

ANTOINE LE GRAND AND JACQUES ROHAULT: LE GRAND AND HIS ANNOTATIONS TO ROHAULT'S TREATISE ON NATURAL PHILOSOPHY

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1. General introduction

Scholars reading early modern texts are by now aware that *some* primary sources are forgotten, that *some* historical figures become neglected, and that *some* early printed works – not to mention manuscript sources – are only rarely requested by readers in libraries across the world. Reasons leading to this situation are diverse, ranging from the availability of primary sources to the rather conservative canonical lists of authors promoted by traditional histories and narratives in various disciplines. The current edition of Antoine Le Grand's annotations to a treatise on natural philosophy, written by Jacques Rohault, illustrates well such a case of historical disregard of an early modern source. It is not about a forgotten figure – Jacques Rohault or Antoine Le Grand – but about a text, which is not studied anymore and only rarely mentioned in the secondary literature, despite its significance in the early modern period.¹ For a number of years, (at least) between 1682 and 1696, the edition of Rohault's book, with Le Grand's annotations, circulated widely in England and The Netherlands, and was used as a university textbook at Cambridge.

In 1671, Jacques Rohault published his *Traité de physique*, a two-volume book covering most of the main aspects of a natural philosophical system.² The book was

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¹ Le Grand's annotations are only mentioned in passing by the scholarly literature, while most of the interest in the annotations to Rohault's *Traité de physique* is directed towards Samuel Clarke's notes, published at a later date; e.g., Michael Hoskin, "Mining All Within: Clarke's Notes to Rohault's *Traité de Physique*," *The Thomist* 24, no. 2 (1961): 353–63; Volkmar Schüller, "Samuel Clarke's Annotations in Jacques Rohault's *Traité de Physique*, and How They Contributed to Popularising Newton's Physics," in *Between Leibniz, Newton, and Kant: Philosophy and Science in the Eighteenth Century*, ed. Wolfgang Lefèvre (Dordrecht: Springer, 2001), 95–110. See the discussion below.

² For studies on Rohault and his works, see, for example, Trevor McClaughlin, "Jacques Rohault and the Natural Sciences" (Cambridge, University of Cambridge, 1972); Pierre Clair, *Jacques Robault (1618–1672). Bio-Bibliographie* (Paris: Centre National de la Recherche Scientifique, 1978); Mihnea Dobre, "Rohault's Cartesian Physics," in *Cartesian Empiricisms*, ed. Mihnea Dobre and Tammy Nyden (Dordrecht: Springer, 2013), 203–26; Mihnea Dobre, "Jacques Rohault and Cartesian Experimentalism," in *Oxford Handbook of Descartes and Cartesianism*, ed. Steven Nadler, Delphine Antoine-Mahut, and Tad Schmaltz (Oxford: Oxford University Press, 2019), 388–401.

considered a Cartesian treatise, dealing in its four parts with the most general problems in natural philosophy (part I), cosmology (part II), the earthly and meteorological phenomena (part III), and the living body (part IV).³ The publication occurred only one year before Rohault's death in 1672, but the content of the treatise was relatively well-known, as it was presented in public conferences for more than a decade. Rohault was a professor of mathematics who performed experiments in Paris, and became a reputed Cartesian in the mid-1660s. His fame as a lecturer ensured a quick dissemination of his natural philosophical views, such that his treatise was soon translated into Latin and published first in Geneva (1674), followed by other places (Figure 1).⁴

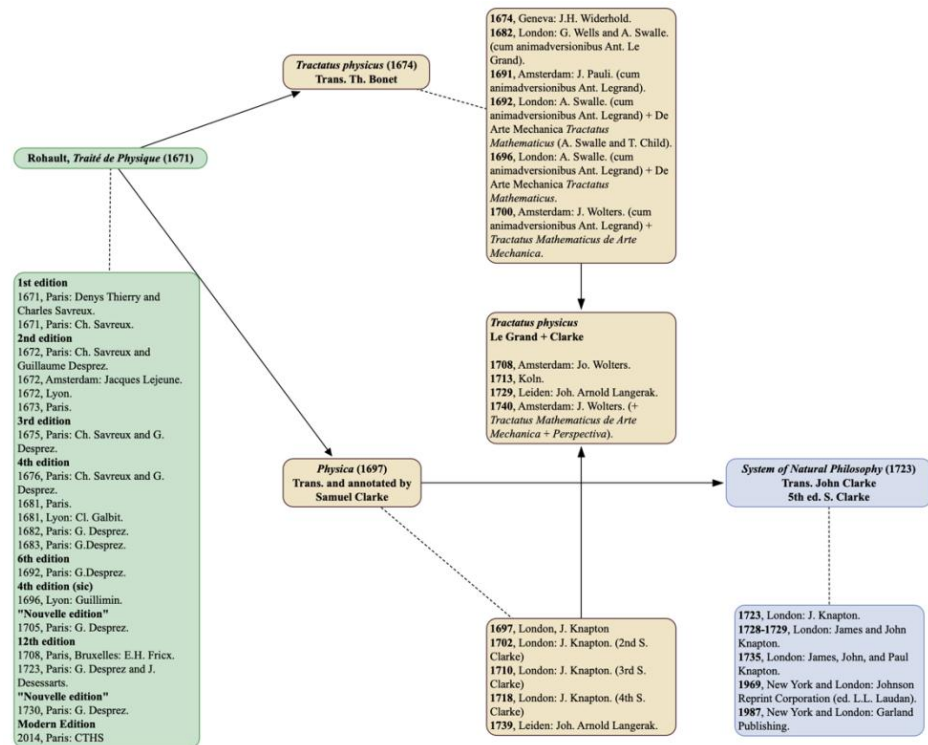


Figure 1. Editions of Rohault's treatise on natural philosophy, in French (green), Latin (yellow), and English (blue).

³ See Jacques Rohault, *Traité de physique* (Paris: Denys Thierry and Charles Savreux, 1671); Jacques Rohault, *System of Natural Philosophy, Illustrated with Dr. Samuel Clarke's Notes, Taken Mostly Out of Sir Isaac Newton's Philosophy*, 2 vols. (New York; London: Garland Publishing, 1987); Jacques Rohault, *Traité de physique* (Paris: Comite des Travaux Historiques et Scientifiques, 2014). For an up to date review of the scholarly works on Rohault's *Traité de physique* and its reception in the early modern period, see Mihnea Dobre et al., eds., "Jacques Rohault, Preface to the *Traité de Physique*. A Critical Edition and Commentary of Four Early Modern Versions of Rohault's Preface," *Society and Politics* 15, no. 1 (29) (2021).

⁴ Details about Rohault's life are based mostly on Clair, *Bio-Bibliographie*. Some additional details are derived from Dobre et al., "Jacques Rohault's Preface."

Rohault's *Traité de physique* enjoyed considerable success during the seventeenth and eighteenth centuries and thus gained the reputation of being "the leading textbook of its time."⁵ As previously stated, the *editio princeps* of the treatise was published in 1671 (Paris: Denys Thierry and Charles Savreux), and from 1672 to 1730 many other French reprints followed in rapid succession. Oddly enough, the first English translation appeared in a Newtonian context, something well acknowledged in its title: *System of Natural Philosophy, Illustrated with Dr. Samuel Clarke's Notes, Taken Mostly Out of Sir Isaac Newton's Philosophy* (London: James Knapton, 1723). The translation was made by John Clarke from the Latin edition of his brother, the distinguished Samuel Clarke.⁶ However, the period between the publication of the first edition in French (1671) and the first translation in English (1723) includes a dynamic history of the text's Latin translations, which was usually discussed only partially or fragmentary in the secondary literature.⁷ Even a quick look at the list with the multiple reissues of the treatise, tracing the intertwined timeline of the publications (see Figure 1), reveals the significant contribution of Latin editions to the spread of Rohault's ideas through numerous reprints of the text. In this study we argue that more research into the

⁵ See Schüller, "Clarke's Annotations," 96. For the positive reception of Rohault's treatise, see Paul Mouy, *Le développement de la physique cartésienne: 1646–1712* (Paris: J. Vrin, 1934); George Sarton, "Second Preface to Volume 38: The Study of Early Scientific Textbooks," *Isis* 38, no. 3–4 (1948): 137–48; Hoskin, "Mining All Within"; Jacques Rohault, *A System of Natural Philosophy. With a New Introduction by L. L. Laudan*. (New York: Johnson Reprint, 1969); Trevor McClaughlin, "Was There an Empirical Movement in Mid-Seventeenth Century France? Experiments in Jacques Rohault's *Traité de Physique*," *Revue d'histoire Des Sciences* 49, no. 4 (1996): 459–81; Dennis Des Chene, "Cartesian Science: Régis and Rohault," in *Blackwell Companion to Early Modern Philosophy*, ed. Steven Nadler (Oxford: Blackwell, 2002), 183–96; Mihnea Dobre, "Rohault's *Traité de Physique* and Its Newtonian Reception," in *The Circulation of Science and Technology: Proceedings of the 4th International Conference of the ESHS, Barcelona, 18–20 November 2010*, ed. A. Roca-Rosell (Barcelona: SCHCT-IEC, 2012), 389–94; Dobre, "Rohault's Cartesian Physics"; Simone Mazauric, "Préface," in *Traité de physique*, by Jacques Rohault (Paris: Comité des Travaux Historiques et Scientifiques, 2014), vii–xxxvi; Aaron Spink, "The Experimental Physics of Jacques Rohault," *British Journal for the History of Philosophy* 26, no. 5 (2018): 850–70; Mihnea Dobre, "Rohault, Jacques," in *Encyclopedia of Early Modern Philosophy and the Sciences*, ed. Dana Jalobeanu and Charles T. Wolfe (Cham: Springer International Publishing, 2019), 1–6.

⁶ For a brief history of Clarke's editions, see Sarton, "Early Scientific Textbooks"; Clair, *Bio-Bibliographie*; Hoskin, "Mining All Within"; Schüller, "Clarke's Annotations"; Dobre et al., "Jacques Rohault's Preface."

⁷ Some exceptions are Hoskin, "Mining All Within"; Schüller, "Clarke's Annotations"; Mihnea Dobre, "Mixing Cartesianism and Newtonianism: The Reception of Cartesian Physics in England," in *Scientific Cosmopolitanism and Local Cultures: Religions, Ideologies, Societies, Proceedings of 5th International Conference of the European Society for the History of Science*, ed. Gianna Katsiampoura (Athens: National Hellenic Research Foundation/Institute of Historical Research, 2014), 126–31; Elena Muceni, "Philosophies cartésiennes à l'usage des étrangers: les traductions latines du *Traité de physique* de Rohault et de la *Recherche de la vérité* de Malebranche," *Rivista di storia della filosofia* 4 (2017): 641–64. However, most of these studies concern Samuel Clarke's Latin translation (1697), with the subsequent editions, up to the English version of 1723, while Le Grand's edition gets scant attention.

reception of the textbook through the Latin translations is needed, as this will capture the changes in the European natural-philosophical thought in the second half of the seventeenth century and the beginning of the eighteenth century. We illustrate this claim with Le Grand’s annotations commented in section 3 of this study.

Three lead historical figures have played an important role in the dissemination of the treatise by translating and/or annotating Rohault’s textbook in Latin: Théophile Bonet, Antoine Le Grand, and Samuel Clarke. Although driven by different aims in pursuing this task (which will be detailed below), the common ground of each translator’s work rests on the high regard for the utility and value of the *Traité*, as appears on the pages preceding the textbook’s Preface: “This Treatise of Physics, produced by the means of a new method, entirely based on other common and long-accepted principles, especially Cartesian ...,” “when the ingenuous Rohault, rose in spirit to equal the genius of our ancestors ...” (Bonet 1674); “such an illustrious *Work*” (Le Grand 1682); “There were two things that motivated me to undertake this work; First, the usefulness of the Treatise itself ...” (Clarke 1697).⁸

As noted, the treatise was first translated into Latin in 1674 and published under the title *Tractatus Physicus* (Geneva: J. H. Widerhold). The typographer’s note mourns the sudden death of the author in 1672 (just after the publication of the French edition), along with the absence of a Latin version of the text, vainly promised by Rohault towards the end of his Preface to the treatise: “However, I am preparing a Latin Version for the Use of Foreigners, with whom I hope to meet with a favourable Reception.”⁹ Therefore, someone who would “fulfil Author’s wishes and publish it in Latin” had to be found. The translator was the Swiss physician Théophile Bonet who, “leaving behind more serious concerns and tasks, agreed to complete his desires.”¹⁰ However, some challenges were encountered in the process of translation: the technical terminology and the new experimental method in natural philosophy used by

⁸ Bonet 1674: “Tractatum hunc Physicum nova methodo exaratum, aliisque omnino à vulgaribus & iam pridem acceptis principiis, Cartesianis præsertim ...”, “Cum ingenuus Rohaultius altius animo assurgens, genio Maiorum nostrorum equiparandus ...”; Le Grand 1682: “tam illustre *Opus*”; Clarke 1697: “Quæ me ad hocce opus suscipiendum impulerunt, duo fuere; Primo, Tractatus ipsius utilitas” See Jacques Rohault, *Tractatus physicus gallice emissus et recens latinitate donatus*, trans. Théophile Bonet (Geneva: J.H. Widerhold, 1674); Jacques Rohault, *Tractatus Physicus...cum Animadversionibus Antonii Le Grand*, trans. Théophile Bonet (London: G. Wells & A. Swalle, 1682); Jacques Rohault, *Physica*, trans. Samuel Clarke (London: J. Knapton, 1697). The translator’s preface is not paginated. The second argument for Clarke’s new edition is the quality of the previous Latin translation, which will be discussed below.

⁹ Eng. 461R; references to Rohault’s preface will use the notation of the new edition, Dobre et al., “Jacques Rohault’s Preface.” Since the early modern editions of Rohault’s book had the preface unpaginated, most of the references in scholarly literature cannot indicate precisely the quoted passages from his lengthier preface. The new reference system makes it easier to identify passages in Rohault’s text.

¹⁰ Bonet 1674: “quempiam qui vices Authoris suppleret, & Latine evulgaret”; “qui sepositis gravioribus curis & occupationibus, votis annuit.” As explained in the opening pages of the first Latin edition; Rohault, *Tractatus physicus*. On Bonet, see Ernest E. Irons, “Théophile Bonet 1620–1689. His Influence on the Science and Practice of Medicine,” *Bulletin of the History of Medicine* 12, no. 5 (1942): 623–65.

