuing year, the regular course of lectures will comprehend a still larger number; and recommend that an essay be read and discussed at every monthly meeting of the Society, with the view to render these more instructive and interesting, and to ensure a large attendance of members and visitors.

The By-Laws of the Society have been submitted to a committee of revision pursuant to a resolution of the Society on the subject; and are shortly to be printed.

Agreeably with the desire of the Canadian Institute of Toronto, to be furnished with the monthly reports of the proceedings of this Society, the necessary matter has been forwarded and published in the "Canadian Journal."

In accordance with the recommendation contained in the last Annual Report, our patron, Sir Edmund Walker Head, has been duly elected an honorary member.

The Council beg to submit the names of their retiring President, His Lordship the Anglican Bishop of Montreal, Sir Wm. Edmond Logan and Charles Smallwood, M. D., L. L. D., as justly meriting a like honour.

The Council have much pleasure in stating that during the month of March last, a committee of the three Vice Presidents and four other members, in company with a few gentlemen interested in Meteorological science, visited the Observatory of Charles Smallwood, M. D., L. L. D., at St. Martin's Isle Jesus, C. E., and a report on the subject of that gentleman's valuable and extended labors was laid before the Society and ordered to be published.

Your Council subsequently forwarded a petition to Parliament praying for such assistance as would enable Dr. Smallwood to publish the records which he has made for the last fifteen years, and to continue the prosecution of his investigations. (The

project of establishing an observatory in Montreal or its neighbourhood was included in the same prayer.)

If to such observations were added an analysis by some member of the society, of those already made, a very valuable amount of information would be furnished to meteorological science.

In this brief general *résumé* your Council find sufficient reason to feel, on the whole, satisfied with the struggles of a Society like this placed by its very nature, so far in advance of our crude national state.

There is sufficient ability in our Society at the present time to raise it to the very proudest rank of literary excellence; and all we need is merely to effect a proper distribution of our forces.

For this end your Council would recommend such a division of the members of the Society into committees on the following subjects, as one of its members has already submitted, namely:

1st.—Botany.
2nd.—Ichthyology, Herpetology and Entomology.
3rd.—Ornithology.
4th.—Other departments of Zoology.
5th.—Geology, Mineralogy and Conchology.
6th.—Comparative Anatomy and Physiology.
7th.— Indian Curiosities, Antiquities, and Miscellanies.
8th.—Library.

Your Council are of opinion that it would be to the Society's advantage, to make a careful distribution of duplicate specimens in the Museum among Institutions of a kindred nature within and beyond the Province. The act would no doubt be cordially reciprocated, and the Museum enriched thereby.

It is also thought advisable to petition the Legislature for a copy-right Law, making it compulsory on all Publishers to contribute a copy of every publication to the several literary and scientific Institutions of the Province. In the mean time members are not denied the privilege of contributing to the Library and Museum; a priviledge most cheerfully accorded likewise to the public.

For a more complete account of the condition and prospects of the Finance, Library, Museum and Collections, you are referred to the accompanying reports of the Treasurer and of the Librarian and Cabinet Keeper.

In conclusion, your Council, taking a retrospective glance at the proceedings of the past year have every reason to hope that the Society has merged *pour toujours* from that anomalous position — so little in harmony with the objects of its founders, and in surrendering their trust into other hands they would beg to accompany it with the hope that the Natural History Society,— established to encourage the study and investigation of the

varied and ever varying physical phenomena of our Country,—possessing a Library which embraces one of the best collections of valuable works pertaining to all branches of positive knowledge in this country; and a museum containing an extensive and varied collection of objects of Natural History — which the liberality of the Members has thrown open to the public free of charge — may meet with even greater success, and obtain that liberal support from its members and the public to which it is justly entitled.

L. A. HUGUET LATOUR,

1st Vice-President.

Montreal, 19th May, 1856.

The Treasurer of the Society (B. Workman, M.D.) then read the following account and statement:

Dr. *Natural History Society in Account with Benjamin Workman, Treasurer.* *Cr.*

1856.								
May 1,	To Cash paid Salaries	-	-	-	-	-	£ 40	0 0
	" " Fuel	-	-	-	-	-	26	19 4
	" " Gas	-	-	-	-	-	3	17 9
	" " Water	-	-	-	-	-	3	0 0
	" " Freights	-	-	-	-	-	1	8 11
	" " Postages	-	-	-	-			2 3
	" " Printing	-	-	-	-		23	12 9
	" " Advertising	-	-	-	-		6	15 7
	" " Interest	-	-	-	-		8	5 3
	" " Commissions	-	-	-	-		2	16 6
	" " Repairs	-	-	-	-		300	0 0
	" " Insurance	-	-	-	-		25	0 0
	" " Incidentals	-	-	-	-		27	0 5½
	" Balance to New Account		-	-	-		51	14 3½
							£520	13 1

