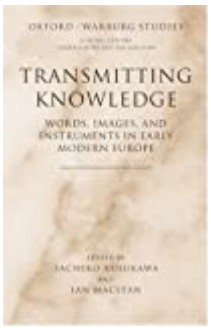
H-Net Reviews
in the Humanities & Social Sciences



Sachiko Kusukawa, Ian Maclean, eds. *Transmitting Knowledge: Words, Images, and Instruments in Early Modern Europe (Oxford-Warburg Studies).* Oxford: Oxford University Press, 2006. 296 pp. $210.00 (cloth), ISBN 978-0-19-928878-6.

Reviewed by Daniel Christensen

Published on H-German (November, 2008)

Commissioned by Susan R. Boettcher

The Interplay of Text and Image in the History of Early Modern Science

This collection of essays, edited by two early modern historians and historians of science, presents nine case studies from the intellectual history of science and intends to accomplish two things. One goal is to examine the production and transmission of scientific knowledge by way of texts, images, and the instruments of early modern science. A connecting thesis concerns the adroit manipulation of textual and visual representations by natural philosophers and the institutions and patrons behind them for their own ends, always with an eye to targeted recipients. A second goal of the book is to cross disciplines: to show by the evidence of these essays how the history of early modern science benefits from and can fruitfully interact with what is called "the history of the book." The authors make the point that a proper understanding of early modern science must understand how vehicles of transmission (such as anatomical diagrams or images of sun dials) affected the reception of the intended content. Ideas, presentations of experimentation, and collections of images and diagrams from the early modern period can be better understood today when we take into account such things as cultural contexts, changes in manuscripts, practical and financial interests of transmitters, and the interests and goals of the intended and unintended audiences of this knowledge.

The book arose from a workshop hosted by the Herzog August Bibliothek in 2004, sponsored by the European Science Foundation as part 4 of a four-part project entitled "From Natural Philosophy to Science 1200-1700." Sachiko Kusukawa oversaw Team 4 and is a co-editor of the book, along with Ian Maclean. While traditional history of science topics are examined, such as the works of RenÃ© Descartes, Andreas Vesalius, and others, the focus of this book falls on production (with an emphasis on illustrations), transmission (and changes over time and place), and reception of ideas by different audiences. We learn quickly from reading these essays how complex the intellectual history of early modern science has become, and rightly so, and at the end of the book we come away with an appreciation of scientists' and thinkers' deft understanding of the best vehicles available to them for the

transmission of their knowledge to the wider world.

Richard Scholar's introduction lays out the intent and framework for the collection. The essays provide in-depth examinations of the literary production and transmission of knowledge. The focus remains on the ways in which knowledge was constructed by the natural philosophers, such as the use of images and diagrams to make their content more intelligible to a wider audience (as with the case of Kepler's *Epitome* [1617-1621]). Any study of the history of science that analyzes texts alone and ignores how these texts were shaped, illustrated, and disseminated is–by implication–incomplete. Literary, visual, and instrumental content affected how the knowledge was presented and perceived; the framing and interaction of the media of the content had implications for the actual transmission of scientific knowledge.

Scholar outlines four aspects of the transmission of knowledge, providing a theoretical template for the very specific case studies that follow. They are: "content," "medium," "receiver," and "context." "Content" is the particular knowledge; "medium" is the vehicle of transmission, such as a book of anatomical drawings with accompanying text, and could also mean institutions that support transmission, such as universities or book fairs; "receiver" is used to mean intended and actual receivers of the content (and is preferred to the terms "reader" or "audience," probably because they are so hard to pin down); and "context" refers to "the questions or needs to which the act of transmission responds and/or the project it serves" (p. 6).

Sven DuprÃ©'s essay investigates strategies of visualization in the mathematical field of optics in the fifteenth and sixteenth centuries. Ettore Ausonio used both textual descriptions and images of a concave mirror to present his work to potential patrons and to show theoreticians a practical tool for their work. DuprÃ© demonstrates how a single device related to varying contexts, both practical and theoretical. The author challenges the thesis that the mathematical arts (in this case, optics) did not change their visual representation in this period, whereas the descriptive arts of botany and anatomy did; he finds significant variations over time in the visualization of optics. The geometrical diagrams of the medieval theorists changed, and when images changed, content did also. One also finds diversity in how images were communicated. One reason for the change was a desire by Ausonio and others to present practical knowledge to desirable patrons.

