

TRANSACTIONS

OF THE

Astronomical and Physical Society of Toronto,

FOR THE YEAR 1895,

INCLUDING SIXTH ANNUAL REPORT.



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must be a subject or object of possible knowledge. Want of progress in the investigation, is no valid argument against its possible solution.

The words of Prof. Tait are again appropriate here, "Failure in the eyes of a genuine scientific man, is only an encouragement to persevere."

Any satisfactory theory must, however, successfully meet the requirements with which the subject is conditioned, namely, (*a*) the energy must be such as can be transmitted by a solid, or pseudo-solid, and (*b*) penetrate all bodies without diminution of force, (*c*) must be a radiant and continuous (*d*) diminishing in intensity as the square of the distance. Though the *cause* of gravitation remains still unknown, it may not always be so. Of the great generalization itself, I cannot do better than close with the words of Prof. Taylor, "But as yet, this grand generalization of universal gravitation, after two centuries of busy thought and daring speculation, still remains the largest, clearest, surest, yet attained by man ; and with each revolving year, new demonstrations of its absolute precision, and of its universal dominion, serve only to fill the mind with added wonder, and with added confidence in the stability, and the supremacy of the power, in which has been found, 'no variableness, neither shadow of turning, but which, the same yesterday, to-day and forever.'"

SIXTH ANNUAL MEETING.

January 7th, 1896 ; the Vice-President, Mr. John A. Paterson, M.A., occupied the chair.

After the reading of the minutes of the previous meeting, reports from the various officers were received.

Mr. Chas. P. Spaling, Recording Secretary, reported that there had been held during 1895 twenty-four regular meetings of the Society, with an average attendance of about thirty members, and two open meetings, to which the public had been invited. All arrangements in regard to the removal of the Society's effects to the Technical School building had been satisfactorily completed. Mr. G. G. Pursey, Librarian, presented a list of donations to the Library during 1895. This included a number of valuable works on astronomy presented by the retiring President, Dr. Larratt W. Smith, Q.C., to whom the thanks of the Society were specially due. The various observatories and scientific bodies which in

the past had favoured the Society by forwarding copies of their publications, had continued to do so in 1895 ; while several, making donations for the first time, had kindly intimated that the Society would be placed upon their regular exchange lists.

Mr. J. Todhunter, Treasurer, reported that the balance of cash on hand would be sufficient to meet the expenses now being incurred in connection with the publication of the *Transactions* for 1895; the income of the Society was, however, still too small to warrant certain expenditure which had been recommended by the Council. It was with the strictest economy only that all necessary expenses could be met. On motion, the Treasurer's report, being duly certified, was adopted.

The election of officers for 1896 was then proceeded with, and resulted as follows—Hon. President, Hon. G. W. Ross, LL.D.; President, Mr. John A. Paterson, M.A.; Vice-Presidents, Mr. Arthur Harvey and Mr. R. F. Stupart; Corresponding Secretary, Mr. G. E. Lumsden; Recording Secretary, Mr. Charles P. Sparling; Treasurer, Mr J. Todhunter; Librarian, Mr. W. B. Musson; Assistant Librarian, Miss Jeane Pursey; Assistant Secretary and Editor, Mr. Thos. Lindsay; Members of Council—Messrs. C. A. Chant, B.A., J. R. Collins, A. DeLury, B.A., G. G. Pursey, ;and Rev. C. H. Shortt, M.A.

It was moved by Mr. T. Lindsey, seconded by Mr. A. Elvins,

Resolved, That the Society place on record its high appreciation of the services of Mr. G. G. Pursey, who had voluntarily retired from the office of Librarian; one who had been among the first in Toronto to take active steps towards the founding of the Astronomical and Physical Society, and who had indeed, during the whole of his life since early manhood, been actively interested in scientific pursuits.

This was carried unanimously.

It was moved by Mr. G. E. Lumsden, seconded by Mr. T. Lindsay, and

Resolved, That section 1 of Article III. of the Constitution be amended by adding the following words after the word "officers" in the fourth line, viz., "and every ex-President and ex-Vice-President"

This was carried.

It was then moved by Mr. G. E. Lumsden, seconded by Mr. W. B. Musson,

Resolved, That we, the officers and members of The Astronomical and Physical society of Toronto, hereby tender our thanks to our retiring President, Larratt W. Smith, D.C.L., Q.C., who has for the past two years so capably filled the chair. We owe to him a debt of gratitude, not only for the uniform interest he has exhibited

in our pursuits, but, moreover, a special meed of praise for the munificence of his gift to our Library, thus giving tangible proof of an earnest devotion to the cause of science and an earnest desire for the advancement of our knowledge therein. It has been our loss that the infirmities of years have prevented him from more frequently discharging his duties among us as our presiding officer. We, however, confidently expect to retain the benefit of Dr. Smith's counsel in the direction of our affairs, and it is our hope that He that doeth all things well will so tenderly guide our retiring President that his life will yet grow richer in happy years and brighter yet as it moves onward from the mere discoveries of human experience to that revelation of divine good that crowns every useful life. May it be long ere with him it grows late and dark.

