



# The Journal of the Astronomical Society of India.

VOL. II.]

SESSION 1911-1912.

[No. 9.

## Report of the Meeting of the Society held on Tuesday, the 25th June 1912.

THE usual Monthly Meeting of the Astronomical Society of India was held on Tuesday, the 25th June 1912, at the Imperial Secretariat Buildings (Ground Floor).

H. G. TOMKINS, C.I.E., F.R.A.S., *President*, in the Chair.

S. C. GHOSH, M.A., *Officiating Secretary*.

The Minutes of the last meeting were read by the Secretary and confirmed.

The following presents to the Society were then announced and the thanks of the members accorded to the donors:—

Books presented by the President, Mr. H. G. Tomkins.

1. Monthly Notices of the Royal Astronomical Society—

Vol. LII.	Vol. LXVII.	Vol. LXIX.
Vol. LIV.	Vol. LXVIII.	Vol. LXX.

Publications received during June 1912—

1. Notices of the Royal Astronomical Society (Vol. LXXII, No. 6).
2. Journal of the British Astronomical Association (Vol. XXII, No. 7).
3. Memoirs of the British Astronomical Association (Vol. XIX, Part I).

4. Revista Di Astronomia (Anno VI, No. 5).
5. Monthly Weather Review of the Alipore Observatory for January 1912.
6. Journal of the Royal Astronomical Society of Canada (Vol. VI, No. 1).
7. The Collegian—  
Nos. 1 and 2, May 1912, and No. 1, June 1912.

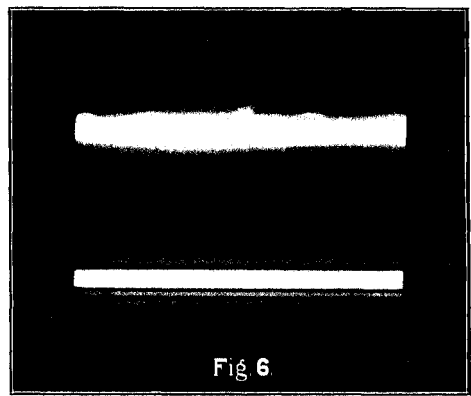
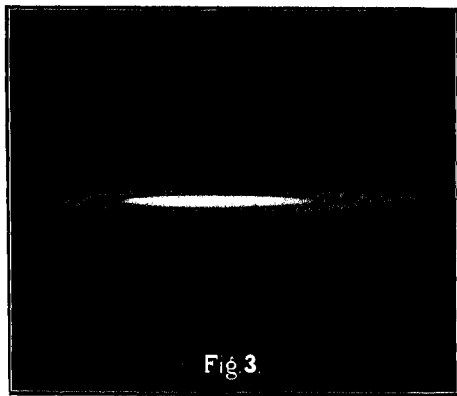
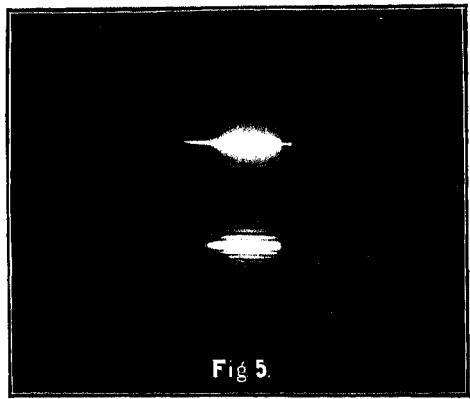
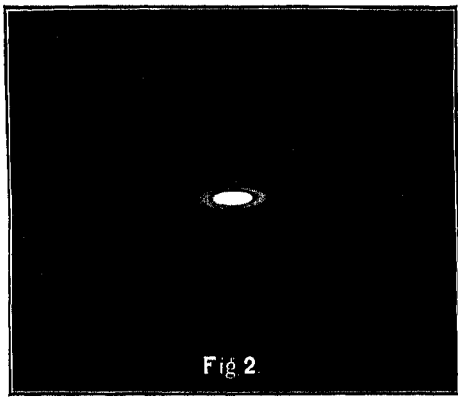
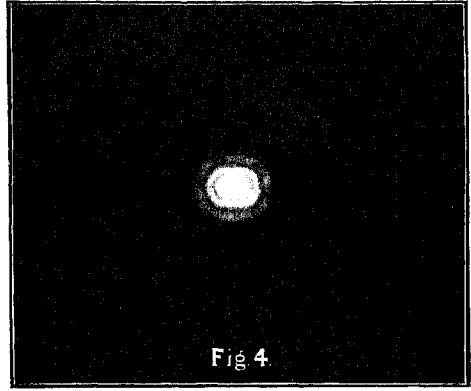
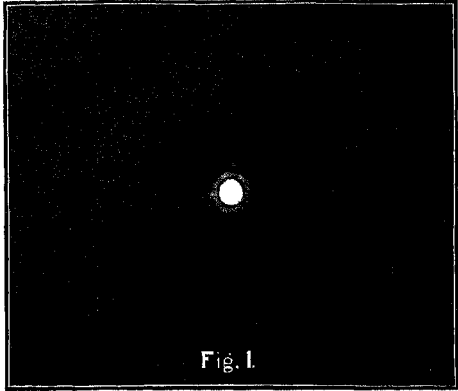
The President then read the names of the following gentlemen elected at the last meeting and the elections were formally confirmed :—

1. D. QUINLAN, ESQ., M.R.C.V.S., Civil Veterinary Department, Ranchi Secretariat.
2. JYOTI PROSAD CHATTERJEE, ESQ., M.A., B.L., *Vakil*, Krishnagar.
3. MAHARAJA KSHAUNISH CHANDRA ROY of Krishnagar.

