

1917

REPRINTED FROM THE JOURNAL
OF THE ROYAL ASTRONOMICAL
SOCIETY OF CANADA,
FEBRUARY, 1917

164

ASTRONOMY IN CANADA.

The Royal Astronomical Society Of Canada

PRESIDENT'S ADDRESS, ANNUAL MEETING, JANUARY 23, 1917.

BY

ALBERT D. WATSON

TORONTO:
1917

PLATE II.



SAMUEL CLARE



CHARLES POTTER



ANDREW ELVINS



JAMES L. HUGHES, LL.D.



ROBERT RIDGEWAY

ORIGINAL MEMBERS OF TORONTO ASTRONOMICAL CLUB, 1868

ASTRONOMY IN CANADA

BY ALBERT D. WATSON

PRESIDENT'S ADDRESS, ANNUAL MEETING, JANUARY 23, 1917.

THE semi-centennial of Canadian Confederation is a timely occasion for reviewing a science whose history in Canada coincides almost precisely with the life-period of this Dominion. This statement is supported by a paper on "Meteors and Falling Stars," read before the Canadian Institute, Feb. 4th, 1854, by T. Hemming, Esq., who expressed his regret that the name of Canada is not found to bear any conspicuous position in the catalogues showing the recorded observations of meteoric phenomena, and hoped that this would not be the case much longer.

In the same year an interesting report on the solar eclipse (May 26) was presented before The Canadian Institute by Professors Cherriman and Irving, and there is evidence of a paper by one Lefroy, afterwards Governor of Bermuda, but no record of further interest in astronomical matters is to be found prior to 1868 so far as I have yet been able to discover. It is, therefore, safe to say that the chronicles, in our land, of the science of Astronomy, cover, pretty accurately, the Confederation period.

In any important field of progress or research, whether in science or statesmanship, the pioneers are not often over self-conscious. They are, as a rule, enthusiasts to whom their work seems like an apostolate, they themselves being but its humble votaries. They are not much given to making records of their own memorable contributions to the cause. They are too busy laying foundations, to engrave their names on the rocks of those temples which they see rising under their hands. The records, even when available, are extremely meagre. The first adventurers into these lonely fields are so little in the light, they fail to realize how vast is the human interest in their heroic doings. Heroes are ever the last to recognize themselves as heroes.

The history of Astronomy in this Dominion, especially in its beginnings, is no exception to this general rule which is borne out by the modesty and reticence of its earliest pioneers. They were, almost without exception, men of unassuming mind and presence. Were we of the ROYAL ASTRONOMICAL SOCIETY OF CANADA, whose duty it is to tell the story of its birth and celebrate its early heroes, to neglect our task, those heroes would remain "unhonoured and unsung." In assuming our proper duty of tracing as accurately and effectively as may be, the antecedents and early history of this society, we shall find our work as difficult as such beginnings usually are. The recorded data are meagre in proportion to the amount of work done and to the results attained by that interesting group of faithful pioneers.

If any are disposed to apply to those results tests of valuation strictly physical, I object to such appraisal as being entirely inadequate. There may have been "mute inglorious" Herschels or Schiaparellis in that little group. Some of us are inclined to think there were. In any case, there were those whose vision was enlarged and made clear by their investigation of those sublime energies and harmonies of nature which constitute its spirit and its law. Their reverence became more profound as they contemplated the unseen forces that balance the suns and swing the planets in their elliptic ways. A faith larger than any creed

demands gave poise and peace to those noble adventurers on a sea with undiscovered shores.

The camera and the spectroscope are the instruments that more than any others have made our modern Astronomy. These were in use for astronomical purposes before the history of the science in Canada began. In 1851, Bond, of Cambridge, had exhibited excellent photographs of the moon, and Huggins had demonstrated the spectra of the stars, thus introducing the science of celestial chemistry, in 1862-3. From these facts, it will be seen that the modern astronomical era had begun before the first astronomical society had been organized in Canada.

The introduction of these instruments has revolutionized many of our views and extended our field of research. The spectroscope has turned our thoughts rather to the physical than to the astrometrical phases of the science, and the camera has increased the number of accurately measured star-magnitudes from a few thousands to millions. Most of you will probably know that the Paris Photographic Congress of 1887 divided the work of photographing the heavens among eighteen observatories. As a result of their work, a map consisting of 22,000 sheets has been prepared showing all stars down to the 14th magnitude, and numbering in all more than two million stars. Copies of these sheets are in possession of the Royal Astronomical Society of Canada.

In our own solar system, many scores of minor planets have been revealed to the camera; treasures of detail in planetary investigation have discovered themselves to its searching eye, and moons that cannot be seen by the actual eye have revealed themselves as dots on the photo-plate. Nothing, since Galileo turned what John Milton called his "optick tube" upon the moon has so loosened and extended the boundaries of our vision, both optical and instrumental, as have these two wondrous instruments of science and vision. Though in quite another field of investigation, they will ever stand with the discoveries of Kepler, Galileo and Copernicus as fundamental to the science.

We have already observed that the beginnings of History are

elusive. We cannot dig up the roots of our own being. The real *fons et origo* of our Society is hidden in the whole course of Astronomical science and in the scientific predilections of those who first organized the various clubs and societies which constituted the forbears of the present Royal Astronomical Society of Canada.

The first society organized in Canada exclusively for the study of astronomical science was held in the Mechanics' Institute building at the corner of Adelaide and Church Streets. The building has since given place to the Toronto Public Library. As the minutes of the first meeting are concise, they may be quoted verbatim. They are as follows:

"Minutes of a meeting held Dec. 1st, 1868, in The Mechanics' Institute, to take into consideration the propriety of forming a society for the prosecution of astronomical science.

"Present:—Messrs. Mungo Turnbull, Andrew Elvins, Daniel K. Winder, James Hughes, Samuel Clare, Robert Ridgeway, Charles Potter, G. Brunt.

"On motion, Mr. Ridgeway was appointed Chairman of the meeting, and Mr. Clare, Secretary.

"Moved by Mr. Elvins, seconded by Mr. Turnbull, that a society be formed under the name of The Toronto Astronomical Club, having for its object the aiding of each other in the pursuit of astronomical knowledge: in order to which it is proposed:—

1. To meet monthly at such time and place as may be agreed upon.
2. To spend the evening somewhat as follows:
 - a. Reading extracts, from papers or publications, of anything new or otherwise interesting, bearing on the subject, of Astronomy.
 - b. Reading original papers connected with any department of Astronomy.
 - c. Examining anything new in astronomical science.
 - d. Observing celestial objects if circumstances should favour our doing so.
 - e. Conversation, etc. Unanimously adopted.

"Moved by Mr. Turnbull, seconded by Mr. Potter, that Mr. Daniel K. Winder be President for the ensuing year. Carried.

"Moved by Mr. Elvins, seconded by Mr. Hughes, that Mr. Samuel Clare be Secretary-Treasurer for the ensuing year. Carried.

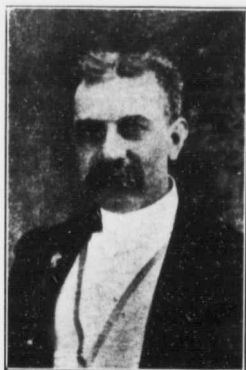
"Moved by Mr. Winder, seconded by Mr. Hughes, that Mr. Ridgeway, the Chairman, with Messrs. Elvins, Clare, and Turnbull, be a Committee to draft a set of by-laws for the government of the club. Carried.

"Moved by Mr. Potter, seconded by Mr. Hughes, that the meetings be held on the first Tuesday evening of every month. Carried.

PLATE III.



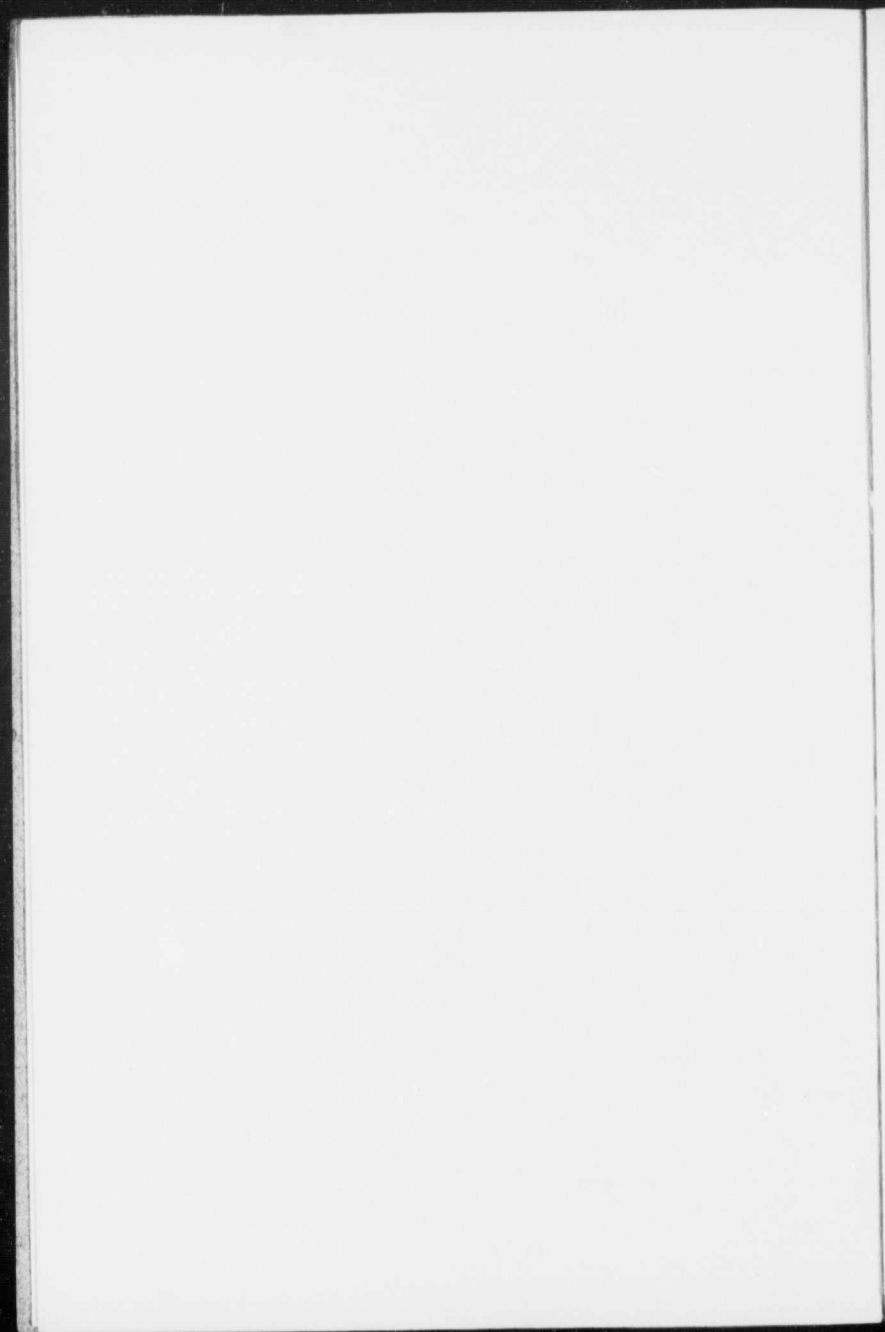
G. G. PURSKY A. ELVINS S. ROBERTS D. J. HOWELL
A. F. HUNTER A. F. MILLER



CHARLES P. SPARLING
CHARTER MEMBER (1890)
GENERAL TREASURER



J. J. WADSWORTH, M.A., M.B.
SIMCOE, ONT. (1905)



"Moved by Mr. Winder, seconded by Mr. Brunt, that the next meeting of the Club be held at the house of Mr. Elvins on the first Tuesday in January, 1869, at 7 o'clock. Carried.

"Paper to be read at the next meeting by Mr. Turnbull, entitled: 'A Brief Notice of the Past and Present State of Optical Science, Viewed Chiefly in its Bearing on Celestial Discovery.'

"Mr. Winder gave notice of a paper to be read by him at a subsequent meeting on 'The Spectroscope—Its Construction and Application to Celestial Chemistry.'"

From such modest beginnings the meetings continued, being held in the homes of all the members, each in turn taking his place as host of the Society.

The second member added to the list was Mr. Thos. Thompson of the Mammoth House, with whom both Mr. Elvins and Mr. Brunt were employed.

As some personal interest must attach to these pioneers of Astronomy in Canada, it will be proper to admit here some notes of reference to them. Their names will be treated in the order in which they occur in the minutes quoted above.

Mungo Turnbull, a well-educated Scotch cabinet-maker, had accompanied a polar expedition as a carpenter some years before the Toronto Astronomical Club was founded. His chief interest in Astronomy was dependent upon his remarkable skill as a maker of optical instruments. The first paper read before an organized astronomical association in Canada was that presented by Mr. Turnbull before the Toronto Astronomical Club on the evening of January 5th, 1869. In the minutes of that meeting, his paper is entitled, "A brief notice of the past and present state of optical science; viewed chiefly in its bearing on Astronomical telescopes and celestial discovery." After an interesting conversation on the subject of the paper, it was "Moved by Mr. Elvins, seconded by Mr. Ridgeway, 'That the thanks of the meeting be given to Mr. Turnbull for his instructive paper, and that he be requested to allow the original Manuscript to become the property of the club, as being the first paper read before the Society.'" Carried. Mr. Turnbull kindly consented, Mr. Ridgeway offering to write out a copy for him.*

*The second paper read before the Club was one by the President, Mr.

D. K. Winder, on "The Spectroscope." The third was a paper by Mr. Elvins entitled: "The Moon—its Physical Constitution and Motions." The fourth paper was contributed by R. A. Procter, B.A., F.R.A.S., the subject being "The Great Nebula in Argo."

Another of Mr. Turnbull's early papers was read exactly five months later (June 5th, 1869), the meeting on this occasion being held in Mr. Turnbull's residence on Bellevue Ave. The subject was "The Doctrine of Eclipses." Enough of this paper is outlined in the minutes to show that the author held a very lofty conception of the aims and achievements of the Science. Before the members left they were invited to inspect Mr. Turnbull's reflecting telescope, which he had lately completed. The minutes record that "The skill and perseverance of the maker were plainly seen in the workmanship."

I very well remember a visit to Mr. Turnbull in later years and how my conversation with him and his wife impressed me with the deep resentment of both at the unpardonable neglect by the public of the science of star-law, which, as they claimed, would have served to ennoble the public mind had it been given right of way with its beneficent influence.

Mr. Turnbull's active interest in astronomical matters was maintained for many years, and all the older members still alive will remember his constant interest in the Science. He died before the incorporation of the Society under its present royal charter.

Andrew Elvins, though keeping always, as far as he could, modestly in the background, and avoiding the chief places of responsibility, will, nevertheless, always be regarded by those best fitted to judge, as the virtual father and *facile princeps* of the founders, of the first Canadian astronomical society.

Born May 4th, 1823, in that part of Cornwall where the Phœnicians secured tin from the ancient Britons, the beautiful minerals first attracted his attention and led him into scientific pursuits. This probably turned his life-course away from the Christian pulpit, for which he was at one time intending to prepare. When, in 1844, he came to Cobourg, Ontario, he continued to collect minerals, and later, sold his collection for a substantial

sum, moved to Toronto and engaged in business with the "Mammoth House."

His days being now entirely occupied, he could no longer make geological excursions, so turned his attention to the stars. He had been interested in Astronomy when only 14 years of age, and at that time made diagrams of star-groups which, corresponding pretty closely with similar groups represented in Chambers' Encyclopædia, he was encouraged to continue his studies.

During his stay in Cobourg, he had met Professor Whitlock of Victoria College, and they together continued to study Geology. Here he had met also Mr. Samuel Clare, already named in foregoing pages as the first Secretary-Treasurer of The Toronto Astronomical Club. Mr. Elvins became a close friend of these gentlemen. They had many conversations during which various scientific interests were discussed with great freedom and deliberation. Among the subjects discussed, Astronomy had a chief place, and when Mr. Elvins later met Mr. Clare and his friend and fellow-teacher, Mr. Ridgeway, in Toronto, these studies and researches were continued in their new place of abode. It will readily be seen how the formal organization of the Toronto Astronomical Club simply marked the definite enlargement and crystallization of a work which had been already under way in easy and pleasant stages among these friends.

Throughout the whole history of the Society in Canada, Mr. Elvins has been active and helpful. When it is stated that he presided over the Canadian astronomical interests for some years, it is necessary to explain that he has never been President pursuant to any election to that office, but rather by virtue of the fact that his interest in the work and his intimate knowledge of the subject made him, despite his repeated refusal of election to a presidential relation, the logical chief of a society over which, at any rate, he, for many years, actually presided.

In a small volume containing the TRANSACTIONS OF THE ASTRONOMICAL AND PHYSICAL SOCIETY OF TORONTO for the years 1890-1891, original letters are bound which embody correspon-

dence between Mr. Elvins and several world-renowned astronomers such as George E. Hale of Chicago University, Edward S. Holden, LL.D., Director of the Lick Telescope at Mt. Hamilton, and Professor E. E. Barnard of the same Observatory. When Barnard discovered a fifth satellite to Jupiter, it was very well known by the members of the Society in Toronto that Mr. Elvins had persistently predicted the discovery of such a satellite and wrote to Professor Barnard, advising search for it. Professor Barnard's reply is in possession of the Society. He continued to predict further discovery of additional moons after that time. The several moons since discovered pertaining to Jupiter may or may not prove much as to the validity of the grounds upon which Mr. Elvins made his predictions, but as to the facts of the case as stated above, no scientific assertion could stand on more solid base. Those who know him best and who are qualified to speak on the subject are of the opinion that had Mr. Elvins had the early training of a professional astronomer, his wonderful aptitude in the scientific field, his originality and enthusiasm together with his logical mind and singularly acute powers of investigation and research, would have given him easily a prominent place among astronomers of world-eminence.

