

hour a ray of light traverses over a space of 592 millions of miles. While, according to the theogony of Hesiod, the dimensions of the universe were supposed to be expressed by the time occupied by bodies in falling to the ground ("the brazen anvil was not more than nine days and nine nights in falling from heaven to earth"), the elder Herschel was of opinion* that light required almost two millions of years to pass to the Earth from the remotest luminous vapor reached by his forty-foot reflector. Much, therefore, has vanished long before it is rendered visible to us—much that we see was once differently arranged from what it now appears. The aspect of the starry heavens presents us with the spectacle of that which is only apparently simultaneous, and however much we may endeavor, by the aid of optical instruments, to bring the mildly-radiant vapor of nebulous masses or the faintly-glimmering starry clusters nearer, and diminish the thousands of years interposed between us and them, that serve as a criterion of their distance, it still remains more than probable, from the knowledge we possess of the velocity of the transmission of luminous rays, that the light of remote heavenly bodies presents us with the most ancient perceptible evidence of the existence of matter. It is thus that the reflective mind of man is led from simple premises to rise to those exalted heights of nature, where, in the light-illumined realms of space, "myriads of worlds are bursting into life like the grass of the night."†

From the regions of celestial forms, the domain of Uranus, we will now descend to the more contracted sphere of terrestrial forces—to the interior of the Earth itself. A mysterious chain links together both classes of phenomena. According to the ancient signification of the Titanic myth,‡ the powers of organic life, that is to say, the great order of nature, depend upon the combined action of heaven and earth. If we suppose that the Earth, like all the other planets, primordially belonged, according to its origin, to the central body, the Sun, and to the solar atmosphere that has been separated into neb-

* "Hence it follows that the rays of light of the remotest nebulae must have been almost two millions of years on their way, and that consequently, so many years ago, this object must already have had an existence in the sidereal heaven, in order to send out those rays by which we now perceive it." William Herschel, in the *Phil. Trans.* for 1802, p. 498. John Herschel, *Astron.*, § 590. Arago, in the *Annuaire*, 1842, p. 334, 359, and 382–385.

† From my brother's beautiful sonnet "Freiheit und Gesetz." (Wilhelm von Humboldt, *Gesammelte Werke*, bd. iv., s. 358, No. 25.)

‡ Otfried Müller, *Prolegomena*, s. 373.