

# How Men of Letters Invented a Scientific Revolution The Emergence of a Narrative in the Age of Louis XIV

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**The emergence of modern science** in early modern Europe continues to be the subject of intense debate. Taking their cue from Joseph Ben-David's classic 1971 study on the social role of the scientist, Stephen Gaukroger and H. Floris Cohen both rely on global contrasts to draw attention to the persistence, rather than the origins, of European developments in the scientific domain.<sup>1</sup> For these authors, while golden ages for scientific thought have emerged in numerous civilizations throughout world history, only in seventeenth-century Europe did one particular efflorescence gain enough momentum to sustain itself without "fizzling out." In this same vein, Joel Mokyr has recently argued that this uniquely sustainable scientific

This article was first published in French as "Hommes de lettres et révolution scientifique. Genèse d'un récit au temps de Louis XIV," *Annales HSS* 78, no. 3 (2023): 543–81.

\* For their help, comments, and suggestions, I cordially thank Naor Ben-Yehoyada, Raz Chen-Morris, Nadine Férey-Pfalzgraf, Netta Green, Shaul Katzir, Dániel Margócsy, Ofer Rom, and Oded Zrachia; audience members at talks delivered at Brown, Cambridge, Haifa, and Tel Aviv Universities; and the *Annales*' anonymous readers, who provided especially insightful comments. This study has been funded by the Israel Science Foundation, grant 972/17.

1. Joseph Ben-David, *The Scientist's Role in Society: A Comparative Study* (Englewood Cliffs: Prentice Hall, 1971); Stephen Gaukroger, *The Emergence of a Scientific Culture: Science and the Shaping of Modernity, 1210–1685* (Oxford: Clarendon Press, 2006), and *The Collapse of Mechanism and the Rise of Sensibility: Science and the Shaping of Modernity, 1680–1760* (Oxford: Clarendon Press, 2010), the first two volumes in a four-volume venture; H. Floris Cohen, *How Modern Science Came into the World: Four Civilizations, One 17th-Century Breakthrough* (Amsterdam: Amsterdam University Press, 2010).

ferment led to a burst of technological innovation associated with the roots of the Industrial Revolution and the vast transformations that swept through agrarian societies.<sup>2</sup> The stakes in understanding how the ideas developed by Galileo, René Descartes, and Isaac Newton gained the long-term momentum to become a movement of world-historical significance are thus high.<sup>3</sup>

Taking the France of Louis XIV (r. 1643–1715) as its case study, this article argues that men of letters played a crucial role in promoting awareness of recent scientific advances among reading elites. They created an image of a sharp break with the past, fostering a commitment to a relatively coherent cultural movement and thereby providing it with an indispensable social as well as scientific impetus. Of course, scientific practitioners were often men of letters themselves, and could devote considerable time and energy to literary or scholarly pursuits that had nothing to do with what we would define as scientific activities. Yet overall men of letters were a much more varied crowd than those who actively pursued scientific projects, and included influential authors who reached a range of different publics. Authors with no recognized scientific expertise shaped the perception of scientific innovations among social and cultural elites and participated in wide-ranging cultural debates. They took noteworthy discoveries, such as the moons of Jupiter; instruments, such as the telescope that made this discovery possible; and the “genius” responsible for them, in this case Galileo, and inserted them into a broad historical narrative that explained developments in natural knowledge in terms of an intellectual movement with a more or less well-defined set of actors and events. The most famous scientific author who contributed to this endeavor in ancien régime France was surely Bernard le Bovier de Fontenelle (1657–1757), perpetual secretary of the Royal Academy of Sciences in Paris. Indeed, recent studies have demonstrated the importance of his institutional role in the Academy, his innovative blending of intellectual inquiry and literary form, and the ways that he codified existing knowledge while “inventing” the history of science.<sup>4</sup>

2. Joel Mokyr, *A Culture of Growth: The Origins of the Modern Economy* (Princeton: Princeton University Press, 2017). See also Patrick O’Brien, “Historical Foundations for a Global Perspective on the Emergence of a Western European Regime for the Discovery, Development, and Diffusion of Useful and Reliable Knowledge,” *Journal of Global History* 8, no. 1 (2013): 1–24.

3. For recent attempts to rethink these developments in a global context, see, for example, Simon Schaffer, “Newton on the Beach: The Information Order of *Principia Mathematica*,” *History of Science* 47, no. 3 (2009): 243–76; Kapil Raj, “Thinking without the Scientific Revolution: Global Interactions and the Construction of Knowledge,” in “After the Scientific Revolution,” ed. J. B. Shank, special issue, *Journal of Early Modern History* 21, no. 5 (2017): 445–58, as well as the other articles in the same issue; James Delbourgo, “The Knowing World: A New Global History of Science,” *History of Science* 57, no. 3 (2019): 373–99; and the recent attempt at synthesis in James Poskett, *Horizons: A Global History of Science* (London: Penguin, 2022).

4. For Fontenelle, “the art of thinking and the art of writing were inseparable,” and his theoretical reflections developed ideas first expressed in his earlier poetical works: Sophie Audidière, “Fontenelle ou la tendresse philosophe,” introduction to Bernard de Fontenelle, *Digression sur les Anciens et les Modernes et autres textes philosophiques*, ed. Sophie

This article focuses, however, on men of letters who, unlike Fontenelle, were not part of the scientific establishment, and who did not themselves contribute to scientific discussions.<sup>5</sup> These authors were for the most part “professionals of letters” who had forged their careers through connections to fashionable Parisian elites, to private and royal academies, and to the court. By mixing different aesthetic and intellectual conventions, they fashioned a narrative of heroic scientific change at an opportune moment: history had yet to become an academic discipline, and historical narratives were fashioned to fit the tastes of a growing and diversified reading public. The second half of the seventeenth century in fact saw a rapprochement between historical narratives and literary fiction, leading to the publication of innovative historical novels and fictionalized memoirs, such as César de Saint-Réal’s *Dom Carlos* (1672) or the *Mémoires de M. d’Artagnan* (1700) by Courtilz de Sandras.<sup>6</sup>

Such authors and their works attest to the historical knowledge of scientific change prevalent among members of the educated elite. More importantly, they themselves played a transformative role in this process. Beyond the confines of the Academy of Sciences, men of letters produced synthetic narratives of scientific change and transmitted them to ever broader audiences, in texts that were read for a range of purposes. The “new science” emerged as a sociocultural movement thanks to the mediating role of authors who presented a new narrative to reading elites, not simply as a by-product of the scientific genius of its heroes and practitioners. Once it had become a prominent phenomenon of elite culture, rather than the exclusive concern of expert practitioners, this “new science” was far less likely to fade away within a couple of generations.

The crystallization of this new narrative of scientific change was a Europe-wide phenomenon. It took shape in German princely courts, Italian *palazzi*, Dutch seaports, and English coffee houses. Yet an intensive study of France in the age of Louis XIV is particularly valuable for several reasons. French high culture was particularly admired throughout Europe, and the texts it produced reached numerous

Audidière et al. (Paris: Classiques Garnier, 2015), 13–58, here pp. 17 and 20; Stephen Gaukroger, “The Académie des Sciences and the Republic of Letters: Fontenelle’s Role in the Shaping of a New Natural-Philosophical Persona, 1699–1734,” *Intellectual History Review* 18, no. 3 (2008): 385–402; Gaukroger, *The Collapse of Mechanism*, chap. 6; J. B. Shank, *Before Voltaire: The French Origins of “Newtonian” Mechanics, 1680–1715* (Chicago: University of Chicago Press, 2018); Maria Susana Seguin, “Anciens et Modernes à l’Académie des sciences,” in *Anciens et Modernes face aux pouvoirs. L’Église, le roi, les académies, 1687–1750*, ed. Christelle Bahier-Porte and Delphine Reguig (Paris: Honoré Champion, 2022), 179–98; Simone Mazauric, *Fontenelle et l’invention de l’histoire des sciences à l’aube des Lumières* (Paris: Fayard, 2007).

5. Female authors had a different social profile from their male counterparts—they did not, for instance, seek out the same relations of patronage—and their connection to the questions addressed in this article merits further study.

6. See Peter Burke, “Two Crises of Historical Consciousness,” *Storia della Storiografia* 33 (1998): 3–16, especially p. 7; more generally, see François Furet, “La naissance de l’histoire,” in *L’atelier de l’histoire* (Paris: Flammarion, 1982), 101–27.

readers across the continent.<sup>7</sup> Paris served as a cultural capital, attracting luminaries such as the Dutch Christiaan Huygens, the English Thomas Hobbes, and the German Gottfried Wilhelm Leibniz for extended periods.<sup>8</sup> More importantly, such a case study allows for a reconstruction of the cultural dynamics in a clearly delineated arena. This is a key question for current scholarship as it seeks to explain the rise of different yet related scientific cultures over the early modern period. Indeed, whereas around 1600 educated Europeans shared similar assumptions on the natural world, by 1730 England had developed a scientific culture distinct from that of the continent.<sup>9</sup> Voltaire's *Lettres philosophiques* (1734) symbolize this divergence, contrasting a Cartesian Paris, in which the universe was composed of vortices and the Earth shaped like a melon, with a Newtonian London in which the universe allowed a void and the Earth was "flattened from both sides."<sup>10</sup> A close study of the French case can thus provide a new angle on some of these broader currents and questions.

Recognizing the role of men of letters as scientific mediators takes some of the theoretical burden off the shoulders of natural philosophers and other practitioners. The landmark studies by Gaukroger and Cohen still foreground the ideas and techniques that brought about a sea change in European approaches to the natural world, without asking how they could generate anything more than an evanescent episode in intellectual history. For Mokyr, scholars such as Francis Bacon and Newton can be seen as "cultural entrepreneurs," a useful shorthand for understanding their influence beyond the strictly scientific domain.<sup>11</sup> It seems to me, however, that someone as relatively reserved as Newton, for example, cannot plausibly be characterized as a cultural entrepreneur. The difference between his own work and comportment and "Newtonianism" as an intellectual and cultural phenomenon demonstrates that such movements cannot be reduced to the intentions—or even the monumental achievements—of their progenitors. Newtonianism was constructed by numerous actors over the course of many years, and could be appropriated for a range of purposes. It was decisively not the brainchild of the Cambridge mathematician, something of a recluse during his most productive intellectual years.<sup>12</sup>

7. For a general analysis of the place of France in the Enlightenment, see Dan Edelstein, *The Enlightenment: A Genealogy* (Chicago: University of Chicago Press, 2010), 104–106; for a revisionist view, see Pierre-Yves Beaurepaire, *Le mythe de l'Europe française au XVIII<sup>e</sup> siècle. Diplomatie, culture et sociabilités au temps des Lumières* (Paris: Autrement, 2007).

8. Stéphane Van Damme, *Paris, capitale philosophique. De la Fronde à la Révolution* (Paris: Odile Jacob, 2005).

9. David Wootton, *The Invention of Science: A New History of the Scientific Revolution* (London: Penguin, 2015), 6–12; see also Roy Porter and Mikuláš Teich, eds., *The Scientific Revolution in National Context* (Cambridge: Cambridge University Press, 1992).

10. M. de V. [Voltaire], *Lettres philosophiques* (Amsterdam: Chez E. Lucas, au Livre d'or, 1734), 139–40.

11. Mokyr, *Culture of Growth*, especially 59–69, and 99–115 on Newton.

12. See, for example, Simon Schaffer, "Newtonianism," in *Companion to the History of Modern Science*, ed. R. C. Olby et al. (London: Routledge, 1990), 610–26; Margaret C. Jacob, "The Truth of Newton's Science and the Truth of Science's History: Heroic

What made European science sustainable was not the ideas themselves, however successful they were, but their anchoring in social space. After all, successful ideas featured prominently in other scientific renaissances without generating a self-propelled and continuous scientific movement. If we are to understand how, why, and when European science became sustainable over the *longue durée*, we need to understand the “culture” in “scientific culture,” and not merely the “science.” Significantly, until we have properly grasped the place of science in European culture, comparisons with other early modern scientific movements risk being incomplete and overly hasty.<sup>13</sup>

## Men of Letters and the Public for Science

Men of letters enjoyed a particular affinity with the scientific movement because in early modern France the cultural sphere was undergoing a process of “literarization”: a growing number of texts were produced outside the context of the socially recognized corporate bodies, predominantly the universities, which had previously legitimized discourses explaining the natural world. This enabled men of letters to define themselves in new ways. If around 1600 they were still dependent to a significant extent on the university model, by 1700 the literary field had become much more self-sufficient in terms of its participants, their strategies, and their relations to different publics. Even so, these actors lacked a clearly defined social identity, often circulating in different social spaces and working as secretaries, tutors to the children of the nobility, or providers of textual services, from the composition of panegyrics to political pamphleteering on behalf of their patrons.<sup>14</sup>

These shifts in the literary world deepened the affinity between men of letters and the burgeoning scientific movement on three distinct levels: intellectually, in the sense that their message on cultural change benefited from the new

Science at Its Eighteenth-Century Formulation,” in *Rethinking the Scientific Revolution*, ed. Margaret J. Osler (Cambridge: Cambridge University Press, 2000), 315–32; and the works of J. B. Shank. Compare Mokyr’s stress on the importance of “content bias” (the success of Newton’s ideas) in the making of Newtonianism, despite his acknowledgment of the role of mediators. For example, “The trend toward mechanistic thinking was the product of the thought and labor of many people . . . who used Newton’s findings in ways that he himself would not have approved of”: Mokyr, *Culture of Growth*, 104.

