

TORONTO ASTRONOMICAL SOCIETY

*Minutes of Meetings of
the Society 1902, Dec. 2
to 1909, May 18
Also some Minutes of Council*

Meeting of the Toronto Astronomical Society held at the Canadian Institute, Toronto, Jan. 7th, 1902. The President Mr. R. F. Stupart, F.R.S.C. in the chair.

Minutes of former meeting read and approved.

The Secretary read a communication from the Secretary of the Hamilton Astronomical Society, acknowledging the congratulations of this society on the formation of a society there as reported by Dr. Marsh.

Rev. Dr. Salten of Hamilton was duly elected an associate member.

Mr. Jansdon stated that the lecture of Dr. Brashear would take place on the 15th instead of the 8th as formerly announced.

The Librarian's report was received, also a report covering the contributions to the shelves of the library during the year.

Mr. Patterson reported the gift to the Society through Mr. James Beaumont Ryan of the following: viz. "Mars" by Percival Lowell, and Rev. James Galls "Easy Guide to the Constellations".

Mr. Howell presented the report of his committee regarding the reception to Dr. Brashear, and same was approved.

Mr. Musson on behalf of members of the Society in a few felicitous remarks presented Mr. Jansdon, the retiring president with a copy of Nelson's "Moon" as a slight token

of their appreciation of his untiring efforts in the Society's behalf during his term of office.

Mr. Weatherbee and Mr. Stupart reported a fine Sun spot on the 7th inst., a drawing of which was thrown on the screen. Mr. Miller, Mr. Lumsden and Mr. Maybee handed in drawings of β Orionis, in response to the suggestion made to members at a previous meeting.

At Mr. Elvins' solicitation his paper on the "Rotation of the Magnetic pole" was postponed to a future meeting.

Mr. Lumsden then addressed the society, reviewing the astronomical events of the year.

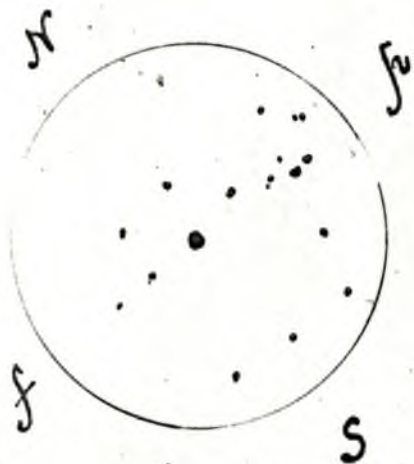
Meeting adjourned at 22 o'clock.

R. F. Stupart

President

J. W. C. C.

Recorder



*Orion's stars in field;
Reflector 72 mm. power 40*

Toronto Astronomical Society, Minutes of Council Meeting
held in Society's Room, Jan. 24th, 5 P.m.

Mr. R. H. Stupart, President in the Chair -- The Following members were present, Mr. G. E. Lumsden, Rev. provost T. Street Macklem, Mr. A. Elvins, Mr. J. E. Maybee, Mr. A. F. Miller, Dr. C. A. Chant, Mr. R. Duncan, Dr. A. D. Watson.

1st After considerable discussion re the expediency of making application to the Crown for privilege of styling the Society "Royal" and in the event of so doing whether "of Toronto", "of Canada" or "of Ontario" should be asked for, Mr. Stupart, Mr. Lumsden, Rev. Mr. Macklem, and Dr. Watson were appointed a committee to consider the whole question.

2nd The President and Treasurer were appointed a committee to enquire re the possibility of obtaining a suitable room up town in which to have the Tuesday Evening lectures, and if deemed advisable to engage one.

3rd It was carried that the Librarian have a suitable label printed for the library books.

4th Rev. Mr. Atkinson and Mr. Duncan were appointed a committee to purchase an Acetylene outfit for the lantern.

5th Mr. Lumsden and the President were appointed a committee to obtain tenders for printing the Report.

All of which is respectfully submitted.

R. F. Stupart, *R.F.S.*
President.

J. E. Webber,
Recorder.

J. E. Webber

Minutes of the Toronto Astronomical Society's Meetings since the last recorded meeting of Jan. 7th '02.

Through the courtesy of Prof. Loudon meetings for the past five weeks, viz. Jan. 21st, 28th, Feb. 4th, 11th and 18th, have been held in the Physical Lecture Room of the Toronto University, in connection with the course of Popular Astronomical Lectures very kindly tendered to the Society by Prof. De. Jury.

These lectures under the following titles:--

"The Cosmos as understood by the Ancients"

"The Development of the Copernican Theory"

"The Newtonian Advance to Physical Astronomy"

"Special Consideration of the Solar System"

"LaPlace's Nebular Hypothesis and Stellar Evolution"

have proved as their subjects suggest an historical outline of the development of Astronomical thought from the Cosmical theories of the Greek Astronomers, to the Nebular theory of LaPlace, as seen in the light of the teachings of Spectroscopy on Stellar Evolution.

The meetings have without exception been largely attended, and considerable interest if not enthusiasm manifested by those who have been present. So that the Society's hope in arranging for this course of lectures, of stimulating Astronomical interest, has apparently been fulfilled.

Regular meetings have alternated from Jan. 21st, but beyond the election of the following members no business was transacted. Messrs J. Murray Clarke K.C. and E. B. Biggar were duly elected associate members at the meeting of Feb. 4th, and Mr. Jas. L. Hughes on Feb. 18th.

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At the close of the last meeting in the series Mr. Geo. G. Lumsden moved, seconded by Rev. Mr. Atkinson, the following, " That the President be requested to convey the Society's best thanks to Mr. A. T. DeJury B.A., for the special course of five lectures on Elementary Astronomy which he had tendered to the Society, and which he had just brought to a close with entire success both as regards the merits of the lectures themselves, and as regards the interest evinced by the members of the Society, and the Public for whom they were intended, and by whom the lecture room was crowded from night to night" -- Carried.

Mr. J. A. Patterson also moved, seconded by Dr. P. H. Bryce, the very hearty thanks of the Society to Prof. Loudon, President of the University for the generous use of the University building during this lecture course.

R. F. Stewart
President.

Stewart

Recorded

Council Meeting Toronto Astronomical Society, Feb.
21st, 1902.

The president Mr. R. E. Stupart occupied the chair.
Members present -- Messrs Lumsden, Miller, Atkinson, J. R.
Collins, R. Duncan and Maybee.

The Librarian was authorized to put suitable printed rules
and regulations in all the books, and to have prepared a
suitable notice to be hung in the Library, asking members
to use the Record Book when taking out or returning a book.
He was also instructed to take stock of the books, and was
promised necessary assistance.

The following accounts were passed:--

Rubber stamp for altering accounts	.35
Caretaker and Engineer University	9.00
Howell re dinner deficit	4.60
Expressage paid by Merryday	.40

The tender of ~~J. R.~~ ^{J. M.} Collins for the printing of the Tran-
sactions at \$1.16 per page for 500 copies or less for 300 was
accepted. Subsequently the tender was raised to \$1.20 for a
superior paper.

The Curator was authorized to spend about \$7.00
on ^{an} Acetylene outfit for the small lantern. The jet to be
extra. The Curator was also authorized to try to secure
slides of Robert's Nebulae photos from the original negatives.
The Council recommended the election of Mr. A. T. De Lury
as a life member in recognition of his services to the
Society in connection with his recent course of lectures.

R. E. Stupart
Pres

Recorder.

J. M. Collins

Regular meeting of Toronto Astronomical Society held at the University Y.M.C.A. Building, Tuesday Evening Feb. 25th '02.

The President Mr. R. F. Stupart in the chair.

Minutes of former meetings read and approved.

Mr. Lumsden reported a communication from Mr. David Boyle, forwarding to the society some notes of Mr. Bowne on the subject "Can the heat of the Sun be increased"

The Secretary reported communications from:--

The Hamilton Astronomical Society., Dr. J. D. Tyrell, thanking the Society for set of transactions, G.M. Seabrooke F.R.A.S., President of British Astronomical Society, and Prof. Fessenden, giving details of his work along the lines of investigation of the nature and cause of gravitation.

