

# The Astronomical and Physical Society of Toronto.

— 1893. —

## Order of Business.

- I Chair to be taken at 20 o'clock.
- II Reading of Minutes.
- III Business arising out of the Minutes.
- IV Communications.
- V Reports from Council.
- VI New Business.
- VII Election of Members.
- VIII Nominations for Membership.
- IX Librarian's Report.
- X Reports of Committees.
- XI Predictions of Phenomena.
- XII Reports of Observations.
- XIII Notes and Queries. (adopted 19 Sept. 1893)
- XIV Announcements; including next place of Meeting and Paper to be read thereat.
- XV Paper for the Evening.
- XVI Adjournment.

The ~~the~~ <sup>Annual</sup> regular meeting of the Astronomical and Physical Society was held at the residence of Dr E. R. Woodlith, 6 Mountale Road on Tuesday eve. Jan. 10<sup>th</sup> 1893

Mr A. Haroey occupied the chair at the beginning of the meeting but vacated it on the arrival of the Vice President, Mr J. A. Paterson.

The attendance numbered 20 persons.

The minutes of the previous meeting were read and, after some slight amendments, confirmed.

Mr Paterson on behalf of the deputation, appointed by the Council, to wait on Mr H. A. Massey reported that, on account of the designs for the proposed Music Hall being so near completion, and the work on it to be begun at once, Mr Massey could not give any distinct promise to have an Observatory constructed in the building, but, when finished, the Society might be accommodated with a room in it, in which to hold meetings.

Mr Colvin in confirming the Chairman's report also intimated that if anything was to be done in the future by the Society, in regard to constructing a popular observatory, Mr Massey would, in all probability be their friend and assist them substantially.

The election of Dr Harrison of Keene, Ont. as a corresponding member was again deferred till next meeting, as time could not be taken to discuss Mr Lumsden's motion regarding Associate members, notice of which was given at last meeting.

Mr G. Hahn 147 Roxboro Ave. was proposed for active membership by Messrs. Howell & Colvin.

Communications were read from Prof. W. H. Pickering, Director of Harvard College Observatory at Arequipa, Peru, about the nomenclature upon Mars. — from

Mr J. G. Turiff, Alameda, Assiniboia, asking for reports of the Society, and from

Mr G. H. Meldrum resigning his position as Recording Secretary to the Society.

Reports of Observations were received from Mr Capland and Mr Howell - the former on Dec. 28<sup>th</sup> observed a very swift meteor taking its rise at Eta Leo Majoris - and disappearing at Delta Cassiopeia, making the distance in a fraction over a second and leaving a diaphanous streak in its wake lasting 8 seconds, then gradually disappearing; 17 min. afterwards another faint one was seen in the same plane, which did not get beyond Leo, the latter, on Jan 8<sup>th</sup> observed in the N. E. Sky a meteor, brighter than Jupiter, of a greenish white color and very slow.

The Society then proceeded to elect the Treasurer and Council, nominations for which were made at the last meeting.

Miss Gray being graciously permitted to withdraw in favor of Mr Toddhunter, the latter was elected Treasurer and as it was found, on referring to the Constitution that the Council should consist of five members, instead of four as stated at the previous meeting - the gentlemen then nominated viz - Messrs Harvey, Elvin, Miller, Meredith, and Howell were elected.

On motion of Mr Elvin seconded by Mr Howell it was agreed to postpone the President's Address and reports of Officers of the Society until next meeting. The acceptance of the Secretary's resignation was also postponed.

A very able and interesting paper on 'Meteorites' was then read by Dr Hahn, who brought with him a fine collection of specimens and micro-photographs which he exhibited and explained. The beautiful polished specimens and microscopic slides, which were examined by means of seven or eight powerful microscopes, were especially admired by the members.

Mr Harney, in moving the cordial vote of thanks of the Society to Dr Hahn 1<sup>st</sup> for his paper, 2<sup>nd</sup> his exhibition of specimens 3<sup>rd</sup> for his gift to the Society of a meteoric stone and a series of photographs - hoped that the book, containing the doctor's views on the forms of life which he has found in the chondrites would soon be given to the world.

The motion was seconded by Mr Clarke and presented to Dr Hahn by the Chairman amid the applause of the Society.

Another vote of thanks was presented to Dr Meredith for his hospitality and the Society adjourned, to meet at the residence of Mr Pursey 189 M<sup>c</sup>Cauley St: on Jan. 24<sup>th</sup>

John A. Galton  
Vice Pres<sup>r</sup>

Annie A. Gray  
Acting Secretary

# Astronomical Physical Society

of Toronto

## Treasurers Statement

Dr

To Balance from last year	56.44	
Membership Fees recd	79.00	
Lantern Slide Fund	10.00	
Publications	4.35	
	149.79	\$ 149.79

Cr

By Brooks Galdie Fund	2.00	
" Publication	100.35	
" Postage Printing etc	18.00	
" Cartage of Telescope	1.00	
" Cash on hand	98.44	
	149.79	\$ 149.79

arrears

Life Membership		20.00
Annual Fees 1891		16.00
" " 1892		68.00
		\$ 104.00

The first regular meeting of the  
Astronomical and Physical Society of Toronto [of 1893]  
was held on the 24<sup>th</sup> Jan'y 1893, at the residence  
of Mr. G. G. Pursey 189 McCarroll St.  
Mr. J. A. Paterson, in the chair.

Thirteen members present.

The Minutes of the previous meeting were  
read and confirmed.

In pursuance of notice of motion  
Mr. Lumsden moved & That the Constitution  
of the Society be so amended as to create  
an Associate Membership to which may  
be appointed ladies and gentlemen, not  
residents of the City of Toronto, whose qualifications  
shall not, in the opinion of the Society, entitle  
them to be elected as Corresponding Members,  
an honorary rank to be reserved for astronomers  
and physicists specially deserving of recognition  
by the Society. The annual fee to be charged  
Associate Members shall be one dollar.

Carried.

The matter of re-arranging the list of  
Corresponding and Associate Members was  
referred to the Council.

The ballot was then taken for the election  
of Dr. Harrison, Keene P. M. as an Associate  
Member and declared in his favour.

The ballot was also taken and declared  
in favour of Mr. G. Hahn as an Active  
Member.

Communications were received from the  
following gentlemen.

Mr. G. H. Meldrum tendering his resignation

- Recording Secretary of the Society.
- Mr. Wm. H. Seyler, tendering his resignation as an Active Member.
- Mr. C. O. Flower asking for the Society's Reports.
- An Unknown writer in the "Mail" asking for the name of Jupiter.
- Mr. Jurriff tendering his thanks to the Society.
- Mr. Gore stating that the copy of his work was intended for Mr. Lumsden.
- Dr. Morrison, Washington stating his intentions to prepare a paper for the Society at an early date, on Perturbations.
- Dr. Veedar, tendering his thanks for Reports of Local distribution of Aurorae.
- Rev. T. E. Espin F.R.A.S. sending List of New Companions to double stars mentioned in Webb's book, also complimenting the Society on its work and acknowledging helpful suggestions to himself.
- Mr. Lumsden asked the permission of this Society to send Mr. Espin's paper to the Editor of Astro-Physics for publication because it would be late in appearing if left to be printed in our own Annual Report. Accepted.
- Mr. Phillips hoped Dr. Morrison will be encouraged to prepare his paper on Perturbations, the subject being a very interesting one.
- The Librarian reported receipts of—
- Monthly Notices Royal Ast. Socy.
- Journal of Br. Ast. Assn. vol. 3
- Memoirs of                      do. vol. 2 pt. 1
- Pub. of Astronomical Soc. of Pacific

A German publication, and  
 "Study of Stars" by Turnbull.

Mr. Sparling stated that the Rev. Dr. Hodgkin of Deer Park was desirous of meeting the members of the Society with a view to stating his intentions of starting a Philosophical Society and asking the assistance of those members willing to join him. After the matter was fully discussed and resulted in a motion being passed recommending Rev. Dr. Hodgkin to apply to the Canadian Institute, the matter being more in the province of that institution.

Moved by Mr. A. Elvins, seconded by Mr. J. W. Lee, and Resolved that the best thanks of this Society are due to the City Editors of the morning papers of Toronto for their unvarying courtesy in publishing the reports of the meetings of the Society and in giving space to announcements in respect of matters in which the Society is interested, and that the Corresponding Secretary be desired to communicate the substance of this resolution to the several City Editors referred to. Carried.

Mr. A. Elvins moved, seconded by Mr. Todhunter that the resignation of Mr. Meldrum as Rec. Secy. be accepted, carried.

Mr. A. Elvins then nominated Mr. Sparling as Recording Secretary, and the ordinary rules being suspended the election proceeded, with the following results



Mr. Chas. P. Sparling elected Rec. Secretary  
 Miss A. Gray " Asst. do.  
 Miss Taylor " Asst. Treas.  
 Miss Pursey " Asst. Librarian.

Mr. Lumsden then mentioned  
 the predictions for the month of January.

Under the order of Observations, one of  
 the members made a report on Sun Spots  
 in the S. Hemisphere. It was also stated that  
 Holmes' Comet was visible with a small  
 Telescope.

The following members invited the  
 Society to meet at their respective residences  
 in due course: — Messrs. Clark,  
 Lumsden, Watson, Todhunter, and  
 Sparling.

Mr. Lumsden kindly consented  
 to read a paper on Phenomena for 1893,  
 on the evening of Feby 7<sup>th</sup>.

Mr. D. J. Howell, late treasurer  
 submitted his Annual Report showing the  
 receipts and disbursements for the year 1892  
 leaving a balance on hand of \$57.29., which  
 was duly received.

On motion of Messrs. Lumsden and  
 Elvins the Treasurers Report was adopted  
 and a hearty vote of thanks tendered for  
 his able services during his term of office-  
 carried.

The drawing up of the Annual  
 Report of the Society for the year 1892  
 was referred to the Council

There being no further business the  
meeting adjourned to meet at the residence  
of Mr. J. M. Clark, 667 Spadina Ave. July 7<sup>th</sup>.

Laurie W. Smith  
V. P.

Chas. Spadina  
Rec. Secy

The Second regular meeting of the Astronomical and Physical Society was held at the residence of M<sup>r</sup> J. M. Clark. 667 Spadina Avenue on Tuesday evening Feb. 7<sup>th</sup>.

Dr. Larratt Smith Vice President in the chair

20 persons present.

The minutes of the previous meeting were read and confirmed.

After thanking the Society for re-electing him Dr. Smith reported, that at the last meeting of Council it had been determined that the Annual reports should be proceeded with at once.

Also that they had decided to ask for a grant of \$400 a year from Government; that he had spoken to the Minister of Education, who had promised to see to the matter.

A special meeting of Council was then called for Wednesday 8<sup>th</sup> inst. to prepare a memorial to send to the Minister.

M<sup>r</sup> Elvins, seconded by M<sup>r</sup> Lee proposed Miss Brodie Parliament St. Toronto as an active member of the Society.

Communications were received from

Dr. Vedder, Lyons. U. S.

Prof. Payne, Editor of Astro-Physics,

thanking the Society for M<sup>r</sup> Espin's paper  
Hon. G. W. Ross, thanking the Society for re-election as Honorary President and regretting his inability to attend meetings.

A Peterboro Gentleman - asking for information about Mars, and returning thanks for information received.

M<sup>r</sup> Holling<sup>worth</sup> Muskoka, sending his report of Aurora, rainfall &c for January.

The Librarian reported the receipt of Publications  
from

Royal Society of England

Astronomical Society of the Pacific

U. S. Naval Observatory, Washington

A paper in the first of these publications, by  
the President of the Royal Society was especially  
recommended to students of Solar Physics  
by Mr. Elvins.

Mr. Harney and Mr. Elvins reported  
observations of an Aurora on Sat. evening  
14<sup>th</sup> inst. The arch rose higher than usual  
above the horizon - color, light green with  
pink blotches and very bright.

Dr. Smith decided to have his name  
added to those who had offered their residences  
for holding meetings of the Society - the list  
reads Messrs Sinsden, Watson, Godhunter,  
Sparling and Dr. Smith.

Mr. Sinsden then read a most  
interesting paper on Celestial Phenomena for  
193, including among those visible in Toronto  
an occultation of the Moon with Jupiter, Monday,  
20<sup>th</sup> Feb. at 9.16 - immersion 10.21.

A rare occultation with Antares 8.36 July 23<sup>rd</sup>  
Mercury seen at his best one hour after sunset  
March 19<sup>th</sup> & two hrs before sunrise in middle of Dec.  
Occultations of Venus and other stars Oct. 12<sup>th</sup>, 28<sup>th</sup> & 29<sup>th</sup>  
Jupiter without a moon Dec. 19<sup>th</sup> The Asteroid  
Ceres now in Aries & Vesta near Lambda Ceti.

