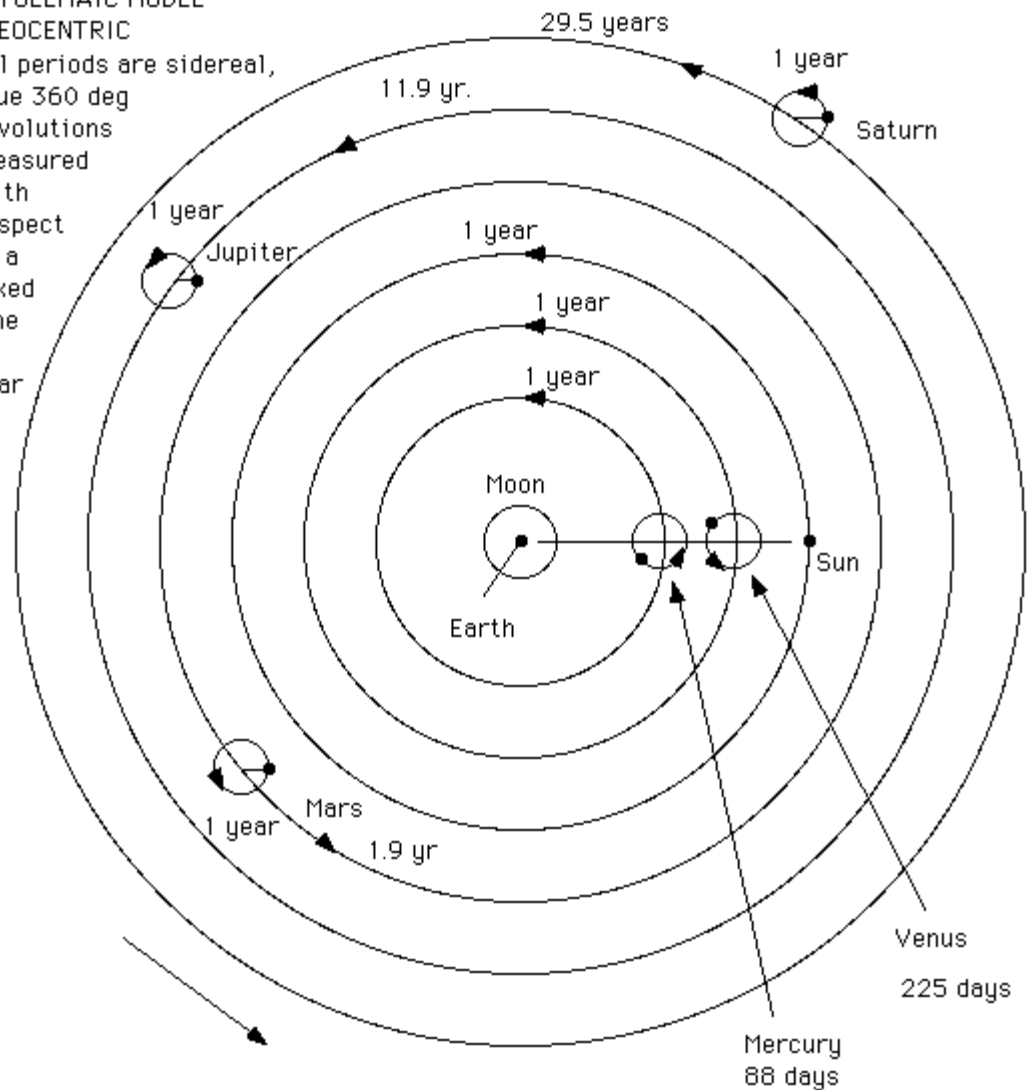


PTOLEMAIC MODEL  
GEOCENTRIC

All periods are sidereal,  
true 360 deg  
revolutions  
measured  
with  
respect  
to a  
fixed  
line  
or  
star



Direction of Revolution toward east, counterclockwise  
as seen from above the north pole.

Claudius Ptolemy (ca. 100 - 170 A. D.), Alexandria. Published synthesis of greek  
astronomy in the "Almagest".

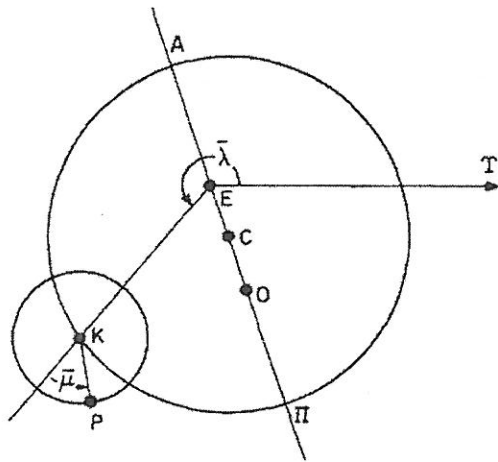


Fig. 1. Ptolemy's theory of longitudes for Venus, Mars, Jupiter, and Saturn.

