both the edition and its paraphernalia thus connects Grund's work with existing research on early modern science. However, paired with the fact that no stemma could be constructed for the surviving witnesses, this emphasis also places some limitations on Grund's study, which merely touches upon the large body of anonymous works in the tradition of alchemical writing. Further, the edition's intended audience, general rather than scholarly, presents a conundrum. For example, the modernization of capitalization and punctuation employed here adds to the accessibility of the text but removes the possibility for researchers to understand the printed text as a representation of the original manuscript, i.e. to use this printed version of Forman's copy as evidence of his scribal practice. Conversely, a general audience may find it difficult to navigate this volume due to its minimalistic table of contents, which lacks chapter numbers and subheadings, and due to the absence of an index – an unfortunate discrepancy between authorial design and publisher's house style. The edition's explanatory notes record scribal peculiarities and list parallel passages from other early modern alchemical texts for textual scholars. Yet general readers will be delighted about the thorough glossary, which brings obscure terminology from the alchemical workshop to life.

Overall, quibbles aside, this is a fine edition which forms a bridge between the central role of alchemy in Elizabethan England and its disproportionately meagre representation in modern scholarship. The nascent tradition of editing alchemica, of which Grund's present book forms part, will evolve as audiences, publishers and interdisciplinary scholarship develop further. It would be a mistake to judge this present book by its humble physical appearance. Historians of alchemy, historical linguists and scholars of Elizabethan England's textual culture will find this a valuable addition to, or perhaps extension of, their collection of well-known authors and the canonical literature of early modern science. As Lock himself put it so aptly in the *Treatise*, these labours should not 'be buried in the bottomlesse lake of oblyuion' (p. 160).

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Patrick J. Boner (ed.), **Change and Continuity in Early Modern Cosmology**. Heidelberg, London and New York: Springer, 2011. Pp. xii + 181. ISBN 978-94-007-0036-9. £90.00 (hardback).
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This collection of essays, originally written for a conference held at Johns Hopkins in 2009, coheres around a major question in the history of astronomy – indeed, the history of science broadly. How does anomalous empirical data affect theory change? Most famously through Galileo's telescope, new heavenly bodies raised profound questions about a picture of the cosmos associated with Aristotle, in which perfect motion and incorruptible bodies characterized the planets and stars while generation and corruption belonged to earth, the universe's center. 'New stars' have long captured the attention of historians, but to my knowledge this is the first set of studies to focus on how early modern astronomers dealt with new stars from 1572 to the late seventeenth century. Therefore it brings a wealth of insight to histories of observation, heavenly physics, Aristotelianism and the like.

The history of astronomy has long focused on unique minds, such as those of Kepler and Galileo. Their world, however, was shaped by a wealth of authors who interpreted the skies, particularly in university texts such as the *Sphere* of Sacrobosco and the *Theories of the Planets* updated by Georg Peurbach. Displaying the rich proliferation of early modern astronomical genres, Peter Barker shows that ignoring such 'introductory' books (text and images) has led historians to miss the striking consistency with which they taught – or at least did not undermine – the reality of the universe as a collection of concentric material orbs. Barker's attention to the range of astronomical discourses is refreshing, and makes explicit a theme that implicitly informs most papers in the volume. Shifting genres formed the loci in which early

modern thinkers used ancient and medieval texts to think through new phenomena: commentaries on Pliny, Virgil's poetry, Stoic doctrines, as well as the expected assortment of Ptolemy and Aristotle.

A particular strength of this volume is its expansion beyond Kepler and Galileo to the larger communities engaged in astronomical and mathematical pursuits. As Reink Vermij puts it, 'it makes sense to study the debate on new stars in a variety of specific contexts' (p. 135). Victor Navarro Brotóns shows how the Spanish polymath Jerónimo Muñoz not only wrote an innovative study of the supernova of 1572, but also formed a lineage of students. Himself a student of Oronce Fine and Gemma Frisius, who had returned to Valencia to take up chairs in Hebrew and mathematics, Muñoz taught that the cosmos was made of a vital air – not crystalline spheres – that could foster new phenomena. Dario Tessicini shows how the understudied Cornelius Gemma presented the *nova* not only as an extraordinary message from God, but also as a product of unusual celestial movement in straight lines, perpendicular to the heavenly circles. This unusual position earned the attention of Tycho Brahe, Giordano Bruno and Kepler, among others.

The three chapters devoted to Kepler also show the importance of reading him firmly within a broader community. Miguel Granada compares David Fabricius's interpretation of the nova of 1604 with Kepler's, arguing that the latter's cautious sceptism about the star's divine origin and meaning was hardly the mainstream position. Patrick Boner demonstrates from correspondence that Kepler's patron Johann Herwart was the conservative audience whom Kepler campaigned to convince of the Copernican hypothesis. To convince Herwart, Kepler founded his arguments on harmonic elegance rather than the traditional physics that Herwart favoured. Aviva Rothman further draws on this exchange to argue that Kepler saw such mathematical harmony as more certain than the probability of physical arguments – he based his (Calvinist) view of the Eucharist on such certitude, thinking it would be a source of unity in a doctrinally divided Europe.

