Mars.—The position of the planet on 15th March at 8 p.m. will be R. A. 20 hrs. 14 mts. 31 secs. Dec. 20° 49′ 17″ S. Time of its rising will be 2 hrs. 56 mts. a.m. on 16th March.

Jupiter.—The position of the planet on 15th March at 8 p.m. will be R. A. 14 hrs. 48 mts. 44 secs. Dec. 14° 50′ 22″ S. The time of its rising will be 9 h. 19 m. p.m.

The New Star.—The position of this body is R. A. 22 hrs. 32 mts. 10 secs. and Dec. +52° 15′ 56″. Its magnitude in January was 7·5, but it has faded rapidly.

Extracts from Publications.

The attention of Astronomers is being directed to a new star which has suddenly blazed forth in the Milky Way in the constellation Lacerta. It was first noticed by Mr. T. E. Espin of Towlaw, Durham. Immediate steps were taken at the Royal Observatory, Greenwich, to keep the new star under vigilant observation. The Astronomer Royal, Mr. F. W. Dyson, assisted by Messrs. Meloth and Stevens, succeeded in photographing it on Friday night. It is situated in 22 h. 32 m. 10 s. Right Ascension, and 52° 15′ 26″ declination (north). Its present magnitude is estimated at 7·5; it is close to the 8·8 magnitude star A. G. C. 7,788. The Milky Way often affords examples of these new stars; it is generally supposed that one of the faint stars of this vast constellation passes in its orbit through different nebulosities, and shows by its violent superficial activity that resistance has been offered to its progress through space. The spectra of these temporary stars offer a close resemblance to that of the solar chromosphere, the incandescent gaseous layer which envelops the sun; hence it may be reasonably inferred that the conflagration is not caused by the collision of two huge bodies, but in the manner previously stated. These temporary stars are vastly, remote, for none have shown a perceptible parallax, nor do they appear to have proper motion; they materialise suddenly, and gradually sink into their former obscurity.

Sir Robert Ball telegraphed to the *Times* from Cambridge Observatory on Monday night: "Mr. Espin's new star in Lacerta was observed here by Mr. Hinks last night. The star was easily identified by its redness. The spectrum shows four conspicuous bright lines in red, yellow, blue-green, and blue. The red hydrogen line was the most intense. The star was observed again this evening at seven o'clock. It has lost nearly half its magnitude. The

brightness of the spectrum was very similar to that of last night, the red hydrogen line being still the most conspicuous."

[*English Mechanic.*

The Astronomical prizes of the Paris Academy have been awarded as follows :—The Lalande to Drs. Cowell and Crommelin for their researches and investigations on Halley's Comet ; and the Valz to M. Stephane Javelle for his researches on Comets and Nebulæ. The Taussen Medal goes to Professor W. W. Campbell for his spectroscopic discoveries and investigations.

[*English Mechanic.*

In the *Bulletin Astronomique* Dr. P. Stwohant suggests that the sun is probably a unit in a stream of stars moving through space in the same direction with a common velocity. As a primary index, he takes those stars of which the movements, relative to the sun, are small, and then reduces their movements to a common plane. The result, remarks *Nature*, is certainly striking, for Dr. Stwohant shows that the seven stars α Cassiopeiæ, β Persei, α Persei, α Scorpionis, γ Cygni, ϵ Pigasi, and α Pegasi are all travelling towards a polar area of only 14° radius, with velocities ranging between 11 and 22 kilometres ; towards the centre of this area the sun is moving at a rate of 19·4 kilometres. The probability that of the 105 stars brighter than magnitude 2·5 seven should accidentally show this common motion is very small ; but it must be borne in mind that the data on which the result is based are, especially in the case of parallax, open to corrections. Dr. Stwohant suggests that, with the accumulation of further more trustworthy data, other stars may be found to belong to the same stream, and he cites γ Pigasi, γ Persei, ζ Geminorum, α Hydræ, ε Leonis, η Leonis, Ψ Ursæ Majoris, η Virginis, γ Aquilæ, α Pavonis, and η Pegasi as stars having small proper motions, and of which the radial velocities relative to the sun are also small.

[*English Mechanic.*

I believe that the exposure given with the 60-inch reflector to photograph stars of magnitude 21 was 240 minutes, so that, adopting the formula exposure × brightness is constant, and the ordinary law of visual magnitudes, it follows that with 40 minutes' exposure, stars of magnitude 19 would be shown. It generally takes an hour to photograph the faint satellites of Jupiter, which are considered to be about magnitude 17, with the 30 inch reflector, though they have been got with less. As I have said, 40 minutes' exposure

with the 13 inch refractor shows magnitude 14·5; so here may be some data for a law.