13. As evidenced, for example, in the debate around Toby E. Huff, *Intellectual Curiosity and the Scientific Revolution: A Global Perspective* (Cambridge: Cambridge University Press, 2011); Ting Xu and Khodadad Rezakhani, “Reorienting the Discovery Machine: Perspectives from China and Islamdom on Toby Huff’s *Intellectual Curiosity and the Scientific Revolution: A Global Perspective*,” *Journal of World History* 23, no. 2 (2012): 401–12. I develop this perspective further in Oded Rabinovitch, “The ‘System of the World’ and the Scientific Culture of Early Modern France,” *Notes and Records: The Royal Society Journal of the History of Science* 78, no. 1 (2024): 29–51.

14. Christian Jouhaud, *Les pouvoirs de la littérature. Histoire d’un paradoxe* (Paris: Gallimard, 2000); and, in the context of philosophy, Dinah Ribard, *Raconter, vivre, penser. Histoire(s) de philosophes, 1650–1766* (Paris: Éd. de l’EHESS/J. Vrin, 2003).

discoveries; aesthetically, in that just like men of letters, scientific practitioners produced texts that relied on new forms and diverged from the expected patterns of discourse on the natural world; and socially, since both social types lacked a fixed corporate identity. Ultimately, the question of the authority of the new science and of the institutions that legitimated it was critical for both men of letters and the practitioners of the nascent scientific movement.

During the seventeenth century, the dominant intellectual, aesthetic, and social models for men of letters underwent a profound transformation. Around 1600, authors mostly followed the conventions of learned humanism, which meant that they praised ancient exemplars, specifically in history and rhetoric, wrote and read largely in Latin, and received their strongest social support from masculine erudite circles, mostly related to the high courts of appeal known as Parlements. Over the course of the century, this model was eclipsed by authors who used the vernacular to write for an expanding reading public, and who praised aesthetic values as equal to, or even surpassing, the learning enshrined by the previous generation. These *nouveaux doctes* saw literature as superior to other forms of writing because of its aesthetic qualities, since in functional terms—its ability to instruct and impart virtue—it was not all that different from the supposed “pedantry” it sought to replace. The decline of the Parlements and of noble grandes as patrons, especially as the nobility increasingly abandoned the countryside for the towns, meant that men of letters became ever more reliant on learned and amateur urban circles for their careers and increasingly intermingled with a mixed reading elite.<sup>15</sup>

This elite reading public reflected the growing role of women in the world of letters. The seventeenth century saw an increase in the number and visibility of female authors.<sup>16</sup> Women also played a crucial role in the transmission of learning and written culture: in some intellectual families they schooled their young children,<sup>17</sup> and they increasingly contributed to the socialization of men of letters through their leadership of literary circles.<sup>18</sup> Authors writing in the vernacular

15. Alain Viala, *Naissance de l'écrivain. Sociologie de la littérature à l'âge classique* (Paris: Éd. de Minuit, 1985), especially 29–50 and 270–90; compare Robert A. Schneider, *Dignified Retreat: Writers and Intellectuals in the Age of Richelieu* (Oxford: Oxford University Press, 2019).

16. See the overviews in Emily Butterworth, “Women Writers in the Sixteenth Century,” and Elizabeth C. Goldsmith, “Seventeenth-Century Women Writers,” both in *The Cambridge History of French Literature*, ed. William Burgwinkle, Nicholas Hammond, and Emma Wilson (Cambridge: Cambridge University Press, 2011), 211–19 and 306–15, respectively.

17. For examples, see Caroline Sherman, “The Genealogy of Knowledge: The Godefroy Family, Erudition, and Legal-Historical Service to the State” (PhD diss., Princeton University, 2008), 177–95; Oded Rabinovitch, *The Perraults: A Family of Letters in Early Modern France* (Ithaca: Cornell University Press, 2018), 44. Such cases seem to go beyond the educational role of women in the medieval aristocracy, described in Michael Clanchy, “Did Mothers Teach Their Children to Read?” in *Motherhood, Religion, and Society in Medieval Europe, 400–1400: Essays Presented to Henrietta Leyser*, ed. Conrad Leyser and Lesley Smith (Farnham: Ashgate, 2011), 129–53.

18. April Shelford, *Transforming the Republic of Letters: Pierre-Daniel Huet and European Intellectual Life, 1650–1720* (Rochester: University of Rochester Press, 2007), 77–113; Schneider, *Dignified Retreat*, 107–21.

had to address this new reading public and its expectations, even if their explicit positions on women could range from Nicolas Boileau's vicious satire to Charles Perrault's defense.<sup>19</sup> Regardless of their differences on this question—and on many others—we shall see in what follows that both of these authors in fact promoted a similar vision of scientific change.

Both scientific authors and men of letters adapted to the aesthetic expectations of a growing public interested in scientific developments. In 1639 the mathematician Girard Desargues published a short treatise on conic sections in preparation for a more developed treatment of the subject. Desargues sought the advice of Descartes on different audiences he might write for, from learned *doctes* to curious amateurs. In the latter case, replied the philosopher,

*it is certain that your terms will be better received by amateurs ... since they are in French, and their choice displays wit and grace; they could serve to attract certain readers to your works, just as they read works dealing with coats of arms, hunting, architecture, etc., having no desire to become either hunters or architects, only wishing to know how to properly speak about such topics.*<sup>20</sup>

Descartes recommended that the book be easy to read, no more difficult than “the description of an enchanted palace in a novel.”<sup>21</sup>

By 1650, interest in the natural sciences had taken hold of a significant fraction of the French cultural elite. They cultivated this interest thanks to tastes, publications, and forms of sociability emanating from the world of letters. Antoine Baudeau de Somaize's *Dictionnaire des Précieuses* of 1660, which aimed at providing a panorama of fashionable aristocratic society, included fourteen portraits of men and women interested in the new science.<sup>22</sup> They included, for example, “Circé” (a nickname for a certain Madame Chataignères), who hated singing and dancing, preferring astrology and above all chemistry (*chimie*): she “constantly worked on finding the philosophers' stone,” and even had at her home ovens specially built for this purpose.<sup>23</sup> *Mercur galant*, the literary journal that catered to polite society, published mathematical riddles, stories of natural curiosities, and announcements

19. Nicolas Boileau, “Satire X,” in *Œuvres complètes*, ed. Françoise Escal (Paris: Gallimard, 1966), 62–80; Charles Perrault, *L'apologie des femmes* (Paris: Veuve J.-B. Coignard et J.-B. Coignard fils, 1694).

20. Letter from René Descartes to Desargues, June 19, 1639, in *Œuvres de Descartes*, ed. Charles Adam and Paul Tannery, 12 vols. (1964–1974; Paris: J. Vrin, 1996), 2:553–57, here pp. 554–55.

21. *Ibid.*

22. Antoine Baudeau de Somaize, *Le dictionnaire des précieuses* [...], [1660], ed. C. L. Livet, 2 vols. (Paris: P. Jannet, 1856); cited in Geoffrey V. Sutton, *Science for a Polite Society: Gender, Culture, and the Demonstration of Enlightenment* (Boulder: Westview Press, 1995), 103–41.

23. Baudeau de Somaize, *Le dictionnaire des précieuses*, 1:59. See also Sutton, *Science for a Polite Society*, 104–106. For Sutton, these fourteen cases (out of about 300) represent a relatively weak interest in natural philosophy among “polite society,” which would quickly change in the following decades. I would argue that this is already a considerable

on astronomical publications alongside news on the opera or obituaries of royal officers.<sup>24</sup> Popular lecturers like Jacques Rohault familiarized Parisian elites with the thinking of Descartes. Rohault published several works that presented a simplified version of Descartes's system of natural philosophy, geared to readers who were not familiar with the scientific debates and often did not possess the mathematical skills to understand topics such as free fall or the structure of Saturn's rings.<sup>25</sup> When Molière famously satirized the aspirations of women to master the new kind of learning, his broader target was also the emergence of this interest in science among the elite.<sup>26</sup>

Further aesthetic and intellectual considerations led to something of an *entente cordiale* between literary authors and the scientific movement. After 1600, literary authors started to use a form of periodization that stressed a break with the past by crowning new founding authors.<sup>27</sup> Boileau's *L'art poétique*, for example, hailed ancient models but presented seventeenth-century developments as a moment of rupture with the preceding period. For Boileau, François de Malherbe (1555–1628) was the first poet in France to introduce the proper cadence, placement of words, and precise rules for poetry. The rigor and harmony of his style was fitting for a new literary situation, in which Latin was still esteemed “but the French reader wants to be respected.”<sup>28</sup> Malherbe thus became the symbol of an aesthetic break with sixteenth-century poetry, represented by Pierre de Ronsard (1524–1585).<sup>29</sup>

presence, considering the fact that Somaize was mostly interested in other details in the lives of his subjects.

24. For example, *Mercuré galant* (July 1682), 361–62 (publication on the conjunction of Saturn, Jupiter, and Mars); *Mercuré galant* (June 1681), 260–62 (wondrous stories on two pregnant women). See further Christophe Schuway, *Un entrepreneur des lettres au XVII<sup>e</sup> siècle. Donneau de Visé, de Molière au “Mercuré galant”* (Paris: Classiques Garnier, 2020). On the broader phenomenon of the rise of scholarly and political journals in the period, see Jean-Pierre Vittu, “Du *Journal des savants* aux *Mémoires pour l'histoire des sciences et des beaux-arts*: l'esquisse d'un système européen des périodiques savants,” *XVII<sup>e</sup> siècle* 228 (2005): 527–45; Marion Brétéché and Dinah Ribard, “Qu'est-ce que les mercures au temps du *Mercuré galant*?” in “Auctorialité, voix et public dans le *Mercuré galant*,” special issue, *XVII<sup>e</sup> siècle* 270 (2016): 9–22.

25. Jacques Rohault, *Entretiens sur la philosophie* (Paris: Michel Le Petit, 1671), structured as a conversation between the author and an amateur obliged to take up military service to maintain the status of his house, touches on topics such as the physics of the Eucharist and the soul of animals. Rohault, *Traité de physique* (Paris: Veuve de Charles Savreux, 1671), deals with topics such as light and vision (1:264–378) or weight and the tides (2:118–40).

26. In *Les femmes savantes* (1672), the protagonists discuss, for example, their scientific preferences and the merits of Aristotle, Plato, and Descartes, as well as their aspirations to perform experiments: Molière “Les femmes savantes,” act 3, scene 2, in *Œuvres complètes*, ed. Maurice Rat, 2 vols. (Paris: Gallimard, 1956), 2:741–822, here pp. 783–84.

27. Hélène Merlin and Dinah Ribard, “Enfin vinrent Malherbe, Galilée, Descartes... Périodisation littéraire et périodisation culturelle: problèmes théoriques, problèmes historiques,” *Littératures classiques* 34 (1998): 47–71, here pp. 49–51.

28. Nicolas Boileau, “L'art poétique,” in *Œuvres complètes*, 157–85, here pp. 160 and 167.

29. Beyond Merlin and Ribard, “Enfin vinrent Malherbe, Galilée, Descartes...,” see Schneider, *Dignified Retreat*, 46–50.



A determination to innovate played a crucial role in one of the signature quarrels of the first half of the century, the debate on eloquence that followed the publication of Jean-Louis Guez de Balzac's letters in 1624. To his adversaries, Guez de Balzac shockingly proclaimed that "I would much rather invent than imitate; and just as our age has discovered new stars, heretofore hidden, I seek—even in the realm of eloquence—beauties previously unknown."<sup>30</sup> As his reference to astronomical discoveries shows, the aesthetic and intellectual affinity between new poetic forms and the new science would play a key role in the formative debates of the seventeenth century.