References were made to the great  
discoveries of 192, making that year rank with  
other most famous years and as no one could

predict these, so 193 may have in store for us much, not in the power of Astronomers and Almanacs to foretell. The rapidly approaching maximum of Sun Spots may be reached this year and we may be treated to Auroral displays like those of July last.

The reference to the latter and to the appearance of the Earth from the Moon brought on an interesting discussion, participated in by Messrs Turnbull, Harvey, Elvins, Dr Smith & others.

Mr Harvey spoke of the probable connection between the Sun Spot maximum now being reached and the extreme heat in Southern America, Africa and Australia at present, of this year's views of the extreme cold of the Northern Hemisphere being a natural consequence of the <sup>extinguish</sup> heat of the Southern and also of the connection between the disturbances in the Northern and in the Southern Solar Hemispheres.

Mr Elvin's impressions were different from Mr Harvey's, for in studying the question years ago, he had failed to find Corresponding Cold in N. Hemisphere when very hot in Southern or vice versa. He had found a Correspondence however <sup>between</sup> the E. & W. Hemispheres, but he was of the opinion that the Cause of all - Sun Spots Aurora &c - was from without the Solar system and acted on the Sun and Earth alike.

Mr Clark requested the members to repair to the dining room for refreshments, after which the meeting adjourned until Tuesday Feb 21<sup>st</sup>.

A. A. Gray  
Act. Recording Sec.

John A. Adams, Jr. Pres.  
Chairman

The Third regular meeting of the Astronomical and Physical Society was held at the residence of the Recording Secretary, 370 St. James Square on Tuesday evening Feby 21<sup>st</sup> 1893 at 20 O'clock. Mr. John A. Paterson in the chair.

14 Members present.

The minutes of the last meeting were read and confirmed.

Communications were read from the following gentlemen:—

The director of the Royal Observatory, Belgium, sending recently published papers for the Society; Prof. Payne acknowledging receipt of last Report; Sir Robt. Ball, desiring a copy of Report No. 2; Dr. Sandford Fleming stating his intention of visiting Toronto at an early date and desiring a meeting with some of the members of the Society re Astronomical Day reckoning; Dr. Veedar, acknowledging receipt of Clippings from Globe newspaper re Holmes' Comet.

The Council reported their proceedings on the matter of the Astronomical Day reckoning and in accordance with their request the following motion was put to the meeting and carried:

Moved by Mr. Pursey and seconded by Mr. Jodhunter "That the Society appoint a Committee of three, Messrs Carpmael, Paterson and Lumsden, to act in conjunction with a like number from the Canadian Institute and Dr. Fleming, to arrange for the fixing of the Astronomical time reckoning.

The Secretary was ordered to cast the ballot for the election of Miss Jessie Brodie as an <sup>active</sup> Associate member, and declared favorable.

Messrs. Harvey and Sparling reported having seen very bright Aurora on the evening of the 16<sup>th</sup>.

The Librarian reported the following receipts:  
Spectroscope of the Alleghany Observatory.  
Report of the Section for the Observation of Jupiter by Keeler - Dr. Waugh.  
Journal of the British Astro. Assn No. 2 Vol. III.  
Report of Observations from Belgium.  
Notes relating to the variations of Latitude by Niesten  
Mittheilungen 3 nos.

Mr. Arthur Harvey then read a very interesting and instructive paper on the Telescope, illustrated by a number of sketches and <sup>an</sup> ingenious model, which were passed around the rooms.

The meeting then adjourned to meet at the residence of Dr. Watson, Euclid Ave. Mar. 27<sup>th</sup>. Paper to be read by Mr. John Phillips "The retrograde motion of Uranus."

Chas. Sparling  
Rec. Secy.

Arthur Harvey  
Chairman

Mr. Lumsden and several of the members reported having seen the "Mock Sun" on Monday last.

Mon. 7<sup>th</sup> 1893. The Fourth regular meeting of the  
 at Astronomical and Physical Society was held at  
 D. A. D. Watson's the residence of D. A. D. Watson 10 Euclid Ave  
 on Tuesday evening Mar. 7<sup>th</sup> 1893 at 20 o'clock.

A. Harvey  
 Chairman Mr. Arthur Harvey, in the chair.  
 18 Members present.

Minutes  
 read &  
 confirmed The Minutes of the previous meeting were  
 read and confirmed.

Report of  
 Committee. The Committee appointed to confer with  
 the Canadian Institute and Dr. Sandford  
 Fleming reported their proceedings respecting  
 the proposed change in the reckoning of the  
 astronomical day. Adopted.

The Committee having charge of the  
 printing of the Annual Report reported  
 having obtained tenders and that the one  
 from Rowell & Hutchinson was accepted  
 as the lowest being seventy six dollars for  
 300 Copies. Adopted.

Communication  
 Prof. Gore A circular was received from Prof. Gore  
 respecting his new work The Visible Universe  
 and on motion of Messrs Sparling and  
 Elvins it was ordered that a copy of  
 the book be purchased for the Library. Carried

Librarian's  
 Report The Librarian reported the receipt  
 of the following periodicals since the last  
 meeting +  
 Proceedings of Royal Society Vol. 52 No. 318



Proceedings of Can. Institute Vol. 3 No. 2 1885.  
 Thunderstorms by Dr. Veeder.  
 Monthly Notices of the Roy. Astr. Society Vol. 53 Jan'y

Paper on  
 Sun Spots.

Mr. Arthur Harvey read an interesting memorandum upon the spots visible on the Sun between the 1<sup>st</sup> & 7<sup>th</sup> of March. Diagrams, made daily for the purpose of showing the position and detail of the spots, were handed in, with a description of the manner in which, by projection, the position and magnitude of spots may be accurately indicated.

Observation of  
 Jupiter & Satellites  
 Oct. 16/92  
 by  
 Dr. Watson

Dr. Watson referred to a very interesting observation made by him on the early morning of the 16<sup>th</sup> of Oct. last, when he was lucky enough to see Jupiter with <sup>apparently</sup> but one moon: two of the moons were invisible owing to the fact that they were in transit and a third was behind the planet. The phenomenon of Jupiter with but one moon is comparatively a rare one.

J. Hollingworth  
 Report on  
 Auroras

Mr. A. Elvins presented the monthly report of Mr. John Hollingworth, of Beatrice, on auroras.

J. Phillips' paper  
 on Retrograde  
 Motions of the  
 Moons of Uranus

The paper for the evening was entitled "The Retrograde Motion of the Moons of Uranus", and was read by Mr. John Phillips. The Author's object was not to demonstrate that his theory, which

he terms the theory of Projection, presents the true cosmogony of the solar system: that, he leaves to posterity to determine.

On the contrary, he takes the less pretentious stand of trying to show how the secondary planets of the system may have found their orbits. He insists that the true theory of the secondary planets, or moons, must account for all the leading phenomena they present, whether their motions in their orbits are direct, that is, from West to East, or retrograde, that is, from East to West: and also whether their revolution periods are longer or shorter than the rotation periods of their primaries on their axes. In a previous paper on the Martian system, read a few months ago, he contended that his theory held equally well whether applied to the inner moon of Mars or to the outer one. His present paper was intended to show that the theory was equally applicable to the Uranian moons, at least in so far as their retrograde motions are concerned, whether they revolve around the equatorial or the polar regions of their primary. Since neither the rotation period of Uranus nor the inclination of his axis to the ecliptic is known, the paper was necessarily largely provisional in character. Mr. Phillips argued that if the Uranian moons revolve around the equator of the planet, his theory fully accounts for their origin and peculiar motions. If, on the other hand, the axis of Uranus is but slightly inclined, then must  
his moons.

be revolving around the polar regions. The main object of the paper was to prove, or, at least, to point out, the mathematical and physical possibility of a system of satellites being projected from the polar vicinities of spheroidal planets - especially from planets of great oblateness, such as Saturn is known to be - and finding orbits around them.

The paper was a careful discussion of the whole subject, and was followed by an interesting discussion, in which the Chairman and Messrs. Pursey, Elvins, Hunt, Dewar, and others took part.

Predictions. It was announced during the evening that between the 13<sup>th</sup> & 18<sup>th</sup> of this month the planet Mercury should be well seen in the West after sunset - the planet is in the constellation Pisces: that Saturn will be in opposition to the Sun on the 29<sup>th</sup> inst., that is, he will be on the meridian at midnight, and that he is well situated for observation after 22 O'clock. He is the brightest star in the south-east and rises about 19.30 and at nearly the same time as Arcturus, the brightest twinkler in the eastern night skies. The rings of the planet will be better seen during the next month or two than later in the summer. Attention was called to the magnificent spectacle afforded about 22 O'clock in the evening by the gradual descending into the West of that grand system or belt of great stars forming the constellation

Leo, Major, Orion and Taurus.  
 The effect would be much heightened if it were possible also to see from Ferris the constellation Argo, south of Leo, which contains the brilliant star Canopus, almost a second Sirius. There will be minima of Algol at 19 on the 12<sup>th</sup> and at midnight on the 29<sup>th</sup>. All of the Satellites of Jupiter will be east of the planet on the 21<sup>st</sup> and west on the 31<sup>st</sup>. There will be the following occultations of stars by the moon in March: 65 Arctis at 19.42 on the 21<sup>st</sup>; 49 Aurigae at 20.39 on the 24<sup>th</sup>; 11 Gemmarum at 19.25 on the 25<sup>th</sup>, and 42 Leonis at 18.46 on the 28<sup>th</sup>. A fine spot has just appeared by rotation on the eastern limb of the sun and will be well worth observation.

Adjournment There being no further business before the meeting, it ~~was~~ was adjourned to meet at the residence of Mr. Jas. T. Hunter 85 Wellesley St. The evening to be devoted to papers on Saturn.

L. Smith

Chairman

Chas. Spaulding  
 Record. Secy

The  
Astronomical and Physical Society.  
Toronto

5<sup>th</sup> Meeting

Mar. 21/93

The Fifth regular meeting of the Astronomical and Physical Society was held at the residence of Mr. Jas. Todhunter, 85 Wellesley St., on Tuesday evening Mar. 21<sup>st</sup> 1893 at 20 O'clock

D. L. W. Smith  
Chairman.

32 present.

Minutes  
read & confirmed.

Dr. Larratt W. Smith 26, in the chair.  
32 Members present.

The minutes of the previous meeting were read and confirmed.

On motion, the order of business was changed for the evening so as to enable Mr. J. A. Copland to read his paper on the Holmes' Comet, he having to retire early.

Mr. Copland's paper on Holmes' Comet read.

The paper read by Mr. Copland was a sketch of the comet since its discovery, quite accidentally, on the 6<sup>th</sup> of November last, by Mr. Edwin Holmes, a well known English amateur astronomer. At first the visitor, which, almost at once, assumed startling proportions, was identified with the lost comet of Biela, and a German astronomer of reputation having announced that it would probably strike the earth on Sunday evening the 27<sup>th</sup> of November, much popular excitement, our readers will remember, was the result. But, happily, before that date arrived, cause for apprehension had been removed by the discovery that the comet was really receding from, and not approaching, the earth. The interest in the comet was heightened, however, by the magnificent meteoric displays witnessed in many

places on Wednesday evening, the 23<sup>rd</sup> November.  
 This portion of the subject received Mr. Copland's careful attention, calculations being made to show that the earth must have moved across a meteoric stream 36000 miles wide, and that during that time, she must have received upon the hemisphere turned toward the radiant, an enormous quantity of matter.

In the course of his paper, the writer discussed the peculiar variation in the brightness of the comet, its orbit, its period - it having been proved that it belongs to Jupiter's family, and its connection with a meteoric stream having, apparently, a shifting radiant point.

The paper was illustrated by diagrams and was deeply interesting and instructive.

Communications  
 Dr. Veeder A communication was received from Dr. Veeder thanking the Society for information received, also a paper from S. R. Peal F.R.S. India, on the Canals of Mars.

Opera Glass Section  
 Mr D. J. Howell addressed the meeting, asking that the Opera Glass Section be re-organized for the ensuing season.

Referred to Council  
 It was moved by Mr. Arthur Harvey and seconded by Mr. Howell That the Council of this Society take the matter up at its next meeting. Carried.

Librarian's Report.  
 The Librarian reported the receipt of the following works, since last meeting.  
 Journal of the British Astronomical Association  
 Annual Report of the Mathematical and

Physical Society of University College, Toronto.  
 Dr. Veeder on Magnetic disturbances caused  
 by Solar influence.

Observations.

Mercury  
brilliant.

Mock Sun

17<sup>th</sup> Mar.