In the course of a paper read at the annual meeting in the year 1891, Mr. Elvins said among other things:—

"We hope to see the Professors in our Colleges, Principals in our High Schools, Teachers in our Common Schools, join our Society and lead it. Any feeling that would divide University men from others less fortunate, ought to be suppressed—destroyed is a better word. Professors who hold chairs in Universities, and Edison, who never passed through one, should be proud of each other

"We hope to see a popular Observatory in Toronto, one to which all citizens can go and see for themselves the interesting objects about which they read, and to which the student may have access when his own instruments are insufficient

"Fields of conquest for future students lie before us. Our Society aims at bringing these together and aiding them in their work. Lovers of the mighty and the beautiful will unite with us; when we lay down our instruments, they will follow with better ones, and aid in unfolding questions obscure to us when we like 'streaks of morning cloud, shall have blended into the distant azure of the past'

"We do not know each other's religious faith or political creed. Pro-

fessor Mitchell and Father Terry, Father Secchi and Rev. T. W. Webb are the best of friends. Anything which can bring men together as friends is lifting humanity to a higher plane."

In 1893, Mr. Elvins was honoured for his services to the science and to the Society by being tendered a life membership in the Astronomical and Physical Society of Toronto. I believe it will readily be conceded that no other member, past or present, of our Society has contributed one-half as many papers to its proceedings as has our venerable friend who, we are pleased to say, is still, at the age of nearly ninety-four years, living among us with a considerable maintenance of intellectual vigour and occasional flashes of the old-time fire.

The singular beauty of his spirit is manifested in a letter written on one occasion to one of our Past Presidents. He closed this letter as follows:—

"If there be no meeting past the grave,
If all is silence,—darkness,—yet 'tis rest;
Be not afraid, ye waiting hearts that weep,
For God still giveth His beloved sleep,
And if an endless sleep, He wills,—so best."

"I can conceive," he adds, "no happier state in which to live, or in which to die, than that which leads us to say 'Not as I will, but as Thou wilt.'"

Daniel K. Winder, being opposed to war under all circumstances, was not comfortable in his Cleveland home when civil war broke out in the United States in 1861. He came to Toronto and, being of the same religious persuasion as Mr. Elvins, and a former lecturer on Astronomy in a United States College, he was attracted to the little group of friends who loved the stars. Being at that time the most thorough astronomer of the group, he was at once accorded a prominent place. While he earned his livelihood as a printer and Mr. Elvins was in the clothing business, they together constructed a telescope out of the crudest materials. This was in 1868. Sometimes he preached. He was a kindly and sanguine person and very popular. After the war was over, he returned to Detroit and, later (1891) became a corresponding member of the Society. He died in Detroit in 1898.

James L. Hughes was a very young man in 1868 when he assisted in the organization of the Toronto Astronomical Club. Few men are better known to-day in this part of the Dominion. Dr. Hughes was, in the early days, a teacher in the Model Schools of Toronto, and it was through Mr. Clare, who was at the time teaching in the Normal and Model Schools, that Mr. Hughes was led to attend the first or organization meeting.

Honoured at an early age with the Chief Inspectorate of the City Schools, he became an authority in educational matters, and is an author and publicist of wide repute. He is a celebrated Dickens scholar. His optimism, his loyalty and his energy have made him, like his distinguished brother, a personality of great influence and charm. In the present world-struggle Dr. Hughes has been a keen sufferer and has the deepest sympathy of thousands of his fellow countrymen.*

Dr. Hughes is a poet, wholesome and radiant. The following stanza closing his touching poem entitled "Chester" tells its own story:

"So through the years will the streamlet,
River and wave-crested sea,
Dawnlight and sunshine and eve-glow,
Star-gleam and flower and tree,
Bird-song and growth-time and wind-breath,
Whisper his sweetness to me."

Samuel Clare, being, as we have already shown, an intimate friend of Mr. Elvins, both in Cobourg and in Toronto, was associated with the astronomical work from the beginning, and it appears to have been his influence that led both Mr. Ridgeway and Mr. Hughes into the Club. We have already shown that at that time they were all teachers. The first minute book of the Society has now reached almost its jubilee year, but it would be hard to find anywhere minutes couched in handwriting more beautiful than that in which Mr. Clare recorded the transactions of this pioneer club.

The present chief officer of The Royal Astronomical Society

*Remains of Lieut. Chester Hughes, son of Dr. J. L. Hughes, interred in Locre, Belgium.

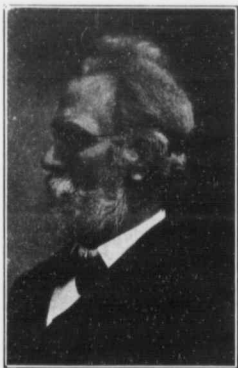
PLATE IV.



ALLAN F. MILLER
CHARTER MEMBER (1890)



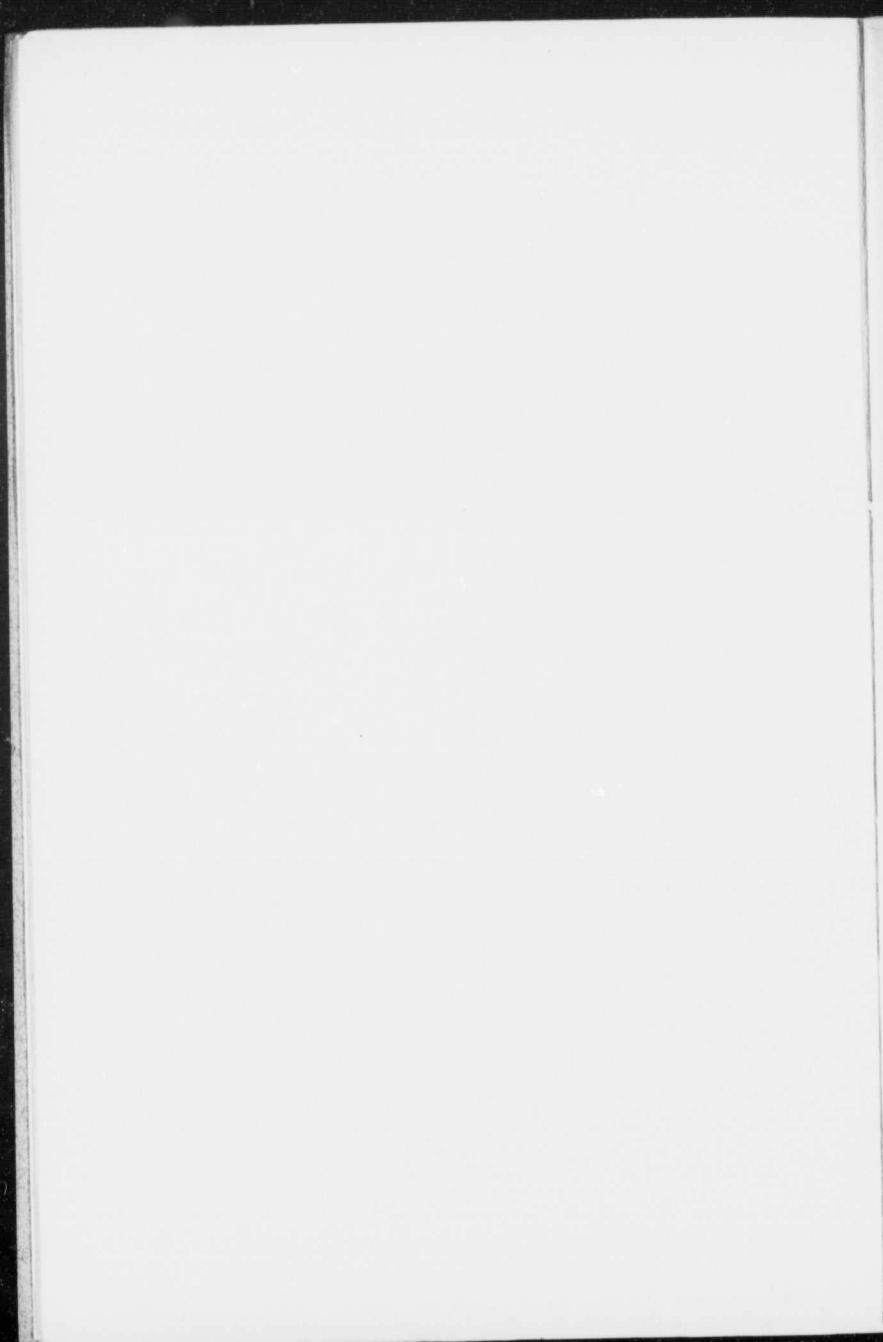
THOMAS LINDSAY
RECORDING SECRETARY 1895-1900



GEORGE G. PURSEY
CHARTER MEMBER (1890)



WM. F. KING, B.A., LL.D., C.M.G.,
Former Chief Astronomer
HONORARY PRESIDENT, 1906-16



of Canada has the honour of being a son-in-law of the first Secretary-Treasurer of The Toronto Astronomical Club.

Mr. Clare's was a mind constitutionally mathematical, a temperament serene and kindly. Apart from his friends, his greatest delight was in the calculus, and his extreme modesty was almost a fault, for it prevented him from accepting positions for which his capacity thoroughly fitted him. One of his favourite quotations was:

"The daisy by the shadow that it casts
Protects the ling'ring dewdrop from the sun."

Robert Ridgeway has been referred to already as Chairman of the organization meeting of The Toronto Astronomical Club. His name occurs in every list of those reported present throughout the Club's history, save only one. He appears to have been a man of ability and usefulness. He is reported in the minutes as having read a paper, September 6th, 1869, on "The Velocity of Light." Like his companions in this venture on the sea with undiscovered shores, he seems to have been anxious to be helpful and obscure, rather than lime-lighted and ornamental. After coming to Toronto, he taught in the Jarvis St. Collegiate Institute. Afterwards he was for some years a customs official, and during the year 1871, the first year of its existence, was editor of the Canadian Magazine.

Charles Potter was the well-known optician. He helped many a young astronomer to obtain his first instrument, and always took a keen interest in the progress of astronomical science in this Dominion. He died some years ago.

George Brunt was one of the partners in the "Mammoth House." He was an accountant there. Mrs. Thompson and Mrs. Brunt were sisters. He took an active interest in the Society, as shown by the minutes. He lived on George St., where one of the meetings was held.

These are the names of all those who at the first constituted The Toronto Astronomical Club, a Society which changed its name at its sixth monthly meeting. For a time it was known as

The Toronto Astronomical Society. This seems to have been its name from 1869 to 1879 and again from 1883 till 1890.

There were times when The Toronto Astronomical Society was not a very vigorous institution. Indeed, the records are meagre throughout all the years during which this name and title was recognized as representing the organized scientists in astronomical fields of research. Mr. Elvins assures me, however, and his accuracy is confirmed by others who have knowledge of the facts in the case, that the meetings have never been discontinued at any time since their inception in 1868. The Society has at various times enlarged its scope, narrowed it, changed its name (five different names are recorded), but never have its activities been wholly relinquished. When no president was formally elected, Mr. Elvins usually presided, but when it was possible to secure the election of a President, Mr. Elvins retreated again into the shades of private membership.

During the summer of 1879, a vigorous renaissance occurred under the name of The Recreative Science Club. This Club was the organization which, for the next few years, absorbed the astronomical interest of all those who had constituted The Toronto Astronomical Society prior to 1879. It was therefore the mainstream of the science during those years, and its records are a part of the chronicles of the Society in the fullest sense of the word. This revival of interest secured a better record of transactions. As a result, we have before us again a list of members among whom, of the original members, only two remain, Mr. Elvins and Mr. Turnbull.

During this period, the meetings were held chiefly at Mr. Elvins' residence, 11 St. Vincent St., though some were held at the Canadian Institute rooms on Richmond St. at the corner of Clare St., and others at the homes of other members. At this time Mr. Roberts, of the firm of Laird and Roberts of King St., had charge of the Section of Astronomy. Mr. Elvins was the President and Mr. G. G. Pursey acted as Secretary. Among the other prominent members of the Recreative Science Club was Dr. Wm. Brodie, the celebrated entomologist. Mr. Joseph Clare, a

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son of the first Secretary-Treasurer, was interested chiefly in Geology. Mr. G. H. Armstrong was interested in the Natural History Department under the leadership of Mr. Elvins. He is still a frequent attendant at our meetings.

George G. Pursey, the Secretary of the Recreative Science Club, has been so closely identified with the Society for the past thirty-seven years, that it seems desirable to refer to him for a moment. Born in Walton, Somersetshire, March 18, 1831, he received his education in the church school, there being no day school in the village. He joined with five other boys to raise a fund to buy books, the first of which to fall into George Pursey's hand was one by Robert Owens on industrial reform. Emerson's "Essays" followed, and when the books were distributed, the essays of the Concord Sage fell to the lot of our friend. They are still in a good state of preservation. I have seen the volume, which is now about seventy years old.

The day when he heard Elihu Burritt lecture was a red-letter day in the boyhood of George Pursey. He came to Canada in 1857. When the Recreative Science Club was organized, besides being Secretary, he was in charge of the department of General Literature. His contributions to the proceedings were ever characterized by grace of diction and a far imaginative sweep. He was a charter member of the Astronomical and Physical Society of Toronto when it was incorporated in 1890.

For nearly eight years, he made daily drawings of those sun-spots which were visible in Toronto. His apparatus was homemade. He made his own telescope. He is still living, victory-winged, in his home at No. 137 Helendale Ave., a shrine to all those who love idealism and the lofty simplicity of great souls. A lover of stars and trees and flowers, to him

"The meanest flower that blows
Can give thoughts that do often lie too deep for tears."

And yet, he loves people far more than stars, and meets all lovers on the open roads of life. Is not this life of poise and peace the only real life?

Several names now appeared upon the roll for the first time.

Among these were those of J. Foster, Prof. Ramsay Wright, John Bengough, Sr., Dr. Cowdry, and others.

Allan F. Miller, now First Vice-President of the Society, became a member about the year 1882. He has been for many years a recognized specialist in the chemistry of the heavenly bodies. The first working spectroscope seen by him was that made by Mr. Elvins, the prism employed being cut from a glass pendant. He made experiments with similar prisms, but soon ascertained that useful work demanded better appliances. After trying out a Hoffman chemical spectroscope, he imported a Browning universal spectroscope and a Browning star spectroscope, which he used in all his studies of stellar spectra, including his researches when the Nova Persei appeared in February, 1901. He also used a Vogel star spectroscope. In Dec. 1884 he imported a Rowland grating which he purchased from Mr. Brashear, then a comparatively unknown man. He has long used a powerful induction coil and the connected appliances in these studies.

Mr. Miller was probably the first person in Toronto, if not in all Canada, to see the solar flames or prominences, and to study and photograph the solar spectrum with a powerful instrument. He paid much attention to solar physics during 1885-6-7, and through all the years since as constantly as his busy life has permitted.

Perhaps the best work he has done for the Society was in a series of addresses on stellar motions. In 1901, he gave a brief resumé of his work (visual, spectroscopic, micrometrical, parallaxic) during the visibility of Nova Persei, which object he noticed quite independently on the night following its discovery by Rev. Dr. Anderson.

Mr. Miller made spectroscopic, visual, and micrometric observations of Mira during some twenty years and once wrote a remarkable paper on the spectrum of the fire-fly. Some of his articles have been quoted by foreign journals and received with favour in Great Britain. His investigations of Nova Persei and of binary and other stellar systems have been notable for their thoroughness,

and place their author without any doubt among those who were born to be astronomers.

George E. Lumsden was introduced to the Society by Mr. Miller. No one throughout its whole history, not even Mr. Elvins, did more for the science in Canada in a like period than Mr. Lumsden was able to accomplish during his membership. He succeeded in interesting Hon. G. W. Ross in the work. All subsequent helpfulness of the various Governments began, as it now seems, with that providential chain of events in which our worthy Vice-President was the primary link.

A reawakening of the energies of the Society occurred in 1890, when Mr. Elvins, Allan F. Miller and Geo. E. Lumsden undertook the project of securing incorporation for the Society under the caption of THE ASTRONOMICAL AND PHYSICAL SOCIETY OF TORONTO. Their efforts were successful, and the cause was furthered by the accession of greatly increased energy and financial resources. The proceedings were henceforth more closely related with the world of science in general, and the Governments and Municipal authorities began to take a financial interest in the work.

The officers of the newly incorporated body were:

<i>President:</i>	Chas. Carpmael, M.A., F.R.S.C.
<i>Vice-President:</i>	Andrew Elvins.
<i>Corresponding Secretary:</i>	George E. Lumsden, F.R.A.S.
<i>Treasurer:</i>	George G. Pursey.
<i>Recording Secretary:</i>	D. J. Howell.
<i>Librarian:</i>	Allan F. Miller.

Among the members who came in at that time or soon afterwards, and who have since been very active in the doings of the Society were the following: Charles Carpmael, President under the new charter; Thomas Lindsay, who soon became Secretary, and whose untimely death was so sadly lamented by everyone who knew and loved that delightful and able mathematician, whose skill in figures was almost genius; Larratt W. Smith, Q.C.; John A. Paterson, Q.C., M.A.; Arthur Harvey, F.R.S.C., etc.; Freder-

ic, now Sir Frederic Stupart, F.R.S.C.; W. B. Musson; all of whom afterwards became Presidents. J. G. Ridout, Miss A. A. Gray, Mr. John R. Collins, and Charles P. Sparling; all since officers of the Society. Rev. C. H. Shortt, M.A., may also be named as a distinguished member of the Council during this period.

Of the Corresponding members, Andrew F. Hunter, M.A., of Barrie, now a valued active member and a regular contributor to the proceedings; D. K. Winder, of Detroit, a name already mentioned in this sketch; J. C. Donaldson, LL.D., of Fergus, an indefatigable and careful observer; John Goldie, of Galt, a generous benefactor of the Society; J. J. Wadsworth, President of the Simcoe branch, and an able and practical astronomer; T. S. H. Shearman, of Brantford, Mrs. R. A. Proctor, W. F. Denning, of Bristol, Eng., Mr. Hollingworth, of Beatrice Ont., and Miss Agnes M. Clerke, of London, Eng., were notable examples.

The following celebrities accepted Honorary membership in the Society at this time:

W. H. M. Christie, LL.D., F.R.S., etc., Astronomer Royal.
Sandford Fleming, C.E., C.M.G., LL.D., Chancellor,
Queen's University.

Professor E. S. Holden, LL.D., Director, Lick Observatory.
William Huggins, D.C.L., LL.D., Ph.D., F.R.S., Hon.
F.R.S.E.