Just as practitioners of the new science tried to shatter the scholastic consensus in natural philosophy, authors at large consciously broke with the dominant model of textual commentary in presenting the new discoveries. It was true that the commentary model, like the composition of textbooks, remained an attractive option in certain cases—as attested by Descartes's *Principia philosophiae* (1644). Nonetheless, this was a dramatic change of status: it was now one option among many for scholarly writing. True to his advice to Desargues, Descartes himself sought to address amateurs without incensing scholars who supported ancient models and might be alienated by new terminology. The result was an experimentation with a wide range of genres, including witty dialogues and a treatise on fencing.<sup>31</sup>

In contrast, university-based opponents of the "new philosophy" continued to rely on the scholastic conventions of commentary, a form closely tied to their role as recognized teachers, even in polemics destined for print. For example, in 1692 Jean du Hamel published an attack on Cartesian philosophy in which he prominently identified himself as a graduate in theology (*licencié en Théologie*) of the Sorbonne and a former professor of philosophy at the collège du Plessis-Sorbonne. His discussion of Cartesian philosophy consisted of commentary on quotations from Descartes and his popularizer, Pierre-Sylvain Régis, who had recently composed an entire course of philosophy based on Descartes's ideas. Such commentary was supposed to expose the internal contradictions and essential problems inherent in notions such as Descartes's use of doubt as the basis of philosophy. Even graphically, du Hamel's text appealed to the format of the university commentary, dividing its topics into items numbered as *primo*, *secondo*, *tertio*, etc.—precisely the format of scholastic disputation ridiculed by Molière in his *Malade imaginaire*.<sup>32</sup>

30. Letter from Guez de Balzac to Boisrobert, November 1623, in Jean-Louis Guez de Balzac, *Les premières lettres de Guez de Balzac, 1618–1627*, ed. H. Bibas and K.-T. Butler (Paris: Droz, 1933), 1:143–48, here p. 147; Merlin and Ribard, "Enfin vinrent Malherbe, Galilée, Descartes..." 52. For a pithy discussion, see also Mathilde Bombart, "Des écritures en polémique: autour de la querelle des *Lettres* de Guez de Balzac (1624–1630)," *Littératures classiques* 59 (2006): 173–91.

31. Jean-Pierre Cavaillé, "'Le plus éloquent philosophe des derniers temps'. Les stratégies d'auteur de René Descartes," *Annales HSS* 49, no. 2 (1994): 349–67.

32. Jean du Hamel, *Réflexions critique sur le système cartésien de la philosophie de Mr. Régis* (Paris: Edme Couterot, 1692), 3–4. Probably Molière's most poignant satire of university

This attachment to commentary extended to authors who, acknowledging the need to engage with a new reading public, turned to French rather than Latin. In 1675, the Oratorian Jean-Baptiste de La Grange published an invective against the “new philosophers, Descartes, Rohault, Regius, Gassendi, Father Maignan, &c.” La Grange explained that in this text he would go beyond a limited defense of Aristotelian positions for two reasons: the ancient philosopher had not formulated explicit opinions on some of the topics La Grange planned to discuss, and, in any case, Cartesians and Gassendists did not recognize Aristotle’s authority. Despite La Grange’s reliance on Aristotle, he had to consider a new audience. As he informed his readers, he had originally composed much of his text in Latin, a language more appropriate than French for philosophical purposes, intending that only those preoccupied with study (*gens d’estudes*) should read it. This would not do, however, for the current situation, in which “most of the books by our new philosophers are in French, meaning that this is the pertinent [language] for disabusing those who study their books and accept their opinions.”<sup>33</sup> Even so, La Grange addressed this new public in a format befitting university instruction: a classification of and commentary on the opinions of his opponents, with chapters treating topics such as “the nature of a sensible object” or “how to know whether two things are really separate and whether these are two separate entities.”<sup>34</sup> In other words, university teaching continued to have a strong affinity with both Aristotelian approaches and the genre of commentary, mobilizing their structure and symbolic value to combat the new philosophy.

In contrast to this long-standing affinity between Aristotelian philosophy, the university as a legitimizing institution, and commentary as a textual model, literary authors presented their historical narratives of scientific change outside the university context and in a wide range of aesthetic forms. Despite the intellectual divides and personal enmities vaunted by their authors, together these texts offered a relatively coherent narrative of recent scientific change as a movement with a clear genealogy, and communicated this image to a broad audience in the reading elite. To fully grasp the emergence of this shift, we must thus consider all its dimensions, intellectual, aesthetic, and social. In a learned and subtle study of the early modern life sciences, Pascal Duris has made a strong argument for reading even the most extreme statements about innovation as hesitant and ambivalent, still deeply indebted to the “ancients.” For Duris, this amounts to denying that a scientific revolution, in the sense of a sharp break with the past,

protocols is the finale to the *Malade imaginaire* (1673), which sees Argan admitted to the community of medical doctors. See further Harcourt Brown, *Science and the Human Comedy: Natural Philosophy in French Literature from Rabelais to Maupertuis* (Toronto: University of Toronto Press, 1976), 91–98.

33. Jean-Baptiste de La Grange, *Les principes de la philosophie contre les nouveaux philosophes Descartes, Rohault, Regius, Gassendi, le P. Maignan, &c.* (Paris: Georges Josse, 1675), 42–44.

34. *Ibid.*, 49–65. Dinah Ribard highlights the importance of the transition from oral lecture to the written form in “La science comme littérature à l’époque moderne,” *Littératures classiques* 85, no. 3 (2014): 135–52, here p. 141.

took place at all in the seventeenth century.<sup>35</sup> It is true that seventeenth-century authors acknowledged their admiration for the ancients and their indebtedness to previous traditions quite explicitly, even when they thought that the “moderns” could outdo past achievements. However, focusing on such intellectual elements risks neglecting the social and aesthetic dimensions of this shift.<sup>36</sup> In particular, Duris’s position underplays the question of who had the authority to speak about nature, a theme that underpinned these debates and rose to prominence in discussions about how to communicate science and new discoveries. In the broadest sense, my argument in this article does not even really concern scientific change per se. Rather, it highlights the emergence of a new canon of figures, instruments, and discoveries among the learned elite, organized into a *narrative* of scientific change by new kinds of text. As we shall see, supporters of the ancients or opponents of Descartes could not avoid discussing this new canon. And even in attacking it, they transmitted a narrative of sharp scientific change to their readers.

The case studies that follow show how literary texts accomplished this. Men of letters mobilized the narrative of scientific change in quarrels concerning a host of topics, from the religious controversy around Jansenism to debates on Descartes’s legacy and the relative merits of the moderns vis-à-vis the ancients. The circulation of particular representations can legitimate new practices, and this was especially true in a context of struggles over the status of scientific practitioners and their role in society.<sup>37</sup> From this perspective, men of letters certainly helped in spreading a historical narrative that legitimated the new science. The usefulness of this narrative of scientific change beyond the narrow confines of learned discussion gave it greater visibility and anchored it in the historical consciousness of the reading elite, thereby implanting the scientific movement in a broader culture.

35. Pascal Duris, *Quelle révolution scientifique? Les sciences de la vie dans la querelle des Anciens et des Modernes, XVII<sup>e</sup>–XVIII<sup>e</sup> siècles* (Paris: Hermann, 2016). See also Sophie Roux, “De la nouveauté à l’âge classique,” in *Concepts, cultures et progrès scientifiques et techniques, Enseignement et perspectives*, ed. Gérard Pajonk (Paris: Éd. du CTHS, 2009), 79–90. For the broader debate on innovation or continuity in seventeenth-century science, see John L. Heilbron, “Was There a Scientific Revolution?” in *The Oxford Handbook of the History of Physics*, ed. Jed Z. Buchwald and Robert Fox (Oxford: Oxford University Press, 2013), 7–24; Stéphane Van Damme, “Un ancien régime des sciences et des savoirs,” in *Histoire des sciences et des savoirs*, vol. 1, *De la Renaissance aux Lumières*, ed. Stéphane Van Damme (Paris: Éd. du Seuil, 2015), 19–20.

36. As John Henry remarked, studies that focus on the “technical and intellectual content of the sciences” can show continuities with the past, whereas discontinuities are much more visible in the social history of the early modern period: Henry, “Science and the Scientific Revolution,” in *Encyclopedia of European Social History: From 1350 to 2000*, ed. Peter N. Stearns (Detroit: C. Scribner’s Sons, 2001), 2:77–94, here p. 78.

37. See the broad statement in Roger Chartier, “Le monde comme représentation,” *Annales ESC* 44, no. 6 (1989): 1505–20.

## Defending Science against Parlement and University: The *Arrêt burlesque*

In 1671, the archbishop of Paris, François de Harlay de Champvallon, published a royal decree ordering universities to teach only the proper doctrine defined in their statutes. The king was concerned that “certain opinions that the faculty of theology had once censored, and whose teaching and publication were prohibited by the Parlement [of Paris], are now being disseminated, not only in the University, but also in the rest of this city and in other parts of the kingdom.”<sup>38</sup> This was a reference to a condemnation of atomism proclaimed in 1624, now being used to prevent the opinions of Descartes from circulating within these institutions of higher learning. Several universities—Angers, Caen, and Paris—did in fact try to implement this decree and block the teaching of Descartes’s doctrines.

This was a sensitive moment. During the 1660s, several of Descartes’s works, such as *Le monde*, had posthumously appeared in print, and the transfer of his remains to the church of Sainte-Geneviève in Paris provided a festive occasion for celebrating the philosopher and his influence. But not all augured well for the fortunes of his “new philosophy.” Cartesian philosophy was censored in Leuven in 1662, and in Rome the following year Descartes’s works were placed on the index of prohibited books pending correction (*donec corrigatur*). While these condemnations did not immediately lead to the Parisian one, they did raise questions, most prominently about the implications of Descartes’s philosophy for understandings of the Eucharist. Conciliatory replies to this problem by Descartes’s supporters, including Antoine Arnauld and Rohault, did not satisfy their adversaries, and may even have galvanized the formal condemnation.<sup>39</sup>

Men of letters were quick to react. August 1671 saw the publication of a short satirical text with a long title: *Request by the Masters of Art, Professors, and Regents of the University of Paris, Presented to the Sovereign Court of Parnassus, Including the Ruling on the Said Request against All Those Who Claim to Teach or Believe in the New Discoveries Not Included in Aristotle*.<sup>40</sup> Parodying the pompous tone and conservative position of the university, it consists of a mock petition followed by the court’s verdict, shot through with ridicule for those who denied the advances of the new science.

38. Cited in Roger Ariew, “Damned If You Do: Cartesians and Censorship, 1663–1706,” *Perspectives on Science* 2, no. 3 (1994): 255–74, here pp. 257–58; translation slightly amended based on Francisque Bouillier, *Histoire de la philosophie cartésienne*, 3rd ed. (1842; Paris: Ch. Delagrave et cie, 1868), 1:469.

39. Sophie Roux, “The Condemnations of Cartesian Natural Philosophy under Louis XIV (1661–91),” in *The Oxford Handbook of Descartes and Cartesianism*, ed. Steven Nadler, Tad M. Schmaltz, and Delphine Antoine-Mahut (Oxford: Oxford University Press, 2019), 755–79, esp. pp. 756–65; more broadly, Stéphane Van Damme, *Descartes. Essai d’histoire culturelle d’une grandeur philosophique* (Paris: Presses de Sciences Po, 2002).

40. [François Bernier], *Requête des maistres ès arts, professeurs, et régens de l’Université de Paris [...]* (Delphy [*sic*, for Delphi]: Societé des imprimeurs ordinaires de la Cour de Parnasse [fictional address], 1671).