Mr. Harvey, reported, Mercury as  
 being very brilliant at present, and that  
 the position was between Jupiter and the  
 Moon.

Mr. Sumner described his  
 observation of the Mock Sun on the  
 17<sup>th</sup> inst.

Dr. Donaldson's

Observations.

A letter from Dr. Donaldson, Fergus,  
 was read respecting some recent observations.

Saturn

Miss Taylor's  
paper.

A very instructive and interesting series  
 of letters or papers on Saturn were then  
 read.

1<sup>st</sup> Miss Sarah L. Taylor, giving a graphic  
 account of the discovery of the planet, his  
 rings and his moons, each new discovery  
 marking some step in the improvement of  
 of the telescope. The work of Galileo, Huyghens,  
 Cassini and others was touched upon and  
 the appearance of the planet, perhaps the  
 most interesting member of the solar system,  
 was described.

Mr. Pursey's  
paper.

2<sup>nd</sup> Mr. G. G. Pursey who took for his subject  
 "Saturn as a Habitable Globe". Necessarily, the  
 writer had to deal largely in speculation,  
 which was made highly interesting, owing  
 to the manner in which he drew deductions  
 from the facts made known by long years of  
 observation. Mr. Pursey stoutly maintains  
 the nebular hypothesis, and took opportunity  
 to discuss several theories relative to



to the formation of Saturn's rings and moons, which do not accord with that hypothesis. He succeeded in making a very brief paper both entertaining and instructive.

D. Watson's  
paper

3<sup>d</sup>. Dr. A. D. Watson who ably discussed the causes of, and the interesting phenomena connected with, the disappearance at certain intervals of Saturn's ring, as viewed from the earth, except in the more powerful telescopes.

The Doctor's own telescopic observations made during the past three years, during which certain disappearances occurred, and his use of the orrery made very clear to his hearers the points dealt with in his paper, a fact much to the credit of the writer, as the subject is not an easy one.

Mr. Harvey's  
paper

4<sup>th</sup> and last paper was read by Mr. A. Harvey and was entitled The simple mathematics of Saturn. The paper was elaborately illustrated by ~~diag~~ diagrams and numerous tables, computed by the author, and was accompanied by a beautifully drawn representation of the planet.

Mr. Harvey described the appearance of the solar system as viewed from without: as seen from the Sun; as seen from the earth and the retrograde motions of the planets: explained how the periodic times of the planets are ascertained: how their distances are calculated: how their specific gravities are known, and referred to the dimensions of Saturn and his rings and to his moons. Most of the equations made use of were worked out by the author.

Mr. Chant's  
Lecture  
Apr 18<sup>th</sup>  
in use of  
University.

The chairman announced that Mr. Chant would lecture to the Society on the 18<sup>th</sup> April in the Mathematical and Physical Room of the University College, the use of which had been kindly granted by Mr. President Louder.

Adjournment

There being no further business before the meeting it was adjourned to meet at the residence of Dr. Larratt W. Smith 26 9<sup>th</sup> Summerhill Ave.  
Paper for the evening 'Canals of Mars' by S. R. Peal F.R.A.S., East India.

Chas. Sparling  
R.S.

Larratt W. Smith

Chairman.

6th Meeting  
 April 4<sup>th</sup> 1893  
 The Sixth regular meeting of the  
 Astronomical and Physical Society of Toronto  
 was held at the residence of Dr. Larratt W. Smith 26  
 94 Summerville Ave., on Tuesday evening 4<sup>th</sup>  
 April at 20 O'clock.

D. L. W. Smith  
 Chairman  
 18 Present.

Dr. Larratt W. Smith D.B., in the chair  
 18 Members present.

Minutes  
 Read and Confirmed

The minutes of the previous meeting were  
 read and confirmed.

Opera Glass  
 Section

The work of the Opera Glass Section  
 for the ensuing year was discussed and  
 finally decided to be left over until next  
 meeting.

Communications  
 Sir R. S. Ball  
 Thanks.

Mr. Niesten  
 Thanks.

Prof. Pickering  
 Report on Mars

Communications were read from,  
 Sir R. S. Ball, professor of Astronomy at  
 Cambridge University, thanking the Society  
 for its Reports.  
 M. L. Niesten, director of the Royal Observatory  
 Belgium, thanking the Society for Papers P.,  
 and Prof. W. H. Pickering, director of the  
 Harvard Observatory, Arequipa, Peru, who  
 intimated that his report on Mars would be  
 published soon after his return to the  
 United States, and that the nomenclature  
 of the planet would probably receive attention  
 at the meeting of Astronomers to be held at  
 Chicago.

On motion of Messrs. Harvey and  
 Elvins the Recording Secretary was  
 instructed to extend an invitation to the  
 Officers and Members of the Canadian  
 Institute

Institute, to be present at the lecture to be given by G.A. Chant B.A. to this Society on the 14<sup>th</sup> inst., in the University College.

Place of Meeting discussed

The question of a permanent place of meeting was discussed and referred to the Council for consideration at its next meeting.

Proposition for Active Member S. McDermott Sunderland Ont.

Dr. McDermott, Sunderland Ont. was proposed as an Active member, by Messrs. A. Cronberg and Chas. P. Sparling.

Librarian's Report

The Librarian reported the receipt of the following works since the last meeting, viz: "Terrestrial Atmospheric Absorption of the Photographic Rays of Light" by Prof. Schaeberle, of Lick Observatory. "Solar Electric and Magnetic Induction", by M.A. Veeder, M.D., of Lyons N.Y. Monthly Notices of the Royal Ast. Society for Dec. + Feby.

Mr. Elwin's presentation Synopsis of paper by Prof. Pickering

Mr. A. Elwin presented to the Society a Synopsis of a paper by Prof. Pickering.

Report of Joint Committee

Mr. G.E. Lumsden reported that the Joint Committee on the Astronomical Day reckoning, had finally agreed to a circular which is being prepared and that proof copies would be laid before the next meeting.

Observations

The Corresponding Secretary reported that Saturn was worthy of observation.

Observations Dr. Donaldson, Fergus Ont. reported a series of solar, planetary and stellar observations.

Mr. Arthur Harvey reported observations made during the past fortnight, for the purpose of showing how some of the apparently intricate problems of astronomy may be simplified by a little practical work. The subject dealt with was the obtaining, by such ready and simple aids as are at the hand of every amateur, the distance of the planet Saturn from the sun. By drawing a map of the region of the sky occupied by Saturn and three bright stars and adopting a rude method of triangulation, Mr. Harvey was able to ascertain, by means of an upright and cross bar marked off into degrees, etc. of arc, the apparent distance moved over in two weeks by the planet, now retrograding towards the west. Having these data, a few easy calculations enabled him to compute Saturn's distance as 9.7172 times the distance of the earth. The distance given by the authorities is 9.538, obtained only after the use of the most exact scientific methods.

Paper.

Canals of Mars

by  
S.E. Peal F.R.S.  
India

The paper of the evening was entitled "The Canals of Mars", and was contributed by Mr. S. E. Peal, F.R.S., of Sibsaigar, Assam, India, and was read by Mr. G. E. Lumsden. Mr. Peal said that among the most recent remarkable geological discoveries of modern times, according to the authorities, was the permanence of continents and of ocean basins: that our continents and oceans have occupied

the same general position they do now: That the solid crust of our globe has always been subject to distortion; that the general trends of the world's coast lines must have been modified from time to time by the movements of the lithosphere, due to the sinking in and crumpling up of the crust on the cooling and contracting nucleus; that the earliest wrinkles coming into existence would be meridional or sub-meridional, and that such is the prevailing direction of the most conspicuous earth features, such as mountain chains and coast lines; that these discoveries give the clue to the cause for the present distribution of land and water on our globe, and that they should be of the highest value in studying the permanent features of our globe. Tested by the moon, Mr. Peal said these discoveries were borne out in the most remarkable manner; that the slow, persistent subsidence of ocean floors, together with the north and south arrangement of the land and sea areas, due to tidal distortion or rupture in the early stage of crust formation, are common features of the earth-moon system, but that on Mars, which has no large satellite and whereon the effect of solar tides, according to Prof. Darwin, are "inconsiderable", one of these two features is practically absent, the result being a totally different distribution of land and water and a conspicuous absence of large equatorial oceans and meridionally, as in our Atlantic and Pacific, and in lieu of these an equatorial girdle of land masses and only two

oceans, one on each pole: that this peculiar arrangement was, there could scarcely be a doubt, due to the following causes: (a) that on Mars the earlier phases of crust formation began at the poles, which, as time passed, became sea basins; that by the slow subsidence of the floors of these polar oceans, which would be the coldest and densest portions of the crust, the emergence of the equatorial land girdle would at last follow as a natural consequence: (b) that the comparative continuity of this latter would be assured by the absence of a large satellite causing tidal rupture, as in our case, the solar ~~satellites~~ influence being inconsiderable. Thus the two features, so conspicuously seen, as influencing the distribution of land and water on our earth—i.e., permanence and subsidence of ocean floors, together with tidal distortion, inducing a sub-meridional arrangement would seem to be valuable aids in interpreting the distribution of land and water on Mars. But though "inconsiderable", the solar influence would yet cause limited tides, a little before, during and after the equinoxes and tend to cause an "over-spill" from one basin into the other when one of the poles was turned towards the sun. Such tidewater passing across the equatorial land girdle by the lowest levels would cause channels or "canals", which the "bore" would tend to straighten, especially if in alluvial strata.

At the equinoxes the tides would, during the day time be drawn up the canals from each polar basin on to the

Equatorial region of solar attraction, the return flow taking place at night. Thus, even with limited tides the effectual circulation of the water on Mars would probably much exceed that seen on our earth and its heating by the solar rays to a large extent daily in the tropics would be greater than with us. The circulation of this heated water in each polar basin might well account for the smallness of the "polar caps", the network of canals across the equator acting as an efficient water heater, mitigating thereby the rigors of the arctic and antarctic climates. The occasional duplicity of the canals may possibly be due to the presence in them of a series of islands, like the sand "churs" of our Brahmaputra, a river which is very seldom, indeed, found to flow in one channel, and some of whose islands, like the "Majuli" or middle land, are 130 miles long by 10 or 20 broad. From an elevation of 20 or 30 miles, in fact, this river would undoubtedly present the appearance of a series of long loops.

Mr. Peal closed his paper by stating that if the geological axiom of the permanent subsidence of ocean floors, so clearly seen on the earth and moon, applies to Mars, "We can see at once that the completeness of the equatorial land girdle is due to the absence of tidal rupture by a large satellite and also an intelligible reason for the origin of the "Canals" as tideways open to the polar basins at each end.



Discussion  
on S. E. Peal's  
paper.

The paper provoked a spirited discussion, led by Mr. A. Harvey, who warmly differed from those geologists who hold the views with respect to permanent continents and ocean basins and meridional and sub-meridional troughs and ridges, credited to them by Mr. Peal. He argued at some length in support of the contrary view, adding, however, that the writer of the paper did not require to substantiate his theory. The Chairman, Mr. Elvins, and others also spoke on the subject.

Adjournment

There being no further business before the Society, the meeting was adjourned, to meet on the 18<sup>th</sup> inst, at the University of Toronto, when C. A. Chant B.A., lecturer on physics, will read a paper, with experiments, on "The Polarization of Light"

Chas. Sparling  
Rec. Secretary

Charles Sparling  
Chairman.

7<sup>th</sup> Meeting  
 April 18<sup>th</sup>  
 1893

The seventh regular meeting of the Astronomical and Physical Society of Toronto was held in the Physical room, University College, on Tuesday evening 18<sup>th</sup> April 1893 at 20 o'clock.

C. Carpmael  
 Chairman

Charles Carpmael M.A., F.R.A.S. in the Chair. 150 Members and friends present.

Minutes  
 read & confirmed

The minutes of the previous meeting were read and confirmed.

Order of  
 proceeding

On motion the order of proceeding was changed so as to enable the Lecturer for the evening to proceed at once with his work carried.

Lecture  
 "Polarization  
 of Light"  
 by  
 C.A. Chant

The Chairman introduced C.A. Chant B.Sc. Lecturer in physics, Toronto University, who proceeded with his lecture, having prepared the apparatus necessary for illustrating his subject by experiments. The history of the theory of light as enunciated by Newton, studied and corrected by physicists since his day and as accepted by scientific teaching of the present time, was sketched and experiments shown to illustrate the wave theory. A particularly clear explanation was given of "wave interference", to illustrate which "Newton's rings" were projected on a screen. After explaining the method of determining the length of a wave of light and the number of oscillations per second, the lecturer proceeded to say: "We are now ready to consider that peculiar undulatory motion, possessing which, light is said to be 'polarized'".