Rohault (“the Author borrowed many words from sciences, mostly unknown to those before us who lacked the means to name the instruments ...”), the reformation of the French language (“which removed the archaic and outdated words, replacing them with newer and more polished ones”), and the difficulty to establish a word-by-word correspondence between the Latin and the French text.¹¹

It was not until 1682, when a revised Latin edition was published, *Tractatus Physicus ... Cum Animadversionibus Antonii Le Grand* (London: G. Wells & A. Swalle). The Cartesian Antoine Le Grand revised and expanded Bonet’s Latin version of the text, while adding his own annotations to the treatise. Although Le Grand does not aim for an entirely new translation, he details the scope of his interventions in a brief dedicatory letter addressed to Thomas Short: to “fix the faulty Work and render it in a more suitable Latin,” blaming either the printer or the translator of the previous edition for rendering Rohault’s ideas in a corrupt manner (“Whether this was the printer’s carelessness, or the translator’s fault ...”).¹²

This 1682 Latin imprint of Rohault’s treatise represents the core of the current critical edition, with an emphasis on growing awareness towards Le Grand’s added annotations. However, it is worth stressing the success of Le Grand’s editions, as only a few years later, a new version of the text was published in Amsterdam (J. Paulus, 1691), with only minimal corrections in the content of the notes. Three other reprints followed – two of them published in London (Abel Swalle, 1692 and 1696) and one in Amsterdam (J. Wolters, 1700) – with no differences found between them. A common feature of these latter editions is their inclusion of Rohault’s treatise on mechanics (*De arte mechanica; tractatus mathematicus. E Gallico sermone Latinè factus*), which was published in Latin translation only in 1692 (London: Abel Swalle; Timothy Child).¹³ After

¹¹ Bonet 1674: “Author ab artificibus multa mutuatus sit, quorum artes cum maioribus nostris ut plurimum ignotæ essent, vocabula quoque eorum instrumentis proprio nomine designandis defuerunt ...”; “quæ plurimas obsoletas voces & vetustate rancidas, abrogavit, recentioribus & nitidioribus substitutis.” All references in this passage are from the *Typographus Lectoris* (unpaginated) in Rohault, *Tractatus physicus*.

¹² Le Grand 1682: “labefactatum Opus refarcirem, aptiorique Latinitate donarem”; “An id Typographi incuria, an vero Translatoris vitio factum sit, animus expiscari non est.” Thomas Short was a physician and a member of the Royal Society. A comparative textual analysis of the Latin editions reveals the limited scope of Le Grand’s interventions in Bonet’s Latin; see Dobre et al., “Jacques Rohault’s Preface,” xviii–xxiii; section “Rohault’s Preface(s): a comparative study.” Elena Muceni argues that Le Grand’s edition is a second Latin translation; see Muceni, “Philosophies cartésiennes à l’usage des étrangers.” Another important detail related to the reception of Le Grand’s Rohault, in the Swalle edition, is that although it was produced in London, it was available in Geneva; see Elena Muceni, “Genevæ apud Johannem Ludovicum Dufour: A Genevan Printer in the History of Malebranchism,” *Quaerendo* 48, no. 1 (2018): 5–6.

¹³ There is no information about the name of the translator – the original French was published in 1682, as part of Rohault’s posthumous works – but it is worth stressing that Rohault’s treatise on mechanics was printed together with the more famous treatise on natural philosophy. This seems to have been the case with subsequent editions, as explained in the preface to the first English translation, *A Treatise of Mechanicks* (1716). The latter case is discussed in Dobre, “Rohault.”

comparing all Latin versions of the text, we chose to focus on the 1682 edition, as being the first one to add Le Grand's annotations to Rohault's text, and we aim to examine how his comments affect the reading of the textbook.

A Latin version with Le Grand's annotations was included in a joint edition together with Samuel Clarke's notes (see Figure 1), and it was reprinted at least four times during the first half of the eighteenth century: 1708 (Amsterdam: J. Wolters), 1713 (Köln), 1729 (Leiden: Joh. Arnold Langerak), 1740 (Amsterdam: J. Wolters). Although Clarke's translation is not the main focus of the current study, it cannot be overlooked that in 1697 (London: James Knapton), he offered a completely new Latin translation of Rohault's *Traité (Physica)* with a new set of annotations. Therefore, both the text and the notes differed from the ones of Le Grand. As explained above, Clarke's edition offers the path usually taken by scholars when trying to elucidate how a commonly described "Cartesian" textbook found its relevance in an already flourishing Newtonian context.¹⁴

As previously stated, Clarke explained in the translator's preface that two reasons drove him to provide a new Latin translation. The first was listed above, namely the utility of Rohault's treatise, while the second reason consists in "the absurdity of the previous version" ("vulgatæ versionis ineptia").¹⁵ To support this harsh claim, he cites examples from the text, condemning "how badly was punished our Author by the ignorance of an unfavorable Translator." Therefore, his main principles for a better translation are summarized:

Using fewer words, I have tried to render faithfully and clearly the meaning of the author. I kept, where possible, the words derived from sciences, although less pure, so that the speech would become clearer and more accommodated to the system of the recent Philosophers. As for those words which seemed entirely barbarous, I considered that they should be deleted [...] as I think that Philosophy and Latinity are separated from each other by the whole sky.¹⁶

Chronologically speaking, Le Grand's annotations fall between the initial publication of Rohault's book (1671), and the English reception mediated by Samuel

¹⁴ A discussion centered upon the content and the traits of Clarke's notes is beyond the scope of the present study and edition, as it has been already addressed in the secondary literature. For the literature dedicated to Clarke's Newtonian notes to Rohault's Cartesian treatise on natural philosophy see note 7.

¹⁵ See the unpaginated preface of Rohault, *Physica*.

¹⁶ See Clarke's *Prefatio Interpretis* in Rohault. "quàm malè multavit Auctorem nostrum Interpretis haud satis felicis inscitia"; "De verbis minùs laborans, sensum authoris fideliter & dilucidè reddere conatus sum. Concepta artis verba, quamvis minùs pura, ubi id facere licuit, retinui, ut perspicuior esset oratio, & ad recentiorum Philosophorum rationem accommodatior: Quæ autem prorsùs barbara videbantur, eliminanda censui; Longè enim ab eo absum ut putem, adèò toto cælo inter se distare Philosophiam & Latinitatem." A comparison between Clarke's Latin and the previous translation (Bonet/Le Grand), but with a limited scope to Rohault's preface is available in Dobre et al., "Jacques Rohault's Preface," xviii–xxiii.

Clarke's editions (1697 onwards). In this sense, it looks like his comments to Rohault's treatise were superseded by the ones of the future prominent Newtonian, Clarke. But this is precisely the issue: Rohault and Clarke are commonly ascribed to competing philosophical camps, which makes them interesting case studies for historians of philosophy and historians of science. So, where does Le Grand fit into this picture?

2. Antoine Le Grand: Life and Works

Antoine Le Grand (1628/29-1699) was a Franciscan missionary, active in England in the second half of the seventeenth century.¹⁷ He was born in the Spanish Netherlands (Belgium nowadays) and was educated in Douai.¹⁸ In the 1650s he started missionary work in England, spending most of the time in London and Oxfordshire. His missionary activity was combined with private teaching of philosophy, such that he acted most likely as tutor in the homes of notable Catholic families. Quite curiously, after writing two books on the ancients (Stoics and the Epicureans), Le Grand published a series of writings in which he defended Descartes's philosophy (*Philosophia veterum; Institutio philosophiae; Historia naturae; Dissertatio de carentia sensus et cognitionis in brutis; Apologia pro Renato Des-Cartes*). These publications, issued in the 1670s – but reprinted several times by the end of the century – established Le Grand as an authoritative Cartesian. He was not connected to any Cartesian network on the continent, which suggests he developed his own reading of Descartes – possibly in relation to his private lessons. His books were printed in London, and judging from the number of reprints, they were in popular demand. This seems to be the case on the continent, too; especially with the significant number of reprints in Nuremberg. For convenience, we provide here a list of his works:

Le sage des Stoïques ou l'homme sans passions, selon les sentiments de Sénèque.
The Hague, 1662. With subsequent editions: *Les caractères de l'homme sans passions, selon les sentiments de Sénèque.* Paris, 1663,

¹⁷ Scholarly works on Le Grand are scarce and usually focused on specific aspects of his philosophy (e.g., logic or method, ethics, etc.); see Richard Watson, *The Downfall of Cartesianism* (The Hague: Martinus Nijhoff, 1966); Desmond Clarke, *Occult Powers and Hypotheses: Cartesian Natural Philosophy under Louis XIV* (Oxford: Clarendon Press, 1989); Desmond Clarke, *French Philosophy, 1572–1675* (Oxford: Oxford University Press, 2016); D. Anthony Larivière, “The Concept of Method Among the Cartesians, 1650–1690” (London, Ontario, University of Western Ontario, 1998); Roger Ariew, *Descartes and the First Cartesians* (Oxford: Oxford University Press, 2014); Han Thomas Adriaenssen, “Antoine Le Grand on the Identity over Time of the Human Body,” *British Journal for the History of Philosophy* 26, no. 6 (2018): 1084–1109. For details about his life and works, see John Ryan, “Anthony Legrand, 1629–99: Franciscan and Cartesian,” *The New Scholasticism* 9 (1935): 226–50; Patricia Easton, “Antoine Le Grand,” in *The Stanford Encyclopedia of Philosophy (Summer 2023 Edition)*, ed. Edward N. Zalta, 2023, <https://plato.stanford.edu/archives/sum2023/entries/legrand/>.

¹⁸ According to John Ryan, Antoine Le Grand completed his studies at Saint Bonaventura's convent at Douai in 1655. Together with the right to preaching, he was also appointed professor of philosophy. One year later, in 1656, he was sent to London. See Ryan, “Anthony Legrand,” 229.

- 1682; Lyon, 1665 and an English translation: *Man without Passion: Or, the wise Stoick, according to the Sentiments of Seneca*. London, 1675.
- L'Épicure spirituel, ou l'empire de la volupté sur les vertus*. Douai and Paris, 1669. An English translation was published as *The Divine Epicurus, or, the Empire of Pleasure over the Virtues*. London, 1676.
- Scydromedia seu sermo quem Alphonsus de la Vida habuit coram comite de Falmouth de monarchia liber primus*. London, 1669; Nuremberg, 1680.
- Philosophia veterum, e mente Renati Descartes more scholastico breviter digesta*. London, 1671 [it is considered the first edition of the *Institutio*].
- Institutio philosophiae secundum Principia D. Renati Descartes: Novo methodo adornata & explicata, cumque indice locupletissimo actua*. London, 1672, 1675, 1678, 1680; Nuremberg, 1679, 1683, 1695, 1711; Geneva, 1694.
- Historia naturae variis experimentis & ratiociniis elucidate*. London, 1673, 1680; Nuremberg, 1678, 1680, 1702.
- Dissertatio de carentia sensus et cognitionis in brutis*. London, 1675; Lyon, 1675; Nuremberg, 1679.
- Apologia pro Renato Des-Cartes contra Samuelem Parkerum, S.T.P. archidiaconum cantuariensem, instituta & adornata*. London, 1679, 1682; Nuremberg, 1681.
- Curiosus rerum abditarum naturaeq[ue] arcanorum perscrutator. Sive, Compendium rerum jucundarum, & memorabilium, in quo naturae arcana, multae rerum sympathiae & antipathiae, & auctoris observationes reserantur*. Nuremberg, 1681; Frankfurt, 1681. A German translation was published in 1682.
- Jacobi Robaulti tractatus physicus gallice emissus et recens latinitate donatus per Tb. Bonetum D.M. Cum animadversionibus Antonii Le Grand*. London, 1682, 1692, 1696; Amsterdam, 1691, 1700, 1708, 1740; Köln, 1713; Leiden, 1729.
- Historia sacra a mundi exordio ad Constatini Magni imperium deducta*. London, 1685; Herborn, 1686.
- An Entire Body of Philosophy, According to the Principles of the Famous Renate des Cartes*, translated from Latin into English by Richard Blome. London, 1694.
- Censura Justissima Responsi, ut habetur, terribilis; cui titulus est idea cartesiana ad lydium veritatis lapidem*. London, 1698.
- Dissertatio de ratione cognoscendi et appendix de mutatione formali, contra J.S. [John Sergeant] methodum sciendi*. London, 1698.
- Historia haeresiarum a Christo nato ad nostra usque tempora*. Douai, 1702, 1724, 1729, 1732.

Le Grand was not affiliated with any university, but he acted as private teacher for (Catholic) families. While his work was well-received in Cambridge, in Oxford he entered in two major debates, one with Samuel Parker and the other one with John Sergeant.¹⁹ The dispute with Parker is connected to the early reception of Cartesianism in England, but it echoes two other more local concerns: Thomas Hobbes's anti-experimentalism and a reaction to Cambridge Platonism.²⁰ Le Grand's *Apologia pro Renato Des-Cartes* aimed to defend Cartesian proofs for the existence of God and to reject, thus, charges of atheism.

Almost two decades later, at the end of the century, Le Grand engaged in a new dispute with John Sergeant. This time, the Cartesian doctrine under threat was the theory of ideas. Remarkably, Sergeant's attack to Le Grand is in a small tract dedicated to Edward Southcot of Albery, with whom Le Grand also exchanged letters.²¹ Unfortunately, Le Grand's letter is undated, but his defence of Cartesian philosophy is worth discussing. First, Le Grand explains how "in arts and sciences, novelty is ever acceptable; for in them, as in the shops where mettals are wrought, there should be a perpetual clatter, and noise of new experiments and fresh inventions."²² The phrase is reminiscent of Francis Bacon's philosophy, and indeed Le Grand refers to "the late Lord Chancellor" as promoter of the new philosophy, which is contrasted to the Scholastics' perpetual return to Aristotle.

In this condition were things amongst the learned, when the assertor of true liberty, Renatus Descartes, in a happy hour undertook the restoring

¹⁹ See Antoine Le Grand, *Apologia pro Renato Des-Cartes contra Samuelem Parkerum* (London: Mary Clark, 1679); Antoine Le Grand, *Dissertatio de ratione cognoscendi et appendix de mutatione formali, contra J.S. [John Sergeant] methodum sciendi* (London, 1698).