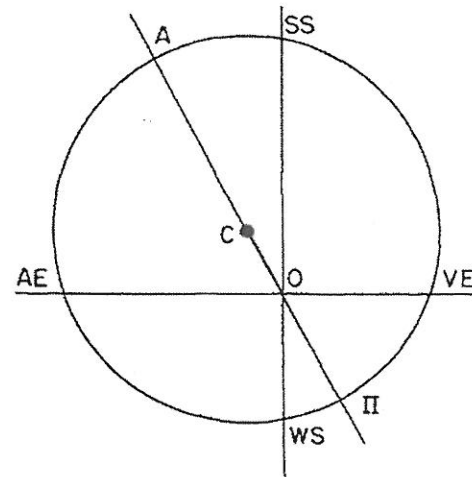


Fig. 3. Hipparchos' solar theory. The line of apsides  $A\Pi$  has been added to Fig. 2.

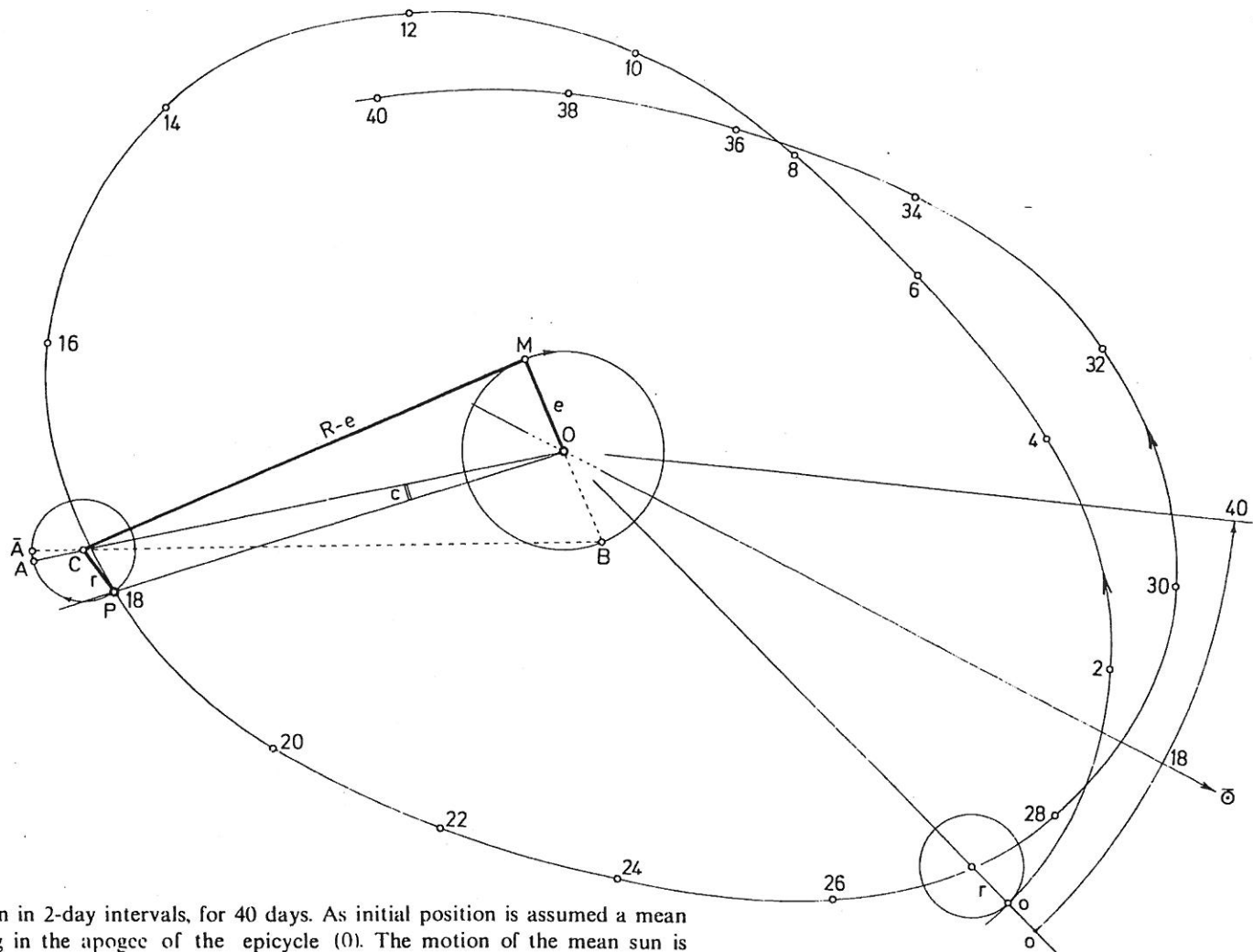


Fig. 88. Positions of the moon in 2-day intervals, for 40 days. As initial position is assumed a mean conjunction, the moon being in the apogee of the epicycle ( $O$ ). The motion of the mean sun is indicated by the arrow from  $O$  over 18 to 40. The elongation for day 18 is  $219 \frac{1}{2}^\circ$ . Drawn to scale