

itself also variable, appears very problematical. Struve* himself merely says, *Suspicio minorem esse variabilem*. Variability is by no means a necessary concomitant of redness. There are many red stars: some of them very red—as Arcturus and Aldebaran—in which, however, no variability has as yet been discovered. And it is also more than doubtful in the case of a star of Cepheus (No. 7582 of the catalogue of the British Association), which, on account of its extreme redness, has been called by William Herschel the Garnet Star (1782).

It would be difficult to indicate the number of periodically variable stars for the reason that the periods already determined are all irregular and uncertain, even if there were no other reasons. The two variable stars of Pegasus, as well as α Hydræ, ϵ Aurigæ, and α Cassiopeiæ, have not the certainty that belongs to Mira Ceti, Algol, and δ Cephei. In inserting them, therefore, in a table, much will depend on the degree of certainty we are disposed to be content with. Argelander, as will be seen from the table at the close of this investigation, reckons the number of satisfactorily determined periods at only twenty-four.†

The phenomenon of variability is found not only both in red and in some white stars, but also in stars of the most diversified magnitude; as, for example, in a star of the first magnitude, α Orionis; by Mira Ceti, α Hydræ, α Cassiopeiæ, and β Pegasi, of the second magnitude; β Persei, of the 2.3d magnitude; and in η Aquilæ, and β Lyræ, of the 3.4th magnitude. There are also variable stars, and, indeed, in far greater numbers, of the sixth to the ninth magnitude, such as the variables Coronæ, Virginis, Cancræ, et Aquarii. The star χ Cygni likewise presents very great fluctuations at its maximum.

* Compare Mädler, *Astr.*, s. 438, note 12, with Struve, *Stellarum compos. Mensuræ Microm.*, p. 97 and 98, star 2140. "I believe," says Argelander, "it is extremely difficult with a telescope having a great power of illumination to estimate rightly the brightness of two such different stars as the two components of α Herculis. My experience is strongly against the variability of the companion; or, during my many observations in the daytime with the telescopes of the meridian circles of Abo, Helsingfors, and Bonn, I have never seen α Herculis single, which would assuredly have been the case if the companion at its minimum were of the seventh magnitude. I believe the latter to be constant, and of the fifth or 5.6th magnitude."

† Mädler's Table (*Astron.*, s. 435) contains eighteen stars, with widely differing numerical elements. Sir John Herschel enumerates more than forty-five, including those mentioned in the notes.—*Outlines*, § 819-826.