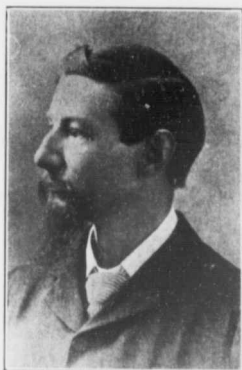
Professor Daniel Kirkwood, LL.D., etc.

Joseph Morrison, M.A., M.D., Ph.D., F.R.A.S., etc.

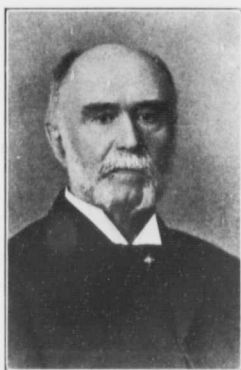
Professor Simon Newcomb, LL.D., Supt. Amer. Naut.
Almanac Office.

Since then others equally distinguished and representing the great observatories and universities of the world have cordially permitted their names to be associated with our Society as Honorary members or Honorary Fellows. Of these are such men as Darwin, Langley, Hale, Pickering, Lowell, Frost and Campbell. We record with deep regret the passing of Professor Lowell, of Flagstaff, and of Professor Backlund, of Pulkowa, Russia, both

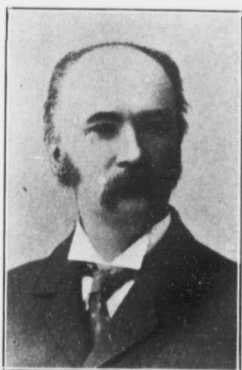
PLATE V.



CHAS. CARPMAEL, M.A., F.R.A.S.
1890-1894



LARRATT W. SMITH, D.C.L., Q.C.
1895



JOHN A. PATERSON, M.A., K.C.
1896-7



ARTHUR HARVEY, F.R.S.C.
1898-9

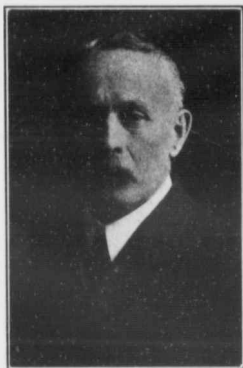
PAST PRESIDENTS



PLATE VI.



GEORGE E. LUMSDEN, F.R.A.S.
1900-1
CHARTER MEMBER (1890)



SIR FREDERIC STUPART,
F.R.S.C., F.R.A.S.C.
1902-3



CLARENCE A. CHANT, M.A., Ph.D.
1904-7



W. BALFOUR MUSSON
1908-9

PAST PRESIDENTS



of whom were elected during the past year to Honorary Fellowship in our Society.

In June, 1891, an Opera Glass Section was organized under the direction of Geo. E. Lumsden, with Mr. Clarence Hall as Secretary. The section did good work, meeting in the parks and reporting at frequent intervals to the Society. A Lunar Section was established in 1896 under the same enthusiastic leader. The following quotation is from the report of that year: "Among the more active members of the section who kept up their work during the year were J. J. Wadsworth, M.A., M.D., of Simcoe; J. C. Donaldson, LL.D., of Fergus, and the veteran Mr. A. Elvins, of Toronto."

The financial disabilities of the Society, even after its incorporation, are vividly suggested by the fact that the meetings were still held in the homes of the members. After Sept. 11th, 1891, the first meeting of each month was held in the rooms of Dr. Foster at the corner of Yonge and Gerrard Sts. The transactions show that "Members shall have liberty to increase the space allotted to their papers at their own expense, subject to the approval of the Reading Committee."

Some humour emerges in the transactions even of a scientific society. Those who knew Mr. Thomas Lindsay will recognize his fine hand in the following entry of August 11th, 1891.

"Mr. Lumsden noticed a difference between English and American authorities in some star names. He instanced Scorpio, which in the American Ephemeris is Scorpius, while in both, the genitive is Scorpii.

"The members present had studied the stars at the expense of their Latin, but were of the opinion that if the nominative is Scorpio, the genitive would be Scorpionis. As no one would swear to the nominative, a member appointed himself a committee to look up the matter."

I presume that to-day we must conclude that the Great British Empire has a right to the privilege of making its own Latin. Another of the many facetiæ of Lindsay declares that

"As usual, after the Vice-President's papers, the discussion might have lasted till midnight, but the meeting adjourned at ten o'clock."

This, of course, was a naïve tribute to the many-sided suggestiveness of all that Mr. Elvins presented for consideration.

But Mr. Lindsay is not to be noticed adequately in a mere allusion. His historical work on the Nautical Almanac was much appreciated by the makers of that great work, and had the life of its historian been spared till his task was completed his achievement would have been, in our judgment, monumental.

About this time, Mr. Larratt W. Smith presented to the Society the three-inch refractor which had been bequeathed to him by the late J. G. Howard, the donor of High Park. A little later, upon the death of Sir Adam Wilson, a good friend and patron of astronomic science in Canada, his six inch reflector was presented to the Society by his widow.

In Dec. 1891, the annual meeting which had hitherto been held in the spring, was transferred to January, additional offices were created and thenceforth the Society boasted an Honorary President, a second Vice-President, and a Patron. The Council also was enlarged. Hon. G. W. Ross, LL.D., then the Minister of Education, was elected Honorary President; Mr. Carpmal was re-elected as President; Larratt W. Smith and Jno. A. Paterson were the Vice-Presidents; Mr. Pursey was elected as Librarian, and all the other officers were re-elected. The total membership was now fifty-eight.

About this time a feature was introduced which in later years has given the members and citizens a great deal of profitable pleasure. Open meetings held in commodious auditoria were provided by the Society when distinguished speakers were available, so that as many as would might hear the very best presentation of the science in its various fields of interest. One of the first of these meetings was addressed by the widow of the celebrated Richard A. Procter, on Nov. 10, 1891. Her subject on that occasion was the Lick Observatory on Mount Hamilton, California. Since then, at frequent intervals, several of the greatest of world-astronomers have given to the public of Toronto through the medium of our Society a series of able and distinguished addresses culminating in that of the late Professor Lowell, of Flagstaff, Arizona, delivered last winter in the Assem-

bly Hall of the New Technical School and so much enjoyed by all who heard it.

Many notable papers have been read before our various clubs and societies, papers which taken together with innumerable verbal reports of investigations, observations, and discussions, constitute the continuous stream of things astronomic in the Dominion from the earliest times. In order to avoid invidious distinctions and yet fairly cover the ground, an analytical index, classified subjectively, and associated with the names of its authors and the pages on which the particular subjects may be found in the Transactions and Journals, is to be published in the near future and it is hoped that this analytical index will be of service to those who intend to write papers or investigate the various subjects treated in the Society. Some of these papers are from astronomers of world-wide fame and deal with living themes. Another class of papers consists of those delivered by retiring Presidents. These have been chiefly of an historical character.

The Society has exercised all its influence at various times in favour of certain reforms in reference to which there was but one opinion among its members. One of these efforts arose out of the confusion of a civil day beginning at midnight, while the astronomical day is calculated from noon. Under the leadership of Sir Sandford Fleming, The Society sought in 1893 and the following years to have the astronomical day changed so as to correspond with the civil day. A Committee, consisting of Sir Sandford Fleming, Arthur Harvey, George Kennedy, Alan McDougall, Charles Carpmael, J. A. Paterson, and Geo. E. Lumsden, was constituted to conduct the effort. Circulars were sent out and questions were propounded to the leading astronomers and navigators of the empire. The overwhelming response to these enquiries was favourable, but the change was not effected, owing, probably, to the non-concurrence of the authorities at Washington.

In 1896, a paper was presented which proposed a revolutionary reform of the calendar. It was shown that a simple and scientific calendar involving a year of 13 months of 28 days each, with one day in each common year and two in each leap year

to be regarded as belonging neither to any week nor to any month would so reconstruct the year that instead of the fourteen different calendars now required to set forth our frowsy method of presenting our process of days and months and years, we should have one simple form of year which would be so easily remembered that no printing of the calendar would henceforth be necessary for all time. All years would be alike except for the added leap year day. The changes of the moon would be so nearly coincident with the months that it would be known just when new moon would occur in every month even from the beginning of the year. Dates also would occur always on the same days of the week throughout all time.

This paper was received with enthusiasm by the Society, which printed it in full in its transactions, but it would seem that

"No might of armies and no rage of storms can turn"

one little habit from its track, however foolish it may be, if once ingrained into the customs of the race. The world will still use its anomalous method of calculating its astronomical day from noon and its fourteen foolish calendars, as it has done for so many centuries.

Notwithstanding the failure of its efforts to bring about these reforms, the Society was never in a more vital state of prosperity than when engaged in active campaigns which sought to benefit the scientific world. The members of our Society learned how appalling is the inertia of the average mind even of educated men. Was not Galileo mistaken when he whispered his famous aside about the world: "*e pur si muove?*" We have the satisfaction of knowing that when the scientific world adopts a properly constituted astronomical day and a sane calendar, they will be using those proposed by our Society more than twenty years ago, and now on record in all the astronomical libraries of the world.

One of the most thorough and interesting papers ever presented before the Society was that of Professor C. A. Chant, M.A., Ph.D., on the great passage of meteorites over the continent on Feb. 9th, 1913. The thorough estimates of mass, height, course,

sounds, and destination, were worked out in a way that gladdened the hearts of all investigators. Those who failed to observe that remarkable phenomenon at the time of its occurrence, may still have the pleasure of reading this valuable and thrilling article in the Transactions of that year. The same is true of all the excellent papers published in the Society's Transactions, and no better or more pleasant way can be found to acquire a working knowledge of Astronomy than to join this Society (the cost being but nominal, \$2.00 per annum) and thus gain the privilege of reading all these papers, reports and observations.

That the Transactions of the Society have a great value is shown by the interest taken in many of the papers by scientists throughout the world. Many of these papers, the authors of which are private or official members resident in Toronto or in other centres of our Canadian Society, have been published either wholly or in part in Great Britain and foreign lands. Some have been translated into foreign tongues and credit has been accorded our Society by distinguished scientists in the various astronomical centres of the world.

A list of the Presidents of the several clubs and societies from the beginning, as far as the records show, is as follows:

1868	Daniel K. Winder.
1879	Andrew Elvins.
1890-1894	Charles Carpmael, M.A., F.R.A.S.
1895	Larratt W. Smith, Q.C., D.C.L.
1896-1897	John A. Paterson, Q.C., M.A.
1898-1899	Arthur Harvey, F.R.S.C.
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1902-1903	Frederic Stupart, F.R.S.C., F.R.A.S.C.
1904-1907	Clarence A. Chant, M.A., Ph.D., F.R.A.S.C.
1908-1909	W. B. Musson.
1910-1911	Alfred T. DeLury, M.A., F.R.A.S.C.
1912-1913	L. B. Stewart, D.L.S., D.T.S.
1914-1915	J. S. Plaskett, B.A., D.Sc., F.R.A.S.C.
1916	Albert D. Watson, M.D.

During the same period the General Secretaries were:

1868	Samuel Clare.
1879	G. G. Pursey.
1890-1899	Geo. E. Lumsden, F.R.A.S.
1900-1901	W. B. Musson.
1902-1916	J. R. Collins.

Other officers who should be mentioned as having rendered much service to the Science through the Society are Mr. Charles P. Sparling, at whose house the instruments of the Society were stored for some time, many years Recorder, and still the excellent and careful Treasurer; Messrs. J. E. Maybee, J. Ridout, J. Todhunter, former Treasurers; Mr. J. E. Webber, Miss Elsie Dent, Dr. L. Gilchrist, and Mr. W. E. W. Jackson, M.A., Recorders; and Rev. R. Atkinson, Alfred MacFarlane, John Ellis, Kenneth Clipsham, A. Sinclair, H. B. Collier, Phm.B., and Dr. Wunder, Librarians. Others not hitherto named, who have served the Society with zeal and ability, especially as councillors, are: Mr. Stuart Strathy; Dr. Otto Klotz, LL.D., F.R.A.S.; Sir Joseph Pope, K.C.M.G.; Rev. I. J. Kavanagh, M.A., D.Sc., S.J.; Rev. D. B. Marsh, D.Sc., F.R.A.S.

Many who have devoted able and willing service to the progress of Astronomy in Canada have been and must remain unnamed in this brief resume of the history of the science, but we trust that these will realize that it is not because their services were less valuable than those we have noticed here, but rather, perhaps, because they were less conspicuous, a failing that does not by any means mean failure. In any case, we may be sure of the truth of one proverb though so many be false, viz.: that "virtue is its own reward."

The Branches of the Society before it became the Royal Astronomical Society are of much interest. One was organized in Meaford in 1893 with a score of active and a few corresponding members. This branch reported in the Transactions of the main Society in 1895 and following years. It was organized in November, 1893, and reported transactions and excellent work under the Presidency of Rev. D. J. Caswell, B.D., Ph.D. Mrs. Henry Manly

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PLATE VII.



ALFRED T. DELURY, M.A., F.R.A.S.C.
1910-11



LOUIS B. STEWART, D.L.S., D.T.S.
1912-13

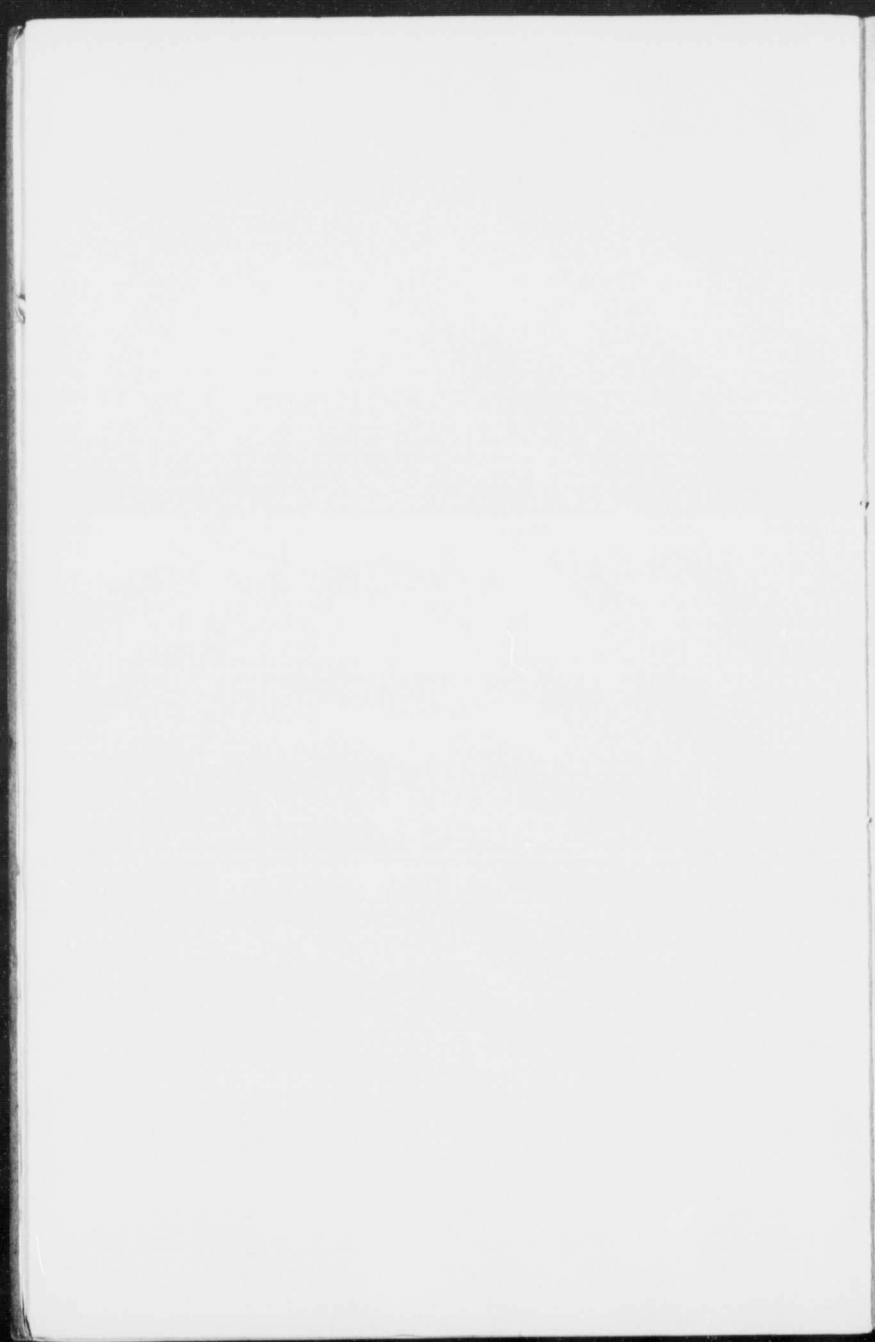


JOHN S. PLASKETT, B.A., D.Sc.
1914-15



ALBERT D. WATSON, M.D.
1916-17

PAST PRESIDENTS AND THE PRESIDENT



was Vice-President, and Mr. Geo. G. Albery, General Secretary.

Concurrently with the Meaford branch, an organization existed in Simcoe, Ont., under the Presidency of J. J. Wadsworth, M.A., M.D., who, with J. C. Donaldson, LL.D., of Fergus, sent frequent contributions and reports of observations to the Society in Toronto.

About this time work was reported in Brantford, Woodstock and Galt. Mr. T. S. H. Shearman, with Mr. Alex. Macdonald, of Galt, and Mr. John Goldie, had been able to interest many in these towns. Mr. Shearman is now in charge of a meteorological post and has an observatory near Vancouver, B.C.

In speaking of Mr. Elvins, we have already quoted his democratic hope that a popular observatory might soon be established in Toronto. This was in 1891.

The need of such an observatory for Toronto has long been felt. Mr. Lumsden devoted much thought and effort to this subject, and on January 6th, 1898, Mrs. George Craig, now of Dawson City, Yukon, read a paper on "Popularizing Astronomy," in which she advocated the observatory project, and recommended ways and means of securing and maintaining it. The progress made thus far is encouraging. A friendly feeling for the enterprise, plans earnestly proposed by Council, assurance of co-operation, beautiful plans on paper also, all go to support the conviction that a certain ten-acre lot on the east side of Bathurst Street, and immediately north of Cedarvale Ravine, the property of the City of Toronto, should be transferred to the Parks and Gardens Committee and set aside as a public park, to be known as "Observatory Park," with three acres on its summit, for a noble observatory equipped with a first-class telescope that would point its far-searching eye from that finest of all our surrounding astronomical sites to the still and infinite star-deeps. Let us hope that when the present world-struggle has spent its fury and ended in harmony with the Divine will, this project, so vital to the interests, and so necessary to the repute of Toronto as the educational centre of Canada, may find powerful friends who will see it accomplished.

