The advantages which were at that period supposed to be obtainable only by gigantic length, led great minds, as is frequently the case, to extravagant expectations. Auzout considered it necessary to refute Hooke, who is said to have proposed the use of telescopes having a length of upward of 10,000 feet (or nearly two miles),* in order to see animals in the moon. A sense of the practical inconvenience of optical instruments having a focal length of more than a hundred feet, led, through the influence of Newton (in following out the earlier attempts of Mersenne and James Gregory of Aberdeen), to the adoption, especially in England, of shorter reflecting telescopes. The careful comparison made by Bradley and Pond, of Hadley's five-feet reflecting telescopes, with the refractor constructed by Constantin Huygens (which had, as already observed, a focal length of 123 feet), fully demonstrated the superiority of the former. Short's expensive reflectors were now generally employed until 1759, when John Dollond's successful practical solution of the problem of achromatism, to which he had been incited by Leonhard Euler and Klingenstierna, again gave preponderance to refracting instruments. The right of priority, which appears to have incontestably belonged to the mysterious Chester More, Esq., of More Hall, in Essex (1729), was first made known to the public when John Dollond obtained a patent for his achromatic telescopes.†

The triumph obtained by refracting instruments was not, however, of long duration. In eighteen or twenty years after the construction of achromatic instruments by John Dollond, by the combination of crown with flint glass, new fluctua-

en tower that had been brought from Marly; and we also placed them in a tube mounted on a three-sided ladder, a method which, in the discovery of the satellites of Saturn, gave us all the success we had hoped." —Delambre, *Hist. de l'Astr. Moderne*, tom. ii., p. 785. Optical instruments having such enormous focal lengths remind us of the Arabian instruments of measurement—quadrants with a radius of about 190 feet, upon whose graduated limb the image of the sun was received as in the gnomon, through a small round aperture. Such a quadrant was erected at Samarcand, probably constructed after the model of the older sextants of Al-Chokandi (which were about 60 feet in height). Compare Sédillot, *Prolégomènes des Tables d'Oloug-Beg*, 1847, p. lvii. and cxxix.

* See Delambre, *Hist. de l'Astr. Mod.*, t. ii., p. 594. The mystic Capuchin monk, Schyrle von Rheita, who, however, was well versed in optics, had already spoken in his work, *Oculus Enoch et Eliæ* (Antv., 1645), of the speedy practicability of constructing telescopes that should magnify 4000 times, by means of which the lunar mountains might be accurately laid down. Compare also *Cosmos*, vol. ii., p. 323 (note).

† *Edinb. Encyclopedia*, vol. xx., p. 479.