

of square miles, are by no means uncommon. One spot which I measured in the year 1837 occupied no less than three thousand seven hundred and eighty millions, taking in all the irregularities of its form; and the black space or "umbra" in the middle of one, which was very nearly round, would have allowed the earth to drop through it, leaving a thousand miles clear of contact on every side: and many instances of much larger spots than these are on record. What are we to think, then, of the awful scale of hurricane and turmoil and fiery tempest which can in a few days totally change the form of such a region, break it up into distinct parts—open up great abysses in one part, such as that I have just described, and fill up others beside them? As to the forms of the spots, they are so conspicuously irregular as to defy description.

(42.) But we must proceed, for there are more wonders yet to relate. Far beyond the photosphere, or brilliant surface of the sun, extends what perhaps may be considered as its true atmosphere. This can only be seen at all in the rare opportunities afforded by total eclipses of the sun. Everybody knows that an eclipse of the sun is caused by the moon coming between it and us. Now, by an odd coincidence, it so happens that the sun being 400 times farther off than the moon, is also ALMOST exactly, but a trifle less than 400 times as large in *diameter*; so that when the centre of the moon comes exactly in the line with the centre of the sun it appears to cover it, and a very little more, so as to project on all sides a very little beyond it. Now, as the