Field, J. V.
Kepler's geometrical cosmology. (English) Zbl 1091.01500
Chicago, IL: University of Chicago Press (ISBN 0-226-24823-2). xx, 243 p. (1988).

This important study of the geometry that Kepler brought to bear to the interpretation of the cosmos focuses mainly on the two editions of the Mysterium cosmographicum (1596 and 1621) and on the Harmonices mundi libri V published in 1619. The author discusses Kepler's debt to Plato's Timaeus (which he took for a commentary on the Book of Genesis) and Proclus's Commentary on the first book of Euclid's Elements. The cosmological theory of the Mysterium cosmographicum explains the spacing between neighbouring planetary orbits by the relations between the circumspheres and inspheres of the five Platonic solids. Kepler's procedure is analysed and his dependence on Book XIII of Euclid's Elements is pointed out.

Of the five books that make up the Harmonices mundi, the first two deal with geometry, the third with musical theory discussed in terms of the properties of certain arithmetical ratios, and the last two apply the mathematical and musical theorems to the interpretation of aspects and the structure of the Solar System. Book II is particularly interesting since it contains Kepler's description of two new regular polyhedra, and his lengthy proof by exhaustion that there are exactly thirteen convex uniform polyhedra, namely the Archimedean solids.

The book under review is a useful corrective to the all too common way of describing Kepler as a mystic who juggled with numbers. He was a first-rate geometer who knew that the structure of the universe is mathematical through and through, and the three laws that go under his name proved him right.

Reviewer: William R. Shea (MR: 89d:01021)

MSC:

01A45	History of mathematics in the 17th century	Cited in **7** Documents
01-02	Research exposition (monographs, survey articles) pertaining to history and biography	

Biographic references:

Kepler, Johannes