1855.								
May 17,	By Balance in Treasurer's hand	-	-	-	-	-	£ 1	3 9
1856.								
May 1,	" Subscriptions, & Diplomas, received fees to this date	-	-	-	-	-	65	5 0
	" " Government Grant	-	-	-	-		50	0 0
	" Cash borrowed on Mortgage	-	-	-	-		400	0 0
	" Interest at Montreal Savings Bank		-	-	-		2	9 4
	" " City & District "		-	-	-		1	15 9
							£520	13 1

E. and O. E.

B. WORKMAN,
Treasurer.

Examined and found correct,
W. H. A. DAVIES.

REMARKS.

The Treasurer in submitting his Annual Account Current, would append thereto the following remarks, viz:—

ESTIMATE OF EXPENDITURE FOR 1856-7.

Balance yet due Contractor for repairs.....				£	72	16 0
Required to complete Repairs, say.....					75	0 0
Salaries.....					40	0 0
Interest.....					30	0 0
Outstanding Accounts for articles purchased for repairs, but of which purchases Accounts have not yet been rendered.....					15	0 0
Chairs & Table.....					20	0 0
Paper & Paperhanging.....					5	0 0
Fuel and Light.....					30	0 0
Incidental Expences.....					25	0 0
Estimated Amount required for 1856-7.....				£	312	16 0

RESOURCES.

In Treasurers' hands.....	£51	14	3½			
Subscriptions.....	75	0	0			
Interest at the Savings Bank, say.....	1	5	8½			
Government Grant.....	50	0	0			
				178	0	0
Estimated Deficit.....				£134	16	0

BENJAMIN WORKMAN,
Treasurer.

Montreal, 1st May, 1856.

P.S.—This statement will shew that the change of the Annual subscriptions from Ten Shillings to Twenty Shillings has been advantageous to the Finances of the Society, viz:

Subscriptions and Diplomas in 1855-6 produce.....	£	65	5	0
Do. Do. 1854-5.....		34	5	0
Gain.....	£	31	0	0

Upon motion by Mr. Dutton seconded by Rev. A. D. Campbell, the Report as read was received and adopted,and ordered to be printed and circulated, and the Lord Bishop of Montreal, Sir Wm. Logan, Knight, F. R. S., F. G. S., L. L. D., &c., &c., and Charles Smallwood, M.D., L. L. D., were by acclamation elected Honorary Members.

Drs. Fraser and Barnston having been appointed Scrutineers, the Meeting then proceeded to Ballot for Office Bearers for the current year; when the following were declared elected:

President.....Mr. Principal Dawson.
First Vice-President.....L. A. H. Latour, Esq.
Second Vice-President.....W. H. A. Davies, Esq.
Third Vice-President.....Rev. A. D. Campbell, M. A.
Treasurer.....Dr. Workman.
Cor. Secretary.....Dr. Hingston.
Rec. Secretary.....A. N. Rennie, Esq.
Curator and Librarian.....Dr. Barnston.
Council....Rev. Canon Leach, D.C. L.; Rev. A. Kemp; Dr. R. P. Howard; J. T. Dutton, Esq.; Dr, Fraser.
Library Committee.....Dr. McCallum; Dr. Jones; Dr. Wright; Dr. Scott; Rev. Canon Gilson, M.A.

Upon motion of Dr. Workman, seconded by Dr. Scott, a cordial vote of thanks was passed to the Lord Bishop of Montreal for his kindness in having consented to fill the President's chair, the able and zealous manner in which he had discharged the duties of his office during the past year, and the exertions he had made in the cause of science, in extending the sphere of operations of the Society, and adding to its list of members.

The meeting then adjourned.

PROCEEDINGS AT THE SOIREE.

On Tuesday evening, the 20th May, 1856, the members of the Society gavea Soiree in honor of Sir Wm. E. Logan, one of its members, which was numerously and fashionably attended. Upwards of 150 ladies and gentlemen, the *elite* of the city and neighborhood, were present, and the proceedings of the evening were listened to with the deepest interest and attention. At half past seven o'clock precisely, the Lord Bishop of Montreal, accompanied by the guest of the evening, and the Council of the Society, entered the Lecture Room, and took their places. The Bishop was supported on the left by J. W. Dawson, Esq., Principal of McGill College, and President elect of the Society. The Meeting was opened by his Lordship calling on Mr. Rennie, the Secretary, to read the minutes of the Annual Meeting and Report of Council. This having been done, his Lordship said,—It is now my pleasing duty to read and present to Sir Wm. Logan, our honored guest, the following address from the Natural History Society:—

To Sir William Edmund Logan, Knight, F. R. S., F.G. S., L. L. D., &c., &c., Chevaer of illthe Legion of Honor, Director of the Geological Survey of Canda.