The satire extends even to the material presentation of the work, whose title page announces that it was printed “in Delphi, by the Society of Regular Printers to the Court of Parnassus.” Though it initially appeared anonymously, it was authored by François Bernier, a famous traveler and orientalist who published letters to his patrons (Jean-Baptiste Colbert, Jean Chapelain, François de La Mothe Le Vayer) describing his stay in the Mughal court,<sup>41</sup> together with Boileau, a poet and ardent supporter of the ancients in the “quarrel of the ancients and the moderns.” Jean Racine, one of the most celebrated playwrights of the age, perhaps contributed, while advice on the juridical vocabulary may have been provided by Nicolas Dongois, a legal clerk (*greffier*) at the Parlement of Paris and Boileau’s nephew.<sup>42</sup> This text, known today as the *Arrêt burlesque*, included several sections, probably penned by the different authors, and circulated in at least two versions, the first of which I shall call the “Bernier version.” The second, shorter text will be called the “Boileau version,” as it appeared in 1701—after numerous modifications—in the poet’s collected works.<sup>43</sup>

Although appearing in the mouths of members of the university as they comically seek to decry them, the list of scientific discoveries highlighted in the Bernier version reads like a modern textbook account of the “Scientific Revolution,” citing the moons of Jupiter, sunspots, the superlunary trajectories of comets, and other astronomical phenomena (see appendix 1).<sup>44</sup> It also enumerates discoveries held to refute Aristotle, such as the weight of the air or the existence of the vacuum, or to counter ancient medical authorities, such as the circulation of the blood and the fact that the head, rather than the heart, is the center of the nervous system.<sup>45</sup>

The Boileau version is narrower in scope. It principally highlights three issues related to the authority of the university, especially in the context of medicine: new discoveries concerning physiological features, new medical treatments, and the publication of texts challenging authorities associated with the University of Paris. For example, it recounts that:

41. Nicholas Dew, *Orientalism in Louis XIV’s France* (Oxford: Oxford University Press, 2009), 131; Faith E. Beasley, *Versailles Meets the Taj Mahal: François Bernier, Marguerite de La Sablière, and Enlightening Conversations in Seventeenth-Century France* (Toronto: University of Toronto Press, 2018), esp. chaps. 1 and 2 for Bernier’s milieu in the 1670s, though the *Arrêt* is not discussed.

42. Jean Luc Robin, “L’Indiscipline de l’*Arrêt burlesque* et les deux voies de la légitimation du discours scientifique,” *Seventeenth-Century French Studies* 29, no. 1 (2007): 101–11, here p. 107. On the text, see Brown, *Science and the Human Comedy*, 102–105; Gad Freudenthal, “Littérature et sciences de la nature en France au début du XVIII<sup>e</sup> siècle: Pierre Polinière, l’introduction de l’enseignement de la physique expérimentale, à l’Université de Paris et l’*Arrêt burlesque* de Boileau,” *Revue de Synthèse* 99–100 (1980): 267–95.

43. Boileau rewrote the text in 1701, as his eighteenth-century editor explained in Nicolas Boileau, “Arret burlesque, donné en la grand’chambre du Parnasse [...],” in *Œuvres de Mr. Boileau Despréaux* [...] (Geneva: Fabri et Barrillot, 1716), 2:237–42, here p. 237.

44. For Duris, this text “provides a rather precise overview of the principal personalities and discoveries claimed by modern science in the last third of the seventeenth century”: Duris, *Quelle révolution scientifique?* 203–209, here p. 204.

45. [Bernier], *Requête des maîtres ès arts*, 7–8.

[an] unknown named Reason has ventured to break into the Schools of the aforementioned University ... [and] using a procedure that is absolutely not valid, attributed to the aforementioned heart the role of receiving the chyle that used to belong to the liver; [Reason] also had the blood circulate in the entire body, giving the aforementioned blood the full authority to wander, err, and circulate with impunity through the veins and arteries. The only claim and title for these vexations being Experience, whose testimony has never been accepted in the aforementioned Schools.<sup>46</sup>

The text also purports to be scandalized by the fact that instead of relying on bleeding and purging, the new methods use pure wine, powders, and quinine (*quinquina*) to treat numerous kinds of fever. These complaints are backed up with mock-outraged references to real publications, including “the Physics of Rohault, the Logic of Port-Royal, Treaties on Quinquina, even the *Adversus Aristoteleos* by Gassendi, and other pieces submitted with this request.”<sup>47</sup>

If the list of scientific discoveries cited reads like a textbook version of the “Scientific Revolution,” in aesthetic terms the *Arrêt* does something quite different. In satirizing the pedagogical institution of the university and the views of its members—an issue directly related to the circulation of scientific information among new audiences and in new genres—the text reflected the aesthetic, social, and intellectual commitments of the new philosophy. The preface to the Bernier version, entitled “Alitophile [Lover of Truth] to the Reader,” explains the circumstances of its composition in these very terms. It recounts how several members of the University of Paris had tried to obtain a ruling by the Parlement that would prohibit the teaching of Descartes. They presented him as an atheist, but this charge would not stick: Descartes had dedicated his *Meditations* to the Sorbonne, as several doctors still recalled. Even worse for the attempts to frame him as an atheist, Alitophile observes, Descartes strove to prove the existence of God and the immortality of the soul, and the Sorbonne had been obliged to recognize the excellence of his arguments. The judges in the Parlement prudently rejected the efforts to prohibit his works, claiming that such measures could bring ruin upon the university and decreeing that new discoveries contradicting Aristotle should be taught. The text thus stages the competition between authorities and the publics they could enlist: the king himself, claims the preface, sponsors “those who work to embellish the sciences and make new discoveries.”<sup>48</sup>

In aesthetic terms, the *Arrêt* relied on a mixture of genres for its comic effect. Ironically framing scientific claims in ponderous legal language, it presented Parnassus (home of the muses and a symbol of poetic art) as the appropriate authority for judging language and taste, underscoring the inappropriate character of the convoluted and pedantic language current at the Sorbonne. In the 1701 version, Boileau remarked that the satire was perhaps “somewhat low, and all in the terms

46. Boileau, “Arrêt burlesque,” in *Œuvres complètes*, 325–30, here pp. 327–28.

47. *Ibid.*, 328.

48. [Bernier], preface to *Requête des maîtres ès arts*, 3–4.

of the [legal] Practice.”<sup>49</sup> This blending of genres is also highlighted in the preface’s description of the text as both “burlesque” and “savant.” While the comic allure of the work was clear, it aimed for more: “This piece ... covers the major discoveries of this age, ... and shows that if Descartes is to be condemned for writing something not included in Aristotle, all those who took part in the new discoveries should be censured, and Gassendi first and foremost.”<sup>50</sup> Pierre Gassendi’s intellectual renown is a key theme in this text, and the humoristic condemnation explains that “Gassendi should be given a harsher punishment, for he is the most criminal and dared display seditious posters (*placards*), which were taken, out of ignorance, as great and long chapters, very learned and judicious”; what is more, his titles are all explicitly anti-Aristotle.<sup>51</sup> Considering that Bernier was to become the most important popularizer of Gassendi in the seventeenth century, it is not surprising that the *Arrêt* presented a coherent picture of recent scientific changes, going far beyond Descartes’s work.<sup>52</sup> It no doubt appealed to readers as a brief and frankly funny text, offering passing amusement without requiring a substantial investment of time or money. On another level, given its weaving together of numerous satirical allusions, it probably required familiarity with legal and scholarly jargon to appreciate its humor. It is likely that its readers had a similar profile to its authors: educated men who kept abreast of recent scholarly scandals.

The *Arrêt* certainly gained some public notoriety, especially in the more detailed Bernier version. As early as 1671 it was also published in the Low Countries, in an edition that included a text discussing “Parnassian” wars between authors who supported the ancients and those who favored the moderns. It probably appeared in two further editions in 1672 and 1674, and was still being published in the Low Countries in 1702, in a version that updated the names of some of the scientific practitioners—Joseph-Guichard Duverney and Jean Méry replaced Nicolaus Steno and Theodor Kerckring, and the list of names to be censored expanded to include Régis and Pierre Bayle.<sup>53</sup> Even in the second half of the eighteenth century, the *Arrêt* and its use of convoluted legal language continued to serve as a model for authors seeking to ridicule their opponents in scientific debates. It was explicitly used as a model in a satire of a 1766 work that claimed to offer a cosmology

49. Nicolas Boileau, *Œuvres diverses du Sr Boileau Despréaux, avec le Traité du sublime, ou du merveilleux dans le discours* [...] (Paris: Denys Thierry, 1701), 292.

50. [Bernier], *Requête des maîtres ès arts*, 4.

51. *Ibid.*, 9.

52. François Bernier, *Abrégé de la philosophie de Gassendi*, 8 vols. (Lyon: Anyson et Posuel, 1678).

53. Gabriel GUÉRET, *La guerre des auteurs anciens et modernes, avec la Requête et arrest en faveur d’Aristote* (La Haye: Arnoult Leers, 1671); Paris, Bibliothèque nationale de France, R-9438, [François BERNIER], *Requête des maîtres ès arts, professeurs et régents de l’Université de Paris* [...] (Libreville: Jacques Le Franc, 1702), pp. 13 and 15 for the updates to the 1671 version. (The place of publication [“Freetown”] and the printer [“Candid Jacques”] were obviously invented to protect the printer behind this pirated edition.) A stand-alone edition from 1674 quite probably existed, but it seems impossible to locate in public collections. The Gottfried Wilhelm Leibniz Library in Hanover holds a copy (Lr 8049) apparently published in 1672, testifying to the probable existence of yet another edition.

to supersede both Descartes and Newton, and in a pamphlet of 1785 supporting Mesmerism.<sup>54</sup> The Bernier version enjoyed a long afterlife, while the Boileau version appeared as a minor sidenote in the oeuvre of the poet, whose fame rested mostly on his satires and his theoretical works on poetry.<sup>55</sup>

With its combination of genres and linguistic registers, the aesthetic choices of the *Arrêt* echoed the social and intellectual position of men of letters and gave shape to their vision of a quick and deep scientific change. What is more, it transmitted this vision to elites in a convenient and accessible form, an effective tactic that was also adopted by the opponents of the new philosophy, as we shall see in the next section.

### The New Philosophy and Religious Polemics: The *Voyage to the World of Descartes*

Even self-proclaimed opponents of the new philosophy were obliged to confront the discoveries championed by the authors of the *Arrêt*. The fact that hostile authors felt the need to refute, reinterpret, or ridicule this scientific canon was evidence of just how well established it already was. The satirical work by the Jesuit Gabriel Daniel, known as Père Daniel, is one such example. His popular novel, *A Voyage to the World of Descartes*, was first published in 1690; it then went through eleven editions and was translated into four languages by the middle of the eighteenth century.<sup>56</sup>

In Daniel's novel, the narrator meets a Cartesian who discloses to him the secret for separating one's soul from one's body: sniffing special tobacco from China mixed with herbs. Thus liberated, the two travel to the Moon, where they meet the

54. *Arrêt burlesque donné sur requête et par défaut en la grand'chambre du Parnasse Ilinois et Huron* [...] (s.l.: L'imprimerie de la Cour, 1770), satirizing Jacques C. François de La Perrière de Roiffé, *Nouvelle physique céleste et terrestre* [...], 3 vols. (Paris: Delalain, 1766); *Requête burlesque, et arrêt de la Cour du Parlement, concernant la suppression du magnétisme animal* (s.l. [Paris]: s.n., 1785).

55. As can be seen, for example, in Nicolas Boileau and Jacques de Losme de Montchesnay, *Bolaeana, ou Bons mots de M. Boileau* [...] (Amsterdam: L'honoré, 1742). The shorter Boileau version was also included in a publication by an opponent of Descartes, who used it to document the unjustified abuse heaped on the University of Paris by the philosopher's supporters: François Babin, *Journal ou Relation fidelle de tout ce qui s'est passé dans l'Université d'Angers au sujet de la philosophie de Des Carthes* [...] (s.l.: s.n., 1679), 18–19.

56. I am quoting the expanded edition of 1702: Gabriel Daniel, *Voyage du monde de Descartes* (Paris: Nicolas Pépie, 1702). On the text, see Merlin and Ribard, "Enfin vinrent Malherbe, Galilée, Descartes..." 60–68; Jean-Luc Solère, "Un récit de philosophie-fiction: Le *Voyage du monde de Descartes* du Père Gabriel Daniel," *Uranie. Mythes et littératures* 4 (1994): 153–84; Nicolas Corréard, "Voyager dans le monde des idées: le roman de la philosophie naturelle selon Margaret Cavendish et Gabriel Daniel," *XVII<sup>e</sup> siècle* 280 (2018): 411–32; Justin Smith, "Gabriel Daniel: Descartes through the Mirror of Fiction," in Nadler, Schmaltz, and Antoine-Mahut, *The Oxford Handbook of Descartes and Cartesianism*, 791–803.



souls of renowned philosophers, from Socrates and Aristotle to Girolamo Cardano and Marin Mersenne; they even have a pleasant conversation with a Chinese philosopher who has encountered Descartes's principles. Finally, the narrator meets Descartes himself, who is constructing a new world in space according to his philosophical principles. The book is undoubtedly intended as a critique of the new philosophy: the encounters with philosophers and the dialogues that ensue are meant to convince readers that Aristotelian philosophy, as taught in the universities, has good answers to the many criticisms leveled at it, while Descartes's philosophy is riddled with contradictions and built on erroneous assumptions.

