

century and a half before the time of Hipparchus), we possess in the astronomy of the Greeks a limit for the period when the fixed stars had not yet been arranged according to their relative magnitudes. In the enumeration of the stars belonging to each constellation, as given in the *Catasterisms*, frequent reference is made to the number of the largest and most luminous, or of the dark and less easily recognized stars;* but we find no relative comparison of the stars contained in the different constellations. The *Catasterisms* are, according to Bernhardt, Baehr, and Letronne, more than two hundred years less ancient than the catalogue of Hipparchus, and are, besides, a careless compilation and a mere extract from the *Poeticum Astronomicum* (ascribed to Julius Hyginus), if not from the poem *Ἐρμῆς* of the older Eratosthenes. The catalogue of Hipparchus, which we possess in the form given to it in the *Almagest*, contains the earliest and most important determination of classes of magnitude (gradations of brightness) of 1022 stars, and therefore of about one fifth of all the stars in the firmament visible to the naked eye, and ranging from the first to the sixth magnitude inclusive. It remains undetermined whether these estimates are all due to Hipparchus, or whether they do not rather appertain in part to the observations of Timocharis or Aristyllus, which Hipparchus frequently used.

This work constituted the important basis on which was established the science of the Arabs and of the astronomers of the Middle Ages: the practice, transmitted to the nineteenth century, of limiting the number of stars of the first magnitude to 15 (although Mädler counts 18, and Rümker, after a more careful observation of the southern celestial hemisphere, upward of 20), takes its origin from the classification of the *Almagest*, as given at the close of the table of stars in the eighth book. Ptolemy, referring to natural vision, called all stars dark which were fainter than those of his sixth class; and of this class he singularly enough only instances 49 stars distributed almost equally over both hemispheres. Considering that the catalogue enumerates about one fifth of all the fixed stars visible to the naked eye, it should, according to Argelander's investigations, have given

* Eratosthenes, *Catasterismi*, ed. Schaubach, 1795, and *Eratosthenica*, ed. G. Bernhardt, 1822, p. 110-116. A distinction is made between stars λαμπροὺς (μεγάλους) and ἀμυροὺς (cap. 2, 11, 41). Ptolemy also limits οἱ ἀμόρφωτοι to those stars which do not regularly belong to a constellation.