I am in a position to say that the University and the Royal Astronomical Society are prepared to co-operate with the city in the government of such an institution. There is no doubt that the equipment of a first-class observatory could be provided by private subscription. When the war is concluded this great work will undoubtedly be undertaken, and we trust that success may crown the efforts of those whose unselfish energies are devoted to such a worthy cause. The Royal Astronomical Society desires that such an institution shall be used not only for the members of the Society and for the students of the University, but that it shall be primarily for the benefit of the citizens generally, and in this desire the University is quite in harmony with the Society.

A gold medal is offered annually by the R.A.S.C. to students of the University for proficiency in Astronomical knowledge. This medal was designed by the Society and is emblematic of the science.



MEDAL AWARDED BY THE SOCIETY FOR PROFICIENCY IN
ASTRONOMY

Before the year 1907, elementary Astronomy was taught in the University of Toronto by Prof. Alfred Baker, M.A., while Prof. Alfred T. DeLury, M.A., F.R.A.S.C., was in charge of the mathematical phases of the science. During that year a distinct advance was made when a separate appropriation was devoted to Astronomy, and Prof. C. A. Chant, M.A., Ph.D., F.R.A.S.C., was given entire charge of Astro-physics in the Uni-

versity. Since then, and in the last few years especially, no one in the Society, no matter what his name or degree, has rivalled in usefulness and ability our Professor of Astro-physics. His services as Editor-in-chief of the *JOURNAL*, his work in the University, and his constant interest in the success of the Society are beyond praise.

Some brief reference—a reference too brief in view of the importance of the subject—must be made here to the various centres of the Society recently established in various parts of the Dominion. Of these, thus far, the most important is that which was instituted in Ottawa by the late Honorary President, Dr. King, with the co-operation of some of the present active and official members. Associated with the Dominion Observatory, it has the prestige to which its corps of distinguished workers entitle it.

THE OTTAWA CENTRE was organized in December, 1906. The late W. F. King, C.M.G., LL.D., occupied the chair at the organization meeting. Dr. Plaskett moved, Sir Joseph Pope seconding, "That an Astronomical Society be formed in Ottawa as a Section of The Royal Astronomical Society of Canada." This resolution prevailing, the following were elected as the first officers of the Ottawa Centre:

<i>President:</i>	W. F. King, LL.D., C.M.G.
<i>Vice-President:</i>	Otto Klotz, LL.D., F.R.A.S.
<i>Secretary:</i>	J. S. Plaskett, B.A., D.Sc.
<i>Treasurer:</i>	R. M. Stewart, M.A., F.R.A.S.C.
<i>Council:</i>	Sir Joseph Pope, K.C.M.G.; A. H. McDougall, B.A.; F. A. McDiarmid, B.A.

The roll included 104 names of members.

The Ottawa Centre provides afternoon meetings in which the papers are chiefly technical, the members of the observatory staff being the chief attendants. The evening meetings are of a more popular character and the general public attend these in large numbers. As might be expected from the many able and distinguished astronomers associated with this Centre. The Royal

Astronomical Society of Canada values greatly the willing assistance which Ottawa is constantly giving to other Centres in the form of excellent papers and reports of observations. The late Dr. King was for many years Honorary President of the main Society.

In the few years since the establishment at Ottawa of the Dominion Astronomical Observatory much valuable work has been done. Reference might be made to that of Dr. J. S. Plaskett and Dr. R. E. DeLury on solar rotation; of Mr. R. Meldrum Stewart on clock synchronization and fundamental meridian circle measurements; of Mr. R. M. Motherwell on the photography of heavenly bodies, especially comets; of Mr. F. A. McDiarmid on latitude, longitude and gravity; and of Messrs. W. E. Harper, J. B. Cannon, T. H. Parker, and Dr. R. K. Young on spectroscopic binaries and other subjects. For a long time before the Observatory was erected, Dr. Otto Klotz was associated with the late Chief Astronomer King in notable boundary and other survey work, especially in the determination of trans-Pacific longitudes. In recent years he has made important investigations in seismology, gravity and magnetism. In addition to all the above, much splendid work has been done by Geodetic, Boundary and Tidal surveys.

While an account of this regular work has been printed in detail in Government reports, all that is of general interest has been presented in less technical form in our *JOURNAL*, in which also have appeared many other original contributions relating to the work on which these men are engaged. Thus, besides spreading among our own people a knowledge of what is being done in scientific matters, much comment has been aroused and a general recognition given to our Dominion by the scientific world abroad. Indeed it is not too much to suggest that the *JOURNAL* published by The Royal Astronomical Society of Canada under the able editorship of Dr. C. A. Chant, and his associate editors, Dr. J. S. Plaskett and Sir Frederic Stupart, is doing as much as any other agency in this Dominion to give Canada her rightful place

in the scientific sisterhood of nations. This service of the Society is made possible only by the action of the governments who make annually a moderate grant to the Society for this purpose. The City of Toronto also contributes a small annual sum to the same purpose. The whole amount thus contributed from all sources for 1916-7 is only \$2,700. Those who have a grasp of the situation and understand its effect, who therefore are in a position to form a just opinion, believe that no public money brings more substantial returns both to the honour and to the international repute of our Dominion.

THE PETERBOROUGH CENTRE was organized February 26th, 1907. Rev. Dr. Marsh, F.R.A.S., delivered a lecture that evening in the Charlotte Street Methodist Church on "A Night With the Stars." After the lecture the Centre was organized with 47 members and the following officers:

<i>President:</i>	Rev. Dr. Marsh, F.R.A.S.
<i>1st Vice-President:</i>	Wm. Pringle.
<i>2nd Vice-President:</i>	Duncan Walker, B.A.
<i>Treasurer:</i>	D. E. Easson, B.A.Sc.
<i>Secretary:</i>	F. C. Neal, M.D.
<i>Council:</i>	S. W. Lowry, W. McFaul, M.D.

The meetings of this Centre were held at first in the Y.M.C.A. rooms, but afterwards the Collegiate Institute was available and the meetings were held there. It is appropriate that the meetings of such a Society as ours should be held in an educational institution, and it is hoped that in no municipality of Canada would The Royal Astronomical Society find itself unwelcome in the best buildings which the educational resources of the place afford.

THE HAMILTON CENTRE was built upon a previous foundation. A society existed here which had been in existence for many years, known as The Hamilton Scientific Association. On December 15th, 1908, a meeting was held in the Museum with Mr. G. Parry Jenkins in the chair. Dr. Marsh explained the objects and scope of our Society and strongly urged the formation

of a Centre in Hamilton, to work in affiliation with the Hamilton Scientific Association. Thirty-five names were presented, whereupon Rev. Dr. Marsh and Rev. R. E. M. Brady were appointed as delegates to arrange to have the new organization become a Centre of the Royal Astronomical Society of Canada. The following were the first officers of the Hamilton Centre:

<i>President:</i>	G. Parry Jenkins, F.R.A.S.
<i>Vice-President:</i>	William Bruce.
<i>Secretary:</i>	E. H. Darling, C.E., A.M.
<i>Treasurer:</i>	A. T. Neal.
<i>Council:</i>	J. J. Evel, T. H. Wingham, B.A.Sc.

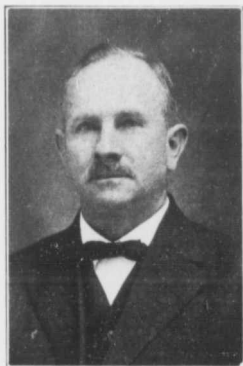
This Centre has been active and successful throughout its whole history, depending largely upon its own resources to make its meetings interesting, and exchanging competent speakers with other Centres from time to time.

Besides the work of Rev. Dr. Marsh and Mr. Jenkins, the Hamilton Centre has been honored by the zeal and interest of its late President, Mr. Wm. Bruce, whose observatory, known as The Elmwood Astronomical Observatory, Upper Hamilton, has been popular for many years. Mr. Bruce is now, at eighty-three years of age, the Second Vice-President of the general Society, and has, during the past year, presented two eloquent papers.

While many artists are idly bemoaning the sad state of affairs Mr. Bruce is setting an example of industry, for though over eighty years of age, he devotes some hours each day to water colour painting. He very happily divides his time between Astronomy and Art.

THE WINNIPEG CENTRE, like that in Hamilton, had its origin in an antecedant Society. Professor Neil Bruce McLean, of the department of Mathematics and Astronomy in the University of Manitoba, organized, in September, 1909, The Astronomical Society of Western Canada. As President of the new Society, Professor McLean was untiring in his zeal. The meetings were held in the University buildings and the University's

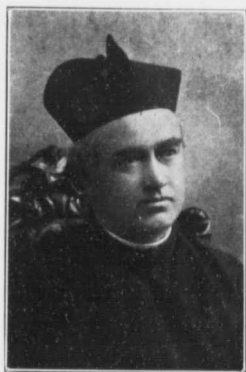
PLATE VIII.



REV. D. B. MARSH, D.SC., F.R.A.S.
ORGANIZER HAMILTON CENTRE



WILLIAM BRUCE, J.P.
HON. PRESIDENT HAMILTON CENTRE



REV. I. J. KAVANAGH,
S.J., M.A., D.SC.
MEMBER OF COUNCIL 1906-17



NEIL B. MCLEAN, M.A.
FIRST PRESIDENT WINNIPEG CENTRE



telescope was made available to the Society one night in each week.

In November, 1910, The Association was incorporated into The Royal Astronomical Society, the following being the first officers:

<i>President:</i>	Prof. Neil B. McLean, M.A.
<i>Vice-President:</i>	C. V. Stout, B.A., C.E.
<i>Treasurer:</i>	Frank Powell.
<i>Council:</i>	Mrs. L. B. Ireland, Mr. Howard, Mr. Collins, Rev. J. Blain, S. J. and Mrs. Kemp.

Professor McLean continued to be President till the end of 1913. During 1914, Prof. L. A. H. Warren, M.A., Ph.D., F.R.A.S., was President, and since that time Mr. C. E. Bastin has occupied this position. Mr. H. R. Kingston is Secretary and is a most energetic officer.

THE REGINA CENTRE likewise had its origin in a previously organized Society. The Saskatchewan Astronomical Society was organized February 25th, 1910, with the following officers:

<i>Honorary President:</i>	Wm. Trant.
<i>Hon. Vice-President:</i>	P. McAra, Jr.
<i>President:</i>	N. McMurchy.
<i>1st Vice-President:</i>	H. Lang.
<i>2nd Vice-President:</i>	J. F. Bryant.
<i>Treasurer:</i>	J. F. Bryant.
<i>Secretary:</i>	H. S. McClung.
<i>Council:</i>	C. B. Keenleyside, J. E. Doerr, Miss E. D. Cathro.

Affiliation with The Royal Astronomical Society was applied for and consummated in Oct., 1910. Since that date the organization has been known as The Regina Centre of the Society which we celebrate to-night.

Early in its history, a four-and-a-half inch Brashear telescope was presented to the Society at this Centre by The Honorable Mr. Justice J. T. Brown.

THE GUELPH CENTRE was organized in 1911. The first meeting was held in the Public Library Building. The following were the first officers:

<i>Honorary President:</i>	Col. A. H. MacDonald, K.C.
<i>Hon. Vice-President:</i>	Dr. W. F. Savage.
<i>President:</i>	Henry Westoby.
<i>1st Vice-President:</i>	Prof. W. H. Day, B.A.
<i>2nd Vice-President:</i>	Dr. J. Lindsay.
<i>Secretary:</i>	H. E. S. Asbury.
<i>Recorder:</i>	J. T. Linton.
<i>Treasurer:</i>	H. J. B. Leadlay.
<i>Council:</i>	A. T. Hobbs, M.D.; Rev. W. J. Wilson, W. C. McLaren, Wm. Tytler, Mrs. H. J. B. Leadlay, Mrs. W. O. Stewart.

Nearly 100 members were soon associated with this Centre.

THE VICTORIA CENTRE claims a fuller notice than its recent origin would warrant. The chief reason is that the Dominion Astrophysical Observatory, Victoria, B.C., is to begin its work there in the immediate future. The director of this observatory will be Dr. J. S. Plaskett, who we are pleased to note, becomes to-night the Honorary President of The Royal Astronomical Society of Canada, succeeding his dear friend, the late W. F. King, I.L.D., C.M.G., in that office. There is little doubt that the new observatory, under such a skilful and practical Astronomer as Dr. Plaskett, will become celebrated for its contributions to the Premier Science. To such a result, the great telescope which he has even now under his charge, will notably contribute, and the wonderfully suitable atmosphere on Saanich Hill, eight miles north of Victoria, B.C., with an elevation of 732 feet, must also be a further enhancement of the future of the Science in our most westerly Province.

Speaking of the new observatory and its equipment with the 72-inch reflecting telescope, Dr. Plaskett stated recently that the action of the Government "in sanctioning the construction of this telescope, larger than any in use, has now been rendered

doubly effective in the cause of science by placing it, independently of any local or sectional influence, where the best and most work can be done. The whole forms one of the largest, if not the largest, single contribution to science ever made by any nation, and Canadians should be proud that their country has so splendidly furthered the cause of astronomical research."

As the work at Victoria Centre is likely to become celebrated, we give some details of its origin. Like many others, this Centre had a predecessor. It was, however, an existence of rather a shadowy nature, as no meetings seem to be recorded. Mr. E. Baynes Reed and Mr. Arthur W. McCurdy, M.P.P., were active in its formation, but it appears that no work of an astronomical character was accomplished.

Largely through the influence of Mr. Arthur W. McCurdy, a meeting was held under the auspices of The Natural History Society, and addressed by Mr. F. Napier Denison. As a result of this meeting and of much assiduous work done by Mr. McCurdy and his associates, an appropriation of \$20,000 was made for a seismological station at Victoria. This station was established, and Mr. F. Napier Denison has been in charge ever since.

When this enterprise was well under way, the same indefatigable workers secured Dr. J. S. Plaskett to give a lecture, and our Honorary President-elect addressed a meeting in Victoria on March 6th, 1914. Mr. McCurdy was the Chairman that evening, and a Centre was organized with 58 members. The following officers were elected:

<i>Hon. President:</i>	J. S. Plaskett, D.Sc., F.R.A.S.C.
<i>President:</i>	F. Napier Denison.
<i>Vice-President:</i>	Arthur W. McCurdy.
<i>Secretary-Treasurer:</i>	C. H. Cotterell, C.E.
<i>Council:</i>	W. S. Drewry, B.C.L.S.; W. J. Sutton, G. G. Aitken, Major C. B. Simonds.

In a letter to Mr. A. W. McCurdy, dated April 14th, 1914, the General Secretary, Mr. J. R. Collins, said:

"Victoria is to be congratulated on the formation of such a strong

centre as your membership list shows it to be. This must be particularly gratifying to yourself, as I believe you are the one chiefly responsible for the successful issue of the affair."

This Centre is active and prosperous and promises a successful future. Besides what information I could obtain from the recorded transactions, I am indebted to Mr. E. M. McTavish, the excellent Secretary of the Victoria Centre; to Mr. C. E. Cotterrell, the first Secretary, and to Mr. McCurdy, the first Vice-President, for the facts pertaining to the formation of this Centre. Others have been equally helpful in supplying the data I have used, among whom I should mention Mr. H. R. Kingston, the energetic and efficient Secretary of the Winnipeg Centre.

It is Social and Political Science that presents those problems in relation to which we of this century must measure up or be condemned at the bar of all future judgment; and though we have already, even in its second decade, begun to

Wreck the towers of yesterday;
Scrap the dead past, and build the future new,

should we succeed thoroughly in such an enterprise, and fill the earth with justice, still, we say of Astronomy that for lofty conception; for induction of general principles from a multiplicity of varied detail; for grandeur of phenomena; for reverence in the presence of Universal Law; for sublimity of imagery and mathematical accuracy of calculation and prediction; Astronomy is still the Premier Science.

We may well quote here the words of Matthew Arnold:

"Weary of myself, and sick of asking
What I am, and what I ought to be,
At this vessel's prow I stand, which bears me,
Forward, forward, o'er the starlit sea.

"And a look of passionate desire
O'er the sea and to the stars I send:
'Ye who from my childhood up have calmed me,
Calm me, ah, compose me to the end!"

" 'Ah, once more,' I cried, 'ye stars, ye waters,
On my heart your mighty charm renew;
Still, still let me, as I gaze upon you,
Feel my soul becoming vast like you.' "

PLATE IX.



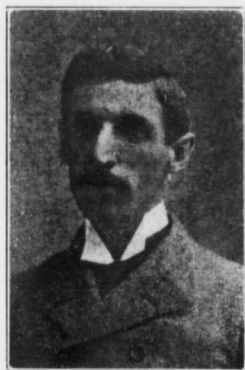
JOHN R. COLLINS
GENERAL SECRETARY 1902-17



SIR JOSEPH POPE,
K.C.M.G., C.V.O., I.S.O.
MEMBER OF COUNCIL 1905-17



HENRY WESTOBY
FIRST PRESIDENT GUELPH CENTRE



F. NAPIER DENISON
FIRST PRESIDENT VICTORIA CENTRE

1917

REPRINTED FROM THE JOURNAL
OF THE ROYAL ASTRONOMI-
CAL SOCIETY OF CANADA,
FEBRUARY, 1917

164

ASTRONOMY IN CANADA.

The Royal Astronomical Society Of Canada

PRESIDENT'S ADDRESS, ANNUAL MEETING, JANUARY 23, 1917.

BY

ALBERT D. WATSON

TORONTO:
1917

PLATE II.



SAMUEL CLARE



CHARLES POTTER



ANDREW ELVINS



JAMES L. HUGHES, LL.D.



ROBERT RIDGEWAY

ORIGINAL MEMBERS OF TORONTO ASTRONOMICAL CLUB, 1868

ASTRONOMY IN CANADA

By ALBERT D. WATSON

PRESIDENT'S ADDRESS, ANNUAL MEETING, JANUARY 23, 1917.

