IS THE COPERNICAN SYSTEM OF ASTRONOMY TRUE?

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Is the Copernican System of Astronomy True? by W. S. Cassedy

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W. S. CASSEDY

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—OF—

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CHAPTER I.

PARALLAX, AND OTHER METHODS FOR FINDING THE DISTANCE OF THE SUN.

Astronomers say, in speaking of the distance of the sun, "The determination of this distance is therefore one of "the capital *problems* of astronomy, as well as one of the "most difficult, to the solution of which both ancient and "modern astronomers have devoted many efforts."

The importance of this knowledge, as a means of determining the distance of all other heavenly bodies, may be judged of, and the uncertainties of it, by the following quotations from "Newcomb's Popular Astronomy"; he says: "Recourse must be had to methods of observation "subject to many sources of error." Again, "The measure-"ments of the heavens involves two separate operations. "The one consists in the determination of the distance be-"tween the earth and the sun, which is made to depend on "the solar parallax, or the angle which the semi-diameter "of the earth subtends as seen from the *sun*, and which is "the *unit* of distance in celestial measurements. The "other consists in the determination of the distances of "the stars and planets in terms of this unit which gives "what we may call the proportions of the universe.

"Knowing this proportion, we can determine all the "distances, when the length of our unit, or the distance of "the sun is known, but *not before*."

The planets which are nearest the earth are regarded by all astronomers much nearer us than is the sun.

The reliability of the method by parallax for finding the distances of the planets may be judged of by the following quotation from "Newcomb's Popular Astronomy"; he says:

"The earth is so small in comparison with the distances "of the planets that the parallax in question almost eludes "measurement, except in the case of those planets which "are nearest the earth, and even then it is so minute, that "its accurate determination is one of the most difficult "*problems* of modern astronomy."

The planet Venus—one nearest us—is estimated to be 33,000,000 miles nearer the earth than is the sun. The parallax of this comparatively near planet "is so minute "that its accurate determination is one of the most difficult "problems of modern astronomy."

As parallax is the method by which the sun's vastly greater distance is to be found, is it possible by this method to have any knowledge, even by approximation, of the *real* distance of the sun?

Before proceeding further with this method and its different applications in finding the sun's distance, let the enquiry be directed as to the reliability of the method for finding the distances of the stars.

Parallax is defined to be "the difference between the direction of a body as seen from two different points," being a mathematical process employed in the solution of a triangle.

The difficulty of finding the distance of a star by this method may be estimated, and, indeed, is found to be insuperable, from the fact that if the position of a star be observed, say, for example, in June, and again in December, it will be found in the same relative position in the latter month as in the former.

Yet, according to the Copernican system of astronomy, in the interval between these observations the earth has progressed in its orbit with a velocity of 67,000 miles per hour, and has travelled a distance of 190 millions of miles measured in a straight line across this orbit, and about 285 millions of miles measured around its curve, and, notwithstanding this startling circumstance, not the

slightest angle can be observed between these periods of observation on attempting the parallax of a star.

What is, in this connection, worth observation as a remarkable coincidence, is the fact that this absence of apparent displacement of the observed star would be observed did the earth not progress in the assigned orbit.

The unreliability of parallax to find the distance of any star may be judged of by the following conclusion of Sir John Herschel, he says:

"It might be naturally enough expected by this enlarge-"ment of our base to the vast diameter of the earth's orbit, "the next step in our survey would be made at a great "advantage; that our change of station from side to side "of it would produce a perceptible and measurable amount "of annual parallax in the stars, and that by its means we "should come to a knowledge of their distances. But after "exhausting every refinement of observation, astronomers "have been unable to come to any positive and coincident "conclusion upon this head; and it seems, therefore, *dem-"onstrated* that the amount of such parallax, even for the "nearest fixed star which has been examined with the re-"quisite attention, remains still mixed up, and concealed "among the errors incidental to all astronomical determi-"nations. Now such is the nicety to which these have "been carried, that did the quantity in question amount to "a single second,* that is, did the radius of the earth's or-"bit subtend at the nearest fixed star that minute angle, it "could not possibly have escaped detection and universal "recognition." *Herschel's Astronomy, Title "Fixed Stars."*

Either one of two conclusions may, possibly, be deduced from the last foregoing quotation, either of which would account for the failure of these attempts to find the distance of any star. One of these may be—as is generally supposed to be the case—because the distances of all the stars are so great that *no* angle is observable; the other is

* Namely, the width of a hair,