The Journal of the Astronomical Society of India.

VOL. III.] SESSION 1912-1913. [No. 7.

Report of Meeting of the Society held on Tuesday, 29th April 1913.

THE Ordinary Monthly Meeting of the Astronomical Society was held on Tuesday, the 29th April 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 had been elected as members were announced and their election was then formally confirmed :—

C. Schünemann, Esq., Parlakimidi, Ganjam District.

Bishnu Chandra Chatterjee, Esq., Pleader, Krishnagar, Nadia.

The following list of presents received since the last meeting was read, and the thanks of the Society was then accorded to the donors :—

1. Monthly Notices of the Royal Astronomical Society, Vol. LXXIII, No. 4.

2. Journal of the British Astronomical Association, Vol. XXIII, No. 5.
3. Memoirs of the British Astronomical Association, Vol. XIX, Part II.
4. Revista Di Astronomia, Anno 7, No. 3.
5. Bulletin of the Astronomical Society of Barcelona for March 1913.
6. Journal of the Royal Astronomical Society of Canada, Vol. VI, No. 6.
7. Monthly Weather Review of the Alipore Observatory for November and December 1912.
8. Bulletin of the Kodai Kanal Observatory, Nos. XXVII, XXVIII and XXX.
9. Annual Report of the Kodai Kanal Observatory for 1912.

The President reminded members that the publications received from the Astronomical Societies and Associations were in the library and available for use.

President.—The next item of business is a paper on "The Construction of a Cheap Telescope" by Mr. H. G. Tomkins, C.I.E., F.R.A.S., whom I would ask to proceed with his paper.

Mr. Tomkins.—Before beginning my paper I have a piece of news which I am sure will be pleasing to all the members. An observatory is about to be erected in Lahore in connection with the University. As members will remember, Mr. Mitchell of Bankura has put up one and is at work and H. H. the Maharajah of Jalawar is putting up another one which I understand will be a large one. The Lahore University is erecting one that is intended for students and I think I am right in saying they intend to work with us. (*Paper.*)

President.—Ladies and Gentlemen, Mr. Tomkins is now ready for cross-examination and any who wish to make remarks may do so.

Mr. Raman.—I have had some experience in the silvering process and can bear out what Mr. Tomkins has said about the need for cleanliness if it is to be carried out at all successfully.

President.—Any further questions? The description Mr. Tomkins has given us of silvering the mirror shows it to be

an extremely interesting experiment but at the same time a very difficult process.

Mr. Raman.—Though perhaps somewhat outside the subject of the present discussion I think I may take this opportunity of giving a brief account of some recent observations of mine on the deposition of silver films on glass which I think is one of the most interesting physico-chemical processes known. In order to watch the actual growth of the film I arranged to cover one surface of a prism of dense glass with a layer of silvering solution, and to illuminate a small area of the inter-surface by a concentrated beam of light incident in the glass beyond the critical angle. The surface is viewed from above under a microscope. Before the silvering commences none of the incident light enters the microscope and the field is therefore perfectly dark. Then a multitude of stars, large and small, rapidly shine out on the surface and cover it up. A thin silver film deposited on glass and viewed in this way under the microscope by light reflected beyond the critical angle is a most beautiful object consisting of a mass of diffraction discs, some large and some small, and these observations bring home to the mind the almost irresistible conclusion that the film is not a homogeneous molecular layer but a colloidal aggregate of minute ultra-microscopic particles. This view is supported by the results of a careful examination of a thin film under oil-immersion using the highest powers of the microscope, when a certain amount of structure unmistakeably reveals itself. I have also observed the effects on the silver film of the action of a polisher. The burnishing agent appears to level down the surface and abolishes its structure. The ultramicroscopic particles which appear as diffraction discs before the polishing commences, gradually disappear as the polishing proceeds.

President.—We may now return a vote of thanks to Mr. Tomkins for his paper. The next item of business is a note by Mr. D. N. Dutt on the "Martian Canals." (*Mr. Dutt's paper.*)

President.—Ladies and Gentlemen, Mr. Dutt's paper opens up some interesting points for discussion. The double discovery by Dawes and Schiaparelli of the Martian Canals was not the only one of its kind in science. The discovery of Neptune was worked out by both J. C. Adams of Cambridge and a young Frenchman, U. J. J. Le Verrier of Paris. Then we had Charles Darwin and A. R. Wallace who both simultaneously arrived at the conclusion that the law of the survival of the fittest was the best explanation of the evolution of species in the organic world.

