inferior to the philosophically combining Theophrastes, while the delicacy of his manner of dissecting, and the extent of his physiological discoveries, place Galen, who extended his observations to various genera of animals, "very nearly as high as Aristotle, and, in some respects, even above him." This judgment embodies the views of Cuvier.*

Besides Dioscorides and Galen, our attention is called to a third and great name—that of Ptolemy. I do not mention him here as an astronomical systematizer or as a geographer, but as an experimental physicist, who measured refraction, and who may, therefore, be regarded as the founder of an important branch of optical science, although his incontestable claim to this title has been but recently admitted.† However important were the advances made in the sphere of organic life and in the general views of comparative zootomy, our attention is yet more forcibly arrested by those physical experiments on the passage of a ray of light, which, preceding the period of the Arabs by an interval of five hundred years, mark the first step in a newly-opened course, and the earliest indication of a striving toward the establishment of mathematical physics.

The distinguished men whom we have already named as shedding a scientific luster on the age of the imperial rulers of Rome were all of Greek origin. The profound arithmetician and algebraist Diophantus (who was still unacquainted with the use of symbols) belonged to a later period.‡ Amid the different directions presented by intellectual cultivation in the Roman empire, the palm of superiority remained with the Hellenic races, as the older and more happily-organized peo-

* Cuvier, *Hist. des Sciences Naturelles*, t. i., p. 312–328.

† *Liber Ptholemei de Opticis sive Aspectibus;* a rare manuscript of the Royal Library at Paris (No. 7310), which I examined on the occasion of discovering a remarkable passage on the refraction of rays in Sextus Empiricus (*adversus Astrologos*, lib. v., p. 351, Fabr.). The extracts which I made from the Paris manuscript in 1811 (therefore before Delambre and Venturi) will be found in the introduction to my *Recueil d'Observations Astronomiques*, t. i., p. lxv.–lxx. The Greek original has not been preserved to us, and we have only a Latin translation of two Arabic manuscripts of Ptolemy's *Optics*. The name of the Latin translator was Amiracus Eugenius, Siculus. Compare Venturi, *Comment. sopra la Storia e le Teorie dell' Ottica*, Bologna, 1814, p. 227; Delambre, *Hist. de l'Astronomie Ancienne*, 1817, t. i., p. 61, and t. ii., p. 410–432.

‡ Letronne shows, from the occurrence of the fanatical murder of the daughter of Theon of Alexandria, that the much-contested epoch of Diophantus can not be placed later than the year 389 (*Sur l'Origine Grecque des Zodiaques prétendus Egyptiens*, 1837, p. 26).