²⁰ For the broader cultural, social, philosophical, and confessional context, see for example Anne Davenport, "English Recusant Networks and the Early Defense of Cartesian Philosophy," *JEMS (Journal of Early Modern Studies)* 1 (2012): 65–86; Dmitri Levitin, "Rethinking English Physico-Theology: Samuel Parker's *Tentamina de Deo* (1665)," *Early Science and Medicine* 19, no. 1 (2014): 28–75; Dmitri Levitin, *The Kingdom of Darkness: Bayle, Newton, and the Emancipation of the European Mind from Philosophy* (Cambridge: Cambridge University Press, 2022); Igor Agostini, "Debating Cartesian Philosophy on Both Sides of the Channel: Johannes Schuler's (1619–1674) Plea for *Libertas Philosophandi*," in *Descartes in the Classroom: Teaching Cartesian Philosophy in the Early Modern Age*, ed. Davide Cellamare and Mattia Mantovani (Leiden: Brill, 2022), 253–78; Sarah Hutton, "Descartes by Letter—Teaching Cartesianism in Mid-Seventeenth-Century Cambridge: Henry More, Thomas Clarke and Anne Conway," in *Descartes in the Classroom: Teaching Cartesian Philosophy in the Early Modern Age*, ed. Davide Cellamare and Mattia Mantovani (Leiden: Brill, 2022), 279–95; Roger Ariew, "Teaching Descartes's Ethics in London and Cambridge," in *Descartes in the Classroom: Teaching Cartesian Philosophy in the Early Modern Age*, ed. Davide Cellamare and Mattia Mantovani (Leiden: Brill, 2022), 296–312.

²¹ For Sergeant's critique, see John Sergeant, *Non Ultra: Or a Letter to a Learned Cartesian; Settling the Rule of Truth, and First Principles, upon Their Deepest Grounds* (London, 1698). Le Grand's letter to Edward Southcot is included in a collection of letters as Letter XCV, Arthur Clifford, *Tixall Letters; or the Correspondence of the Aston Family and Their Friends*, vol. II (London: Longman, Hurst, Rees, Orme, and Brown, 1815), 166–74.

²² See Clifford, *Tixall Letters*, II:167.

of philosophy, and the freeing the literate world from slavery and bondage; but with that moderation and temper, as not to personate a dictator, but rather an advisor; not a master giving precepts with authority, but an inventor, who wished and hoped the advance of learning from his successors. Whence he gave the name of Principles to his philosophy; intimating thereby, that from them conclusions were more to be expected from his followers. For which reason, in his speculations, hee chose to himself such a method of instructing, as might show in what manner the thing was found out; and might rather more fully satisfy the mind of the desirer to leant, than force the assent of one resolved to oppose; Imitating thereby the divine Plato, in his book of a Commonwealth, [...]”²³

This is a remarkable passage in which Le Grand defends not only Descartes’s views, but also the right of his followers to expand the (principles of) Cartesian philosophy. Reading the two fragments together, the term “speculations” in the second is not detrimental to Cartesianism, as theory and experimentation are meant to complement each other.²⁴ The Cartesianism resulting from here is one that promotes philosophical education, something testified by Le Grand’s long-time commitment to teaching.

In the early 1690s, his philosophical work – which was priorly published in Latin – was translated into English and printed by Richard Blome in a voluminous tome, *An Entire Body of Philosophy. According to the Principles of the Famous Renate Des-Cartes*.²⁵ As alluded by several titles of his works, Le Grand was a self-fashioned Cartesian. His initial publications concerned Stoic and Epicurean philosophies, but in the 1670s he became a public defender of Cartesianism, and it is precisely this corpus of writings that was included in the English edition prepared by Blome (*Institutio*

²³ Clifford, II:169–70.

²⁴ For the experimental-speculative distinction in the early modern period, see Peter Anstey, “Experimental versus Speculative Natural Philosophy,” in *The Science of Nature in the Seventeenth Century: Patterns of Change in Early Modern Natural Philosophy*, ed. Peter Anstey and John Schuster (Dordrecht: Springer, 2005), 215–42; Peter Anstey, “Philosophy of Experiment in Early Modern England: The Case of Bacon, Boyle and Hooke,” *Early Science and Medicine* 19, no. 2 (2014): 103–32. For a critical approach to the use of this distinction, see Mihnea Dobre and Tammy Nyden, “Introduction,” in *Cartesian Empiricisms*, ed. Mihnea Dobre and Tammy Nyden (Dordrecht: Springer, 2013), 1–21; Mordechai Feingold, “‘Experimental Philosophy’: Invention and Rebirth of a Seventeenth-Century Concept,” *Early Science and Medicine* 21, no. 1 (2016): 1–28.

²⁵ See Antoine Le Grand, *An Entire Body of Philosophy, According to the Principles of the Famous Renate Des Cartes, in Three Books, I The Institution; II The History of Nature; III Dissertation on Brutes*, trans. Richard Blome (London: Richard Blome, 1694). Commenting upon the changes between the Latin printed works and the English version of Le Grand’s philosophy, Sarah Hutton argues that Le Grand was not satisfied with the new result precisely because of the many changes in the text; see Sarah Hutton, “Cartesianism in Britain,” in *Oxford Handbook of Descartes and Cartesianism*, ed. Steven Nadler, Tad Schmaltz, and Delphine Antoine-Mahut (Oxford: Oxford University Press, 2019), 503n9.

philosophiae, Historia naturae, Dissertatio de carentia sensus et cognitionis in brutis). Due to the structure of the work and to the pedagogical content, Le Grand's *An Entire Body of Philosophy* is often depicted as a Cartesian textbook.²⁶ But Le Grand was also contributing to the success of another textbook, Jacques Rohault's Cartesian treatise on natural philosophy. The format of commentaries was not uncommon, although his notes differ significantly from Scholastic commentaries. One question is what was he trying to address in the commentaries? In other words, we are interested to understand the philosophical stakes of Le Grand's interventions, which occurred at a time when Newtonianism was not an option.²⁷ Before examining this question, it is important to have a look at Le Grand's annotations to Rohault's treatise.

3. Le Grand's Annotations to Rohault's Treatise

Rohault's *Traité* is organized in four parts and Le Grand's annotations are distributed throughout the entire Latin edition of the treatise (translated as *Tractatus physicus*): I. *Pars prima* (14 annotations); II. *De Cosmographia* (7 annotations); III. *De Rebus Terrestribus* (one annotation); IV. *De Corpore Animato* (6 annotations). Some of the notes are longer than others, and they are placed in the text (no footnotes or endnotes), immediately after the commented article or at the end of the chapter in Rohault. For this reason, in what follows, we are constantly marking both the place in Rohault's treatise and the number of Le Grand's annotation. The overview provided below is an invitation to explore in greater detail the 28 annotations made by Le Grand, which constitute the core of this edition.

²⁶ See for example Roger Ariew, "Ethics in Descartes and Seventeenth Century Cartesian Textbooks," in *The Rationalists: Between Tradition and Innovation*, ed. Carlos Fraenkel, Dario Perinetti, and Justin E. H. Smith (Dordrecht: Springer, 2011), 67–75; Ariew, *Descartes and the First Cartesians*.

²⁷ The London prints of Le Grand's annotated edition of Rohault were produced in 1682, 1692, and 1696. Isaac Newton's famous *Principia* was published in 1687, and the first groups of Newtonians emerged in the early eighteenth century. For the early reception of Newton in England, see, for example, Mordechai Feingold and Andrej Svorenčik, "A Preliminary Census of Copies of the First Edition of Newton's *Principia* (1687)," *Annals of Science* 77, no. 3 (2020): 253–348; Steffen Ducheyne, "Early and Earliest Uses of the Word 'Newtonian,'" *Notes and Queries* 67, no. 4 (2020): 483–85; Steffen Ducheyne and Jip van Besouw, "Readers of the First Edition of Newton's *Principia* on the Relation between Gravity, Matter, and Divine and Natural Causation: British Public Debates, 1687–1713," *Centaurus* 63 (2021): 381–95; Jip van Besouw and Steffen Ducheyne, "Characterisations in Britain of Isaac Newton's Approach to Physical Inquiry in the *Principia* between 1687 and 1713," *Early Science and Medicine* 26, no. 4 (2021): 341–72.

PART I

The first annotation [*Animadversio I*] is added to PI.1.2. “That it is needless to stop at previous Questions.”²⁸ Le Grand places Rohault among the mathematicians (“*Mathematicos*”) who are of the opinion that for an idea of a thing to be understood, the thing itself must be explained first (AIG p. 4: “*nullius Rei ideam posse obtineri, quæ non per vocabuli designationem fuerit declarata*”; “the idea of a thing cannot be reached, unless it has not been stated by the description of the term”). This is done partly to contrast Rohault’s approach with that of the Scholastics. Le Grand claims that Rohault’s explanation of the term “physics” contradicts Aristotle’s understanding of this word, sending the reader to *Tractatus de Physica Auscultatione*.²⁹ A brief comparison between Aristotle and Descartes follows in Le Grand’s commentary: while the former defines physics as the knowledge of natural things in so far as they are natural (AIG p. 4: “*Physicam ut Institutionem quandam considerat, qua ad rerum naturalium cognitionem pervenitur*”), the latter “transfers the name of Physics to the science of natural things itself, and wants to teach from it the causes and reasons which nature uses to produce the effects” (AIG p. 4: “*Physicæ nomen ad ipsam rerum naturalium scientiam transfert, vultque causas ac rationes ab illa doceri, quibus natura utitur, ad effectus procreandos*”). Le Grand concludes that “Cartesian Physics is not the *Method* of acquiring the knowledge of Natural Things, as Aristotle holds, but it is the knowledge itself of Natural Things, and the firm Reason derived from the very principles of nature” (AIG p. 4: “*Non igitur Physica Cartesianæ Methodus est, quemadmodum Aristoteli placuit, Rerum Naturalium scientiam acquirendi, sed revera est ipsamet Naturalium Rerum scientia & deducta ab ipsis naturæ principiis inconcussa Ratio*”). In other words, if in the former understanding physics represents the knowledge of natural things *qua* natural, in the latter, it concerns the properties of natural things as derived from the principles of nature.

One should be reminded that for more than a decade before the publication of the *Traité*, Rohault was a private teacher and a public lecturer in Paris. It is thus not surprising that he acts as a careful professor and in the second chapter of his treatise, he warns the reader about the several notions that should precede the study of natural philosophy. The argument builds upon the four types of knowledge recognized by Rohault along the lines of the Port Royal Logic: perception (Fr. *concevoir*), judgement (Fr. *juger*), reason (Fr. *raisonner*), and sensation (Fr. *sentir*).³⁰ Even though a common

²⁸ References to Rohault’s text will follow the English edition of 1723, unless otherwise indicated. In addition to the page number, we also provide a reference to the section of the treatise: part (in Roman number), chapter, article; in this case, PI.1.1–2.; Rohault, *System of Natural Philosophy*, 1, vol. I. References to Le Grand’s comments will follow the text of the current edition, abbreviated from now on as AIG, followed by the page number. The English translation of the Latin is our own.

²⁹ For Rohault’s definition of physics, see PI.1.1.: “the Knowledge of natural Things, that is, that Knowledge which leads us to the Reasons and Causes of every Effect which Nature produces”; Rohault, 1, vol. I.

³⁰ We have included both the French original and the English translation of the terms, as in John Clarke’s version of the treatise (1723). Rohault does not refer to the *Logique de Port-Royal*, but there is a great resemblance with the opening passage of the section on “Logique” (“Logic

trait of Rohault's argumentation is his avoidance of theological questions (since they are not the subject of natural philosophy), when considering the relation between "existence" and "reason" (the latter being in close connection to "judgement," which "does not prove that any Thing exists"), Rohault provides an exception: God (PI.2.13. "The Existence of God may be proved by Reason").³¹ This is the place where the more theologically minded Le Grand comments the text [*Animadversio II*], reiterating Descartes's ontological argument.³² The metaphysical background is important; and Le Grand acknowledges it, while engaging with Gassendi's objections (AIG p. 5: "celeberrimo *Gassendo* haud placet") and Descartes's replies (AIG p. 5: "Respondet *Cartesius*"). He sends the reader to his own earlier works on the subject: "hac de re consule *Institutionem Philosophiae*, part 2. Cap. 3; *Apologiam pro Renato Descartes*, cap. 22."³³ The reference to the *Institutio* is of particular interest, especially if one examines the changes made in the corresponding section of the various editions, up to the English translation of *An Entire Body of Philosophy*. Quite curious is that all Latin editions produced up to 1680 (which is the fourth edition) of the *Institutio* do not mention

or the art of thinking"): "Cet art consiste dans les réflexions que les hommes ont faites sur les quatre principales opérations de leur esprit, *concevoir, juger, raisonner et ordonner*" (Antoine Arnauld and Pierre Nicole, *La logique ou l'art de penser* (Paris: Gallimard, 1992), 30.); "This art consists in reflections that have been made on the four principal operations of the mind: *conceiving, judging, reasoning, and ordering*" (Antoine Arnauld and Pierre Nicole, *Logic or the Art of Thinking*, trans. Jill Vance Buroker (Cambridge: Cambridge University Press, 1996), 23.). For Port-Royal Logic, see for example, Antony McKenna, "La composition de la *Logique de Port-Royal*," *Revue Philosophique de la France et de l'Étranger* 176, no. 2 (1986): 183–206; Roger Ariew, "La *Logique de Port-Royal*, les premiers cartésiens et la scolastique tardive," *Archives de Philosophie* 78, no. 1 (2015): 29–48; John N. Martin, *The Cartesian Semantics of the Port Royal Logic*, Routledge Studies in Seventeenth-Century Philosophy (London: Routledge, 2020).

³¹ See Rohault, *System of Natural Philosophy*, 5, vol. I. For the relation between metaphysics and physics, see Mihnea Dobre, *Descartes and Early French Cartesianism: Between Metaphysics and Physics* (Bucharest: Zeta Books, 2017), 322–75.

³² The literature on the topic of Descartes's ontological argument is vast; see for example Lawrence Nolan and Alan Nelson, "Proofs for the Existence of God," in *The Blackwell Guide to Descartes' Meditations* (Oxford: Blackwell Publishing, 2006), 104–21; Igor Agostini, "Descartes's Philosophical Theology," in *The Oxford Handbook of Descartes and Cartesianism*, ed. Steven Nadler, Tad Schmaltz, and Delphine Antoine-Mahut (Oxford: Oxford University Press, 2019), 209–25.