A crystal of Iceland Spar seems as clear as glass. But let us now project a beam of light through it. Strange to relate, it emerges as two beams, two bright spots appearing on the screen apparently of equal intensity." (The experiment was then successfully performed.) "Each of these two beams is found to have peculiar properties. One is called the ordinary ray and the other the extraordinary ray. The ordinary ray, or beam, has peculiarities which are symmetrical with respect to a certain plane: the peculiarities of the extraordinary one are symmetrical to a plane at right angles to the former, and each ray is said to be "plane polarized". Many crystals, besides Iceland Spar, have the power of polarizing light, and it has been found also that light reflected from almost any substance, except metal, is practically <sup>artificially</sup> polarized, and that when the tangent of the angle of incidence is equal to the index of refraction for the substance, the reflected ray is totally polarized".

Continuing his experiments, Mr. Chaut explained the construction of a "Nicol Prism" viz, a crystal of Spar cut along a certain plane and cemented together again with Canada balsam, the result of this arrangement being that the ordinary ray is reflected at the surface of the balsam and driven out of the prism, while the extraordinary ray passes through and can be examined with more ease. This prism, or "polarizer" being placed in the path of a beam of light from an arc lamp was observed to allow

The ray to pass through the vibrations being all in a single plane. This light was then projected through a second nicol prism, and it was seen that vibrations passing through this prism must be in a single plane, too, and that they passed through easily if this plane coincided with the similar plane in the other prism: but on turning the planes at right angles to each other it was perceived that the light could not get through the second nicol at all. This second nicol is called the "analyzer", its duty being to examine the light on emergence from the polarizer. Some beautiful experiments were shown by introducing between the polarizer and analyzer prisms of mica, gypsum, unannealed glass etc. Projected upon the screen, the images of these were colorless, but as one prism was rotated, brilliant colors were seen far excelling in beauty any artificial pigments. The lecturer ably explained at some length how these were due to "interference", the different colors depending upon the thickness of the crystal through which the light was passed. The experiments were made extremely interesting, and several times elicited the pronounced approval of the audience. At the close of the lecture a vote of thanks was heartily accorded Mr. Chant, and also Prof. London, president of the University, who had so kindly placed the rooms and apparatus at the service of the Society.

Vote of  
Thanks

In moving the vote of thanks, Mr. J. A. Paterson M.A. referred to the pleasure

which many of the audience experienced in renewing their acquaintance with a subject so instructive and so admirably presented by the lecturer, recalling the days when in those very halls similar lectures had been delivered by former Professors of Physics.

In seconding the motion, Mr. Elvins said that a wish long entertained by him had been gratified by the meeting of the society in the well appointed lecture rooms of the University, and that he hoped this the first lecture given here to the Society would not be the last. On the merits of the paper he spoke in a very complimentary way.

In presenting to Mr. Chant the thanks of the Society and visitors, Mr. Carpmael stated that not only had the paper been made highly interesting, but that Mr. Chant had succeeded in condensing into one lecture, and in making clear to a popular audience, subject-matter usually occupying many lectures, even as given by masters of physics, such as Tyndall, Stokes, and Faraday, all of whom Mr. Carpmael had heard on the subject of light. Many of the audience remained to inspect the acoustic apparatus in the adjoining room, while the business of the meeting was continued.

Communications

A communication ~~fr~~ was received from Walsingham Observatory Eng. announcing the discovery that the Star

Communication 180 of Espin's catalogue is variable: position in right ascension, 6 hours and 15.5 minutes: declination, 47 degrees 43 minutes N.

A letter from Dr. Donaldson, Fergus, giving an interesting account of some observations of Saturn and of stars in the neighborhood of that planet.

Dr. Veeder, of Lyons, N.Y. contributed a paper on "The Source of Solar Heat"; which was laid over for reading at a future meeting.

A paper on "Selenology" by Mrs. E. Paul of India was also received, and reading postponed.

Phenomena.

Phenomena during the next fortnight Occultation of star B.A.C. 3206, at 11 pm. April 23, and that Mercury reaches his greatest elongation west on April 28, rising in the morning of that day at about 4.40 o'clock, just north of the east point.

Notice of Motion  
re  
Constitution

Mr. G. E. Lumsden gave notice that at the next meeting of the society, he would move to so amend the Constitution and Bylaws that they shall accord with the amendments made in 1891 and 1892, with a view to the same being printed as an appendix to the Report for 1892

Ballot.  
Dr. McDermott

The ballot was cast and declared in favour of Dr. McDermott, Sunderland Ont., as an Active Member.

The following gentlemen were proposed  
Nomination as Active Members.

- Active Members Mr. W.B. Musson, 145 Stowland Ave City  
pro. by D. L. W. Smith & sec. by Mr. Pursey
- Mr. Musson G. F. Hull B.A., 425 Church St. City  
pro. by Mr. Chant and sec. by Rec. Secretary
- J. Von Sommer Mr. J. Von Sommer, Tennish  
pro. by Mr. Lumsden & sec. by Mr. Lindsay.
- G. F. Hull A. J. Dehury B.A., University College.  
pro. by Mr. Chant & sec. by Rec. Secretary
- A. J. Dehury J. W. Smith M.D., 425 Logan Ave City  
pro. by Mr. Carpmael & sec. by Rec. Secretary
- J. W. Smith

Adjoornment There being no further business before the Society, the meeting was adjourned, to meet on the 2nd May, at 20 o'clock, at the residence of Mr. D. J. Howell, 316 Wellesley St. Paper for the evening 'Solar Heat' to be read by Mr. G. G. Pursey.

Approved. John H. Waterman Chas. Sparling  
Recording Secretary.

Chairman.

Nomination John Duff B.A. School of Technology, proposed by Mr. Jas. Todhunter and recorded by the Recording Secretary.



8<sup>th</sup> Meeting

May 2<sup>nd</sup>  
1893

The Eighth regular meeting of the Astronomical and Physical Society of Toronto was held at the residence of Mr. D. J. Howell 318 Wellesley St. on Tuesday evening 2<sup>nd</sup> May 1893 at 20 O'clock.

J. A. Paterson M.A.  
Chairman.

John A. Paterson M.A. in the chair  
29 Members present.

Minutes  
read & confirmed

The minutes of the previous meeting were read and confirmed.

Communications

A communication was received from Dr. Veeder, Lyons N.Y., also from Mr. Espin relating to a plate taken April 11<sup>th</sup> compared by Max Wolf showing two stars E.S. Birmingham proved variable, the one 9.1 and the other 8.8.

A communication was also received from the Canadian Institute thanking the Society for their invitation to Mr. Chant's lecture.

Mr. G. E. Lumsden in accordance with notice of motion at last meeting distributed proof copies of the Constitution with amendments and after considerable discussion the matter was referred back to the Council for adoption - Carried.

Ballot.

W. B. Musson  
G. F. Hull  
J. Von Sommer  
A. J. DeLury  
J. W. Smith  
John Duff

The ballot was ordered to be cast by the Recording Secretary and declared in favour of the following Active Members.  
Mr. W. B. Musson Howland Ave. City  
G. F. Hull B.A. University College  
Mr. J. Von Sommer City  
A. J. DeLury B.A. Univ. College



J. W. Smith M.S. 425 Logan Ave. City  
 John Duff B.A. School of Technology City

Librarian's  
Report.

The Librarian reported the receipt of the following publications since last meeting:  
 Report of the Hamilton Public Library.  
 2 Nos. Journal of the Br. Astro. Assn.  
 2 Indices to vol. 2 do.

Observations  
 Saturn  
 Sun Spots

Mr. Arthur Harvey reported an observation of Saturn in occultation 4<sup>th</sup> Mar &c accompanied by diagram.

The Sun was also reported as a fine object for observation at this date there being 22 or 25 spots to be seen.

D. Veeder  
 introduced.

At this stage of the meeting the Chairman introduced D. Veeder, of Lyons, N.Y. who happened to be in the city and took the opportunity of visiting the Society.

D. Veeder made a brief speech detailing his connection with Lieut. Peary, the Arctic Explorer, and also some very interesting points regarding Aurorae.

Mr. Arthur Harvey followed with his theory, as to the causes of Aurorae.

Mr. Pursey's  
 Paper Solar Heat

Mr. G. G. Pursey read the paper for the evening on the subject of "Solar Heat," which was ably written, but owing to the lateness of the hour discussion was postponed until next meeting.

Adjournment

There being no further business before the meeting it was adjourned to meet at the direction of Mr. G. E. Lumsden

on the 16<sup>th</sup> May at 20 o'clock  
 paper for the evening: Solar Heat by D. Veeder  
 and an article by Mr. Thos. Lindsay.

John A. Paterson ~~Chairman~~ *Chas. R. Sparling*  
*Recording Secretary*  
 Chairman.

Ninth Meeting  
 - 16<sup>th</sup> May  
 St. Georges Hall.

The ninth regular meeting of the  
 Astronomical and Physical Society of  
 Toronto was held at the St. Georges Hall,  
 Elm Street on Tuesday evening 16<sup>th</sup> May  
 at 20 o'clock.

J. A. Paterson M.A. John A. Paterson M.A. in the chair.  
 Chairman 15 Members present  
 15 Present.

Minutes read & confirmed  
 The minutes of the previous meeting  
 were read and confirmed.

Communications  
 W. D. Barbour  
 Leeds Eng.

A communication was received through  
 Mr. Todhunter from Mr. W. D. Barbour, Leeds,  
 Eng. giving a sketch of the Leeds Astro-  
 nomical Society and enquiring into the  
 working of our Society also desiring an  
 exchange of Reports &c.

Canadian Institute  
 re  
 Astro. Day

also a communication from the  
 Canadian Institute respecting the  
 work of the Committee on the Astronomical  
 day reckoning.

On motion the Corresponding  
 Secretary was requested to reply to the letter

of Mr. Barlow, Leeds, Eng. giving him such information and Reports as he desired.

Librarian's Report

The Librarian reported the receipt of the following publications since the last meeting:

- Photography of the Corona without an Eclipse. Hale.
- The Spectroheliograph, by G. E. Hale.
- On the Probability of Chance Coincidence of Solar and Terrestrial Phenomena Hale.
- On the Condition of the Sun's Surface in June & July 1892 as compared with the record of Terrestrial Magnetism Hale.

Paper.

Dr. Veeder on "Solar Heat."

The Recording Secretary read a paper contributed by Dr. Veeder on "Solar Heat." The theory was advanced that the great pressure excited upon the interior of the Sun was sufficient to dissociate the molecules of the combinations there existing.

A discussion followed during which Mr. Miller called attention to the fact that the theory did not agree with experimental chemistry. In this Mr. Miller was sustained by Rev. J. F. McBride.

Remarks upon the paper were also made by Messrs. Elvins, Harvey and the Chairman.

Paper

J. Lindsay on Planetary Rotation

Mr. Lindsay read a paper on Planetary rotation calling attention to the want of harmony between the observations of Prof. Pickering recently made on Jupiter's satellites and the tidal theory which has been advanced to prove that the satellites cannot rotate. Prof. Kirkwood and others

was also referred to and the whole problem of Planetary rotation was considered as one well worthy of study there being a probability that the truth of nebular hypothesis might be proved beyond a doubt by following up this line of investigation.

Adjournment.

There being no further business before the meeting it was adjourned to meet at the residence of Mr. John A. Paterson, 23 Walmer Road on the 30<sup>th</sup> May at 20 O'clock.  
Paper for the evening: Solar Heat by Mr. Elvins.

Chas. T. Sparling  
Rec. Secy.

E. A. Mendell  
Chairman.

<sup>Mission</sup>  
Nomination  
of M. Martin  
for Active Member.  
Mr. John M. Martin 29 Clarence Square  
Accountant was nominated for Active  
Membership by Messrs Paterson & Sparling.

10<sup>th</sup> Meeting  
30<sup>th</sup> May  
J.A. Paterson's  
Residence.

The tenth regular meeting of the Astro-Physical Society of Toronto was held at the residence of John A. Paterson Esq. 23 Walmer Road, on Tuesday evening 30<sup>th</sup> May at 20 O'clock.

E.A. Meredith  
Chairman  
19 present

E.A. Meredith LL.D. in the chair.  
19 Members present.

Minutes  
read & confirmed

The minutes of the previous meeting were read and confirmed.

Communications  
Prof. S.W. Burnham

A communication was received from Prof. S.W. Burnham, late of Lick Observatory, with respect to the variability of Kappa Gemmorum, in which it was stated that while at one time variability was suggested, the evidence amounted to nothing, and that he had "never yet found a variable companion to a double star, or even had suspected one".

