"Selenology," says M. Fauth, "will have to include all the ring formations, even the largest, in one general explanation," and this the bombardment theory does.

The best test of any theory is whether it covers the observed facts, and from this point of view I think the bombardment theory is easily first.

It does not necessarily follow that all the formations were due to impact. It is only reasonable to suppose that volcanic action may have played its part, and we have evidence of this in the fact that some observers have seen volcanic cones with craters on their tops similar to what we find on the Earth. But these are so small as to be beyond the range of any but very powerful instruments. But the fact that we have evidence of volcanic action similar to what we find on the Earth is added evidence in favour of the bombardment theory, for it shows that the smaller gravitational force of the Moon does not (as has sometimes been maintained by upholders of the volcanic theory) cause volcanic action to produce results different from what we should expect.

I am much indebted to Mr. Tomkins for lending me the slides of the Moon which are now to be shown.

Extracts from Publications.

A Simple Method of Measuring the Heights of Solar Prominences.

BY THE REVD. A. L. CORTIE, S.J., F.R.A.S.

A very convenient, simple, and quite accurate method of measuring the heights of solar prominences is by means of a photographed scale on glass, which can be fitted in the shoulder of the draw tube containing the positive eye-pieces of the viewing telescope of a spectroscope. If an accurate scale be drawn to any convenient size it can be reduced by photography, and, from the negative, glass positives can easily be obtained on very thin glass, like microscopic cover glasses. For instance, in the case of such a scale fitted to one of the eye-pieces of the Browning 12-prism automatic spectroscope at Stonyhurst, the diameter of the thin circular glass containing the scale is 20 mm. on which the scale of 100 divisions centrally placed covers 9·1 mm. The thickness of the glass is only 0·2 mm.

The following method can be adopted for finding the scale value in seconds of arc of each interval of the photographed scale. Let the image of the Sun be accurately focussed on the slit plate, and let the slit be adjusted in the N. and S. direction, which can be done by turning the spectroscope by means of the attached position circle into the required position. The attached position circle to the carrier of the spectroscope now reads 0°. Next turn the spectroscope through 90°, when the slit will lie parallel to the direction of the diurnal motion. Place the divided scale also parallel to the same direction, stop the clock, and let the Sun's image transit the slit, which is now radial to the E. and W. limits of the Sun's image. The spectrum, supposed sharply focussed, will now transit the divisions of the scale. Select some particular convenient division of the scale, and take the times when each edge of the spectrum band, corresponding to each limb of the Sun, transits it. This observation (and the mean of several can be taken) gives the interval in time required for the diameter of the Sun to cross the slit, or the spectrum band to cross any particular division of the scale. The accuracy of this observation can be conveniently tested by taking from the Nautical Almanac the sidereal time of the semi-diameter of the Sun passing the meridian, or if a mean time watch be used, the mean time of the same, the correction for each day to sidereal time being indicated in a foot-note in the Almanac, for the given day on which the observation is made.

At the same time as this observation is being made the interval of time taken by the sharp edge of the advancing spectrum, corresponding to the preceding or W. limb of the Sun, to cross any given convenient number of divisions of the scale—for example, 20—can be ascertained. One observer can watch the advancing edge of the spectrum in the viewing telescope and another can take the times. Let us suppose that the 10th division of the scale is selected. The observer at the spectroscope sees the advancing edge of the spectrum, and calls when it reaches the 10th division, and again when it reaches the 30th, and finally when the following edge of the spectrum reaches the 10th division. These observations can be repeated and controlled, and the mean of several taken as the final result. An example will illustrate the simple arithmetic then required to obtain the value in seconds of arc of the scale.

On October 12, 1912, as a mean of several observations, the time that the spectrum band took to cross the 10th division of the scale was 2 m. 10 s. and to cross the divisions 10 to 30, 5 seconds. From the Nautical Almanac the value of the Sun's

semi-diameter on October 1912 was 16′ 3·32″. This is for noon, but the change for a few hours before or after is immaterial in the present case, as it affects only the figures after the decimal point in the seconds.

Therefore 16′ 3·32″ of arc passed one selected scale division in 65 seconds of time.

Or $\frac{16' 3{\cdot}32''}{65}$ seconds of arc crossed in 1 second of time.

Or $\frac{16' 3{\cdot}32'' \times 5}{65} = \frac{16' 3{\cdot}32''}{13}$ seconds of arc crossed in 5 seconds of time 20 scale intervals.

Therefore 1′ 14·1″ arc = 20 scale intervals.

∴ value of 1 scale division or interval = 3·7″ of arc.

The mean height of the chromosphere on the same date was 2·2 divisions of the scale = 8·14″ corresponding to 3,460 miles.

[*Journal of the British Astronomical Association for Oct. 1913.*]

Jupiter's Equatorial Current.