³³ In his prior dispute with Parker, Le Grand tackled similar topics; see Le Grand, *Apologia pro Renato Des-Cartes contra Samuelem Parkerum*. For the context of Le Grand's dispute with Parker, including the latter's use of Gassendi in the arguments, and the reception of Cartesianism in Britain, Levitin, "Rethinking English Physico-Theology"; Hutton, "Cartesianism in Britain." By way of comparison, although Samuel Clarke will add a note to the same passage, it will be a brief one and without any reference to Gassendi. Instead, Clarke shows good knowledge of Cartesian philosophy, as he refers to Descartes's *Principles*, part I, art. 14 and to Régis's section on metaphysics in his *Cours entier de philosophie*, book I, part I, chap. 5. These references are preserved in all Clarke's editions of Rohault.

Gassendi. Yet the English translation of 1694 includes a new article in the chapter referred here, which seems to be based on the comment to Rohault's treatise.³⁴

This is not the only place where Le Grand references the *Apologia*, or his own works, more generally.³⁵ The final article of the second chapter (PI.2.43: "Another Mistake"), a new note is added [*Animadversio III*]. First, Le Grand explains what an axiom is: "The term Axioms refers to common notions, or propositions [that are] so clear and evident that they require no Demonstration in order to become manifest" (AIG p. 5: "Axiomatum nomine, intelliguntur notiones communes, sive propositiones adeo claræ & perspicuæ ut nulla Demonstratione indigeant, qua evidentes reddantur"). This pedagogical introduction is followed by an interesting choice of words in Le Grand's exposition: "If indeed one asks ... I answer" (AIG p. 5: "Si quis vero roget ... Respondeo"). It is a rhetorical strategy to contrast different views, and, while arguing against the validity of a proposition based on the general approval and common opinion, Le Grand refers to the second chapter of his *Apologia*.³⁶ In other words, the curious reader will find a solution in Le Grand's earlier publication, which supports Rohault's Cartesian explanation. The content of Rohault's text in PI.2.43 provides a conclusion for what has been previously discussed about the qualities in bodies, such as heat, cold, smell, sounds, light, and colour. By making use of an argument similar to what was discussed by Descartes in his correspondence with Mersenne, Rohault emphasizes that even though we have within ourselves the sensation of many things, the information that comes to us from the senses is ambiguous.³⁷ This is not to deny the existence of sensation, but to draw the very Cartesian conclusion that without reason it is not possible to know what things are in themselves. The same idea is developed by Le Grand in the second half of his annotation, where he says that truth depends both on "the evidence of senses and the connection of Ideas" (AIG p. 6: "perceptionum evidentiæ, & Idearum connexionem"). Thus, Le Grand concludes that axioms provide certainty by "unius Idea alterius Ideam infert ac deducit" (AIG p. 6).

Chapter 5 of the *Traité* provides an incomplete list of the principal axioms of natural philosophy. Between articles 2 and 10, Rohault sums up a total of eight axioms, each of them accompanied by short explanations. In his commentary to this section [*Animadversio IV*], Le Grand complements the list with two new axioms: "No

³⁴ The title of the new article is "Existence is a Perfection without which the nature of God cannot be conceived." The added text begins with a direct rejection of Gassendi's views: "Wherefore in this point, we differ from Gassendus, who denies Existence to be a Perfection, or the Property of any thing, but that which adds neither Perfection nor Imperfection to a thing" (*An Entire Body of Philosophy*, part. I, chap. III, art. V). Le Grand, *An Entire Body*, 58 in the section "The Institution of Philosophy."

³⁵ For an analysis of the authors cited by Le Grand in his annotations – including self-references –, see section 4, "The Problem of Reception: Rohault and Le Grand," below, in this study.

³⁶ The title of the second chapter is "Quid Sceptici, quidque docuerint, & an inter illos sit Cartesius numerandus"; see Le Grand, *Apologia pro Renato Des-Cartes contra Samuelem Parkerum*, 10–17.

³⁷ See, for example, Descartes's letter to Mersenne of 26 April 1643 (AT III 648–650; CSMK 216–217). For Rohault's argument, see Rohault, *System of Natural Philosophy*, 12, vol. I.

body can move by itself” (AIG p. 6: “Nullum Corpus à seipso moveri potest”) and “No body can move another [body], unless it has been moved first” (AIG p. 6: “Nullum Corpus alterum movere potest, ni prius ipsum motum fuerit”). Le Grand hints at Descartes’s theory of motion, which, however, will be brought into discussion by Rohault only in chapter 10 of the treatise, “On motion and rest.” Thus, one may wonder: why does Le Grand anticipate here the discussion on motion? An answer might be that he wanted to promote his own writings – he does refer to the *Institutio Philosophiae*, chapters 7 and 8 – where some of the topics were discussed at length.³⁸ In particular, the examination of “the real *Qualities* of gravity and heaviness” (AIG p. 6: “reales Gravitatis & Levitatis *Qualitates*”).³⁹ He enters into one of the most heated debates about the ontological and epistemic status of qualities, a real problem for the scholastics and for the new philosophers alike. Le Grand briefly refers to “certain Philosophers” (AIG p. 6: “quidam Philosophi”) who were “led by a false opinion” (AIG p. 6: “falsa opinione adducti”) and “not being well aware, they fall into that error which they strive to avoid” (AIG p. 6: “Haud satis animadvertentes, se in illum errorem delabi quem vitare tantopere adnituntur”). The use of the scholastic terminology should be remarked in this context, especially in comparison to Rohault’s more direct and distant style.⁴⁰

Animadversio V complements the prior annotation. It is added to the second article (“On Form”) of the sixth chapter (“Of the Principles of Natural Things”), and offers brief explanations on the traditional notions of *cause* and *principle*: “although the cause and the principle are often confused, and, here and there, are taken by some as being the same; however, among Philosophers there is a great difference between these opinions” (AIG p. 7: “licet Causa & principium sæpe confundantur, passimque à nonnullis pro eodem sumantur; apud Philosophos tamen magnum inter has voces discrimen intercedit”). Le Grand could have easily point here to his *Institutio*, Part I, Chapter 9, where this distinction was treated at length, but his comment was meant to

³⁸ See Antoine Le Grand, *Institutio philosophiæ secundum Principia D. Renati Descartes: Novo methodo adornata & explicata, cumque indice locupletissimo actua* (London: John Martyn, 1680), 36–44 (chap. VII: “De Communibus Substantiæ Attributis” and chap. VIII: “Quomodo Deo, & Creaturis Substantiæ nomen conveniat”). For the English version, see Le Grand, *An Entire Body*, 15–20 (chap. VII: “Of the Common Attributes of Substance” and chap. VIII: “How the Name of Substance agrees to God and the Creatures”) in the section “The Institution of Philosophy.” The number of articles included in each chapter differs between the Latin and the English editions: 9 articles in chap. VII and 11 in chap. VIII for the Latin, while the English translation consists in 14 articles (chap. VII) and 12 articles (chap. VIII).

³⁹ As noted above, the English version of *An Entire Body of Philosophy* differs from the Latin editions of the *Institutio*. The most obvious difference is the enlarged text in English, but unlike other places, here we were unable to make a connection between Le Grand’s comments to Rohault and the “improved” edition produced by Blome in 1694.

⁴⁰ Of course, this can be explained through the language in which each of the text was written: for Rohault, the use of French was less inviting in replicating the taxonomy of the school, while Le Grand was using Latin in a university textbook, and a more traditional vocabulary is indeed in place. Another explanation can be based on the different backgrounds of the two: Rohault was trained in mathematics and interested in natural philosophy, including more experimental approaches; Le Grand was trained as a theologian and more interested in general philosophical topics.

introduce Aristotle’s *Metaphysics* (the fifth book), and to provide two examples: the dot and the line and the Father-Son relation. The latter is of particular interest for the current study:

The Eternal Father is the principle of the Son, and by no means his cause, since the son does not exist apart from the father, but only as someone else. He is indeed another person, but not another nature.⁴¹

It is noteworthy that Le Grand uses theologically loaded examples – arguably, being influenced by his Franciscan religious background –, in contrast to Rohault who leaves aside matters related to theology, which are considered as falling outside the proper subject of natural philosophy. Le Grand concludes, recalling an Aristotelian distinction, that “Matter and Form are more properly seen as parts of a compound, than as causes ...” (AIG p. 7: “Materia igitur & Forma magis propriè partes compositi haberi debent, quam causæ, quoniam absurdum merito existimandum est, quod Causa effectu suo sit deterior”).

Rohault’s evasion of matters related to theology is clearly noticeable in the next article annotated by Le Grand [*Animadversio VI*]: article 9 (“In what a natural Philosopher ought to acknowledge the Essence and essential Properties of Matter to consist”) of chapter 7 (“Of Matter”). He explains:

If it should be here objected; That God could make Something to the *Essence* of Matter, which neither we, nor any Man living, can understand what it is; we can make no other Answer, but only this; that God, being Lord of all Things, might create them according to his own Will; for we do not pretend to determine by our Reason, that which Reason cannot come at. ... and conclude from that Knowledge which we have by Reason, that the Essence of Matter consists in Extension, because that is that we first perceive in it, and from which every Property of Matter is derived, and upon which it depends.⁴²

⁴¹ AIG p. 7: “Pater Æternus Filii principium est, nequaquam illius causa, quippe filius non aliud à patre existit, sed alius dumtaxat; est quidem alia persona, non autem alius naturæ.” The passage quoted here shows some striking similarities with the Le Grand, *An Entire Body*, 20, part I, chap. 9, art. V in the section “The Institution of Philosophy.”: “GOD the *Father* is the Principle, but not the Cause of the *Son*; for the Son is another Person from the Father, but not another Thing, that is, not of another or different Nature.” Since this comparison is not present in the Latin editions of the *Institutio* (other examples of the father-son relations are discussed), its inclusion in the English translation might very well be due to the set of comments added to Rohault’s treatise. The topic is also relevant in the context of the spread of the Cambridge Platonism and Samuel Parker’s criticism discussed earlier, but also for the possibility of developing metaphysico-theological arguments, more generally; see Hutton, “Cartesianism in Britain”; Agostini, “Debating Cartesian Philosophy.”

⁴² Rohault, *System of Natural Philosophy*, 24, vol. I.

Rohault's argument in this chapter is particularly important for the way in which he understands the relation between theology, metaphysics, and natural philosophy. He discusses matter as the foundation of everything that exists in nature, without the need to refer to God. He does this, "without invading the Territories of others," by making an alluded distinction between natural philosophy and theology ("who carry their Views far beyond what Reason can do").⁴³ Le Grand, however, begins his rather brief annotation to this section in a Cartesian manner, asserting the three-dimensional extension of an object in space: "Hence the *Nature* of the Corporeal thing is established in three Dimensions, or in Extension into length, breadth, and depth" (AIG p. 7: "rei Corporeæ *Natura* in tribus Dimensionibus, sive in Extensione in longum, latum, & profundum stabilitur"). He uses the example of water existing in three different states of matter (solid, liquid, gas), but the main feature of his annotation is the Mathematical essence ("Corpus *Mathematicum*") and the Physical essence ("Corporis *Physici* essentiam") of a body.

Le Grand's next four annotations are not connected to one another, yet they share a common ground in a greater use of experience in order to complement Rohault's argumentation. Moreover, they are based on some of the most famous experiments of the time. If Le Grand's commentary to chapter 5 [*Animadversio IV*, discussed above] was only briefly touching upon the topic of motion, the annotation to chapter 10 ("Of Motion and Rest"), article 10 ("How to Bodies hang at the Ends of a Balance may be in *aequilibrio*") deals at length with this topic [*Animadversio VII*]. Rohault's text concerns the problem of the equilibrium of bodies, which he illustrates with the case of a balance. In his commentary, Le Grand seems to be aware of ongoing contemporary debates, which he reduces to a problem in mechanics (and to the principle of the lever).⁴⁴ This note is of particular interest because Le Grand seems to follow the guidelines of a textbook and offers some general statements accepted "apud Mechanicos" (e.g., "this thing is considered to be a principle among Mechanics" or "among Mechanics, this is called *momentum*").⁴⁵

⁴³ What Rohault aims to establish here is the independence of natural philosophical investigations from the insights derived from faith (or revelation). It is consistent with the conclusion of chapter 5 (PI.5.14.): "sur tout je me garderay bien d'approfondir ce que la Foy m'apprend estre un mystere, et d'entreprendre d'expliquer ce qu'il y a d'obscur"; see Rohault, *Traité*, 32, vol. I. The English translation changes the meaning of the text slightly, and for this reason we refer only to the French original here. The two fragments cited in the text are from Rohault, *System of Natural Philosophy*, 24, vol. I. Rohault p. 24.

⁴⁴ For an overview of the status of mechanics in the early modern period, see, for example, Alan Gabbey, "Between Ars and Philosophia Naturalis: Reflections on the Historiography of Early Modern Mechanics," in *Renaissance and Revolution: Humanists, Scholars, Craftsmen and Natural Philosophers in Early Modern Europe*, ed. J. V. Field and F. A. J. L. James (Cambridge: Cambridge University Press, 1993), 133–45; Sophie Roux and W. R. Laird, eds., *Mechanics and Natural Philosophy before the Scientific Revolution* (Dordrecht: Kluwer Academic Publishers, 2008).

⁴⁵ Interesting, Clarke has a similar approach in this case, as he begins the note with a classic problem in Archimedes, in order to direct the reader to Wilkins's *Mathematical Magick*. From the 1710 edition, a cross-reference to an extensive note discussing the so-called "Mechanick Powers" is added; the new note is to PI.14.9.

Chapter 12 (“Of such Motions as are commonly ascribed to the Fear of a Vacuum”) of Rohault’s treatise includes various pneumatic experiments and it was one of the most discussed sections of the book in the secondary literature.⁴⁶ Le Grand adds an annotation [*Animadversio VIII*] to article 10 (“Another very considerable Experiment; and that the Air is weighty”), but not to criticize Rohault’s experimental setup or the use of a syringe, as the main experimental device. Rather, he comments in support to Rohault’s explanation, in particular for the claim that air has weight due to the small particles composing it. The second part of the annotation is a short review of Boyle’s pneumatic experiments proving the weight of air: “Many Experiments confirm the weight of air, in Boyle’s pneumatic machine” (AIG p. 9: “æris pondus confirmant plurima Experimenta, in machina pneumatica Boyliana”).⁴⁷ This is not the only annotation where Le Grand refers to Boyle. *Boyliana Machina* will be brought into discussion in two other instances: first, in *Animadversio IX*, which is added to article 62 (“Why the Flesh swells”) of the same chapter, and second, in the third part of Rohault’s treatise (PIII.2.3.; *Animadversio XXI*).