Mr. Stupart on behalf of his committee appointed to secure a suitable room for the Society's meetings reported that through the good offices of Prof. Loudon, he was able to secure the present building belonging to the University Y.M.C.A. until June next.

It was moved by Mr. J. E. Maybee, and seconded by Mr. A.F. Miller that carrying out the recommendation of Council Mr. A.T. De Lury be elected a life member of this Society. -- Carried.

The Librarian's report was received and adopted. Mr. Pursey and Mr. Stupart reported no Sun spots since Jan. 3 Oth.

Mr. Miller reported his recent observations of Nova Persei, which he described as a definite Stellar object of about the eighth magnitude. On account of Moonshine no

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Spectroscopic observations had been possible. Mr. Miller also reported observations in the Constellation, Orionis, & suggested (β) Orionis. Theta (θ) 1 and 2 Sigma (σ) and Epsilon (ϵ) Orionis as objects of interest to the members.

Mr. Miller reported that both Mr. Lumsden and himself had been unable to find Hinds' Crimson Star R. Leporis, and were of the opinion that it was variable, and approaching minimum. Mr. Lumsden added that he had since found that this red Phenomena is peculiar to the stars' Minima.

Mr. Lumsden also suggested to the members the advisability of making observations with an opera glass, say counting the stars in the Pleiades, also noting the Moons' surface particularly Herodotus and Aristarchus.

Mr. Maybee presented a sketch of Aristarchus, Herodotus and Schroeters valley made at the telescope on Wednesday evening Feb. 19th. Mr. Maybee called attention to the observations of Gruithensen and Dr. Klein who both claim that the region surrounded by the valley or rill is strongly green in tint. Gruithensen likened the appearance to that of vineyards and plantations on the earth. Dr. Klein thinks that here if anywhere will be found evidences of the vegetation. Prof. W.H. Pickering thinks may exist on the moon.

Mr. Maybee asked observers to look for this alleged green tint which he himself has been thus far unable to see.

Of Predictions the Occultation of Spica on the morning of the 26th was the most important promised.

Rev. Mr. Atkinson then addressed the meetings on the " Planets " illustrating his remarks with slides, and drawing attention to the features of particular interest from an observational standpoint.

The meeting adjourned at 22 o'clock.

President

Recorder.

Regular Meeting of the Toronto Astronomical Society held at the University Y.M.C.A., Tuesday Evening March 11th, 1902.

The President Mr. R. F. Stupart in the chair.

Minutes of former meeting read, and approved.

The Secretary reported communications from the Royal Society of Canada, requesting that delegates from this Society be appointed to attend the next meeting in Toronto.

Also a circular letter from the Secretary of the British Association for the Advancement of Science, requesting that members of this Society undertake some of the special work assigned to various committees: None of the subjects, however, are relating to Astronomy or Astronomical Physics.

In compliance with the request of the Royal Society of Canada, it was moved by Rev. R. Atkinson, seconded by the President that --

Mr. J. A. Patterson, Mr. A. Elvins, and Mr. G. E. Lumsden, represent this society at their meeting on May next.

Mrs. McCoy, 36 Gloucester St., was duly elected an associate member.

The Librarian reported a donation to the Society through Mrs. McCoy of a copy of "Astronomy with an Opera Glass".

Mr. Stupart here announced that through an unfortunate circumstance it was necessary to postpone the lecture of Mr. Anderson' announced for to-night until April 1st, when it would be delivered in the physical Lecture Room of the University.

Predictions were as follows:--

Thursday the 13th occultation of P Arietis at 7.43.

Saturday the 15th Occultation of (2) Taurii, at 7.33, and on

Wednesday the 19th of (A) Canerii at 8.52.

Mr. F. M. Blake reported Sun Spots on the 4th, 6th, 10th and 11th. Mr. Pursey also reported spots on these dates, and reasoning from Mr. Elvin's observations thought there were indications of the beginning of a new cycle of spots.

Mr. Elvins explained that the theory in which Mr. Pursey based his reason was Prof. Airys' and that his own observation had not altogether confirmed it.

The President also read a letter from Mr. Weatherbee reporting Sun Spot disturbance, and his drawing of the group of March 6th was thrown on the Screen. Mr. Weatherbee went to suggest the coincidence between recent Sun outbreak and Atmospheric disturbances on the earth.

Mr. Elvins referring to Mr. Weatherbee's drawing stated as his observation that the "preceeding" spot usually remained visible longer than the one following it..

Mr. Miller reported the results of his observations of the Pleiades with an opera glass. He was able to count 27 or 28 stars in the group by this means. With a field glass 65 were visible, while a small $1\frac{1}{2}$ in. telescope with a power of 17 or 18 showed 95.

Mr. Lumsden had been able to count 48 or 49 with an opera glass, while only 8 were visible to the naked eye.

An interesting discussion followed on the relative merits of opera glasses in astronomical work.

Mr. Lumsden raised the question of forming a lunar section and the following have expressed their willingness to join in such work, were appointed.

Mr. Lumsden (Chairman) Mr. Elvins, Mr. Patterson, Mr. Maybee, and Mr. Atkinson.

Some Lunar slides were then thrown on the screen, while Mr. Lumsden and other members drew attention to some of the features of particular interest on the Lunar surface.

The Meeting adjourned at 9.50


Recorder

President

Regular Meeting of the Astronomical Society held at the
University Y.M.C.A. Tuesday Evening, March 25th, 1902.

The President Mr. R. F. Stupart in the chair. The Secretary reported a letter from Prof. Wadsworth, Director of the Allegheny Observatory, in reference to Photo prints of the Spectrum of Saturn's rings, showing displacement in the line of sight due to unequal velocity therein.

Also a telegram from Harvard College Observatory announcing that Prof. Perrin of the Lick Observatory had examined photographically with the Crossley Reflector the points of condensation in the Nebula surrounding Nova Persei, and found that the light from these points was not polarized, and therefore could not be reflected light, and must be emitted by the nebula itself. The President read a circular letter from Prof. Pickering of Harvard College Observatory, announcing an unconditional gift of \$20,000. to the Observatory, which it was proposed to expend in a building for the care and collection of Astronomical Photographs.

Mr. Pursey reported no spots on the Sun.

Mr. Lumsden read a letter from Mr. Wadsworth reporting an observation of Venus, visible to the naked eye on the morning of the 24th, about eleven o'clock.

Mr. Weatherby reported observations on the Sun, and handed in drawings of the last series of Sun spots. He also asked if members had seen more than seven stars in Sigma Orionis, and reported Neptune easily visible in Gemini.

Mr. Lumsden reported the Moon particularly favorable for observation in the last lunation.

Mr. Maybee referring to Mr. Kimball's paper on "Some causes of the variability of Earth Shine" said he had drawn Mr. Kimball's attention to what he thought an inaccuracy in his percentage of increase; the extreme variation in the intensity of Earthshine above the minimum being 72% instead of 52%, as stated by Mr. Kimball. Mr. Kimball had in reply confirmed Mr. Maybee's calculation.

Mr. Lumsden suggested that an invitation be extended to the Teachers Convention to attend Mr. Anderson's lecture on Tuesday April 1st.

Mr. Miller then read a paper on --

The Spectroscope in Astronomical Research.

