Biographical Encyclopedia of Astronomers

Posidonius

Born Apamea, (Syria), 135 BCE

Died Rhodes, (Greece), 51 BCE

Posidonius is responsible for an early measurement of the Earth's circumference.

Posidonius came from a Greek family, though he was born in Syria. He was raised in the Greek tradition and completed his education in Athens under the great Stoic philosopher Panaetius of Rhodes. His name is sometimes listed as Posidonius of Apamea, while at other times it is listed as Posidonius of Rhodes. The former obviously refers to the place of his birth, while the latter refers to the place where he ultimately taught

Presumably, the influence of Panaetius is what brought Posidonius to Rhodes. Sometime after 100 BCE he is known to have become the head of the Stoic school at Rhodes, where he taught both Cicero and Pompey (the Great). In 86 BCE, Posidonius was sent as an envoy to Rome, where he met Gaius Marius, the Roman politician and general. It is also probable that it was around this time that he first met Pompey, who later visited him in Rhodes and became his pupil for a time. It is a remarkable testament to his abilities that we know as much about him as we do, as only fragments of his own writings have survived.

Posidonius is chiefly remembered for providing a value for the circumference of the Earth. There were, in fact, four attempts to measure the circumference of the Earth between the time of Aristotle and that of Ptolemy. Posidonius estimated that the distance from Rhodes to Alexandria was 5,000 stadia (According to some estimates, a stade is roughly 185 m, though the one used by Posidonius may have been shorter.) He then observed that if the star Canopus was exactly on the horizon at Rhodes, then it was 1/4 of a sign (1/4 of 30°) about the horizon at Alexandria. This meant that the circumference of the Earth had to be 240,000 stadia, the accuracy of which depends on the value of the unknown stade. His result, whether based on observation or, more likely, serving as an illustration, was probably a bit too large and not as accurate as that of Eratosthenes, but Posidonius's methods were a precursor to understanding the concept of latitude. It is interesting to note that later scholars indicate that Posidonius actually used different values both for the distance from Rhodes to Alexandria and for the altitude at which the star Canopus rose above the horizon. Both numbers as given earlier are actually incorrect for that approximate date. (Obviously, the distance never changes, but precession has changed Canopus's position from Posidonius's time.) Posidonius also made an estimate of the size of the Sun, but for its calculation used a value for the size of the Earth different from the one he had himself calculated, thereby revealing something of his own convictions about its accuracy.

Most of our knowledge about Posidonius's astronomy comes to us from Cleomedes. Posidonius also showed a great interest in the earth sciences, having developed theories of clouds, mist, wind, rain, lightning, earthquakes, frost, hail, and rainbows in a work on *Meteorology*.

Ian T. Durham

Selected References

Heath, Sir Thomas L. (1931). *A Manual of Greek Mathematics*. Oxford: Clarendon Press. (Reprint, New York: Dover, 1963.)

Neugebauer, Otto (1975). *A History of Ancient Mathematical Astronomy*. 3 pts. New York: Springer-Verlag

Smith, David Eugene (1923). *History of Mathematics*. Vol. 1. Boston: Ginn and Co. (Reprint, New York: Dover, 1958.)

—— (1925). *History of Mathematics*. Vol. 2. Boston: Ginn and Co. (Reprint, New York: Dover, 1958.)

Swetz, Frank J. (1994). *From Five Fingers to Infinity*. Chicago: Open Court