

one gradation brighter than the star 17 Cygni. The fluctuations, however, are in this case also very considerable, and have been observed from thirteen gradations below the mean to ten above it. At this lowest maximum the star would be perfectly invisible to the naked eye, whereas, on the contrary, in the year 1847, it could be seen without the aid of a telescope for fully ninety-seven days; its mean visibility extends to fifty-two days, of which, on the mean, it is twenty days on the increase, and thirty-two on the decrease.

(4) 30 Hydræ Hevelii, R. A. $200^{\circ} 23'$, Decl. $-22^{\circ} 30'$. Of this star, which, from its position in the heavens, is only visible for a short time during every year, all that can be said is, that both its period and its maximum brightness are subject to very great irregularities.

(5) Leonis R. = 420 Mayeri; R. A. $144^{\circ} 52'$, Decl. $+12^{\circ} 7'$. This star is often confounded with 18 and 19 Leonis, which are close to it, and, in consequence, has been very little observed; sufficiently, however, to show that the period is somewhat irregular. Its brightness at the maximum seems also to fluctuate through some gradations.

(6) η Aquilæ, called also η Antinoi; R. A. $296^{\circ} 12'$, Decl. $+0^{\circ} 37'$. The period of this star is tolerably uniform, 7d. 4h. 13m. 53s.; observations, however, prove that at long intervals of time trifling fluctuations occur in it, not amounting to more than 20 seconds. The variation of light proceeds so regularly, that up to the present time no deviations have been discovered which could not be accounted for by errors of observation. In its minimum, this star is one gradation fainter than ι Aquilæ; at first it increases slowly, then more rapidly, and afterward again more slowly; and in 2d. 9h. from its minimum, attains to its greatest brightness, in which it is nearly three gradations brighter than β , but two fainter than δ Aquilæ. From the maximum its brightness does not diminish quite so regularly; for when the star has reached the brightness of β (*i. e.*, in 1d. 10h. after the maximum), it changes more slowly than either before or afterward.

(7) β Lyræ, R. A. $281^{\circ} 8'$, Decl. $+33^{\circ} 11'$; a star remarkable from the fact of its having two maxima and two minima. When it has been at its faintest light, one third of a gradation fainter than ζ Lyræ, it rises in 3d. 5h. to its first maximum, in which it remains three fourths of a gradation fainter than γ Lyræ. It then sinks in 3d. 3h. to its second minimum, in which its light is about five gradations greater than that of ζ . After 3d. 2h. more, it again reaches, in its second maximum, to the brightness of the first; and afterward, in 3d. 12h., declines once more to its greatest faintness; so that in 12d. 21h. 46m. 40s. it runs through all its variations of light. This duration of the period, however, only applies to the years 1840 to 1844; previously it had been shorter—in the year 1784, by about $2\frac{1}{2}$ h; in 1817 and 1818, by more than an hour; and at present, a shortening of it is again clearly perceptible. There is, therefore, no doubt that in the case of this star the disturbance of its period may be expressed by a formula of sines.

(8) δ Cephei, R. A. $335^{\circ} 54'$, Decl. $+57^{\circ} 39'$. Of all the known variable stars, this exhibits in every respect the greatest regularity. The period of 5d. 8h. 47m. $39\frac{1}{2}$ s. is given by all the observations from 1784 to the present day, allowing for errors of observation, which will account for all the slight differences exhibited in the course of the alternations of light. This star is in its minimum three quarters of a gradation brighter than ϵ ; in its maximum it resembles ι of the same constellation (Cepheus). It takes 1d. 15h. to pass from the former to the latter; but, on the other hand, more than double that time, *viz.*, 3d. 18h., to change