Sir,—It is with feelings of sincere pleasure mingled with no small degree of pride that we, the President and Members of the Natural History Society of Montreal, welcome you as our guest on the present occasion. We have invited you here this evening, not merely from a sense of duty, nor in consideration of the honor your presence would confer upon us, but likewise for the purpose of testifying publicly the interest which we, as a Scientific Institution, have always taken in your indefatigable labours to advance the cause of Geological Science in Canada. It is for this latter reason, that the opportunity now presented of acknowledging your valuable services, both to Science and our country, affords us unfeigned gratification. As Director of the Geological Survey of this Province, you have laboured for a long series of years with unremitting zeal and assiduity, and if your untiring efforts have surmounted the many difficulties of a scheme, in its nature so extensive and gigantic, and have at length met with that success to which they are so justly entitled, we rejoice to think that the rewards so honorably gained have been acquired by one whom Canada claims, not only as her brightest ornament in Science, but as her honored and cherished son.

Limited as have been the means hitherto placed at your disposal in order to carry out your investigations, you have nevertheless, by skilful economy and at much personal sacrifice, succeeded in bringing to light the valuable internal resources of our country, and of raising our Province to that high and important position

which it now holds in foreign estimation. That the Provincial Legislature has appreciated your past labors, and is convinced of the necessity of continuing the noble work under your guidance, is abundantly proved by the munificent grant of the present session towards the Geological Survey, and we believe this is but the echo of the mind of an intelligent public.

Your unwearied efforts when in London and Paris, on two memorable occasions, have been acknowledged in a manner which must be very gratifying to you; and while we congratulate you upon the high honors received at the hands of our Most Gracious Queen and of his august Majesty the Emperor of the French, we are no less rejoiced to know that Science, from its loftiest throne, has not omitted to present to you its highest tributes of praise, and its rarest token of reward, in acknowledgment of your valuable researches and discoveries in one of its most important departments. The value of such honors can only be measured by the severe toils and hardships of those mental and bodily labors which have so happily gained them; and our humble prayer is, that you may long live to enjoy these rewards, and continue to prosecute those researches, which will prove lasting memorials of your talents and perseverance, and be of permanent benefit to the country.

In thus tendering you our hearty congratulations, we beg respectfully to present you with the highest mark of esteem and recognition our Society can bestow, namely, the Diploma of Honorary Member of the Natural History Society of Montreal.

(Signed) F. Montreal,
President.

A. N. Rennie,
Rec.-Secretary.

Montreal, May 20, 1856.

Sir Wm. Logan said,—My Lord, Ladies and Gentlemen, I have to return your Lordship and the members of the Natural History Society my sincere thanks for the very flattering address you have just read, and the honor you have done me, in bestowing the highest mark of your esteem and approbation upon me, by presenting me with the diploma of an Honorary Member of the Society. The marks of distinction which have been bestowed upon me, as the fruits of my labors connected with the Geological Survey of Canada, are no doubt highly appreciated by me—both those from the hands of the Queen of England, and the Emperor of France, and those of the learned of both countries. And though the marks of your consideration, my Lord, come after them, and are perhaps in part given to me in consequence of them, yet I do not on that account esteem them the less; for I have a grateful remembrance of the satisfaction with which many years ago, when residing in England, I received the diploma of a corresponding member of this Society, and that, before I had given to the public any geological researches worthy of notice (applause.) I was happy, my Lord, to receive that diploma from the hands of my old master, Mr.

Skakel, to whose instructions I am indebted for the first rudiments I obtained of some of those exact sciences connected with that branch of geology which I have since more especially pursued (applause.) I cannot forget, also, that though ten years before the establishment of the geological survey, many worthy and enlightened persons both in and out of parliament, had endeavoured to induce government to grant their aid in the investigation of our mineral resources, yet it was only in the time of Lord Sydenham, when petitions had been forwarded from the Natural History Society of Montreal, and the Literary and Historical Society of Quebec, the former presented by Mr. Holmes, and the latter by Mr. Black—it was only then that the Hon. Mr. Harrison was induced to recommend to the government the first grant bestowed upon the geological survey [cheers.] In this way, the act of this Society has, in some degree, been the cause of my opportunity; and on being elected a Fellow of the Royal Society of England, it was with great satisfaction that in enrolling myself among its members, I designated myself as a member of the Natural History Society of Montreal [cheers.] It has been a source of great satisfaction to me, that there has never yet been a single dissentient voice raised against the support given to the geological survey of the Province. The position in which the liberality of the Legislature, and the good will of the community has at present placed the survey, is a worthy object of congratulation, and will enable me to extend its usefulness. It will give me an opportunity of publishing a map of the Geology of Canada, so far as it is known—similar to that published and exhibited in France. It will, by means of illustrations, enable me to make our annual reports much more intelligible than hitherto, and afford me the means of attracting much attention to science in Canada, by publishing those new organic forms which may be found in a fossil state, while prosecuting our studies [applause.] Of these still unrepresented forms, a large collection has already been made, many of them of great interest. And in classifying and describing them I hope to have the occasional assistance of Professor Hall, Palæontologist of the State of New York, and to secure the permanent aid of Mr. Billings, of Ottawa, who has recently shown so much attachment to the science, and such an anxious desire to promote its diffusion. And I am sure, my Lord, I shall never find wanting the advice and assistance, or when his occupations will permit, the active co-operation of a distinguished member of your Society—Mr. Principal Dawson—whose researches in geology are so well and so favorably known, and whose advent among us I consider a great and sure benefit to the advance of Canadian science [loud cheers.]

