



The Journal of the Astronomical Society of India.

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SESSION 1912-1913.

[No. 9.

Report of the Meeting of the Society held on Tuesday, 24th June 1913.

THE Ordinary Monthly Meeting of the Society was held on Tuesday, the 24th June 1913, in the Imperial Secretariat (Treasury Buildings), at 5 P.M.

W. J. SIMMONS, ESQ., F.R.A.S., *President*, in the Chair.

C. V. RAMAN, ESQ., M.A., *Honorary Secretary*.

The minutes of the previous meeting were read and confirmed. The names of the following gentlemen who were elected as members since the last meeting were then announced and their election was formally confirmed :—

REVD. A. C. RIDSDALE, Howrah Parsonage.

MR. THOMAS MURRAY, Engineer, Dum-Dum.

The members who were present and had not previously signed the roll were then requested to do so.

President.—As this is the last meeting of the current 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. The list is subject to the gentlemen named agreeing to stand for election :—

President ... THE HON'BLE MR. W. A. LEE,
F.R.M.S.

Vice-Presidents ... (1) H. H. THE MAHARAJ RANA
BAHADUR SIR BHAWANI
SINGH, K.C.S.I., F.R.A.S.

(2) J. EVERSLED, ESQ., F.R.A.S.

(3) COL. LENNOX CONYNGHAM,
R.E., F.R.A.S.

(4) W. J. SIMMONS, ESQ., B.A.,
F.R.A.S.

Secretary (Scientific) ... DR. E. P. HARRISON, PH.D.

Do. (Business) ... D. N. DUTT, ESQ., M.A.

Treasurer ... RAI BAHADUR U. L. BANNER-
JEE, M.A.

Directors of Sections—

Director of Classes ... H. G. TOMKINS, ESQ., C.I.E.,
F.R.A.S.

Lunar Section ... REVD. J. MITCHELL, M.A.,
F.R.A.S.

Variable Star Section B. M. RAKSHIT, ESQ., B.A.

Meteor Section ... P. C. BOSE, ESQ.

Instrumental Director S. WOODHOUSE, ESQ.

Librarian ... C. V. RAMAN, ESQ., M.A.

Editor ... C. T. LETTON, ESQ.

Secretary to the Scientific Sub-Committee

C. V. RAMAN, ESQ., M.A.

Other Members of the Council:

L. DEMETRIUS, Esq.

J. C. DUTT, Esq.

S. C. GHOSH, Esq., M.A.

HARIDAS DAS, Esq., B.E.

F. W. HOWSE, Esq.

THE HON'BLE MR. P. C. LYON, C.S.I., I.C.S.

J. C. MITRA, Esq., M.A., B.L.

DR. D. N. MULLICK, B.A., D.Sc.

MRS. SMALLWOOD.

CAPTAIN A. M. URQUHART, R.A.

President.—You are not limited to these names and are at liberty to suggest any other names that may occur to you as being in your opinion more suitable. You have three months to think over it, till October, and any further recommendations you should like to make will be very thankfully accepted, but for the present there are the recommendations that have been submitted.

President.—We have just received a letter from Mr. A. B. Chatwood of the Nizamiah Observatory in Hyderabad. He says that he would be very pleased to see any of our members who would like to visit the Observatory. He is also preparing a paper which he will submit to the Society at the next meeting.

President.—I will now ask Mr. Tomkins to read us his paper on the construction of a cheap telescope. (*Mr. Tomkin's paper.*)

President.—Ladies and Gentlemen, Mr. Tomkins has certainly laid the Society under a great debt to him by giving this series of interesting and useful papers extending over six consecutive meetings. The value of these papers has been recognised in Barcelona, and the Barcelona Astronomical Society, as you already know, have asked permission to have the papers translated for their journals, which Mr. Tomkins has kindly given. There are two questions I should like to ask Mr. Tomkins which struck me during the reading of his paper. First, that the cell on which the mirror is fixed is made of wood, and, second, that the tube is also made of wood. Now it occurred to me that a wooden cell in Bengal is apt to warp owing to the changes in temperature and humidity in which case any strain on the mirror would, I think, be likely to crack it. Then with regard to a wooden

tube, the adjustments, as we have heard, have to be done very carefully. If the tube is made of wood surely it will warp, and if it does that it will cause some trouble in the adjustments.

Mr. Tomkins.—As regards your questions, Mr. President, first the wooden cell. In this case the mirror would not crack or be damaged, because it is lying comparatively loosely on the cell. In the case of a reflector the mirror lies on a thick piece of felt or cloth and this gives it plenty of room provided the wood is well seasoned, and there is no danger of cracking. A metal cell is, of course, much superior but is dearer, and I use a wooden one for economy. I have a wooden one on my telescope at Barrackpore and I find it works very well.

