

the limits of an atmosphere of mercury (that is, the elevation at which mercurial vapors precipitated on gold leaf cease perceptibly to rise in an air-filled space) have given considerable weight to the assumption of a definite surface of the atmosphere "similar to the surface of the sea." Can any gaseous particles belonging to the region of space blend with our atmosphere and produce meteorological changes? Newton* inclined to the idea that such might be the case. If we regard falling stars and meteoric stones as planetary asteroids, we may be allowed to conjecture that in the streams of the so-called November phenomena,† when, as in 1799, 1833, and 1834, myriads of falling stars traversed the vault of heaven, and *northern lights* were simultaneously observed, our atmosphere may have received from the regions of space some elements foreign to it, which were capable of exciting electro-magnetic processes.

II.

NATURAL AND TELESCOPIC VISION.—SCINTILLATION OF THE STARS —VELOCITY OF LIGHT.—RESULTS OF PHOTOMETRY.

THE increased power of vision yielded nearly two hundred and fifty years ago by the invention of the telescope, has afforded to the eye, as the organ of sensuous cosmical contemplation, the noblest of all aids toward a knowledge of the contents of space, and the investigation of the configuration, physical character, and masses of the planets and their satellites. The first telescope was constructed in 1608, seven years after the death of the great observer, Tycho Brahe. Its earliest fruits were the successive discovery of the satellites of Jupiter, the Sun's spots, the crescent shape of Venus, the ring of Saturn as a triple planetary formation (*planeta tergeminus*), telescopic stellar swarms, and the nebulae in Andromeda.‡ In 1634, the French astronomer Morin, eminent for his observations on longitude, first conceived the idea of mounting a telescope on the index bar of an instrument of measurement, and seeking to discover Arcturus by day.§

* Newton, *Princ. Mathem.*, t. iii. (1760), p. 671: "Vapores qui ex sole et stellis fixis et caudis cometarum oriuntur, incidere possunt in atmosphæras planetarum. . . ."

† *Cosmos*, vol. i., p. 124-135

‡ See *Cosmos*, vol. ii., p. 317-335, with notes.

§ Delambre, *Histoire de l'Astronomie Moderne*, tom. ii., p. 255, 269