Between the years 1887 to 1911 the motion of the equatorial current has been nearly uniform in velocity, apart from comparatively slight and temporary variations from time to time. The mean values of the rotation period during the 20 years, 1887—1906, from a very great number of observations by numerous observers, are 9 h. 50 m. 32·8 s. for the northern half of the current and 9 h. 50 m. 25·9 s. for the southern half.

But previously to the year 1887 it is well known that the rotation-period was considerably shorter than the above values as will be seen from the following figures, taken in part from the Monthly Notices, vol. 58, p. 14 :—

	H.	M.	S.		H.	M.	S.
1879 ... R =	9	49	59	1885 ... R =	9	50	14·3
1880 ... R =	9	50	7·6	1886 ... R =	9	50	22·9
1881 ... R =	9	50	10·2	1887 ... R =	9	50	22·4
1882 ... R =	9	50	9·7	1888 ... R =	9	50	27·8
1884 ... R =	9	50	12·4	1889 ... R =	9	50	30·3

These figures show clearly that there was an almost continual decrease in the velocity (or increase of rotation-period) from 1880 to 1889, and that in the year 1880 the rotation period had been as short as 9 h. 50 m. 7·6 s. It is, therefore, a fact

of the highest importance to find that a great acceleration in the velocity of the current has now set in nearly contemporaneous, moreover, with an acceleration in the motion of the red spot and of the material in some other Jovian latitudes.

It would be interesting to know if the southern half of the current participates in the acceleration of velocity of the northern half. Possibly Mr. Sargent or the Revd. T. E. R. Phillips could say if the S. equatorial spots also give a shorter period of rotation? In conclusion, may I be permitted to question the propriety of excluding spot No. 7 in deriving the mean? Probably this spot is a survival of the old order of things, but it is perhaps the best-observed spot of all, and there seems to be no sufficient reason for excluding it.

[*Mr. A. Stanley Williams in the Observatory for Dec. 1913.*]

In the case of the two Chinese astronomers, however, on whom the following flippant epitaph was composed, unnatural causes intervened to prevent their attainment of that ripe old age to which their profession almost entitled them. The two astronomers, named Hi and Ho, were appointed to watch an eclipse, but, having become intoxicated and failed in the fulfilment of their trust, they were condemned to be executed by the Chinese Emperor, Ho Kang. A short while after their death it was found that the eclipse was invisible!

Here rest the bones of Ho and Hi
  Whose fate, though sad, was risible;
Being hung, because they could not spy
  The eclipse, that was invisible.
Heigho! 'tis said a love of drink
  Occasioned all their trouble;
But this is hardly true, I think,
  As drunken men see double.

[*Mr. C. Edgar Thomas in the Observatory for Dec. 1913.*]

Mr. E. W. Maunder retired (in accordance with regulations) from the position of Superintendent of the Solar Department at the Royal Observatory, Greenwich, on November 6, 1913, after forty years' service. His work on solar and magnetic phenomena is too well known to need comment here. It may be recalled that he was for a time Editor (jointly or solely) of this Magazine from 1881 to 1887. He was Secretary of the Royal Astronomical Society from 1892 to 1896. In 1890

owing to his exertions the British Astronomical Association was established, and he is always justly regarded as its founder. In the office of President and otherwise he has since contributed largely to its present established position.

[*The Observatory for December 1913.*]

About the Earth-Moon System as expounded specially by the late Sir George Darwin, in effect, the day and the month are both becoming longer, which is in accordance with the doctrine of the conservation of moment of momentum. The Earth is slowing down and consequently is losing moment of M. and to compensate for this the Moon must gain moment. But it cannot do this by simply rotating faster and remaining at the same distance, for in that case Kepler's Third Law would not be satisfied. Now, the question is whether it is known from observation that this loss and gain are equal, and I do not think it is known whether the balance is exact. The effects on the motions of the Earth and of the Moon are so gradual that they can only doubtfully be detected by the most refined astronomical researches. The best, probably the only, way of settling such a point is by investigations of the circumstances—time and place—of ancient eclipses, such as those with which Dr. Cowell's name is connected. As just mentioned, the day and the month are both lengthening, but they are not lengthening at the same rate or, in other words, there are $27\frac{1}{3}$ days in the month now; but this has not been, nor will it always be, so. Sir George Darwin once pointed out "that the day must now be suffering a greater degree of prolongation than the month, so that we may look back to a time when there were more days in the month than there are at present. That number was once twenty-nine in place of the present twenty-seven; but the epoch of twenty-nine days in the month is a sort of crisis in the history of the Moon and Earth, for yet earlier the day was shortening less rapidly than the month: hence there was an earlier time when there was a reversion to the present smaller number of days in the month, and we have the curious conclusion that twenty-nine is a number of days in the month that can never be exceeded."

[*English Mechanic and World of Science—12th Dec. 1913.*]