He invited those who had not signed the roll to do so.

*The President.*—As this is the last meeting of the Session, under Bye-Law 10 the Council have to present to the Society the proposed list for the election of the Council at the next meeting in October, and the list proposed by the Council is as follows :—

<i>President</i>	...	... W. J. SIMMONS, ESQ.
<i>Vice-Presidents</i>	...	... (1) COL. S. G. BURRARD, R.E., C.S.I., F.R.S. (2) J. EVERSHERD, ESQ., F.R.A.S (3) C. MITCHIE-SMITH, ESQ., C.I.E., F.R.S.E., F.R.A.S. (4) HIS HIGHNESS THE MAHARAJA RANA BAHADUR SIR BHAWANI SINGH, K.C.S.I., F.R.A.S
<i>Secretary (Scientific)</i>	...	... DR. E. P. HARRISON, PH.D.
<i>Do. (Business)</i>	...	... C. V. RAMAN, ESQ., M.A.
<i>Treasurer</i>	...	... U. L. BANERJEE, ESQ., M.A.
<i>Directors of Sections :—</i>		
<i>Lunar Section</i>	...	... THE Rev. J. MITCHELL, M.A.
<i>Meteor Section</i>	...	... P. C. BOSE, ESQ.
<i>Variable Star Section</i>	...	... B. M. RAKSHIT, ESQ., B.A.
<i>Instrumental Director</i>	...	... S. WOODHOUSE, ESQ,



DIFFRACTION IMAGES.

<i>Director of Classes</i>	..	H. G. TOMKINS, ESQ., C.I.E., F.R.A.S.
<i>Secretary</i>	...	P. C. BOSE, ESQ.
<i>Librarian</i>	...	J. A. LAWRIE, ESQ.
<i>Editor</i>	...	J. J. MEIKLE, ESQ.

*Other Members of the Council.*

J. C. DUTT, ESQ., M.A., B.L.  
 F. W. HOWSE, ESQ.  
 S. C. MITTER, ESQ., M.A., B.L.  
 C. K. SIRCAR, ESQ., C.E., M.S.A., M.S.E.  
 D. N. MULLICK, ESQ., B.A., D.Sc.  
 D. N. DUTT, ESQ., M.A.  
 C. T. LETTON, ESQ.  
 MRS. TOMKINS.  
 C. W. PEAKE, ESQ., M.A.  
 W. A. LEE, ESQ., F.R.MET.S.

I have not heard from the gentlemen proposed that every one of them agree to serve, and the list is therefore subject to their agreeing to stand for election. I vacate the office of President at the end of this Session, under Bye-Law No. 5. Mr. Simmons has very kindly consented to be our President, and I think we are to be congratulated on his having agreed to stand for election to this office.

Should any of the members like to put in other names in the list they are free to do so. The next meeting will be held in October and at that meeting the election will take place.

I would now ask Mr. Raman to give us his paper on Astronomical Optics.

Mr. Raman then read his paper and illustrated it with lantern slides.

*The President.*—Mr. Raman has just promised to give us some account of the Zeeman effect later on. We learnt something about this sometime ago from Dr. Harrison, and I am sure we shall look forward to hearing more of it from Mr. Raman at a subsequent meeting. One point, which struck me, was that Mr. Raman says he had never stood on the platform when an Express passed by and noticed the changing tones of the whistle, but anyone who has stood there must have noticed this and how the pitch of the note alters as the engine approaches and then passes on. We must thank Mr. Raman for the valuable slides he has shown

us. They must have taken considerable trouble to make, for these things are not found in books or ordinary laboratories.

The thanks of the meeting were then accorded to Mr. Raman.

*The President.*—I will now ask Mr. Lee to read his paper on the Nebular Hypothesis and show us the slides regarding it.

Mr. Lee then read an interesting paper and showed a number of slides of Nebulæ at the end.

*The President.*—We are most fortunate this evening in having such an interesting paper, and should anyone like to ask questions, they may do so.