Unlike the enduring *novae* of 1572 and 1604, in the decades after 1596 a *mira nova* in the constellation Ceti appeared, disappeared and then reappeared. Rienk Vermij evokes the Dutch Republic of an early observer of Mira Ceti, Johannes Phoclides Holwarda, to mark a shift between humanist (mathematical) astronomers and a newer generation who followed Descartes in offering physical explanations. Holwarda explained new stars as exhalations that coalesced, not in the earthly atmosphere but in the heavens themselves. He adopted the Aristotelian explanation (exhalations), but transposed them to a place Aristotle had forbidden. The new star in Ceti, therefore, was an exhalation that could gather, disperse and reform. Whether the reappearances were of a different star or the same one remained in question until the systematic and collaborative observations of Johannes Hevelius and Ismaël Boulliau in the second half of the seventeenth century, a story Robert A. Hatch tells with deft clarity.

In editing this volume, Patrick Boner has done a great deal to dispatch the myth that Galileo's telescope dealt the heroic death blow to Aristotelian accounts of the universe. As his evocative introduction describes, the shifting status of astronomers, and their explanations of the heavens, involved a tangle of Aristotelian viewpoints and a range of other authorities besides. But the work leaves alive some big questions about early modern cosmology. (We may hope Boner will organize more conferences.) One question concerns the status of books and genres of astronomical writing. As Barker shows, astronomical debates were not only carried out in ad hoc treatises devoted to unique events, but also in textbooks and commentaries. How did these new observations inform the images and genres of early modern pedagogical and reference books, i.e. the books most people read?

Finally, these essays repeatedly touch on an old theme. For early modern astronomers, new celestial events raised the question of God's role in causing them – if there was no natural cause, then God must have done so directly – and then the meaning of such supernatural events. Significant categories that keep popping up include the distinction between ordained and absolute

powers of God, and the identification of miracles. In the last decade or so, intellectual historians have drawn back from thinking hard about these categories (perhaps because the fifteenth century is so frequently avoided by both early modernists and medievalists), but their incidence in this volume suggests to me that they deserve more critical attention.

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LISSA ROBERTS (ed.), **Centres and Cycles of Accumulation in and around the Netherlands during the Early Modern Period**. Zurich and Berlin: LIT Verlag, 2011. Pp. ii + 290. ISBN 978-3-643-90095-1. €34.95 (paperback).
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Very few of today's scholars would accept a description of their own research activities purely in economic terms or metaphors. While recognizing that jobs, salaries and aspects such as status and privileges are decidedly relevant, many would also point to international exchanges, the pleasure of discovery or writing, intellectual curiosity and even such an (only apparently) outmoded ideal as 'the advance of knowledge'. Why is it, then, that the international community of historians of science seems to be so meekly resigned to the dominant use of economic metaphors for the analysis of the research practices of their early modern predecessors, whether these operated in court societies, private academies, universities or artisanal workshops?

In her stimulating introduction to the present volume Lissa Roberts rightly affirms that the case has been convincingly made 'for intimate connections between commerce and (natural) knowledge' (p. 5) in the early modern period. She stops short, however, at the question raised above, even though the whole volume is meant as an investigation of the relevance of the notion of accumulation, as applied by Bruno Latour to the history, sociology and philosophy of science, while uncoupling it from Latour's teleological orientation. Knowledge accumulation and circulation, the transformation of local knowledge into more generalized knowledge, the role of printed works in knowledge circulation, the relevance of place to the development of expertise, historical openness and contingency are themes that recur throughout the essays in this volume. Another common factor is the emphasis on the early modern Netherlands – a most appropriate 'laboratory' for this kind of investigation given the country's position as *stapelmarkt* and entrepôt. But this geographical setting never becomes a constraint and the authors freely range through other parts of Europe where relevant.

Collecting as a concept is close to accumulation, but, as Lissa Roberts argues, 'accumulation is historically understood as a step in a more extended process' (p. 8), while collecting can be understood as an end in itself. Some of the essays address both. Rina Knoeff, for instance, discusses early modern tourism and the way in which narratives linked with exhibits in anatomical cabinets (and not merely their scientific relevance) were directly pertinent to their presentation and organization. Tim Huisman explores layers of meaning connected with early modern scientific instruments and the ways in which narratives can be used in modern presentations, allowing a larger role for audience participation. Ernst Hamm analyses two Mennonite compilations – a seventeenth-century one of martyrs' lives in print, and an eighteenth-century one of scientific instruments – exploring the intricate and not always easy relations between accumulation, economic gain, natural philosophy and the particular religious creed of the Mennonites. Johan de Jong discusses accumulation of labour, materials, designs and know-how in the shipyards of the Dutch East India Company.

Accumulation in text and printed image is of central importance to the essay by Ben Schmidt on seventeenth- and eighteenth-century Dutch works that depict and describe the exotic world. In his investigation of the making of global knowledge by the Dutch, commodification and accumulation are almost indistinguishable; commercial metaphors abound. Pete Langmann (discussing Francis