Animadversio IX complements Rohault’s discussion of the use of cupping glasses in early modern medicine, which is explained by Rohault through a natural philosophical process caused by the warming of the air inside the small glass objects.⁴⁸ The causal mechanism incorporates what has been said before about the weight of the air, which is responsible for the phenomenon of cohesion. This is recognized by Le Grand from the very start of his annotation: he recounts in great detail the case of the adhesion of two polished pieces of marble, an example well-known in the early modern debates about cohesion.⁴⁹ While Le Grand does not hint at these historical developments, he addresses one pneumatic experiment in Boyle, in agreement with the previous annotation, most probably, reviewing the marble experiment described in the *News Experiments*.⁵⁰

⁴⁶ See for example Mouy, *Le développement*; Sophie Roux, “Was There a Cartesian Experimentalism in 1660s France?,” in *Cartesian Empiricisms*, ed. Mihnea Dobre and Tammy Nyden (Dordrecht: Springer, 2013), 47–88; Dobre, “Rohault’s Cartesian Physics”; Tad Schmaltz, *Early Modern Cartesianisms: Dutch and French Constructions* (Oxford: Oxford University Press, 2017); Spink, “The Experimental Physics”; Ovidiu Babeş, “The Experimentalism of Jacques Rohault: ‘Whether the World Be Full or Not, It Is the Same Thing,’” in *Cartesian Physics and Their Receptions: Intellectual and Institutional Contexts*, ed. Mihnea Dobre, Rodolfo Garau, and Pietro Daniel Omodeo (Leiden: Brill, forthcoming).

⁴⁷ Boyle’s experiments were widely discussed at the time. For contemporary reactions to Boyle’s experiments with the air pump, see Steven Shapin and Simon Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Princeton: Princeton University Press, 1985).

⁴⁸ See PI.12.61–62; Rohault, *System of Natural Philosophy*, 77–78, vol. I.

⁴⁹ The case was already discussed by Galileo, but also by Descartes; see for example Zvi Biener, “The Unity of Science in Early-Modern Philosophy: Subalternation, Metaphysics and the Geometrical Manner in Scholasticism, Galileo and Descartes” (Pittsburgh, University of Pittsburgh, 2008); Ovidiu Babeş, “Descartes and Mixed-Mathematics” (Bucharest, University of Bucharest, 2022).

⁵⁰ “The truth seems to be against this Experiment because if the same two pieces of Marble are suspended in Boyle’s Machine, and all the Air being drawn out, then they will not be torn
XXII

After dealing with the rejection of *horror vacui* arguments and the main properties of the air, Rohault returns to the topic of motion in chapter 14 (“Of the Composition of Motion, and of its Determination”). His main focus is the difficult Cartesian notion of the determination of motion.⁵¹ Le Grand adds a very short comment [*Animadversio X*] to PI.14.3. (“A Demonstration of compound Motion”), building upon a common example (“vulgari exemplo”): the motion of a ship and the movement of a sphere (“globus”) found at the top of the mast’s ship. This is done solely for explanatory purposes, to illustrate Rohault’s discussion of compound motion. Remarkably, Clarke uses a similar example in his note, referring to the experiments performed at the Accademia del Cimento.⁵²

Animadversio XI complements Rohault’s article “A Mistake in some Philosophers” in chapter 16 (“Of hard Bodies put into Liquors”; PI.16.9.). The mistake highlighted by Rohault concerns the traditional use of “the natural place” of the elements as an explanatory device, with a particular emphasis on one experiment of extracting water from a fountain. Le Grand continues Rohault’s argument grounded on the equilibrium of elements, to which he adds a more general conclusion: “Hence, it may be claimed that an absolute weight in Bodies does not exist, but only a *Relative* one” (AIG p. 11: “Hinc inferre licet, nullam esse Corporibus gravitatem absolutam, sed *Relativam* dumtaxat”). For further clarifications, Le Grand explains how different types of bodies (such as the ones made of wood and copper) behave differently when immersed in a pond, supplementing the examples one can find in Rohault’s textbook.

From the beginning of chapter 18 (“Of Forms”), Rohault warned the reader about the challenging nature of this traditional topic, emphasizing the need of a distinct approach than the one of the scholastics. He explains the received view, where form was distinguished from matter, since “the *Form* of any Thing, is that which makes it to be that particular Thing, and distinguished it from every Thing else.”⁵³ In agreement with his general method in natural philosophy, Rohault argues against generalizations and defends the study of particulars. This is clearly stated in PI.18.2., where Rohault solves an apparent “useless Enquiry” by indicating his favourite method of investigation: “the Solution of this Difficulty, depends upon the particular Knowledge of the Things.”⁵⁴ Le Grand acknowledges some limitations in Rohault’s approach with respect to the scholastic explanations. For this reason, he adds a

apart, but will remain united ...” (AIG p. 10: “Verum huic Experimento adversari videtur quod duo eadem Marmora, si in Boiliana Machina suspendantur, omni Aere extracto, non tamen inde divellantur; sed unita manent...”). See Robert Boyle, *New Experiments Physico-Mathematicall Touching the Spring of the Air and Its Effects* (Oxford: H. Hall, 1660), 229–33, Experiment 31.

⁵¹ For the problem of motion in Cartesian physics, see, for example, Edward Slowik, *Cartesian Spacetime: Descartes’ Physics and the Relational Theory of Space and Motion* (Dordrecht: Kluwer Academic Publishers, 2002); David Marshall Miller, “The Parallelogram Rule from Pseudo-Aristotle to Newton,” *Archive for History of Exact Sciences* 71, no. 2 (2017): 157–91.

⁵² See Rohault, *System of Natural Philosophy*, 83, vol. I.

⁵³ PI.18.1.; Rohault, 102, vol. I.

⁵⁴ Rohault, 103. For Rohault’s method in natural philosophy, see especially Dobre, “Rohault’s Cartesian Physics.”

commentary, which is intended to offer some needed clarifications about “forms.” This is plainly stated in the beginning of the annotation [*Animadversio XII*]: “Since the Illustrious Author does not reveal in this place what precisely is understood by the name of Forms, it would not be wrong if we linger a little in explaining them and discuss more precisely their character” (AIG p. 12: “Quoniam Clarissimus Author, quid Formarum nomine, hoc in loco præcise intelligendum est, non aperit, non abs re futurum est, si tantillum in earum explicatione immoremur, atque earum indolem pressius discutiamus”). Note that even though Le Grand’s comment is added after the final article of the chapter (PI.18.9., “That simple Forms ought to be understood first”), judging from its content, it appears that he had in mind an evaluation of the entire chapter. First of all, he rejects the opinion of Peripatetics, who believed that Forms are “incomplete substances” (“substantias incompletas”), stating that there is only one substantial Form, namely the human mind (“Mens Humana”) or the rational soul (“Anima rationalis”). The other forms, as Le Grand suggests, are nothing more than accidents or modes, which are five in number: Size, Figure, Motion, Rest and Position (“*Magnitudo, Figura, Motus, Quies, & Situs*”). After briefly defining each of them, he concludes: “These five are called Mechanical Principles or the general properties of bodies” (AIG p. 13: “Hæc quinque Exordia Mechanica dicuntur, aut generales corporum proprietates”).⁵⁵ Next, Le Grand sends the reader to his own *Institutio*, part IV, chapter 9 (“Que demum rebus Naturalibus Forma Intelligibiles, sunt tribuendæ”; “What Intelligible Forms may be attributed to Natural things”). It is interesting to note a difference between the list of modes provided above. While the commentary to Rohault’s treatise shows a different list than the one included in the *Port-Royal Logic*, the text of the *Institutio* repeats it. The English translation of 1694 is the following:

Mind, Measure, Rest, and Motion,
With Figure, and Position,
To Matter join’d, the Causes be
Of all what here below we see.⁵⁶

Animadversio XIII follows article 12 (“That these three Elements are not imaginary”) in chapter 21 (“Of the Elements of Natural Things”; PI.21.12.). Le Grand confirms the importance of the three (Cartesian) elements discussed by Rohault: fire,

⁵⁵ This seems to be a common objection by the new philosophy of the early modern period against the view of the scholastics. It was published in verse form in the *Port-Royal Logic*: “Mens, mensura, quies, motus, positura, figura. Sunt cum materiâ cunctarum exordia rerum”; see Arnauld and Nicole, *La logique*, 45; Arnauld and Nicole, *Logic*, 34. For the general context and other uses of this phrase, see Martine Pécharman, “Pierre Bayle as a Teacher of Philosophy,” in *Teaching Philosophy in Early Modern Europe*, ed. Susanna Berger and Daniel Garber (Cham: Springer, 2021), 234, especially 234n124.

⁵⁶ See Le Grand, *Institutio*, 214. and Le Grand, *An Entire Body*, 106 in the section “The Institution of Philosophy.” For comparison purposes, the modern English translation of the *Port-Royal Logic* states “Mind, measure, rest, motion, position, shape: Are with matter the beginning of all things.” Arnauld and Nicole, *Logic*, 34.

air and earth; and rejects once again the vacuum with an argument against interstitial void: “even if the parts of solid bodies are joined together, yet they cannot be bound so closely, without leaving many *gaps*, which, since they cannot be filled with thick air, [they] must be occupied by subtle matter” (AIG p. 13: “quantumvis solidorum Corporum partes inter se compingantur, non possunt tamen ita arctè constringi, quin plurima *intervalla* relinquunt, quæ quum crasso Aere repleti nequeant, oportet, ut subtili materia occupentur”). The remaining of the note illustrates instances of solid and fluid bodies that contain subtle matter. Rohault’s text is annotated also by Clarke, who promotes the Newtonian view as opposed to Descartes’s, but not before the 1710 edition.

Last note [*Animadversio XIV*] in the first part of Rohault’s treatise is in chapter 23 (“Of Heat and Cold”). Commenting on article 44 (“A Defect in this Thermometer”), Le Grand directs the reader to one of his works, “*Hist. Nat. Part. II, Artic. II*”.⁵⁷ Next, following Rohault’s example, he turns to experience: “cum usu veniat”; “Alias experientia manifestum evadit” (AIG p. 14). Consequently, he explains how “a lukewarm” (“tepidum”) body, appears as cold (“gelidum”) to human senses, especially when touched by a warm (“fevida”) hand. Le Grand illustrates his view with the following example: “caves ought to be less warm at the beginning of *Summer* than towards the end of it, when the heat of the sun, falling upon the surface of the earth, enters its interior” (AIG p. 14: “Caveas debere minus calidas esse, in principio *Æstatis*, quam circa finem, ubi solis calor, terræ superficiei diu incumbendo, ad eius interiora penetrat”).⁵⁸ To demonstrate the difference between heat and cold in subterranean places, depending on different heights and considering the variations of temperature throughout the year, Le Grand adds a table displaying the recorded data from “two thermometers 3 feet and a half high, *Hermetically* sealed in the upper part” (AIG p. 14: “... duobus *Thermometris*, 3. pedibus & semisse altis, in superiori parte *Hermetice* sigillatis”). The results are borrowed from *Clarissimus* physicist, Edme Mariotte, who conducted experiments on this specific matter between November 1674 to September 1676.⁵⁹

PART II

The second part of Rohault’s treatise, *De Cosmographia* is dedicated – as the title suggests – to the topic of cosmology. There are seven annotations added by Le

⁵⁷ “De Calore” (“Of Heat”); see Antoine Le Grand, *Historia naturæ variis experimentis & ratiociniis elucidate* (London: John Martyn, 1680), 42–48; Le Grand, *An Entire Body*, 22–25 in the section “The History of Nature.”

⁵⁸ The topics are discussed in the *Historia* (see especially fragments 3 and 5 in Article 2, “De calore”).

⁵⁹ For Mariotte, see Sophie Roux, *L’Essai de logique de Mariotte: archéologie des idées d’un savant ordinaire* (Paris: Classiques Garnier, 2011). Interesting, the references to Mariotte in *An Entire Body of Philosophy* do not have a correspondent in the same sections of the Latin *Institutio*; see Gary Hatfield, “The Cartesian Psychology of Antoine Le Grand,” in *Cartesian Empiricism*, ed. Mihnea Dobre and Tammy Nyden (Dordrecht: Springer, 2013), 269n74.

Grand in this section and a common feature of these notes is the frequent reference to Cassini's astronomical observations.⁶⁰

In chapter 2 ("General Observations"), Rohault provides an overall image of the universe, first presenting some general properties of the Earth and its superficies, then about planets, stars, and constellations. At PII.2.5. ("Of the Number of the fixed Stars"), Rohault refers in passing to the famous discovery of a new star in late 1572, which vanished completely after a span of six months. Although Rohault mentions this event only to illustrate the uncertain nature of these *novæ*, in his annotation [*Animadversio XV*], Le Grand uses this discussion to elaborate on the latest astronomical observations; i.e., the appearance of a new star in Paris of 1671, which was observed near the head of the constellation Cygnus (AIG p. 18: "circa rostrum Cygni"). Changes of the celestial object – as observed during July and August – are the ones that are highlighted: "its size diminishing every day, it totally disappeared from sight" (AIG p. 18: "decescente singulis diebus eius mole, penitus ex oculis evanuit"). Le Grand explains in his comments that this *nova* was observed by Dom Anthelme Voituret, a Carthusian monk from Dijon, and by *Clarissimus* Cassini, already well known in Europe for his astronomical discoveries. Clearly, the emphasis is put on the latter, together with his observations made in the Cygnus and Lyra constellations. The end of the annotation brings more praise to Cassini's celestial discoveries, unknown to prior Astronomers (AIG p. 18: "quæ priores Astronomos latuere"). The contrast between the received knowledge and the modern discoveries in the sky is a key topic for both Le Grand and Rohault, just as they both remark the temporary visibility of some *novæ*.