Reverting to the Rev. Dawes' discovery of the "Martian Canals" being neglected till Schiaparelli came forward as their discoverer, the President reminded them that an obscure Austrian priest, Gregor Mendell, had made a series of exhaustive observations on the results of crossing peas, the record of which was lost sight of for many years. It was fortunately at last brought to light and Mendelism was now of recognised value to all who worked at the problem of heredity. Mr. Dutt's note, he hoped, would provoke a lively discussion.

Mr. Tomkins.—Dawes was obviously the first who discovered the canals and put them down as streaks, Schiaparelli improved on the discovery but it is not fair that he should have all the credit of the discovery. I think Prof. Lowell ought to have distinctly mentioned it and given Dawes his share of the discovery. Schiaparelli found the canals in 1887 and Dawes some of them at least in 1867, so that the former was not by any means the first to see the canals though he was of course the first to extend our knowledge of them and to found theories on them.

Mr. Raman.—The instance, now familiar to all physicists, of the way in which Waterston's paper on the Kinetic Theory of Gases was laid aside and put into the unpublished archives of the Royal Society shows that even valuable work may occasionally be overlooked by an enlightened society if too much in advance of the times.

Mr. Lee.—The reason why Dawes did not attract more attention than Schiaparelli is that he saw with the comparatively small instruments which he used much that nobody else could observe, and that most people in Dawes' time did not believe that he really saw what he said he did.

President.—Any further remarks ?

The President, in closing the discussion, said it must be remembered that while many supported the view that the markings in Mars were "canals," many still seriously doubted their existence. Schiaparelli had counted 113 "canals"; at Flagstaff Observatory 437 had been detected, or according to the Encyclopædia Britannica, 585. Of the 437 "canals," 51 had been observed to be double. In addition there were 186 "oases." The average width of the "canals" was ten miles, and one of them was said to be 2,250 miles long. In this connection it was noteworthy that the "canals" are seen to the best advantage, not when Mars is nearest to the

earth (35 millions of miles), but when it is furthest (63 millions). When you are a few feet from the side of a big ocean liner you can plainly see her bolts and rivets, and the outlines of her plates; but when she is a mile or two away you cannot see these details. The reverse seems to hold good in the case of Mars. The President considered this was a noteworthy fact. It is scarcely surprising then that some well-known observers doubt the existence of the "canals." Mr. Chambers, who is a barrister, in his latest book, "Astronomy," just published, and which every member of the Society should read, says :—

"Weighing the *pros* and *cons* of the controversy on the principles of the law of evidence as applied by lawyers, I cannot consider that the arguments put forth in support of the multiplicity of sharply defined markings are established, and I think that the only thing which is established is, that there are numerous markings on Mars which take various shapes, and, when clearly visible, are at best ill-defined, and that very often they are not clearly visible. Finally that their visibility depends in no small degree on the personality of the observer and on atmospheric and other circumstances."

Mr. Maunder, whose works are also well-known to our members, has recently published a book entitled "Are the Planets Inhabited?" which is reviewed in *The Englishman* of the 24th April current. The President read an extract from *The Englishman* which after showing that Mars is essentially an icebound planet, reluctantly dismissed it from the category of planets which may be homes of sentient life. On the other hand there was the evidence of photography. Photographs of the "canals" had been obtained. Some would no doubt claim this to be conclusive proof of their existence. Perhaps it was best to regard the problem as being still *sub judice*. He had much pleasure in conveying a hearty vote of thanks to Mr. Dutt for his note.

President.—The next item will be a lunar sketch and photographs by the Rev. J. Mitchell. (*Exhibited.*)

Mr. Tomkins.—Mr. President, in returning a vote of thanks to Mr. Mitchell we may also send him our congratulations on the success of his photographs, which are very good indeed for a first attempt. (*Lantern Slides by Mr. Tomkins.*)

A vote of thanks was accorded to Mr. Tomkins for his slides and the meeting was adjourned to the 27th May 1913.