In his paper Mr. Miller gave a brief account of the researches of Fraunhofer, and the discoveries of Kirchhoff, which form the basis of Spectroscopic astronomy. He showed the importance of accuracy in mapping the solar spectrum, and described the methods followed by Kirchhoff, Ångström, Thollon, Cornu, and Rowland. He described the various stages through which the spectroscopic study of the Sun has been carried, and gave a detailed account of the methods adopted in the investigations of sunspots, faculae, the chromospheric forms and the corona. Under the head of stellar spectroscopy he explained the use of the objective prism and other forms of the star-spectroscope, and spectrograph, and pointed out the great advantage resulting from the application of photography in this line of research. He referred to the determination of stellar motions in the sight line, and the discovery of spectroscopic binary-stars, a class of bodies which but for the spectrographic method would probably never have become known. Referring to theories of stellar evolution, he inclined to the view that the different types of stellar spectra are due to differences in the proportions of the gaseous and metallic stellar constituents rather than to changes in the temperature of the stars themselves: He did not however, extend this theory to such bodies as variables of the Ceti type, or to temporary stars.

W. B. ...
Recorder

President

Regular Meeting of the Toronto Astronomical Society held at the University Y.M.C.A. Building, Tuesday Evening, April 8th '02. The President Mr. R. F. Stupart in the chair.

Letters were read from Dr. Brashear, also Col. Markarck, Director of the Variable Star Section, British Astronomical Association, re Hinds Crimson Star in Lepus, and W. Goodacre F.R.A.S. Director of the Lunar Section, British Astronomical Society.

The Secretary reported a communication also from Prof. Campbell. (Director of the Lick Observatory) in answer to a query as to the method Perrin employed to determine non-polarity of light from condensations in Nebulae of Nova Persei.

He stated that a double image prism was interposed about 3 inches in front of the focus before the photographic plate; also that Perrin had photographed the regions surrounding Nova Aurigae, and several other recent Novae without getting any evidence of Nebulae. *about 1/2 inch (Nova Aurigae Cygni)*

A letter from Mr. Atkinson was read tendering his resignation as Librarian, owing to ill-health, but on the motion of Mr. Miller seconded by Mr. Maybee it was decided not to accept this resignation, and to take advantage of Mr. Lumsden's kind offer to perform the duties meanwhile.

Mr. Lumsden reported a very successful meeting of the Lunar Section at the Institute on March 31st.

The following occultations were predicted:

26 Gemini on the 13th, 68 Gemini on the 14th, and (w) Leonis on the 16th.

Mr. Pursey reported no spots on the Sun, but the appearance of some bright faculae on the 8th was noticed. Mr. Black had also noticed this phenomenon.

Mr. Weatherbee reported observations in the Constellations of Hercules.

Mr. Lumsden asked as to the visibility of stars during rain fall and snow fall. Mr. Stupart thought in the instance of such snow fall that it was probably carried by the wind from a quarter where snow was falling at the time.

Mr. Geo. R. Anderson M.A. was duly elected an Associate member.

The paper of the evening by Dr. G. F. Hull, Dartmouth College was on the subject "The Pressure of Light in its application to Astronomical problems".

Dr. Hull referred to the old problem of the apparent repulsion of comets' tails by the sun, explained by Kepler as being due to the impact of the corpuscles of light on it, and remarked that on the acceptance of the wave theory of light this explanation had to be given up.

Maxwell showed that according to the electro-magnetic theory of light, light should exert a pressure on unit surface equal to the energy of one unit of volume, divided by the velocity of light. This magnitude as calculated by him, was so small that little hope was held out of it ever being experimentally observed. Very recent experiments, however, in part made by Dr. Hull had given decisive demonstration of the existence of the minute force, the actual force observed agreeing with the calculated result within 5%. A brief description of the apparatus was given, and then some interesting applications of light pressure to astronomical problems. It was shown that on a body sufficiently small the pressure due to the light of the sun would be greater than his attraction but there is a limit to this smallness, since particles of excessive smallness reflect very little light, and hence receive little pressure. It was also remarked that the velocity due to this light pressure could never be as great as the velocity of light.

The behavior of the tails of comets followed naturally from the principle of light pressure, while the zodiacal light, the Gegenschein and Aurora Borealis are likely in large part due to the same cause.

An interesting discussion followed the reading of the paper, in which Mr. Miller, Mr. Lumsden, Mr. Maybee and the President joined.

R. J. Shepard *J. W. Emerson*

Recorder

President

Regular meeting of the Toronto Astronomical Society held in the University Y. M. C. A., Apl. 22, 1902. The President, Mr. R. F. Stupart, in the chair.

A letter was received from Mrs. Keeler, widow of the late Dr. Keeler, promising to send the society, by request, a print of the spectrum of Saturn's Rings, as a memento of her late husband's contributions to science.

A telegram forwarded by Harvard College Observatory was received, announcing that Prof. W. R. Brooks had; on Apl. 15, observed the comet suspected by him on Apl. 14, at 21^{h} , *Greenwich Mean Time* in R. A. $23^{\text{h}} 8^{\text{m}} 10^{\text{s}}$, and Dec. *Right Ascension* $27^{\circ} 25'$, Daily motion in Dec. 12^{m} , Daily motion in Dec. $- 2^{\circ}$, brightish, with tail. This comet had also been since seen at *Kitt Peak* and *Lick* Observatories.

Miss E. Sims was duly elected an associate member.

Under the head of predictions, attention was called to the fact that Saturn would be in opposition to the sun on July 17, 18 *hrs.* *Greenwich Time* or 3 p. m. Toronto time.

Mr. Arthur Harvey made a few remarks concerning a handy method of mapping the constellations. Mr. Blake reported the sun's surface still clear of noticeable spots. Mr. Elvins stated that he and several members had taken advantage of the President's kind invitation to make use of the observatory telescope.

The President reported that the Sismograph at the observatory had recorded a severe Earth-quake shock, accompanied by a sharp electrical disturbance on Apl. 18th at 4.38 p.m. The origin of the disturbance was afterwards found to be in Guatemala the shock taking place there about 11 min. before it was recorded here, that being the time taken for the tremor to travel to Toronto, a distance of about 1800 miles *representing a velocity of 2 2/3 miles per second approximately.*

Mr. Miller reported observations of small solar prominences, and of his continued observations of the stars in Gemini, remarking that they were nearly all of a yellow tinge.

Dr. Marsh of Hamilton, referred to observations of the Moon and Planets. The Hamilton Astronomical *society* was reported progressing

favorably, with a membership of 35. President Stupart's recent lecture at Hamilton had been appreciated.

The paper of the evening - "The Apex of the Sun's Way", was then read by Mr. John A. Patterson M. A., who had collected, in a condensed form, information on the subject up to date. The methods of determining the direction and velocity of the sun's motion through space were described, viz, - the apparent opening out of the stars in one direction, and the apparent closing in of the stars in the opposite direction, indicating motion from the latter towards the former direction. Also the Spectroscopic method was described - where the average greater motion of all the stars in the line of sight indicated a point of average greater motion, and at the opposite point in the heavens a point where the average motion is less: both these points, ^{apparently} coinciding with the ^{positions} ~~points~~ indicated by the first method, ^{indicating} ~~showing~~ that the Solar System is moving towards a point, ^{near Vega} in the constellation ~~Seyna~~ ^{Lynx} at the rate of from 5 to 10 miles per second.

R J Stupart
Pres.

J R Collins
for the Recorder

Meeting of the Toronto Astronomical Society, held at the University Y. M. C. A. building, Tuesday Evening, May 6, 1902. The President, Mr. P. W. Stupart, in the chair:

Under the head of predictions, Mr. Lumsden reminded members that Mercury, becomes the "Evening Star" on the 21st, this being unusually early.

Mr. Elms reported that he had been making observations at Belleville, where he found the seeing particularly good, the Zodaical line being very clear.

Mr. Blake and Mr. Furse reported no spots on the sun.

Mr. Atkinson reported recent observations on the lunar surface, particularly of the "straight wall".

Mr. Stupart stated that reports from showed there had been fine Auroral displays in that region.

The President also reported seeing nine very fine meteor, on the evening of the 5th.