Book four of Daniel's text masquerades as a letter written by the narrator to Descartes. After his conversion to Cartesianism, the narrator returns to Earth and starts to spread the philosopher's doctrines at social gatherings, claiming to be the "most zealous disciple for the honor and the growth of the Sect."<sup>57</sup> He manages to make inroads in this endeavor, and converts several supporters of Aristotelian philosophy. Others, however, are not swayed by his arguments and present him with objections that require answers from the master himself. The putative letter uses this conceit to sketch out potential problems in Descartes's physics, touching on topics such as subtle matter, the vacuum, and the rotation of particles. Significantly, the arguments it mobilizes are common-sense scholasticism, "used every day in class," rather than the observations, experiments, and mathematical discussions that formed the backbone of counterarguments by other participants in the scientific movement.<sup>58</sup> Moreover, Daniel frames the argument as taking place between the new philosophy and the scholastic establishment, firmly entrenched in pedagogical institutions. It seems that in the public eye, the university remained inextricably linked to Aristotelian philosophy up to the final decade of the seventeenth century.<sup>59</sup>

By the time the *Voyage* was published, both opponents and proponents of the scientific movement faced a veritable canon of new philosophical problems, new instruments, and newly identified natural phenomena. Daniel was thus obliged to reinterpret the same repertoire of problems and discoveries that authors like Bernier and Boileau had presented as proof of the triumph of scientific innovation. This included phenomena central to the new science, such as the moons of Jupiter,<sup>60</sup> although he avoided addressing other discoveries such as the phases

57. Daniel, *Voyage du monde de Descartes*, 346.

58. *Ibid.*, 343–53, citation p. 348.

59. As widely demonstrated by L. W. B. Brockliss, for example in "Aristotle, Descartes and the New Science: Natural Philosophy at the University of Paris, 1600–1740," *Annals of Science* 38, no. 1 (1981): 33–69. For a review of the debate on the relation of universities to early modern science, especially in the English context, see Mordechai Feingold, "Between Teaching and Research: The Place of Science in Early Modern English Universities," in *The Institutionalization of Science in Early Modern Europe*, ed. Mordechai Feingold and Giulia Giannini (Leiden: Brill, 2020), 3–19.

60. Daniel acknowledged the existence of the moons of Jupiter in his description of the building of Descartes's world, but did not elaborate on the context of their discovery: Daniel, *Voyage du monde de Descartes*, 321.

of Venus.<sup>61</sup> While Daniel mostly concentrated on physical problems amenable to conceptual discussion in the scholastic tradition, he also covered contested topics such as whether animals had souls.<sup>62</sup> He even used newly established phenomena, including the existence of the vacuum, to argue against Descartes and to suggest that Aristotle's position on these issues had been misunderstood.<sup>63</sup> Overall, the *Voyage* was probably a very accessible text: presented as a novel of cosmic travel, it did not require the familiarity with Descartes or scholastic forms of discussion demanded by the *Arrêt*. Since it could also serve as a critical introduction to Descartes's ideas, it would not lose readers who lacked a comprehensive education. Nor did it depend on knowledge of recent scandals to make its arguments. Like Fontenelle's *Conversations* (1686), its readership may well have been much more mixed than that of the *Arrêt*, including in terms of gender.

For its advocates and critics alike, the new philosophy was embedded in an informal institutional framework that facilitated the circulation and discussion of texts outside the university. Even authors critical of the new science were obliged to recognize these new conditions for the transmission of ideas. When the narrator of the *Voyage* returns to Earth after visiting Descartes's world and converting to Cartesianism, his life changes dramatically. He speaks with contempt of scholastic philosophy, good only for filling people's minds with confused ideas. When invited to attend the defense of a philosophy thesis, he forces himself to go, observing the proceedings with pity. He culls from his library books by scholastic philosophers such as Francisco Suárez and Pedro de Fonseca, and "abandons them in a dank side room, at the mercy of dust and worms."<sup>64</sup> The shelves are restocked with a lavishly bound volume of Descartes and works by his followers. Where once he could not stand the sight of a dead chicken, the narrator is now able to slaughter an entire town's population of dogs for the purposes of dissection. Finally, Daniel describes the "conferences and assemblies" that the narrator holds with other savants to spread the ideas of his master.<sup>65</sup> Ultimately, for Descartes's opponents, Cartesian ideas were so patently false that their success was predicated on the social and institutional framework that made their popularity possible even in the absence of intellectual merit.<sup>66</sup>

61. The Jesuits recognized the phases of Venus by 1611, nine years before they formally accepted Tycho's models, in spite of their devastating potential for geocentric models: Mario Biagioli, *Galileo's Instruments of Credit: Telescopes, Images, Secrecy* (Chicago: University of Chicago Press, 2006), 155, n. 33.

62. This is the main subject of book 5: Daniel, *Voyage du monde de Descartes*, 427–516. An early version of this section appeared as *Nouvelles difficultez proposées par un péripatéticien à l'auteur du "Voyage du monde de Descartes." Touchant la connoissance des bestes [...]* (Paris: Vve de S. Benard, 1693). This text was published anonymously, but Barbier has very plausibly identified Daniel as the author: Antoine-Alexandre Barbier, *Dictionnaire des ouvrages anonymes*, 3rd ed., 4 vols. (Paris: Paul Daffis, 1872–1879), 3:569–70.

63. Daniel, *Voyage du monde de Descartes*, 175.

64. *Ibid.*, 343.

65. *Ibid.*, 342–45.

66. Merlin and Ribard, "Enfin vinrent Malherbe, Galilée, Descartes....," 60.

While this stress on the social context of the new science remained a constant, the particular circumstances of the early 1690s had a significant impact on Daniel's authorial choices. There was definitely a sense that the last word had not been said about Descartes, even forty years after his death. The year 1691 saw the publication of Adrien Baillet's two-volume biography of the philosopher, which provoked furious reactions in certain quarters. Bishop Pierre-Daniel Huet, one of the foremost scholars of the age, published a satire of Descartes in 1692, having reached an impasse in his own philosophical arguments with the latter's positions.<sup>67</sup> Daniel's work was part of a current of reassessments of Cartesianism, not all of them scholarly in the traditional sense. But in other, probably deeper ways, the *Voyage* was also conceived as a part of a religious polemic against the Jansenists and their philosophical supporters.

The attack on Jansenism is particularly evident in the association Daniel wove between the reception of Descartes's philosophy and a shifting religious context. When they first meet, Descartes asks the narrator of the *Voyage* for an update on the fortunes of his philosophy. Conscious that his response will disappoint, the latter recounts how, after an initial period in fashion, it had begun to decline. In particular, the "conversion of the Huguenots," as Daniel calls the revocation of the Edict of Nantes in 1685, had lost the philosopher many disciples—as new converts to Catholicism, convinced of the real presence of the body of Christ in the host, they had seen the errors in his arguments.<sup>68</sup> Daniel's account of the history of Cartesianism foregrounds its links to religious institutions even further: when Descartes failed to find support among the Jesuits, he embraced the positions of the Jansenists, while the survival of his philosophy depended on the Oratorians, a competing teaching order.<sup>69</sup>

The anti-Jansenist polemic that structured the *Voyage* and Daniel's literary career more widely found a focal point in the person of Blaise Pascal, the celebrated philosopher, experimentalist, and Jansenist polemicist. In the *Voyage* Daniel initially celebrates Pascal's experiments on the vacuum, as they help refute Descartes's physics and his assumption of a plenum. But the text goes on to discredit Pascal as an author across a range of topics, asserting that his most famous experiment on the vacuum was carried out by Florin Périer, his brother-in-law, and really should have been named after Descartes, who claimed to have encouraged Pascal to perform it. Further, Pascal's work on conic sections had been strongly inspired by Desargues, and his father, Étienne Pascal, was probably its real author. The narrator and Descartes then deconstruct the story of the young Pascal's discovery of

67. M. G. de l'A. [Pierre-Daniel Huet], *Nouveaux mémoires pour servir à l'histoire du cartésianisme* (s.l.: s.n., 1692). On Huet's "throwing in the towel" and his turn to "ridicule, hyperbole, and abusive ad hominem attacks" in the *Nouveaux mémoires*, see Thomas M. Lennon, "Pierre-Daniel Huet, Skeptic Critic of Cartesianism and Defender of Religion," in Nadler, Schmaltz, and Antoine-Mahut, *The Oxford Handbook of Descartes and Cartesianism*, 780–90, here p. 787.

68. Daniel, *Voyage du monde de Descartes*, 258.

69. Ibid., 254–57 and 271–79.

Euclid's first thirty-two propositions, as recounted in the biography written by his sister, Gilberte Périer. All this leads up to a direct attack on Pascal's authorship of the anti-Jesuit *Provincial Letters*, which Daniel claims were based on briefs prepared by other Jansenists "that he thought were correct, even though they were false, not recognizing sufficiently the spirit of the party he supported."<sup>70</sup>

Daniel also critiqued Pascal in other publications during the 1690s, reacting directly to the praise heaped upon him in Perrault's *Parallèle des Anciens et des Modernes*, and quoting directly from the second volume, which appeared in 1690.<sup>71</sup> Pasquier Quesnel, an Oratorian and prominent Jansenist theologian, even alleged that Daniel's works were deliberately intended to provoke Arnauld, the notable Jansenist theologian and scholar, who as a supporter of Cartesian ideas might be lured into a public conflict with an author "trying to make a name for himself."<sup>72</sup>

Daniel did indeed make a name for himself, and by his death in 1728 was well known for a *History of France* (1696–1713) and a *History of the French Militia* (1721). The *Voyage* certainly contributed to his international renown, and it quickly appeared in English (1692), Latin (1694), Spanish (late seventeenth century), Dutch (1700), and Italian (1703). These translations reveal how such a text could fit into different philosophical and religious contexts. The English translator, T. Taylor, a fellow of Magdalen College, Oxford, would also translate Nicolas Malebranche, and appeared deeply interested in the continental debates on Descartes and his followers.<sup>73</sup> The Italian translation, in contrast, was the work of Giovanni Battista De Benedictis, an influential Jesuit active around Naples who was fiercely opposed to reformist currents in the Church. A later Spanish translation of 1742 was the work of Alonso Ambrosio, the general chronicler of the Cistercian order in Spain.<sup>74</sup> In contrast to the reception of the *Arrêt*, which remained part of a scientific and philosophical discussion even in the late eighteenth century, the transmission of the *Voyage* relied

70. Ibid., 261–69, here p. 268. For Pascal's biography, see Gilberte Périer, "La vie de Monsieur Pascal, écrite par Madame Périer, sa sœur," in Blaise Pascal, *Œuvres complètes*, ed. Jacques Chevalier (Paris: NRF, 1954), 3–34, here pp. 4–5 for the anecdote on the young Pascal's spontaneous reconstruction of Euclid's first thirty-two propositions.

71. Gabriel Daniel, *Entretiens de Cleandre et d'Eudoxe, sur les "Lettres au Provincial"* (Cologne: Pierre Marteau, 1694), esp. 2–9 for the reaction to Perrault. The name Pierre Marteau was conventionally used for pirated or unlicensed editions.

72. [Pasquier Quesnel], *Le roman séditieux du Nestorianisme renaissant* [...] (s.l.: s.n., [1693]), 1; [Gabriel Daniel], *Lettre apologétique de l'auteur du "Voyage du monde de Descartes," accusé fausement dans un écrit intitulé "Le roman séditieux, etc."* [...] (s.l.: s.n., 1693). On the broader context for these polemics, see Jean-Pascal Gay, *Morales en conflit. Théologie et polémique au Grand Siècle, 1640–1700* (Paris: Éd. du Cerf, 2011).

73. Gabriel Daniel, *A Voyage to the World of Cartesius*, trans. T. Taylor (London: Thomas Bennet, 1692); Nicolas Malebranche, *Father Malebranche his Treatise Concerning the Search after the Truth* [...], [1664–1675], trans. T. Taylor (London: W. Boyer et al., 1700).

74. Augustin de Backer, *Bibliothèque des écrivains de la Compagnie de Jésus, ou Notices bibliographiques* (Liège: Impr. de L. Grandmont-Donders, 1853), 1:241; Francisco Aguilar Piñal, *Bibliografía de autores españoles del siglo XVIII* (Madrid: Instituto de filología Miguel de Cervantes, 1981), 1:151.

on the networks of religious orders, probably indicating its reach into different sets of publics, both scholarly and ecclesiastical.

