Orion, we have a combination of six—probably a system subject to peculiar physical attraction, since the five smaller stars (6·3m.; 7m.; 8m.; 11·3m.; and 12m.) follow the proper motion of the principal star, 4·7m. No change in their relative positions has yet been observed.* In the ternary combinations of ξ Libræ and ζ Cancri, the periodical movement of the two companions has been recognized with great certainty. The latter system consists of three stars of the third magnitude, differing very little in brightness, and the nearer companion appears to have a motion ten times more rapid than the remoter one.

The number of the double stars, the elements of whose orbits it has been found possible to determine, is at present stated at from fourteen to sixteen.† Of these, ζ Herculis has twice completed its orbit since the epoch of its first discovery, and during this period has twice (1802 and 1831) presented the phenomenon of the apparent occultation of one fixed star by another. For the earliest measurements of the orbits of double stars; we are indebted to the industry of Savary (ζ Ursæ Maj.), Encke (70 Ophiuchi), and Sir John Herschel. These have been subsequently followed by Bessel, Struve, Mädler, Hind, Smyth, and Captain Jacob. Savary's and Encke's methods require four complete observations, taken at sufficient intervals from each other. The shortest periods of revolution are thirty, forty-two, fifty-eight, and seventy-seven years; consequently, intermediate between the periods of Saturn and Uranus; the longest that have been determined with any degree of certainty exceed five hundred years, that is to say, are nearly equal to three times the period of Le Verrier's Neptune. The eccentricity of the elliptical orbits of the double stars, according to the investigations hitherto made, is extremely considerable, resembling that of comets, increasing from 0·62 (σ Coronæ) up to 0·95 (α Centauri). The least eccentric interior comet—that of Faye—has an eccentricity of 0·55, or less than that of the orbits of the two double stars just mentioned. According to Mädler's and Hind's calculations, η Coronæ and Castor exhibit much less eccentricity, which in the former is 0·29, and in the latter 0·22 or 0·24. In these double stars the two suns describe ellipses which come very near to those of

* Mädler, *Astr.*, s. 517. Sir John Herschel, *Outl.*, p. 568.

† Compare Mädler, *Untersuch. über die Fixstern-Systeme*, th. i., s. 225–275; th. ii., s. 235–240; and his *Astr.*, s. 541 Sir John Herschel, *Outl.*, p. 573.