

stances in which a brilliant white star (1527 Leonis, 1768 Can. ven.) is accompanied by a small blue star; others, where in a double star ( $\delta$  Serp.) both the principal and its companion are blue.\* In order to determine whether the contrast of colors is merely subjective, he proposes (when the distance allows) to cover the principal star in the telescope by a thread or diaphragm. Commonly it is only the smaller star that is blue: this, however, is not the case in the double star 23 Orionis (696 in Struve's Catalogue, p. lxxx.), where the principal star is bluish, and the companion pure white. If, in the multiple stars, the differently colored suns are frequently surrounded by planets invisible to us, the latter, being differently illuminated, must have their *white, blue, red, and green* days.†

As the *periodical variability*‡ of the stars is, as we have already pointed out, by no means necessarily connected with their red or reddish color, so also coloring in general, or a contrasting difference of the tones of color between the principal star and its companion, is far from being peculiar to the *multiple* stars. Circumstances which we find to be frequent are not, on that account, necessary conditions of the phenomena, whether relating to a periodical change of light, or to the revolution in partial systems round a common center of gravity. A careful examination of the bright double stars (and color can be determined even in those of the ninth magnitude) teaches that, besides white, all the colors of the solar spectrum are to be found in the double stars, but that the principal star, whenever it is not white, approximates in general to the red extreme (that of the least refrangible rays), but the companion to the violet extreme (the limit of the most refrangible rays). The reddish stars are twice as frequent as the blue and bluish; the white are about  $2\frac{1}{2}$  times as numerous as the red and reddish. It is moreover remarkable that a great difference of color is usually associated with

oped by the action of the accompanying star, which is generally much the more brilliant of the two." (Arago, in the *Annuaire pour* 1834, p. 295-301.)

\* Struve, *Ueber Doppelsterne nach Dorpater Beobachtungen*, 1837, s. 33-36, and *Mensura Microm.*, p. lxxxiii., enumerates sixty-three double stars in which both the principal and companion are blue or bluish, and in which, therefore, the colors can not be the effect of contrast. When we are forced to compare together the colors of double stars, as reported by several astronomers, it is particularly striking to observe how frequently the companion of a red or orange-colored star is reported by some observers as blue, and by others as green.

† Arago, *Annuaire pour* 1834, p. 302. ‡ *Vide supra*, p. 130-136.