Cassini is the main authority quoted (although not always explicitly) by Le Grand in his annotations to this second part of the treatise. A new reference to Cassini's astronomical observations appears at the end of chapter 20, "An Explication of the Motions of Mercury and Venus" [*Animadversio XVII*]. Rohault's purpose was to explain why the revolutions of Mercury and Venus complete in less than a year, even though "they ought to appear to take up more Time in making a Revolution, than they really do take up."⁶¹ Le Grand addresses this issue based on Cassini's observations and complements Rohault's explanation with recent astronomical data. He starts with the case of Mercury (AIG p. 19: "Circa Mercurium adnotavit D. Cassinus ...") and draws attention to its distance from the Sun and its motion, pointing out that the planet can be seen only "with the help of an optical tube" and "it is seen under the shape of a globe, or round" (AIG p. 19: "vix tubi optici ope sub globi forma, seu rotundus cernitur"). Next, Venus is discussed (AIG p. 19: "Circa Venerem hæc deprehendit D. Cassinus"). The final part of the annotation reviews the observations of Venus from 14 October 1666 and 24 April 1667, which is prior to the

⁶⁰ For the general context of early modern astronomical observations, including Cassini's, see Albert van Helden, "Telescopes and Authority from Galileo to Cassini," *Osiris* 9, no. 1 (1994): 8–29..

⁶¹ PII.20.6; Rohault, *System of Natural Philosophy*, 52, vol. II.
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publication of Rohault's *Traité* and raise some questions about the time of composition of the cosmology section.⁶²

The chapter "An Explication of the Motion of Mars, Jupiter, and Saturn" includes a new comment [*Animadversio XVIII*] grounded upon recent astronomical observations. Cassini is mentioned twice: once for the observations of the motion of planet Mars, and the second time for the discovery of the three satellites of Saturn (1672).⁶³ But Cassini is not the only figure featured in Le Grand's extensive note. Related to the observations of Saturn, Christiaan Huygens, Galileo's discovery of Jupiter's satellites and Simon Marius's use of the term "revolvitur" in his work titled *Mundus Jovialis* are mentioned. In this context, Le Grand presents a table including the periodical times of Jupiter's satellites, as documented by Galileo.⁶⁴

In a concise exposition [*Animadversio XIX*], Le Grand discusses the time interval of the moon's rotation (presented by Rohault in chapter 22, "An Explication of the Moon's Motion"), as discovered by Cassini, and highlights the explanations of the three ways in which the moon's distance from the Earth changes during its rotation.

One final reference to Cassini is made in *Animadversio XX*, in chapter 26 ("Of Comets"). Although initially hesitant to delve into a subject of fervent controversies, Rohault cautiously approaches the topic of comets and provides a description of these celestial bodies: "I think I ought not so far to lay aside this Matter, as not to say at least what is most certainly known about it; leaving it to them who shall come after, to philosophise in a different Manner."⁶⁵ Throughout his note, Le Grand falls short in offering substantial clarifications into the discussion concerning the essence of comets and fails to offer extensive explanations regarding the persisting ambiguity and variability surrounding their appearances, motions, paths, durations, or magnitudes. Instead, he reports Cassini's observations of cometary phenomena in different places (Bologna and Paris) and at different times (the earliest date in 1652 and the later from 1672). It is noteworthy to mention that Clarke, too, adds here an extensive commentary on the puzzling nature of comets. However, contrary to Le Grand's sole interest in Cassini's discoveries, Clarke's *annotatiuncula* plainly exhibits his Newtonian position. In this regard, one should note here that after a brief recollection of the

⁶² For the observations of Venus made by Cassini, see *Philosophical Transactions*, vol. 2, no. 32 (February 1668), pp. 615–617. For the stages of composition of Rohault's treatise, see Mazaauric, "Préface"; Mihnea Dobre, "Rohault's Private Lessons on Cosmology," in *Descartes in the Classroom*, ed. Davide Cellamare and Mattia Mantovani (Leiden: Brill, 2022), 456–76; Mihnea Dobre, "Layers of Natural Philosophy: Constructing Authority in an Early Modern Textbook on Natural Philosophy," in *Cartesian Physics and Their Receptions: Intellectual and Institutional Contexts*, ed. Mihnea Dobre, Rodolfo Garau, and Pietro Daniel Omodeo (Leiden: Brill, forthcoming).

⁶³ See *Philosophical Transactions*, vol. 12, no. 133 (March 1677), pp. 831–833.

⁶⁴ This is again quite curious that Le Grand uses astronomical data and observations that were made prior to the publication of Rohault's treatise in 1671. Hence, the updates included in his notes are not only about more recent discoveries, but also about modern astronomical knowledge (as opposed to the explanations of the Ancients).

⁶⁵ PII.26.1.; Rohault, *System of Natural Philosophy*, 80, vol. II.

limited views of the Ancients on this topic (through short quotations from Pliny and Seneca), Clarke puts forward Newton's opinion on comets as presented in his *Principia*.⁶⁶

In light of the previous exposition, it becomes evident that the recurring mentions of Cassini serve as a means of providing updated information in relation to Rohault's treatise. The texts of Rohault and Le Grand appear as separate entities complementing each other. Moreover, one should note that Le Grand does not quote directly from Cassini's works, nor does he provide explicit citations or references to indicate the sources he uses to gather the information (as he does when it comes to his own works). The reason for this omission remains unclear, but it might very well be due to the status of Cassini's works, already widely recognized during that period.⁶⁷

Out of the seven annotations to the second part of Rohault's *Traité* discussed above, there are two others that do not mention Cassini. One of them [*Animadversio XVI*] is found at PII.12.3. (chapter "Of the true Bigness of the Earth, Moon, and Sun, and of their Distance from each other"; article: "Of the Earth Semi-diameter"). In this chapter, Rohault presents a method to determine the Earth's circumference. He emphasizes the significance of experimentation, demonstrating how measuring the distance between Paris and Amiens can be used as a practical example.⁶⁸ Nevertheless, due to the lack of agreement and the diversity of observations (AIG p. 18: "non omnes conveniunt"), Le Grand acknowledges the uncertainty and variation in determining the exact size of Earth's circumference, while seems to be aware of contemporary debates in Paris concerning this topic. Although he does not include explicit references to other natural philosophers, Le Grand includes the experimental results of Jean Fernel (cca. 1528), Willebrord Snell (cca. 1615) and Jean Picard (cca. 1668).⁶⁹

The last note [*Animadversio XXI*] added to this section of the treatise is in the final chapter of *De Cosmographia*: chapter 29 ("Of the Flux and Reflux of the Sea"). Le Grand addresses various phenomena related to water movements and tides, with examples gathered from different geographical regions, such as: the Northern Ocean (beyond Scotland, towards Norway and Greenland), the Garonne River, the borders of Normandy and Brittany ("Armorica"), the Seine River. It is noteworthy to observe

⁶⁶ Clarke refers to Book III of Newton's *Principia* (from prop. 39, lemma 4, to the end). This note appears already in the first edition of Clarke's Rohault (1697).

⁶⁷ This seems to be a common practice of Le Grand, which will be noticeable in other parts of the treatise when dealing with references already considered as authoritative. In this regard, see also section 4 of the current study.

⁶⁸ PII.12.2.; Rohault, *System of Natural Philosophy*, 35, vol. II.

⁶⁹ The values provided by Le Grand in the annotation coincide with the results of the experiments. For example, for Picard's measurements, see *Philosophical Transactions* vol. 10, no. 112 (March 1675), pp. 261–272. On the precise measurements conducted to determine the length of the meridian arc, see L. B. Stewart, "The Form and Constitution of the Earth," *Journal of the Royal Astronomical Society of Canada* 8 (1914): 1–20; N. D. Haasbrock, *Gemma Frisius, Tycho Brahe and Snellius and Their Triangulations* (Delft: Netherlands Geodetic Commission, 1968); A. H. Batten and J. R. Smith, "Measuring the World: Excursions in Astronomy and Geodesy," *Journal of Astronomical History and Heritage* 9, no. 1 (2006): 65–75.

that, for the first time in this section of the treatise, Le Grand encourages the reader to consult his own *Historia natura*, where he provides a lengthier exposition about the tides.⁷⁰

PART III

As previously stated, several references to Boyle can be discovered in Le Grand's annotations. Above, we discussed the case of annotations VIII and IX in part I of the *Traité*, but the same is true for the only comment added by Le Grand to the third part of the treatise [*Animadversio XXII*]. Le Grand provides a summary of Boyle's explanations and experiments from the *New Experiments Physico-Mechanicall touching the Spring of the Air*. This aspect is evident from the very beginning, where Le Grand introduces the topic: "some believe that the air is comprised by certain springs of air" (AIG p. 24: "Nonnulli sibi imaginantur aerem ex quibusdam filis"). Le Grand continues with an analogy between the air and a fleece of wool ("lanam") that can be compressed; a reference clarified a few lines later: in the "Boylia Machina," the experiment with a lamb's bladder ("Agni vesicula") reveals the property of air to expand or dilate. Le Grand's note seems to translate Rohault's account into Boyle's terminology of elastic force: "I refer to this as the Elastic force, or the force that springs back in the air" (AIG p. 24: "Hanc vim Elasticam, seu resiliendi in aere repertam ... refero") or "the flexibles springs of the air" (AIG p. 24: "flexiles aeris fibræ").⁷¹

PART IV

The fourth part of the treatise comprises a collection of annotations dealing with the anatomy of the human body. These notes are lengthier than the ones added to the previous three parts. The first annotation [*Animadversio XXIII*], found at the end of the first chapter ("Of the Things contained in this Fourth Part"; PIV.1.6.), follows Rohault's argumentation based on the classification of human body parts. Le Grand acknowledges the need to offer a general description of "partium corporis delineationem" (AIG p. 25) since, he claims, "the harmony of the whole body could be more clearly distinguished" (AIG p. 25: "quo dilucidius totius corporis harmonia dignoscatur"). He begins from the definition of the body part, which is grounded

⁷⁰ See part IV, article 6 in Le Grand, *Historia naturae*, 186–90. In the English translation of the fourth part of the *History of Nature* (in *An Entire Body of Philosophy*), article 6 corresponds to article 16. It should also be pointed out that the topic of the tides appealed to Clarke as well. However, the 1697 edition lacks the annotation for this chapter, which was only introduced in the 1702 edition (being kept in the future versions of the text as well). In his commentary, Clarke presented the phaenomena of flowing and ebbing of the sea, as explained by Mr. Edmund Halley through the use of Newton's *Principia*. For the exact reference, see *Philosophical Transactions*, vol. 19, no. 226 (March 1697). Towards the end of the note, an interesting reference is made to Kepler who, as Clarke suggests, was a precursor of Newton.

⁷¹ Rohault did not use this terminology (i.e., "elastic force") in the treatise. Interesting, starting with the 1702 edition, Clarke adds a note here too. He also refers to Boyle's experiments, but also to other experiments performed by Wallis, Mersenne, and Newton.

upon Galen's views.⁷² Le Grand follows a rather traditional explanation and distinguishes between "sensible" and "insensible" parts of body. To offer a more comprehensive understanding of the latter, he sends the reader to his *Institutio* IV, cap. 5. The sensible parts, meaning the parts that make the object of our sensation (AIG p. 25: "sensibus nostris obiiciuntur") are, in turn, classified in "solids" and "fluids," denoting the status of composition of the small (insensible) bodily parts. Le Grand focuses on the "solid" bodies and further classifies them based on factors such as: their origin, the relationship between their parts, their use, and their importance. Fernel is briefly mentioned here for providing an explanation for the similarity of bodily parts.⁷³ When talking about auxiliary (AIG p. 28: "ministræ & ignobiles censentur") and main body parts, Le Grand draws attention to the fact that, "by the diligence of anatomists" (AIG p. 27: "anatomicorum industria"), the liver does not play a role in generating ("procreandi") blood due to a lack of connection between the lymphatic vessels ("venis lacteis") and the liver. It is no surprise to find another example of self-promotion, as the extended explanation provided so far relies on Le Grand's prior publications. Two references are offered here, the first one being to his own *Dissertatio de carentia sensus et cognitionis in brutis*, art. 48 (where he discusses about the main function of the liver). The second reference is to Paul Barbette's work on surgery.⁷⁴

The following annotation [*Animadversio XXIV*], added to chapter 3, "Of the Brain, Nerves, and Muscles," provides an anatomical exploration of the brain and its internal mechanisms as developed by Louis de La Forge in his *Remarques* on Descartes' *L'Homme*.⁷⁵ Le Grand's summary is structured around nine main points, dealing with

⁷² AIG p. 25: "Pars est omne illud, inquit Galenus, quod facit ad complendum totum corpus." For Galen, see Galen, *Galen and the Usefulness of the Parts of the Body*, trans. Margaret Tallmadge May (Ithaca: Cornell University Press, 1968).

⁷³ "A similar part is one in which all the particles are of the same form: or, as Fernel believes, one that, being similar to itself on all sides, has acquired one and the same substance altogether" (AIG p. 26: "Similaris pars, est cuius omnes particulæ eiusdem invicem sunt formæ: seu ut Fernelio placet, quæ sui undique similis, unam parilemque omnino substantiam est adepta").

⁷⁴ For the discussion on the liver functions, see Antoine Le Grand, *Dissertatio de carentia sensus et cognitionis in brutis* (London: John Martyn, 1675), art. 48. The English translation of this treatise as part of *An Entire Body of Philosophy* reveals differences and additions in translation. The topic indicated by Le Grand in article 48 of the Latin edition can be found under article 56. Le Grand's reference to "Barbesse Part. III. Chirurg. cap. XIV" is to Paul Barbette; see for example the collection of his medical works published later as Paul Barbette, *Pauli Barbette ... Opera omnia medica, chirurgica et anatomica, notis et observationibus nec non pluribus morborum historiis & curationibus illustrata* (Geneva: Chouet, Jean Antoine; G. de Tourne; Cramer; Perachon; Ritter; S. de Tourne, 1704). On Barbette, see Daniel de Moulin, "Paul Barbette, M.D: A Seventeenth-Century Amsterdam Author of Best-Selling Textbooks," *Bulletin of the History of Medicine* 59, no. 4 (1985): 506–14.

⁷⁵ See Louis de La Forge, "Remarques de Louis de La Forge, docteur en médecine, sur le *Traité de l'homme* de René Descartes et sur les figures par luy inventées," in René Descartes, *L'Homme de René Descartes et un Traité de la formation du fœtus du mesme auteur. Avec les Remarques de*
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the physiology of the brain. The subsequent points outline the main topics discussed, which are incidentally part of contemporary debates in medicine and anatomy: the nature and structure of the brain, with specific attention to the ventricles, the formation and structure of a particular cavity in the brain, the relationship between nerve actions and sensory experiences.