THE semi-centennial of Canadian Confederation is a timely occasion for reviewing a science whose history in Canada coincides almost precisely with the life-period of this Dominion. This statement is supported by a paper on "Meteors and Falling Stars," read before the Canadian Institute, Feb. 4th, 1854, by T. Hemming, Esq., who expressed his regret that the name of Canada is not found to bear any conspicuous position in the catalogues showing the recorded observations of meteoric phenomena, and hoped that this would not be the case much longer.

In the same year an interesting report on the solar eclipse (May 26) was presented before The Canadian Institute by Professors Cherriman and Irving, and there is evidence of a paper by one Lefroy, afterwards Governor of Bermuda, but no record of further interest in astronomical matters is to be found prior to 1868 so far as I have yet been able to discover. It is, therefore, safe to say that the chronicles, in our land, of the science of Astronomy, cover, pretty accurately, the Confederation period.

In any important field of progress or research, whether in science or statesmanship, the pioneers are not often over self-conscious. They are, as a rule, enthusiasts to whom their work seems like an apostolate, they themselves being but its humble votaries. They are not much given to making records of their own memorable contributions to the cause. They are too busy laying foundations, to engrave their names on the rocks of those temples which they see rising under their hands. The records, even when available, are extremely meagre. The first adventurers into these lonely fields are so little in the light, they fail to realize how vast is the human interest in their heroic doings. Heroes are ever the last to recognize themselves as heroes.

The history of Astronomy in this Dominion, especially in its beginnings, is no exception to this general rule which is borne out by the modesty and reticence of its earliest pioneers. They were, almost without exception, men of unassuming mind and presence. Were we of the ROYAL ASTRONOMICAL SOCIETY OF CANADA, whose duty it is to tell the story of its birth and celebrate its early heroes, to neglect our task, those heroes would remain "unhonoured and unsung." In assuming our proper duty of tracing as accurately and effectively as may be, the antecedents and early history of this society, we shall find our work as difficult as such beginnings usually are. The recorded data are meagre in proportion to the amount of work done and to the results attained by that interesting group of faithful pioneers.

If any are disposed to apply to those results tests of valuation strictly physical, I object to such appraisal as being entirely inadequate. There may have been "mute inglorious" Herschels or Schiaparellis in that little group. Some of us are inclined to think there were. In any case, there were those whose vision was enlarged and made clear by their investigation of those sublime energies and harmonies of nature which constitute its spirit and its law. Their reverence became more profound as they contemplated the unseen forces that balance the suns and swing the planets in their elliptic ways. A faith larger than any creed

demands gave poise and peace to those noble adventurers on a sea with undiscovered shores.

The camera and the spectroscope are the instruments that more than any others have made our modern Astronomy. These were in use for astronomical purposes before the history of the science in Canada began. In 1851, Bond, of Cambridge, had exhibited excellent photographs of the moon, and Huggins had demonstrated the spectra of the stars, thus introducing the science of celestial chemistry, in 1862-3. From these facts, it will be seen that the modern astronomical era had begun before the first astronomical society had been organized in Canada.

The introduction of these instruments has revolutionized many of our views and extended our field of research. The spectroscope has turned our thoughts rather to the physical than to the astrometrical phases of the science, and the camera has increased the number of accurately measured star-magnitudes from a few thousands to millions. Most of you will probably know that the Paris Photographic Congress of 1887 divided the work of photographing the heavens among eighteen observatories. As a result of their work, a map consisting of 22,000 sheets has been prepared showing all stars down to the 14th magnitude, and numbering in all more than two million stars. Copies of these sheets are in possession of the Royal Astronomical Society of Canada.

In our own solar system, many scores of minor planets have been revealed to the camera; treasures of detail in planetary investigation have discovered themselves to its searching eye, and moons that cannot be seen by the actual eye have revealed themselves as dots on the photo-plate. Nothing, since Galileo turned what John Milton called his "optick tube" upon the moon has so loosened and extended the boundaries of our vision, both optical and instrumental, as have these two wondrous instruments of science and vision. Though in quite another field of investigation, they will ever stand with the discoveries of Kepler, Galileo and Copernicus as fundamental to the science.

We have already observed that the beginnings of History are

elusive. We cannot dig up the roots of our own being. The real *fons et origo* of our Society is hidden in the whole course of Astronomical science and in the scientific predilections of those who first organized the various clubs and societies which constituted the forbears of the present Royal Astronomical Society of Canada.

The first society organized in Canada exclusively for the study of astronomical science was held in the Mechanics' Institute building at the corner of Adelaide and Church Streets. The building has since given place to the Toronto Public Library. As the minutes of the first meeting are concise, they may be quoted verbatim. They are as follows:

"Minutes of a meeting held Dec. 1st, 1868, in The Mechanics' Institute, to take into consideration the propriety of forming a society for the prosecution of astronomical science.

"Present:—Messrs. Mungo Turnbull, Andrew Elvins, Daniel K. Winder, James Hughes, Samuel Clare, Robert Ridgeway, Charles Potter, G. Brunt.

"On motion, Mr. Ridgeway was appointed Chairman of the meeting, and Mr. Clare, Secretary.

"Moved by Mr. Elvins, seconded by Mr. Turnbull, that a society be formed under the name of The Toronto Astronomical Club, having for its object the aiding of each other in the pursuit of astronomical knowledge: in order to which it is proposed:—

1. To meet monthly at such time and place as may be agreed upon.
2. To spend the evening somewhat as follows:
 - a. Reading extracts, from papers or publications, of anything new or otherwise interesting, bearing on the subject of Astronomy.
 - b. Reading original papers connected with any department of Astronomy.
 - c. Examining anything new in astronomical science.
 - d. Observing celestial objects if circumstances should favour our doing so.
 - e. Conversation, etc. Unanimously adopted.

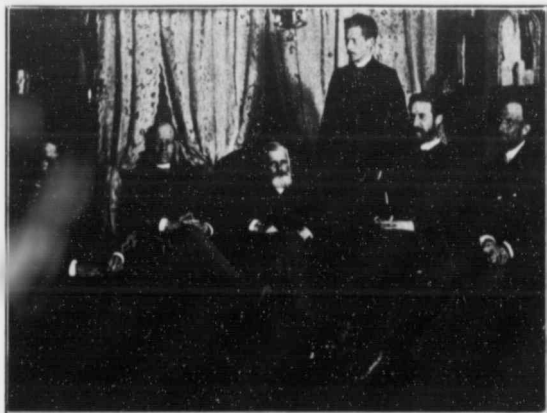
"Moved by Mr. Turnbull, seconded by Mr. Potter, that Mr. Daniel K. Winder be President for the ensuing year. Carried.

"Moved by Mr. Elvins, seconded by Mr. Hughes, that Mr. Samuel Clare be Secretary-Treasurer for the ensuing year. Carried.

"Moved by Mr. Winder, seconded by Mr. Hughes, that Mr. Ridgeway, the Chairman, with Messrs. Elvins, Clare, and Turnbull, be a Committee to draft a set of by-laws for the government of the club. Carried.

"Moved by Mr. Potter, seconded by Mr. Hughes, that the meetings be held on the first Tuesday evening of every month. Carried.

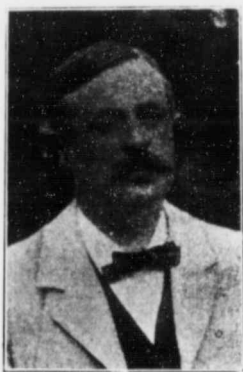
PLATE III.



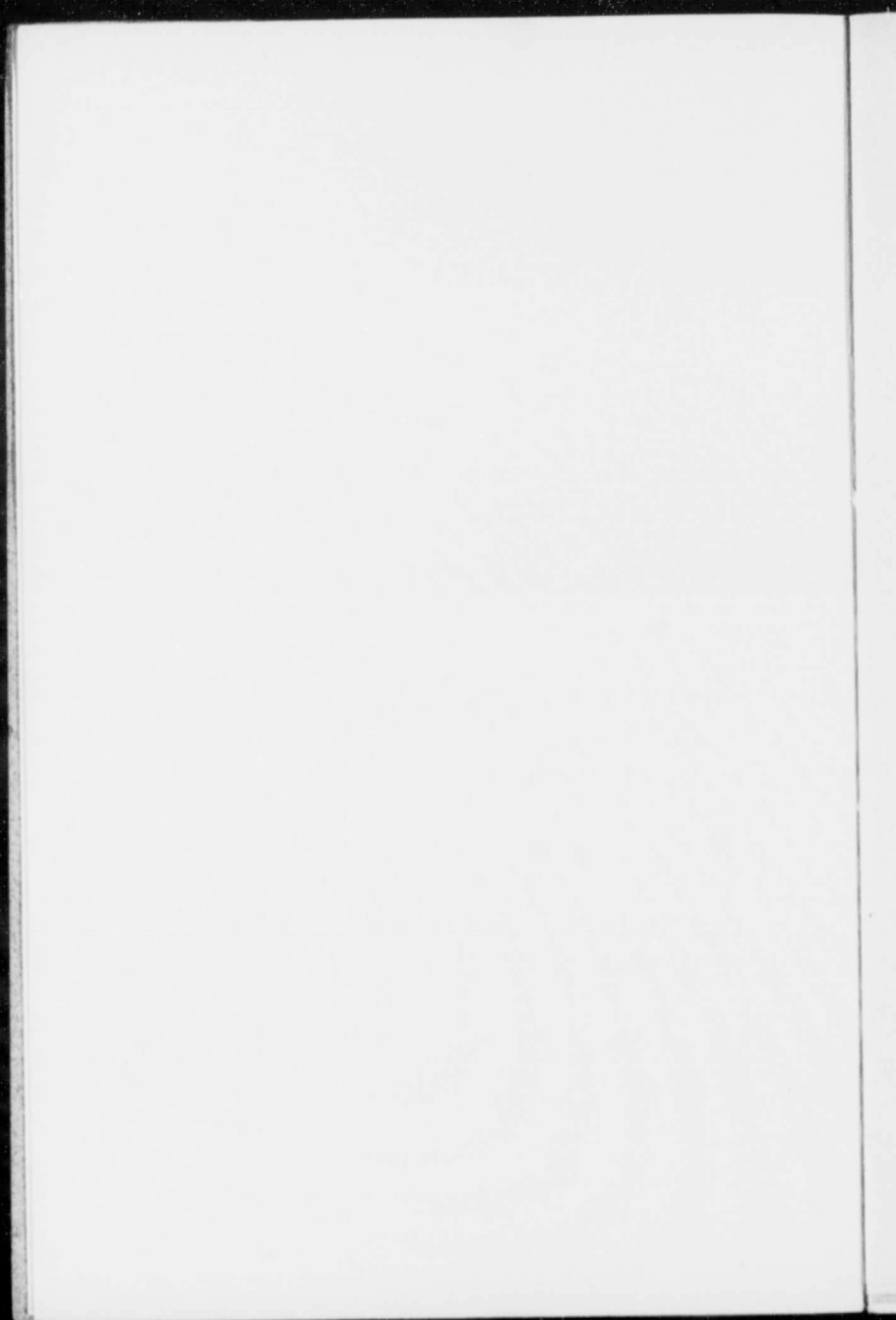
G. G. PURSKY A. ELVINS S. ROBERTS D. J. HOWELL
A. F. HUNTER A. F. MILLER



CHARLES P. SPARLING
CHARTER MEMBER (1890)
GENERAL TREASURER



J. J. WADSWORTH, M.A., M.B.
SIMCOK, ONT. (1905)



"Moved by Mr. Winder, seconded by Mr. Brunt, that the next meeting of the Club be held at the house of Mr. Elvins on the first Tuesday in January, 1869, at 7 o'clock. Carried.

"Paper to be read at the next meeting by Mr. Turnbull, entitled: 'A Brief Notice of the Past and Present State of Optical Science, Viewed Chiefly in its Bearing on Celestial Discovery.'

"Mr. Winder gave notice of a paper to be read by him at a subsequent meeting on 'The Spectroscope—Its Construction and Application to Celestial Chemistry.'"

From such modest beginnings the meetings continued, being held in the homes of all the members, each in turn taking his place as host of the Society.

The second member added to the list was Mr. Thos. Thompson of the Mammoth House, with whom both Mr. Elvins and Mr. Brunt were employed.

As some personal interest must attach to these pioneers of Astronomy in Canada, it will be proper to admit here some notes of reference to them. Their names will be treated in the order in which they occur in the minutes quoted above.

Mungo Turnbull, a well-educated Scotch cabinet-maker, had accompanied a polar expedition as a carpenter some years before the Toronto Astronomical Club was founded. His chief interest in Astronomy was dependent upon his remarkable skill as a maker of optical instruments. The first paper read before an organized astronomical association in Canada was that presented by Mr. Turnbull before the Toronto Astronomical Club on the evening of January 5th, 1869. In the minutes of that meeting, his paper is entitled, "A brief notice of the past and present state of optical science; viewed chiefly in its bearing on Astronomical telescopes and celestial discovery." After an interesting conversation on the subject of the paper, it was "Moved by Mr. Elvins, seconded by Mr. Ridgeway, 'That the thanks of the meeting be given to Mr. Turnbull for his instructive paper, and that he be requested to allow the original Manuscript to become the property of the club, as being the first paper read before the Society.'" Carried. Mr. Turnbull kindly consented, Mr. Ridgeway offering to write out a copy for him.*

*The second paper read before the Club was one by the President, Mr.

D. K. Winder, on "The Spectroscope." The third was a paper by Mr. Elvins entitled: "The Moon—its Physical Constitution and Motions." The fourth paper was contributed by R. A. Procter, B.A., F.R.A.S., the subject being "The Great Nebula in Argo."

Another of Mr. Turnbull's early papers was read exactly five months later (June 5th, 1869), the meeting on this occasion being held in Mr. Turnbull's residence on Bellevue Ave. The subject was "The Doctrine of Eclipses." Enough of this paper is outlined in the minutes to show that the author held a very lofty conception of the aims and achievements of the Science. Before the members left they were invited to inspect Mr. Turnbull's reflecting telescope, which he had lately completed. The minutes record that "The skill and perseverance of the maker were plainly seen in the workmanship."

I very well remember a visit to Mr. Turnbull in later years and how my conversation with him and his wife impressed me with the deep resentment of both at the unpardonable neglect by the public of the science of star-law, which, as they claimed, would have served to ennoble the public mind had it been given right of way with its beneficent influence.

Mr. Turnbull's active interest in astronomical matters was maintained for many years, and all the older members still alive will remember his constant interest in the Science. He died before the incorporation of the Society under its present royal charter.

Andrew Elvins, though keeping always, as far as he could, modestly in the background, and avoiding the chief places of responsibility, will, nevertheless, always be regarded by those best fitted to judge, as the virtual father and *facile princeps* of the founders, of the first Canadian astronomical society.

Born May 4th, 1823, in that part of Cornwall where the Phenicians secured tin from the ancient Britons, the beautiful minerals first attracted his attention and led him into scientific pursuits. This probably turned his life-course away from the Christian pulpit, for which he was at one time intending to prepare. When, in 1844, he came to Cobourg, Ontario, he continued to collect minerals, and later, sold his collection for a substantial

sum, moved to Toronto and engaged in business with the "Mammoth House."

His days being now entirely occupied, he could no longer make geological excursions, so turned his attention to the stars. He had been interested in Astronomy when only 14 years of age, and at that time made diagrams of star-groups which, corresponding pretty closely with similar groups represented in Chambers' Encyclopædia, he was encouraged to continue his studies.

During his stay in Cobourg, he had met Professor Whitlock of Victoria College, and they together continued to study Geology. Here he had met also Mr. Samuel Clare, already named in foregoing pages as the first Secretary-Treasurer of The Toronto Astronomical Club. Mr. Elvins became a close friend of these gentlemen. They had many conversations during which various scientific interests were discussed with great freedom and deliberation. Among the subjects discussed, Astronomy had a chief place, and when Mr. Elvins later met Mr. Clare and his friend and fellow-teacher, Mr. Ridgeway, in Toronto, these studies and researches were continued in their new place of abode. It will readily be seen how the formal organization of the Toronto Astronomical Club simply marked the definite enlargement and crystallization of a work which had been already under way in easy and pleasant stages among these friends.

Throughout the whole history of the Society in Canada, Mr. Elvins has been active and helpful. When it is stated that he presided over the Canadian astronomical interests for some years, it is necessary to explain that he has never been President pursuant to any election to that office, but rather by virtue of the fact that his interest in the work and his intimate knowledge of the subject made him, despite his repeated refusal of election to a presidential relation, the logical chief of a society over which, at any rate, he, for many years, actually presided.

In a small volume containing the TRANSACTIONS OF THE ASTRONOMICAL AND PHYSICAL SOCIETY OF TORONTO for the years 1890-1891, original letters are bound which embody correspon-

dence between Mr. Elvins and several world-renowned astronomers such as George E. Hale of Chicago University, Edward S. Holden, L.L.D., Director of the Lick Telescope at Mt. Hamilton, and Professor E. E. Barnard of the same Observatory. When Barnard discovered a fifth satellite to Jupiter, it was very well known by the members of the Society in Toronto that Mr. Elvins had persistently predicted the discovery of such a satellite and wrote to Professor Barnard, advising search for it. Professor Barnard's reply is in possession of the Society. He continued to predict further discovery of additional moons after that time. The several moons since discovered pertaining to Jupiter may or may not prove much as to the validity of the grounds upon which Mr. Elvins made his predictions, but as to the facts of the case as stated above, no scientific assertion could stand on more solid base. Those who know him best and who are qualified to speak on the subject are of the opinion that had Mr. Elvins had the early training of a professional astronomer, his wonderful aptitude in the scientific field, his originality and enthusiasm together with his logical mind and singularly acute powers of investigation and research, would have given him easily a prominent place among astronomers of world-eminence.

In the course of a paper read at the annual meeting in the year 1891, Mr. Elvins said among other things:—

"We hope to see the Professors in our Colleges, Principals in our High Schools, Teachers in our Common Schools, join our Society and lead it. Any feeling that would divide University men from others less fortunate, ought to be suppressed—destroyed is a better word. Professors who hold chairs in Universities, and Edison, who never passed through one, should be proud of each other"

"We hope to see a popular Observatory in Toronto, one to which all citizens can go and see for themselves the interesting objects about which they read, and to which the student may have access when his own instruments are insufficient"

"Fields of conquest for future students lie before us. Our Society aims at bringing these together and aiding them in their work. Lovers of the mighty and the beautiful will unite with us; when we lay down our instruments, they will follow with better ones, and aid in unfolding questions obscure to us when we like 'streaks of morning cloud, shall have blended into the distant azure of the past'"

"We do not know each other's religious faith or political creed. Pro-

fessor Mitchel and Father Terry, Father Secchi and Rev. T. W. Webb are the best of friends. Anything which can bring men together as friends is lifting humanity to a higher plane."

