Ita sentiebant veteres: use and omission of Latin classical poetry in Isaac Newton’s *Principia Mathematica*

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One might be surprised to find Latin classical poetry playing a role in the work which is considered the culminating work of the Scientific Revolution, Isaac Newton’s *Naturalis Philosophiae Principia Mathematica*. However, it is well known that the study of Latin language and literature was still at the core of the basic curriculum of seventeenth-century European scholarship. Consequently, the intellectual activity of that time developed to a large degree as a dialogue with the authors of Graeco-Latin Antiquity, as well as with their medieval and humanistic interpreters. Likewise, it is not less known that the so called “Scientific Revolution” relied from the beginning on theological preoccupations. Scriptural exegesis and classical philology were deeply embedded in the mind of the seventeenth-century scientist, whose ultimate goal was to achieve the best possible understanding of God.

To the second edition of his *Principia* (1713), Isaac Newton added the controversial text entitled *Scholium generale*, where God’s nature and attributes are discussed. This text was intended to make explicit and unambiguous the philosophical and theological implications of the work, whose first edition of 1687 had been attacked precisely because of the ambiguity of its possible interpretations in that sense. However, in spite of this explanatory character, the *Scholium generale* is very far from being an easily understandable text. Professor Snobelen has demonstrated that the *Scholium* is a deliberately heretical text which shows different levels of calculated codification, so that the orthodox contents (God’s absolute government over His creation) are directly

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1 This is the text of the paper which I delivered at the 13th Congress of the FIEC (Fédération Internationale des Associations d'Études Classiques), Humboldt Universität zu Berlin, 24-29 August 2009. Only bibliographical references and some short notes have been added. It has been carried out within the Spanish national research project "Edición crítica de textos inéditos de Isaac Newton en lengua latina" (HUM07-60506).


displayed and clearly intelligible upon a first reading, whereas more heterodox ones (the radical anti-trinitarianism) are veiled and only perceptible to the learned and intitiated reader.

Newton’s philosophical and theological discourse is shaped and nuanced at each of these levels by means of intertextuality. Stephen Snobelen has detected specific Socinian parallels for the Newtonian argumentation on God’s attributes⁴; Rudolf de Smet and Karin Verelst have found passages from Philo and from Justus Lipsius closely corresponding to the same discussion⁵. I will now intend to offer another example of how deeply literary references were used to codify the complex ideological background of the most influential physical-mathematical work of its time. The reference I would like to discuss concerns, as I have mentioned, Latin classical poetry; its marginal position in the text of the *Scholium* may illustrate how accurately each detail of the Newtonian discourse was calculated.

In dealing with God’s attribute of ubiquity, Newton inserts a footnote in which he refers to several Graeco-Latin and biblical passages, in order to prove that the Ancients had already felt the omnipresence of a Divinity. The passage⁶ reads as follows:

> Deus est unus et idem Deus semper et ubique. Omnipraesens est non per virtutem solam, sed etiam per substantiam: nam virtus sine substantia subsistere non potest. In ipso continentur et moventur universa, sed sine mutua passione.

The footnote refers to this last sentence, and reads:


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⁴ SNOBELEN, «"God of gods, and Lord of lords"», 191-6.
The only mention of a Latin poet in the whole *Principia* is that reference to those Virgilian passages from *Georgics* and *Aeneid*. The *Georgics* reference belongs to the passage in which Virgil deals with the ancient tradition of the divine nature of bees (*Georg*. 4. 219-27):  

*His quidam signis atque haec exempla secuti  
esse apibus partem divinae mentis et haustus  
aetherios dixere; deum namque ire per omnis  
terrasque tractusque maris caelumque profundum;  
hinc pecudes, armenta, viros, genus omne ferarum,  
 quemque sibi tenues nascentem arcessere vitas:  
scilicet huc reddi deinde ac resoluta referri  
omnia, nec morti esse locum, sed viva volare  
sideris in numerum atque alto succedere caelo.*

