

Biographical Encyclopedia of Astronomers

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Marcus Vitruvius

Born Fundi (Fondi, Campania, Italy), circa 85 BCE

Died circa 15 BCE

Vitruvius is best known for his writings on architecture, but he also wrote on astronomy, describing the understanding of his time and its usefulness in making sundials

Vitruvius was born amid the death throes of the Roman Republic to an old South Italian family prominent at Fundi (midway between Rome and Naples). Trained in architecture, as a young man he served in the army corps of engineers under Caesar, first in Gaul (known service includes Larignum in 56 BCE and Marseilles in 48 BCE), then in North Africa (at Zama in 46 BCE). After his general's assassination, Vitruvius joined the troops of Octavian (the future Augustus), on active duty as an artillery engineer; by 33 BCE he was an aqueduct official

Vitruvius wrote one known work, a handbook (*institutio*) in ten books on "architecture"—that is, civil engineering from the selection of a city site through design and construction to maintenance and defense. He gives extensive theoretical justifications for each precept, devoting over two-thirds of Book 9 to astronomy and astrology as the basis for constructing sundials. He wrote for many years around 25 BCE, in his old age and during peacetime.

Vitruvius offers no original astronomy, but summarizes contemporary beliefs and preserves some otherwise lost astronomy. A brief but polemical account of astrology (recently popular) is given. Constellations visible in Rome are described from a star map based on Aratus' poem (possibly using Hipparchus' commentary). Annual solar motion causes seasonal phenomena, especially variable day length, with equinoxes and solstices occurring at 8° of Aries, Leo, Libra, and Capricorn. Vitruvius gives two explanations of lunar phases: Aristarchus of Samos thought moonlight was reflected sunlight, the phases being explained by geometry, while Berôssus of Babylonia claimed the luminous lunar hemisphere is attracted by sunlight which rotates the Moon. The Vitruvian universe is standard for the era, described in mechanical terms: the heavens rotate about the Earth on pin-like poles beyond the stars, around which wheel rims roll as on a lathe (tornus). In orbits contrary to the stars, the Moon, Mercury, Venus, the Sun, Mars, Jupiter, and Saturn (the standard order) "wander" from west to east, one above another "as if on a staircase."

For the planets outside the Sun, Vitruvius gives the most accurate ancient solar periods: Mars 683 days (4 days less than the modern value), Jupiter 11 years, 313 days (2 days less), and Saturn 29 years, 160 days (7 days less). He explains their apparent retrogradations through an alleged greater attraction by solar rays at greater distances. Vitruvius offers a heliocentric model for Mercury and Venus in which the Sun's rays serve as a center that those planets "crown," their varying speeds being explained by their varying distance from the attractive Sun

Vitruvius bases his architectural theory primarily upon Hermogenes of Alabanda (circa 160 BCE) and earlier Greeks, attributing authority to Antiquity (e.g., Aratus, Aristarchus, Berôssus, and Ctesibius, all 3rd century BCE), the latest astronomer cited being Hipparchus. Since the partially heliocentric theory presumes epicycles, it postdates Apollonius and probably Hipparchus (whom Ptolemy alleges attempted no planetary theory). One may suspect the heliocentrist Seleucus or perhaps the neopythagorean astronomer Apollonius of Mundos, who theorized that comets were long-period planets on elongated orbits.

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Alternate name

Pollio, Marcus

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