The resolution was adopted and the Recording Secretary instructed to inscribe the same upon the minutes of the Society.

It was moved by Mr. Chas. P. Sparling, seconded by Mr. A. Elvins,

Resolved, That we, the officers and members of The Astronomical and Physical Society, of Toronto, hereby offer our thanks to our retiring Vice-President, E. A. Meredith, LL. D., for the uniform and kindly interest he has always exhibited to us in our meetings and pursuits. It has been most gratifying to us all to have enjoyed the distinction of ranking amongst our officers the name of Dr. Meredith. Although he retires from our list as Vice-President, we yet confidently trust to retain the benefit of his counsel in the direction of our affairs. If a man will but keep his light shining, the Almighty will put it where it can be seen. We earnestly hope that our retiring Vice-President, full of years and rich in life's experience and of mature scholarship as he is, will be helped to keep his light shining, and we know that it will be seen ever lustrous and clear for the good and the right and the true.

The resolution was adopted and the Recording Secretary instructed to inscribe the same upon the minutes of the Society.

Mr. R. F. Stupart, Director of the Toronto Magnetic Observatory, presented the following

REPORT OF THE EARTH CURRENT COMMITTEE.

During the past year, through the courtesy of Mr. S. S. Dickenson, Superintendent of the Commercial Cable Company at Canso, N. S., returns showing the direction and voltage of Earth Currents measured at 5 a.m. each day on the Company's cables, have been received at Toronto. These readings are likely to prove most useful and valuable; they have been charted, the ordinates used being the current expressed in volts and time. On the same paper have been charted curves showing the daily mean values of the vertical and horizontal magnetic components at Toronto Observatory. A comparison of the curve formed from the Earth Currents, measured on a cable running eastward from Canso to

Ireland, with the magnetic components, is especially interesting, as there is often a marked similarity in the curves, indicating pretty clearly that there is a close connection between the two phenomena; doubtless had we a continuous record of the Earth Currents the comparison would be still more interesting, and the connection more evident.

In the accompanying table are given the values of the E. C. readings for the month of April, together with the absolute values of the magnetic elements :—

APRIL, 1895.

DATE.	EARTH CURRENTS IN VOLTS. CANSO, N.S. CABLE NO. 3	HORIZONTAL FORCE, TORONTO.	VERTICAL FORCE, TORONTO.	TOTAL FORCE, TORONTO.	DECLINATION, TORONTO.
1	+ 3.28	0.16645	0.60271	0.62527	284.9 West
2	+ 8.82	0.16657	0.60283	0.62541	284.3 “
3	- 2.85	0.16662	0.60252	0.62514	284.0 “
4	+ 0.20	0.16670	0.60276	0.62539	283.9 “
5	+ 4.02	0.16647	0.60285	0.62540	285.9 “
6	+ 1.62	0.16651	0.60267	0.62525	285.4 “
7	+ 1.20	0.16652	0.60313	0.62581	285.7 “
8	+ 0.62	0.16663	0.60282	0.62542	285.3 “
9	+ 0.38	0.16653	0.61262	0.62520	284.0 “
10	- 0.45	0.16650	0.60304	0.62560	285.8 “
11	+ 9.76	0.16635	0.60257	0.62511	281.6 “
12	+ 20.32	0.16623	0.60321	0.62570	285.2 “
13	- 1.36	0.16643	0.60300	0.62554	283.6 “
14	+ 1.83	0.16647	0.60263	0.62532	282.9 “
15	+ 2.43	0.16650	0.60273	0.62530	285.3 “
16	+ 0.55	0.16659	0.60311	0.62569	288.8 “
17	+ 6.10	0.16649	0.60256	0.62514	284.5 “
18	+ 4.83	0.16649	0.60285	0.62542	283.7 “
19	+ 0.22	0.16651	0.60288	0.62545	283.3 “
20	- 0.48	0.16648	0.60290	0.62546	283.6 “
21	+ 1.54	0.16660	0.60304	0.62564	285.6 “
22	- 0.37	0.16667	0.60251	0.62540	284.6 “
23	- 3.15	0.16669	0.60274	0.62537	283.6 “
24	+ 1.22	0.16653	0.60296	0.62554	284.7 “
25	+ 1.02	0.16658	0.60277	0.62537	282.2 “
26	+ 9.80	0.16647	0.60275	0.62531	286.1 “
27	+ 0.50	0.16657	0.60261	0.62534	284.9 “
28	+ 0.20	0.16660	0.60311	0.62571	285.4 “
29	+ 2.23	0.16663	0.60289	0.62549	284.9 “
30	+ 1.50	0.16670	0.60280	0.62543	284.9 “

It was then announced that at a special meeting, to be held Jan. 21st, the President would read a review of astronomical progress during the past year, and the proceedings were brought to a close by adjournment.