

that moment in which it touches the Moon's edge. If a refraction took place at the edge of the Moon, the second determination of her diameter must give a value smaller by twice the amount of the refraction than the former; but, on the contrary, both determinations correspond so closely in repeated determinations, that no appreciable difference has ever been detected."\* The ingress of stars, which may be particularly well observed at the dark edge, takes place suddenly, and without gradual diminution of the star's brilliancy; just so the egress or reappearance of the star. In the case of the few exceptions which have been described, the cause may have consisted in accidental changes of our atmosphere.

If, however, the Earth's Moon is destitute of a gaseous envelope, the stars must appear then, in the absence of all diffuse light, to rise upon a black sky; † no air-wave can there convey sound, music, or language. To our imagination, so apt presumptuously to stray into the unfathomable, the Moon is a voiceless wilderness.

The phenomenon of apparent adherence on and within the Moon's edge, ‡ sometimes observed in the occultation of stars, can scarcely be considered as a consequence of *irradiation*, which, in the narrow crescent of the Moon, on account of the very different intensity of the light in the ash-colored part of the Moon, and in that which is immediately illuminated by the Sun, certainly makes the latter appear as if surrounding the former. Arago saw, during a total eclipse of the Moon, a star distinctly adhere to the slightly luminous disk of the Moon during the conjunction. It still continues to be

\* Bessel, *Ueber eine angenommene Atmosphäre des Mondes* in Schumacher's *Astron. Nachr.*, No. 263, p. 416-420. Compare also Beer and Mädler, *Der Monde*, § 83 and 107, p. 133 and 153; also Arago, in the *Annuaire* for 1846, p. 346-353. The frequently mentioned proof of the existence of an atmosphere round the Moon, derived from the greater or less perceptibility of small superficial configurations and "the Moon-clouds moving round in the valleys," is the most untenable of all, on account of the continually-varying condition (darkening and brightening) of the upper strata of our own atmosphere. Considerations as to the form of one of the Moon's horns on the occasion of the solar eclipse on the 5th of September, 1793, induced William Herschel to decide against the assumption of a lunar atmosphere. (*Philos. Transact.*, vol. lxxxiv., p. 167.)

† Mädler, in Schumacher's *Jahrbuch* for 1840, p. 188.

‡ Sir John Herschel (*Outlines*, p. 247) directs attention to the ingress of such *double stars* as can not be seen separately by the telescope, on account of the too great proximity of the individual stars of which they consist.