

Eclipse of the Sun.

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In view of the interest attached to the eclipse of 16th-17th April 1912, I will endeavour to say a few words on the subject.

A Solar Eclipse can only happen when the Moon is at or near one of its Nodes and also in conjunction with the Sun.

Eclipses of every sort repeat themselves at the end of each Saros.

A Saros is a period of 18 years and 12 days when the Sun and Moon find themselves in much the same position as they did at the previous eclipse.

They will not be in exactly the same position, owing to two causes, *viz.* :—

(a) Difference of eight hours during each Saros.

(b) The change in the Moon's line of motion in the meanwhile.

The path of the shadow will thus pass further north or south.

Total eclipses of the Sun happen with tolerable frequency so far as regards the Earth as a whole, but they are exceedingly rare at any given place, and under the most favourable circumstances the breadth of the track of totality across the Earth is not more than 170 miles. On the last occasion the Sun rose eclipsed in Venezuela, and after crossing Guiana, the line of central eclipse left the South American Continent at a point west of Cayenne.

It traversed the Atlantic in a north-easterly direction and came to land again at a point in the north of Portugal.

The line of centrality then passed over the north-west of Spain, the Gulf of Gascony, the coast of France near the Sands of Olonne (Vendée) and thence to Paris, passing west of the French capital, but east of St. Germain.

It continued by Hamburg, the Baltic, St. Petersburg, and ended its journey in Russian Asia.

It will thus be noticed that the line of central eclipse ran very obliquely from south to north, beginning its course in Venezuela and ending in Russian Asia.

The longitudes and latitudes of the line of central eclipse varied from $0^{\circ}-17'2$ to $10^{\circ}-35'0$ longitude and $40^{\circ}-5'7$ to $53^{\circ}-11'4$ latitude.

If we look at the diagram about eclipses in any text-book, we see that if the Moon is near the Earth, that is at perigee or nearly so, when she eclipses the Sun, the eclipse will be total, and if the eclipse happens quite at perigee the Moon's shadow on the Earth will be large.

On the other hand, if the Moon be comparatively far from the Earth, the eclipse will be annular.

In April the Moon was in apogee on the 9th and in perigee on the 22nd, so the eclipse happened about midway between these dates, which defined approximately the limit between totality and annularity.

The type of eclipse was therefore annular and total for about 6 seconds whilst crossing Portugal and Spain only.

A partial eclipse was seen from all places in the British Isles.

A photo taken by one of my sons from South Lincolnshire and reflected on the screen, will give an idea of the eclipse as seen at that place on the 16th April 1912.

If any enterprising person went up in a flying machine on the 16th-17th April, he must have seen the whole of the Moon's shadow at a glance, as a dark spot on the Earth's surface.

The special feature of the eclipse was that the shadow cast by the Moon just covered the Sun's disk and no more.

This is of rare occurrence, when we recall the fact that the Sun has about four hundred times the diameter of the Moon and is also four hundred times as far from us as the Moon.

In plain language, for this to happen, the Moon must be in one particular spot between the Sun and the Earth, and this, as will be readily perceived, will take place very occasionally.

The Corona was an outstanding feature, and its observation should lead to valuable scientific results, as apart from the fascination of following closely an eclipse, it enables the scientist to study the Sun's Corona, and to determine through the aid of the spectroscope the substances of which it is formed.

The exact nature of the Corona is still in doubt, and it is certainly a complex phenomenon.

The next total eclipse of the Sun will take place on 10th October 1912, but unfortunately it will not be visible in India.

It will be visible only in South America.