The Worlds of Oronce Fine: Mathematics, Instruments and Print in Renaissance France edited by Alexander Marr

Reviewed by
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This is a collection of papers first presented at a conference entitled 'The Worlds of Oronce Fine: Mathematics, Instruments and Print in Renaissance France' and held in the School of Art History, University of St Andrews, 12–14 May 2006. Its goal is

> [to] bring this much neglected polymath [Oronce Fine] to the attention of a new audience. The essays gathered here aim to cast fresh light on Fine and his myriad activities, placing him within the broad socio-intellectual context of Renaissance Europe and demonstrating his important contribution to the worlds of mathematics, instruments, and print. [9–10]

The introduction [ch. 1] and epilogue [ch. 13] are excellent in unifying the content of the essays. Alexander Marr (introduction) briefly describes the scholarship about Fine and explains the need to reevaluate the role of this mathematician. Fine's biography is presented and a short abstract of each paper is added. Stephen Clucas (epilogue) gathers the main ideas stressed through the book.

Chapters 2 and 3 show how Fine fought for a strong institutional and epistemological foothold for 'embedding mathematics in sixteenth-century French intellectual culture' [10]. Isabelle Pantin looks at the material context of Fine's teaching (his appointment, the teaching of mathematics at the Collège Royal, the program of studies that he promoted) and Angela Axworthy looks at Fine's epistemological views on the status of mathematics, inscribing them in the tradition that extends from Antiquity to the celebrated *Quaestio de certitudine mathematicarum.* Fine's opinion is a commonplace firmly rooted in ancient and modern authors (Ptolemy, Proclus, Regiomontanus); still, it clarifies the program and approach that Fine

intended to put into practice. Axworthy's essay should be paralleled with section 5 of the preceding chapter ('Defending Mathematics' [24]) and is, in a way, complemented by chapter 4.

The next six chapters deal with what may be called Fine's 'theoretical practical mathematics', if one wants to use Mosley's expression. These chapters emphasize Fine's focus on practical, and not pure, mathematics, but stress that although concrete problems are addressed, they are always presented in a theoretical manner and within a bookish tradition that treats applied mathematics as an 'affair of paper, print and drawings', to use Dupré's expression [82]. One might say that this group of papers considers Fine's practical mathematics as *epistēmē* and not as *technē*. The latter is to be found in the instruments made by Fine; the former always includes theoretical reasoning. Fine comes out as a pragmatic mathematician able to negotiate theory and mathematical practice.

In the fourth chapter, Jean-Jacques Brioist inscribes Fine's practical geometry in the two traditions of practical geometry that existed before: the one initiated by Hugh of St Victor, which focused on the 'use of instruments in solving practical geometrical problems' [54], and the one which originated with Italian abacus books and dealt with problems of measuring lines, surfaces, and volumes (height of a tower, breadth of a river, depth of a well, for instance). The author examines the concept of 'practical mathematics' and emphasizes that this practical geometry is idealized; this can be seen, for instance, in the illustrations which show the problems faced by the men making actual measurements. The usefulness of mathematics is a commonplace referred to by mathematicians since Antiquity, and this chapter can be paralleled with the previous one on the status of mathematics.

The fifth chapter focuses on *De speculo ustorio*, one of the first works on optics to be published in France, and explains its sources and the influence it had in Italy. Sven Dupré uses *De speculo ustorio* to determine where is the correct place between theory and practice to assign Fine's work. He concludes that practical mathematical knowledge is not the same as material knowledge because the instruments which Fine presents are truly mathematical objects, and that the work itself belongs to a long bookish tradition and should not be interpreted as the craft of the mirror-maker [82].

Chapter 6 searches for the sources and influence of *De solaribus horologiis*, whether in real instruments or books. Catherine Eagleton shows that Fine was able to correct some inaccuracies of previous works and brought 'some geometrical order to the enormous variety of sundials available' [89]. The pioneering role of Fine is stressed: through the compilation of *De solaribus horologiis*, Fine helped to create a new genre, the sundial book. The theme is very interesting and some additional bibliography on sundials would be most welcome.[1] Anthony Turner [ch. 12] further deals with Fine's waterclock, one of his most famous inventions, referring to earlier descriptions of the clepsydra and to the interest in it up to the 18th century.

Chapters 7–9 deal with Fine's cosmography, geography, and cartography. Jean Marc Besse deals with the definition of cosmography and geography in the Renaissance context; Adam Mosley proposes

> [to] explore two related issues raised by this text [= *De Cosmographia, siue sphaera mundi*]: the character and significance of Fine's cosmographic work, and the nature of the Early Modern genre of which it was such an apparently successful example. [114]

Brioist explains Fine's complex cartographical methods, which mix up several techniques that do not match the methods described in his mathematical works.

Chapter 10 explains the true agenda underlying Pedro Nunes' criticism of Fine. Henrique Leitão convincingly shows that Nunes needed to establish his credentials as a young mathematician. Nunes' criticisms are, therefore, not only a piece of scientific refutation but a self-promoting *libellum*.

Chapter 11 shows Fine's importance by looking at his influence in the French algebraic tradition. There follows an index of names and subjects and some 48 pages with images of various kinds (instruments, pages from books, schemes, maps).

The absence of monographs and the low number of articles about Fine have made him a forgotten character. However, this modest academic output does not match Fine's influence. This book fills the

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[1] A trivial editing mistake erased the picture of Clavius' work on gnomonics referred to on page 97; on the previous page, the Columba of Kircher is referred to as 'fig. 6.6', while one should read 'fig. 6.7'.

lacuna and reveals Fine's importance by looking at his pivotal and triggering role in the mathematical culture of the 16th century. It is not about saving Oronce Fine's ability as an original mathematician, which he was not, but more about stating how much he can help us understand the mathematical culture of the 16th century, which he definitely helped shaping. Fine's failure as a top mathematician appears counterbalanced by his prolificacy and success as a polymath. Stress is put, on the other hand, on his success in establishing roots for the mathematical developments that were still to come. He was the teacher of mathematicians as famous as Pierre de la Ramée, Jacques Peletier, or Pierre Forcadel, who were to pave the way for Descartes and Viète; he wrote or edited 74 books, ranging across practical geometry, arithmetic, gnomonics, optics, music, astronomy, and cosmography; he is quoted by authors across Europe and earned, more than suffered, the criticisms of Pedro Nunes or Cristopher Clavius, who took advantage of his influence and editorial success to expand their own mathematical reputations. This is the perspective one finds here: no big claims, just a shift in perspective and a factual look at the materials available.

The result is an unpretentious book, clearly organized and broad enough to cover all fields of mathematics to which Fine dedicated himself. The reader will find an overall perspective of Fine's activities, roots, goals, achievements, influence, and context. What comes out is a highly productive scholar, deeply committed to bring mathematics back to life in academic institutions and society, an innovator (he was the first man to print books in France on topics such as burning mirrors) who was not afraid to address difficult mathematical problems or to provoke his fellow colleagues, a man striving to balance family life with work.

Although the book is a collaborative work, the structure of the essays is common, always relating content and context by presenting the sources, influence, and background of Fine's work. The editorial work is excellent; the introduction and epilogue unify the whole; all this, and the high standards of the contributions, give the book a high degree of unity and quality. As stated in the first paragraph of this review, new audiences are especially addressed and for this reason the mathematics never gets too technical.