Biographical Encyclopedia of Astronomers

Callippus of Cyzicus

Born Cyzicus (near Erdek, Turkey), circa 370 BCE

Died possibly Athens, (Greece), circa 300 BCE

Callippus, a fellow citizen and follower of Eudoxus, is best known for his modifications to the Greek lunar calendar and to Eudoxus' model of the planetary spheres

Callippus made observations from the Hellespont and moved circa 334 BCE to Athens, where he associated with Aristotle. To improve the accuracy of Eudoxean planetary models, Callippus added two spheres to the model of the Sun, two to that of the Moon, and one each to the models of Mars, Venus, and Mercury. The two new spheres assigned to the Sun accounted for its unequal motion in longitude, which Meton and Eudoxus had discovered a century earlier but Eudoxus ignored. Callippus assigned 94, 92, 89, and 90 days to the northern spring, summer, autumn, and winter, respectively. (The error in these numbers ranges between 0.08 and 0.44 days.) Presumably, the two new spheres for the Moon performed a similar task. We do not know the exact purpose of the supplementary spheres in the case of Mars, Venus, or Mercury

Callippus' most significant contribution to astronomy rested in a better adjustment of the lunar calendar used by the Greeks to the solar year. He replaced Metonic's 19-year cycle with a 76-year cycle. Metonic's scheme provided for the intercalation of 7 months in the course of 19 lunar years and the regular elimination of 1 day from some of the 30-day months. If the rules were followed properly, the cycle would comprise $(19 \times 12) + 7 = 235$ months, of which 110 had 29 days, making a total of 6,940 days. Since 19 tropical years amount to 6,939.6 days, the Metonic calendar errs, on average, by a little more than 30 minutes a year Callippus' scheme of $4 \times 19 = 76$ years intercalates $4 \times 7 = 28$ months, but subtracts 1 day from each of 441 months, and therefore comprises 27,759 days. Since 76 tropical years amount to 27,758.4 days, the Callippan calendar errs, on average, by only 11.3 minutes of a year[1], which is the accuracy of the Julian calendar.

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