Mr. Miller reported continued observations in Gemini and the Corona. Also that he had been making some measurements which would be presented to the Society when complete. He also advised members to single out the stars in the Coronae for observation, mentioning in particular Eta and Cygne Coronae, the latter being a triple star, and an easy object. (see front mtg)

Mr. Harvey, editor of Transactions, laid on the table the printed report for 1901.

* *η Coronae* / this star, which during many years past ^{my eyesight has been} has been frequently examined, but never was able to see other than a single one, now appears elongated with ^{the} high powers of a 4 in. aperture. It would appear that this is about the period when the 2 components are at their greatest distance. Observers are asked to examine the spot with care, & it is hoped that the fair & rich cube spectra of the Society may show a clear double.

the papers of the evening were, "The Transit Instrument and its adjustment" by Mr. F. M. Blake, and "Solar Radiation", by Mr. Arthur Harvey.

Mr. Blake described the transit instrument, also the chronograph and other instruments in use at the observatory for measuring and recording the time: and explained the difference between solar and mean time. The mercurial and compensating pendulum were also described. It was remarked that the mercurial pendulum is in use at the observatory here.

Solar Radiation".

Mr. Harvey appears to have been the first to be able to establish the fact that magnetic phenomena such as Aurorae synchronize at the North and South simultaneously. The sun, he held, was the original cause of such disturbances: comparative curves sustaining this position were shown on the screen.

C. A. Bhand.

V. P. Bhand.

John E. ...
Reiner

Regular Meeting of the Toronto Astronomical Society held at the University Y.M.C.A., Tuesday Evening, May 21st, 1902.

Vice President, Mr. C. A. Chant in the chair.

The Secretary reported a communication from Prof. Bickerton. Mr. Harvey also reported a communication from the Academy of Science, St. Louis, asking for a copy of this Society's transactions for last year. At Mr. Harvey's suggestion it was decided to send on a copy.

Mr. Lumsden for the President asked that a meeting of Council be called for Monday Evening, May 22nd.

On behalf of Mr. Todhunter who was present, Mr. Musson announced that Mr. Todhunter had decided to present to the Society his 2 inch Telescope.

Mr. Chant in acknowledging the gift for the Society took occasion to acknowledge the many kindnesses received by the Society at Mr. Todhunter's hands, and at his suggestion it was moved and carried that a suitable plate be mounted on the telescope acknowledging the doner of this splendid gift.

Mr. Lumsden moved, seconded by Mr. Weatherbee that the President, Mr. A. F. Miller, and the mover be a committee to make preliminary enquiries with respect to the total Eclipse of the Sun on August 29th, 1902. This motion was carried.

Prof. A. J. Bell tendered his resignation as an active member of the Society.

The Librarian reported that several books were still missing from the Library without any record of their whereabouts. After some considerable discussion it was decided to report the matter to council, with a recommendation to take into consideration the whole question of the library.

Mr. Blake reported no spots on the Sun.

Mr. Miller reported several Solar Prominences on May 11th, some very bright and conspicuous.

Mr. Miller also casually remarked the coincidence between their activity and the recent volcanic action in the I^{le} of Martinique.

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Mr. Harvey referring to coincidence of solar and volcanic activity mentioned the catalogue of Mexican Earthquakes for exhaustive information on the subject.

Mr. Harvey offered to take care of the Society's 4 inch Telescope, and to kindly allow members the use of his lawn for observation.

Mr. Musson^{Am} read a paper on "Variable Stars" in which he drew attention to the main points of difference between variables of long and short period, and also stars of the Algol class.

While there was little doubt that the variability of the latter is caused by the Eclipse of one body by another the fluctuations of long period variables is still much of a mystery.

Attention was also drawn to the fact that Prof. Chandler had confirmed his theory advanced in 1888, that the long period irregularity which he had discovered in the light curve of Algol had followed the course then predicted in the theory that Algol and its companion together moved in an orbit about a third body.

Reference was made to the work on variables stars now being actively pursued at Harvard observatory and various methods used in detecting variable stars were described.

The paper was illustrated by a number of light curves representative of the different classes of stars dealt with.

R. F. Shepard
President.

J. W. Eveson
Recorder

Regular Meeting of the Toronto Astronomical Society, held at the University Y.M.C.A. building June 3rd, 1902. The President Mr. R. F. Stupart in the chair.

It was moved by Mr. E. B. Biggar, seconded by Mr. Geo. E. Lumsden, that this Society records its appreciation of the persevering efforts of Capt. E. J. Bernier to organize the first purely Canadian expedition for Polar research, and, recognizing the value to Canada of further exploration of our far Northern Regions, would commend Capt. Bernier's enterprise to the active sympathy of Provincial Government and the Public, a copy of this resolution to be transmitted to the Honorable the Premier of this Province.

After Mr. Stupart, Mr. Musson, and Mr. Harvey and other members had spoken to the motion, it was carried unanimously. Mr. Harvey added a suggestion that the Society pledge itself also to some financial assistance, say \$100.00 offering if such were done to contribute personally, say \$25.00.

After some discussion of the matter it was decided to send the recommendation of a contribution on to council to report.

Mr. Miller spoke of observations in (γ) Virginus, which he described as "a wide and easy double" that should be observed by all owners of telescopes. Since its discovery by Bradley, when the separation of the components was about $6''$. it gradually closed till in 1837 the components were seen barely elongated, by the very best observer; and most powerful telescopes, the distance then was about $5''$. From that date till the present there has been a gradual opening out and Mr. Miller's measurements show the pair now separated at $6.6''$. (mean of 9 measures). The change of position angle was also referred to as a still more interesting feature. This shows rapid movement at the periastron the movement declining as the stars separate.

Thus between 1830 and 1836 the angle changed 122° whereas Mr. Miller now finds the angle to have changed but $3\frac{1}{2}^\circ$ in 22 years.

The components Mr. Miller added are now equal in color and brightness though they have been known to vary in both particulars.

Mr. Harvey reported fine displays of Zodiacal light on March 29th and Apr. 27th. also a small distinct Sun Spot on the 3rd inst.

Mr. G. E. Jumsden read a paper on the subject of "Lunar Ring Plains," their origin, varying size and shape, and their arrangement, often in chains, suggesting their formation by volcanic action along fissures caused by the shrinking and folding of the hardening lunar crust through which at the places of greatest weakness, and therefore of least resistance from below, were ejected the materials of which they were constituted. Attention was drawn to the fact that in some portions of the Moon ring-plains occur with greater frequency than in other portions, and that there appear to be vast differences as to time in the periods of their formation. Note was made of the fact that many of the most important ring plains are situated along the margins of areas supposed to have been at one time sea-floors, in this manner resembling similar volcanic formations on the earth, most terrestrial volcanoes being found in the vicinity of oceans. Reference was also made to numerous examples which had wholly or partially been deformed by some action, such as that of water, an idea all the more suggested by the existence of partially or wholly deformed craters on the bottoms or along the shores of ancient seas. The paper was illustrated by a series of lantern-slides, some of them especially prepared, and advantage of the throwing of the slides on the screen was taken to point out various formations and details in connection with them which the speaker thought to be worthy of study.

J. W. Eveson

President

Recorder

Council Meeting held at the Observatory June 12th '02. Members present, Mr. R. F. Stupart, Mr. Geo. E. Lumsden, Mr. A. F. Miller, Mr. Arthur Harvey, Dr. A. D. Watson, Mr. A. Elvins, Mr. W. B. Musson, Rev. Mr. Atkinson, Mr. J. R. Collins, Mr. Duncan, and Mr. J. E. Webber.

The chief item of business was the question of a suitable place for the Society's Meetings. After a considerable discussion of the matter it was decided to submit to a vote of the members of the Society the question whether they preferred to meet in the present building or at the Canadian Institute, conditions being equal as regards library &c.

It was also decided to open a subscription to the Capt. Bernier expedition, taking advantage of Mr. Harvey's kind offer to contribute \$25.00 to such a fund providing \$100.00 were raised, the amount to go in in the Society's name.