D. Keeder

A letter was received from Dr. Keeder regarding a prominent aurora observed at Yarmouth N.S., at 8.45 on the 9<sup>th</sup> of May, a display which was invisible at the same hour at points in New York and Ontario, where observers were stationed, thus establishing its local character.

Pooler Bros.

Messrs Pooler Bros wrote asking for a list of Members to be published in a hand-book.

D. Donaldson

Dr. Donaldson also wrote to the Society in reference to some recent observations.

Ballot  
J.M. Martin

The ballot was cast and declared in favour of Mr. J.M. Martin, Accountant, as an Active Member.

The Librarian reported the receipt of the following publications, since the last

Librarians Rept. meeting viz:  
 Proceedings of The Royal Astro. Society July 16 & 23  
 Journal Br. Astro. Assn. Vol. 3 No. 6, ~~and~~

Observation

Mr. A. Harvey  
 re Rainy Season

Mr. Arthur Harvey referred to the often observed fact that during the summer seasons there are certain days of the week upon which rain almost invariably falls. He had been looking for the cause of this periodicity, and was on the point of preparing a paper, when, a few days ago, it came to his knowledge that he had been forestalled by a writer in the Meteorological Journal. Under the circumstances he would be content with stating the fact that he had been studying the subject for some time past, and that the conclusion arrived at was that the periodicity was due to solar rotation, or was intimately connected with it. Though his data for this season were not quite complete, he ventured to predict that the rainy day during the summer of 1893 would be either Sunday or Monday; possibly the rain would fall during the night of Sunday. The subject of the weather having been introduced remarks were made by several of the members.

Papers.

Mr. A. E. Elvins.  
 Solar <sup>on</sup> Heat and  
 Energy

The remainder of the evening was given up to the discussion of various theories respecting solar heat and energy. Two papers were read by Mr. A. E. Elvins, the first in criticism of the views of Mr. G. G. Pursey expressed in a paper read on the 2<sup>nd</sup> inst., the second stating his own views. In the latter he contended that the greater part of solar energy passes into the ether and keeps up the motion of that all-permeating medium, from which its own energy is derived. This ether and ether

motion connect the universe as one harmonious whole, conveying our Sun's energy far beyond the stars whose light can be seen by our giant telescopes, and bending the paths of the planets and many double stars into their orbits, for we may seek the cause of gravitation in this motion and receive a satisfactory reply. Ether energy is scattered in every direction, and is the chief cause of solar energy.

The papers were followed by a very animated discussion, by Messrs Phillips, Lindsay, Chant, Pursey, Hull, Harvey, Paterson and Elvins.

Adjournment

There being no further business before the meeting it was adjourned at 22 O'clock to meet at the residence of the Recording-Secretary, on the 13<sup>th</sup> June at 20 O'clock. Paper for the evening: - Pythagorean System of Astronomy by Mr. Arthur Harvey.

John Paterson  
Vice Pres.

Chas. Spaulding  
Rec. Secy.

Chairman

Council  
Meeting  
June 5<sup>th</sup>

A meeting of the Council was held in the Office of Mr. J. A. Paterson on the 5<sup>th</sup> June 1893 at 16 o'clock.

Present. Messrs. Jas. Todhunter, A. Elvins, G. G. Pursey, G. E. Lumsden, Chas. P. Sparling, and Dr. Meredith.

Dr. Meredith  
Chairman

On motion Dr. Meredith took the Chair.

The following accounts were examined and recommended to be paid by the Society.

Viz - S. Michael, Repairs to Telescope	\$ 15.00
J. M. Poole, Printing Plate	3.00
The Roberts Estate, for Books	7.50
Roswell Hutchinson, Printing &c.	133.25

Mr. Pursey submitted an offer of a place of meeting and accomodation for the Library and Instruments of the Society, from the Women's Christian Guild, McGill Street. The rent to be One dollar per meeting.

The matter was thoroughly discussed and the Council decided to hold the next regular meeting in the Womens Christian Guild Building so as to give the members of our Society an opportunity of viewing the premises and deciding upon what arrangements to make.

There being no further business before the Council it was adjourned to meet first Monday in July at 16 o'clock

Chas. P. Sparling  
Rec. Secy.



11<sup>th</sup> Meeting  
13<sup>th</sup> June The eleventh regular meeting of the Astronomical and Physical Society of Toronto was held at the rooms of the Womens Christian Guild, McGill St., on Tuesday evening June 13<sup>th</sup> at 20 O'clock

J.A. Paterson  
Chairman  
24 present John A. Paterson M.A. in the chair.  
24 Members present.

Minutes  
read & confirmed The minutes of the previous meeting were read and confirmed.

Communications  
M. Cobb A communication was received from Mr. John M. Cobb asking for Reports of the Astro-Physics Society's meetings.  
Provincial Treas. From the Provincial Treasurer stating that the Ontario Legislature had made a grant of \$200 to the Society and that the departmental cheque for the same would be forwarded shortly.

Report of Council The report of the last Council Meeting was received and adopted.

Motion  
to publish Report to public On motion of Messrs Sparling and Lumsden it was decided to ask the Council to consider the matter of publishing the Reports of the Society half yearly in the future. Carried.

Motion  
to Astro-Physics On motion of Messrs. Elvins and Lumsden it was considered advisable for the Society to subscribe for Astro-Physics, the Council to report on the matter Carried

Librarian's Report The Librarian reported the receipt of the Report of the Smithsonian U.S. National Museum

Predictions Under the head of predictions it was stated that during June & July the richest observations would be in early <sup>morning</sup> evening and 1<sup>st</sup> July Mercury, Venus and Mars would be in conjunction in the West.  
Mercury visible in the early portion of the <sup>evening</sup> morning. Venus would be brilliant Saturn and Uranus evening planets. Neptune in the morning.

Observations Dr. Donaldson reported Star between Spica and Saturn seen through a triple 3 $\frac{1}{2}$  or 3 in glass., also Sun Spots worthy of observation  
Mr. Copland reported Jupiter very brilliant in constellation Taurus in the morning

Dr. Fleming introduced Present was introduced by the chairman to the members of the Society. The Doctor made a few remarks congratulating the Society upon its work and expressed his pleasure at being present.

Paper Mr. Arthur Harvey read a very carefully compiled paper, on the Pythagorean System of Astronomy, which was well received by the members

Adjournment

There being no further business before the Society, it was adjourned to meet at the residence of W<sup>m</sup> P. Atkinson M.A. 220 Jamieson Avenue. The evening to be spent in observations on the lawn on Tuesday June 27<sup>th</sup> at 20 o'clock.

Chas. R. Spaulding  
Rec. Secy

W. P. Atkinson  
Chairman.

12<sup>th</sup> Meeting.  
June 27<sup>th</sup> 1893  
W.P. Atkinson's  
Residence.

The twelfth regular meeting of the Astronomical and Physical Society of Toronto was held at the residence of Mr. P. Atkinson M.A., 220 Jameson Ave on Tuesday evening June 27<sup>th</sup> 1893.

Observations  
on  
the lawn

A large number of the members being present with their Telescopes and Opera Glasses the evening was almost entirely devoted to observations of the Moon, Saturn, Mercury, Double Stars &c. The moon being full gave those present, an excellent opportunity for study. Saturn was also an object of much admiration, particularly to the younger members. Mercury was also very bright and viewed under favourable circumstances.

W.P. Atkinson  
Chairman

At ten o'clock an adjournment was made from the lawn to the drawing room when Mr. Atkinson was requested to take the chair and the regular business of the Society transacted.

Minutes  
read & confirmed

The minutes of the last meeting were read and confirmed.

Communication  
from  
Chas. Clark

A communication from Chas Clark London Ont. requesting information re monthly magazine of Astronomy was read and referred to the Corresponding Secretary.

Vote of thanks  
G.E. Lumsden

On motion of Messrs. Clovis and Harvey, a hearty vote of thanks was

tendered to Mr. G. E. Lumsden for the very able and satisfactory manner in which he compiled and edited the Society's Report recently published. Carried.

Application  
Prof Smyth  
Active Memb.

An application for Active membership was received from Prof. J. H. Smyth, Trinity University, residence 482 Euclid Ave. recommended by the Recording Secretary and Miss Taylor.

Librarians  
Report

The Librarian reported the receipt of the following publications since last meeting: viz.:-

Proceedings of Royal Astro. Soc. Vol. 53 No. 22  
Journal Br. Ast. Assn. Vol. 3 No. 7  
Historical Sketch of Cincinnati Observ. 1843-1893  
Les Astronomes par Aug. Fischer.

Adjournment

There being no further business before the Society the meeting was adjourned to meet on the evening of July 11<sup>th</sup> at 20 o'clock, in the rooms 19 McGill St.

Chas. P. Sparling  
Rec. Secretary

Lewis H. Smith  
Chairman.

Council Meet.

A meeting of the Council was held in the office of Dr. L. W. Smith Toronto St. on the 3<sup>rd</sup> July 1893 @ 16 O'clock  
 Present, Dr. L. W. Smith & E. A. Meredith  
 Messrs Lumsden, Todhunter, Elvins, Pursey and Sparling.

Dr. L. W. Smith  
 Chairman

Dr. L. W. Smith in the Chair.

Motion.  
 Subscribe for  
 Astro-Physics.

On motion it was decided that the Society should subscribe for Astro-Physics commencing with the present series and continue. Carried.

Motion.

Rent Room  
 19 McGill St.

Moved and seconded that the Society do rent a room for a regular place of meeting, from the Young Women's Christian Guild, 19 McGill Street, on the terms stated by the Guild, and that the selection of the room be made at the Society's next regular meeting. Carried.

Issuing Report  
 4 yearly  
 to be laid over.

The matter of issuing the Report semi-annually was taken up and after discussion decided to allow it to stand over until January next. Carried.

Recommendation  
 Edit. Com. ex.

It was recommended The Council decided to recommend to the Society the appointment of an Editing Committee whose duty in future would be to compile and edit the Annual Reports. Carried.

Accounts.

The following accounts were received and ordered to be paid viz —  
 Russell & Hutchinson, Postages on Reports, &c.

and Grip Printing Co. for photo-engravings.

Arrears of  
dues.

The Recording Secretary was requested to remind the Chairman of the Society, at its next meeting, of the number of members who have not paid their annual dues.

Adjournment

There being no further business before the Council it was adjourned to meet on the afternoon of first Monday in August at 16 o'clock.

Chas. Sparling  
Secy to Com-

13<sup>th</sup> Meeting The thirteenth regular meeting of the  
 July 11<sup>th</sup> 1893 Astronomical and Physical Society of Toronto  
 20 o'clock was held in their room 19 McGill St on Tuesday  
 evening July 11<sup>th</sup> at 20 o'clock

D. W. Smith L. W. Smith B. Sc. D. Sc. in the chair  
 Chairman 19 Members present

Minutes The minutes of the previous meeting were  
 read & confirmed read and confirmed.

Communications Communications were received from,

Prof. Payne Prof. Payne, enclosing prospectus of Magazine on Astronomy  
 J. N. Cobb John N. Cobb, Philadelphia, applying for membership.  
 J. H. Kedsey J. H. Kedsey, on Solar Heat.  
 D. Pickering D. E. C. Pickering,  
 D. Veeder D. M. A. Veeder and others.

Report of Council Meeting and on motion of Messrs.  
 Council, Harvey & Ellis "It was decided to leave the  
 adopted. arrangement of renting a suitable place of  
 meeting, in the hands of the Council" Carried.

Motion Moved by Mr. Harvey and seconded by the  
 re defaulters. Recording Secretary That defaulters be given to  
 the 1<sup>st</sup> of October to pay their fees and if not  
 paid by that date, to be struck off the rolls -  
 carried.

Motion On motion it was unanimously decided  
 G. E. Lumsden to appoint Mr. G. E. Lumsden as Editor in Chief  
 Editor in Chief to issue the Society's reports - carried.

Motion On motion of Mr. Lindsay and Dr. Meredith  
 re 25 copies Repts the Society decided to place in the hands of  
 for distribution Mr. Lumsden 25 copies of the Annual



Report for distribution as suggested by him—  
Carried

Prof. Smyth  
elected

The ballot was cast and declared in  
favour of Prof. J. H. Smyth, as an Active Member.  
Carried.

Applications  
in Member.

W. L. Dobbin  
Miss Dupont

Mr. W. L. Dobbin, Rochester U.S.A. and  
Miss Dupont, Toronto were nominated for Associate  
and Active Membership.

Librarian's  
Report.

The Librarian reported the receipt of the  
following publications since last meeting.—  
Journal of Br. Astro. Association No. 8 Vol. 3  
Proceedings Royal Society June No. 323  
Publications of the Astronomical Society of the  
Pacific Vol. 5 No. 30.  
Greenwich Observations 1893

The Corresponding Secretary was requested  
to communicate with Chas. Carpmall Esq. Meteorological  
Office asking for the use of the Telescope for evening  
of July 23<sup>rd</sup> 1893.