Mr. Simmons, in proposing a vote of thanks to Mr. Lee for his paper, said his reading it recalled to the speaker's mind the time in the early "nineties" when Mr. Lee used to take part in the proceedings of the now defunct Microscopical Society of Calcutta, and he was glad Mr. Lee had joined our Society. He agreed with Mr. Lee that whatever might be the difficulties raised by the Nebular Hypothesis, it was at present the best provisional theory of the solar system available. Evolution was now in the air, and everyone who thought at all was an evolutionist. Many still considered evolution applied only to organic nature. Laplace's theory with which Mr. Lee had been dealing showed that there had been evolution in inorganic nature. It raised difficulties, he believed they were chiefly mathematical. Mr. Hinks, to whose book the speaker had frequently directed attention at the meetings, said these mathematical difficulties were increasing year by year. There were, however, several features in the solar system which give support to the Hypothesis. The planets all revolved in one plane, they all revolved in one direction in their orbits, and in the same direction on their individual axes. With the outstanding cases of the satellites of Uranus and Neptune excepted, the satellites all revolved in the same direction. It was perhaps not without significance that Uranus and Neptune were the outermost planets of the system, and were followed by Saturn which still retained its rings. Ocular demonstration of the truth of the Nebular Hypothesis could not be expected; a Nebular took very many millions of a year to condense. Nor did the Nebulæ which had so far been discovered furnish a complete series which would illustrate all the stages of the whole evolutionary process. But the Spiral Nebular was distinctly important and so too were the Nebulæ of a class illustrated by one of Mr. Lee's slides. It was an elegant form of Nebula, with marked condensation in the centre. That was in his opinion such a nebulous mass as the Hypothesis assumed, but seen edgewise.

For the present the speaker considered we must accept the Hypothesis as a working theory. It could be rejected when it had been further tested and proved to be insufficient.

There were many who scoffed at Science because it changed its theories from time to time. The speaker held it to be the glory of Science that it did change its hypothesis when they were tested and found wanting. Evolution, he would remind them, was not a new thing. It had been foreshadowed by Thales and Heraclitus. The Hindoos claimed it was also foreshadowed in the Sankhya Philosophy of Kapila, who evolved the Universe itself from emanations of a primeval essence.

The Nebular Hypothesis applied evolution to inorganic nature, and recently in experiments which showed that Radium was evolved from Uranium there was ground for considering that the very elements themselves were no more fixed entities than the stars themselves were fixed.

There was reason to believe there is what might be termed elemental evolution. It seemed to the speaker appropriate that at the close of a session during which planets and stars and stellar systems had been reviewed and discussed, they should have a paper on a subject which gave unity to all their speculations, and to the facts of Astronomical Science, and which suggested how the Universe itself had been evolved.

*The President.*—I will ask you to accord your thanks to Mr. Lee. One small item of business which comes under Bye-Law 27 has to be seen to this evening.

The October meeting will be the next Annual General Meeting. Some alterations have been proposed by Mr. Lee on behalf of the Council in Bye-Law No. 27.

*Bye-Law No. 27.*—If the subscription be not paid within one month of the due date, a notice shall be given to the subscriber that he is in arrear. If the subscription be not paid within six months of the due date, the name of the subscriber shall be posted at the next meeting of the Society, and if the subscription be not paid within twelve months of the due date, the defaulter shall cease to be a member of the Society, unless otherwise ordered by the Council. The Council may at any time reinstate such a member upon payment of all arrears. For the purpose of this rule a notice shall be deemed to have been served if it is sent by registered post to the address of the member registered in the Society's books."

I am sorry to say that there have been certain members who have come as far as the 12 months limit and some the 6 months limit without paying their subscriptions. This compels the Society and Council to go through the unpleasant duty

of posting the gentlemen's names as men who have not paid their subscription at the next meeting. The Council think, however, that it is scarcely necessary to do this, though they find it absolutely necessary to protect the Society against members who will not pay their dues, but who nevertheless use the JOURNALS. There seems to be a kind of epidemic disease in India with regard to subscriptions which are neglected to be paid; but we cannot have JOURNALS and books sent to Members when they do not pay for them. We therefore propose the following amendment to the Bye-Law which I give notice will be considered at the General Meeting in October.

“*Revised Bye-Law No. 27.*—If a subscription be not paid within one month of the due date, a notice shall be given to the member that he is in arrear. If the subscription be not paid within five months of the due date the member shall be informed by a notice that if the subscription be not paid within six months of the due date the JOURNALS and other publications of the Society shall not be sent to the member until payment of the overdue subscription. If the subscription be not paid within twelve months of the due date, the defaulter shall cease to be a member of the Society, unless otherwise ordered by the Council. The Council may, at any time, reinstate such member upon payment of all arrears.”

This is the last meeting of the Session, and during the next three months there will be no meetings at all. The library and business part of the Society, however, does not close and those who want to get books and JOURNALS may do so.

The meeting was then adjourned to 29th October 1912.

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## Astronomical Optics.

BY C. V. RAMAN, M.A.

Astronomical Optics is a very extensive subject, and this is not very surprising considering the fact that our principal source of information in Astronomy—one might almost say our only source of information, if we exclude the stray pieces of meteoric matter that occasionally reach the Earth's surface,—is the radiation that reaches us from the objects in the sky. I have therefore to confine myself to a few branches of my subject in the present paper. In the paper which I read at the last meeting of the Society I discussed the phenomena of