Before discussing the circulation of blood, Le Grand adds a comment to chapter 11 of Rohault's treatise, "Of the Kidneys and Bladder." This annotation [*Animadversio XXV*] is similar to the first one in this section of the treatise, as it employs a classification-based approach. The text expands into a comprehensive discussion about two types of cognition (AlG p. 30: "præcipuæ cogitationum species"): perceptive ("perceptivæ") and volitional ("à voluntate dependent"). The process of sensory perception in relation to the pineal gland is further explained, and subsequently a description of the five senses and their functions is provided. The final part of the annotation delves into the relation between nerves, sensory perceptions, and body movements, explaining how the human body responds to external stimuli. This extensive note builds on Le Grand's Cartesian explanations, which are located in various publications, such as the *Intitutio* and the *Disseratio de carentia sensu et cognitionis in brutis*.⁷⁶

The reputed disagreement between Descartes and William Harvey regarding the cause of blood circulation in the heart represents the core of *Animadversio XXVI*, added by Le Grand to chapter 12 of the treatise, "Of the Motion of the Blood."⁷⁷

Louis de la Forge Docteur en Medecine, demurant à La Fleche, Sur le Traitté de L'Homme de René Descartes; et sur les Figures par luy inventées (Paris: Ch. Angot, 1664), 171–408.

⁷⁶ Three references to *Institutio* (1680) appear in this annotation. Two of them are to the eight part of the treatise, which deals with matters related to the human body ("De Homine, quoad Corpus ejus, spectato"). First, when speaking about the pineal gland as being the seat of the senses (AlG p. 31: "ad sensus communis sedem, hoc est, glandulam pinealem"), Le Grand refers to chapter 10 (dedicated to a general discussion about senses). The article that could be of interest here is art. 5; in the English translation from *An Entire Body of Philosophy*, the article can be found under art. 7 and contains a reference to Aristotle, which do not exist in the Latin edition of 1680. Second, chapter 12 ("De Sensibus speciatim, ac primùm de Tactu") of the eight part is mentioned. However, this seems to be an inaccurate reference of Le Grand: when the reference was made, he was discussing about the sense of taste. Therefore, most probably, the intended chapter from the *Institutio* was chapter 13 ("De Sensu Gustu"). Third, Le Grand advises the reader to check the ninth part of the *Institutio*, about the mind ("De Homine, quoad Mentem (altera ejus parte) spectato"), since he has already treated here at length the topic of perceptive and volitional thoughts. For the references to *Dissertatio*, see *Disseratio de carentia sensu et cognitionis in brutis* (London, 1675), articles 53 and 57 (in the English translation they correspond to articles 61 and 65). For the problem of sense perception in Cartesian philosophy, including Le Grand's views, see Gary Hatfield, "Rationalist Theories of Sense Perception and Mind–Body Relation," in *A Companion to Rationalism*, ed. Alan Nelson (Malden: Blackwell, 2005), 31–60.

⁷⁷ The controversy between Descartes and Harvey on the circulation of blood was vastly discussed in the secondary literature. See, for example, Marjorie Grene, "The Heart and Blood: Descartes, Plemp, and Harvey," in *Essays on the Philosophy and Science of René Descartes*, ed. Stephen Voss (Oxford: Oxford University Press, 1993), 324–36; Geoffrey Gorham, "Mind-XXXI

Harvey's opinion about the size of the ventricles in the heart is presented, together with some examples of animal dissections. Then, Le Grand refers to *Tractatus de homine, et de formatione foetus*, where Descartes argues that experiments can sometimes be misleading (AIG p. 34: "nobis sæpe hallucinandi occasionem offerant") and advises in favor of further investigation (AIG p. 35: "alia experimenta perpendenda sunt"). He briefly presents some additional experiments proposed by Descartes, which are meant to support and provide evidence for the different perspectives held by the two regarding the dilatation and constriction of the heart's cavities.

The next annotation is towards the end of the treatise, in chapter 23 ("Of the Excrements"). *Animadversio XXVII* complements Rohault's exposition on urine and sweat. Le Grand describes different sorts of excretion, namely: bile, menstrual blood, tears, nasal mucus, saliva, and sputum. Notably, he refers to Sylvius' experiments regarding the secretion of the bile and to Steno's anatomical investigation of production of tears. Rohault already named in his text some contemporary anatomists (including Steno), but it is worth noting that Le Grand will refer several times to Sylvius's contributions.⁷⁸

Le Grand concludes his set of annotations with an extensive note about fever [*Animadversio XXVIII*]. He describes the progression of a disease, in four stages: the initial stage ("principium"), augmentation ("augmentum"), vigor ("status seu vigor") and decline ("declination"). After generally categorizing diseases into "universal" and "particular," Le Grand shifts the focus to the former and characterizes fever as "an illness known almost to everyone, but its nature is understood only by few" (AIG p. 37: "omnibus pene nota ægritudo, sed cuius naturam nonnisi pauci perspectam habent"). He compares two opposing views about the cause of intermittent fever: Thomas Willis's opinion that intermittent fevers are caused by the accumulation of

Body Dualism and the Harvey-Descartes Controversy," *Journal of the History of Ideas* 55, no. 2 (1994): 211–34; Thomas Fuchs, *The Mechanization of the Heart: Harvey & Descartes*, trans. Marjorie Grene (Rochester: University of Rochester Press, 2001).

⁷⁸ The experiment mentioned by Le Grand regarding the secretion of bile was conducted by Sylvius in September 1660, as it can be read in Sylvius, *Disputationem Medicarum*, part I (Amsterdam, 1663), p. 101 [*Disputationum Medicarum Sexta*]. For an introductory study on Sylvius and his experiments, see Harm Beukers, "Acid Spirits and Alkaline Salts: The Iatrochemistry of Franciscus Dele Boë, Sylvius," *Sartomiana* 12 (1999): 39–58; Evan R. Ragland, "Chymistry and Taste in the Seventeenth Century: Franciscus Dele Boe Sylvius as a Chymical Physician Between Galenism and Cartesianism," *Ambix* 59, no. 1 (2012): 1–21; Evan R. Ragland, "Mechanism, the Senses, and Reason: Franciscus Sylvius and Leiden Debates Over Anatomical Knowledge After Harvey and Descartes," in *Early Modern Medicine and Natural Philosophy*, ed. Peter Distelzweig, Benjamin Goldberg, and Evan R. Ragland (Dordrecht: Springer, 2016), 173–205. For Steno's account on the production of tears, see Nicolas Steno, "Nicolai Stenonis De Glandulis oculorum, novisque earundem vasis observationes anatomicae, quibus veri lacrymarum fontes deteguntur," in *Nicolai Stenonis Observationes anatomicae quibus varia oris, oculorum et narium vasa describuntur, novique salivae, lacrymarum et mucii fontes deteguntur* (Leiden: Jacob Chouët, 1662), p. 95. For studies on Steno, see Troels Kardel and Paul Maquet, eds., *Nicolaus Steno: Biography and Original Papers of a 17th Century Scientist*, 2nd ed. (Dordrecht: Springer, 2018).

nutrient fluid (which suffered a disruption in assimilation) in the blood vessels and Sylvius' opinion that intermittent fevers are produced by the pancreatic fluid.⁷⁹

This summary of Le Grand's annotations is not offered as an interpretation of his philosophical views. It opens a series of possible paths to explore in connection to the evolution of Cartesian natural philosophies in the second half of the seventeenth century. Le Grand is a prime example of how Cartesianism has adapted at that time and how it has developed in close connection with university teaching. This raises the problem of the reception of Rohault's treatise annotated by Le Grand.

4. The Problem of Reception: Rohault and Le Grand

Despite the interest manifested towards Le Grand's annotated edition of Rohault, testified by the early modern reprints (Figure 1), its reception remains a difficult topic. Some questions are still left unanswered here: "How was the treatise supposed to be read," "Were the annotations meant to guide students while reading Rohault's textbook," or "Did the annotations change the reading of Rohault?"⁸⁰ However, if we take a look at the bigger picture of the reception of Le Grand's works, a hypothesis can be sketched out.

Whereas in France Le Grand stayed out of the intellectual turmoil, his works being almost completely overlooked by the *Journal des Sçavans*, in England we find him in a completely different position.⁸¹ Viewed by many of his contemporaries as a fervent advocate of Descartes, a number of his Cartesian-influenced treatises were quickly reviewed in the *Philosophical Transactions*, asserting his status as an esteemed figure in the fields of natural philosophy and logic. One of Le Grand's work was first reviewed by the journal in 1671 (jointly with Rohault's *Traité*), on the occasion of the publication of his *Philosophia Veterum* (1670), described as a suitable introduction to Descartes's philosophical thought: "Epitome of the Cartesian Philosophy, digested by the Author for the use and advantage of those, that have inclinations to initiate themselves in the doctrine of that Famous Philosopher."⁸² The text, however, switches to Rohault: "But we shall say no more of this, since we find our selves obliged to discourse somewhat more largely of an ample Treatise of this same Argument, lately come to our hands from Paris."⁸³ Nevertheless, after the publication of his famous *Institutio Philosophiae* in 1672, the journal applauds how Le Grand succeeded "with much industry and clearness" to comprise an integrated volume of

⁷⁹ On the topic of intermittent fever, see chapter 30 of Sylvius's *Praxeos Medicae Idea Nova*, book I (Leiden: Viduam Joannis Le Carpentier, 1671); for Thomas Willis's view, see "De febribus" (esp. chapter 3 and chapter 4), *Diatribae duae medico-philosophicae: quarum prior agit de fermentatione ... altera de febribus* (London: Roycroft, 1659).

⁸⁰ In order to answer such and similar questions, access to students' notebooks is needed. Unfortunately, by the time of sending this edition to print, we were not able to locate any relevant information with respect to this set of questions.

⁸¹ See, for example, the section with recently published books in the two scientific journals, *Journal des Savants* and the *Philosophical Transactions*.

⁸² See the *Philosophical Transactions*, vol. 6, no. 70 (April 1671), 2138. The reader should note that *Philosophia Veterum* is considered the first edition of the *Institutio*.

⁸³ See the *Philosophical Transactions*, vol. 6, no. 70 (April 1671), 2138.

Cartesian philosophy, “to facilitate the study of the same to such as desire to instruct themselves in it.”⁸⁴ Two book reviews followed in 1673 (*Historia naturae*) and 1675 (*Dissertatio de Carentia Sensus & Cognitionis in Brutiis*).⁸⁵

This brief history of the reception of Le Grand’s publications attests that by the time he got involved in the edition of Rohault’s textbook – including the *annotationes* – of 1682, he was already a notorious figure in the British intellectual arena. We observe, however, that his reception is not necessarily subjected to his value as a philosopher *per se*, but to his ability to develop his thought along Cartesian lines and to instruct others into Descartes’s philosophical views. Although an “outsider” (Mautner 2000), Le Grand succeeded through his works to contribute to the replacement of Aristotelian teaching by Cartesian in the university curricula (Ariew 2014), and furthermore, as Sarah Hutton argues, to testify, by the many reprints, “an enduring interest in Descartes in England.”⁸⁶ But what was the early modern reader able to grasp from Le Grand? An answer was provided in the previous section, but we aim to tackle the question from a different angle and focus in the next subsection on the lists of names included in Le Grand’s annotations to Rohault’s treatise.

Establishing Authorities and the spread of Cartesianism

An alternative approach to study the early modern annotations to Rohault’s *Traité* is to compare the list of names mentioned by the two commentators, Antoine Le Grand and Samuel Clarke, respectively. As discussed above, they write at different moments and Clarke changed his annotations with almost every new edition. However, a glimpse at such lists might be instructive, and it can offer a more visual representation of established authorities in natural philosophy. For the current study, we limit to the list of authors mentioned by Le Grand in his annotations to Rohault’s textbook.

As can be observed in Table 1, Le Grand’s annotations to Rohault’s book refer to a number of authors: Anthelme, Aristotle (6), Barbette, Boyle (4), Cassini (9), Descartes (11), Fernel, Galen, Galileo, Gassendi, Harvey (4), Huygens, La Forge, Le Grand (21/ 13), Mariotte, Simon Marius, Steno, Sylvius (3), Willis. We identified a total of 70 references, with 62 found in the annotations and 8 provided as in-text references within Rohault’s text.⁸⁷ A special case is Le Grand himself, as his name is not printed, but there is an explicit (and most of the time a very precise) reference to

⁸⁴ See the *Philosophical Transactions*, vol. 6, no. 80 (February 1672), pp. 3094–3095.

⁸⁵ For the *Historia naturae*, see *Philosophical Transactions*, vol. 8, no. 94 (May 1673), pp. 282–284 and for the review of the *Dissertatio*, see *Philosophical Transactions*, vol. 10, no. 112 (March 1675), pp. 282–284.

⁸⁶ See Thomas Mautner, “From Virtue to Morality: Antoine Le Grand (1629–1699) and the New Moral Philosophy,” *Jahrbuch Für Recht Und Ethik / Annual Review of Law and Ethics* 8 (2000): 209–32; Ariew, *Descartes and the First Cartesians*; Sarah Hutton, *British Philosophy in the Seventeenth Century* (Oxford: Oxford University Press, 2015), 67.

⁸⁷ This difference can be seen in the case of Le Grand, where 21 occurrences were part of the annotations, while the rest were included in Rohault’s text.

one of his Latin treatises.⁸⁸ Self-references indicate passages in the *Apologia* [*Apologia pro Renato Des-Cartes contra Samuelem Parkerum*], *Brutis* [*Dissertatio de carentia sensus & cognitionis in brutis*], *Historia Naturae*, and especially *Institutio* [*Institutio philosophiæ*].

Table 1. The list of names mentioned by Antoine Le Grand – or indicated by references to their works – in different sections of Robault's treatise.