Predictions

Predictions. Mr. Lindsay called special  
attention to the occultation of the first magnitude  
star Antares by the moon on the evening of the  
23<sup>rd</sup> inst. Using the graphic method, he had computed  
the time of immersion for Toronto at 8h. 25 m.  
and the time of the re-appearance of the star  
at 9h. 18 m. 30 sec.

Observations

Observations. A letter was received from Mr. J. R. Connor  
Elora giving an animated description of the Rendell  
Comet, discovered on the 8<sup>th</sup> inst. at Salt Lake City,  
and now easily visible to the naked eye as

nebulous object, situated a little more than half way between the dipper in the Great Bear and the horizon. He added two drawings made at the telescope, and described the tail as being several degrees in length, presenting the appearance of a hollow tube or cone, and the nucleus as being of a pale electric green color.

Mr. John Goldie sent a telegram announcing the position of the Comet.

A description, with drawings, of a large bolide, or fire ball, observed on Friday night last by Mr. R.A. Eaton, of this City, was received, and was ordered to be forwarded to Sir Robt. Ball,

This Bolide appears to have passed slowly eastwards a short distance below the dipper in Ursa Major and to have exploded a little beyond a line drawn to the horizon from the pole star. Of the three large pieces into which the fire-ball separated, the smallest flew northward in the line of the eye and disappeared apparently as a very bright point on the meteor's track, seeming not to change its position; a second portion dropped towards the earth and the third came towards the ~~earth~~ observer in the line of sight.

A short paper was received from the Rev. Father McBride containing the details of some observations made with a portable transit for the purpose of determining latitude and longitude. The position of St. Helen's Church, Brockton, was deduced from the observed altitudes of Spica and Polaris.

Mr. Arthur Harvey read a note made on the appearance of the sky at 3 o'clock in the morning of the 10<sup>th</sup>. The atmosphere was unusually clear and the Celestial Vault

adorned with Jupiter in all his glory, the rising moon in her last quarter, various bright stars, and the milky way, hanging, as it were, with festoons of stars in their millions, formed, with the stillness of the night, an awe-inspiring subject for contemplation until the rays of the rising sun obliterated everything else.

Messrs. Elvins and A. F. Miller described the great activity at present going on in the Sun. Sunspots have been numerous and extremely interesting owing to rapid changes.

Mr. Miller said he had again noticed that the breaking out of spots in one solar hemisphere was usually followed by the appearance of spots in the corresponding portion of the other hemisphere. Mr. Elvins presented drawings made of the face of the Sun every day in July, together with enlarged representations of the chief groups of spots, showing accurately and graphically the alterations in their appearance.

A long series of observations by D. Donaldson was read. He had been steadily observing the Sun since January 1<sup>st</sup> 1892 and states that on no day was his disc entirely free from spots.

Chairman  
reads paper.

The Chairman read Prof. Barnard's interesting description of the Yerkes giant telescope at Chicago.

Adjournment

There being no further business the meeting was adjourned until Tuesday 2<sup>nd</sup> July at 20 o'clock.

Small meeting

Chairman

Chas. Spaulding  
Rec. Secy.

14<sup>th</sup> Meeting  
July 25<sup>th</sup> 1893

The fourteenth regular meeting of the Astronomical and Physical Society of Toronto was held in their room 19 McGill St. on Tuesday evening July 25<sup>th</sup> at 20 o'clock.

D. L. W. Smith  
Chairman

D. L. W. Smith 2.C. in the chair.  
25 Members present.

25 Present

Minutes  
Read & Confirmed

The minutes of the previous meeting were read and confirmed.

Communications  
W. W. Payne

Communications were received from Mr. W. W. Payne, Northfield Minn. announcing that the first number of Popular Astronomy, will appear in September.

Com. Ashe

Commander Ashe, Quebec, in reference to the recently discussed theories accounting for auroral displays, and forwarding some copies of Science, containing articles by him on the subject.

J. R. Connor

Mr. J. R. Connor, Elora, enclosing several photographs of the comet and drawings of the aurora of 15<sup>th</sup> inst.

Clarke

Mr. Clarke, London Ont. enclosing One dollar with application for membership.

Report of  
Committee

The Committee appointed to secure place of meeting - Reported progress.

Election  
W. L. Dobbin  
Miss Dupont

Mr. W. L. Dobbin, Rochester N.Y. and Miss Dupont, Toronto, were elected Associate and Active Members respectively -

Nominations  
J. F. Wadsworth  
Clarke

Mr. J. F. Wadsworth, Amice, and Mr. Char. Clarke, London Ont. were nominated as Associate Members, and

A. J. Patterson  
John Webber

Messrs. A. J. Patterson 72 King St. E. City and John Webber, 172 Sherbourne St. City nominated as Active Members of this Society.

The Librarian reported the receipt of Mittheilungen, May No., since last meeting English Mechanic  
E. Fogel on Atomic Weights. \*

### Predictions

Mention was made by Mr. Leusden of the occultations of the Moon in August. Venus was well situated for observation and that Jupiter was to be found in the early morning sky.

### Observations

Messrs. J. Lindsay, J. Todhunter, W. Mitchell, J. A. Patterson, A. Harvey, A. Elvins, A. F. Miller and D. Donaldson gave very interesting accounts of their observations on the occultation of Antares on July 23<sup>rd</sup>. The immersion was observed at 8h. 24 min. 55 sec and the re-appearance at 9h. 22 min.

Messrs. J. R. Common, Elvins and Miller also reported on the Comet.

Mr. J. J. Wadsworth, Suriceo Ont. reported the phenomenon of the occ. of Antares and made the time of the immersion 8h. 24 m. 10 sec.

### A. Elvins on Solar Heat

Mr. A. Elvins read the continuation of his former essay on "Solar Heat", arriving at the conclusion that the Sun and Stars are not necessarily growing cooler, but that they may retain all their present heat through all time to come.

A short discussion, in which  
 Mr. G. G. Pursey and Mr. J. Phillips took  
 part concluded the subject.

---

There being no further business  
 before the meeting it was adjourned  
 until Aug. 8<sup>th</sup> at 20 o'clock.

Chas. Sparling  
 Rec. Secy.

Larratt W. Hyatt  
 Chairman.

Affirmed.

15th Meeting  
Aug 8<sup>th</sup> 1893

The fifteenth regular meeting of the Astronomical and Physical Society of Toronto was held in their room 19 McGill St. on Tuesday evening Aug 8<sup>th</sup> at 20 o'clock

D. L. W. Smith D. L. W. Smith 26. in the chair.  
Chairman. 17 members present.  
17 present

Minutes Minutes of the last meeting were read  
read & confirmed and confirmed

Committee's Rept. The Committee on Quarters for  
Renting of Meeting reported that they had secured  
Room in accomodation in the Young Womens  
Christian Guild building, for the sum  
of Thirty dollars per annum. The Society  
to have access to the roof when desired,  
a room to meet in once every two weeks,  
and accomodation for the Society's  
Library. Rent to be paid quarterly in  
advance. The Report was adopted and  
carried.

Communications A communication was received from  
Editor, Astro-Physics the Editor of Astro-Physics, stating that  
Pooles Hand Book of Astronomy was an  
excellent work.

F. H. Young Mr. F. H. Young, Belleville wrote asking  
Rev. A. Corbett for the Society's Report and terms of membership.  
Mr. Barber Rev. A. Corbett, Paisley also wrote asking  
for Report re.  
Mr. Barber Leeds Eng. Thanking the  
Society for information and reports  
forwarded to the Leeds Astronomical  
Society.

Elected

The following gentlemen were elected as members of the Society viz  
 A. J. Pattison Mass. A. J. Pattison and John Webber, Active Members  
 J. J. Wadsworth " J. J. Wadsworth, Simcoe, and Chas. Clarke, London  
 John Webber Ont. as Associate Members.  
 Chas Clarke

Nominations

The following gentlemen were nominated for Active members.  
 Rev. C. H. Shortt Rev. C. H. Shortt, St Cyprianus Church City prop.  
 by Chas. P. Sparling & Sec. by S. L. W. Smith  
 Rev. T. M. Collins Messrs. J. R. & T. M. Collins, 172 Borden St. City  
 W. A. Douglas prop. by J. Lindsay and Sec. by J. Todhunter.  
 Mr. W. A. Douglas, 220 Wellesley St. City prop.  
 by Chas. P. Sparling and Sec. by G. E. Leveson

Motion

re Globes. On motion it was decided to place in the room of the Society the Sir Adam Wilson Celestial Globe and that the Council is hereby instructed to insure the Globe, Telescope &c. Carried.

Librarian's Report

The Librarian reported the receipt of the Report of the solar section of the British Astronomical Assn.

Predictions

Mr. J. Lindsay stated that the occultations of the moon for August were to be found in the Society's Report just issued.

Observations

Under the head of Observations Messrs. Elwins, Miller, Harvey & D. Donaldson gave most interesting descriptions of the great Sun spots now visible.

Aurora

July 16/93 The remainder of the evening was taken up by correspondence and discussion



on the Aurora of July 16<sup>th</sup> 1893.

---

There being no further business  
before the meeting it was adjourned  
until the 22<sup>nd</sup> at 20 o'clock.  
Paper for the next meeting "Sir Robert  
Ball, on the Universe".

Chas. Spaulding

Arthur Garrey  
Chairman

16<sup>th</sup> Meeting  
 Aug. 22<sup>nd</sup> 1893

The sixteenth regular meeting of the Astronomical and Physical Society of Toronto was held in their room 1970<sup>th</sup> St. Aug. 22<sup>nd</sup> at 20 o'clock.

Mr. A. Harvey  
 Chairman  
 16 Present.

Mr. Arthur Harvey, in the chair  
 16 Members present.

Minutes  
 Read & Confirmed

The minutes of the last meeting were read and confirmed.

Communications

A communication was received from Rev. W. Burke, Belleville enclosing the sum of one dollar and asking to be elected as an Associate Member.

Miss K. E. Vale also from Miss K. E. Vale, Davenport, Iowa enclosing one dollar and application for Associate Membership.

Election  
 of Active Mem.

The following gentlemen were elected as Active Members of the Society

Rev. C. H. Shortt, St. Cyprianus Church, City  
 J. R. Collins, 172 Borden St. City  
 Z. M. Collins, 172 Borden St. City  
 W. A. Douglas, Freehold Loan Co. City

Election  
 Associate Mem.

On suspension of the rule as to election, Miss K. E. Vale, Davenport, Iowa, and Rev. J. W. Burke, Belleville were elected Associate members of the Society.

Motion of Condolence  
 Moved by Mr. J. Lindsay and seconded by Mr. G. Pursey "That this Society learns with much regret of the death of the Rev. Father McBride, one of its members, and deeply sympathizes with his relatives

and friends in the loss sustained by them: carried.

Librarian's Report

The Librarian reported the receipt of the following publications:—  
 Elements of Galvanism 2 vols.  
 Mitteilungen 1 number  
 Photograph Album  
 Poole Bros. Planisphere  
 or Handbook of Astronomy.

Predictions

Under the head of Predictions Mr Lindsay reported 3 occultations of Stars for the 23<sup>rd</sup>, 25<sup>th</sup> & 28<sup>th</sup> Aug.

Observations

D. L. W. Smith contributed two sketches of Sunspots taken by him on the 9<sup>th</sup> at 6.45 p.m. and Sunday 20<sup>th</sup>.

Mr. Haddan, Iowa, interesting observations of Meteors, recently made.

Mr. A. F. Miller made some lengthened remarks on Sun Spots and submitted a sketch of Hydrogen flames 258° Aug 23 1893 8<sup>h</sup> 35<sup>m</sup>, also photo. of Normal Solar Spectrum Feb H<sup>2</sup> Aug 13<sup>th</sup> 1893.

Mr. Miller presented to the Society a photo. showing some experiments recently made by him in photographing portions of the heavens: The specimen given to the Society being a portion of Cassiopeia - photographed Aug. 15<sup>th</sup> 1893 22<sup>h</sup>. with an exposure of 45 min.

Mr. Arthur Starvey read a paper on some experiments recently made by himself on reflecting the Sun &c.

Mr. G. G. Pursey alluded to observations made by ~~himself~~ while in Kingston during the Aurora of July 15<sup>th</sup> 1893.

Messrs. Collins Bros., Elvins and Miller described the Aurora of Friday 18<sup>th</sup> Aug.

Vote of thanks  
Poole Bros.

