



# The Journal of the Astronomical Society of India.

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VOL. III.]

SESSION 1912-1913.

[No. 3.

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## Report of Meeting of the Society held on Friday, the 3rd January 1913.

THE ordinary monthly meeting of the Astronomical Society of India was held on Friday, the 3rd January 1913, at the Imperial Secretariat (ground floor), at 5 P.M.

W. J. SIMMONS, Esq., *President*, in the Chair.

C. V. RAMAN, Esq., M.A., *Secretary*.

The minutes of the previous meeting were read and confirmed. The following presents received since the last meeting were then announced by the Secretary and the thanks of the Society were accorded to the donors :—

1. Monthly Notices of the Royal Astronomical Society, Vol. LXXII, No. 9.
2. Journal of the British Astronomical Association, Vol. XXII, No. 10 and Vol. XXIII, No. 1.
3. Journal of the Astronomical Society of Wales for 1911.
4. Revista De Astronomia Anno VI, No. 11.
5. Bulletin of the Astronomical Society of Barcelona for November 1912.
6. Journal of the Royal Astronomical Society of Canada, Vol. VI, No. 5.

*President.*—In addition to what the Honorary Secretary has just read, I have to announce that arrangements have been made and are nearly complete for a *Conversazione* which is to be held at the Town Hall, and at which it is hoped His Excellency the Governor of Bengal will be present. There will also be a course of popular lectures similar to those given last year. The first will be delivered on the 15th of this month by Mr. Lee and will be presided over by Sir William Duke. It is to be on “The Life History of a World.”

Will the Honorary Secretary now please read the names of members who have been elected since the last meeting.

The Secretary read the names of the following gentlemen and their election was then formally confirmed :—

Mr. W. E. PINCOMBE, A.M.I.C.E.,  
*Resident Engineer, E. I. Railway.*

Mr. G. RAMSEY SHORT,  
*General Manager, Butterworth & Co., Ltd.*

Mr. DEVENDRA NATH DUTT, M.A., B.L.,  
*Superintendent, Office of the Accountant-General,  
Bengal.*

Mr. T. K. ACHARYA, B.A.,  
*Superintendent, Office of the Accountant-General,  
Bengal.*

The members who were present and had not signed the roll were invited to do so.

*President.*—The next item of business is a paper on the Construction of a Cheap Telescope, by Mr. Tomkins, and I would ask him to proceed with it. (*Paper.*)

*President.*—Ladies and Gentlemen, the paper which Mr. Tomkins has just read is of a technical nature, but it certainly suggests questions if it does not provoke criticism.

*Mr. Demetrius.*—I should like to ask whether, in the manufacture of a large telescope, the mirrors are ground by hand or machinery.

*Mr. Tomkins.*—It depends upon the size. If large they are done by machinery. The mirror I am grinding is 2 feet diameter and 4 inches thick and over 3 cwt. in weight, and if pieces of glass like that are to be ground they must be done by machinery. Mr. Woodhouse thinks that with a little extra trouble we might have attempted it by hand. When we grind a large size mirror the machine is used. The hand grinding is more simple for small mirrors.

*Mr. Bose.*—When grinding the mirror for my telescope I did not use the barrel but fixed my glass on a stool  $2\frac{1}{2}$  feet high without turning round the stool. It is easier to grind without moving round the tub.

*Mr. Tomkins.*—It is very easy for a 4" mirror, but for a 6" one I think it would be rather difficult to grind it without going round the tub. In grinding and moving round you have not got to worry yourself about the kinds of stroke, and after a time you get accustomed to it, and get the curve easily.

*Mr. Lee.*—The sides of the mirror cannot be ground without walking round the tub. It is impossible to make the side stroke without that, for the only way to get an accurate side stroke is by moving round the barrel.

*Mr. Tomkins.*—I first made a 4" and found it rather tedious walking round it, but I think it is better to do it.

*Mr. Bose.*—I think the side stroke can be given without moving.

*Mr. Lee.*—Very few people could do it.

*Mr. Raman.*—I do not quite follow what is meant by a side stroke.

*Mr. Tomkins.*—It means that as you push the mirror forward and back, its centre is made to go first to one side of the centre of the tool and then to the other.

*President.*—I will ask you, Ladies and Gentlemen, to give your hearty vote of thanks to Mr. Tomkins for his paper, and I hope he will continue it at the next meeting as it is likely to be of practical use to the Society. I am glad to see that some of the members here have some previous knowledge of the subject dealt with by Mr. Tomkins.

The next item on the agenda for the evening is a paper on a Meteoric Shower by Mr. P. C. Bose. (*Paper read by Mr. Bose.*)

*President.*—Ladies and Gentlemen, the paper is now under discussion and I trust it will be taken up and a lively discussion ensue.

*Mr. Raman.*—What I should like to know is, whether there is any evidence that an actual extensive shower of Meteoric stones fell on the region referred to by Mr. Bose. If so there should be something about it in the records of the Geological Survey.

*Mr. Tomkins.*—There have been some Meteoric stones found in India, but whether they were in the part of the country named I do not know.

There are two points in Mr. Bose's paper which struck me. In the concluding portion of his paper, he expressed a hope that the East and West should join hands in the progress of Astronomy. I would ask him to refer to our own Society in which I hope the East and West have joined hands. The second with reference to Hanuman who soon after his birth mistook the rising sun for a fruit and wished to eat it. If that was really the case I should say that the children of those days must have been more forward than those of to-day in wanting to eat a fruit soon after birth.

