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Geometry and arithmetic in the medieval traditions of Euclid's *Elements*: a view from Book II. (English summary)

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Sabetai Unguru's 1975 paper "On the need to rewrite the history of Greek mathematics" [Arch. History Exact Sci. **15** (1975/76), no. 1, 67–114; MR0504604 (58 #21009)], in which he argued that the then-current algebraic understanding of the geometric propositions of Book II of Euclid's *Elements* seriously undermines proper reflection on how the Greeks understood it, set off a firestorm that eventually helped to reshape the historiography of mathematics. This article attempts to build directly from Unguru by developing a nuanced approach to various medieval editions and recastings of the content of Book II. The major issue, then and now, is the struggle over Euclid's strict distinction between a purely geometric approach in Book II (dealing with magnitudes in general), and his arithmetic approach in later books (dealing with numbers). The various medieval authors (al-Khwārizmī, Abū Kāmil, Thābit ibn Qurra, and al-Nayrīzī in Islam; Abraham bar Ḥiyya, the *Liber Mahameleth*, Fibonacci, Jordanus Nemorarius, Campanus, Levi ben Gerson, and Barlaam in Latin Europe) all take differing but related approaches to either upholding the barrier or breaking it down. Some rely on the authority of geometric methods while others lean toward numerical proofs, even in some cases a sort of proto-algebra; some keep the content completely general, while others mix in specific numeric examples of the theorems.

The analysis in this paper provides much-needed linguistic and conceptual distinctions, opening a door to approaches to these texts that are more respectful of their historical contexts. It is an important contribution to work in this manner from Unguru's paper, and one hopes that will take less than 40 years for the story to be elaborated further.

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Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.