a way"; page 145, "There is any Platonic form" should read "is not any"; page 188, "if using" should be "of using." The worst of the lot is on page 70, where the Hippocratic author of *On Regimen* is misquoted: "This steers all things though all (*panta dia pantos kuberna*)" should read "through all". Most annoyingly, the very same error is repeated on page 71.

This book is a much-needed corrective to the imposition of mechanistic interpretations of nature onto early Greek thought. Combined with his cautionary warning "… that the doxography can be wrong on cosmogony …" (page 84), Gregory has convincingly developed a scholarly challenge that historians of astronomy and classicists alike cannot ignore.

Dr Clifford Cunningham
University of Southern Queensland, Australia,
and 5201 N. Spring View Drive, Tucson
AZ 85749, USA.
E-mail: Cliff.Cunningham@usq.edu.au

***The Shogun's Silver Telescope: God, Art, and Money in the English Quest for Japan, 1600–1625*, by Timon Screech. (Oxford, Oxford University Press, 2020). Pp. xviii + 306, ISBN 978-0-19-883203-4 (hardback), 152 × 228 mm, US$35.**

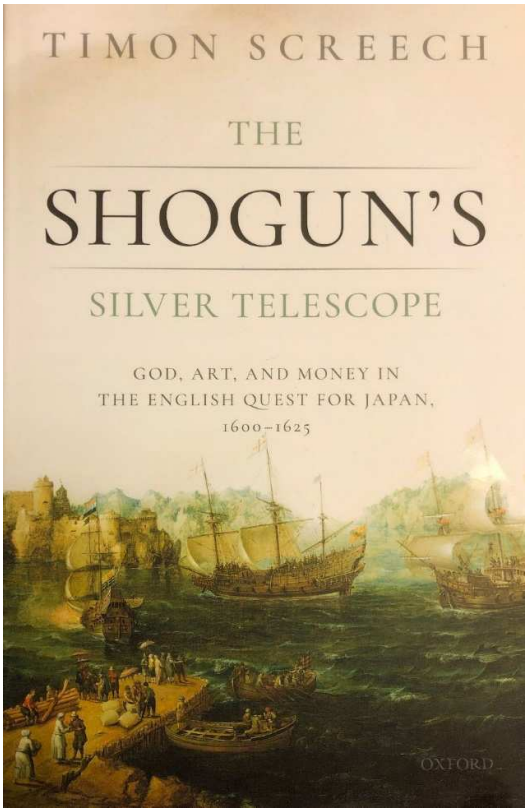
Were this book by Timon Screech titled *The Shogun and the Clove: God, Art, and Money in the English Quest for Japan, 1600–1625*, it would not catch the interest of historians of astronomy, and it would not be reviewed in *JAHH*. But the words "Silver Telescope" and the fifteen pages of so of the book that pertain to those two words both make the book of interest to *JAHH* and turn what might have been a good book about the history of England and Japan into something highly problematic.

The Shogun's Silver Telescope tells the story of English efforts to sell their wares in Japan in the early seventeenth century. The title refers to a telescope that was to be a gift for the Shogun, which was taken to Japan aboard a ship called the *Clove*. The ship left England in 1611.

Screech proposes that the purpose of this telescope was to help the English gain access to Japan by discrediting the members of the Society of Jesus who had already been there for some time. The telescope would do this, according to Screech, by showing that the geocentric astronomy that the Jesuits taught was wrong. "The Japanese were thirsty for scientific knowledge, and the Jesuits taught as much astronomy as theology …" he writes (page 74). "A telescope could be used to turn the tables …" [against the Jesuits, because] a telescope would confuse and embarrass their whole mission."

Screech explains how it would do this (page 73):

> Here is the crux: telescopes allowed any careful observer to see that Copernicus was correct. The instrument made it possible to detect with one's own eyes—never mind abstruse calculations in Latin—that the earth does revolve around the sun. To maintain the opposite view, after 1608, was to persist in wilful error.



But this is wholly incorrect. Prior to the advent of the telescope, Tycho Brahe had introduced his hybrid geocentric, or geoheliocentric system, which was mathematically and observationally identical to the system of Copernicus in-sofar as the Sun, the Moon, and the planets were concerned. No telescopic observation of those bodies could show that Copernicus was correct. Observations of the fixed stars would have done the job in theory, but practically speaking, the ability to observe annual parallax in the fixed stars, or to observe the aberration of starlight, was still a long way off in 1611.

