β, Variable and binary, 3.4 to 4.5, very white.

Sheliak, Shelyak, and **Shiliak** are from **Al Shilyāḳ,** one of the Arabian names for Lyra. The star lies about 8° southeast from Wega and 2½° west from γ.

With δ and ε it was **Tsan Tae** in China.

The changes in its brilliancy, detected by Goodricke in 1784, were fully investigated by Argelander from 1840 to 1859, and showed a regularly increasing period of variability which now is 12 days, 21¾ hours, with several fluctuations of a somewhat complex nature.

Like γ Cassiopeiae and other variables of the Sirian type, it shows in its spectrum,— perhaps the best specimen of Pickering's 4th class,— not only the usual dark lines, but also the bright lines of glowing gases, hydrogen and helium being especially conspicuous. Pickering concluded, from the singular character and behavior in the shifting of these lines, that the chief star must consist of at least two luminous bodies rotating around a common centre of gravity at a very great rate of speed, perhaps three hundred miles a second, the period of revolution equaling the period of variability. Scheiner says of it, "There is great probability that more than two bodies are concerned in the case of β Lyrae"; and yet it may not be impossible, in view of the recent discoveries at the Johns Hopkins Laboratory, that variations of *pressure* may be concerned in this remarkable shifting of lines.[1]

γ, 3.3, bright yellow,

2½° east of β is **Sulafat,** from another of the titles of the whole constellation.

Jugum, formerly seen for it, may have come from a misunderstanding of Bayer's text, where it probably is used merely to designate the star's position on the frame of the Lyre, his words being *ad dextrum cornu, Ζυγόν, Jugum,* — a fair example of the indefiniteness of much of his stellar nomenclature.

At a point ⅓ of the distance from β to γ is the wonderful **Ring Nebula,** N. G. C. 6720, 57 M., discovered in 1772 by Darquier from Toulouse, although its apparent annular form was not revealed till later by Sir William Herschel's observations. In our day high-powers show its oval form somewhat undefined at the edges, with a dark opening in the centre containing a few very faint stars, among which, visible only in the largest telescopes, but prominent in photographs, is a central condensation of light like a star.

[1] A full and interesting discussion of this appears in *Popular Astronomy* for July, 1898.

The spectrum of nebula and central "star" is purely gaseous. Although appearing oval to us, it is supposed to be nearly circular, but seen obliquely. It is the only annular nebula visible through small telescopes, although there are six others now known.

ε^1, or Fl. 4, Binary, 4.6 and 6.3, yellow and ruddy;

ε^2, or Fl. 5, Binary, 4.9 and 5.2, both white.

These are the celebrated **Double Double,** each pair probably separately revolving in a period of over two hundred years, and both pairs perhaps revolving around their common centre of gravity; but if so, the period is to be reckoned only by millenniums, for the measures of the last fifty years show no sensible orbital motion. This is by far the finest object of the kind in all the heavens.

They are 207″ apart, and, to the ordinary eye, form an elongated star; but exceptionally sharp sight will resolve them without aid. The pairs are 3″.2 and 2″.45 apart respectively, and a good 2¼-inch glass with a power of 140 will separate each pair. The position angle of the components of ε^1 is 12°; and of those of ε^2, 132°; while that of ε^1 and ε^2 is 173°. Their "double-double" character was first published by the Jesuit father Christian Mayer in 1779, although its discovery has generally been attributed to Sir William Herschel.

The distance between ε^1 and ε^2, small as it is, is nearly twice that noticed by astronomers, in 1846,—128″—between the actual and the computed positions of the planet Uranus, a discrepancy which convinced them of the existence of a still more remote planet and led to the discovery of Neptune. Such is the marvelous nicety of modern astronomical measurements!

Between these stars lie three very much fainter, two of which, of the 13th magnitude, are the **Debilissima,** Excessively Minute, of Sir John Herschel, discovered by him in 1823.

ε and ζ form an equilateral triangle with Wega, the sides about 2° long; ε being at the northern angle. These three stars were one of the **Athâfyy** of the early Arabs.

η, a 4.4-magnitude, is **Aladfar** in the *Century Atlas*, by some confusion with the star μ; and with θ, of the same brilliancy, was, in China, **Lêen Taou,** Paths within the Palace Grounds.

μ, of the 5th magnitude, was Kazwini's **Al Aṭhfār,** the Talons (of the Falling Eagle), which he described as a fainter star in front of the bright one, *i. e.* west of Wega.