Catherine Eagleton's article concerns treatises on medieval sun dials. She argues two main points, albeit cautiously: first, typical sun dial publications demonstrate the transmission of content via all the vehicles of transmission–through text, images, and instruments; second, the corrupted and non-illustrated presentation of a particular sun dial (renamed by recipients the *organum ptolomei*) significantly shaped how its audience perceived it. The audience viewed this second type of sun dial differently due to its weaker presentation. Whereas the typical images of sundials (being *naviculae* following a standard design) conveyed more of what their creators intended, the latter example of an anomaly demonstrates how audience members could reconstruct, based on their own understandings, the scientific instrument for their own purposes. Instrument makers and mathematicians might do the same thing, Eagleton adds. Tiny changes that crept into diagrams and written explanations of sundials over time had the potential to alter designs of later instruments drastically. Just as contemporaries formed their information from a number of sources if possible, modern-day historians of scientific instruments need to rely on a multidisciplinary approach, Eagleton concludes, combining textual, visual, craft-mechanical, and scientific analyses to offer a more complete picture to us.

Sachiko Kusukawa takes on the important topic of whether the Scientific Revolution was a radically new phenomenon or a continuation of medieval learning with minor variations. She does so by looking at two illustrated books of the sixteenth century, one by Leonhard Fuchs on the history of plants and the other Vesalius's *Fabric of the Human Body* (1543). She argues that when one focuses one-sidedly on the illustrations of each book, one might see a radical new scientific program being presented in the realm of empirical observation. However, we are advised by Kusukawa to look at images and texts together as an interconnected, holistic presentation or discourse. When we analyze images and texts properly–presumably according to the introduction's four categories–we see these works as helpful comments on ancient learning, not as something wholly new. Both Fuchs and Vesalius wanted to present the ideal and the general, not to emphasize the new and different. Their texts stated this principle and their illustrations were intended as amplification. New information was to corroborate the general thinking of the ancients by elaborating on the "ideal" plant, physical form, and the like. This essay is a corrective to the recent interest in pictorial analysis of Renaissance works, which has

gone so far as to divorce images from their accompanying texts in order to see them on their own terms as valid discourses. Kusukawa and the other authors in the volume argue that images in scientific treatises can only be understood when they are analyzed as interconnected with accompanying texts and as one element in agendas of production and transmission.

Kusukawa argues for the complementary nature of texts and images in her chapter, as does Isabelle Pantin in considering how Kepler sought to use fresh images to make his *Epitome* accessible to a larger readership. The harmony of text with images could also go awry, however, as in the case of Descartes' publication of *Principia philosophiae* (1644). This is the subject of Christoph LÃ¼thy's essay. Descartes argued in his work for corpuscular theory and against an atom-based theory of natural phenomena, yet his book's abundant illustrations presented atomist imagery. The illustrations left Descartes' readers entirely confused as to what to make of the work regarding atomism. Alternatively, perhaps many of his readers believed that Descartes was advancing atomism. How did this happen? One explanation is that Descartes wanted images in his publication that would show small entities making up larger entities as a way to reveal God's detailed handiwork in creating the larger entities, and to show specific information for different kinds of phenomena. But his rationalism led him to plenary thinking, while his empirical side veered toward the particular and the non-plenary. As LÃ¼thy says, "Descartes's rational metaphysics keeps interfering with his visual atomist intuitions" (p. 114). LÃ¼thy's essay is persuasive and a treat to read. By taking the reader into an analysis of the interplay between text and image, it shows how the works of early modern intellectuals can become clear and distinct.

These case studies are careful examinations of intricate subject matter that, as the introduction claims at the outset, can only be understood after a multidisciplinary and complex analysis is completed of text plus image, content plus context, and intention plus reception. The illustrations throughout the volume are clear and helpful to the reader. Footnotes at the bottom of pages are refreshing. There is no bibliography and the index lists only personal names. The book is recommended for advanced readers in the history of science or scholars interested in the analysis of visual representations in early modern Europe.

Citation: Daniel Christensen. Review of Kusukawa, Sachiko; Maclean, Ian, eds, *Transmitting Knowledge: Words, Images, and Instruments in Early Modern Europe (Oxford-Warburg Studies).* H-German, H-Net Reviews. November, 2008.

URL: http://www.h-net.org/reviews/showrev.php?id=15495