

Shank, J. B. (2018) *Before Voltaire. The French Origins of “Newtonian” Mechanics, 1680-1715*. Chicago and London: The University of Chicago Press, pp. ix+444. Cloth, \$55.00, ISBN: 9780226509297.

Ten years after the publication of the highly influential *The Newton Wars and the Beginning of the French Enlightenment* (2008), J. B. Shank's new book *Before Voltaire. The French Origins of “Newtonian” Mechanics, 1680-1717* comes as an integration of the narrative inaugurated with the *Newton Wars*. *Before Voltaire* aims to provide, first and foremost, a fresh account of the early Continental reception of Newton's *Principia*. Contrary to mainstream teleological histories of mathematics and mechanics, Shank wants to offer “a new and sugar-free account of the outcomes that ensued when other mere mortals [...] began to study Newton's *Principia* without any awareness of the epochal significance that later interpreters would attribute to this treatise or their reading of it” (p. 5). In fact, analytical mechanics is not, as many historians have assumed, the direct outcome of Newton's work, but rather the contingent result of a long process of re-elaboration of the mathematical and mechanical results of the *Principia*, viewed through the lens of Leibniz's and Malebranche's scientific and philosophical ideas¹. The central actor in Shank's story is Pierre Varignon, who is presented as chiefly responsible for the elaboration of a “new science of motion after 1698” (p. 33), namely analytical (“Newtonian”) mechanics.

The book provides an accurate contextualisation of academic science within the wider dynamics of fin-de-siècle political and societal changes in France. The genesis and early development of the Royal Academy of Sciences is analysed in detail in the first section of the book, while chapter eight of part three completes this account by presenting the reform of 1699. The second part of the book is devoted to the intellectual sources of calculus and analytical mechanics, namely Newton (whose legacy is further discussed in the *coda*), Leibniz and Malebranche. Whereas the description of the early reception of Newton's theories in France is essentially the same as that provided in *The Newton Wars*,² *Before Voltaire* dwells much more on the

¹ Malebranche's thought is equivocally qualified as “mathematical philosophy” (throughout chapter six), “mathematical scientific philosophy” (p. 178), and “mathematico-phenomenalist philosophy” (p. 215).

² “Actors such as these [Malebranche's followers at the Royal Academy] saw no apparent contradiction in accepting Newton as a distinguished contributor to the advanced mathematical physics that they

question of Malebranche's influence on the rise of eighteenth-century mathematics and mechanics. Relying on a tradition dating back to Thomas L. Hankins, Shank rightly emphasizes the importance of the "Malebranchian moment" in late seventeenth- and early eighteenth-century French scientific culture. The third and last part of the book is composed of four long chapters on the actual emergence of analytical mechanics in the Royal Academy, and to the *querelle des infiniment petits*. The originality of this section lies not only in the emphasis put on Varignon's work, but also on the use of neglected manuscript sources. This is the case with Claude Bourdelin II's "personal diary of the academic meetings he attended from 1699 to 1709" (p. 415, note 20), which plays a determinant role in Shank's reconstruction of the *querelle*.

Despite the accuracy and breadth of the narrative Shank puts forward, a few aspects of the historiographical approach adopted in *Before Voltaire* are in need of further clarification. A first question concerns the polemical target of the book. According to Shank, "the history of the so-called exact sciences is still routinely written through recourse to teleological assumptions about their rational progress toward ever-greater perfection" (p. 7). Scholars, Shank says, still regard eighteenth-century science as the "overdetermined consequence" of Newton's mathematical physics. Unfortunately, the only references to secondary literature Shank provides are to Ernst Mach, Alfred Rupert Hall, I. Bernard Cohen. The only recent source quoted is George Smith's entry on Newton's *Principia* in the *Stanford Encyclopedia of Philosophy* (2007). Yet nowadays very few scholars (surely not those mentioned polemically at p. 375, note 21) would deny the importance of Leibniz's influence in the history of calculus, let alone the role of the Royal Academy's Malebranchian circle in shaping the French reception of Newton's *Principia* and in the elaboration of analytical mechanics. It would thus have been useful to see more references on the fortune of the "teleological approach" in the history of mathematics and mechanics in the last twenty years or so.

A second question concerns methodology. Shank states that *Before Voltaire* "avoid[s] the retrospective conceptual teleologies" but rather adheres to "aggressively historicist scholarship" (pp. 12-13). In a Foucauldian way, Shank aims to provide an "archaeology of early modern mathematics." Contextually, he emphasizes the

practiced while also dismissing out of hand his particular [...] physics of universal gravitation" (p. 356).

contingency of the creation of analytical mechanics and the insufficiency of rigid interpretative schemes not based on a meticulous historical contextualization of the scientific effort (see pp. 14-15). In this framework, one important part of Shank's methodological agenda is the need to overcome the distinction between the internalist and externalist approach to the history of science. *Before Voltaire* would in fact carry out a "historicist synthesis of internal and external perspectives," that is, an integration of a "precise technical scientific understanding with an appreciation for its full immersion in the contingencies of ordinary human history" (pp. 21-22). In practice, however, Shank's approach seems to be more externalist than internalist: he insists much more on historical contingencies and contexts than on mathematical arguments. As a matter of fact, *Before Voltaire* could be better described as a comprehensive cultural history of post-1687 French mathematics and mechanics, an erudite reconstruction of the historical contingencies of the scientific enterprise where mathematics and mechanics are only a part – however important – of the overall picture. This, of course, does not undermine the quality of Shank's effort, but casts doubt on the very possibility of overcoming the distinction between internalism and externalism at all.

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