Daniel's *Voyage* shows how a seemingly well-defined set of intellectual problems—namely, how to react to Descartes's philosophy—became entangled in a new religious polemic and spread through different channels. But it also points to important commonalities. Seventeenth-century authors understood the shifts brought about by the new philosophy in terms that transcended changing ideas about nature. In their eyes, the diffusion of the new philosophy in print and through informal academic circles led to the formation of a canon of problems and phenomena that went beyond the limits of a particular philosophical current, even a central one like Cartesianism. Men of letters presented this canon for their own reasons: Daniel used criticism of Descartes as part of an attack on Jansenism, the religious current that formulated the sharpest criticisms of the Jesuits' supposed moral laxity in the seventeenth century. Such debates clearly resonated widely, and these different uses helped spread the image of a sharp, recent, and deep scientific break among the reading elite.

### Science in an Aesthetic Quarrel: Perrault's *Parallèle des Anciens et des Modernes*

Sometime before October 1688, Perrault addressed a letter to Huygens, who, besides being one of the greatest luminaries of seventeenth-century science, was a close friend of the Perrault family. Perrault sought Huygens's opinion on the thesis he was trying to support, namely that “in all the arts and sciences, the moderns are at least equal to the ancients, and the moderns outdo the ancients in many respects.”<sup>75</sup> Perrault asked Huygens to send a brief on the greatest discoveries of the age in astronomy, mathematics, and mechanics, and to include Huygens's own achievements. He also asked for references to works he could use to delve deeper into the issue. Huygens hesitated about whether he should discuss developments in mathematics: as a mathematician himself, he might appear presumptuous. Nonetheless, he listed advances in geometry made thanks to developments in algebra, and jotted down that “eighty years ago, astronomy was nothing compared to what it is today. It was all conjecture, and now we know the truth. On top of all the new discoveries.”<sup>76</sup> This exchange fed into Perrault's broader thinking about the accomplishments of his day. He had asked Huygens for a concise list of achievements, stamped, as it were, with his imprimatur, but what Perrault produced was a volume of more than three hundred pages, the last of a four-part series, polemically presenting the cardinal accomplishments of seventeenth-century science and technology. In all probability,

75. Christiaan Huygens, *Œuvres complètes*, 22 vols. (The Hague: Martinus Nijhoff, 1888–1950), 9:301–302. Neither the original letter nor the reply has been preserved. Huygens's notes for a reply state the thesis of his presumed correspondent, in all probability Perrault.

76. *Ibid.*

he already possessed fairly accurate historical knowledge regarding the scientific transformations that had taken place in that century, which he had developed over a long career as a man of letters.

Today, Perrault is known mostly for his famous fairy tales, including *Cinderella* and *Puss in Boots*. But he was one of the most renowned authors in seventeenth-century France. An aide and cultural adviser to the minister Jean-Baptiste Colbert, he held a seat in the Académie française and published in a range of genres, from fashionable gallant poetry to discussions of painting and political encomia. In 1687, a reading of his poem celebrating the achievements of the age of Louis XIV reignited the “quarrel of the ancients and the moderns.” Between 1688 and 1697, Perrault, who favored the modern case, published four volumes on parallels between the achievements of the ancients and the moderns, with the first three focusing respectively on art and architecture, eloquence, and poetry (the second was the text that provoked such a strong reaction from Daniel for its praise of Pascal). He devoted the final volume, published in 1697, to scientific and technological achievements.<sup>77</sup>

The quarrel pitted supporters of authorities dating from antiquity against those who, like Perrault, considered modern achievements superior to those of their ancient predecessors. Despite the heated debate—Boileau apparently became so incensed by Perrault’s claims in the poem read to the academicians in 1687 that he shouted until he lost his voice<sup>78</sup>—there was consensus on the recent developments in science. The protagonists of the quarrel carefully distinguished between the progress possible in the sciences, where modern achievements seemed indisputable, and progress in the arts, a notion that left more room for differing visions of historical change. Even Hilaire-Bernard de Longepierre, who published his *Discours sur les anciens* in 1687 as a direct reply to Perrault’s poem, praised recent accomplishments in “physics, astronomy, and other sciences whose perfection depends on the great number of experiments, observations, and discoveries that are made each day.”<sup>79</sup>

Nonetheless, Perrault treated the sciences as the cornerstone of his argument for the modern position. Though his volume on the topic only appeared in 1697, he had consulted with Huygens a decade earlier, and had originally planned to publish his work on the sciences as the second volume of the *Parallèle*. According to Perrault, he ultimately decided to devote the second volume to eloquence rather than “astronomy, geography, navigation, physics, mathematics, etc.,” because avoiding topics such as eloquence and poetry might suggest that the modern case was

77. Charles Perrault, *Parallèle des Anciens et des Modernes en ce qui regarde les Arts et les Sciences* [...], 4 vols. (Paris: Veuve J.-B. Coignard et J.-B. Coignard fils, 1688–1697).

78. Sara E. Melzer, *Colonizer or Colonized: The Hidden Stories of Early Modern French Culture* (Philadelphia: University of Pennsylvania Press, 2012), 125.

79. Cited in Larry F. Norman, *The Shock of the Ancient: Literature and History in Early Modern France* (Chicago: University of Chicago Press, 2011), 40; compare Duris, *Quelle révolution scientifique?* 251–57, and 262–66 more broadly on Perrault’s *Parallèle*.

weaker there.<sup>80</sup> Taken together, the attitudes of Perrault and Longepierre show that both sides in the quarrel distinguished between science-based topics and poetry, and considered the progress of the specifically scientific and technological domains to be ultimately self-evident.

The way that Perrault's polemic classifies the broad range of the arts and sciences is especially remarkable. First, the selection of scientific topics for his fourth volume is not limited to an early modern category of "natural history" or "natural philosophy," but is much closer to an expansive notion of "science and technology" as we understand it today, ranging from mapmaking and navigation through clockmaking and mathematical techniques to astronomical observations of the solar system and the invention of the microscope (see appendix 2). "Philosophy" appears in the traditional guise of the university discipline, divided into logic, morals, physics, and metaphysics. But even here, the bulk of the discussion is devoted to topics of scientific interest, notably whether animals have souls or are pure machines (also treated at length by Daniel).<sup>81</sup> The way that Perrault divides up the discussion thus implies a coherence of scientific and technological topics, distinct from the aesthetic and literary issues discussed in the other volumes of the *Parallèle* but not limited to the disciplinary demarcations and subdivisions of philosophy as enshrined in the university curriculum.

Like Daniel or Bernier and his coauthors, it is evident that Perrault was referencing a relatively clear canon of discoveries and scientific problems that was shared among French authors. This canon included illustrious figures such as Galileo, Descartes, Nicolaus Copernicus, Johannes Kepler, and William Harvey; famous discoveries, such as the mountains and valleys of the Moon, the satellites of Jupiter, Saturn's rings, the existence of the vacuum, the circulation of the blood, and the mapping of new continents; and the instruments and techniques that made such discoveries possible, including the telescope, the microscope, the use of dissection in anatomy, and observatories (such as Uraniborg on the island of Hven or that of the Academy of Sciences on the outskirts of Paris). As a longtime aide to Colbert, Perrault was highly conscious of the patronage value of some of these discoveries, and in this his text displays some continuity with earlier histories of art and invention, especially Giorgio Vasari's *Lives of the Artists* (1550) and Johannes Stradanus's series of prints, *Nova reperta* (1590).<sup>82</sup> Just like the Bernier version of the *Ârret*, Perrault's text included topics that could be portrayed as

80. Perrault, *Parallèle des Anciens et des Modernes*, preface to vol. 2 (non-paginated); see also the preface to volume 4.

81. Perrault, *Parallèle des Anciens et des Modernes*, 4:123–230, specifically 182–230 on the souls of animals and the relation of this question to reason.

82. Among many possible references, see Ingrid D. Rowland and Noah Charney, *The Collector of Lives: Giorgio Vasari and the Invention of Art* (New York: W. W. Norton & Co., 2017); Dániel Margócsy, "The Global Reception of Stradanus and the Political Use of the *Nova Reperta*," in *Renaissance Invention: Stradanus's "Nova Reperta"*, ed. Lia Markey (Evanston: Northwestern University Press, 2020), 115–33. On scientific patronage, see Aurélien Ruellet, *La maison de Salomon. Histoire du patronage scientifique et technique en France et en Angleterre au XVII<sup>e</sup> siècle* (Rennes: Presses universitaires de Rennes, 2016).

useful to potential patrons, such as geographic exploration, alongside discoveries that stressed truths about nature, such as the dimensions of the Sun's orbit or the hypothesis that other planets revolve around their axes.<sup>83</sup> This kind of text could thus build on Renaissance traditions while innovating in presenting a composite image of a substantial scientific transformation.

Other authors made the same distinction as Perrault between the scientific movement and broader changes in philosophy. In 1683, the Oratorian professor Bernard Lamy published his *Entretiens sur les sciences*, a text setting out his views on recent scientific developments. As befits a scholar who was suspended for teaching Cartesian doctrines, Lamy praised Descartes for "opening the way for a true physics," thereby glorifying France and the period as a whole.<sup>84</sup> Like Perrault, however, Lamy conceived of scientific change in terms broader than the developments prompted by Descartes. He emphasized the contribution of instruments such as the telescope, the microscope, and the air pump, and with some intellectual dexterity even praised the last item specifically for confirming Descartes's claims. He also recognized that these claims themselves could become outmoded, observing for example that Marcello Malpighi's work showed the "very imperfect" nature of Descartes's thinking on the human machine.<sup>85</sup>

Lamy's explicit reference to Galileo, Huygens, and John Wallis further confirms his conception of recent changes as a movement broader than Cartesianism. Drawing on the same canon of names, discoveries, and instruments as Perrault, Lamy likewise recognized scientific development as a particular topic with its own logic within the broader world of scholarship. "The ancients," he explained, "knew hardly anything [in physics], ... their learning was confined to morals." Even though Democritus and Epicurus are held to be the first physicists (*phisiciens*), their knowledge was rather limited. Lamy underscored the importance of explaining "everything in terms of matter and the configuration of its constituent parts, in terms of motion or rest." From this perspective, the ancients, ignorant of the laws of motion, lacked "the principles of physics" that were as fundamental as the principles introducing Euclid's *Elements of Geometry*.<sup>86</sup>

83. For conflicting interpretations of the importance of truth versus utility to patrons in the paradigmatic case of Galileo, see Mario Biagioli, *Galileo, Courtier: The Practice of Science in the Culture of Absolutism* (Chicago: University of Chicago Press, 1993), esp. chap. 1; Robert S. Westman, *The Copernican Question: Prognostication, Skepticism, and Celestial Order* (Berkeley: University of California Press, 2011), esp. 436–40. For the constitutive tension between contemplation of natural truths and scientific utility, see Peter Dear, "What Is the History of Science the History Of? Early Modern Roots of the Ideology of Modern Science," *Isis* 96, no. 3 (2005): 390–406.

84. Bernard Lamy, *Entretiens sur les sciences* [...], ed. François Girbal and Pierre Clair (Paris: Presses universitaires de France, 1966), 256. On Lamy's expulsion from teaching, see Fred Ablondi, "Bernard Lamy, Empiricism, and Cartesianism," *History of European Ideas* 44, no. 2 (2018): 149–58, here pp. 152–53.

85. Lamy, *Entretiens sur les sciences*, 257–59.

86. *Ibid.*, 256.



Men of letters were not simply popularizers of a historical image created by scientific practitioners.<sup>87</sup> While they certainly recognized a canon of personalities and discoveries, these authors sometimes attempted to modify or augment it, especially at its fringes. Perrault, for example, listed the achievements of his brother Claude as an authority on ancient music, and referred to the advances made by his colleagues under Colbert in the arts of physiognomic drawing, gardening, and firework displays.<sup>88</sup> In the *Arrêt*, Bernier and his coauthors included anatomical information on the circulation of blood and bile obtained through the vivisection of dogs.<sup>89</sup> Nonetheless, the most significant items, those that formed the core of a scientific canon, were widely shared, and there was a consensus on their importance, if not their interpretation.

