Reconstructing Vernacular Mathematics: The Case of Thomas Hood's Sector

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Abstract

This article presents an account of my attempt to follow Thomas Hood's instructions for the inscription of two scales on the sector, as laid out in his *The Making and Use of the Geometricall Instrument, Called a Sector* (1598). This will allow us to identify those aspects of the work that he expected readers to infer for themselves. I will then piece together the ways in which readers might have inscribed the scales and build up a picture of the kind of background knowledge that the author expected of his readers. It was this knowledge that made it possible to communicate the tacit skills involved in instrument making through a book. We will find that much of the background knowledge required involved experience of manual techniques, rather than abstract principles. Thus, we will develop an understanding of the thoroughly practical nature of vernacular mathematics.

Keywords

sector, instrument, tacit knowledge, experience, knowledge transfer, reverse engineering, reconstruction

Introduction

In 1598, Thomas Hood (*bap. 1556, d. 1620*) published *The Making and Use of the Geometricall Instrument, Called a Sector*, which acted as a guide for readers interested in making a sector or in grasping the principles underlying the operation of the instrument. In this article I will use excerpts from Hood's book together with my own experience of working

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through the account, to explore the extent to which the book governed
the construction of the instrument. I will move from the written and
visual instructions in Hood’s account, to the practice required to inscribe
the sector’s scales through a process of “reverse engineering,” inferring
what to do to achieve the ends described by Hood. Contemporary read-
ers would have had to make similar inferences when reading Hood’s
book. Thus, the investigation will provide an insight into the level of
background knowledge that was expected of Hood’s readers and so give
us a sense of the prerequisites for the transmission of knowledge of prac-
tice through books. In particular, I will draw attention to the importance
of prior practical experience to the understanding of this work of vern-
acular mathematics.

There are, of course, several difficulties with using reconstructions to
inform historical accounts. A central problem is that reconstructions
can never be truly complete. There is often insufficient evidence avail-
able about the materials used or the procedures followed. Even when
we do have precise details of the original set up, it may not be practi-
cable to follow the procedure exactly or possible to source historic mate-
rials. Furthermore, even if we were able to rebuild an instrument using

of Astronomy* 37 (2006), 472–73, identifies reverse engineering as an important mode of
communication in astronomical works which receives inadequate attention from histor-

2) W.D. Hackmann, “The Relationship Between Concept and Instrument Design in Eighteenth-Century Experimental Science,” *Annals of Science*, 36 (1979), 205–24, surveys the various ways in which objects may be used in research in the history of science, including scientific practice, paying particular attention to replicas and reconstructions at 101–6. He also considers the role of instrumentation in the development of scientific theory.


4) For example, in H. Otto Sibum’s “Reworking the Mechanical Value of Heat: Instruments or Precision and Gestures of Accuracy in Early Victorian England,” *Studies in