On motion of Messrs. Lindsay and Elvins a vote of thanks was passed thanking the Messrs. Poole Bros. for their kind donation of Planisphere and Handbook of Astronomy - Carried

Adjournment

There being no further business before the Society the meeting was adjourned to Sept. 5<sup>th</sup> 1893.

John A. F. Atterus

Chairman

Chas. P. Sparling  
Rec. Sec.

17<sup>th</sup> Meeting  
Sept 5<sup>th</sup> 1893. The seventeenth regular meeting of the Astronomical and Physical Society of Toronto was held in their rooms 19 McGill St. Sept 5<sup>th</sup> 1893 at 20 o'clock

J. A. Paterson  
Chairman  
21 present  
Mr. John A. Paterson, in the chair.  
21 members present.

Minutes  
read & confirmed  
The Minutes of the last meeting were read and confirmed.

Communications  
J. J. Wadsworth  
J. A. Copland  
Communications were received from Messrs. J. J. Wadsworth and J. A. Copland re Meteors etc.

Council to  
insure property  
of Society  
books.  
The Council was instructed to effect insurance on the property of the Society and also to arrange for the necessary binding in the library.

Librarian  
Report  
The Librarian reported the receipt of the Royal Society's proceedings no. 325.

Motion.  
to purchase  
Est. Robert's books.  
On motion of Messrs Sparling and Todhunter it was agreed to purchase the balance of the books belonging to the Robert's Estate - the cost to be somewhere in the neighbourhood of \$2 to \$3. Carried.

Predictions  
Mr. Lindsay referred the members to the Annual Report for the predictions of the current month

Observations  
Mr. Arthur Harvey read an interesting article in the Third Annual Report of the Vatican Observatory.

## Communications

A communication from Mr. Lumsden was read, giving a description of some observations recently made in Muskoka.

Mr. A. F. Miller reported the return of the great sun spot Aug 10<sup>th</sup>, transit 14 days. The large spot in the north does not seem identical with the great spot seen before.

Mr. Elvins reported the sun spots Aug 30 & Sept 3<sup>rd</sup> as changed and nearer to a line with each other.

Mr. Dewar reported having heard sound during the Aurora July 23<sup>rd</sup>.

## Adjournment.

There being no further business before the meeting it was adjourned to Sept. 19<sup>th</sup> at 2 o'clock.

John A. F. Atkinson

Chairman

Chas. Sparkling  
Rec. Secy

18<sup>th</sup> Reg. Meeting  
Sept 19<sup>th</sup> 1893

The eighteenth regular meeting of the Astronomical and Physical Society of Toronto was held in their room 19 McGill St. Sept. 19<sup>th</sup> 1893 at 20 o'clock.

J. A. Paterson  
Chairman  
22 present.

Mr. John A. Paterson in the chair.  
22 members present.

Minutes  
read & confirmed

The minutes of the last meeting were read and confirmed.

Communications  
Prof. Newcomb

Communications were received from Prof. Newcomb, Supt. of the Nautical Office, Washington, respecting the computation of certain of the quantities published in the Tables of Star Occultations; from Prof. Hale, Kenwood Observatory; Prof. Payne; Sir Robt. Ball thanking the Society for a report of the bolide, seen at Toronto July 7<sup>th</sup> by Mr. R. A. Eaton; from the Librarian of the Smithsonian Institution and from inquirers as to membership in the Society.

Proposition  
Prof. Goldwin Smith

D. L. W. Smith seconded by Chas. P. Spangley proposed Prof. Goldwin Smith, of the Orange, as an Active member.

The  
Suspension of Rule  
& Ballot

On motion of Messrs. Todhunter and Elvins it was decided to suspend the rule relating to the ballot, on Prof. Smith's application, and proceed to elect him this evening.

Election  
Prof. G. Smith

The ballot being taken, <sup>and found favourable</sup> the Chairman declared Prof. Goldwin Smith as being duly elected an Active Member of the Society.

Librarian's Report The Librarian reported that Mrs. Jodhunter had kindly donated to the Society a copy of Prof. Barnard's "Micrometer Measures of the Fifth Satellite of Jupiter," and a photograph of a portion of the Milky Way, received by herself and friends while paying a visit to Lick Observatory in California also, 2 Vols. Fergusson's Astronomy

Committee Report The Committee of Ladies appointed to look after the cover for the Globe reported progress.

Observations Under the heading of Observations a letter to Mr. Copland from Dr. Veeder was read re the famous Auroral band of July 15<sup>th</sup>.  
 Mr. A. J. Miller reported on the Sun spots and Mr. Arthur Harvey read a most interesting series of "Astronomical Notes" upon the Sun also handed in sketches of the Sun spots made on the 10<sup>th</sup> inst.  
 Messrs J. R. & L. M. Collins exhibited negatives of the Sun recently made with an ingenious apparatus of their own construction.  
 Mr. W. D. Musson read several extracts from an article entitled "Is the Universe Infinite" by Sir Robt. Ball.

Order of Business On motion of Messrs Sparling and Harvey it was unanimously decided to add a new number in the order of business to read "Notes and Queries", carried

Under the heading of Predictions the members attention was directed



to the Society's Annual Report, where the predictions are given for the month.

M. Turnbull's  
Altazimuth Stand

Mr. Mungo Turnbull exhibited and explained a new altazimuth stand for telescopes recently devised by him and intended for the use of amateurs.

Papers  
for next meeting

The paper for next meeting to be read by Mr. John Phillips on "The Projectile Theory of the Planets", also a short paper from Mr. A. Elvins.

Adjournment

There being no further business the meeting was adjourned to Oct. 3<sup>rd</sup> at 20 o'clock.

Chas. Spaulding  
Recording Secy.

Larratt W. Smith

Chairman.

19 <sup>th</sup> Meeting Oct. 3 <sup>rd</sup> 1893	The nineteenth regular meeting of the Astronomical & Physical Society of Toronto was held in their room 19 McMill St. Oct. 3 <sup>rd</sup> 1893 at 20 o'clock.
D. L. W. Smith Chairman 28 Present	D. L. W. Smith in the chair 28 members present.
Minutes read & Confirmed	The minutes of the previous meeting were read and confirmed.
Nominations W. Dougall C.B.	On motion of Messrs. J. A. Paterson and Chas. P. Sparling M.P. W. Dougall C.B. County of York was nominated for Active Membership. Carried
Librarian's Report	The Librarian reported the receipt of the Hamiltonian Association Report, The Iowa Weather Review, Millers Old Red Sandstone.
Motion Subscribe for Pop. Astronomy	Moved by Mr. G. G. Pursey and seconded by the Recording Secretary that this Society subscribe for the new magazine Popular Astronomy - Carried
Predictions	Under the heading of Predictions it was noticed that Popular Astronomy published an accurate list of predictions for the month, it was also noted that the Comet would be visible in early part of Oct., in constellation Cancer or what is known as the Beehive.
Observations	Messrs. Collins presented the Society with some photographs taken experimentally by <del>themselves</del> themselves

showing what may be done in an Amateur way.

Papers  
Mr. J. Phillips  
"A. Elvins

Mr. J. Phillips read an interesting paper on the Volcanic Theory of Planetary Formation also Mr. A. Elvins, Thoughts on Terrestrial Magnetism but owing to the lateness of the hour discussion was postponed until a future meeting.

Paper  
next Meeting  
by  
Mr. J. Lindsay

The paper for the next meeting to be read by Mr. J. Lindsay, on the Chemistry of the Atom.

Adjournment

There being no further business the meeting was adjourned to Oct. 17<sup>th</sup> at 20 o'clock

Chas. Sparling  
Rec. Secy

John A. Fagerstrom  
Chairman.

20<sup>th</sup> Reg. Meeting  
Oct. 17<sup>th</sup> The twentieth regular meeting of  
the Astronomical & Physical Society of Toronto  
23 Present was held in their room 197 McGill St. Oct. 17<sup>th</sup>  
1893 at 20 o'clock.

J.A. Paterson M.A. J.A. Paterson M.A. in the chair.  
Chairman 23 Members present

Minutes read The minutes of the previous meeting  
& Confirmed. were read and confirmed.

Jas. McDougall Esq. Mr. Jas. McDougall C.E. County of  
Elected York, nominated for active membership by  
Messrs. J.A. Paterson and Chas. P. Sparling, was  
duly elected and declared a member of the  
Society.

Librarian's Report The Librarian reported the receipt of the  
following periodicals since last meeting viz:-  
Memoirs British Astronomical Association.  
Report of Astronomical Society, Pacific Coast,  
and presentation from Mr. Stephenson of  
2 Nos. Astro-Physics and Astronomy

Committee on Cover for Globe The ladies committee to secure  
a suitable cover for the Terrestrial Globe,  
having completed their labours, exhibited  
a handsome cover with Astronomical  
designs neatly worked in silk.

Vote of thanks On motion of D.E.A. Meredith  
and Mr. R. Dewar the cover was duly  
received and a vote of thanks tendered to  
the ladies for their kindness and labour  
in providing the cover - Carried

Observations

Mr. John A. Copland reported an observation made by him on the morning of Saturday Sept. 30<sup>th</sup> at 3 o'clock, of an interesting meteoric combination, also observation of a number of meteors, several mornings afterwards, until Oct. 12<sup>th</sup>.

Paper.

Mr. J. Lindsay read an exhaustive and interesting instructive paper on the 'Chemistry of the Atom', illustrating some of his points on the blackboard and experiments, with the assistance of Mr. R. Dewar.

Mr. J. Van Sommer followed with a few general remarks and explanations.

Adjournment.

There being no further business for the evening the meeting was adjourned to Oct. 31<sup>st</sup> at 20 o'clock.

Larratt &amp; Smith

Chas. Spading  
Rec. Secy

Chairman

25<sup>th</sup> Reg. Meeting  
Oct. 31<sup>st</sup> 1893

The twenty first regular meeting of the Astronomical and Physical Society of Toronto was held in their room 19 McGill St. on Tuesday evening Oct. 31<sup>st</sup> 1893 at 20 o'clock

D. L. W. Smith  
Chairman.  
40 present

J. A. Pa. D. L. W. Smith in the chair.  
40 members present.

Minutes  
read & confirmed

The minutes of the previous meeting were read and confirmed.

Communications

Communications were received from Miss A. Clarke of Redcliffe Sq., London; Mr. E. Gore F.R.A.S., Ballysodare, Ireland, and Mr. W. F. Denning F.R.A.S., Bristol, Eng. each enclosing a special paper to be read and published in the Society's Report.

Mr. F. J. Espin

Rev. F. J. Espin

A circular was received from Rev. F. J. Espin F.R.A.S. of Tor Law Eng., announcing a fine red star (observed at R.A. XXh. 46min. 59s. and north declination  $46^{\circ}$  and  $47^{\text{m}}$ .) as a variable and now fading.

Nomination

A. Sinclair

Mr. Geo. G. Pursey and the Recording Secretary nominated A. Sinclair M.A. Toronto, for Active Membership. Carried.

Nomination

Selection

Mr. C. Bogart

Mr. Geo. E. Lumsden, seconded by Mr. Arthur Harvey, nominated Mrs. Ella Bogart, Belleville for membership as an Associate and under a motion to suspend the rule as to election, the Chairman on taking the ballot, declared the lady elected. Carried.

Librarian's  
Report.

The Librarian reported the receipt of No. 10 British Astronomical Society's Proceedings, A work on the Hail Storm, and a copy of The Owl, published by the Ottawa University.

Observations,

Under the head of Observations, Mr. A. J. Miller and Mr. A. Elving referred to a large sunspot, visible to the naked eye, which passed off the solar disc last week.

Mr. Arthur Harvey described an aurora observed by him at Manitowaning on the 7th Oct. Though the display was not a brilliant one, it was interesting from the fact that the dark arch, which rose slowly, was so dense as to suggest the approach of a storm. Its true character was revealed by the appearance of streamers, and the eventual shining through it of bright stars. The Messrs. Collins exhibited several photographs, including one of the full moon, very sharp and clear. Dr. J. C. Donaldson of Fergus reported an interesting series of observations upon the moon, some close double stars, and the satellites of Jupiter.

Mr. Harvey presented a small stone given to him as an aerolite, which he had examined and found to be a nodule of iron pyrites. He stated that while on Cockburn Island, recently he had been informed that a meteorite weighing several tons fell some years ago on the Island and had been built into a wharf on the north side of the Island.

Presentation  
to  
Corresponding  
Secretary.