And, practically speaking, an observer not experienced with a 1611 telescope was unlikely to be able to detect anything at all with such an instrument. Telescopes in 1611 were not user-friendly. There is actually a tangential

reference to this in the book. Screech describes (page 180) how two Japanese gentlemen hear about the silver telescope, and inquire about getting a telescope of their own. An English merchant had one, Screech writes, and

> This he was willing to give, though having experimented with it, the gentlemen graciously handed it back. There is no further record, but the two Japanese lords must have gone away with many new ideas.

Any observer today who has used a replica of a telescope from that era will tell you what one new idea those two lords most likely went away with: the same idea that was why they handed it back—namely, that it was almost impossible to see anything through that tube.

Thus, the *Silver Telescope's* title thesis, that the English took a silver telescope to Japan as a gift for the Shogun so that "… the astronomical notions conveyed with the telescope …" (page 182) would undermine the Jesuits, is based on a misunderstanding of what a telescope in 1611 could possibly reveal, and of what a person using a 1611 telescope could actually see.

There are other basic errors about the history of astronomy in this book, although they do not so directly undermine the book's central thesis. For example, Screech writes that

> Galileo undertook his researches in Padua, but his patron was in Florence, the Grand Duke of Tuscany, Cosimo II de Medici. In thanks for his support Galileo sent Duke Cosimo a copy of his book [*Starry Messenger*] upon publication in 1610. The Duke reciprocated by awarding Galileo a professorship at Pisa. (page 74).

Then, once in Pisa, "… Galileo continued with his work." (page 77). But Galileo taught at the University of Pisa for a few years starting in 1589, then at the University of Padua until 1610. After publishing *Starry Messenger* he was made philosopher and chief mathematician to the Grand Duke, not a professor at Pisa again.

A second example is Screech's timeline on events relating to heliocentrism. For example, he says "Having let [Copernicus's] *De orbium* sit in the Vatican library for two generations, Rome had now banned the book." (page 73), but what "now" refers to is uncertain as Screech makes frequent jumps in topics and dates, and since the *Clove* sailed for Japan in 1611 and Rome took no action against the book until 1615–1616 (and even then did not fully ban it), this statement is problematic. So is the statement that by 1611 Bellarmine was "… preparing to launch the papacy's devastating attack on Galileo …" (page 235), or that the "… terrible findings …" of telescopes in general "… were shaking the papacy." (page 236).

Screech's overall characterization of the Jesuits and the Church as being shaken by the telescope, and even wanting to conceal its existence (page 234) is a third example. in 1611 Jesuit astronomers confirmed Galileo's discoveries with their own telescopic observations, and honored Galileo in Rome. Jesuits went on to do more telescopic work. For example, Christoph Scheiner published his *Mathematical Disquisitions* in 1614, which featured precision telescopic observations, praise for Galileo, and support for a hybrid geocentric system (a 2017 translation of this work was recently reviewed here in *JAHH*—see Cunningham, 2020). Scheiner went on to conduct a years-long telescopic study of the Sun.

Here are two final examples of very basic errors: (1) mis-spelling the title of Galileo's work as *Sideris Nuncius* (on page 101) instead of *Sidereus Nuncius*; and (2) the remarkable absence of the words 'telescope' and 'astronomy' in the book's substantial index.

These examples by no means comprise an exhaustive list, and it is difficult to understand how such an abundance of basic errors could be present in a book written by an accomplished historian and published by one of the world's best-regarded academic presses. This should be of concern to many.

These errors are, however, confined to a very limited number of pages. The book is 306 pages long, and there are only two sections where telescopes and astronomy are discussed at any length: pages 72–82 and 233–237. Otherwise, there are only scattered isolated references to the telescope (e.g. "The arrival of the telescope was recorded …", on page 223). Screech cites records of the telescope going to Japan and being given to the Shogun, but he does not provide any evidence that the telescope was used. It is true that the shogunate did turn against the Jesuit missions after the arrival of the English, but the idea that the telescope contributed to this seems to be mere speculation, based upon erroneous notions about telescopes.

Were the words "Silver Telescope" absent from the title, and the afore-mentioned two short sections omitted, with the silver telescope simply mentioned as an interesting item that was given to the Shogun, then this would be a nicely illustrated informative book about England and Japan, and trade and politics.

Reference

Cunningham, C., 2020. Review of *Mathematical Disquisitions: The Booklet of Theses Immortalized by Galileo*, by Christopher Graney. *Journal of Astronomical History and Heritage*, 23, 414–415.