All of which is respectfully submitted.



Recorder

President.

Sept 4/08

A meeting of the South Astronomical Society was held in the Canadian Institute on Sep 9th

The President, R. F. Stupart F.R.S.C, in the Chair

Under Observations, Mr G. F. Miller reported having observed the new comet 'Perrine' in the constellation Perseus near Algol, he had found it without difficulty in the position given in the ephemeris furnished to society by the Harvard College Observatory (the comet was to be at ~~perihelion~~ perihelion in Nov)

The president reported that the sismographs ^{and} had recorded recent disturbances of the earths crust a notable one accompanying the disappearing of an island in the south Pacific

Mr Edwin Fletcher reported having ~~observed~~ a double shadow ~~of~~ from a satellite on Jupiters disk at one time

Mr Ellis at Swansea had observed an occultation of Jupiters satellites No 1 occulting No 2 on the evening of Aug the 31st

Communications

a letter was received from the British

of the British Association for the Advancement of
Science, stating that this Society remains on the list
of corresponding societies for the current year.

A request was received from the Director of the
New York Public Library, that a set of the transactions
of this Society be forwarded them and that their
institutions be placed on the list of institutions
receiving ~~the~~ ^{their} publications. This was done.

The trustees and faculty of Northwestern University
at Evanston Chicago Ill forwarded an invitation
to this Society to send a delegate to the meeting
Edmund James James Ph.D. LL.D. as President of the
University, on the 19th 20th and 21st of October next.

Dr G. F. Hull ^{as member of this Society} now at Dartmouth College Hanover
N. H. was appointed to represent the Society on
occasion.

Mr Andrew Elvin contributed the paper
of the evening, entitled "Cause of the 25 day period
in the magnetic curve." Mr Elvin ~~has~~
reviewed the work that had been done along the
line of investigation of the cause of this period and
held that the inflow of cosmic matter to
the earth is known to receive would produce

the magnetic effect and the position of
the moon and the larger planets, ~~would~~
could be such at periods of 25 days, as to justify
ultra-cosmic surmises sufficient to produce
a 25 day magnetic period

C. A. Chant

1 V.P.

P. Lillies
for the Recorder

Sept 23/02

Sept 23/02

The regular meeting of the Astronomical Society was held in the Canadian Institute on Sep 23rd

C.A. Chant the Hon. Just Vice President in the Chair. The minutes of the last meeting was read and confirmed under communication.

Mr Sumner read a letter from Louis Swift in which the writer referred to a former visit to Toronto in 1849 when he lectured on electricity in the old City Hall.

Report from Council was taken as read and adopted.

J. Jackson Henderson and J. Smith and John Ellis of Swansea were elected associates of the society.

Mr John J. Wright of Toronto was nominated as an associate by

E. B. Biggar and G. C. Sumner

Under observations Mr Atkinson described his visit to Edinburgh Observatory and Kew as well as South Kensington ^{at summer} exhibition seeing and handling Herschel's 4 ft telescope, with which he is said to have discovered Uranus.

Moved by Mr Atkinson see by Mr Harvey that a copy of the Society's transactions for the last year be forwarded by Mr Peck director of the City of Edinburgh.

Mr Harvey reported having observed some sun spots on the 23rd inst.

Mr Sumner reported having observed Perrin's comets on the 10th whilst in Muskoka.

The evening the members of the Society
 enjoyed at the residence of Mr John Ellis
 Swansea on the evening of Sept 13th

The evening was fine and the members
 had the opportunity of seeing Saturn Jupiter
 and other celestial objects in a clearer
 atmosphere than is to be found within the
 city limits

Dr Marsh's telescope (of Hamilton) was
 referred to mentions had been made
 to it in the Hamilton Paper when it
 was stated that Dr Marsh had now the
 most thoroughly equipped private observatory
 in Canada

It was found impracticable to send
 Dr Hull to the installation exercises
 at Evanston Chicago

The Paper of the evening was by
 Mr Withers on Astronomical work
 for the autumn. The autumnal
 constellations were shown on the screen
 and stars of particular interest pointed
 out

W B Munson

P. Collins.

Council Meeting 1st Aug. 02.

772 W.B. Mearns - 2nd V. Pres. in the
Chair -

Present - Mr. Ellis, Mr. Leavelle,
Mr. Harvey, Mr. Miller, ~~Mr.~~ D. Watson
Mr. Duval -

Moved by Mr. Harvey } That, in the
Seconded - - Ellis }
absence of the Librarian, Mr. Leavelle
be appointed acting Librarian with
full powers to make any improvements,
which, in his opinion, are necessary

to put the library in proper order, and
to ~~incure~~ ^{expends} therefore a sum not
to exceed \$50.00 same to be
chargeable to the funds of the
Society - Carried -

Moved Mr. Miller

Second. - - Duval

That the Secretary be in-
-structed to have a suitable
inscription engraved upon
the Lodheader, Lavett Smith &

Swi Adam Wilson telescopes,
Carried.

Moved Mr Elvins
Second ~~by~~ ^{Miller} ~~founder~~ } That ~~the~~

The Acting Librarian be
authorized to purchase a
copy of Picturing's "Discov-
eries of the Moon". Carried

The Secretary was ^{authorized} ~~instructed~~
to notify Rev. G. B. Ward that
he had been elected an Associate
of the Society.

Oct 7/02

The regular meeting of the ^{group} Astronomical Society was held in the Canadian Institute on ~~the~~ ^{the} 6th

Second Vice President W.B. Mussen in the chair. The minutes of last meeting were read and confirmed.

Mr John J. Wright was elected an associate. The Librarian reported the receipt of a number of publications from France England France Germany Italy.

The Librarian requested help in ~~the~~ cataloguing and indexing the large number of papers and other valuable material now on the shelves of the library. Mr Atkinson moved, seconded by Mr Slipport that a committee be appointed empowered to put the library in order both by obtaining additional books and cataloguing the lists the committee being authorized to incur the necessary expense in having this done - Carried. Mr Atkinson Mr Lumsden and Mr Mussen were appointed a committee to take charge of the matter and report at next meeting.

Under predictions, Mr Atkinson drew the attention of the members to the approaching lunar eclipse, visible here on the 16th of the month. The time of the moon's entry into the umbra of the earth's shadow was stated as 2h 17.3^m totality at 16^h 22.19^m emerging 50 minutes past midnight.

On the 14th Jupiter's 4 satellites were according to ephemeris to be all on the ~~left~~ ^{western} side of the planet, ~~and 2 transiting it at the same time~~

on Oct 7/02
The president referred to several communications he had received in reference to the time of high-tide at Quebec on the date of the battle

the Claims of Monahan his answer to this had been sent but Mr. Stupart stated he would be pleased if some of the members would work out the time of high tide at that time independently.

Mr. Elms referred to the appearance of Comet "Perini" then visible near Annapolis. Mr. Lumsden also described the telescopic appearance of the object as exhibiting what he took to be rifts in the comet from nucleus extending through the tail.

Mr. Miller stated that on three nights he had succeeded in observing the spectrum of Comet "Perini" (6'02) he had seen three bright bands and occasionally a fourth very faint band. The bright band in the green seems to correspond to that of the Bunsen flame. Though he had not succeeded in verifying this by actual comparison he believes that the appearance of the comet's spectra and the fact of the bands being sharp towards the red are good evidences that the light is emitted by a hydro-carbon gas the nucleus seeming to give a continuous spectrum and viewed telescopically with a high-power ocular appears to consist of several small bright masses involved in the nebulae of the coma.

Mr. Stupart described a group of sun spots that had appeared on the 7th inst. Mr. Wetmore had also observed these on the 5th and 6th.

The paper for next meeting "Ancient Coast Lines" by G. E. Smith, F.R.S., was announced.

In Reader
J. R. Collins

G. J. Lamb

Two-Pruders

Meeting of the Toronto Astronomical Society, held at the Canadian Institute, Tuesday, October 21, 1902.

