**The *Structure of Scientific Revolutions* in Ancient Greek Mathematics**

***Dr Michalis Sialaros***

In 1975, Unguru’s paper ‘On the Need to Rewrite the History of Greek Mathematics’ caused a heated debate among leading historians. Although the original discussion was focused on a rather specialised subject, i.e. the possible algebraic character of a part of Greek mathematics, it constituted a reason to undermine the methodological foundations of the traditional historiography. Among the prime subjects that concerned historians and philosophers of science in the ‘80s was the relationship between the events that followed Unguru’s publication and Kuhn’s (1962) well-known picture of the growth of science as consisting of regular periods interrupted by occasional revolutions. Originally, most of the debates were focused on whether scientific revolutions may happen in the field of mathematics, but, at a later stage, the discussion was focused on historiography. There appears to be a consensus that, in this field, scientific revolutions may actually happen, and Unguru’s intervention, in all probability, started one. Our aim is to discuss this conclusion.

**Essential Pre-reading**

1. Kuhn, T.S., 1962. The Structure of Scientific Revolutions, Chicago Press 1970, Chicago.
2. Euclid’s elements book II, propositions 1-4 (in Heath, T. L. (ed.), (1956), *The thirteen books of Euclid's Elements* (2nd edn., New York: Dover) **[vol. i, pp. 375-382]**.
3. Van der Waerden, B. L. (1954), *Science Awakening*, trans. A. Dresden (Groninger: Noordhoff) **[pp. 71-2, 118-126, 265-266]**.
4. Unguru, S. (1975), 'On the Need to Rewrite the History of Greek Mathematics', *The Archive for the History of Exact Sciences,* 15 (1), **67-114**.
5. Crowe, M. (1992), 'Afterword: A revolution in the historiography of mathematics?', in D. Gillies (ed.), *Revolutions in Mathematics* (Oxford: Clarendon Press), **306-16**.
6. Berggren, J. L. (1984), 'History of Greek Mathematics: A Survey of Recent Research', *Historia Mathematica,* 11, **394-410**.

**Selected Bibliography**

1. Dauben, J. (1984), 'Conceptual revolutions and the history of mathematics: two studies in the growth of knowledge', in D. Gillies (ed.), *Revolutions in Mathematics* (Oxford: Clarendon Press), 49-71.
2. Freudenthal, H. (1975), 'What is algebra and what has it been in history', *The Archive for the History of Exact Sciences,* 16 (3), 189-200.
3. Fried, M. and Unguru, S. (eds.) (2001), *Apollonius of Perga's Conica: Text, Context, Subtext* (Leiden: Brill). [chap. I: ‘GEOMETRIC ALGEBRA’].
4. Fowler, D. H. (1994), 'Could the Greeks have used mathematical induction? Did they use it?', *Physis,* 31, 252-65.
5. Grabiner, J. (1975), 'The Mathematician, the Historian, and the History of Mathematics', *Historia Mathematica,* 2, 439-47.
6. Grattan-Guinness, I. (2004), 'The mathematics of the past: distinguishing its history from our heritage', *Historia Mathematica,* 31, 163-85.
7. Saito, K. (1998), 'Mathematical reconstructions out, textual studies in: 30 years in the historiography of Greek mathematics', *Revue d’ histoire de mathematics,* 4, 131-42.
8. Unguru, S. (1991), 'Greek mathematics and Mathematical Induction', *Physis,* 28, 273-89.
9. Unguru, S. (1994), 'Fowling after induction', *Physis,* 31, 267-72.
10. Unguru, S. (1979), 'History of Ancient Mathematics: Some reflections on the state of the art', *Isis,* 70, 555-65.
11. Van der Waerden, B. L. (1975), 'Defence of a shocking point of view', *The Archive for the History of Exact Sciences,* 15 (3), 199-210.
12. Weil, A. (1978), 'Who betrayed Euclid', *The Archive for the History of Exact Sciences,* 19 (2), 91-93.