making a clear historiographical intervention. Tellingly, the evolutionary theory set out in the introduction does not recur. And the essays share many references to key texts without establishing cross-references to each other's use and interpretation of them. For a work about cross-referencing and how the total can be more than the sum of its parts, this seems remiss. Brill's lack of copyediting has not done favors to the many authors whose first language is not English, as the errors and idiosyncratic language distract from their substantive contributions. But these are mere issues of style and presentation, and come from disappointment that the high standards of the individual intellectual contributions did not get translated more broadly.

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Visual Culture and Mathematics in the Early Modern Period.
Ingrid Alexander-Skipnes, ed.
Visual Culture in Early Modernity 59. London: Routledge, 2017. x + 204 pp. $160.

In the past two or three decades research has demonstrated the integration of mathematics into the arts of the Renaissance. From Martin Kemp's *The Science of Art* to the catalogue of the excellent 2015 exhibition in Reggio Emilia entitled *Il disegno tra arte e scienza*, there has been ample evidence of artists borrowing from mathematics and other sciences for artistic purposes and in turn contributing to mathematical knowledge. The present volume contains eight essays that address several perspectives on this integration. Ingrid Alexander-Skipnes introduces the essays and contributes a spirited exploration of Raphael's knowledge of mathematicians as exemplified in the foreground of his *School of Athens*. Her introduction provides summaries of the essays and places them in the context of recent understandings of the relationship of the arts and mathematics. The introduction at times returns to an earlier moment when the integration had to be demonstrated. A significant alternative would have been to explore more controversial residual questions and to pose new ones.

The introduction would also have benefited from an interrogation of the meaning of the title's "visual culture." What constitutes a visual culture and, beyond the integration of mathematics and the arts, what was the specific visual culture of early modern Europe? How was it different from the preceding and subsequent periods? Angeliki Pollali addresses this problem in her analysis of Francesco di Giorgio Martini's *Trattati*, in which she reviews Rudolf Wittkower's interpretation of architectural history, specifically the idea that geometry dominated in the Middle Ages while arithmetic emerged dominant in the Renaissance. Pollali demonstrates that Francesco di Giorgio based his architectural plans on geometrical forms, and especially the square, and that the numbers are added on after and unnecessarily, thereby disputing the Wittkower generalization.

Another line of fruitful inquiry is the question of the nature of visual culture of lesser artists, not to mention the common person, who theoretically was a participant in the

visual culture. The introduction and the essays draw evidence recurringly from relatively few artists (Brunelleschi, Leon Battisti Alberti, Piero della Francesca, Francesco di Giorgio, Dürer, and Leonardo da Vinci). What do we know of the visual culture of Nanni di Banco, Parmigianino, and other non-scribal painters? Why are other major artists unmentioned, Michelangelo for example? Michael Landrus does observe that "Michelangelo de-emphasized the roles of mathematics and proportion in his work" (63). Was Michelangelo outside the book's visual culture?

In an essay that returns the reader to the fundamental elements of a visual culture, Caroline Fowler examines treatises on drawing and painting from Alberti to Hogarth. Her thesis is that treatises and painting practices of the Quattrocento posited the point as the basic element for designs and paintings while by the seventeenth century the moving line had become the fundamental element. The essay demonstrates the fruitfulness of concentrating on an artistic problem or practice rather than a specific artist in order to provide insightful reflections on the visual culture. Rangsook Yoon addresses the fundamental importance of Euclidian geometry and proportion in the visual culture through the prism of Dürer's instructions on forming alphabet letters. Another purported fundamental element of Renaissance visual culture was the predominance of Platonism, which John Hendrix has knowledgeably explicated.

Two essays, in addition to the editor's discussion of Raphael, examine artistic practice. Perry Brooks is interested in how Piero della Francesco structured his paintings. Brooks assumes that, since Piero wrote treatises on proportions and geometry, he would have utilized his mathematical knowledge in forming his paintings. This hypothesis leads to his application of numerous lines over Piero's *Resurrection* to find its underlying structures, especially those derived from π and the divine proportion. Renzo Baldasso and John Logan look again at the *Portrait of Luca Pacioli and Gentleman* (Jacopo de' Barbari?). In it they find a "portrayal of mathematical humanism," a result of Pacioli's instructions on a sophisticated geometry to the painter. Here again the divine proportion is central to the interpretation.

In total the volume reminds the reader of the intimate involvement of mathematics in the arts that are frequently regarded as making up a visual culture. The essays recount specific episodes of how thoroughly mathematics was incorporated into artistic thinking.

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Memory in Early Modern Europe, 1500–1800. Judith Pollmann. Oxford: Oxford University Press, 2017. xii + 232 pp. $39.95.

This recent contribution by Judith Pollmann to the thriving area of early modern memory studies targets a readership (student as well as researcher) engaged primarily in the disciplines of history and cultural studies. It is throughout characterized by an impressive