Men of letters built their texts around fictional elements in ways that supported their arguments or expanded their appeal to a wider readership, as well as distancing them from the model of academic commentary. Perrault composed his *Parallèle* as a series of conversations among three characters: an Abbé, supporting the position of the moderns and serving as a thinly-veiled mouthpiece for the author's own opinions; a judge or Président, hailing from the provinces and representing the position of the ancients; and a Chevalier, representing a more naïve and less biased approach to the quarrel, though he progressively becomes convinced by the Abbé's reasoning.<sup>90</sup> This aesthetic choice was a clever device for furthering Perrault's arguments. For example, when he has the Président claim that Descartes's philosophy was nothing but the "slightly disguised opinion of Democritus," the Abbé can conveniently refute this statement by pointing to differences concerning the divisibility of the "corpuscles" of matter and the role of God in creating matter.<sup>91</sup> Perrault's choice of Versailles as the setting for their learned exchanges also allows the Abbé to use the example of the palace and its treasures as further evidence to support the modern position.<sup>92</sup> On the other side of the debate, Daniel relied on the conventions of the fantastic voyage—a model going back to Lucian of Samosata, a clear source of inspiration for his text—to convey his critique of Descartes to the relevant public: readers who indulged in frivolous pastimes such as marvelous voyages or parodies of Cartesian philosophy.

87. For a broad survey of the problem, see Roger Cooter and Stephen Pumfrey, "Separate Spheres and Public Places: Reflections on the History of Science Popularization and Science in Popular Culture," *History of Science* 32, no. 3 (1994): 237–67; contrast Emma C. Spary, *Eating the Enlightenment: Food and the Sciences in Paris, 1670–1760* (Chicago: University of Chicago Press, 2012).

88. Perrault, *Parallèle des Anciens et des Modernes*, 4:62, 265, 276, and 290.

89. [Bernier], *Requête des maîtres ès arts*, 8. Though Charles Perrault tried to present Claude as an authority on ancient music, he is mostly known today as an architect and member of the Parisian Academy of Sciences.

90. For a different reading of the aesthetic role of technology in the text, see Anthony Saurais, "Le pouvoir de la mécanique et la mécanique du pouvoir. Le progrès technique dans l'imaginaire de Charles Perrault," in Bahier-Porte and Reguig, *Anciens et Modernes face aux pouvoirs*, 287–302.

91. Perrault, *Parallèle des Anciens et des Modernes*, 4:178–81.

92. Rabinovitch, *The Perraults*, 106–10.

Bernier applied the precepts of legal writing to parody the plight of scholastic philosophy. This appealing blend of philosophy, history, and literature enabled the authors to convey their intellectual positions and to impress readers with the changes in natural philosophy in an accessible way that also reflected broader social and aesthetic shifts.<sup>93</sup>

Perrault's text certainly caught the attention of his contemporaries. Published in a convenient duodecimo format, it probably appealed to a readership similar to that of Daniel's *Voyage*: well-off men and women who sought to keep abreast of cultural events. With its Versailles setting, the presence of a "provincial" character in the *Président*, and a didactic style of discussion suited to novices, the text's audience likely overlapped with that of the fashionable *Mercure galant* or Perrault's own fairy tales, published in the exact same period. In a testament to their success, the first volumes of the *Parallèle* had appeared in a second edition in 1692–1693, even before the publication of the fourth volume.<sup>94</sup> After Perrault's death in 1703, his obituaries listed his controversial poem on the age of Louis XIV and ongoing involvement in the debates it ignited among his most prominent achievements. Though a few contemporaries may have claimed that Perrault had exaggerated in his support of the moderns, his works provided a highly visible platform for the new scientific canon that emerged over his lifetime.<sup>95</sup>

The examples of Bernier, Daniel, and Perrault collectively attest to the affinity between literary composition and the new science on the intellectual, aesthetic, and social levels. Indeed, all of these figures—with the telling exception of the Jesuit Père Daniel—lived the in-between lives of literary authors, serving as cultural mediators between different spheres. Literary support for the scientific movement was not limited to a particular cultural current: supporters of both the ancients and the moderns made a case for the new philosophy. Even authors at the opposite ends of the spectrum—and bitter personal rivals—like Perrault and Boileau still conformed to the new model of the man of letters, the *nouveau docte*, who sought to distinguish himself from the pedantry of their predecessors. Daniel, a Jesuit committed to the goals of his order and limited in his ability to formally espouse the new philosophy as a whole, had to interpret the same canon as his opponents and even found stylistically innovative and appealing ways to do so.

93. See more broadly the burgeoning scholarship on literature and science, for instance Frédérique Ait-Touati, *Contes de la Lune. Essai sur la fiction et la science modernes* (Paris: Gallimard, 2011), and the approaches highlighted in Howard Marchitello and Evelyn Tribbles, ed., *The Palgrave Handbook of Early Modern Literature and Science* (London: Palgrave Macmillan, 2017).

94. Charles Perrault, *Parallèle des Anciens et des Modernes*, 2nd edn., 2 vols. (Paris: Vve J.-B. Coignard et J.-B. Coignard fils, 1692–1693), published simultaneously with the third volume of the first edition.

95. For his obituaries, see *Mercure galant* (May 1703): 232–53; Abbé Tallemant, "Eloge funèbre de Mr. Perrault," in *Recueil des harangues prononcées par Messieurs de l'Académie françoise dans leurs réceptions, & en d'autres occasions différentes, depuis l'establissement de l'Académie jusqu'à présent* (Amsterdam: Aux dépens de la Compagnie, 1709), 2:591–602; *Journal des sçavans* (March 10, 1704): 174–76.

## Biographical Material and the Construction of a Canon

By the late seventeenth century, the lives of the learned had been documented in an increasingly dense web of scholarly journals, obituaries, and biographical dictionaries that made their careers and achievements accessible to a broad reading public. This public would perhaps not want to delve into the intricacies of philosophical discussion, but was eager for a means to identify the names and personalities who had marked the intellectual, political, and ecclesiastical worlds.<sup>96</sup>

Such biographical materials provide a sense—if only a rough one—of what educated readers were supposed to know about the protagonists of the new philosophy. If men of letters did indeed help shape the narrative of a veritable scientific revolution, we should expect to see significant continuity between the information available to seventeenth-century readers and that contained in equivalent texts from the High Enlightenment, by which time this historical narrative was widely recognized.<sup>97</sup> To this end, I examined the 1683 edition of Louis Moréri's biographical dictionary, the most widely available biographical source in late seventeenth-century France, which went through twenty-four editions between 1674 and 1759. I compared the space devoted to a list of more than 150 persons connected to scientific endeavors, and arranged these figures in descending order according to the number of lines dedicated to each one. I then repeated the process with the final, 1759 edition of the same dictionary. I also analyzed the sections dealing with scientific change in Jean Le Rond d'Alembert's "Preliminary Discourse" to the *Encyclopédie* of 1751—a major source for Enlightenment understanding of the previous century's revolution in science—and divided them into two groups, again based on the space attributed to them in the text.<sup>98</sup>

This analysis furnished a basic benchmark for the visibility of actors involved in scientific change in the cultural sphere prior to the High Enlightenment. Since we do not have detailed information on the authorship and composition of these biographical entries, this kind of quantitative assessment can lead to facile or circular arguments: data that do not fit a given interpretation can be explained away on an ad hoc basis as exceptions or irregularities. Nevertheless, it does give us at least

96. Ribard, *Raconter, vivre, penser*; Rabinovitch, *The Perraults*, 17–19.

97. I. Bernard Cohen, "The Eighteenth-Century Origins of the Concept of Scientific Revolution," *Journal of the History of Ideas* 37, no. 2 (1976): 257–88. Continuities with the quarrel of the ancients and the moderns are suggested in Catherine Fricheau, "Des Modernes aux Encyclopédistes. Le bon sens de l'idée de progrès?" *Dix-huitième siècle* 40, no. 1 (2008): 543–59.

98. Louis Moréri, *Le grand dictionnaire historique, ou le Mélange curieux de l'histoire sacrée et profane* [...] (Lyon: Jean Girin et Barthelemy Rivière, 1683); Moréri, *Le grand dictionnaire historique* [...] *Nouvelle édition* (Paris: Les libraires associés, 1759); Jean Le Rond d'Alembert, "Discours préliminaire des éditeurs," in *Encyclopédie, ou dictionnaire raisonné des sciences, des arts et des métiers, etc.*, ed. Denis Diderot and Jean Le Rond d'Alembert (University of Chicago, ARTFL Encyclopédie Project, Autumn 2017 edition, ed. Robert Morrissey and Glenn Roe, <http://encyclopedie.uchicago.edu>), vol. 1, i–xliv.

an approximate idea of the general information available to the educated elite, and thus provides a useful counterpoint to focused case studies.

An examination of the rankings generated (see appendices 3–5) yields four complementary observations. The first is simply that even in the 1683 edition of Moréri’s dictionary, the expected names are largely present, from the famous to the (more numerous) not-so-famous, broadly arranged in the order of influence one would anticipate for France circa 1680: the first ten names include Gassendi, Descartes, and Galileo; the “top twenty” include Pascal, Copernicus, Tycho Brahe, Paracelsus, Petrus Ramus, and Cardano. It perhaps comes as something of a surprise that Francis Bacon only makes it into the top thirty, where one can also find Mersenne, Giambattista della Porta, Regiomontanus, and Gilles Personne de Roberval. Kepler is also lower than one might expect to find him, but his place seems to reflect the fact that the influence of his work would only gain wide recognition toward the end of the seventeenth century. If one adds the names of those figures who died after this edition was printed—and were therefore not included in it—it is really not a great leap to the canon presented by d’Alembert’s “Preliminary Discourse” nearly seventy years later.

Second, the persons cited and the amount of space their descriptions occupy conform quite well to the intellectualist bias of classic narratives of the “Scientific Revolution” found in twentieth-century historiography. The intermingling of names like Bacon, Leibniz, and John Locke with those of Newton, Robert Boyle, Galileo, and Isaac Barrow, so characteristic of the “Preliminary Discourse,” is furthermore found not only in the early edition of Moréri’s dictionary, but also in the literary texts discussed above. The emphasis that these sources place on names such as Gassendi, Descartes, Nicolaus Cusanus, and Giovanni Pico della Mirandola shows that the current bias toward theory over craft and hands-on experimentation is not simply a product of Cold War scholarship but has strong roots in seventeenth-century perceptions.<sup>99</sup>

The third observation concerns the balance between international names and figures that had been active in the French literary field since the middle decades of the seventeenth century. The emergence of a scientific culture was a phenomenon on a European scale, and it brought together scholars working in the broad urban and commercial corridor that stretches from northern Italy through the Rhineland and northern France to the Low Countries and England. The European pantheon that included Galileo, Leonardo da Vinci, Regiomontanus, and Bacon is as familiar to a modern audience from any of those countries as it would have been to French readers in the late seventeenth and early eighteenth centuries.

Yet recent scholarship’s emphasis on such transnational factors should also be balanced with the local configurations that modified perceptions of the scientific movement overall. As seen above, literary texts written in France foregrounded

99. See, for example, Lissa Roberts and Simon Schaffer, preface to *The Mindful Hand: Inquiry and Invention from the Late Renaissance to Early Industrialisation*, ed. Lissa Roberts, Simon Schaffer, and Peter Dear (Amsterdam: Koninklijke Nederlandse Akademie van Wetenschappen, 2007), xiii–xiv.

particular local contexts and tensions, such as the censorship of Descartes's work or the quarrel of the ancients and the moderns. In a similar vein, it is striking to observe the remarkable prominence given to Arnauld and Fontenelle in the 1759 edition of Moréri's dictionary. Arnauld was a dominant Jansenist theologian and a hugely important figure in the cultural sphere of late seventeenth-century France.<sup>100</sup> Aside from his role as secretary of the Academy of Sciences over nearly half a century, Fontenelle authored numerous popular works and was also a powerful presence in the French literary field. Together, these two authors point to the specific religious and cultural developments that led to the establishment of a particularly French national scientific culture. The French case also demonstrates the crystallization of a narrative of scientific change even before Newton's work—the crowning achievement of the scientific movement at the European level—became widely known in France after 1730.<sup>101</sup> The different dynamics of local scientific cultures played a major role in Ben-David's foundational 1971 work, and the affinities between science and the world of letters open up a range of new possibilities through which to explore this question.<sup>102</sup>

Finally, the timing of this canonization mattered. The middle decades of the seventeenth century were precisely the period in which the scientific movement in Europe itself seemed to enter a lull, potentially at risk of petering out. Regaining momentum required a serious institutional transformation, culminating in the establishment of the Royal Society in London around 1660 and the Academy of Sciences in Paris in 1666, in whose foundation Perrault was intimately involved as Colbert's aide.<sup>103</sup> By this point men of letters and their readers were already taking an interest in scientific changes; even if they would not play a direct role in the institutionalization of science, they surely contributed to the emerging public interest that ultimately offset the apparent slowing of new discoveries. However, as distinct scientific cultures developed by 1730 or so, the mediating role of the world of letters became somewhat ambivalent. In lending support to a movement that was in danger of vanishing or at least losing momentum, the interest of men of letters had also tethered science to divergent literary cultures across the continent. This in turn would lead to an increasing need for tools of scholarly communication,

100. See the indication in Viala, *Naissance de l'écrivain*, 306, column 9 of the table.

101. Newton was known quite early to French scholars, but he only came to symbolize recent scientific achievement after 1730: J. B. Shank, *The Newton Wars and the Beginning of the French Enlightenment* (Chicago: University of Chicago Press, 2008); Shank, *Before Voltaire*. On Newton in the context of the quarrel of the ancients and the moderns, see Christoph Lehner and Helge Wendt, "Mechanics in the *Querelle des Anciens et des Modernes*," *Isis* 108, no. 1 (2017): 26–39.

