boundary, being, in fact, the peaks of high mountains on which the sun is shining, although his rays are intercepted from the valleys in the same neighbourhood. Again, when a star is occulted by the moon, it is sometimes seen to run along the extremity of the disc, alternately appearing and disappearing as it is successively hidden by the mountains on the edge, and allowed to shine through the hollows between them. These mountains may be much more considerable at one part of the circumference than at another: and although, speaking roughly, the moon always keeps the same face turned towards the earth, yet in consequence of her librations, and the different positions of observers, the portion which forms the boundary of her visible hemisphere will vary, though within small limits. Consequently, it is quite possible that the edge of the moon's disc might appear serrated during one eclipse, and smooth during another; but it is difficult to understand why at the same time the moon's limb should have appeared serrated to one observer, and to another, at a comparatively short distance from the former, perfectly sharp and smooth. This is the more remarkable, because, at Prescott, a phenomenon *was* observed which depends upon this mountainous boundary of the moon, viz., "Baily's beads." These have been observed both in total and annular eclipses. In the case of a total eclipse, just at the commencement of the totality, that is, just at the moment when the eastern limb of the moon is coming into contact with the eastern limb of the sun, the very narrow bright segment of the latter body becomes broken up into brilliant irregular portions called, from the person who first observed them, "Baily's beads." The same appearance is also observed at the end of the totality. This phenomenon is certainly a result of the unevenness of the lunar surface; the "beads" being nothing else than gaps between the mountains, through which the sun can still be seen. The Astronomer Royal thus describes their appearance at the beginning of the totality of the eclipse of 1851, pointing out very distinctly the cause to which he considers them due. He says, "I took off the higher power, with which I had scrutinized the sun, and put on the lowest power (magnifying about 34 times). With this I saw the mountains of the moon perfectly well. I watched carefully the approach of the moon's limb to the sun's limb, which my graduated dark glass enabled me to do in great perfection. I saw both limbs perfectly well defined to the last, and saw the line becoming narrower, and the cusps becoming sharper without any distortion or prolongation of the limbs. I saw the moon's serrated limb advance up to the sun's, and the light of the sun glimmering through the hollows between the mountain peaks, and saw these glimmering spots extinguished, one after the other, in extremely rapid succession." In the case of an annular eclipse, the same phenomena are observed, but in an inverted order. The first appearance of the beads is at the moment when the western edge of the moon is just detaching itself from the western edge of the sun. If the boundary of the disc of the former body were perfectly smooth, we should see the bright disc of the sun surrounding it gradually and continuously, until the whole surface of the moon became projected upon that of the sun. Instead of this, however, when the annularity has very nearly commenced, and consequently only a very small segment of the circumference of the sun is obscured, that remaining segment, instead of being gradually revealed, becomes suddenly bright in a number of points, with dark spaces intervening; the bright spots increase in size, and seem to run into each other, until the moon's limb is at length wholly surrounded by the bright disc of the sun. A similar appearance recurs at the end of the annularity, when the eastern limb of the moon joins the eastern limb of the sun. These beads were seen by one of the observers at Prescott, distinctly at the beginning of the annularity, and with less clearness at the end; and the fact that they were visible is sufficient to prove that, althought the moon's limb did not *appear* jagged in passing over the sun's disc, it really was uneven, and that it must have been in consequence of some peculiarity in the instruments or colored glasses employed that the serrated edge was not previously observed. The beads were not distinctly observed at Kingston, but we have the following remark in the report from that station, "On the first contact of the western limbs of the sun and moon, Baron de Rottenburg remarked a slight appearance of the light as it were running along the line of contact, but not with that degree of brilliancy or certainty which has been recorded on similar occasions."

Another indication of the unevenness of the surface of the moon appears in the fact, that at one time during the progress of the eclipse, the horn or cusp of the solar disc was observed at Montreal to be slightly blunted, which must have been caused by the existence of a large mountain just at that part of the moon's limb which, at the time in question, appeared to join the sun's limb. It has, indeed, been suggested that this appearance of bluntness in the cusp might be produced by a lunar atmosphere. The effect of such an atmosphere would certainly be to distort perceptibly the shape of the narrow crescent of light, when the eclipse was considerably advanced. The rays of the sun would be bent inwards by passing through this medium, and thus a small portion of the sun would become visible, which would not be seen if this lunar atmosphere did not exist, and the extremity of the bright segment would, in consequence, appear blunted. The existence, therefore, of a lunar atmosphere would account for such an appearance as that noted by Dr. Smallwood; but we must not infer from the phenomenon that such an atmosphere really does exist. As has been before remarked, the existence of a large mountain at the part of the moon's disc which intersects that of the sun would also account for the appearance: and that this, and not the former explanation, is the true one, is evident from several considerations. In the first place, there is pretty conclusive evidence, from other sources, that no such atmosphere does exist in the moon: no atmosphere, that is to say, capable of sensibly refracting light passing through it. Thus, in the case of the occultation of a star by the moon, if a lunar atmosphere existed the star would continue to be visible by reason of the refraction after the moon's disc was really interposed, so that the disappearance of the star would be postponed in consequence of the existence of such an atmosphere; and as the time of re-appearance would be anticipated by the same amount, the observed time of occultation would be shorter by twice that amount than the time given by calculation. No such difference, however, is observed. Again, if the moon were surrounded by an atmosphere containing any appreciable amount of vapour, the extinction of a star's light by an occultation ought to be gradual, and very faint stars ought to become invisible before the proper time of occultation, as the moon's atmosphere would be sufficient to intercept their light. This is also contrary to what is observed; for, during an eclipse of the moon (which, owing to the absence of diffused light, is the most favourable time for making such observations), stars of the tenth magnitude are seen *suddenly* extinguished by the interposition of the moon's disc. And, in addition to this evidence from other sources, it is clear, that in the case of a solar eclipse, any alteration in the shape of the bright crescent produced by an atmosphere about the moon, would be of a