Mark A. Waddell

Jesuit Science and the End of Nature's Secrets. Farnham: Ashgate, 2015. Pp. 224. Hb, \$119.95.

This book concerns the Jesuit response to the crisis of certainty that took hold of natural philosophy in the early modern era, as skepticism, experimental practices, and new information coming from all around the world challenged traditional Aristotelian conceptions of knowledge. That the Jesuits participated in the epistemological and institutional transformations of this period no longer comes as a surprise. Yet, the nature of this participation is still debated by historians, who disagree on how to interpret the tensions existing between the Society of Jesus's official endorsement of Aristotelianism and the attempts by some of its members to engage with the findings of the "new science." Resulting from this tension was an eclectic and perplexing amalgam of methods and doctrines; sometimes referred to as "Jesuit science," this brand of natural philosophy calls for a detailed characterization. Waddell's *Jesuit Science and the End of Nature's Secrets* achieves this beautifully.

Aside from acknowledging the role of Jesuit teaching in the dissemination of mixed-mathematics, Waddell demonstrates, through his reading of several key Jesuit texts, the intellectual coherence and unique flavor of such diverse enterprises as those of Niccolò Cabeo (1586–1650), Athanasius Kircher (1602–80), and Gaspar Schott (1608–66). According to Waddell, these and other Jesuit philosophers were on a quest for epistemological and ontological clarity. This quest led them to address one of the murkiest problems that beset early modern philosophers, namely, the study of the preternatural—the realm of hidden causes and insensible properties that fell beyond the scope of peripatetic standards of certain knowledge.

Waddell's most original insight is that finding innovative ways of making the unseen visible lay at the core of Jesuit spirituality, which involved rigorous meditation exercises including imaginative visualization of religious scenes—the so-called composition of places. Transposed onto the realm of natural philosophy, the mental habit of making manifest what is concealed to the senses predisposed some Jesuits to expose (and over time demystify) the secrets of nature, as well as to relax their Aristotelian standards of certainty in favor of probabilistic knowledge.

After a contextual introduction and first chapter, Waddell turns to two case studies illustrating Jesuit attempts at "Building a Better Ontology." First, Martin Delrio's *Disquisitionum magicarum libri sex* (Leuven, 1599–1600) provides an example of a valiant (if ultimately frustrated) Jesuit effort to rid late-medieval

ontology of the preternatural in the field of demonology and magic. The second case study consists in the debate surrounding the efficacy of the weapon *salve*, which Waddell compellingly argues was an important locus for philosophical discussion about the insensible in the sixteenth and seventeenth centuries, for Jesuit and non-Jesuit thinkers alike. Both cases entailed retracing boundaries between natural and supernatural causes. Establishing clear categories in this regard was essential for theologians who needed to discriminate between miracles, prodigious but natural phenomena, and tractations with demons.

Chapter 3, “The Demise of Occult Qualities,” examines Jesuit attacks on two additional cases of preternatural phenomena: the magnet and the *remora* (the latter, a mythical fish rumored to stall ships when it attached to their hulls). The object of these attacks was the Aristotelian doctrine of “occult qualities,” which once provided a way to discuss the properties of things that did not fit the four manifest qualities (hot/cold, dry/moist), but which was increasingly regarded as an intellectual cop out. Waddell shows how Jesuits like Cabeo (who features prominently in this chapter), Kircher, and Schott “found means of both ridding their shared philosophy of the troublesome doctrine of occult qualities and undermining the foundation of a category that too often blurred the all-important lines between nature and God” (59). Under their scrutiny, the magnet’s pull became mundane, and the *remora*’s powers, fictional.

Chapter 4, “Spectacle, Uncertainty, and the Fallibility of the Eye,” and Chapter 5, “Probabilism, or the World as it Might Be,” are both devoted to the philosopher-showman Athanasius Kircher. Chapter 4 offers a new take on the famous Kircherian Museum. It shows how by “bemusing” its audience with its machines and other wonders, the collection “did more than display tantalizing hints of nature’s secrets” for it “also displayed the methodological keys required to unlock those secrets” (89–91). Chapter 5 makes a similar argument about Kircher’s printed works, the importance of which lay more in the epistemological reflexions they forced upon their readers than on the accuracy of their contents. Waddell provides insightful readings of Kircher’s *Magnes* (Rome, 1641), *Ars magna lucis et umbrae* (Rome, 1647), and *Mundus subterraneus* (Rome, 1665), along with thoughtful interpretations of some of these books’ plates. These texts are connected by their author’s attention to questions of “seeing,” and they go a long way toward substantiating the author’s thesis about the transposition of Jesuit meditative arts into natural philosophy. Waddell’s argument also has the merit of revealing the coherence underlying Kircher’s famously eclectic approach.

Waddell’s argument ends with the oeuvre of Gaspar Schott. Readers will find Chapter 6, “The Culture of Marvels, Exposed,” particularly useful for its exposition of Schott’s *Magia universalis naturae et artis* (Herbipoli, 1657) and

his *Technica curiosa* (Nuremberg, 1664). Waddell situates these and some other works as a “response to the prevailing culture of marvels” within which Schott was immersed, but he argues, contrary to common expectations, that the Jesuit’s “primary interest lay in the demise of mystery, not its perpetuation” (161–62). Indeed, Waddell shows that Schott deliberately “shuttled” between hiding and revealing mysteries, inspiring his readers with a sense of awe for natural and artificial wonders while also laying bare their mundane underpinnings. Remembered today as Kircher’s greatest pupil, Schott is rarely given the scrutiny that he rightly receives here.

Waddell’s argument may occasionally be somewhat difficult to follow since it pulls together many different themes and terms associated with the Jesuit’s quest for clarity: preternatural phenomena, occult qualities, insensible causes, unreliability of the senses, probabilism. But this ambitious scope in a book so concise (less than two hundred pages) is a strength, as it provides the reader with a compelling survey of Latin texts that would, and undoubtedly did, take years to plow through.

Jean-Olivier Richard

Chemical Heritage Foundation

jeanolivierrichard@gmail.com

DOI 10.1163/22141332-00401005-14