Vice-President, Dr. J. A. Chant, in the chair.

Minutes of former meeting read and confirmed.

Mr. Lumsden read a letter from Miss Carpmael, denoting to the Society a number of books and instruments, the property of her father, the late Dr. Carpmael, one time president of the Society.

The Secretary also reported communications from Dr. G. F. Hull, of Dartmouth College, announcing his inability to act as the Society's delegate at the installation of President James North-Western University, Evanston, Ill.

A letter from Dr. Wadsworth, Simcoe, who had taken photographs of Comet "b" 1902 (Perrine), stating also that at the last meeting of the Simcoe Society seventeen were in attendance.

A letter from Dr. D. B. Marsh, Hamilton, stating he had been carefully noting faculae and sun spots by projection - had photographed the eclipsed moon on the 17th of October - had been studying Jupiter's red spot.

The President asked for a meeting of Council, for Thursday evening, October 23rd.

Mr. Atkinson presented the report of the Library Committee, which recommended the temporary appointment of an outsider to put the library into proper shape, and attend to the cataloging and indexing of the books, these services to be paid for at \$10.00 per week. Mr. Atkinson moved, seconded by Mr. Maybee, that the Report of the Library Committee be accepted and hereby approved. Carried.

The recent lunar eclipse came in for discussion, particularly the "crape band", which was an interesting feature of the eclipse, Mr. Lumsden, Mr. Elvin, Mr. Maybee, and others, contributing to the discussion. A photographic slide ^{of the eclipsed moon}, also, was thrown on the screen, illustrative of this particular feature.

Mr. Lumsden reported an observation of the comet Perrin, made at the Observatory, but the object was not a satisfactory one.

Under predictions, Mr. Lumsden reported Algal Minima, October 31st, at 11 o'clock, and November 2nd, at 8 o'clock.

Mr. Lumsden, referring to the gift by Miss Carpmael, thought that some suitable acknowledgment was necessary, and for that reason moved that the matter be referred to Council for action. Mr. Miller and Mr. Elvia speaking in support of the motion referred very feelingly to their own personal association with the late Prof. Carpmael, and their acquaintance with the valuable instruments now denoted to the Society.

Captain Bernier, who was present, addressed the meeting for a few minutes on his proposed North Pole expedition.

Mr. Lumsden read the Paper of the evening, on the subject of "Ancient Lunar Coast Lines".

Approved
C. J. Hunt

President,

W. E. ...

Recorder.

Minutes of Council Meeting held at the Observatory Thursday, October 23, 1902.

Members present:- R. F. Stupart, President, Mr. G. G. Lumsden, Mr. A. F. Miller, Mr. A. Elvins, Dr. C. A. Chant, Mr. ~~W. B. Musgrave~~ W. B. ~~Musgrave~~ Rev. R. Atkinson, Mr. J. E. Maybee, Mr. R. Duncan, Mr. J. M. Collins, and Mr. J. E. Webber.

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Discussing the Report of the Library Committee, it was moved by Mr. ~~Musgrave~~ seconded by Mr. Maybee, that a sum not exceeding Seventy five dollars may be expended in bookbinding, shelving, and other matters connected with the Library improvements, in addition to the cost of indexing already authorized.

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Carried.

It was moved by Mr. Lumsden, seconded by Mr. Miller, "That a respectful memorial be presented to the Governor-General, praying His Majesty's permission for the privilege of calling this Society "The Royal Astronomical Society of Canada".

That Mr. Lumsden, Mr. Harvey, Mr. Miller, Mr. de Lury, and the President be a committee to draft the memorial.

Moved by Mr. Miller, seconded by Dr. Chant, "That Miss Agnes Carpmael receive an engrossed resolution of thanks for her munificent gift to the Society, and that her name be inscribed upon the Roll of the Society as a Lifefellow.

And that Mr. Lumsden be asked to draw ~~up~~ the form of the address.

Carried.

That Mr. Miller, Dr. Chant, and the Curator, Mr. Duncan, be a committee to examine the Carpmael Instruments, and have them put in proper order.

R. F. Stupart, *J. E. Webber*
Recorder

Meeting of the Toronto Astronomical Society, held at the Canadian Institute Tuesday Evening, November 4, 1902.

Vice-President, Dr. C. A. Chant, in the Chair.

Minutes of previous meeting read and approved.

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The Secretary reported a communication from the President of the Hamilton Astronomical Society, in which reference was made to a visit there of Mr. Blake of the Observatory, and Mr. ^{Arthur} Harvey. The latter gentleman had addressed their Society on subjects connected with the Sun, of which the letter spoke appreciatively. It was also mentioned that the Hamilton Society had presented a telescope to Captain Bernier to be used in his proposed Polar Expedition. The Astronomical Society of Hamilton has succeeded in raising upwards of \$1,000.00, in aid of the Bernier Expedition Fund.

Under Predictions, it was announced that Mercury becomes a Morning Star in November.

The business of the meeting was curtailed in order to give Mr. W. F. King's paper as much time as possible.

Mr. King, who was personally present, devoted his paper to the subject of "Astronomy in Canada". After referring to the difficulty of stimulating interest in scientific inquiry in a comparatively new country, engaged in commercial and practical expansion of all kinds, Mr. King explained that the chief uses of Astronomical science such as determining longitude, were well within the realm of the practical. Defining Scientific investigation as the proper direction of inquiring towards increasing the general stock of available human knowledge", the lecturer pleaded the importance of a staff of scientific men in a community, as a national asset. He then spoke of the prospects of Ottawa Observatory, which is about to be equipped with a ^{four} 15" Equatorial, furnished with a large Spectrometer, and a photographic doublet 8", besides the usual Micrometric means for making accurate measurements: a Meridian circle of good size, various instruments for Meteorological geodetic, and other useful and necessary work.

At the close of the lecture a vote of thanks to Mr. King was moved by Mr. Patterson, seconded by Mr. de Lury, and supported by Mr. Lumsden, Mr. Hamilton, Mr. Maybee, and others.

Mr. King, who replied, spoke particularly of the work already done in determining longitude, and described the methods employed by his department, the results being exceedingly accurate.

A paper on "New Developements in Wireless Telegraphy", by Dr. C. A. Chant, was announced for the next meeting.

President,

W. B. ...
Recorder.

The Toronto Astronomical Society

1902

September-December Session

PAPERS, ETC.



List of Officers:

Honorary President	The Hon. Richard Harcourt, M.A., LL.D., K.C., M.P.P., Minister of Education.
President	Mr. R. F. Stupart, F.R.S.C., Direc- tor of the Toronto Observatory and Superintendent of the Domini- on Meteorological Service.
1st Vice-President	Mr. C. A. Chant, M.A. (Tor.), Ph.D. (Har.), Lecturer in Physics, To- ronto University.
2nd Vice-President	Mr. W. Balfour Musson, 37 Yonge Street, Toronto.
Treasurer	Mr. J. Edward Maybee, M.E., 103 Bay Street, Toronto.
Secretary	Mr. J. R. Collins, 131 Bay Street, Toronto.
Recorder	Mr. John E. Webber, 6 Sultan Street, Toronto.
Librarian	Rev. Robert Atkinson, 498 Ontario Street, Toronto.
Curator	Mr. Robert Duncan, 516 Ontario Street, Toronto.

Council:

The above officers, with the following members, constitute the Council of the Society: Mr. A. F. Miller; The Reverend T. O. Street-Macklem, M.A. (Cantab.), LL.D., D.D. (Tr. Coll., Tor.), Provost of Trinity College; and Dr. A. D. Watson, elected by the Society, and the following Past Presidents: Mr. Andrew Elvins; Mr. Larratt W. Smith, K.C., D.O.L.; Mr. J. A. Paterson, M.A. (Tor.); Mr. A. Harvey, F.R.S.C., Honorary President and Director of La Instituto Solar Internacional, Monte Video, Uruguay; and Mr. G. E. Lumsden, F.R.A.S., and Membre de la Societe Astronomique de France.

