

mosphere, and thrown into the shadow cone. The reddened or glowing disk is moreover never uniformly colored. Some places always appear darker, and are, at the same time, continually changing color. The Greeks had formed a peculiar and curious theory with respect to the different colors which the eclipsed Moon was said to present according to the hour at which the eclipse took place.*

During the long dispute as to the probability or improbability of an atmospheric envelope round the Moon, accurate occult observations have proved that no refraction takes place on the surface of the Moon, and that, consequently, the assumption made by Schröter† of the existence of a lunar atmosphere and a *lunar twilight* are disproved. "The comparison of the two values of the Moon's diameter which may be respectively deduced from direct measurement, or from the length of time that it remains before a fixed star during the occultation, teaches us that the light of a fixed star is *not perceptibly* deflected from its rectilinear course at

qu'elle se trouve plus près du centre de l'ombre géométrique; car se sont les rayons les moins réfrangibles qui se propagent le plus abondamment par diffraction, à mesure qu'on s'éloigne de la propagation en ligne droite." "The diffracted light which penetrates into the Earth's shadow always predominated, and was, indeed, alone sensible. It was the more red or orange in proportion as it was nearer to the geometrical center of the shadow; for those rays which are least refrangible are those which are propagated most abundantly by diffraction, in proportion as they differ from a rectilinear course." The phenomena of diffraction take place as well in a vacuum, according to the acute investigations of Magnus (on the occasion of a discussion between Airy and Faraday). Compare, in reference to the explanations by diffraction in general, Arago in the *Annuaire* for 1846, p. 452-455.

* Plutarch (*De Facie in Orbe Lunæ*), *Moral.*, ed. Wytten., tom. iv., p. 780-783: "The fiery, charcoal-like, glimmering (*ἀνθρακοειδής*) color of the eclipsed Moon (about the midnight hour) is, as the mathematicians affirm, owing to the change from black into red and bluish, and is by no means to be considered as a character peculiar to the earthy surface of the planet." Also Dio Cassius (lx., 26, ed. Sturtz, p. iii., p. 779), who occupied himself especially with eclipses of the Moon, and the remarkable edicts of the Emperor Claudius, which *predicted* the *dimensions* of the eclipsed portion, directs attention to the very different colors which the Moon assumed during the conjunction. He says (lxv., 11, tom. iv., p. 185, Sturtz), "Great was the excitement in the camp of Vitellius in consequence of the eclipse which took place that night. The mind was filled with melancholy apprehensions, not so much at the eclipse itself, although that might appear to predict misfortune to an unquiet mind, but much more from the circumstance that the Moon displayed blood-red, black, and other gloomy colors."

† Schröter, *Selenotopographische Fragmente*, th. i., 1791, p. 668; th. ii., 1802, p. 52.