Now as regards the tube. In a reflecting telescope you have to give five minutes attention to the adjustment of the mirror before work each evening. These adjustments are very fine and the mere taking off of the tin caps of the mirror is liable to upset them. It is not like a refractor where the tube is a very important matter. In a reflector your mirror is hanging on the adjusting bolts, and a little warping of the tube does not matter as long as it does not warp very much. In fact, the tube is not essential at all. On the other hand, a wooden tube has an advantage over a metal one. The telescope I bought in 1897 and used for seven or eight years in this country had a wooden tube and never gave me 5 minutes' trouble. I find the wooden tube does not accumulate heat, as a metal one does. With a metal tube the metal gets hot and as it is not air-tight air currents are set up and running through spoil your definition. I have a metal tube now which has sometimes given me trouble in this way.

Rev. Ridsdale.—May I ask a question with regard to the reflector: is not its use subject to great drawbacks in this country? A refractor is very much better than a reflector.

Mr. Tomkins.—I suppose you mean with regard to the film. A silver film will always last one year and mostly two. It is very easy to replace, and when I have a prospect of important work I wash my old film off and put another on. The process only takes about 3 or 4 hours.

Mr. Raman.—What would be the price of an 8" reflector if it were purchased straight off?

Mr. Tomkins.—A second-hand reflector (equatorial) would cost about £40.

President.—Any more questions? I would remind you that this is the last meeting of the session, and should any one be thinking of making a telescope he may now like to have more particulars as to how he might do so.

Rev. Ridsdale.—Can a refractor eye-piece be used for this purpose?

President.—I read somewhere that microscope eye-pieces can be used for this purpose. I tried them myself and found them succeed. You have to wrap them up in paper and jam them in, but you will find it works all right.

President.—There is one question. Can a 3" reflector give you the same results as a 3" refracting telescope?

Mr. Tomkins.—You have hit upon the subject of a battle which lasted for 30 years in England and they have not arrived at a decision yet. The man with a refractor says that there is nothing like it and a man with a reflector swears by his instrument, and so the question remains where it was when the discussion began. With a reflector you get more light, but with a refractor you have no adjustments to worry about. A reflector has this disadvantage that it has these adjustments of the mirror to be constantly attended to.

Mr. Pincombe.—Could not the door frame form suggested by Mr. Tomkins be used as an equatorial by putting the inside frame at the correct angle instead of vertical? If so, there would be a difficulty with regard to the position of the eye-piece. How could this be got over?

Mr. Tomkins.—The form which you are thinking about is the old form of English equatorial. The inner frame is put at the same angle as the latitude of the place. The eye-piece is a common trouble with equatorial reflectors and is got over by having a cylindrical tube mounted in a pair of rings, so that it can be revolved and the eye-piece thus put in any position.

President.—Any more questions? Then, Ladies and Gentlemen, we must return a hearty vote of thanks to Mr. Tomkins for his paper. He has given a great deal of time to the preparation of these papers, and he has explained them very clearly and simply; he has focussed his instructions as accurately as he would focus his telescope for use. (*Reading of Mr. Mitchell's letter.*)

Mr. Raman.—Last night I observed Jupiter and observed all four satellites on one side of it.

Revd. Ridsdale.—I observed two on one side of Jupiter and two on the other, but that was early in the morning.

Mr. Tomkins.—That accounts for the difference which Mr. Raman saw.

President.—Our thanks are due to Mr. Mitchell for his paper. I will now ask Mr. Tomkins to show us some of his lantern slides. (*Slides projected.*)

Revd. Ridsdale.—May I ask a question? Does not Nasmyth take it the same as you do, that the bright rays represent the lines along which the crust surrounding the molten stuff in the interior cracked as it cooled?

Mr. Tomkins.—My idea is that there are no cracks at all. The white spots are saline deposits.

President.—Ladies and Gentlemen, as I have already told you this is the last meeting of the session; we do not meet again till October, but I may add that meantime the library and telescope will always be available for use, and if there are any who wish to join the Society they can always send in their names any time they like. I will now bring the meeting to a close, and thank you very much for the courtesy you have shown me during the time I was President.

The meeting was adjourned to the 21st of October 1913.

On the Construction of a Cheap Telescope.

BY

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

PAPER VII.

WE have now reached the final stage in the construction of the telescope—namely, the operation of putting the mirror and the eye-piece in place in the tube for use, and I have no doubt that by this time the workman will be looking forward to the pleasure of using his telescope for the first time. Now, of course, there are various ways of mounting the instrument and the workman can exercise his ingenuity on it to any extent: he can go in for an elaborate and highly finished equatorial instrument with position circles and driving clock