PAPERS, ETC.

1902.

Sept. 9th.—“Cause of the 25-day Period in the Magnetic Curve.” Mr. A. Elvins, Past President.

Sept. 13th.—Lawn Party on the grounds of Mr. John Ellis, at Swansea, from 4 to 10 p.m. It is desirable that members should accept Mr. Ellis' courteous invitation. In the evening telescopes will be provided for observation. Take the street cars to Ellis Ave., Swansea.

Sept. 23rd.—“Astronomical Work for the Autumn.”
Mr. J. H. Weatherbe.

Oct. 7th.—“The Application to the Stellar Universe of Kelvin's Theory of the Ether.”
Mr. J. R. Collins.

Oct. 21st.—“Ancient Lunar Coast Lines.”
Mr. G. E. Lumsden, F.R.A.S.,
Past President.

Nov. 4th.—“Astronomy in Canada.” Mr.
W. F. King, C.E., D.L.S.,
Chief Astronomer, Ottawa.

Nov. 18th.—“New Developments in Wireless Telegraphy.” Mr. C. A. Chant, M.A., Ph.D., First Vice-President.

Dec. 2nd.—“Vagaries of the Mariner's Compass.” Mr. A. Harvey, F.R.S.C., Past President.

Dec. 12th.—Meeting of the Council to take into consideration the general state and welfare of the Society, and to nominate Candidates for Office during 1903.

Dec. 16th.—Further nominations by the Society of Candidates for Office.
“Stellar Motion.”
Mr. A. F. Miller.

Dec. 30th.—Annual General Meeting, Election of Officers, and transaction of other business.

“Astronomy during the Moorish Ascendency.”
Mr. John E. Webber.

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Toronto, Dec. 2nd, 1902.

Regular meeting of the Toronto Astronomical Society held at the Canadian Institute on Tuesday evening, Nov. 18th, 1902. The President, Mr. R. F. Stupart in the chair.

Minutes of former meeting read and approved. The Secretary reported communications from the "Encyclopedia Britannic Co", one inquiry for Mr. A. F. Miller's published observations on "Nova Persei."

Mr. Miller reported for his committee on the conditions of the Carpmael Instruments and on his recommendation it was decided to incur the small expense necessary to put them into perfect order.

Mr. Pursey reported no spots on the Sun within a month.

The following paper was announced ~~at the end~~ for the next meeting, - "Vagaries of the Mariner's Compass", by Mr. Arthur Hanley.

"New Developments in Wireless Telegraphy" was the subject of an interesting paper by Dr. C. A. Chant, First Vice-Pres. of the Society. Special reference was made to the history of the Marconi experiments, also to those of English and German investigators along somewhat similar lines. One of the most important of the Marconi developments being the introduction of the "tall wire", and, as Dr. Chant explained, while this tall wire itself was not exclusively Marconi's, it had not been used by others, as Marconi had used it in connection with the Oscillator. He found that a message which could be sent only 100 feet without the wire could be sent 1000 yards with it. Reference was also made to subsequent experiments in telegraphy across the Channel and the later triumphs of communication across the Atlantic. The lecture was illustrated by lime light views of some of the apparatus in use and by a series of portraits of the leaders in Wireless Telegraphy.

John E. ...
Records

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Regular Meeting of the Toronto Astronomical Society
held at the Canadian Institute Tuesday evening, Dec. 2nd, 1902.

The President, Mr. R. F. Stupart, in the chair.

Minutes of former meeting read and approved.

The Secretary reported a communication from Dr. Wadsworth and Prof. Beckerton, the latter's referring to his theory of Stellar Impact and forwarding some literature on the subject to the Society.

Mr. Lumsden read a personal letter from Dr. Brashear referring among other things to the 37" Telescope for the Chili Observatory, which is nearing completion.

Mr. Musson reported the receipt of a letter from Sir Wm. Huggins, acknowledging the Society's report and wishing the Society every success.

The Librarian reported that the cataloging had been completed and that the library is again open to the use of the members.

Mr. Alfred Mc Farlane was nominated as an associate.

Under the head of predictions, Mr. Lumsden referred to the coming occultation of Dec. 3rd, 6th and 7th; also that Venus would become visible as a morning Star on the 11th, shortly before sunrise; and a minimum of Algol on the 12th.

Mr. Pursey and Mr. Weatherbee reported ^{that} a Sun spot group had passed over the Sun since the last meeting, first visible on the 19th ult. and disappearing on the 26th.

"Vagaries of the Mariner's Compass" was the subject of an interesting paper by Mr. Arthur Harvey. In discussing the subject, Mr. Harvey mentioned several features in connection with the erratic behavior of the magnetic compass at times. He had examined and compared the magnetic temperature and the meteorological records at the Observatory and found that the motion of the

magnetic pole varied as the annual temperature at Toronto varied. In other words, whatever the cause of that movement might be, it was hastened by a warm year and retarded by a cool year in the region to the south of it. This was a point that appeared to have not been noted before. Speaking of local spots of magnetic intensity, which may also deflect the needle, Mr. Harvey said there were many such regions in Canada, a remarkable one being near Kingston, and extending to and beyond Ottawa, within a few miles of which the compass will change several degrees from its true northerly direction. Among other localities similarly affected was Kennebec Falls, near Port Arthur, as was shown by Leffroy's magnetic survey of the Northwest, and even near Toronto instances were cited where on certain occasions the magnetic needle had to be abandoned by surveying parties. This led to a discussion as to whether the force of local attractions, especially more powerful by electric or magnetic storms, may not be a serious source of danger to navigation. This had special reference to the frequent dangers to shipping on Canadian Atlantic coasts. Mr. Harvey had invoked the aid of several high authorities in the study of the question, and acknowledged the valued assistance of Sir Sandford Fleeming and Messrs. H. and A. Allan. The latter gentlemen placed him in communication with several of their captains, and the quantity of correspondence summarized showed the deep interest navigators are taking in the subject.

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Mr. Stupart, in discussing the paper afterwards, showed that it was unlikely that any magnetic storm could cause a declination of more than half a point. Also, he considered the declination from local attraction of rather less value than the paper supposed. Several members took part in a further discussion, among them Mr. Elvins, Mr. Lumsden and Mr. Fry, an old Provincial Surveyor, who referred to his own experience with the compass

Geo. E. W. ...

Revised

General Meeting of Council held at the Observatory, Friday Dec. 12th, 1902 Members present:- Mr. R.F. Stupart, Mr. G.E. Lumsden, Mr. A. Elms, Mr. Jno. A. Patterson, Mr. W.B. Musson, Mr. J.R. Collins, Mr. J.E. Maybee, Mr. R. Duncan and Mr. J.E. Webber.-

The following officers were nominated by Council for the ensuing year:-

Honorary President:- The Hon. Richard Harcourt, M.A., L.L.D., K.C., M.P.P., Minister of Education.

President:- Mr. R.F. Stupart, F.R.S.C., Director of the Toronto Observatory and Superintendent of the Dominion Meteorological Service.

1st Vice-President:- Mr. C.A. Chant, M.A. (Tor) Ph.D. (Har), Lecturer in Physics, Toronto University.

2nd Vice-President:- Mr. W. Balfour Musson, 37 Yonge St. Toront

Treasurer :- Mr. J. Edward Maybee, M.E., 103 Bay St., Toronto.

Secretary:- Mr. J.R. Collins, 131 Bay St., Toronto.

Recorder:- Mr. John E. Webber, ^{37 Dundas St West} ~~37 Dundas St~~, Toronto.

Curator:- Mr. Robert Duncan, 516 Ontario St., Toronto.

Council:- Mr. A.F. Miller, Rev. T.C. Street-Maclem, Dr. A.D. Watson, Prof. A.T. de Lury and Mr. Geo. Ridcut.