In 1893, Mr. Elvins was honoured for his services to the science and to the Society by being tendered a life membership in the Astronomical and Physical Society of Toronto. I believe it will readily be conceded that no other member, past or present, of our Society has contributed one-half as many papers to its proceedings as has our venerable friend who, we are pleased to say, is still, at the age of nearly ninety-four years, living among us with a considerable maintenance of intellectual vigour and occasional flashes of the old-time fire.

The singular beauty of his spirit is manifested in a letter written on one occasion to one of our Past Presidents. He closed this letter as follows:—

"If there be no meeting past the grave,
If all is silence,—darkness,—yet 'tis rest;
Be not afraid, ye waiting hearts that weep,
For God still giveth His beloved sleep,
And if an endless sleep, He wills,—so best."

"I can conceive," he adds, "no happier state in which to live, or in which to die, than that which leads us to say 'Not as I will, but as Thou wilt.'"

Daniel K. Winder, being opposed to war under all circumstances, was not comfortable in his Cleveland home when civil war broke out in the United States in 1861. He came to Toronto and, being of the same religious persuasion as Mr. Elvins, and a former lecturer on Astronomy in a United States College, he was attracted to the little group of friends who loved the stars. Being at that time the most thorough astronomer of the group, he was at once accorded a prominent place. While he earned his livelihood as a printer and Mr. Elvins was in the clothing business, they together constructed a telescope out of the crudest materials. This was in 1868. Sometimes he preached. He was a kindly and sanguine person and very popular. After the war was over, he returned to Detroit and, later (1891) became a corresponding member of the Society. He died in Detroit in 1898.

James L. Hughes was a very young man in 1868 when he assisted in the organization of the Toronto Astronomical Club. Few men are better known to-day in this part of the Dominion. Dr. Hughes was, in the early days, a teacher in the Model Schools of Toronto, and it was through Mr. Clare, who was at the time teaching in the Normal and Model Schools, that Mr. Hughes was led to attend the first or organization meeting.

Honoured at an early age with the Chief Inspectorate of the City Schools, he became an authority in educational matters, and is an author and publicist of wide repute. He is a celebrated Dickens scholar. His optimism, his loyalty and his energy have made him, like his distinguished brother, a personality of great influence and charm. In the present world-struggle Dr. Hughes has been a keen sufferer and has the deepest sympathy of thousands of his fellow countrymen.*

Dr. Hughes is a poet, wholesome and radiant. The following stanza closing his touching poem entitled "Chester" tells its own story:

"So through the years will the streamlet,
River and wave-crested sea,
Dawnlight and sunshine and eve-glow,
Star-gleam and flower and tree,
Bird-song and growth-time and wind-breath,
Whisper his sweetness to me."

Samuel Clare, being, as we have already shown, an intimate friend of Mr. Elvins, both in Cobourg and in Toronto, was associated with the astronomical work from the beginning, and it appears to have been his influence that led both Mr. Ridgeway and Mr. Hughes into the Club. We have already shown that at that time they were all teachers. The first minute book of the Society has now reached almost its jubilee year, but it would be hard to find anywhere minutes couched in handwriting more beautiful than that in which Mr. Clare recorded the transactions of this pioneer club.

The present chief officer of The Royal Astronomical Society

*Remains of Lieut. Chester Hughes, son of Dr. J. L. Hughes, interred in Locre, Belgium.

PLATE IV.



ALLAN F. MILLER
CHARTER MEMBER (1890)



THOMAS LINDSAY
RECORDING SECRETARY 1895-1900



GEORGE G. PURSEY
CHARTER MEMBER (1890)



WM. F. KING, B.A., LL.D., C.M.G.,
Former Chief Astronomer
HONORARY PRESIDENT, 1906-10



of Canada has the honour of being a son-in-law of the first Secretary-Treasurer of The Toronto Astronomical Club.

Mr. Clare's was a mind constitutionally mathematical, a temperament serene and kindly. Apart from his friends, his greatest delight was in the calculus, and his extreme modesty was almost a fault, for it prevented him from accepting positions for which his capacity thoroughly fitted him. One of his favourite quotations was:

"The daisy by the shadow that it casts
Protects the ling'ring dewdrop from the sun."

Robert Ridgeway has been referred to already as Chairman of the organization meeting of The Toronto Astronomical Club. His name occurs in every list of those reported present throughout the Club's history, save only one. He appears to have been a man of ability and usefulness. He is reported in the minutes as having read a paper, September 6th, 1869, on "The Velocity of Light." Like his companions in this venture on the sea with undiscovered shores, he seems to have been anxious to be helpful and obscure, rather than lime-lighted and ornamental. After coming to Toronto, he taught in the Jarvis St. Collegiate Institute. Afterwards he was for some years a customs official, and during the year 1871, the first year of its existence, was editor of the *Canadian Magazine*.

Charles Potter was the well-known optician. He helped many a young astronomer to obtain his first instrument, and always took a keen interest in the progress of astronomical science in this Dominion. He died some years ago.

George Brunt was one of the partners in the "Mammoth House." He was an accountant there. Mrs. Thompson and Mrs. Brunt were sisters. He took an active interest in the Society, as shown by the minutes. He lived on George St., where one of the meetings was held.

These are the names of all those who at the first constituted The Toronto Astronomical Club, a Society which changed its name at its sixth monthly meeting. For a time it was known as

The Toronto Astronomical Society. This seems to have been its name from 1869 to 1879 and again from 1883 till 1890.

There were times when The Toronto Astronomical Society was not a very vigorous institution. Indeed, the records are meagre throughout all the years during which this name and title was recognized as representing the organized scientists in astronomical fields of research. Mr. Elvins assures me, however, and his accuracy is confirmed by others who have knowledge of the facts in the case, that the meetings have never been discontinued at any time since their inception in 1868. The Society has at various times enlarged its scope, narrowed it, changed its name (five different names are recorded), but never have its activities been wholly relinquished. When no president was formally elected, Mr. Elvins usually presided, but when it was possible to secure the election of a President, Mr. Elvins retreated again into the shades of private membership.

During the summer of 1879, a vigorous renaissance occurred under the name of The Recreative Science Club. This Club was the organization which, for the next few years, absorbed the astronomical interest of all those who had constituted The Toronto Astronomical Society prior to 1879. It was therefore the main-stream of the science during those years, and its records are a part of the chronicles of the Society in the fullest sense of the word. This revival of interest secured a better record of transactions. As a result, we have before us again a list of members among whom, of the original members, only two remain, Mr. Elvins and Mr. Turnbull.

During this period, the meetings were held chiefly at Mr. Elvins' residence, 11 St. Vincent St., though some were held at the Canadian Institute rooms on Richmond St. at the corner of Clare St., and others at the homes of other members. At this time Mr. Roberts, of the firm of Laird and Roberts of King St., had charge of the Section of Astronomy. Mr. Elvins was the President and Mr. G. G. Pursey acted as Secretary. Among the other prominent members of the Recreative Science Club was Dr. Wm. Brodie, the celebrated entomologist. Mr. Joseph Clare, a

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son of the first Secretary-Treasurer, was interested chiefly in Geology. Mr. G. H. Armstrong was interested in the Natural History Department under the leadership of Mr. Elvins. He is still a frequent attendant at our meetings.

George G. Pursey, the Secretary of the Recreative Science Club, has been so closely identified with the Society for the past thirty-seven years, that it seems desirable to refer to him for a moment. Born in Walton, Somersetshire, March 18, 1831, he received his education in the church school, there being no day school in the village. He joined with five other boys to raise a fund to buy books, the first of which to fall into George Pursey's hand was one by Robert Owens on industrial reform. Emerson's "Essays" followed, and when the books were distributed, the essays of the Concord Sage fell to the lot of our friend. They are still in a good state of preservation. I have seen the volume, which is now about seventy years old.

The day when he heard Elihu Burritt lecture was a red-letter day in the boyhood of George Pursey. He came to Canada in 1857. When the Recreative Science Club was organized, besides being Secretary, he was in charge of the department of General Literature. His contributions to the proceedings were ever characterized by grace of diction and a far imaginative sweep. He was a charter member of the Astronomical and Physical Society of Toronto when it was incorporated in 1890.

For nearly eight years, he made daily drawings of those sun-spots which were visible in Toronto. His apparatus was home-made. He made his own telescope. He is still living, victory-winged, in his home at No. 137 Helendale Ave., a shrine to all those who love idealism and the lofty simplicity of great souls. A lover of stars and trees and flowers, to him

"The meanest flower that blows
Can give thoughts that do often lie too deep for tears."

And yet, he loves people far more than stars, and meets all lovers on the open roads of life. Is not this life of poise and peace the only real life?

Several names now appeared upon the roll for the first time.

Among these were those of J. Foster, Prof. Ramsay Wright, John Bengough, Sr., Dr. Cowdry, and others.

Allan F. Miller, now First Vice-President of the Society, became a member about the year 1882. He has been for many years a recognized specialist in the chemistry of the heavenly bodies. The first working spectroscope seen by him was that made by Mr. Elvins, the prism employed being cut from a glass pendant. He made experiments with similar prisms, but soon ascertained that useful work demanded better appliances. After trying out a Hoffman chemical spectroscope, he imported a Browning universal spectroscope and a Browning star spectroscope, which he used in all his studies of stellar spectra, including his researches when the Nova Persei appeared in February, 1901. He also used a Vogel star spectroscope. In Dec. 1884 he imported a Rowland grating which he purchased from Mr. Brashear, then a comparatively unknown man. He has long used a powerful induction coil and the connected appliances in these studies.

Mr. Miller was probably the first person in Toronto, if not in all Canada, to see the solar flames or prominences, and to study and photograph the solar spectrum with a powerful instrument. He paid much attention to solar physics during 1885-6-7, and through all the years since as constantly as his busy life has permitted.

Perhaps the best work he has done for the Society was in a series of addresses on stellar motions. In 1901, he gave a brief resumé of his work (visual, spectroscopic, micrometrical, parallaxic) during the visibility of Nova Persei, which object he noticed quite independently on the night following its discovery by Rev. Dr. Anderson.

Mr. Miller made spectroscopic, visual, and micrometric observations of Mira during some twenty years and once wrote a remarkable paper on the spectrum of the fire-fly. Some of his articles have been quoted by foreign journals and received with favour in Great Britain. His investigations of Nova Persei and of binary and other stellar systems have been notable for their thoroughness,

and place their author without any doubt among those who were born to be astronomers.

George E. Lumsden was introduced to the Society by Mr. Miller. No one throughout its whole history, not even Mr. Elvins, did more for the science in Canada in a like period than Mr. Lumsden was able to accomplish during his membership. He succeeded in interesting Hon. G. W. Ross in the work. All subsequent helpfulness of the various Governments began, as it now seems, with that providential chain of events in which our worthy Vice-President was the primary link.

A reawakening of the energies of the Society occurred in 1890, when Mr. Elvins, Allan F. Miller and Geo. E. Lumsden undertook the project of securing incorporation for the Society under the caption of THE ASTRONOMICAL AND PHYSICAL SOCIETY OF TORONTO. Their efforts were successful, and the cause was furthered by the accession of greatly increased energy and financial resources. The proceedings were henceforth more closely related with the world of science in general, and the Governments and Municipal authorities began to take a financial interest in the work.

The officers of the newly incorporated body were:

<i>President:</i>	Chas. Carpmael, M.A., F.R.S.C.
<i>Vice-President:</i>	Andrew Elvins.
<i>Corresponding Secretary:</i>	George E. Lumsden, F.R.A.S.
<i>Treasurer:</i>	George G. Pursey.
<i>Recording Secretary:</i>	D. J. Howell.
<i>Librarian:</i>	Allan F. Miller.

Among the members who came in at that time or soon afterwards, and who have since been very active in the doings of the Society were the following: Charles Carpmael, President under the new charter; Thomas Lindsay, who soon became Secretary, and whose untimely death was so sadly lamented by everyone who knew and loved that delightful and able mathematician, whose skill in figures was almost genius; Larratt W. Smith, Q.C.; John A. Paterson, Q.C., M.A.; Arthur Harvey, F.R.S.C., etc.; Freder-

ic, now Sir Frederic Stupart, F.R.S.C.; W. B. Musson; all of whom afterwards became Presidents. J. G. Ridout, Miss A. A. Gray, Mr. John R. Collins, and Charles P. Sparling; all since officers of the Society. Rev. C. H. Shortt, M.A., may also be named as a distinguished member of the Council during this period.

Of the Corresponding members, Andrew F. Hunter, M.A., of Barrie, now a valued active member and a regular contributor to the proceedings; D. K. Winder, of Detroit, a name already mentioned in this sketch; J. C. Donaldson, LL.D., of Fergus, an indefatigable and careful observer; John Goldie, of Galt, a generous benefactor of the Society; J. J. Wadsworth, President of the Simcoe branch, and an able and practical astronomer; T. S. H. Shearman, of Brantford, Mrs. R. A. Proctor, W. F. Denning, of Bristol, Eng., Mr. Hollingworth, of Beatrice Ont., and Miss Agnes M. Clerke, of London, Eng., were notable examples.

The following celebrities accepted Honorary membership in the Society at this time:

W. H. M. Christie, LL.D., F.R.S., etc., Astronomer Royal.
Sandford Fleming, C.E., C.M.G., LL.D., Chancellor,
Queen's University.

Professor E. S. Holden, LL.D., Director, Lick Observatory.
William Huggins, D.C.L., LL.D., Ph.D., F.R.S., Hon.
F.R.S.E.

Professor Daniel Kirkwood, LL.D., etc.

Joseph Morrison, M.A., M.D., Ph.D., F.R.A.S., etc.

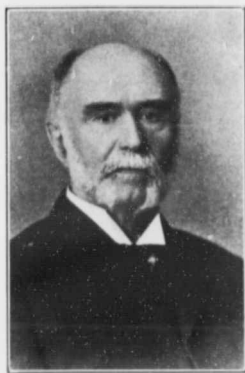
Professor Simon Newcomb, LL.D., Supt. Amer. Naut.
Almanac Office.

Since then others equally distinguished and representing the great observatories and universities of the world have cordially permitted their names to be associated with our Society as Honorary members or Honorary Fellows. Of these are such men as Darwin, Langley, Hale, Pickering, Lowell, Frost and Campbell. We record with deep regret the passing of Professor Lowell, of Flagstaff, and of Professor Backlund, of Pulkowa, Russia, both

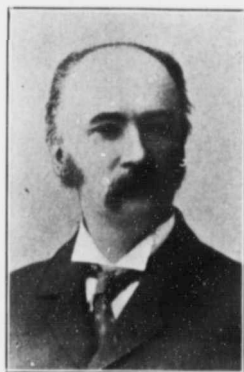
PLATE V.



CHAS. CARPMAEL, M.A., F.R.A.S.
1890-1894



LARRATT W. SMITH, D.C.L., Q.C.
1895



JOHN A. PATERSON, M.A., K.C.
1896-7



ARTHUR HARVEY, F.R.S.C.
1898-9

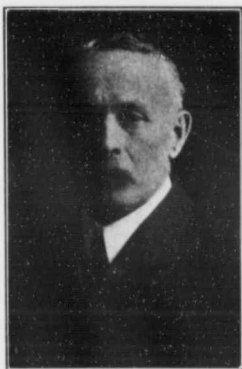
PAST PRESIDENTS



PLATE VI.



GEORGE E. LUMSDEN, F.R.A.S.
1900-1
CHARTER MEMBER (1890)



SIR FREDERIC STUPART,
F.R.S.C., F.R.A.S.C.
1902-3



CLARENCE A. CHANT, M.A., Ph.D.
1904-7



W. BALFOUR MUSSON
1908-9

PAST PRESIDENTS



of whom were elected during the past year to Honorary Fellowship in our Society.

In June, 1891, an Opera Glass Section was organized under the direction of Geo. E. Lumsden, with Mr. Clarence Hall as Secretary. The section did good work, meeting in the parks and reporting at frequent intervals to the Society. A Lunar Section was established in 1896 under the same enthusiastic leader. The following quotation is from the report of that year: "Among the more active members of the section who kept up their work during the year were J. J. Wadsworth, M.A., M.D., of Simcoe; J. C. Donaldson, LL.D., of Fergus, and the veteran Mr. A. Elvins, of Toronto."

The financial disabilities of the Society, even after its incorporation, are vividly suggested by the fact that the meetings were still held in the homes of the members. After Sept. 11th, 1891, the first meeting of each month was held in the rooms of Dr. Foster at the corner of Yonge and Gerrard Sts. The transactions show that "Members shall have liberty to increase the space allotted to their papers at their own expense, subject to the approval of the Reading Committee."

Some humour emerges in the transactions even of a scientific society. Those who knew Mr. Thomas Lindsay will recognize his fine hand in the following entry of August 11th, 1891.

"Mr. Lumsden noticed a difference between English and American authorities in some star names. He instanced Scorpio, which in the American Ephemeris is Scorpius, while in both, the genitive is Scorpii.

"The members present had studied the stars at the expense of their Latin, but were of the opinion that if the nominative is Scorpio, the genitive would be Scorpionis. As no one would swear to the nominative, a member appointed himself a committee to look up the matter."

I presume that to-day we must conclude that the Great British Empire has a right to the privilege of making its own Latin. Another of the many facetiae of Lindsay declares that

"As usual, after the Vice-President's papers, the discussion might have lasted till midnight, but the meeting adjourned at ten o'clock."

This, of course, was a naive tribute to the many-sided suggestiveness of all that Mr. Elvins presented for consideration.

But Mr. Lindsay is not to be noticed adequately in a mere allusion. His historical work on the Nautical Almanac was much appreciated by the makers of that great work, and had the life of its historian been spared till his task was completed his achievement would have been, in our judgment, monumental.

