Biographical Encyclopedia of Astronomers

Pappus of Alexandria

Flourished probably 4th century

Primarily a mathematician, Pappus also wrote commentaries on Ptolemy, Aristarchus, and Theodosius, and summaries of other astronomers such as Apollonius and Eratosthenes.

Pappus's dates from the literary sources are uncertain, though he was apparently computing an eclipse in 320. His most recent cited source is Ptolemy; a scholastic puts Pappus in the reign of Diocletian (284–305); and the *Suda* has him a contemporary of Theon of Alexandria, and flourishing in the reign of Theodosius (379–395).

His surviving work provided and continues to provide points of departure for developments in the history of mathematics. He, with Diophantus, provided François Vieta with his point of departure in the development of algebra; one problem in Collection 7 provided René Descartes with his point of departure for his Geometry; and Pappus's work continues to appear as starting points for articles in mathematical journals.

Credited with being halfway between compiler-commentator and originator, Pappus was fully capable of extending the work of his predecessors. His greatest—or at least most famous—individual achievement is the universalization of Euclid 1.47, the Pythagorean theorem. Pappus further extended the work of Archimedes and (apparently) originated the theorems that were rediscovered and named after Paul Guldin

As a reporter of the status quo of the mathematics of his time, it is thanks to Pappus that we have the Greeks' threefold division of problems: (1) solvable with straightedge and compass, called plane; (2) solvable with one or more conics, called solid; and (3) solvable with a more complicated curve, called linear. Modern mathematicians still find this classification appropriate, though they would rename (3) and further split it into algebraic problems and transcendental problems.

Pappus's principal surviving work is the *Collection*, a treasury of all the mathematics of his time, including some of his own, in eight books. We have fragments from his other works: a commentary on Ptolemy's *Almagest*, a commentary on Euclid, and a geography. The *Collection* contains such mathematical topics as arithmetic, geometric, and harmonic means, the universalizing of Euclid, the Globularizing of the spiral of Archimedes, and epitomes of Euclid, Apollonius, Aristarchus, and Eratosthenes; there is also a summary of mechanics. The astronomy is in book 6, which gives commentary on Theodosius's *Spherics*, *Autolycus's On the Moving Sphere*, Aristarchus's *On the Size and Distance of the Sun and the Moon*, plus Euclid's *Optics* and *Phenomena*.

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