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Report of Meeting of the Society held on Tuesday, 25th February 1913.

THE Ordinary Monthly Meeting of the Society was held on Tuesday, the 25th February 1913, at the Imperial Secretariat (ground floor), 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 meeting was begun as usual by the reading of the minutes of the previous meeting, which were then confirmed.

The following presents received since the last meeting were then announced and the thanks of the Society were accorded to the donors :—

1. Monthly Notices of the Royal Astronomical Society, Vol. LXXIII, No. 2.
2. Journal of the British Astronomical Association, Vol. XXIII, No. 3.
3. Revista Di Astronomia Anno 7, No. 1.
4. Monthly Weather Review for September 1912.
5. Annales De L'Observatoire Royal De Belgique.
6. Description Des Installations Du Service De D'Heure.

President.—The following members have been elected since the last meeting and these persons have been recommended by our Council. If any of them are present, will they please come up and sign the roll in the usual way:—

1. The Hon'ble Mr. Justice A. Choudhury.
2. The Rev. F. Westcott, Lord Bishop of Chota-Nagpur.
3. Mrs. Pincombe.
4. L. Bulle, Esq.
5. Mrs. H. Bulle.
6. Indu Bhusan Bhaduri, Esq., B.L.
7. Satyendra Nath Roy, Esq., M.A., B.L.
8. Nagendra Nath Sarkar, Esq., M.A., B.L.
9. Becharam Lahiry, Esq., B.L.
10. R. L. Crawford Bowen, Esq.
11. K. D. Banerjee, Esq.
12. Raja Damodar Das Barman.

President.—We now have the paper on the Construction of a Cheap Telescope by Mr. Tomkins. This paper is one of a series for which we are very much indebted to Mr. Tomkins as it will prove very useful to those who may try to make their own telescope.

Mr. Tomkins.—Mr. President, before beginning with my paper, I think the members will join with me in congratulating you on the honour which the Royal Astronomical Society have done you in electing you a Fellow of that Society.

The President thanked the meeting and added he would also thank Mr. Tomkins and Colonel Burrard for having interested themselves in the matter on his behalf. (*Mr. Tomkins's paper.*)

President.—Ladies and Gentlemen, the paper is now open to discussion and I trust everybody will take part in it.

Mr. Raman.—I should like to ask where the artificial star is put.

Mr. Tomkins.—As near to the knife edge as possible without burning one's face with the hot lamp chimney. I generally put it about three inches away.

Mr. Raman.—Would not an electric light be better?

Mr. Tomkins.—No. I have tried it. The best thing is an oil flame.

President.—There is one point I would like to know more about, because it seems that your testing is chiefly directed to spherical aberration. Is there no question of chromatic aberration ?

Mr. Tomkins.—Not in the case of glass mirrors. That is the advantage of a reflector.

Mr. Raman observed that the method of testing mirrors described in Mr. Tomkins's papers was of great interest, and had important applications in other branches of physics. For instance, there are very minute ripples on the surface of mercury or other liquids and their reflection and refraction can be very conveniently studied by its aid.

President.—I will ask you, Ladies and Gentlemen, to accord your hearty vote of thanks to Mr. Tomkins for his paper, which will no doubt be very useful to anybody who would like to take this work up. (*Mr. Hart's paper on the Planets in 1913 was next read.*)

Mr. Tomkins.—This is the third of a series of papers which we have got from Mr. Hart, who sends us one every year.

President.—The paper is accompanied by a well executed drawing which will be reproduced in the JOURNAL. We should return a hearty vote of thanks to Mr. Hart.

President.—The next paper is a note by Mr. Hart and is entitled " The Wandering Pole." (*Paper.*)

President.—I trust that there will be a full discussion on this very interesting subject.

Mr. Raman.—Of course Mr. Hart deals only with the long period motion of the Pole in his paper. We have besides the small short period variations in the positions of the Pole which are of great interest. Mr. Hart's paper reminds us of the very fascinating subject of ancient temples and monuments, *e.g.*, Stonehenge, the Pyramids, etc., and of the astronomical questions connected with them.

Mr. Tomkins.—The Egyptian temples were, I think, built in such a way that the Pole Star of the time might shine on the inner sanctuary. The stars are not all of the same age. I think I am right in saying that the age of the temple has been determined by them.

The President in closing the discussion said the paper suggested to him how much one has to unlearn as one grows older. We have for one thing to regard the stars which we call " fixed " as being in motion ; and while we had learned in youth to look to the Pole as an unique fixture in the heavens,

we now discover that it too appears to wander, and that there are other Poles besides the one we were taught to regard as such. He directed attention to the distance which separates Alpha of Draco, which was the Pole Star 2,700 years before Christ, from our present Pole Star; and to the still greater space which separates the latter from Vega, the star which will be near our celestial North Pole in the year 13600 A.D. Our Pole Star will, however, retain its present position for 1,587 years, or till 3500 A.D. After defining the terms "Procession" and "Nutation," the President observed these were phenomena which in his opinion were often confounded. The two were no doubt connected, but they were by no means identical phenomena. The President also by a diagram on the black-board showed the distinction between the Celestial Pole, the Pole of the Ecliptic and the Galactic Pole. He then asked the meeting to return a hearty vote of thanks to Mr. Hart for the thought-provoking Note they had just heard and for the neatly executed diagram which accompanied it, and which Mr. Raman had kindly reproduced as the lantern slide which had been projected on the screen. (*Lantern slides shown by Mr. Tomkins.*)

President.—We must accord a vote of thanks to Kodaikanal for the very fine specimens of photography illustrating Solar Physics which we have just seen.

The meeting was then adjourned.

The Construction of a Cheap Telescope.

BY

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

PAPER IV.

WE left our mirror last month fairly polished and ready to be tested by a more accurate and sensitive method than hitherto adopted.

We have reached a stage at which the irregularities of the surface, if they exist, fail to result in any difference in appearance of the surface which may be detected by the unaided