Rev. Mr. Atkinson, the present librarian, having requested that he be not re-appointed, no nomination was made for this office.

It was moved by Mr. Musson and seconded by Mr. Maybee "That the Council be empowered, should it deem advisable, to remunerate the Librarian of the Society for his services, said remuneration not to exceed the sum of Fifty ~~two~~ Dollars per Annum".

The President announced that Mr. A.T. de Lury had kindly agreed to deliver another series of popular lectures for this Society during the coming winter, beginning probably with the evening of Jan. 20th, the subjects to be biographical and dealing with the old

Astronomers.

The Treasurer, Mr. Maybee, reported to Council that Mr. D. J. Howell had forwarded him Ten Dollars in lieu of damage done to some of the lunar plates while in Mr. Howell's custody. Council however, thought Mr. Howell not responsible for the damage and authorized the Treasurer to notify him to this effect and return the Cheque.

Council also recommended to members that all Reports of Observations or Reports of Committees be handed in in writing, in order to ensure a proper record on the Minute Book of the Society.

Mr. Miller and Mr. Atkinson were appointed to audit the accounts for the past year.

Regular Meeting of the Toronto Astronomical Society held at the Canadian Institute, Toronto, Dec. 16th-1902. The President, Mr. R. Stupart, in the chair.

Minutes of former meeting read and approved.

The Secretary read a communication from Prof. Edward C. Pickering, stating that Comet "B 1902" on Nov. 29th passed close to Mercury. At that time its geometric distance was less than that of Mercury. The orbits being on different planes, it was difficult to say what Mercury's influence would be. The Comet's orbit would likely, however, be appreciably changed.

Mr. Alfred Mc Farlane was duly elected an Associate.

Under the head of Observations, Mr. Stupart reported a small spot in the N.W. Quadrant on the 15th. Mr. Stupart also stated that a canvas of Meteorological observers throughout the Dominion, Leonides showed that no - had been seen at any point.

Under Predictions, Mr. Lumsden announced that Neptune would be in opposition to the Sun on the 24th, also a Minimum of Algol on the 18th at 5.06 p.m.

On the call for further nominations for offices of the Society for 1903, Mr. Alfred Mc Farlane was duly nominated for the librarianship, making the complete list of nominations as follows:-

- Honourary President - The Hon. Richard Harcourt, K.C., M.P.P., Minister of Education.
- President - - - - - Mr. R.E. Stupart, F.R.S.C., Superintendent of the Meteorological Service of Canada and Director of the Toronto Observatory.
- First Vice President - Mr. C.A. Chant, M.A. (Tor), Ph.D., (HAR).
- Second Vice-President - Mr. W. Balfour Musson.
- Treasurer - - - - - Mr. J.E. Maybee.
- Secretary - - - - - Mr. John R. Collins.
- Recorder - - - - - Mr. John E. Webber.
- Librarian - - - - - Mr. Alfred Mc Farlane.
- Curator - - - - - Mr. R. Duncan.
- Council - - - - - Mr. A.F. Miller.
Prof. A.T. de Lury.
Mr. Geo. Ridout.
Rev. T.C. Street Macklem, M.A., L.L.D.
Dr. A.D. Watson.

There being five nominations for Council and three vacancies only on the board, an election was called to be held on the 30th inst. by ballot, in accordance with the Society's Constitution.

Mr. A. F. Miller then addressed the Society on "Stellar Motions". As Mr. Miller was not able to complete his remarks on the subject in the time allotted to him, he very kindly consented to deliver another lecture on the same subject during this winter.

"Stellar Motions" Dec. 16th-1902. A.F. Miller.

Mr. Miller gave his reasons for concluding that we are probably indebted for the earliest star-catalogues to the efforts of the Egyptian and Greek Astronomers to define with accuracy the annual motion of the Sun and the planetary movements. He showed their forethought in the selection of the fundamental points from which the stars' positions are measured, illustrating by diagrams and calculations the methods probably adopted by the ancients for determining the position of the celestial equator and the vernal equinox, and drew attention to the extraordinary care with which these old observations must have been made, especially as concerns the determination of time, since Hipparchus was able to detect the precessional movement of the equinoxial point, though it had advanced but five minutes in a century. He referred to the ingenious means devised by the Greeks for making angular measurements, and the profound mathematical skill which they brought to bear upon their investigations. He showed the vital importance of exactitude in the angular measures from which the stars' positions are laid down, and described the various devices which have been employed to minutely divide a degree of arc. He referred to the labours of Tycho Brahe and the curious instruments which he employed

President.-

Recorder.-

Regular Annual Meeting of the Toronto Astronomical Society held at the Canadian Institute, Dec. 30th, 1902. President R. F. Stupart in the chair.

Minutes of the former meeting read and approved.

Mr. Lumsden read a letter from Miss Carpmael, expressing her pleasure at her election to life fellowship in this Society, and thanking the Society for their generous acknowledgment of her gift.

The following were declared duly elected members of Council for 1903:- Mr. A. F. Miller, Mr. A. T. de Lury and Mr. Geo. Ridout, making the complete list of officers and Council for 1903 as follows:-

- Honourary President:- The Hon. Richard Harcourt, K.C., M.P.P., Minister of Education.
- President:- Mr. R. F. Stupart, F.R.S.C., Superintendent of the Meteorological Service of Canada and Director of the Toronto Observatory.
- 1st Vice-President :- Mr. C. A. Chant, M.A. (Tor), Ph.D. (Har).
- 2nd Vice-President :- Mr. W. Balfour Musson.
- Treasurer:- Mr. J. E. Maybee.
- Secretary:- Mr. John R. Collins.
- Recorder:- Mr. John E. Webber.
- Librarian:- Mr. Alfred Mc Farlane.
- Curator:- M r. R. Duncan.
- Council:- Mr. A. F. Miller, Prof. A. T. de Lury, and Mr. Geo. Ridout.

On motion of Mr. Jno. A. Patterson, Mr. Lumsden took the chair, when Mr. Patterson in a happy ~~speech~~^{speech} moved a vote of thanks to the officers for the past year. This motion was duly seconded by Mr. Elvins and carried.

Mr. Stupart replied suitably on behalf of the officers.

It was ~~seconded~~^{announced} that the Library would be open to members every Saturday evening in addition to the regular nights of meeting.

Under predictions, Mr. Stupart announced that on - Jan. 1st, 1903, Jupiter would be in conjunction with the Moon at
h m o
7.6 p.m., Jupiter S 5 29'.

Jan. 4th, 1903, Mercury would be in conjunction with Jupiter,

7 p.m., Mercury S ⁰ 58'.

Jan. 17th, 1903, Mercury would be at greatest elongation East ⁰ 18 46'.

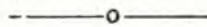
Jupiter is getting too near the Sun for observations, although on the 4th Jan., occultations of Satellites II and I may be observed, the former at 5.51 p.m. and the latter at 6.41 p.m.

Neptune is well placed for observations, being just south of α Geminorum on Dec. 31st.

Mr. Stupart also reported no Sun spots since last meeting.

Also that ^(γ) Geminorum (Mag .3.6) would be occulted by the Moon on Jan. 12th.

The Toronto Astronomical Society.



Nomination Paper for an Associate.

being desirous of admission into The Toronto Astronomical Society, we, the undersigned, being active members thereof, hereby propose and recommend _____ as a proper person to become an Associate.

Witness our hands, this _____ day of _____ 19 _____

(From personal knowledge.)

I HEREBY CERTIFY that the above _____ was on the _____ day of _____ 19 _____, balloted for and declared to be duly elected, and that I have this day handed this Nomination Paper to the Treasurer for action under the By-laws in that behalf.

Recorder.

Toronto, _____ 19 _____ .

I HEREBY CERTIFY that the above mentioned _____ was this day duly notified by me of _____ election as an Associate.

Treasurer.

* [Here State the name in full, the calling and the usual place of residence of the candidate.]