Dr Christopher M. Graney
Vatican Observatory & Vatican Observatory Foundation, Castel Gandolfo, Vatican City & Tucson, Arizona, USA.
Email: c.graney@vaticanobservatory.org

***Ptolemy's Philosophy: Mathematics as a Way of Life*, by Jacqueline Feke. (Princeton, Princeton University Press, 2018). Pp. xi + 234. ISBN 978-0-691-17958-2 (hardback), 160 × 240 mm, U.S. $39.50.**

Most reviews of this important book have dealt with its theological, philosophical and mathematical aspects. Here I will focus on those elements most closely associated with history of astronomy, which is an integral part of the elucidation of the philosophy of Ptolemy by author Jacqueline Feke. She is Assistant Professor of Philosophy at the University of Waterloo (Canada), where I earned my degrees in physics and classics.

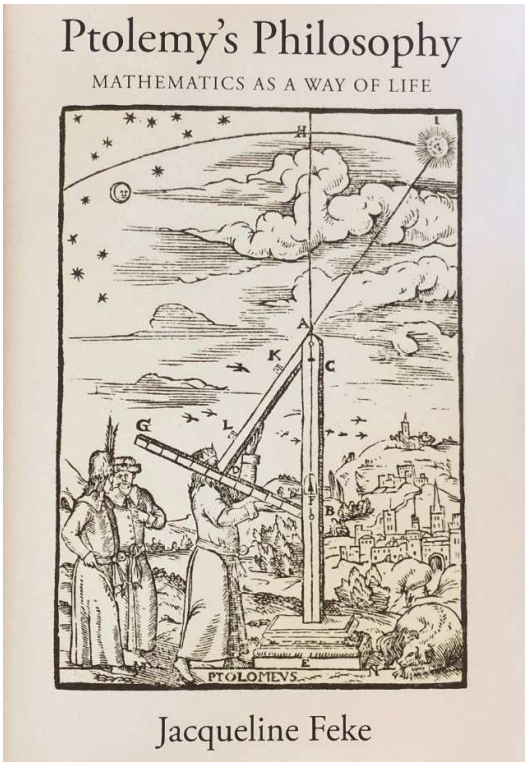
Feke identifies "Franz Boll, a nineteenth-century philologist … [as] the only scholar besides myself to attempt a complete study of Ptolemy's philosophy." (page 15). Considering all the subsequent scholarship on Ptolemy, that is indeed a sobering realisation, but in the few instances in which Feke mentions Boll's analysis, it is only to agree with him. This may be a testament to the genius of Boll, although I find it perplexing she did not engage more fully with what he wrote, or express any divergence between his findings and hers. Certainly, Feke's scholarship on Ptolemy's philosophy extends that of Boll, but in what areas and to what extent are left for the reader to imagine. This is all the more regrettable as "Boll was a scholar of great originality, with that rare ability to combine astronomy, religion, and literature …" (Weinstock, 1951), the very elements Feke has shown such proficiency in with this book.

A key argument of the book can be found on page 70:

> According to Ptolemy, the study of mathematics and, in particular, the contemplation of the constancy, good order, commensurability and calm of astronomical objects makes makes the individual a lover of divine beauty and transforms his soul to a state similar to the one contemplated.

While the relationships between constancy, good order and commensurability are quite intuitive and well explained by Feke, it is not obvious how an astronomical object can be calm. The fact there is no index entry for any of these four attributes does not help the reader, nor does the fact that when the qualities are reiterated on page 71 she omits 'calm'. In the conclusion to the book, she writes

> I suggest that in Ptolemy's philosophical system both astronomy and harmonics produce the virtuous transformation of the human soul. (page 204).



An entire chapter is devoted to *harmonia*, in which she quotes the third century novelist Antonius Diogenes "… who depicts Pythagoras as singing paeans at dawn in order to calm the soul." (page 76). Relying on a novelist who lived some eight centuries after Pythagoras to support the attribution of calmness to astronomical objects in the philosophy of Ptolemy strikes me as a bit tenuous. Nonetheless, I found her statement that for Ptolemy "… none of the stars make music …" to be of great moment. Rather

> … the same ratios that describe the relations in musical systems exist in the movements and configurations of heavenly bodies. (page 112).

Feke's study of rays from the stars is masterful, and culminates in an unexpected way. First, she interprets the stars' rays to be material: "As rays act upon material objects, bodies and souls, they too must be material." (page 181). This leads her to examine the movement of the rays, concluding "… the