The Chairman, with a few well chosen remarks, introduced a feature of special interest in the order of business, and called upon Mr. John A. Paterson M.A., who read an eloquently worded address from the Society to Mr. Lumsden, the Corresponding Secretary, who had been identified with the Society since incorporation and had ever, he said, taken an intense interest in its welfare. The address referred to the services which Mr. Lumsden had rendered to the Society: it was largely due to his individual efforts that it is now known throughout the scientific world: the preparing and editing of the annual reports had been his work and had received special attention: he had maintained a voluminous correspondence with men of science to the great advantage of the Society, and it was a notable fact that in this fair Province and throughout Canada an active interest was being taken in scientific study, which was in a measure due to his efforts, furthered in the handsomest manner by the Toronto Press, to give to the public from time to time interesting reports of the Society's meetings. Reference was also made to contributions to science in the field of telescopic observations, some of which had been discussed in certain European scientific journals. It was hoped the Secretary would continue in his work and that he would, for himself and his wife, accept a gift as a token of the Society's interests.



A beautiful silver urn and silver inkstand, suitably engraved, were then presented amid applause. A very complimentary address in verse from Mr. Geo. G. Pursey, and a letter from Mr. J. A. Copland were also read.

In accepting the address and the gifts, Mr. Sumner said he did so confidently feeling that any services he had performed had been greatly overestimated in the one and unduly recognized in the other. He protested that in no sense was the society indebted to him. On the contrary, the obligation rested upon him, as he had derived great pleasure from its encouraging and valuable auspices. He referred to astronomy and physics pertaining to astronomy, as subjects which may be taken up by any one as a pastime, if not seriously, and said they would be found to be ever interesting and useful in improving the mind.

After the presentation, refreshments were <sup>generously</sup> served by the ladies and a very pleasant and social hour spent, thus closing one of the red-letter meetings of the Society.

Chas. Sparling  
Rec. Secy

E. J. Meredith  
Chairman

22<sup>nd</sup> Meeting  
 Nov. 14<sup>th</sup> 1893 The twenty second of regular meeting  
 of the Astronomical and Physical Society  
 of Toronto was held in their room 197<sup>th</sup> Gill  
 St. on Tuesday evening Nov. 14<sup>th</sup> 1893 at  
 20 o'clock

D. Meredith E.A. Meredith LL.D. in the chair  
 Chairman 18 Members present  
 18 Present

Minutes The minutes of the last meeting were  
 read & confirmed read and confirmed.

Communications Communications were received from  
 Sir Geo. Stokes, Victoria Institute, London Eng.,  
 J.H. Young and J.H. Young, Belleville.

Motion. On motion of Messrs. Sparling and  
 Thanks. Pursey it was resolved That the Thanks  
 of this Society be tendered, through Mr. J.A.  
 Paterson, to the young gentleman who so  
 kindly expressed the address to Mr. Lumden  
 Carried.

Motion Moved by Mr. A. Elvin and seconded by  
 to appoint Mr. J. Van Sommer "that whereas the editors  
 Foreign Press of various Astronomical publications have  
 Correspondent opened their columns to the Society and  
 whereas it is in the best interests of this Society  
 that notices of its proceedings should regularly  
 appear in the said publications, Be it  
 resolved that the office of British and  
 Foreign Press correspondent be created. Carried.

Election Moved by Mr. Fodhunter and seconded  
 H.C. Copland by Mr. Musson, That Mr. John A. Copland, a  
 Foreign Press member of this Society, be appointed to be  
 Corr.

British and Foreign Press Correspondent,  
Mr. Copland having signified his willingness  
to act. Carried.

Election

A. Sinclair M.A.

active member

Mr. A. Sinclair M.A. was duly elected  
an Active member of this Society - Carried

Proposition

Mr. Merrishaw

Mr. J. Todhunter moved, seconded  
by Mr. Sparling, Mr. J. Merrishaw, Markham  
St. as an Active member - Carried

Librarian's

Report

The Librarian reported the receipt  
of Canadian Almanac 1894 and  
Proceedings of the Royal Astro. Soc. Vol. 54 # 327.

motion.

On motion of Messrs. Sparling and  
Todhunter, it was resolved that the Address  
presented to Mr. Geo. E. Sumner and his  
reply thereto, be printed in full in the Annual  
Report of the Society - Carried.

Predictions

Under the heading of Predictions  
Mr. Geo. E. Sumner stated that the  
Zodiacal Light would be visible during the  
month. Mercury would be visible some evenings  
Venus also, Sagittarius - 27 minimum of  
Algol on 22<sup>nd</sup> 11.57 o'clock, on 25<sup>th</sup> at 8.46 o'clock.  
Jupiter in the position of the Earth between  
him and the Sun on 18<sup>th</sup>.

Miss Clarke's

paper

Miss Clarke's paper on "The distance  
of the Nebulae" was read by Mr. W. B. Musson.

Motion.

Thanks to

Miss Clarke

Moved by Mr. Arthur Harvey and  
seconded by Mr. Thos. Lindsay that the  
thanks of this Society be tendered to

Miss Agnes M. Clarke for her valuable paper. Mr. Harvey went on to express his great satisfaction derived from listening to the paper which, he said, was written with that clearness and felicity of style which make all her writings and her larger works especially attractive to the student. he reminded the Society that it was no small compliment to receive so valuable a contribution, so that, if for that reason only, an exception should be made to the rule of not formally thanking a member for a paper.  
Carried.

There being no further business the meeting was adjourned to Nov. 28<sup>th</sup> at 2 o'clock.

Chas. Sparling  
Rec. Secy.

E. A. Mendall  
Chairman

23<sup>rd</sup> Meeting  
Nov. 28<sup>th</sup> The twenty third regular meeting of the Astronomical and Physical Society was held in their room 19 McGill St. on the 28<sup>th</sup> November at 20 o'clock

Dr. Meredith  
Chairman  
17 present E.A. Meredith LL.D in the chair.  
17 Members present.

Minutes  
read & confirmed The minutes of the previous meeting were read and confirmed.

Election  
Mr. F. Merrichau  
The ballot was taken and declared in favour of the application of Mr. F. Merrichau Markham St., for active membership.

Nomination  
Mr. W. Burton Messrs. Pursey and Lumden nominated Mr. W. Burton, City Paymaster for active membership.

Predictions  
Mr. E. B. Lumden stated that the planet Mercury would be visible about the middle of Decr. nearly 2 hours before sunrise. Mars at present is badly situated for study, on the 6<sup>th</sup> Decr it and the planet Uranus would be together. On the afternoon of 6<sup>th</sup> Decr it would pass at about 6 m. of Arc. The rings of Saturn are opened up.

Notes & Queries  
Dr. Meredith's  
Memoranda Under the heading of Notes and Queries Dr. Meredith read the following memo. in reply to an enquiry from Mr. A. Harvey:  
"At the last meeting Mr. Harvey referred to the belief prevalent in some countries and especially among the Teutonic races, that seed should be sown when the moon was  
was

was waxing not when it was waning. The question was asked if Virgil in his Georgics said anything on this point. I promised to look up the matter. In the opening lines of the Georgics I find ~~and~~ Virgil proposes to treat of the proper times for sowing seed and planting trees. He tells us that the farmer should watch the Constellations, the rising and setting of the stars, as carefully as the sailor - that the position of the Sun in the Zodiac determined "Messis diem, tempus que secundi," i.e. the time of harvest and the season for sowing. In other words the proper time for sowing seed is regulated solely by the Calendar. In one passage only, so far as I can find, is any reference made to the moon. 1 Geo. C. 276 where he says that the fifth day after new moon was unlucky, while the seventeenth was lucky for planting the vine and other things.

Opera Glass  
Section.

Mr. Lumsden spoke briefly on the prospects of forming an Opera Glass section.

G. Gores  
Paper

Mr. Edward Gores paper on "Luminiferous Ether" was read by Mr. Chant, and cleverly replied to by Mr. Hull.

Adjournment

There being no further business for the evening the meeting was adjourned.

John A. Tattler

Chas. Sparling  
Rec Secy

Chairman

24<sup>th</sup> Meeting  
Decr. 12<sup>th</sup> 1893

The twenty fourth regular meeting of the Astronomical and Physical Society of Toronto was held in their room 197 McGill St. on the 12<sup>th</sup> Decr. 1893 at 20 o'clock.

J. A. Paterson  
Chairman  
26 present

John A. Paterson, M.A. in the chair.  
26 Members present.

Minutes  
read & confirmed

The minutes of the previous meeting were read and confirmed.

Mr. A. Elvins  
elected  
Life Member

On motion of Messrs. G. G. Pursey and A. F. Miller, the founder of this Society Mr. A. Elvins was made a Life Member with full privileges. Carried.

Opera-glass  
Section

Moved by Mr. Arthur Harvey and seconded by Mr. Geo. E. Lumsden that the organization and work of the Opera-glass Section be referred to the Council and that Mr. Tho. Lindsay be invited to attend the Council meeting. Carried.

Wm Burton  
elected  
Active Member

The application of Mr. Wm Burton for Active membership was balloted for and the Chairman declared him duly elected. Carried.

Librarian's  
Report

The Librarian reported the receipt of  
Bull. Astr. Assn. Vol. 3 No. 11.  
L'Astronome et les Astronomes by Zischner.  
Catalog der farbigen Sterne

Observations

Mr. Arthur Harvey stated that on two occasions last week he observed shadows from Venus and Jupiter, these shadows

are only seen on nights when the moon is obscure

Mr. Deming

Mr. J. Von Sommer read a paper from Mr. W. F. Denning on "the radiant points of the Perseid Meteors"

Adjournment

There being no further business before the meeting it was adjourned to the 26<sup>th</sup> Decr.

Chas. P. Spang  
Rec. Secy.

Chairman

R. B. Bellis

Omitted.

Mr. Lumsden, the Corresponding Secretary, read a very instructive and interesting paper on the astronomical display at the Worlds Fair, Chicago. He also shewed a number of photographs.



25<sup>th</sup> Meeting  
26<sup>th</sup> Decr 1893

The twenty fifth regular meeting of the Astronomical and Physical Society of Toronto was held in their room 19 McGill St. on the 26<sup>th</sup> Decr 1893 at 20 o'clock

Mr. R. B. Ellis  
Chairman

Mr. R. B. Ellis in the chair  
15 members present.

15 Present

Minutes

Read & Confirmed

The minutes of the previous meeting were read and confirmed.

Communications

Communications were received from Dr. Morrison, Washington U.S.A., and Prof. Carpmael.

Election  
M. Turnbull

The rule respecting nomination and election of members was suspended for the evening and Mr. Mungo Turnbull duly declared elected an Active Member of the Society.

Notices of  
Motion

Mr. Jas. Todhunter gave notice that he would move, at the next regular meeting, for an alteration in the constitution of the Society changing the fees of admission.

Mr. R. Dewar gave notice of motion for next meeting "That a committee be appointed to enquire into the advisability of creating a fellowship in connection with this Society, and the necessary changes in our Charter etc in furtherance of same

Mr. Lumsden gave notice That at the next meeting, he will move for a Committee to consider the advisability of

addressing a respectful memorial to the Hon<sup>ble</sup> the Minister of Finance respecting the propriety of reducing or repealing the duty on astronomical instruments not made in Canada.

Nomination

Moved by Mr. Thos Lindsay  
 Seconded by Mr. D. G. Ross  
 "Whereas much of this Society's prosperity during the past year has been largely due to the deep interest taken by its officers in all branches of the work and whereas some of the excellent measures for enlarging the Society's field of usefulness are still under consideration, therefore be it resolved That the best interests of the Society will be served by making no change in the list of Officers and Council for 1894. and that the Recording Secretary be requested to prepare one nomination paper containing the names as they stand now upon the roll and that at the annual meeting in January 1894, the election of these Officers be made unanimous. Carried.

Librarian's  
 Report

The Librarian reported the receipt of the following publications.  
 2 Nos. Mitteilungen  
 Physical Observations of Mars — Keeler  
 Grecian & Roman Mythology — Swright  
 Report of the Board of Visitors 1871, Royal Observatory Edinburgh, wherein there is a reference to our Mr. A. Elvin's correspondence on "Connection between Rain-falls and Sunspots."

Donations

Mr. Geo. E. Lumsden presented the Society with several numbers of Astro Physics. 2 Sketches of Venus and Jupiter 4.45 pm 26<sup>th</sup> Decr. 1893, also, a photograph of frost tracing on a window.

Motion

Moved by Mr. Ross and seconded by Mr. A. F. Miller that the Astronomical Journal be ordered for the Society - Carried

Notes &amp; Queries

Mr. Lindsay directed attention to the fact that the Royal Society medal was awarded to a German Professor for researches in chemistry shewing that atoms were linked together, substantiating his theory as read before the Society a short time since. There was also a medal awarded to Prof. Meyer.

Paper

Miss Gray read Prof. Barnards paper on the photos of Brooks' Comet.

Closing

There being no further business the meeting was adjourned to Jan'y 9. 1894

John A. Gattens

Chairman

Chas. Spaulding  
Rec. Secy.