

The alternating light and dark rings which surround the small spurious disks of the stars when magnified two or three hundred times, and which appear iridescent when seen through diaphragms of different form, are likewise the result of interference and diffraction, as we learn from the observations of Arago and Airy. The smallest objects which can be distinctly seen in the telescope as luminous points, may be employed as a test of the perfection in construction and illuminating power of optical instruments, whether refractors or reflectors. Among these we may reckon multiple stars, such as ϵ Lyræ, and the fifth and sixth star discovered by Struve in 1826, and by Sir John Herschel in 1832, in the trapezium of the great nebula of Orion,* forming the quadruple star θ of that constellation.

A difference of color in the proper light of the fixed stars, as well as in the reflected light of the planets, was recognized at a very early period; but our knowledge of this remarkable phenomenon has been greatly extended by the aid of telescopic vision, more especially since attention has been so especially directed to the double stars. We do not here allude to the change of color which, as already observed, accompanies scintillation even in the whitest stars, and still less to the transient and generally red color exhibited by stellar light near the horizon (a phenomenon owing to the character of the atmospheric medium through which we see it), but to the white or colored stellar light radiated from each cosmical body, in consequence of its peculiar luminous process, and the different constitution of its surface. The Greek astronomers were acquainted with red stars only, while modern science has discovered, by the aid of the tele-

* "Two excessively minute and very close companions, to perceive both of which is one of the severest tests which can be applied to a telescope." (*Outlines*, § 837. Compare also Sir John Herschel, *Observations at the Cape*, p. 29; and Arago, in the *Annuaire pour* 1834, p. 302-305.) Among the different planetary cosmical bodies by which the illuminating power of a strongly magnifying optical instrument may be tested, we may mention the first and fourth satellites of Uranus, re-discovered by Lassell and Otto Struve in 1847, the two innermost and the seventh satellite of Saturn (Mimas, Enceladus, and Bond's Hyperion), and Neptune's satellite discovered by Lassell. The power of penetrating into celestial space occasioned Bacon, in an eloquent passage in praise of Galileo, to whom he erroneously ascribes the invention of telescopes, to compare these instruments to ships which carry men upon an unknown ocean: "Ut propria exercere possint cum cœlestibus commercia." (*Works of Francis Bacon*, 1740, vol. i., *Novum Organum*, p. 361.)