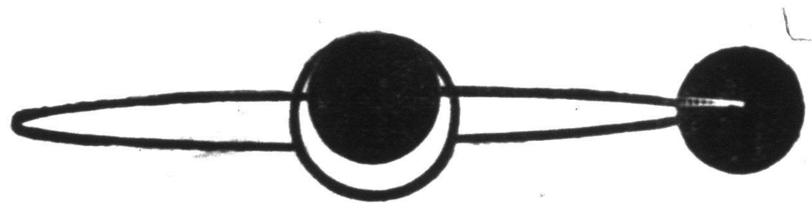
rapid changes at regular periods of time. *Beta Persei*, commonly called Algol or the Demon Star, is one of this class. We hope some of our readers were so fortunate as to have observed the phenomenon of obscuration described last month. Various theories have been formulated to explain it. But none can account for its uniform brilliancy for sixty hours, followed by the peculiar rate of diminution of brilliancy for about four hours and a half, and the same rate of increase for the next four hours and a half, so satisfactorily as the "planetary eclipse" theory. Some of the most eminent astronomers of the present day have measured the rate of darkening and lightening of this star, which, according to Royal Hill, is as follows: Let the brilliancy just before obscuration be indicated by 1·000. Then each successive half hour it was found to be ·968, ·920, ·861, ·762, ·685, ·566, ·480, ·433, and at the minimum, ·416. In fifteen minutes it commenced to brighten in the reverse order. This exactly corresponds to the rate at which light from a luminous disc whose diameter is *one* would be obscured by the transit of a dark disc of diameter 0·764 across its surface a little to one side, so that the eclipse would be *nearly*, but not quite, annular. The following diagram, drawn to scale, illustrates the point:



The dark body is the planet revolving around the luminous sun, Algol. The planet is shown at its greatest elongation, and at the middle of the eclipse. The plane of its orbit passes nearly through our earth, so that could we see it, the dark planet would appear to describe the narrow ellipse drawn in our diagram while revolving around Algol. Of course, both Algol and its planet really revolve around their common centre of gravity. Now Algol is so distant that the most powerful telescope cannot show its disc, and therefore an ocular demonstration of the presence of this dark companion sun cannot be given. The relative sizes of the two are inferred from the rate of the obscuration. The relative dimensions of the planetary orbit is deduced in this way: The length of more or less obscuration is nearly nine hours, which is coincident with the interposition of the whole or part of the planetary disc between us and Algol. During this time the planet moves the distance of Algol's diameter plus its own,—equal to 1·764 times Algol's diameter. If it moves that far in nine hours how far will it move in sixty-nine hours, in which time it completes its revolution? 9 : 69 : : 1·764 : 13·5+ That is, the planet's orbit must be, roughly speaking, 13·5 the diameter of Algol. The diameter of the orbit, which is 13·5÷3·1416, is about four times the diameter of Algol. So that our diagram above is in good proportion.

Next, let us estimate the distance and magnitude of these bodies. If you were to look at the steeple of a church from the street and see the ball on its spire projected against a star in the sky, you would notice on taking a few steps along the street that the ball on the spire changed its apparent position against the sky. If the church were a quarter of a mile distant, instead of being near at hand, a change of a few steps would make a very small change in position of the steeple ball against the sky. This apparent change of the position of the ball against the sky might be called its *parallax*—for your change of position. The more distant the church spire, the less its parallax for a change of a given number of paces. Given the amount of change of position and the observed parallax, it is only a simple problem in trigonometry to find the distance of the spire of the church from you.

Well, this world swings us through space. Six months after to-day we shall be about 185,000,000 miles exactly on the opposite side of our sun. Those fixed stars which are nearer than the more remote, like the ball on the church spire, must appear to change their places. This apparent change of position may be called their annual parallax. Practically it is found more convenient to call the half of this displacement the parallax. The parallax of several stars have been accurately measured. The one having the greatest parallax is *Alpha* of Centaurus. When the earth is at one point of its orbit, *Alpha Centauri* is displaced from its mean position nearly *one* second of arc. Six months after it is displaced nearly *one* second of arc in the opposite direction. Total displacement, nearly *two* seconds of arc. Let us calculate its distance by a simple approximate method. If from *Alpha Centauri* as a centre two radii be drawn to opposite points of the earth's orbit, these two lines will contain an angle of about *two* seconds of arc. For so small an angle, the diameter of the earth's orbit will nearly coincide with the arc between the two radii. If the radius is taken as unity, the arc of 180 degrees is the well-known 3·14159+. Divide by 180° and we get ·0174533 as the arc of 1°. Divide by 60 and we get ·0002909 as the length of arc of 1 minute. Divide by 60 again, and we get ·00000485 the length of arc of 1 second. For a radius equal to unity, 2″ of arc would therefore be ·0000097 in length; that is, if the distance of *Alpha Centauri* from the earth be represented by one, then the diameter of the earth's orbit