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[Isis \(/action/showPublication?journalCode=isis\)](#) > [Vol. 33, No. 3, Sep., 1941 \(/stable/i214415\)](#) > George Valla: An Unn...



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George Valla: An Unnoted Advocate of the Geo-Heliocentric Theory

Grant McColley

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the argument; alas! in many cases we are obliged to accept results without knowing exactly how they have been obtained. When a capable man has devoted his life to the study of a series of problems, has examined each from every possible angle, considered every objection, he becomes an authority in that limited field, and deserves to be listened to with respect and confidence. His judgment is generally acquiesced in by his colleagues, at least as a first approximation. He continues to be trusted as long as he is not proved untrustworthy. This is true of every field of research. Why should one distrust theologians more than other scholars? From PLATO and ARISTOTLE down to our own contemporaries, they have dedicated their lives to the study of questions which other scientists have no time to explore deeply enough. Why should we reject their conclusions on the basis of our knowledge, however deep, of *other* fields? Why not accept their report at least as first approximations even as we do in the case of scientific investigations which we are unable to verify ourselves?

One may object that theologians do not by any means agree. Neither do competent men of science agree on every point. Yet there are some fundamental concepts which are equally shared by theologians of every kind to such an extent that they may serve as a basis for all men. It is, I believe, wiser to accept that religious basis than to reject it.

GEORGE SARTON

Rockport, Massachusetts
July 5, 1941

George Valla: An Unnoted Advocate of the Geo-Heliocentric Theory

By GRANT MCCOLLEY

THROUGHOUT the late sixteenth and early seventeenth centuries, five astronomical systems struggled for supremacy: the revised Ptolemaic; the semi-Ptolemaic, with the diurnal rotation of the central earth; the geo-heliocentric; the Fourth System of the world; and the heliocentric or Copernican.¹ To repeat a commonplace, the more orthodox astronomers, and particularly those of Roman Catholic faith, generally supported the geo-heliocentric. Under this theory, as in the Ptolemaic, the three

¹ Cf. the writer's "Nicolas Reymer's and the Fourth System of the World," *Popular Astronomy*, XLVI (1938), 25 ff.

known superior planets, Saturn, Jupiter, and Mars, revolved about both sun and earth. Again as in the Ptolemaic, the inferior planets, Mercury and Venus, moved about the earth, completing their orbital revolution in the same period as did the sun. The earth also stood in the center of the universe

In contrast with the Ptolemaic system, the geo-heliocentric theory generally placed Mercury next to the sun. The sun, rather than a point some distance from the earth, became ultimately the center of the planetary orbits. The basic feature of the theory, however, was the movement of Mercury and Venus around the sun. As Mercury and Venus turned about the sun, the sun in turn revolved in an orbit about the earth. Geocentric in respect to the seven "planets," Saturn, Jupiter, Mars, the sun, Mercury, and Venus; and heliocentric to both the true superior and the inferior planets, this system is aptly termed the geo-heliocentric.

The most complete historical study of this system is that made by PIERRE DUHEM, part of whose extensive researches as yet unfortunately remain unpublished.² Following earlier historians, DUHEM made HERACLIDES of Pontus the first advocate of the hypothesis. However, if it is true that HERACLIDES also believed in the earth's axial rotation, he is more properly described as the first supporter of the Fourth System of the world—a combination of the geo-heliocentric theory and that of the diurnal rotation of the central earth. In any event, he apparently believed that Mercury and Venus revolve about the earth.

A fragmentary record makes it impossible to conjecture how widely the Greeks and later the Romans accepted the geo-heliocentric theory. Various historians have seen advocacy of the theory in a number of descriptions which name Mercury and Venus "companions of the sun."³ Such expressions, however, were as applicable to the Ptolemaic as to the geo-heliocentric theory, for the Ptolemist generally regarded Venus and Mercury as remaining close to the sun, and described these planets as revolving about the earth in the same period as the sun. More acceptable are those descriptions which state that the inferior planets are at times above, and at times below the sun. However, from VITRUVIUS to TYCHO BRAHE we have recorded less than ten accounts which specifically describe Mercury and Venus in orbital revolution about the sun.

In part because of the present scarcity of such descriptions, and in part because of the importance of the geo-heliocentric theory to the late sixteenth and the early seventeenth centuries, it is interesting to find that the

² *Le Système du Monde: Histoire des doctrines cosmologiques de Platon à Copernic*, 5 vols., Paris, 1913–1917.

³ J. L. E. DREYER previously has questioned the pertinence of these and similar descriptions in his "Mediaeval Astronomy," *Studies in the History and Method of Science*, II, ed. CHARLES SINGER. Oxford, 1921, pp. 105 ff.

first encyclopedia of the sixteenth century explicitly described the inferior planets as moving about the sun. This encyclopedia, prepared by GEORGE VALLA under the title *De Expetendis et Fugiendis Rebus Opus*, set forth the description in Chapter I of the third book devoted to astronomy. This is Book XVIII of the encyclopedia.⁴ We hear little of VALLA today, but GEORGE SARTON notes that in 1488 he edited the first Latin edition of ARISTARCHUS's treatise *On the Sizes and Distances of the Sun and Moon*.⁵ The volume of 1488, which I have not seen, also included NICEPHORUS's *Logica* and other works. It is perhaps the same as that of Venice, 1498, which included ARISTOTLE's *De Caelo*, edited by VALLA.⁶

The description which VALLA set forth of the geo-heliocentric theory is brief and unembellished. His account first mentioned "some" of the five planets, and subsequently identified these as "Saturn, Jupiter, and Mars." Continuing, he wrote: "The others, however, are moved about the sun. In one fashion, Mercury and Venus encircle the sun; in another way, they are encircled by the sun."⁷ Here we find a complete description of the movements of the inferior planets under the geo-heliocentric system, wherein Mercury and Venus revolved about the sun; and, as the sun carried their epicycle about the earth, the sun in its turn moved about the two inferior planets.

There doubtless exist other unnoted advocates of the geo-heliocentric theory. As they are found from time to time, we may become certain that forces more powerful than the "inspiration" of TYCHO BRAHE made this theory a major hypothesis during the late sixteenth and early seventeenth centuries. We also may note that long before TYCHO the geo-heliocentric theory had been the most active among the several competitors of conventional geocentric astronomy.

Armour College of Illinois Institute of Technology

⁴ *Georgii Vallae Placentini viri clariss. de Expetendis, et Fugiendis Rebus opus*. . . (Colophon) Venetiis in aedibus Aldi romani, impensa, ac studio Ioannis Petri Vallae filii pientiss. mense decembri. M. D. I.

⁵ *Introduction to the History of Science*, I, 157. For other scientific editions of his see pp. 319, 609.

⁶ *Georgio Valla Placentino Interprete*. . . Impressum Venetiis per Simonem Papiensem. . . 1498. *Aristotelis de caelo*, the thirteenth work in the volume, opens on signature niii, misnumbered biii.

⁷ Lib. XVIII, De motu planetarum, caput primum. "Quarto quod horum quinque planetarum alii quidem omni distantia ab ipso Sole distent diametro, aliquando triquetra figura, & quadrata quandoque, modo sexangula, hoc nanque faciunt Saturnus. Iuppiter. Mars. Alii autem circa Solem moveantur, modo Solem comprehendentes, modo a Sole comprehensi Venus, & Mercurius."