

that the Galaxy is in some way intimately connected with the distribution of the stars and nebulae of our system.

Notes on Conjunction of Jupiter and Venus.

By P. C. BOSE.

At the latter end of January and the beginning of February last Astronomers and Astrologers were busy discussing the effects of conjunctions of the various planets, Jupiter, Venus, Saturn and Mars and our Satellite the Moon. I was interested in the conjunction of Jupiter and Venus and the rate at which they were approaching each other made it clear to everybody about the earlier part of February, that the time of conjunction was not distant. The monthly notes of our Society which I got some time ago were particularly reticent about this phenomenon, but on the 3rd February a short paragraph appeared in the *Statesman* which fixed the date as the 14th February, and it further stated that they will set together with a separation of less than half a degree. I wished to take some photographs of the event, and fortunately I had just then had everything handy for it. I had a French lens of 1.4" aperture and about 10" focal length, and I had these fitted to a light hand-made camera body especially made for taking star photographs. The plates I used were Ilford's "Empress" which as you all know are twice as rapid as Ilford's "Ordinary." I decided to take three photos, one on the 13th, one on the 14th and one on the 15th. I simply allowed the planets to trail on the plates. The thin dots and lines represent Jupiter and the thick ones, Venus. The photos were all taken at 7.15 on the respective dates and when they were at an altitude of 20° to 25°. The exposures given were 2½, 5 and 4 minutes respectively as I did not like to introduce complications by bringing in stars by longer exposures. On the 13th the planets were about 3½° apart. On the 14th they were less than 1½° apart. I could not see the actual setting owing to smoke near the horizon, but during the period of observation the angle remained almost invariable. But Mr. Mitchell told me the other day that he got an angle of about 34' with his instrument at Bankura. Bankura is about a degree or a little more to the north-west of Calcutta. The gentleman, who wrote in the *Statesman*, must have calculated for some other station west

of Calcutta. The photos are not as could be expected, but I am a new hand at the subject and should be excused. On the 13th by an inadvertence the glass side was exposed. It was discovered too late, but as it gives the relative positions of the planets all right, I think not much harm is done. It is possible to get from the 1st and 3rd photos the actual angle between the planets at the nearest approach and the time it took place because these photos were taken every 24 hours. The fourth projection shows what it is like although the drawing is not at all perfect.

The Absorption of Light in reference to the Infinity of the Universe.

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OF late years the important question has been much debated, as to whether the stars of the universe occupy only a limited space, or on the other hand are distributed without limit throughout infinite space. The answer largely depends upon the further question, as to whether light when traversing immense distances in space suffers diminution by absorption on its way to our Earth, or not. Firstly, we will assume for the sake of argument, that the stars *are* infinitely distributed, and that light does *not* suffer absorption. And let us see what would follow. Now, with the Earth as centre of vision, we may assume, an infinite number of imaginary or geometrical spherical surfaces, whose radii from the Earth are proportional to the natural sequence 1, 2, 3, 4, 5, &c. Then the number of stars at the second surface will be by elementary geometry four times the number at the first. And the stars at the distance of the third surface will be four times the number at the second, and so on. But at the same time the area of the star-discs will vary inversely to the square of their distances. Thus, whilst the number of the stars at the second surface will be four times the number at the first, yet, at the same time, the area of the individual star-discs will be diminished by one-fourth. Hence the total area of star surface at the second sphere will be equal to that at the first, and that at the third equal to that at the second, and so on to infinity. If then as per hypothesis, there be an infinite number of these geometrical concentric surfaces, extending that is to an infinite distance from, the Earth, the whole face of the sky would be covered with stars, with no intermission,