[*Mr. Hollis in the English Mechanic.*

It is not possible to set an equatorially mounted telescope exactly on the Pole, unless the Polar axis is perfectly adjusted to point to the Pole, and the instrument is perfect as to its axis, that is to say, the declination axis must be exactly at right angles to the Polar axis, and the line of collimation of the telescope exactly at right angles to the declination axis. Of course, it is possible to conceive the Polar axis not pointing to the Pole, and that there is some particular maladjustment otherwise which would allow the telescope to be set exactly on the Pole; but, speaking generally, it requires perfect adjustments, and this is a little difficult to realise. I remember Sir Robert Ball saying not long ago at the Royal Astronomical Society that it is generally known among surveyors that (miracles apart) it is impossible to set the telescope of an altazimuth on the zenith, and Sir Robert went on, in his usual humorous way, to explain how this was somehow connected with the mathematical conception of circular points at infinity. But passing over this theoretical point, we come back to the practical fact that it is generally impossible to set the Polar axis exactly on the celestial Pole, and if it is not set exactly on the Pole, it is impossible to get perfect images on a photographic plate. The stars will leave trails whose length is proportional to the angular error of adjustment of the Polar axis and to the length of time of exposure. In fact, at Greenwich, and no doubt at other places, this principle is used to adjust the photographic equatorials. A plate is put in the telescope, the clock drives it for an hour, and exposure is made at the beginning and end of that time. If there are two images of each star, the distance between them (which is the same, and in the same direction, for every star) is a measure of the error of adjustment, and an indication of its direction.

[*Mr. Hollis in the English Mechanic.*

Many readers doubtless are acquainted with Mr. John Evershed, who was an amateur solar spectroscopist, but joined Dr. Michie-Smith a few year ago as his chief assistant at the Government Observatory at Kodai Kanal, India. Dr. Michie-Smith is now retiring, and Mr. Evershed is to be Director. The new Chief Assistant will be Mr. Royd, from the Victoria University, Manchester. Another recent appointment is that of Mr. Chapman, also a graduate of Manchester and of Cambridge, to be one of the Chief Assistants at Greenwich.

[*Mr. Hollis in the English Mechanic.*

The Astronomer Royal in the *Times* of January 14, says: "I have received from Professor Pickering the following communication dated December 31, with reference to the new star discovered by Mr. Espin.—'This object, which will be designated as Nova Lacertæ, was observed last night visually and photographically at Harvard College Observatory. The collection of photographs shows that it was invisible November 19, 1910, but appeared on November 23 and December 7. It was then equal in brightness to ρ Lacertæ, photographic magnitude 5·00. Its photographic magnitude last night was about 7·0. It does not appear on several early photographs, the first taken on December 1, 1887, showing very faint stars. Photographs of the spectrum by Mr. E. S. King showed eleven bright lines. From photometric measures by Professor Windell the Nova appears to be 1·50 magnitudes brighter than + 51° 3420 magnitude 8·7. Observations by Mr. Campbell with Angelander's method make the photometric magnitude of the Nova 7·1. It is visible with an opera glass.' It is interesting to note that the new star remained undiscovered from November 23 to December 30."

[*English Mechanic.*

Mr. Lynn writes on the subject of the Total Solar Eclipse of April 1911:—

"The date of the eclipse in question will be the 28th of April, and the phenomenon will not be visible in any part of Europe, Asia, or Africa. The central line will pass from the south-east coast of Australia in a north-eastern direction over the Pacific Ocean, nearly (but not quite) reaching Central America. A partial eclipse will be seen in Tasmania and New Zealand in the early morning, and in the south-eastern parts of the United States and in Cuba and its neighbourhood in the late evening.

But the totality will cross land only over some of the small islands in the Central Pacific Ocean, and it is to one of these that I wish to draw attention. Its duration will be longest on what is called Christmas Island, where it will amount to nearly five minutes. The Island derives its name from the fact that it was discovered by Captain Cook in his last voyage (which ended so disastrously) on the 24th December 1777. He celebrated Christmas day there, and remained off the Island (when some of his people had unpleasant experiences in a fog) until the end of the year. Cook himself, however, called it Turtle Island from the abundance of turtle found there. It is about 60 miles in circuit, with a very large lagoon, and has a good anchorage

on the western side. For many years it was much resorted to, especially by Americans, for guano.

Cook observed on the Island the eclipse of the sun on the 29th December 1777, which was total further to the south. The latitude of Christmas Island is about 2° north ; its longitude about 157° west. Cook calls it 203° east, reckoning all round easterly."

[*Journal of the British Astronomical Association.*

Comet Notes.—Halley's Comet has been reobserved at Yerkes, Helwan, Nice, and Algiers. The magnitude is about 14. The connection of Elull's ephemeris was + 13*s.*,—0·′5 on November 11, + 9*s.*—0·′3 on December 7. As the Comet is approaching the earth till February 9, observations may be expected for two or three months more.