It is relevant to focus on the Lucretian spirit of these verses, specially patent in the idea of the impossibility of death. In his commentary on this Virgilian passage, Servius had already quoted Lucretius (1. 671): *continuo hoc mors est illius quod fuit ante*\(^8\). Modern critics have also pointed out the strong Lucretian echoes of these lines by Virgil, which are used paradoxically to express a doctrine exactly opposite to the one defended by Lucretius. In Wilkinson’s words\(^9\), this passage of *Georgics* is “an excellent example of the way in which Virgil will recast a Lucretian idea to express a different approach. Lucretius had claimed that there was no room for death because dissolved bodies supplied material for new bodies (3. 964-71); Virgil applies the same idea to souls”.

The same thing happens in the second Virgilian passage referred to by Newton in the footnote we are dealing with. The passage is that of the speech pronounced by Anchises in the Elysium, concerning the future of human souls beyond death (*Aen*. 6. 724-9):

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Principio caelum ac terram camposque liquentis
lucentemque globum lunae Titaniaque astra
spiritus intus alit, totamque infusa per artus
mens agitat molem et magno se corpore miscet.
Inde hominum pecudumque genus vitaetque volantum
et quae marmoreo fert monstra sub aequore pontus.

In his commentary, Austin wrote about Anchises’ speech that “the manner is constantly and pointedly Lucretian; the matter would have excited Lucretius’ disdain”\textsuperscript{10}.

Both Virgilian passages, then, have in common their subversion of Lucretius’ doctrine on immortality, carrying it from a corporeal to a spiritual understanding, as well as the paradox of expressing this subversion in Lucretian terms. They echo each other, and together they echo passages from the poem \textit{De rerum natura}: \textit{Georgics} 4. 222 (\textit{terrasque tractusque maris caelumque profundum}) corresponds to \textit{Aeneid} 6. 724 (\textit{principio caelum ac terram camposque liquentis}), and both to \textit{De rerum natura} 5. 92 (\textit{principio maria ac terras caelumque tuere})\textsuperscript{11}; \textit{Georgics} 4. 223 (\textit{hinc pecudes, armenta, viros, genus omne ferarum}) is echoed by \textit{Aeneid} 6. 728 (\textit{inde hominum pecudumque genus vitaetque volantum}), and both bring to mind, specially in their endings, the famous opening \textit{Aeneadum genetrix, hominum divomque voluptas, / alma Venus, caeli subter labentia signa / quae mare navigerum, quae terras frugiferentis / concelebras, per te quoniam genus omne animantum…} \textsuperscript{12}

My point is that Newton could not ignore the Lucretian reminiscences of the Virgilian passages he was referring to in his \textit{Scholium} footnote, and I put forward basically two reasons for this assertion:

First, it is attested enough that Newton never merely repeated quotations which he had found elsewhere, but always revisited the original sources as far as it was

\textsuperscript{10} R. G. Austin, \textit{Aeneidos liber sextus}, Oxford 1977, 221. The same idea had been pointed out by F. Fletcher, \textit{Virgil: Aeneid VI}, Oxford 1941, 84.
\textsuperscript{11} For all Lucretian quotations I use the edition of C. Bailey (ed), \textit{Lucreti De rerum natura libri sex}, Oxford 1922\textsuperscript{2}.
\textsuperscript{12} Modern critics have noted this close relationship between both Virgilian passages (see e. g. Austin, \textit{Aeneidos}, 222; Wilkinson, \textit{Georgics}, 123); Servius himself had already pointed it out in his commentary to the \textit{Georgics} passage: \textit{locum hunc plenius essecutus est in sexto, quem hoc loco breviter colligit} (Thilo - Hagen [ed.], \textit{Servii grammatici commentarii}, III, 336-7). On the other hand, an exhaustive analysis of the Lucretian verbal echoes present in Anchises’ speech (\textit{Aeneid} 6. 724-51) can be found in Austin, \textit{Aeneidos}, 219-23.
possible to him. De Smet and Verelst (2001: 16-7) have pointed out that the Graeco-Latin references of the footnote I am discussing are found already in Justus Lipsius’ work, with only two exceptions: the reference to Anaxagoras, and precisely the one to Georgics. Besides the fact that the references which they do share are presented differently by the Flemish humanist and by Newton (Lipsius writes literal quotations, while Newton concisely records the reference without quoting), the addition of those two references by Newton suggests that he personally researched the sources. In the case of Virgil, we can presume knowledge of his poems in anyone who had received a scholarly education in the seventeenth century; furthermore, Newton owned four editions of Virgil’s poems, one of them being Pierio Valeriano’s 1532 edition, which included Servius’ Commentarii. And Lucretius is referred to twice by Servius in his commentary on the aforementioned Georgics passage.