His Lordship then said, it now only remains for me to quit the Presidental Chair, and the Office which, as far as I have been able, I have endeavoured to make efficient for the Society's objects, during the last twelve months. And while I look back with no small satisfaction to the efforts which have been so successfully made during the past year, by several members of this Society for the promotion of its efficiency, and the advancement of Natural Science, I cannot but rejoice that I shall close this my year of office with so graceful and appropriate an act, as the presentation of this address to Sir Wm. Logan, giv-

ing him a hearty welcome amongst us. I could have wished that it had been compatible with his other duties for him to have acceded to the request made to him on behalf of a large number of the members of the Society; and that he could have given us the aid of his counsel, and the strength of his name, if chosen as our next President. But the important business connected with the Geological Survey of the Province, which is about to be renewed under his superintendence, will make such demands upon his time and attention, and cause him to be so constantly absent from Montreal, that he informed us he would be obliged to decline the office, if it were offered him. But I feel sure that he will at all times be ready to give us his best advice and co-operation, as far as circumstances will permit; and possessing as he now does, so high a reputation for scientific knowledge—a reputation not confined to this Province or this hemisphere—he will be no small aid in promoting the efforts, which this society is now making, to place itself in connection with other learned bodies and professors of Natural Science in all parts of the world. The improvements in these premises, for the purpose of rendering them better adapted for the Society; the classified distribution of subjects, alluded to in the Report, to be made the special objects of investigation by different members in some regular order and system; and the large increase of members during the past year, lead us to hope that the forthcoming year will neither be unproductive in satisfactory results, nor uninteresting in its details; and while we trust that there will be, at the Meetings of the Society and in its Lectures enough of the popular element to attract the many, there will be also such enquires prosecuted, and advances made, as shall give evidence, that there are amongst us, some minds imbued with a true spirit of philosophy, and an ardent zeal for Natural Science. And this study is of great importance, indeed necessary, not only for the reputation of any country, but to enable it to compete with other parts of the world, and protect itself from injustice and fraud. It is only a few days since, I read in the evidence given in London before the Committee of the House of Commons on the adulteration of Food, &c., that "a large drug grinder and manufacturing Chemist" stated that it was his belief that Rhuburb was universally ground pure. He believed it was true that there was some English Rhubarb mixed with the pure to be ground; but it was chiefly for Ireland and the Colonies." But why should the impure article be sent into the Colonial market rather than the London one, except it be that it is concluded the fraud will not be so easily detected; because Botany and Chemistry are not believed to be so actively or generally studied there, as in England? And not now to speak of "the wonders of Geology," on which subject many of us heard very recently a most interesting lecture in this room; or of the stupendous revelations which modern Astronomical Science has opened for the adoring contemplation of men, whereby, "in our day, indeed, within these few years, the scope of the material universe visible to man, has through Lord Rosse's great telescope been enlarged, as it is computed, no less than 125,000,000 times, and has brought to our view stars, worlds, systems, without number,

whose existence had scarcely been suspected before." Without enlarging upon facts like these, I will only observe, that there is no branch of trade or commerce, scarcely any amusement or means of sustaining life, where, in some way or other, scientific knowledge and scientific investigation will not be most essential to our comfort, our progress and our success. Many branches also of science necessarily require simultaneous investigation and experiments to be made, in a variety of places at the same time, in order, by general induction, to arrive at any definite conclusion; particularly, for instance, those connected with Meteorology. So that every fresh location of a well-ordered observatory, and every fresh record of any Philosophical observer, is a help towards perfecting the experiments and observations of all.