*Mr. S. C. Ghose.*—Was it really believed that all the planets were in one line?

*Mr. Bose.*—I have only given the order in which the planets were supposed to be. Of course they keep moving round.

*Mr. Tomkins.*—I do not quite see why the planets are placed on both sides of the sun. I suppose because the Earth was taken as the centre of the system.

*Mr. Raman.*—That seems to be analogous to what was assumed in the Ptolemaic theory. Another point which I wish to refer to is whether there are any instances of Meteoric showers recorded in history.

*The President* replied that some years ago it had been suggested that Sodom, Gomorrha and the Cities of the Plain had been overwhelmed by a shower of Meteoric stones, and some place in North America had been cited where there were indications of a similar catastrophe. He, however, was of opinion, that in the cases mentioned geological causes furnished a more acceptable explanation. The Cities of the Plain had stood in a tract of country where it is not improbable a volcanic eruption occurred. He knew of no other case where the destruction of a city had been occasioned by meteorites.

*President.*—Are there any further remarks?

In closing the discussion the President directed attention to what he considered a few points which must be kept in view in dealing with an ancient epic like the Ramayana. Too much should not be made of its being purely mythical, or purely allegorical. In the case of the Iliad, Max Muller and those of that school had tried to explain away the main incidents of the poem by stating they were poetically elaborated myths of storm, and cloud, and dawn and so forth. Schliemann's excavations in the Troad had proved that a great city and civilization like that ascribed to Troy in the Iliad had undoubtedly once existed. It seemed to him probable that there was generally some nucleus of historical

fact at bottom in these cases round which myth and legend gathered as years went by. Another point was that people in those old times had more leisure than we possessed. They observed celestial phenomena and arrived at results such as the Chaldean Saros cycle, which he believed was arrived at after a long series of observations on eclipses. It was found by observation that they recurred at intervals corresponding to the number of years included in the cycle. So, too, in the case referred to in the paper Mr. Bose had read. It was necessary to guard one's self against assuming that a so-called prophecy was a glance in advance; he believed it was in many instances the historical rendering of a past fact. Ancient writers acted on principles very different to those now in vogue. Writers like Cæsar and Livy did not hesitate to put in the mouths of the characters they dealt with speeches they assumed they must have uttered, although it was now certain they could not have been spoken by the persons in question. So, too, if weight was to be gained by doing so, ancient writers attached to books and documents written by themselves the names of authors who were not responsible for them, perhaps not capable of writing them. Modern criticism had established these as points which had to be kept in view when old books of the character of the Ramayana were under consideration. The Society was indebted to Mr. Bose for the learned paper he had read, and for directing their attention to the passages in the Ramayana which had been discussed by him, and the President was confident all present would join him in tendering a hearty vote of thanks to Mr. Bose for his interesting paper.

*President.*—There are two notes come from Mr. Mitchell at Bankura which he has illustrated by drawings and photographs taken by his 5" telescope. I think you will agree with me when I say that we have a very valuable member in Mr. Mitchell. (*Reading.*)

The paper will appear in the JOURNAL and so will the photographs.

*Mr. Tomkins.*—I may say that he has sent us two slides which you may like to see. (These were shown on the screen and were much appreciated.)

*President.*—We record a vote of thanks to Mr. Mitchell for his notes.

*Mr. Tomkins.*—There is one thing I should like to say with regard to the classes regarding which I issued a circular a few days ago. I have received several names

of European members but none yet from Indian members, and I hope that some of the latter will join and send in their names. They need not mind how limited their knowledge of astronomy may be.

*President.*—The next meeting of the Society will be held on a date to be notified hereafter. The meeting is adjourned.

At the conclusion of the proceedings Mr. Tomkins showed on the screen a photograph of the Daylight Comet which had been taken by Professor Lowell and some photographs of solar and planetary spectra, which were greatly admired. A spectroscope which had been set up by Mr. Raman to show the bright line spectrum of sodium was also exhibited to several of the members present.

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## The Construction of a Cheap Telescope.

By H. G. TOMKINS, C.I.E., F.R.A.S.

### II.

In my last paper I dealt with the grinding of the glass mirror the curve of which had been roughly ground and tested by the sun for focal length. At this stage the glass is of course full of pits caused by the rough emery, and the next process consists in getting rid of these until we have a surface sufficiently fine to take a good polish. It is this process which I shall describe in the present paper. The first steps are very simple, it being merely necessary to use finer and finer grades of emery powder until the flour emery is reached. Care should be used between each stage to thoroughly clean the tub and tools as well as the vessels in which the emery is to be mixed, as a rough grain of emery will badly scratch the mirror and necessitate a return to the coarser grades to get rid of it. It is also a good plan to mix a larger quantity of emery than is required in plenty of water. Stir this up well and let the emery settle. Then syphon off the water and use only the top half-inch of the material for grinding. By this means any rough grains will be left at the bottom of the vessel. The procedure and steps for grinding are the same as already described, and each stage should be carried on until the pits in the glass left by the previous grinding have been completely removed. The curve should also be continually tested with the sun as already explained, and if it is found that the curve is deepening too rapidly, the stroke should be reduced in length. It is very easy to deepen the