larly eight rays at angles of 45° in stars from the first to the third magnitude. As, according to Hassenfratz, these radiations are caustics intersecting one another on the crystalline lens, they necessarily move according to the direction in which the head is inclined.* Some of my astronomical friends see three, or, at most, four rays above, and none below the star. It has always appeared extraordinary to me that the ancient Egyptians should invariably have given only five rays to the stars (at distances, therefore, of 72°); so that a star in hieroglyphics signifies, acoording to Horapollo, the number five.†

The rays of the stars disappear when the image of the radiating star is seen through a very small aperture made

ments of the head. The property of the telescope, in giving a definite outline to images, causes it to concentrate in a small space the light which would otherwise be more widely diffused. This obtains for the fixed stars and for the disks of planets. The light of stars having no actual disks, maintains the same intensity, whatever may be the magnifying power of the instrument. The aërial field from which the star is projected in the telescope is rendered more black by the magnifying property of the instrument, by which the molecules of air included in the field of view are expanded. Planets having actual disks become fainter from this effect of expansion. When the focal image is clearly defined, and when the rays emanating from one point of the object are concentrated into one point in the image, the ocular focus affords satisfactory results. But if, on the contrary, the rays emanating from one point do not reunite in the focus into one point, but form a *small circle*, the images of two contiguous points of the object will necessarily impinge upon each other, and their rays will be confused. This confusion can not be removed by the ocular, since the only part it performs is that of magnifying. It magnifies every thing comprised in the image, including its defects. As the stars have no sensible angular diameters, those which they present are principally owing to the imperfect construction of the instrument (to the different curvatures of the two sides of the object-glass), and to certain defects and aberrations pertaining to the eye itself. The smaller the star appears, the more perfect is the instrument, providing all relations are equal as to the diameter of the object-glass, the magnifying power employed, and the brightness of the star. Now the best means of judging whether the stars are very small, and whether the points are represented in the focus by simple points, is undoubtedly that of directing the instrument to stars situated very near each other, and of observing whether the images of known double stars are confused, and impinging on each other, or whether they can be seen separate and distinct." (Arago, *MS. of* 1834 *and* 1847.)

* Hassenfratz, *Sur les rayons divergens des Etoiles* in Delamétherie, *Journal de Physique*, tom. lxix., 1809, p. 324.

† *Horapollinis Niloi Hieroglyphica*, ed. Con. Leemans, 1835, cap. 13, p. 20. The learned editor notices, however, in refutation of Jomard's assertion (*Descr. de l'Egypte*, tom. vii., p. 423), that a star, as the numerical hieroglyphic for 5, has not yet been discovered on any monument or papyrus-roll. (Horap., p. 194.)