But I will not detain you any longer with more lengthened observations of mine on this occasion, when there are other and better means devised for your instruction and entertainment this evening. And since I believe it is an admitted fact that "nature abhors a vacuum," that every space within the bounds of creation, when relieved from the occupation of any one substance or portion of matter, must immediately be taken possession of by some body of some kind or other that immediately fills up the void, so it is with this our Society. True to the laws of Nature, this our "Natural History Society" has provided that on my leaving this chair, there shall be no vacancy unoccupied — for our Society in this respect, like Nature, abhors a vacuum; but it will be immediately filled by my successor, and one far more able than I can pretend to have been, to do justice to the office, and add strength and reputation, by his own scientific knowledge, to the position which he has been elected to fill. I have now only, therefore, to take my leave of you, as your President, to thank the various officers of the Society, and other members, for the kindness and attention I have received from them, and to introduce to you Mr. Dawson, F.G.S., and Principal of McGill College in this city, as the President of the "Natural History Society of Montreal," for the ensuing year. (Loud cheers.)

His Lordship then left the Chair, which having been taken by Principal Dawson, he rose and said, — I regard as a very high honor, the position in which I have been placed. I look upon it as a tribute not to myself, but to the subjects of scientific investigation to which I have devoted myself. And I hope and trust that the place of President of the Natural History Society will not during my incumbency be found a vacuum; at least, it shall not be want of exertion or pains on my part, if it be But on referring to the programme I find that I am not now to make a speech, but to announce to you what perhaps you will listen to with more pleasure, that in about twenty minutes from this time refreshments will be on the table below, and that until then we shall adjourn and inspect the collection of specimens and curiosities in the other apartments; or view the wonders and beauties of Nature through the Microscopes which Dr. Barnston and others have provided for our amusement and instruction.

The company then adjourned below, and examined with the greatest interest the collection in the Museum. Dr. Barnston and Mr. E. Murphy had three

powerful Microscopes on the table which attracted numbers of the fair visitors, and many of the gentlemen. The refreshments were prepared in the Library by Mr. Alexander, of Notre Dame Street. After an adjournment of about three quarters of an hour, business was again proceeded with in the Lecture Room.

The President (Mr. Principal Dawson) took the Chair and said:—

LADIES AND GENTLEMEN,—It is not my intention to deliver a formal address, but merely to bring before you, perhaps in a somewhat desultory manner, a few thoughts that have occurred to me as suitable to a social meeting of this kind; and at the same time, having some bearing on the functions and policy of this Society. And in the first place, I would remind you that Science does not always appear, as on the present occasion, in holiday attire; nor does it confine itself to the lecture room or the library; but that it often toils severely and imposes on itself hard fare and self-sacrifice. It scales every mountain, gropes in every mine, toils through every wilderness, boils its camp kettle by all streams, pores over the minutest objects, anatomises the least agreeable creatures, stifles itself in laboratory fumes, breaks stones like a road maker, and carries loads like a porter. In short, when you see the scientific man in his working garb, you may well be pardoned for supposing, as a kind old lady once remarked of a Scottish geologist, that he looks like one "who has seen better days."

The true naturalist, animated by that enthusiasm which alone can furnish an adequate incentive to the work, delights in such labours, and combines them with the eager search for great general principles and natural laws. Such men must form the basis of a society like this. Without them there may be meetings and agreeable small talk, but no progress in original investigation. To such men, on the other hand, a scientific association offers great benefits. It gives them that encouragement which they often require; it gives them means of investigation which, individually, they could not command; it gives them influence by their union with one another, and with men who value science, though they may not themselves labour in its advancement as original enquirers. Above all, it gives opportunities for friendly discussion. Isolated enquirers, especially in a new country, where few can devote themselves wholly to scientific pursuits, are very liable to be satisfied with half truths, which are near akin to error, or to enter on unprofitable paths of enquiry. But if they bring their results before a society like this, they are subjected to the criticism of others who may have had superior opportunities of investigation, or who, from the same facts, may have reached conclusions in some respects different. Free discussion of this kind is the life of science: and however hardly the author of a paper may be dealt with, if he is a true lover of truth, he feels satisfied that to have all defects and errors thoroughly exposed is best, not only for the interests of science, but for his own ultimate reputation.

To such free and fearless criticism every paper, however high the the reputation of its author, must be subjected in a scientific society; because the object is not to uphold any preconceived views, but to arrive at the pure and simple

truth. Many persons present must have read in the last of the late Edward Forbes's lighter productions, his review of Murchison's Siluria, the comparison of the discussions of the Geological Society, so fierce in their progress, yet so friendly in their issue, with the carousals of the deified heroes in the Scandinavian Valhalla, where the fabled gods of our ancestors were supposed, after their feasts, to hack and cut each other to pieces, only that by the vigour of their immortal nature, each fragment might be immediately restored to its fellow, and all reappear sound and unhurt. You may also remember the anecdote, in the same paper, of a military gentleman, who having been present at one of these disputatious meetings, retired somewhat precipitately, under the conviction that if he remained he would infallibly be called on to act as second in some of the affairs of honour which must grow out of the discussion. The Report read this evening asks for original Papers, and I trust that we shall discuss them with this combination of the earnest love of truth with the most perfect good humour.

