Benno Artmann
Euclid. The Creation of Mathematics
 New York: Springer-Verlag, 1999

Reviewed by Kim Williams

In spite of our age's growing familiarity with non-Euclidean geometries, applied geometries in the building trades remain for the most part firmly Euclidean. As far most builders are concerned, two parallel lines do not ever intersect, nor should they, and to this we owe our confidence in buildings with plumb vertical walls and right angles. Up until the advent of CAD/CAM technology, almost all architectural projects were visualized in drawings constructed with compass and straightedge using drafting techniques that are traceable to Euclid. So for architects and historians wishing to understand the roots of architectural expression, perhaps the most important mathematics book of all times is Euclid's *Elements*. However, in spite of the fact that the geometry that most of today's architects studied in primary and secondary school was Euclidean, reading *The Elements* remains a daunting task. Therein lies the importance of this present book by Benno Artmann. Long a scholar of Greek mathematics, Dr. Artmann accompanies the reader of Euclid with a chapter-by-chapter summary and explanation of key concepts. But the book does more than just *illuminate The Elements*, necessary as that may be; it also places its key concepts in their historical context. In fact, this is two books, one nested inside the other.

The book is prefaced by a note from the author and brief introductions to *The Elements*'s historical context and contents, which set the stage for the analysis that follows. Interspersed between chapters analyzing *The Elements* are chapters entitled "The Origin of Mathematics", in which Artmann tells us what is happening behind the scenes, as it were. For example, Chapter 4 deals with Book I of *The Elements*, and follows the convention adopted by Euclid himself: first definitions, postulates and common notions are discussed, followed by a discussion of the theories. But Chapter 5, "Parallels and Axioms" ("The Origin of Mathematics 2"), tells us what has been so important historically about the parallel axiom. This is what cannot be gleaned by reading *The Elements* alone; this is what so delighted me about Artmann's book.

Architects and architectural historians reading this book will be interested to see how many architectural examples Artmann has included to illustrate Euclid's concepts. A plan of the Tholos of Delphi decorates the cover; *The Elements* themselves are illustrated as a map of a castle, the *Castrum Euclidis*, at the book's end. In the introduction, Artmann writes, "Knowing Euclid's *Elements* may be of the same importance for a mathematician today as knowing Greek architecture is for an architect". Those who are familiar with Artmann's other work will not be surprised at his affinity for architecture. Among other publications, he contributed a paper on the mathematics of Gothic tracery to the Nexus '96 conference on architecture and mathematics, which appears in the book *Nexus: Architecture and Mathematics*.

I found *Euclid: The Creation of Mathematics* accessible and well-written. The illustrations are by the author and are clear and helpful. I doubt if I shall ever turn to Euclid again without referring to Artmann.

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The reviewer

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