[*The Observatory.*

Photographic Magnitudes.—There is now being developed in more than one quarter schemes for determining photographic magnitudes. Professor E. C. Pickering has set down steps of a scheme in various publications of the Harvard Observatory, one being 'Circular 160,' dated 1910, August 1, from which most of the following notes are extracted.

A "photographic magnitude" is a number which will indicate the effect of a star's light on a photographic plate, just as a photometric magnitude represents its effect on the eye.

Photographic and photometric magnitudes are not the same, but they have some relation.

It is found that, within limits of observation, the colour of all stars whose spectrum is of the same class is the same. The photographic magnitude depends on star-colour, and constants may be found for each class of spectrum to reduce the photometric to photographic magnitudes, as follows :—

B.	A.	F.	G.	K.	M.
—0·31	0·00	+0·32	+0·71	+1·17	+1·68

That is, if the photometric magnitude of a star whose spectrum is of class B, be 5, its photographic magnitude is 5·00—0·31 = 4·69. Explanation of the zero under heading A will be found in the next paragraph.

The scale of photographic magnitudes has to fulfil certain conditions. First, if the intervals are equal, or in arithmetical progression, the intensities of the corresponding lights should be in geometrical progression. Secondly,

the ratio of the geometrical progression should be 2·512, whose logarithm is 0·400, as in the case of photometric magnitudes. Thirdly, having such a scale, it is necessary to adopt a zero, and this is chosen by Professor Pickering so that the photometric and photographic magnitudes of stars whose spectrum is of the first type, or of class A, should be the same. It is found that, if the photographic magnitude (M) be computed from the measured diameter (d) by the formula $M = C - N \log d$, first proposed, we believe, by Sir William Christie (Mon. Not. Vol. lii), the first two of the above conditions are satisfied, the constants of the formula, C and N, being determined for individual plates by help of the known photographic magnitudes of stars on them.

Professor Pickering is selecting, or has selected, certain stars as standard, and is assigning a photographic magnitude to these. It will be possible to compare all other stars with these through the measures of their photographic images, and so find the photographic magnitude of any star, though the process may be laborious until the system has been much developed. On the other hand, if the differences given in the earlier part of this note are well founded, it may be possible to determine a star's photographic magnitude by finding to which spectrum class it belongs, and applying the appropriate difference to its photometric magnitudes.

There is another method of determining the magnitudes in a more absolute way by directing a certain proportion of a star's light, so that the image of a tenth magnitude star (say) on a plate is accompanied by an apparent image of a fifteenth magnitude star, and comparison of the large and small images of different stars on the same plate will give means of forming a scale, further details of which plan may be found in 'Harvard Annuals," Volume 26.

The above are some of the points in a large and difficult problem.

[*The Observatory.*

The Markings of Mars.—It seems fair to the observers at Flagstaff to give as much prominence as possible to a letter in "Nature" of November 10 last, by Mr. James Worthington of High Wycombe. Mr. Worthington has just returned to this country after a series of visits to the observatories of America. He observed Mars at the Lowell Observatory from 1909 September 27 to October 25 with the 24-inch refractor stopped down generally to 18-inches. At first the seeing was bad, and he saw practically nothing, but as his eye got accustomed to the work, and the seeing

improved, canals gradually became visible, until, on a night of peculiar clearness, October 25, he saw Mars with canals and oases so distinctly and steadily without intermission for an hour and a half that no doubt was left in his mind as to the reality of the features shown in Professor Lowell's drawings. He writes : "Nothing that I had hitherto seen had prepared me for the astonishing steadiness and fineness of the details visible on this superb night"; and later on "As to the deductions which Professor Lowell has drawn from his observations, I have nothing to say except that the startlingly artificial and geometrical appearance of the canals did force itself upon me."

[*The Observatory.*

Notices of the Society.

The Common Seal.

The illustration which accompanies this number of the JOURNAL is a representation of the Common Seal of the Society which, through the kind offices of Lt.-Col. Lenox Conyngham, R.E., F.R.A.S., has been designed for the Society by Mr. F. C. Scallan; the print is taken directly from the engraving.

The Seal has been approved by the Council and was accepted by the members at the last meeting. It now only remains therefore to complete Bye-law No. 57, which will be done this month.

It may be mentioned that the Seal was selected from several designs, one of which came from the pen of Mrs. Colquhoun, a member of the Society, and the acknowledgments of the Council are due to all those who have assisted them in the matter.

Election of Members.

The attention of members is invited to Bye-law No. 14 regulating the election of persons who desire to join the Society. It is hoped that those who are already members will induce others to join. Forms of application can be had from the Secretary, Mr. P. N. Mukherjee.

The Library.

A subscription list for the furnishing of a Library has been opened, and a good many members in Calcutta have