This Society may also render an important service to Science in Canada and elsewhere, by publishing such papers as may endure the test of its criticism. Hitherto, the Society has done comparatively little in this direction, while many British American papers have been published abroad; but if good papers be furnished, little difficulty will be found in having them printed, and widely circulated.

Another important function of this Society is, that of forming a depot for al. interesting objects of Natural History; and thus rendering them accessible to those who can appreciate their value; and at the same time affording facilities to Students. In this valuable department, this Socety has done much, and we may hope will do much more.

It is also one of the functions of a Scientific Society to exert itself to popularize science in such a way as to extend its humanising influences, to make it generally attractive, and to enlist new workers in its varied fields of investigation. The success of the lectures of the past winter should encourage us to make still more energetic efforts in this direction in future.

Lastly, allow me to say, that though abstract science is our proper field, we regard it also in its utilitarian ends, and in its highest and holiest relations. This society has already, on several occasions, successfully labored in the development of the industrial resources of this country; and, more or less, all its labours tend in that direction. An excellent illustration of the utility of apparently small matters in science, lies before me in these beautiful engravings of Canadian fossils, which are exhibited by Sir W. E. Logan, as a specimen of the style in which he desires to publish the new forms of organic life, discovered in the course of the survey; and which, if so published, will greatly extend the scientific reputation of Canada. It may appear of little consequence that, in ages far bygone, certain little shell-fish, distinguishable from each other only by minute and sometimes almost microscopic characters, lived in this country and have left their remains in its rocks; yet by the study of these ex-

tinct forms of life, that arrangement of the rocks of the country which is necessary to the understanding of its mineral resources, may be accomplished in much shorter time and with far greater certainty than without their aid; and thus years of labour to the survey, and of expense to the Province, may be saved.

In like manner Natural Science, in all its departments, connects itself with our higher spiritual relations, by refining and enobling our minds, and by leading us from nature to its Divine Author. It is true that Natural History is in itself merely intellectual; it is not to be identified with either morality or religion, and is sometimes unhappily dissociated from them, yet it is akin to these higher interests. Like the sunlight, it shines on the evil and the good, and may sometimes light a bad man in the path of crime; but in its natural and its general consequences it is allied to good, and has no affinity with those social and moral evils which emphatically belong to the darkness.

Actuated by such views, and following out these paths of usefulness, I trust that our Society may steadily prosper; and as a favourable omen of our success in the ensuing year, it gives me much pleasure to state that our active and zealous Vice-President, Mr. Latour, has announced his intention of offering a gold medal for the best Essay on any Department of Canadian Natural History, to be read at the concluding meeting of next Session.

The Hon. Judge Aylwin being called upon by the President, said:—

Ladies and Gentlemen,— I should not undertake to address this meeting, if I understood that any thing I was to say should be connected with any one of the natural sciences. I must confess my utter ignorance of all the *ologies*—I am sorry to be obliged to confess my entire ignorance of geology. But just because of this, I can better appreciate the efforts of others, in founding an institution like the present, and contributing, by the accumulation of facts, to our present stock of knowledge. Facts, Ladies and Gentlemen, are always important. There is knowledge in stones, as there is knowledge of a higher kind. But without the knowledge of the art of reasoning all would be unavailing. And a man's reasoning may be faulty in the extreme, and calculated to mislead others; but if in his study of nature, and the observations he makes in the course of that study, he chooses to state merely facts, and state them truly,—whatever efforts he may make to mislead, the result must be necessarily unavailing, for the Baconian Philosophy controls and overrides all *ologies*.

The infidel Voltaire, boldly assumed to be an encyclopedia to himself; and, in the pride of his supposed science, to put down religion and its Divine Founder; but his puny efforts have long since been scouted by genuine philosophers. Others have attempted to follow in the same career, and will have the like success; for notwithstanding all the apprehensions created in timorous minds, the votaries of science work on, and the more they work on, the result is found to be only to confirm us the more, if ever a doubt we had, of the existence of a Creator and Redeemer. As to the advantages to be derived from institutions such as the present, I cannot flatter myself that here any very brilliant results will be obtained. But we have the power to accumulate fact after