	I. General Natural Philosophy	II. Cosmology	III. The Earth	IV. Animal Body	Total
Anthelme		1			1
Aristotle	5	1			6
Barbette				1	1
Boyle	3		1		4
Cassini		9			9
Descartes	5			6	11
Fernel				1	1
Galen				1	1
Galileo		1			1
Gassendi	1				1
Harvey				4	4
Huygens		1			1
La Forge				1	1
Le Grand	12	2		7	21
Mariotte	1				1
Simon Marius		1			1
Steno				1	1
Sylvius				3	3
Willis				1	1
Total	27	16	1	26	70

It is worth stressing the extended use of modern authors, and, while some of them are already featured in Robault's text, one should remark a feature of Le Grand's style of commentary: he aims to complement the argument in the text by the terms

⁸⁸ At the time of the publication of the set of comments (1682), the *Institutio* had a fourth and expanded edition (1680), *Historia Naturae* was reprinted in 1680, while the *Dissertatio* was published in 1675. An English translation of the three will be available in 1694 as *An Entire Body of Philosophy*.

advanced by Rohault himself.⁸⁹ By way of contrast, Clarke’s annotations show at least two characteristics. One is the rather eclectic collection of commentaries in the early editions (1697 and 1702), where ancient sources have a strong presence in comparison to the modern ones (e.g., Pliny is mentioned 25 times, more than Le Clerc, 20 times, and Boyle, 24 times, but only in 1702). The other important characteristic of Clarke’s editions is the increased reliance on Newtonian sources, which is becoming abundantly clear with the 3rd edition, printed in 1710 (e.g., from 15 occurrences of Newton’s name in 1702, in 1710, the name appears 70 times!). Of course, a more detailed analysis of Clarke’s annotations is in place, not to mention the need to acknowledge the contribution of other authors compiling some of the notes, such as Richard Laughton for the 1702 edition and Charles Morgan for the one of 1710. However, it is not the place here to provide an in-depth examination of Clarke’s annotations. Rather, we mention Clarke’s notes in order to contrast the strategies of the two commentators. Le Grand builds on Rohault’s text; he sometimes adds references to new experiments (e.g., Boyle) or observations (e.g., Cassini), but he also expands the scope of Rohault’s arguments (e.g., references to Descartes or to his own writings can be seen in this way). The first edition of Clarke’s edition is more of a showcase of erudition from the young Cambridge graduate. A more solid foundation – one that resembles Le Grand’s in some respects – is in the second edition of 1702, when the experimental advancements taking place between the publication of Rohault’s *Traité* (1671) and Clarke’s translation are emphasised in the notes. As already noticed, the third edition develops a Newtonian outlook, which is also the basis for all future readings of Clarke’s Rohault. We consider that additional insights can be derived from the examination of what is annotated by the two commentators, but we leave the question open for future investigations. However, one should note that while Le Grand comments across all four parts of the *Traité*, Clarke pays a particular attention to the first part, which deals with general natural philosophy. He comments on the subsequent two sections (on cosmology and the earthly phenomena) but fails to add any note to the fourth part (on living bodies).⁹⁰

It is well known that Rohault’s treatise was one of the natural philosophical textbooks recommended to students in Cambridge and Oxford.⁹¹ Already at the time

⁸⁹ An analysis of authoritative figures mentioned by Rohault is in Dobre, “Layers of Natural Philosophy.”

⁹⁰ For Le Grand’s annotations to the cosmology section, see Ioana Bujor, “Antoine Le Grand’s Annotations in the Second Part of Rohault’s *Traité de Physique*,” in *Cartesian Physics and Their Receptions: Intellectual and Institutional Contexts*, ed. Mihnea Dobre, Rodolfo Garau, and Pietro Daniel Omodeo (Leiden: Brill, forthcoming). For situating Rohault’s treatise in the context of early modern debates about cosmology and medicine (parts III and IV), see Dobre, “Rohault’s Private Lessons”; Mihnea Dobre, “Jacques Rohault on Medicine,” in *Descartes and Medicine: Problems, Responses and Survival of a Cartesian Discipline*, ed. Fabrizio Baldassarri (Turnhout: Brepols, 2023), 361–76. For Le Grand’s own views in physiology and psychology, see Hatfield, “Cartesian Psychology of Le Grand.”

⁹¹ See, for example Sarton, “Early Scientific Textbooks”; Hoskin, “Mining All Within”; Mordechai Feingold, “The Mathematical Sciences and New Philosophies,” in *The History of the University of Oxford: Volume IV Seventeenth-Century Oxford*, ed. Nicholas Tyacke (Oxford: Oxford XXXVI

Le Grand annotated the text, it had this status, and despite – or due to – Samuel Clarke’s efforts, it remained a commonly ascribed reading to all university students.⁹² The success was so great that Samuel’s brother, John Clarke, made an English translation, which was printed – with Samuel Clarke’s final intervention in the annotations – in 1723. But, while the interest on Rohault’s natural philosophy was stable, it cannot be said that Le Grand’s publications had the same fate. The 1694 publication of the English translation of Le Grand’s philosophical work – *An Entire Body of Philosophy* – seems to have been the swan song of his positive reception or to his presence on the English intellectual scene, despite the controversy of the late-1690s between Le Grand and Sergeant.⁹³ Clarke’s annotated Rohault must have contributed to this fall, as all references to Le Grand’s Latin works were not anymore part of Rohault’s legacy. This observation allows us to return to the question about the readership of Le Grand’s writings. As already discussed, he was teaching philosophy in private, and his writings were often introductory on topics relevant for students enrolling at the universities. Moreover, Le Grand managed to put together Aristotelian and modern sources: he preserved the structure of Scholastic treatises, while adding materials derived from modern sources, most notably, Descartes. He was grafting the new philosophy on a long-tried structure, turning his works into “a truly Cartesian Aristotle,” as aptly characterised by Roger Ariew.⁹⁴ But just as the new philosophy was growing stronger in relation to the philosophy of the schools, Cartesian philosophy was challenged by other alternatives. In a sense, Clarke’s new translation of Rohault, together with his different sets of commentaries, marked this transition to a new philosophical explanation. Le Grand’s work was thus left behind, just like his set of commentaries, which was soon to be forgotten. A final blow of this development is the placement of the *Institutio* on the Index of prohibited books in 1709.⁹⁵

Nevertheless, Le Grand was an important author for the two English universities of the time, and this can still be seen nowadays in the catalogues of the Cambridge and Oxford libraries.⁹⁶ We found 60 book copies listed in the catalogues,

University Press, 1997); Schüller, “Clarke’s Annotations”; Des Chene, “Cartesian Science.” An important early modern source testifying for this role of the treatise is Daniel Waterland, *Advice to a Young Student, with a Method of Study for the Four First Years* (London: John Crownfield, 1730).

⁹² See the various editions produced by Clarke in 1697, 1702, 1710, 1718, and 1723.

⁹³ This was a famous dispute at the time. See Sergeant, *Non Ultra*; Le Grand, *Dissertatio de ratione cognoscendi*. See for example Adriaenssen, “Antoine Le Grand on the Identity over Time.”

⁹⁴ See Roger Ariew, “Le Grand, Antoine,” in *Historical Dictionary of Descartes and Cartesian Philosophy*, ed. Roger Ariew et al. (London: Rowman & Littlefield, 2015), 158.

⁹⁵ The episode is discussed in Jean-Robert Armogathe, “The Roman Censure of the *Institutio Philosophiae* of Antoine Le Grand (1629–99) According to Unpublished Documents from the Archives of the Holy Office,” in *Cartesian Views: Papers Presented to Richard A. Watson*, ed. Thomas Lennon (Leiden, The Netherlands: Brill, 2003), 193–203.

⁹⁶ See Mihnea Dobre et al., “Cartesian and Newtonian Authors: A Database [Data Set]” (Zenodo, 2022), <https://doi.org/10.5281/zenodo.6923317>. We queried the library catalogues in Oxford and Cambridge, searching for books authored by a number of “Cartesian” and “Newtonian” figures from the end of the seventeenth century and the beginning of the

which include 16 book titles, with the publication date ranging from 1662 to 1702 (see Table 2):

Table 2. *A list with Antoine Le Grand's publications that are now in the library holdings at Oxford and Cambridge.*

	1662	1665	1669	1671	1672	1673	1675	1676	1679	1680	1681	1682	1683	1685	1692	1694	1698	1702	Total
An entire body of philosophy															5				5
Apologia pro Renato Des-Cartes								4											4
Curiosus rerum											1								1
Dissertatio de carentia sensus & cognitionis in brutis						7													7
Dissertatio de ratione cognoscendi																	1		1
Historia hæresiarcharum a Christo																		1	1
Historia naturæ						6				3									9
Historia sacra														5					5
Institutio philosophiæ					4		2			5			2						13
L'épicure spirituel				1															1
Le sage des Stoïques		2																	2
Les caracteres de l'homme sans passion			1									1							2
Man without passion							3												3
Philosophia veterum					3														3
Scydromedia				1															1
The divine Epicurus								2											2
Jacobi Rohaulti Tractatus physicus													3		2				5
Total	2	1	2	3	4	6	12	2	4	8	1	4	2	5	2	5	1	1	65

Table 3. *Le Grand's publications in the catalogues of the libraries in Oxford and Cambridge, organised by the place of publication.*

	Douai	London	Nuremberg	Paris	s.l.	The Hague	Total
An entire body of philosophy		5					5
Apologia pro Renato Des-Cartes		4					4
Curiosus rerum				1			1
Dissertatio de carentia sensus & cognitionis in brutis		7					7
Dissertatio de ratione cognoscendi		1					1
Historia hæresiarcharum a Christo		1					1
Historia naturæ		9					9
Historia sacra		5					5
Institutio philosophiæ		11		2			13
L'épicure spirituel					1		1
Le sage des Stoïques						2	2
Les caracteres de l'homme sans passion				2			2
Man without passion		3					3
Philosophia veterum		3					3
Scydromedia					1		1
The divine Epicurus		2					2
Jacobi Rohaulti Tractatus physicus		5					5
Total	1	55	3	3	1	2	65

The list is remarkable in at least two different ways. On the one hand, it comes to testify the continuous interest in Le Grand's publications, as some of the books in the list are from different early modern editions of the same book (e.g., the *Institutio* offers the best illustration for this). On the other hand, if one compares the information in

eighteenth. The result is included in the Dataset from which we selected here only Antoine Le Grand's works.

Table 2 with the list of Le Grand's publications provided above, one should remark that most of his publications are present. Yet, there is another point to make here, which is illustrated in Table 3: although most of the publications are printed books made in England, the presence of books published elsewhere (Douai, Nuremberg, Paris, The Hague) indicates a good share of interest on Le Grand's works. However, as indicated above, Le Grand's good reception is at the time he was active – publishing and providing private lessons – in the second half of the seventeenth century.

This allows us to reach a provisional answer to the question about Le Grand's Rohault. His prior theological formation, but also his activity as a private tutor must have put a mark on the annotations. As we have noticed in several cases, Le Grand is more interested in the metaphysical and theological groundings of natural philosophical problems, despite Rohault's constant effort to confine his arguments to the natural philosophical discourse. Le Grand opens the discussion to some of the broader consequences of Cartesian philosophy, but he achieves this without turning Rohault's text into something else. Instead, the annotations are supporting Rohault's explanations, usually adding either new examples or complementing the philosophical views expressed in the text, and they do not intend to change the reading of Rohault's text. In this regard, one strategy employed by Le Grand is to commonly refer to modern authors (see Table 1). His examples reflect ongoing experimental efforts or series of observations (e.g., references to Mariotte, Boyle, Cassini, or Sylvius). Le Grand proves himself knowledgeable about new natural philosophical developments and does not disregard more empirical approaches, as alluded in the letter to Edward Southcot, cited in the first part of this study. At the same time, Le Grand is aware of the Scholastic terminology and provides – in a few cases – summaries of the received view. Since he already dealt with most of the topics in his treatises, references to his works are not out of context. Hence, an alternative strategy of Le Grand is to send the reader to his own prior publications; references to *Institutio philosophiae*, *Historia naturae*, *Dissertatio de carentia sensus et cognitionis in brutis*, *Apologia pro Renato Des-Cartes* can be seen throughout the treatise.

As both Cartesian and Aristotelian terminologies are employed, the annotations can be helpful for a student audience. Consequently, Le Grand's writings proliferate within the universities (as also seen in Table 2 and Table 3). For this reason, the annotations to Rohault's treatise integrate well within the same pedagogical context. Le Grand smoothens the entry into Rohault's voluminous treatise on natural philosophy and provides an aid for the early modern students exposed jointly to Scholastic and Cartesian philosophies.

Anyhow, this study was not meant to discuss Le Grand's philosophical views, but only to assess the significance of his annotations to a well-known natural philosophical treatise. We provided a summary of Le Grand's annotations – the entire text is available in the edition provided below – and contextualised his edition of Rohault within the intricate reception of the *Traité* in a broader European context (see Figure 1). So far, Clarke's annotated editions of Rohault received scholarly attention, but shifting the focus upon Le Grand's Latin notes can enrich the current understanding of the multiple transformations of natural philosophy at a time of

change in the early modern period. It is a period marked by the spread of the new philosophy, often exemplified by Descartes, but also dominated by other conceptual, practical, and methodological innovations. To document and shed light upon the various changes – including paths that were eventually not followed – require more contextualization, including exploratory investigation of early modern texts, such as Le Grand’s annotations to Rohault’s treatise, as illustrated in this study.

5. Editorial Notes and Bibliography

Our edition comprises Le Grand’s Latin annotations to Jacques Rohault’s *Traité de physique*. The notes are preceded by Le Grand’s “Dedicatory letter,” addressed to Thomas Short, and the preface letter (“Typographus Lectoris”) written by Théophile Bonet for the original Latin translation of 1674. We included these two additional fragments because they contain relevant details that motivate Le Grand’s endeavour to produce a revised Latin edition of Bonet’s Rohault’s treatise.

We used the Latin imprint of 1682 as the basis of this edition, because it is the first edition that includes Le Grand’s annotations to Rohault’s treatise. The other early modern reprints contain little to no changes in the content of the notes. However, we offered variant readings from the 1692 edition, with differences marked in the footnotes.

Sources: *Jacobi Rohaulti tractatus physicus gallice emissus et recens latinitate donatus per Th. Bonetum D.M. Cum animadversionibus Antonii Le Grand.* Translated by Théophile Bonet. London: G. Wells & A. Swalle, 1682; 1692.

The Latin transcript

Before each note, we have indicated the name of the corresponding article annotated by Le Grand from Rohault’s *Tractatus physicus*, including a reference to the section of the treatise: part (in Roman number), chapter, article (e.g., Pl.1.2).

We have standardised the following cases:

- “I” and “i” for “J” and “j”
- “V” and “v” for “U” and “u”, and vice versa
- “s” for the long “ſ”
- the ligatures “æ” and “œ” have been preserved, as well the “&”
- accents have been preserved

Throughout the text, we marked where the page starts, indicating within square brackets the page number corresponding to the 1682 edition (“[p. ...]”). However, the “Dedicatory letter” and the “Preface letter” are unpaginated in the original and we indicated by “ / ” where each page ends.

The three images included in the current edition are from the 1682 version of the text and they belong to Rohault’s treatise, not to Le Grand’s notes. However, the images provide a visual aid that might facilitate the reading of the annotations. We enclosed

the reference to the corresponding table and figure in square brackets. (e.g., “[Tab. 1. Fig. 3]”).

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