

## Books IV and V of Kepler's *Epitome*: An Overview

“... all the more strange to them [readers] would be this Fourth Book, which airs so many new and unthought-of things concerning the whole nature of the heavens – so that you might doubt whether you were doing a part of physics or astronomy, unless you recognized that speculative astronomy is one whole part of physics.” (p. 5)

### Book IV

Part I: System of the world, pp. 13-47 (of Prometheus ed.)

1. On the Principal Parts: p. 16, no solid spheres
2. On the Place of the Sun at the center: true Sun, p. 20
3. On the order of the movable spheres

With respect to the perfect solids p. 23ff

The harmonies: p. 31-32

4. On the ratios of the Principal Bodies to one Another  
on imperceptibility of annual stellar parallax: p. 43ff

Part II: On the Movement of Bodies: pp. 47-88

1. How many and what sort of movements  
denial of motion of fixed stars
2. Concerning the Causes of the Movements: pp. 48-55  
"inertia" and the need for a motive force

3. On the Revolution of the Sun about its Axis, and Its Effects: pp. 55-65

solar magnetic emanation: pushing planets

strength varies inversely with distance

p. 63: why not as inverse-square, like light

4. On the Causes of the  $3/2$  Power Ratio: pp. 65-67

5. On the Annual Movement of the Earth: pp. 67-88

p. 67: five questions

p. 68: appeal to phases of Venus

p. 70: eight reasons for true Sun

pp. 71-76: eighteen reasons to reject Tycho's

pp. 78-88: rotation of Earth, Jupiter; Moons

Part III: On the Real and True Irregularity of the Planets and its Causes (pp. 88-120)

1. The causes of the true irregularities: pp. 88-93

three part answer: p. 89

2. On the Causes of Irregularity in Longitude: pp. 93-94

laws of variation in speed: lever, balance analogy

3. Causes of Irregularity in Altitude (i.e.  $r$  or  $SP$ ): pp. 95-106

p. 98: no interaction between planet and Sun

p. 99: basic account

pp. 101-105: thread displacement, restoration; precession of apsides

4. On the Movement of the Latitude: pp. 106-112

basic answer: pp. 106-107

pp. 107-112: why inclination at all; why different from one to another

5. On the Twofold Irregularities of the Moon and Their Causes: pp. 112-120

basic answer: pp. 113-114

precession of the line of apsides: p. 117

### Book V (pp. 124-164)

#### Part I: On the Eccentric Circles or Schemata of the Planets (pp. 124-146)

p. 125: basic answer (figure)

p. 127: seven tasks

1. Concerning the Increment in Libration: p. 128

why sinusoidal (p. 129); balance (p. 131)

2. On the Sum of the Libration Gone Through With (p. 133)

(i.e. the cumulative or progressive change in  $r$ )

3. On the Figure of the Orbit: pp. 135-139

i.e. circumscribed circle, eccentric anomaly, and varying  $r$

4. On the Measure of Time (with apology for statement in *Astronomia Nova*):  
pp. 139-143

5. On the Equivalence of the Circle of the Plane and the Plane of the Ellipse in  
Measuring Delays: pp. 143-145

"Kepler's problem"

6. On the Regularity of the Digression in Latitude: pp. 145-146

i.e. motion of the nodes

Part II: On the Astronomical Terms Arising From Calculations and the Eccentric Orbit (pp. 146-164)

(an explanation of important terms)

1. Concerning Designation
2. Concerning Libration
3. Concerning the Delay of the Planet in any Arc
4. Concerning the Angle of the Sun
5. On the Digression of the Planets Away from the Ecliptic
6. On the Movement of the Apsides and Nodes

For the contents of the first three books, see p. 4; for the contents of Books VI, on the individual orbits, and VII, see p. 164; the following is from Book VI:

	Aphelium.	Medium.	Perihelium.	Eccentricitates qualium semidiameter est 100000.
Saturni . . . . .	1005207.	951000.	896793.	5700
Iouis . . . . .	544708.	519650.	494592.	4822
Martis . . . . .	166465.	152350.	138235.	9263
Orbis Magni . . .	101800.	100000.	982000.	1800