fact, and so to state them, as to enable others by analysis to arrive at results useful to themselves and to the world. I am satisfied this institution has not languished in consequence of want of effort on the part of its members. It is no reason for discouragement that in every point of view it has not been so successful as its best friends could have wished. On the contrary it should induce the members to use greater efforts for the time to come. There is more expected from us now than ever there was before. I recollect the time when no man would have dared to admit he was a Canadian—or the admission would have been made with pain. Now we are proud to own our country; and not a little flattered at its progress and prosperity. And we have reason to be proud of our fellow townsman, Sir Wm. Logan, of the position he occupies, the fame he has attained. When he first commenced his scientific investigations, he could scarcely himself have hoped for such a result; for the very science in which he has now attained so much eminence, in its infancy, was rather disliked than otherwise. He might have entered the walks of trade and commerce, and therein attained to opulence or wealth. He might have attached himself to any one of the learned Professions, and no doubt, with his love of study, and habits of thought, he would therein have obtained eminence and distinction. But for the love of the science alone, he probably entered upon its investigation; and by this desire to investigate facts and accumulate them he has probably attained his well-earned honors in the way he least expected. And there is this to be said of Sir Wm. Logan. He has received these honors by universal assent. The honors conferred on him at Home have been confirmed by the unanimous voice of his fellow Colonists. [Cheers.]

It would be trespassing on the time of the meeting were I to make further observations. But I cannot conclude without congratulating the society on the acquisition which it made by electing the Bishop as President. His Lordship is not a Canadian born; but we must not draw invidious comparisons between the natives of this country, and those who possess the same claim as ourselves, acknowledging and loving the same Queen. To his energy and wise judgment Montreal is already indebted in many respects; and the members of the Society had never done a better act than when they appointed him to the highest office they had it in their power to bestow. I have no doubt that he will not be a stranger among us; that he will very shortly be thoroughly naturalized, and sympathise with us more strongly than any one who newly came from that England, which my grandfather left a century ago, and which I may be destined never to see. Let it be the object of this society, then, to accumulate facts, and though I shall be proud to see that science shall be directly benefitted thereby, as I have already said I can hardly expect, so limited is our sphere of investigation, that this will be the result. The persevering efforts of your new President are well known, and by a continuance of them, he will be enabled to arrive at conclusions, confirming others in the opinions they have formed, or striking out a new and better path for himself—(cheers.)

Dr. Barnston then read the following Paper :—

ON SOME OF THE FORMS OF SNOW CRYSTALS AND THE DIFFERENT ELECTRICAL STATES OF THE ATMOSPHERE DURING THEIR FORMATION. BY CHARLES SMALLWOOD, M.D., L.L.D.

In taking a cursory view of the objects that surround us, the most casual observer must be often impressed with the beauty and variety of the forms exhibited in the three vast Kingdoms of Nature—the Animal, Vegetable and Mineral; and upon a closer and more minute inspection, we are almost led to adopt the Platonic doctrine, that Deity proceeds by Geometry.

The types and forms of matter which are every moment brought before us, have led some few to trace their different shapes, to generalize their outward features, and to reduce, as it were, to a standard, the vast number of objects, organic as well as inorganic.

The Geologist has his primitive rock — the Naturalist his archtype skeleton— the Botanist his cell developement, all of which bear witness, that beneath the outward form there exists an unknown agency wielded by the Omnipotent Power of "Him who created all things."

The subject of our present investigation is one of those meteors, which all of us living in Canada, have had many frequent opportunities of observing, if not of admiring; but few of us, I dare say, have taken the trouble to look into the minute and perfect Geometrical structure of the evanescent Snow Crystal, which presents as distinct a mathematical form of crystalization, as that which characterizes the more lasting and indestructible gem that bedecks the Regal Crown.

The subject has been the study of Aristotle, Descartes, Kepler, Scoresby and others, but I shall not dwell on their investigations, because made in a climate different from our own, but shall at once proceed to give the results of my own feeble and unmerited efforts, and by so doing endeavour to enlist others to labour in this, an interesting department of Meteorology.

For many years past my attention has been called to the different varieties of the snow crystals of our climate, which I found to depend upon well defined hexagonal or six-sided prisms, all the jacets or angels of which have an inclination of 60 degrees. This constitutes the primitive form or type; and so far as my observation goes, a combination of discs and prisms, of this simple and primitive form, gives rise to those of a more elaborate character. (Specimens of the crystal were put in and explained.) There are many and various forms not here described; but those now enumerated form the type of the whole. Snow falling when the Thermometer is only a few degrees below the freezing point, does not possess any distinct crystaline form, being merely frozen masses, irregular in shape, and scarcely even transparent, but the greater the degree of cold, the more distinct and well defined are the crystals. The size of the perfect crystal is ftom 1 to 2 tenths of an inch, only in diameter, and who does not but admire the handy-work of that Almighty Power, that made in so small a space so beautiful and distinct a crystal, possessing a true mathematical

character, and what must be the immense numbers of these small bodies, that fall in the great snow storms of our Canadian winter, when we call to mind that during the winters 1854-5, no less than 86 inches deep of these small crystals fell.

