

Anthony Gerbino and Stephen Johnston. *Compass and Rule: Architecture as Mathematical Practice in England*.

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This book accompanies the exhibition of the same title held at the Museum of the History of Science in Oxford in late 2009, and at the Yale Center for British Art, New Haven, in early 2010. Jointly authored by an architectural historian (Gerbino) and a historian of science (Johnston), *Compass and Rule* has two primary aims: firstly, to demonstrate the rootedness of architectural practice (principally technical drawing) within a wider culture of mathematical practice; and secondly, to show how the “reiterated bond between architecture and mathematics” (11) contributed to the development of the architectural profession in England.

The intellectual origins of this book lie in the work of another historian of science, J. A. Bennett. In *The Mathematical Science of Christopher Wren* (1982), Bennett persuasively located the totality of Wren’s career — the architecture and the science — within an indigenous culture of practical mathematics. This culture was famously mapped out in John Dee’s “Mathematical preface” of 1570, where, with a magician’s deftness, Dee managed to situate architecture within the realm of mathematical practice (owing to its geometric basis), while at the same time locating the whole of mathematical practice within the realm of architecture (owing to Vitruvius’s broad formulation of architecture). With equal deftness, Bennett located the seemingly multifarious nature of Wren’s career within the Vitruvianism of English mathematical practice.

Gerbino and Johnston take a much broader view of mathematics, but their book is strongest when they relate English architecture to the specific culture of mathematical practice as defined by E. G. R. Taylor in the 1940s and ’50s. An early chapter, for example, explores the origins of scale drawing in the necessities of cannon warfare. This is followed by a chapter on instrumentation — the compasses and rules of the title — which, the authors demonstrate, became emblematic of the technical skill and professional status of their users. This is nicely illustrated by a series of little-known early Stuart portraits, in which the sitters proudly display their instruments. When viewed alongside the skilful draughtsmanship of Robert Smythson (1534/35–1614), the implicit claims of these pictures seem entirely justified.

These chapters act as a prelude to the middle section of the book on Christopher Wren. The juxtaposition of Wren’s early drawings with those of earlier mathematical practitioners is highly revealing, serving to emphasize and contextualize the skilful nature of his technical draughtsmanship. The machined precision of his early design for remodelling Old St Paul’s Cathedral (fig. 81; cat. no 43), for example, stands in telling contrast to Inigo Jones’s earlier proposal for the same (fig. 60), which was executed with a quill rather than a drawing pen, and with less recourse to a ruler. Viewed in this context, Wren’s technical facility becomes consistent with his duties as Savilian Professor of Astronomy at Oxford, one of two chairs founded in 1619 for the furtherance of mathematical studies in England.

But was the reverse true? Did Wren's tenure of the Savilian professorship qualify him, in the eyes of his contemporaries, to practice architecture? This brings us to Gerbino and Johnston's wider claims regarding the mathematical basis of architectural design and the legitimization of the architectural profession through its intersection with mathematics. The authors' notion of mathematics is grounded in instrumentation, and they resist the temptation to trace geometric schema underpinning Wren's designs. English mathematical practice was more concerned with utility than metaphysics — as Bennett once observed, it was more Vitruvian than Platonic. My own analysis of Wren's drawings is consistent with this: the mathematics almost always follows the design, seldom the other way round.

In an important coda to the book, however, Gordon Higgott reveals a colossal exception. The dome of St Paul's Cathedral, he shows, was designed with reference to Robert Hooke's formula for a "cubic parabola." Wren's recourse to mathematical theory on so conspicuous a scale helps us to understand the supreme confidence with which he diagnosed the structural failings of large-scale medieval buildings. Rooted in his understanding of statics and forces, his unshakable belief in what he called "the geometrical . . . the most essential part of architecture" played an important part in establishing his credibility as an architect and surveyor.

But it is harder to explain his contemporaries thus. Roger Pratt and Roger North certainly delighted in instrumentation, but to attribute the phenomenon of the gentleman architect to their technical facility runs the risk of mistaking effect for cause. It was they themselves that made architecture polite, and they defined themselves as architects not by recourse to instrumentation or mathematics, but by a new kind of architectural knowledge, best described as connoisseurial, that was grounded in foreign travel, architectural publication, and — eventually — academy culture. Mathematics therefore becomes less central to the formulation of English architectural culture as the book progresses, a process of waning that might have been explored in a conclusion.

The interdisciplinarity of *Compass and Rule*, however, is genuinely revelatory, and that emphatic conjunction in the book's subtitle, "Architecture as Mathematical Practice," is brilliantly justified, especially for the Tudor and early Stuart periods. By inviting us to think afresh about how architecture was conceived and practiced in early modern England, *Compass and Rule* makes an uncommonly sophisticated contribution to British architectural history.

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