About this time, Mr. Larratt W. Smith presented to the Society the three-inch refractor which had been bequeathed to him by the late J. G. Howard, the donor of High Park. A little later, upon the death of Sir Adam Wilson, a good friend and patron of astronomic science in Canada, his six inch reflector was presented to the Society by his widow.

In Dec. 1891, the annual meeting which had hitherto been held in the spring, was transferred to January, additional offices were created and thenceforth the Society boasted an Honorary President, a second Vice-President, and a Patron. The Council also was enlarged. Hon. G. W. Ross, LL.D., then the Minister of Education, was elected Honorary President; Mr. Carpmael was re-elected as President; Larratt W. Smith and Jno. A. Paterson were the Vice-Presidents; Mr. Pursey was elected as Librarian, and all the other officers were re-elected. The total membership was now fifty-eight.

About this time a feature was introduced which in later years has given the members and citizens a great deal of profitable pleasure. Open meetings held in commodious auditoria were provided by the Society when distinguished speakers were available, so that as many as would might hear the very best presentation of the science in its various fields of interest. One of the first of these meetings was addressed by the widow of the celebrated Richard A. Procter, on Nov. 10, 1891. Her subject on that occasion was the Lick Observatory on Mount Hamilton, California. Since then, at frequent intervals, several of the greatest of world-astronomers have given to the public of Toronto through the medium of our Society a series of able and distinguished addresses culminating in that of the late Professor Lowell, of Flagstaff, Arizona, delivered last winter in the Assem-

bly Hall of the New Technical School and so much enjoyed by all who heard it.

Many notable papers have been read before our various clubs and societies, papers which taken together with innumerable verbal reports of investigations, observations, and discussions, constitute the continuous stream of things astronomic in the Dominion from the earliest times. In order to avoid invidious distinctions and yet fairly cover the ground, an analytical index, classified subjectively, and associated with the names of its authors and the pages on which the particular subjects may be found in the Transactions and Journals, is to be published in the near future and it is hoped that this analytical index will be of service to those who intend to write papers or investigate the various subjects treated in the Society. Some of these papers are from astronomers of world-wide fame and deal with living themes. Another class of papers consists of those delivered by retiring Presidents. These have been chiefly of an historical character.

The Society has exercised all its influence at various times in favour of certain reforms in reference to which there was but one opinion among its members. One of these efforts arose out of the confusion of a civil day beginning at midnight, while the astronomical day is calculated from noon. Under the leadership of Sir Sandford Fleming, The Society sought in 1893 and the following years to have the astronomical day changed so as to correspond with the civil day. A Committee, consisting of Sir Sandford Fleming, Arthur Harvey, George Kennedy, Alan McDougall, Charles Carpmal, J. A. Paterson, and Geo. E. Lumsden, was constituted to conduct the effort. Circulars were sent out and questions were propounded to the leading astronomers and navigators of the empire. The overwhelming response to these enquiries was favourable, but the change was not effected, owing, probably, to the non-concurrence of the authorities at Washington.

In 1896, a paper was presented which proposed a revolutionary reform of the calendar. It was shown that a simple and scientific calendar involving a year of 13 months of 28 days each, with one day in each common year and two in each leap year

to be regarded as belonging neither to any week nor to any month would so reconstruct the year that instead of the fourteen different calendars now required to set forth our frowsy method of presenting our process of days and months and years, we should have one simple form of year which would be so easily remembered that no printing of the calendar would henceforth be necessary for all time. All years would be alike except for the added leap year day. The changes of the moon would be so nearly coincident with the months that it would be known just when new moon would occur in every month even from the beginning of the year. Dates also would occur always on the same days of the week throughout all time.

This paper was received with enthusiasm by the Society, which printed it in full in its transactions, but it would seem that

"No might of armies and no rage of storms can turn"

one little habit from its track, however foolish it may be, if once ingrained into the customs of the race. The world will still use its anomalous method of calculating its astronomical day from noon and its fourteen foolish calendars, as it has done for so many centuries.

Notwithstanding the failure of its efforts to bring about these reforms, the Society was never in a more vital state of prosperity than when engaged in active campaigns which sought to benefit the scientific world. The members of our Society learned how appalling is the inertia of the average mind even of educated men. Was not Galileo mistaken when he whispered his famous aside about the world: "*e pur si muove?*" We have the satisfaction of knowing that when the scientific world adopts a properly constituted astronomical day and a sane calendar, they will be using those proposed by our Society more than twenty years ago, and now on record in all the astronomical libraries of the world.

One of the most thorough and interesting papers ever presented before the Society was that of Professor C. A. Chant, M.A., Ph.D., on the great passage of meteorites over the continent on Feb. 9th, 1913. The thorough estimates of mass, height, course,

sounds, and destination, were worked out in a way that gladdened the hearts of all investigators. Those who failed to observe that remarkable phenomenon at the time of its occurrence, may still have the pleasure of reading this valuable and thrilling article in the Transactions of that year. The same is true of all the excellent papers published in the Society's Transactions, and no better or more pleasant way can be found to acquire a working knowledge of Astronomy than to join this Society (the cost being but nominal, \$2.00 per annum) and thus gain the privilege of reading all these papers, reports and observations.

That the Transactions of the Society have a great value is shown by the interest taken in many of the papers by scientists throughout the world. Many of these papers, the authors of which are private or official members resident in Toronto or in other centres of our Canadian Society, have been published either wholly or in part in Great Britain and foreign lands. Some have been translated into foreign tongues and credit has been accorded our Society by distinguished scientists in the various astronomical centres of the world.

A list of the Presidents of the several clubs and societies from the beginning, as far as the records show, is as follows:

1868	Daniel K. Winder.
1879	Andrew Elvins.
1890-1894	Charles Carpmael, M.A., F.R.A.S.
1895	Larratt W. Smith, Q.C., D.C.L.
1896-1897	John A. Paterson, Q.C., M.A.
1898-1899	Arthur Harvey, F.R.S.C.
1900-1901	Geo. E. Lumsden, F.R.A.S.
1902-1903	Frederic Stupart, F.R.S.C., F.R.A.S.C.
1904-1907	Clarence A. Chant, M.A., Ph.D., F.R.A.S.C.
1908-1909	W. B. Musson.
1910-1911	Alfred T. DeLury, M.A., F.R.A.S.C.
1912-1913	L. B. Stewart, D.L.S., D.T.S.
1914-1915	J. S. Plaskett, B.A., D.Sc., F.R.A.S.C.
1916	Albert D. Watson, M.D.

During the same period the General Secretaries were:

1868	Samuel Clare.
1879	G. G. Pursey.
1890-1899	Geo. E. Lumsden, F.R.A.S.
1900-1901	W. B. Musson.
1902-1916	J. R. Collins.

Other officers who should be mentioned as having rendered much service to the Science through the Society are Mr. Charles P. Sparling, at whose house the instruments of the Society were stored for some time, many years Recorder, and still the excellent and careful Treasurer; Messrs. J. E. Maybee, J. Ridout, J. Todhunter, former Treasurers; Mr. J. E. Webber, Miss Elsie Dent, Dr. L. Gilchrist, and Mr. W. E. W. Jackson, M.A., Records; and Rev. R. Atkinson, Alfred MacFarlane, John Ellis, Kenneth Clipsham, A. Sinclair, H. B. Collier, Phm.B., and Dr. Wunder, Librarians. Others not hitherto named, who have served the Society with zeal and ability, especially as councillors, are: Mr. Stuart Strathy; Dr. Otto Klotz, LL.D., F.R.A.S.; Sir Joseph Pope, K.C.M.G.; Rev. I. J. Kavanagh, M.A., D.Sc., S.J.; Rev. D. B. Marsh, D.Sc., F.R.A.S.

Many who have devoted able and willing service to the progress of Astronomy in Canada have been and must remain unnamed in this brief resume of the history of the science, but we trust that these will realize that it is not because their services were less valuable than those we have noticed here, but rather, perhaps, because they were less conspicuous, a failing that does not by any means mean failure. In any case, we may be sure of the truth of one proverb though so many be false, viz.: that "virtue is its own reward."

The Branches of the Society before it became the Royal Astronomical Society are of much interest. One was organized in Meaford in 1893 with a score of active and a few corresponding members. This branch reported in the Transactions of the main Society in 1895 and following years. It was organized in November, 1893, and reported transactions and excellent work under the Presidency of Rev. D. J. Caswell, B.D., Ph.D. Mrs. Henry Manly

sounds, and destination, were worked out in a way that gladdened the hearts of all investigators. Those who failed to observe that remarkable phenomenon at the time of its occurrence, may still have the pleasure of reading this valuable and thrilling article in the Transactions of that year. The same is true of all the excellent papers published in the Society's Transactions, and no better or more pleasant way can be found to acquire a working knowledge of Astronomy than to join this Society (the cost being but nominal, \$2.00 per annum) and thus gain the privilege of reading all these papers, reports and observations.

That the Transactions of the Society have a great value is shown by the interest taken in many of the papers by scientists throughout the world. Many of these papers, the authors of which are private or official members resident in Toronto or in other centres of our Canadian Society, have been published either wholly or in part in Great Britain and foreign lands. Some have been translated into foreign tongues and credit has been accorded our Society by distinguished scientists in the various astronomical centres of the world.

A list of the Presidents of the several clubs and societies from the beginning, as far as the records show, is as follows:

1868	Daniel K. Winder.
1879	Andrew Elvins.
1890-1894	Charles Carpmael, M.A., F.R.A.S.
1895	Larratt W. Smith, Q.C., D.C.L.
1896-1897	John A. Paterson, Q.C., M.A.
1898-1899	Arthur Harvey, F.R.S.C.
1900-1901	Geo. E. Lumsden, F.R.A.S.
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1904-1907	Clarence A. Chant, M.A., Ph.D., F.R.A.S.C.
1908-1909	W. B. Musson.
1910-1911	Alfred T. DeLury, M.A., F.R.A.S.C.
1912-1913	L. B. Stewart, D.L.S., D.T.S.
1914-1915	J. S. Plaskett, B.A., D.Sc., F.R.A.S.C.
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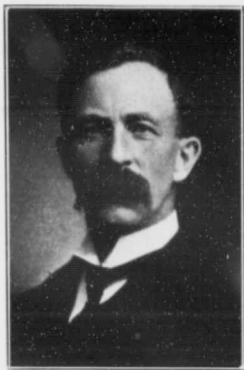
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PLATE VII.



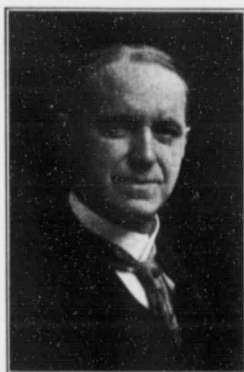
ALFRED T. DELURY, M.A., F.R.A.S.C.
1910-11



LOUIS B. STEWART, D.L.S., D.T.S.
1912-13

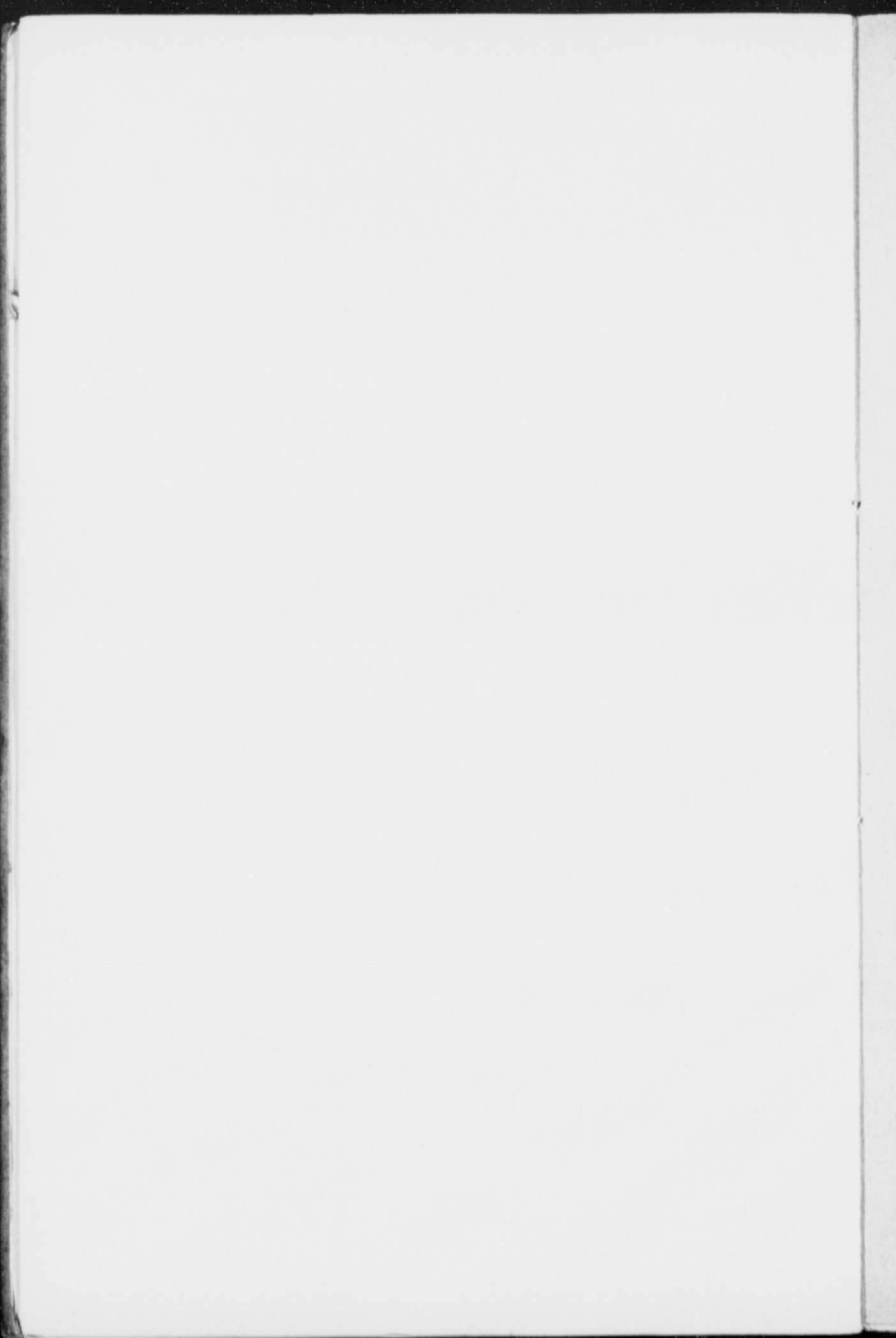


JOHN S. PLASKETT, B.A., D.SC.
1914-15



ALBERT D. WATSON, M.D.
1916-17

PAST PRESIDENTS AND THE PRESIDENT



was Vice-President, and Mr. Geo. G. Albery, General Secretary.

Concurrently with the Meaford branch, an organization existed in Simcoe, Ont., under the Presidency of J. J. Wadsworth, M.A., M.D., who, with J. C. Donaldson, LL.D., of Fergus, sent frequent contributions and reports of observations to the Society in Toronto.

About this time work was reported in Brantford, Woodstock and Galt. Mr. T. S. H. Shearman, with Mr. Alex. Macdonald, of Galt, and Mr. John Goldie, had been able to interest many in these towns. Mr. Shearman is now in charge of a meteorological post and has an observatory near Vancouver, B.C.

In speaking of Mr. Elvins, we have already quoted his democratic hope that a popular observatory might soon be established in Toronto. This was in 1891.

The need of such an observatory for Toronto has long been felt. Mr. Lumsden devoted much thought and effort to this subject, and on January 6th, 1898, Mrs. George Craig, now of Dawson City, Yukon, read a paper on "Popularizing Astronomy," in which she advocated the observatory project, and recommended ways and means of securing and maintaining it. The progress made thus far is encouraging. A friendly feeling for the enterprise, plans earnestly proposed by Council, assurance of co-operation, beautiful plans on paper also, all go to support the conviction that a certain ten-acre lot on the east side of Bathurst Street, and immediately north of Cedarvale Ravine, the property of the City of Toronto, should be transferred to the Parks and Gardens Committee and set aside as a public park, to be known as "Observatory Park," with three acres on its summit, for a noble observatory equipped with a first-class telescope that would point its far-searching eye from that finest of all our surrounding astronomical sites to the still and infinite star-deeps. Let us hope that when the present world-struggle has spent its fury and ended in harmony with the Divine will, this project, so vital to the interests, and so necessary to the repute of Toronto as the educational centre of Canada, may find powerful friends who will see it accomplished.

I am in a position to say that the University and the Royal Astronomical Society are prepared to co-operate with the city in the government of such an institution. There is no doubt that the equipment of a first-class observatory could be provided by private subscription. When the war is concluded this great work will undoubtedly be undertaken, and we trust that success may crown the efforts of those whose unselfish energies are devoted to such a worthy cause. The Royal Astronomical Society desires that such an institution shall be used not only for the members of the Society and for the students of the University, but that it shall be primarily for the benefit of the citizens generally, and in this desire the University is quite in harmony with the Society.

A gold medal is offered annually by the R.A.S.C. to students of the University for proficiency in Astronomical knowledge. This medal was designed by the Society and is emblematic of the science.



MEDAL AWARDED BY THE SOCIETY FOR PROFICIENCY IN
ASTRONOMY

Before the year 1907, elementary Astronomy was taught in the University of Toronto by Prof. Alfred Baker, M.A., while Prof. Alfred T. DeLury, M.A., F.R.A.S.C., was in charge of the mathematical phases of the science. During that year a distinct advance was made when a separate appropriation was devoted to Astronomy, and Prof. C. A. Chant, M.A., Ph.D., F.R.A.S.C., was given entire charge of Astro-physics in the Uni-

versity. Since then, and in the last few years especially, no one in the Society, no matter what his name or degree, has rivalled in usefulness and ability our Professor of Astro-physics. His services as Editor-in-chief of the *JOURNAL*, his work in the University, and his constant interest in the success of the Society are beyond praise.

Some brief reference—a reference too brief in view of the importance of the subject—must be made here to the various centres of the Society recently established in various parts of the Dominion. Of these, thus far, the most important is that which was instituted in Ottawa by the late Honorary President, Dr. King, with the co-operation of some of the present active and official members. Associated with the Dominion Observatory, it has the prestige to which its corps of distinguished workers entitle it.