"A shower of gems is strew'd around;"
The flowers of winter, rich and rare;
Rubies and sapphires deck the ground,
"The topaz, emerald, — all are there."

But to obtain a perfect view of these crystals it is necessary to submit them to examination immediately after their fall, for if allowed to remain for ever so short a time, the angles become rounded, and it is then difficult to define their true and distinct characters.

Intimately connected with this subject, and one to which I would draw attention, are the different electrical states of the atmosphere, during the formation and fall of these crystals.

During my observations on the different crystalline forms, my attention was at an early period drawn to the fact, that whenever the forms Nos. 1, 2, 3 and 4 were present, the electrometers indicated the presence of *negative* or *resinous* electricity, especially during the fall of those crystals marked Nos. 1 and 2. On the other hand the *stellar* or *star form*, No. 5 and its varieties, were always accompanied by electricity of a *positive* or *vitreous* character; and I have found from observation that snow storms, when the crystals are of a perfect form, are always accompanied by indications of atmospheric electricity of a negative character and high intensity; but whenever the crystals are imperfect, or are shapeless masses of ice, presenting no crystaline form, then the electrometers indicate electricity of a positive character, and of very feeble intensity.

The question now is, do the different electrical states of the atmosphere give rise to those different forms of crystals, or does the formation of those crystals excite a different electrical state of the atmosphere?

I trust shortly to be able to lay before you a solution of those interesting and scientific questions, for in the pursuit of this object it requires patient and attentive investigation during the most inclement season of our rigorous climate; but how happy should I be if these short observations should be the incentive to others to assist in this interesting branch of scientific research, and that to Canada should be awarded the claim of the discovery.

The apparatus that I have used in these investigations for collecting and examining the electrical state of the atmosphere, consists of a pole 70 feet high, upon which is twisted a copper rod, the lower part of which is fixed on a glass pillar; this glass pillar is kept warm and dry by a small lamp to preserve insulation. At the other or upper extremity is a copper lanthorn, also containing a lamp, to keep a current of dry air around it; this forms the collecting apparatus, which is lowered when required, for the purpose of trimming the lamps. From this descends a conductor, to which are fixed measures, or what are called electrometers, for measuring the amount or intensity. Other instruments are also used for indicating its kind, whether *positive* or *negative*. Great care is re-

quired in the construction and use of this apparatus, as results fatal to life have sometimes occurred. The unfortunate Professor Richman was, on the 6th of August, 1753, at a meeting of the Academy of Sciences, when the sound of distant thunder caught his ear. He hastened with his artist to his observatory, and while intent upon examining the electrometers, a spark passed through his body, instantly depriving him of life. A red spot was found on his forehead, his shoe was burst open, and the door of the apartment was torn to pieces.

The method I have adopted to obtain enlarged outline copies of the snow crystal, consists in first throwing a magnified image either on photographic paper or by means of the common camera obscura. By this means the different angles may be measured and drawn out on paper. The copies now shown are obtained by the chromotype process, which consists in exposing to the sun for a few minntes paper prepared by washing with a solution of chromate of potash and sulphate of copper having the outline-drawing superimposed; it is then washed with a weak solution of nitrate of silver, and afterward with water, and then allowed to dry.

I have now only to express my regret at not being able to be present this evening; but circumstances, over which I have no control, have been the only cause of my absence; for it would have been to me a source of great pleasure to be *one with you*, to render honour to Sir William E. Logan, who, though tardily, has yet received that especial mark of her Majesty's favour, to which he was so well entitled, together with the approbation of the Emperor of France; and I feel that he will cherish these honors as an acknowledgment of his unwearied exertions in that laborious department of science to which he has devoted so many years of his life, and to which he has contributed so much. With a wish for his future prosperity, and for the prosperity of the Montreal Natural History Society, its office-bearers and members, I conclude this brief and imperfect sketch.

Dr. Holmes afterwards addressed the meeting at considerable length, sketching the History of the Society, of which he was an original member, since its formation, and dwelling upon his early friendship with Sir William Logan, and the many agreeable associations connected therewith.

And the President, in conclusion, thanked the ladies and gentlemen present for their attendence; and referred to some interesting points noticed in the several addresses—more especially to the place which Canada, and British America in general, might take in the department of original scientific investigation; glancing at the past and present progress of Canadian science, and anticipating still greater results in the future. He also noticed the remarks made on the subject of making science popular and attractive, and thanked Dr. Holmes for his observations on this subject, in which he expressed his cordial concurrence.