102. For examples, which though current scholarship would dispute them still illustrate this type of question, see Ben-David, *The Scientist's Role in Society*, 64–65 (for the decline of Italian science in the seventeenth century) or 97–100 (on the importance of Enlightenment dynamics, rather than Revolutionary or Napoleonic reforms, for the success of French science in the first decades of the nineteenth century).

103. Cohen, *How Modern Science Came into the World*, 565–94; Domenico Bertoloni Meli, *Thinking with Objects: The Transformation of Mechanics in the Seventeenth Century* (Baltimore: Johns Hopkins University Press, 2006), 161–65.

from a lingua franca to international institutions, to counterbalance the pull of local influences. This fascinating tension merits further investigation that will no doubt reveal much about the role of letters in shaping early modern science.

Men of letters presented their readers with a narrative of dramatic scientific change, with a clear core of heroes, celebrated discoveries, and technologically advanced instruments. This article has suggested several complementary approaches—from the study of particular texts or the social and intellectual commitments of individual men of letters, to an analysis of the emerging genre of reference works—that collectively show how this presentation functioned. Yet my argument does not seek simply to prove that eighteenth-century understandings of a scientific revolution were underpinned by a seventeenth-century reality. My goal is more dynamic: to observe how men of letters produced texts that gained traction among an elite audience and shaped its perception of a historical watershed. Historians of science have tended to overlook these texts, perhaps because they lean toward compilation over innovation and popularization over original argumentation.<sup>104</sup> They nevertheless shed light on the emergence of a sustained scientific movement that did not fizzle out as equivalent movements already had in other contexts. Thanks to these literary “go-betweens,” it reached wide publics among the continent’s reading elites, expanding the broader impact of the new science even before the Industrial Revolution demonstrated its utilitarian applications. Such figures and their efforts are easy to overlook when our analytical gaze is trained primarily on practitioners and their immediate patrons.<sup>105</sup> Yet we cannot understand the cultural meaning of the “Scientific Revolution” without men of letters, who did so much, I argue, to transform activities that were difficult for contemporaries to understand into a hallmark of modern society as it emerged in Europe.

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104. Perhaps also because such texts do not conform to the “textbooks” that, according to the influential formulation by Thomas S. Kuhn, were the most basic way of transmitting a newly established paradigm: Kuhn, *The Structure of Scientific Revolutions*, 2nd ed. (1962; Chicago: University of Chicago Press, 1970), 136–43.

105. See, for example, the broad overview in Paul A. David, “The Historical Origins of ‘Open Science’: An Essay on Patronage, Reputation and Common Agency Contracting in the Scientific Revolution,” *Capitalism and Society* 3, no. 2 (2008): <https://doi.org/10.2202/1932-0213.1040>.

## Appendix 1. Examples of scientific phenomena mentioned in the *Arrêt burlesque* (1671)

Rings of Saturn (Huygens)  
 Moons of Jupiter  
 Sunspots  
 Venus has a higher orbit than the sun  
 Existence of mountains, shadows, and valleys on the Moon  
 Stars visible in daylight (Picard)  
 Passages and cracks in the sky through which comets go (Denis, 1664–1665); Petit, Auzout, and Cassini see them as superlunary objects  
 Air has weight (Pascal, Roberval, and others)  
 Navigation around the globe  
 Earth orbits around the Sun  
 Construction of beehives (Thévenot)  
 Teachings that animals are pure machines (Rohault)  
 The brain is the center of the nervous system (and not the heart)  
 Anatomical discoveries by Kerckring and Steno  
 Circulation of the blood (related role of the liver)

In addition, there are references to new publications (the *Journal des sçavans*), techniques (telescopes, windmills), and institutions (the Paris observatory), as well as general satire against Aristotelian principles.

## Appendix 2. Examples of scientific phenomena mentioned in volume four of Charles Perrault's *Parallèle des Anciens et des Modernes* (1697)

Sunspots  
 “Great Year” (after six hundred years, the sun and the moon return to the same spot)  
 Eclipses (and their prediction)  
 Obliquity of the ecliptic  
 Movements of the fixed stars, Zodiac  
 Changes in the size of Venus, discovery of the phases of Venus (confirming Copernicus)  
 The new star of 1572  
 Dimension of the Sun’s orbit: apogee, eccentricity, spring equinox; Tycho determined these using Venus and not the Moon  
 Comets as wandering planets and not exhalations (Kepler)  
 Impact of the atmosphere on astronomic observations (Kepler)  
 Sun revolving around its axis (observed thanks to sunspots)  
 Mountains and craters on the surface of the Moon  
 Jupiter’s satellites  
 Saturn’s rings  
 Saturn’s satellites  
 Jupiter’s revolution around its axis in ten hours  
 Revolution of Mars around its axis in twenty-four hours and forty minutes  
 Hypothesis that other planets also revolve around their axes  
 Speed of light, as measured by the satellites of Jupiter

Speed of sound, independent from the speed of wind  
 The Milky Way and nebulas are collections of small stars grouped closely together  
 Observations of Mercury and Venus across the disc of the Sun, used to correct the tables for the movement of these planets  
 Observations of planets and some fixed stars in plain daylight  
 New lands discovered (geography)  
 Earth's round shape (a view not shared by some ancients and the Siamese) and its size  
 Measurements of particular areas of the Earth  
 Availability of commodities thanks to geographical discoveries  
 Descartes's system (in comparison to Democritus and Aristotle)  
 Mechanical explanation of digestion  
 Vacuum

*Chain of developments in medicine:* in the mid-sixteenth century, Vesalius made new advances in anatomy; in 1627, Aselli of Cremona discovered the lacteal veins; in 1628, Harvey discovered the circulation of blood; in 1661, Pecquet of the Academy of Sciences discovered the “reservoir of chyle”; in 1663, Bartholin and Rudbeck discovered (in parallel) the lymphatic vessels; Steno discovered the structure of muscles; Ruysch discovered the structure of the lymphatic valves; Malpighi that of viscera; Lower that of the heart; and Wirsung that of the pancreas.

### **Appendix 3. Canon in the “Preliminary Discourse” to the *Encyclopédie* (1751)**

*First tier:*

Bacon, Francis  
 Descartes, René  
 Leibniz, Gottfried Wilhelm  
 Locke, John  
 Newton, Isaac

*Second tier:*

Barrow, Isaac  
 Boyle, Robert  
 Galileo  
 Harvey, William  
 Huygens, Christiaan  
 Kepler, Johannes  
 Malebranche, Nicolas  
 Pascal, Blaise  
 Régis, Pierre-Sylvain  
 Rohault, Jacques  
 Sydenham, Thomas  
 Vesalius, Andreas  
 Viète, François



## Appendix 4. Canon in the 1683 edition of Moréri's *Dictionnaire*

Tier	Names (in descending order, according to number of lines)
First tier (70–82 lines)	Gassendi, Pierre Campanella, Tommaso Gessner, Conrad Cusanus, Nicolaus Fracastoro, Girolamo
Second tier (50–69 lines)	Bellarmino, Robert Galileo Descartes, René Pico della Mirandola, Giovanni Leonardo da Vinci Casaubon, Isaac Ramus, Petrus
Third tier (30–49 lines)	Paracelsus Pascal, Blaise Brahe, Tycho Osiander, Andreas Agricola, Georgius Cardano, Girolamo Copernicus, Nicolaus Barbaro, Ermolao Cremonini, Cesare Regiomontanus Mersenne, Marin Clavius, Christopher Porta, Giambattista della Bacon, Francis Ficino, Marsilio Clusius, Carolius (Charles de l'Escluse) Acosta, José Roberval, Gilles Personne de Dürer, Albrecht
Fourth tier (1–29 lines)	Peiresc, Nicolas-Claude Fabri de Brunfels, Otto Van Helmont, Jan Baptista Kircher, Athanasius Magini, Giovanni Antonio Peucer, Caspar Paré, Ambroise Kepler, Johannes Fuchs, Leonhard Hernández, Francisco Pomponazzi, Pietro Mattioli, Pietro Andrea Aldrovandi, Ulisse Cavalieri, Bonaventura Bauhin, Gaspard Leonico, Niccolò Piccolomini, Alessandro Reinhold, Erasmus

## Appendix 5. Canon in the 1759 edition of Moréri's *Dictionnaire*

Tier	Names (in descending order, according to number of lines)
First tier (1000+ lines)	Arnauld, Antoine Fontenelle, Bernard le Bovier
Second tier (200–500 lines)	Descartes, René Bernoulli, Jean Leibniz, Gottfried Wilhelm Boyle, Robert Locke, John Cusanus, Nicolaus Tournefort, Joseph Pitton de Steno, Nicolaus
Third tier (100–199 lines)	Brahe, Tycho Ramus, Petrus Ficino, Marsilio Peiresc, Nicolas-Claude Fabri de Hobbes, Thomas Kepler, Johannes Huygens, Christiaan Bacon, Francis Pascal, Blaise Newton, Isaac Halley, Edmond Cesi, Federico Bellarmine, Robert Sennert, Daniel Poullain de La Barre, François Malebranche, Nicolas Leonardo da Vinci Fermat, Pierre Bernoulli, Jacques Galileo Torricelli, Evangelista Charleton, Walter
Fourth tier (50–99 lines)	Aldrovandi, Ulisse Copernicus, Nicolaus Clarke, Samuel Fabri, Honoré Fuchs, Leonhard Dee, John Fracastoro, Girolamo Ray, John Sloane, Hans Willis, Thomas Dürer, Albrecht Regius, Henricus Campanella, Tommaso Pardies, Ignace-Gaston Merian, Maria Sybilla Thévenot, Melchisédech

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	Perrault, Claude
	Boulliau, Ismaël
	Hevelius, Johannes
	Wilkins, John
	Kircher, Athanasius
	Stahl, Georg Ernst
	Gassendi, Pierre
	Gessner, Conrad
	Pico della Mirandola, Giovanni
	Casaubon, Isaac
	Rømer, Ole
	Viète, François
	Hooke, Robert
	Malpighi, Marcello
	Winkelmann, Maria
	Paracelsus
	Glanvill, Joseph
	Caramuel y Lobkowitz, Juan
Fifth tier (1–49 lines)	Sylvius, Jacobus
	Osiander, Andreas
	Wallis, John
	Ward, Seth
	Beeckman, Isaac
	Muffet, Thomas
	Agricola, Georgius
	Sprat, Thomas
	Stevin, Simon
	Pomponazzi, Pietro
	Cardano, Girolamo
	Oldenburg, Henry
	Regiomontanus
	Flamsteed, John
	Lister, Martin
	Rohault, Jacques
	Porta, Giambattista della
	Brunfels, Otto
	Mersenne, Marin
	Varignon, Pierre
	Régis, Pierre-Sylvain
	Brosse, Gui de La
	Harvey, William
	Peucer, Caspar
	Descartes, Catherine
	Ashmole, Elias
	Clavius, Christopher
	Cremonini, Cesare
	Paré, Ambroise
	Piccolomini, Alessandro
	Clusius, Carolius (Charles de l'Escluse)
	Barbaro, Ermolao
	Lower, Richard
	Acosta, José
	Sydenham, Thomas
	Roberval, Gilles Personne de

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Alberti, Leon Battista  
Bauhin, Gaspard  
Magini, Giovanni Antonio  
Rheticus, Georg Joachim  
Van Helmont, Jan Baptista  
Cotes, Roger  
Harriot, Thomas  
Barlow, William  
Oviedo, Gonzalo Fernández  
Reinhold, Erasmus  
Cavalieri, Bonaventura  
Tartaglia, Niccolò  
Riccioli, Giovanni Baptista  
Hernández, Francisco  
Leoniceno, Niccolò  
Pereira, Benito  
Scheiner, Christoph  
Goorle, David van

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