THE OTTAWA CENTRE was organized in December, 1906. The late W. F. King, C.M.G., LL.D., occupied the chair at the organization meeting. Dr. Plaskett moved, Sir Joseph Pope seconding, "That an Astronomical Society be formed in Ottawa as a Section of The Royal Astronomical Society of Canada." This resolution prevailing, the following were elected as the first officers of the Ottawa Centre:

<i>President:</i>	W. F. King, LL.D., C.M.G.
<i>Vice-President:</i>	Otto Klotz, LL.D., F.R.A.S.
<i>Secretary:</i>	J. S. Plaskett, B.A., D.Sc.
<i>Treasurer:</i>	R. M. Stewart, M.A., F.R.A.S.C.
<i>Council:</i>	Sir Joseph Pope, K.C.M.G.; A. H. McDougall, B.A.; F. A. McDiarmid, B.A.

The roll included 104 names of members.

The Ottawa Centre provides afternoon meetings in which the papers are chiefly technical, the members of the observatory staff being the chief attendants. The evening meetings are of a more popular character and the general public attend these in large numbers. As might be expected from the many able and distinguished astronomers associated with this Centre. The Royal

Astronomical Society of Canada values greatly the willing assistance which Ottawa is constantly giving to other Centres in the form of excellent papers and reports of observations. The late Dr. King was for many years Honorary President of the main Society.

In the few years since the establishment at Ottawa of the Dominion Astronomical Observatory much valuable work has been done. Reference might be made to that of Dr. J. S. Plaskett and Dr. R. E. DeLury on solar rotation; of Mr. R. Meldrum Stewart on clock synchronization and fundamental meridian circle measurements; of Mr. R. M. Motherwell on the photography of heavenly bodies, especially comets; of Mr. F. A. McDiarmid on latitude, longitude and gravity; and of Messrs. W. E. Harper, J. B. Cannon, T. H. Parker, and Dr. R. K. Young on spectroscopic binaries and other subjects. For a long time before the Observatory was erected, Dr. Otto Klotz was associated with the late Chief Astronomer King in notable boundary and other survey work, especially in the determination of trans-Pacific longitudes. In recent years he has made important investigations in seismology, gravity and magnetism. In addition to all the above, much splendid work has been done by Geodetic, Boundary and Tidal surveys.

While an account of this regular work has been printed in detail in Government reports, all that is of general interest has been presented in less technical form in our *JOURNAL*, in which also have appeared many other original contributions relating to the work on which these men are engaged. Thus, besides spreading among our own people a knowledge of what is being done in scientific matters, much comment has been aroused and a general recognition given to our Dominion by the scientific world abroad. Indeed it is not too much to suggest that the *JOURNAL* published by The Royal Astronomical Society of Canada under the able editorship of Dr. C. A. Chant, and his associate editors, Dr. J. S. Plaskett and Sir Frederic Stupart, is doing as much as any other agency in this Dominion to give Canada her rightful place

in the scientific sisterhood of nations. This service of the Society is made possible only by the action of the governments who make annually a moderate grant to the Society for this purpose. The City of Toronto also contributes a small annual sum to the same purpose. The whole amount thus contributed from all sources for 1916-7 is only \$2,700. Those who have a grasp of the situation and understand its effect, who therefore are in a position to form a just opinion, believe that no public money brings more substantial returns both to the honour and to the international repute of our Dominion.

THE PETERBOROUGH CENTRE was organized February 26th, 1907. Rev. Dr. Marsh, F.R.A.S., delivered a lecture that evening in the Charlotte Street Methodist Church on "A Night With the Stars." After the lecture the Centre was organized with 47 members and the following officers:

<i>President:</i>	Rev. Dr. Marsh, F.R.A.S.
<i>1st Vice-President:</i>	Wm. Pringle.
<i>2nd Vice-President:</i>	Duncan Walker, B.A.
<i>Treasurer:</i>	D. E. Easson, B.A.Sc.
<i>Secretary:</i>	F. C. Neal, M.D.
<i>Council:</i>	S. W. Lowry, W. McFaul, M.D.

The meetings of this Centre were held at first in the Y.M.C.A. rooms, but afterwards the Collegiate Institute was available and the meetings were held there. It is appropriate that the meetings of such a Society as ours should be held in an educational institution, and it is hoped that in no municipality of Canada would The Royal Astronomical Society find itself unwelcome in the best buildings which the educational resources of the place afford.

THE HAMILTON CENTRE was built upon a previous foundation. A society existed here which had been in existence for many years, known as The Hamilton Scientific Association. On December 15th, 1908, a meeting was held in the Museum with Mr. G. Parry Jenkins in the chair. Dr. Marsh explained the objects and scope of our Society and strongly urged the formation

of a Centre in Hamilton, to work in affiliation with the Hamilton Scientific Association. Thirty-five names were presented, whereupon Rev. Dr. Marsh and Rev. R. E. M. Brady were appointed as delegates to arrange to have the new organization become a Centre of the Royal Astronomical Society of Canada. The following were the first officers of the Hamilton Centre:

<i>President:</i>	G. Parry Jenkins, F.R.A.S.
<i>Vice-President:</i>	William Bruce.
<i>Secretary:</i>	E. H. Darling, C.E., A.M.
<i>Treasurer:</i>	A. T. Neal.
<i>Council:</i>	J. J. Evel, T. H. Wingham, B.A.Sc.

This Centre has been active and successful throughout its whole history, depending largely upon its own resources to make its meetings interesting, and exchanging competent speakers with other Centres from time to time.

Besides the work of Rev. Dr. Marsh and Mr. Jenkins, the Hamilton Centre has been honored by the zeal and interest of its late President, Mr. Wm. Bruce, whose observatory, known as The Elmwood Astronomical Observatory, Upper Hamilton, has been popular for many years. Mr. Bruce is now, at eighty-three years of age, the Second Vice-President of the general Society, and has, during the past year, presented two eloquent papers.

While many artists are idly bemoaning the sad state of affairs Mr. Bruce is setting an example of industry, for though over eighty years of age, he devotes some hours each day to water colour painting. He very happily divides his time between Astronomy and Art.

THE WINNIPEG CENTRE, like that in Hamilton, had its origin in an antecedant Society. Professor Neil Bruce McLean, of the department of Mathematics and Astronomy in the University of Manitoba, organized, in September, 1909, The Astronomical Society of Western Canada. As President of the new Society, Professor McLean was untiring in his zeal. The meetings were held in the University buildings and the University's

MEMBER OF COUNCIL 1906-17

REV. I. J. KAVANAGH,
S.J., M.A., D.S.C.



FIRST PRESIDENT WINNIPEG CENTRE

NEIL H. McLEAN, M.A.

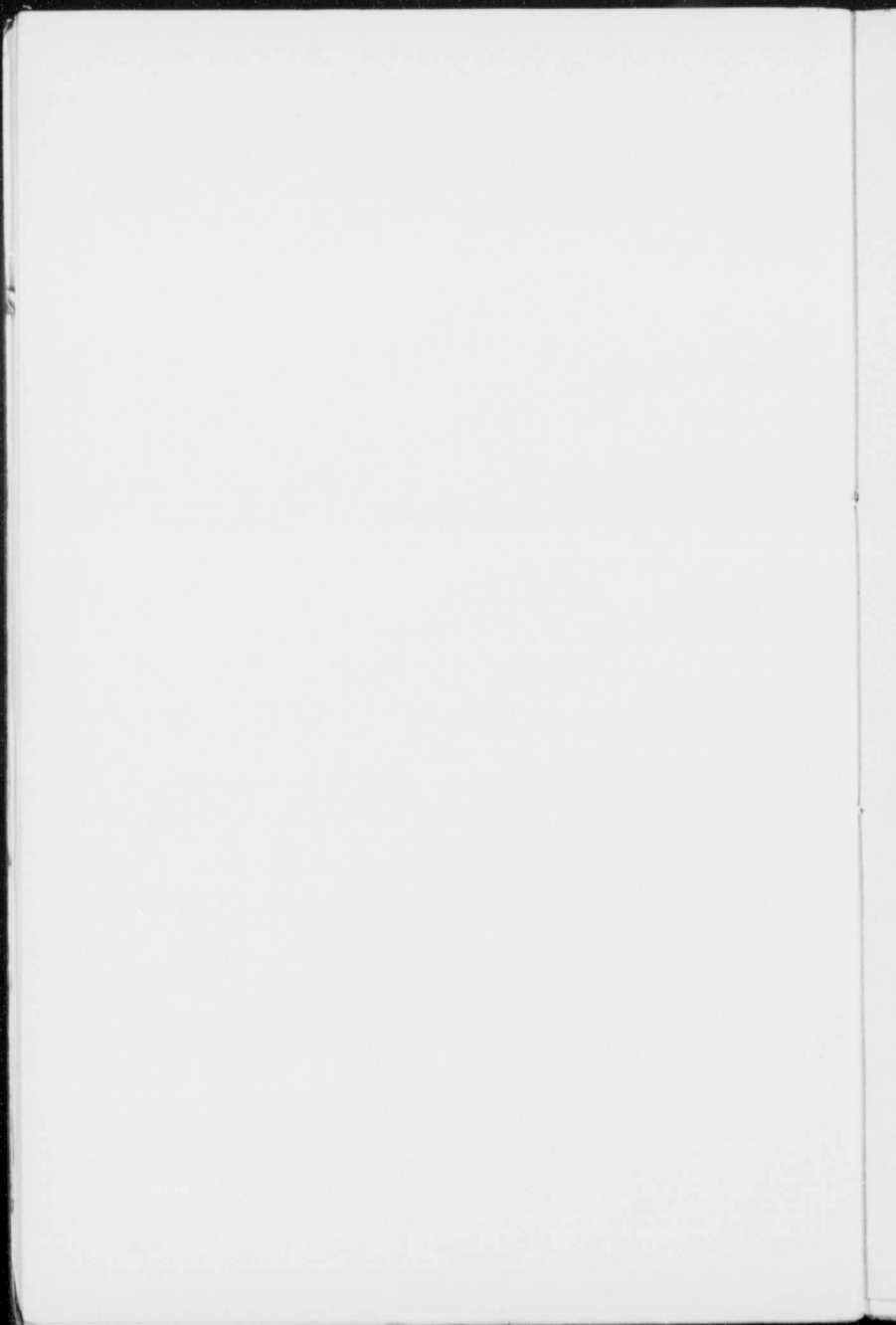


REV. D. B. MARSH, D.S.C., F.R.A.S.
ORGANIZER HAMILTON CENTRE



HON. WILLIAM BRUCE, J.P.
HON. PRESIDENT HAMILTON CENTRE





telescope was made available to the Society one night in each week.

In November, 1910, The Association was incorporated into The Royal Astronomical Society, the following being the first officers:

<i>President:</i>	Prof. Neil B. McLean, M.A.
<i>Vice-President:</i>	C. V. Stout, B.A., C.E.
<i>Treasurer:</i>	Frank Powell.
<i>Council:</i>	Mrs. L. B. Ireland, Mr. Howard, Mr. Collins, Rev. J. Blain, S. J. and Mrs. Kemp.

Professor McLean continued to be President till the end of 1913. During 1914, Prof. L. A. H. Warren, M.A., Ph.D., F.R.A.S., was President, and since that time Mr. C. E. Bastin has occupied this position. Mr. H. R. Kingston is Secretary and is a most energetic officer.

THE REGINA CENTRE likewise had its origin in a previously organized Society. The Saskatchewan Astronomical Society was organized February 25th, 1910, with the following officers:

<i>Honorary President:</i>	Wm. Trant.
<i>Hon. Vice-President:</i>	P. McAra, Jr.
<i>President:</i>	N. McMurchy.
<i>1st Vice-President:</i>	H. Lang.
<i>2nd Vice-President:</i>	J. F. Bryant.
<i>Treasurer:</i>	J. F. Bryant.
<i>Secretary:</i>	H. S. McClung.
<i>Council:</i>	C. B. Keenleyside, J. E. Doerr, Miss E. D. Cathro.

Affiliation with The Royal Astronomical Society was applied for and consummated in Oct., 1910. Since that date the organization has been known as The Regina Centre of the Society which we celebrate to-night.

Early in its history, a four-and-a-half inch Brashear telescope was presented to the Society at this Centre by The Honorable Mr. Justice J. T. Brown.

THE GUELPH CENTRE was organized in 1911. The first meeting was held in the Public Library Building. The following were the first officers:

<i>Honorary President:</i>	Col. A. H. MacDonald, K.C.
<i>Hon. Vice-President:</i>	Dr. W. F. Savage.
<i>President:</i>	Henry Westoby.
<i>1st Vice-President:</i>	Prof. W. H. Day, B.A.
<i>2nd Vice-President:</i>	Dr. J. Lindsay.
<i>Secretary:</i>	H. E. S. Asbury.
<i>Recorder:</i>	J. T. Linton.
<i>Treasurer:</i>	H. J. B. Leadlay.
<i>Council:</i>	A. T. Hobbs, M.D.; Rev. W. J. Wilson, W. C. McLaren, Wm. Tytler, Mrs. H. J. B. Leadlay, Mrs. W. O. Stewart.

Nearly 100 members were soon associated with this Centre.

THE VICTORIA CENTRE claims a fuller notice than its recent origin would warrant. The chief reason is that the Dominion Astrophysical Observatory, Victoria, B.C., is to begin its work there in the immediate future. The director of this observatory will be Dr. J. S. Plaskett, who we are pleased to note, becomes to-night the Honorary President of The Royal Astronomical Society of Canada, succeeding his dear friend, the late W. F. King, I.L.D., C.M.G., in that office. There is little doubt that the new observatory, under such a skilful and practical Astronomer as Dr. Plaskett, will become celebrated for its contributions to the Premier Science. To such a result, the great telescope which he has even now under his charge, will notably contribute, and the wonderfully suitable atmosphere on Saanich Hill, eight miles north of Victoria, B.C., with an elevation of 732 feet, must also be a further enhancement of the future of the Science in our most westerly Province.

Speaking of the new observatory and its equipment with the 72-inch reflecting telescope, Dr. Plaskett stated recently that the action of the Government "in sanctioning the construction of this telescope, larger than any in use, has now been rendered

doubly effective in the cause of science by placing it, independently of any local or sectional influence, where the best and most work can be done. The whole forms one of the largest, if not the largest, single contribution to science ever made by any nation, and Canadians should be proud that their country has so splendidly furthered the cause of astronomical research."

As the work at Victoria Centre is likely to become celebrated, we give some details of its origin. Like many others, this Centre had a predecessor. It was, however, an existence of rather a shadowy nature, as no meetings seem to be recorded. Mr. E. Baynes Reed and Mr. Arthur W. McCurdy, M.P.P., were active in its formation, but it appears that no work of an astronomical character was accomplished.

Largely through the influence of Mr. Arthur W. McCurdy, a meeting was held under the auspices of The Natural History Society, and addressed by Mr. F. Napier Denison. As a result of this meeting and of much assiduous work done by Mr. McCurdy and his associates, an appropriation of \$20,000 was made for a seismological station at Victoria. This station was established, and Mr. F. Napier Denison has been in charge ever since.

When this enterprise was well under way, the same indefatigable workers secured Dr. J. S. Plaskett to give a lecture, and our Honorary President-elect addressed a meeting in Victoria on March 6th, 1914. Mr. McCurdy was the Chairman that evening, and a Centre was organized with 58 members. The following officers were elected:

<i>Hon. President:</i>	J. S. Plaskett, D.Sc., F.R.A.S.C.
<i>President:</i>	F. Napier Denison.
<i>Vice-President:</i>	Arthur W. McCurdy.
<i>Secretary-Treasurer:</i>	C. H. Cotterell, C.E.
<i>Council:</i>	W. S. Drewry, B.C.L.S.; W. J. Sutton, G. G. Aitken, Major C. B. Simonds.

In a letter to Mr. A. W. McCurdy, dated April 14th, 1914, the General Secretary, Mr. J. R. Collins, said:

"Victoria is to be congratulated on the formation of such a strong

centre as your membership list shows it to be. This must be particularly gratifying to yourself, as I believe you are the one chiefly responsible for the successful issue of the affair."

This Centre is active and prosperous and promises a successful future. Besides what information I could obtain from the recorded transactions, I am indebted to Mr. E. M. McTavish, the excellent Secretary of the Victoria Centre; to Mr. C. E. Cotterrell, the first Secretary, and to Mr. McCurdy, the first Vice-President, for the facts pertaining to the formation of this Centre. Others have been equally helpful in supplying the data I have used, among whom I should mention Mr. H. R. Kingston, the energetic and efficient Secretary of the Winnipeg Centre.

It is Social and Political Science that presents those problems in relation to which we of this century must measure up or be condemned at the bar of all future judgment; and though we have already, even in its second decade, begun to

Wreck the towers of yesterday;
Scrap the dead past, and build the future new,

should we succeed thoroughly in such an enterprise, and fill the earth with justice, still, we say of Astronomy that for lofty conception; for induction of general principles from a multiplicity of varied detail; for grandeur of phenomena; for reverence in the presence of Universal Law; for sublimity of imagery and mathematical accuracy of calculation and prediction; Astronomy is still the Premier Science.

We may well quote here the words of Matthew Arnold:

"Weary of myself, and sick of asking
What I am, and what I ought to be,
At this vessel's prow I stand, which bears me,
Forward, forward, o'er the starlit sea.

"And a look of passionate desire
O'er the sea and to the stars I send:
'Ye who from my childhood up have calmed me,
Calm me, ah, compose me to the end!'

"'Ah, once more,' I cried, 'ye stars, ye waters,
On my heart your mighty charm renew;
Still, still let me, as I gaze upon you,
Feel my soul becoming vast like you.'"

PLATE IX.



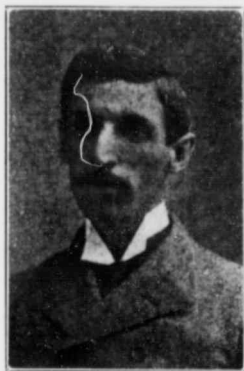
JOHN R. COLLINS
GENERAL SECRETARY 1902-17



SIR JOSEPH POPE,
K.C.M.G., C.V.O., I.S.O.
MEMBER OF COUNCIL 1905-17



HENRY WESTOBY
FIRST PRESIDENT GUELPH CENTRE



F. NAPIER DENISON
FIRST PRESIDENT VICTORIA CENTRE