The second reason why I state that Newton could not ignore these Lucretian reminiscences is that he occupied himself with Lucretius’ poem in the time between the publication of the first and the second edition of the Principia. He owned and used the 1686 Cambridge edition of De rerum natura, published only one year before the first edition of the Principia. Newton deeply respected Epicurean and Lucretian atomistic philosophy, from which he himself took advantage in his research on physics and whose only mistake, in his opinion, had been to conceive a purely materialistic universe, devoid of God. His pupil David Gregory’s notes from May 1694 reflect Newton’s view on this: Epicuri et Lucretii philosophia est vera et antiqua, perperam ab illis [sc. a veteribus] ad Atheismum detorta.

We know the reason for Newton’s interest in Lucretius during these years: at the time, he was writing his so called Classical Scholia, a collection of quotations by Graeco-Latin authors with his own commentary, with which he intended to demonstrate that the mathematical-physical theory contained in the Principia was already known in Antiquity, as a part of the later corrupted prisca sapientia. The most frequently quoted

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15 Cf. HARRISON, Library, 183.
works in this collection are Macrobius’ *Commentarium in Somnium Scipionis*, and Lucretius’ *De rerum natura*. The Lucretian material includes around one hundred hexameters, literally reproduced[^18] —among them, incidentally, the aforementioned 5. 92 (*principio maria ac terras caelumque tuere*). On the other hand, the selection from Macrobius’ *Commentarium* is used to indirectly reproduce quotations from other authors, among which Virgil is placed in a prominent position. Indeed, the passage of *Aeneid* VI which Newton would refer to in the *Scholium generale*’s footnote is already present in the Classical Scholia, partially quoted through Macrobius[^19].

Although these Scholia had been conceived by Newton for their inclusion in the *Principia* second edition, they ultimately were not. As Paolo Casini (1984: 2-3) has pointed out, the seven concise Graeco-Latin references given in our *Scholium generale*’s footnote are the only published trace that remains of the deep source research carried out by Newton in order to prove the cosmological wisdom of the Ancients. The question then arises as to why the Cambridge physician finally decided not to publish his Classical Scholia. Casini (1984: 16) has also suggested that Newton could have “kept back the Scholia in order to avoid being personally involved in the last struggles of the ‘quarrel’ between the Ancients and the Moderns (…) The work of Newton could not but serve as an essential point of reference, certainly not on the side of those who maintained the superiority of the Ancients. The classical Scholia, if they had been inserted in the *Principia*, would have carried the flavour of paradox”.

This keeping back of the Classical Scholia is another example of the extreme caution with which Newton proceeded each time he was to make public the conclusions of his research, his thoughts or his personal beliefs. In the case of the Scholia, his already cautious behaviour may have been exacerbated by what Casini has suggested, as well as by the fact that Lucretius is one of the most literally quoted authors in this text. We should not forget that the Roman poet has traditionally been viewed as a paradigm of atheism and associated with heterodoxy[^20]. This fact was of no little importance in Restoration England, and a notable example of its effects was very close to Newton:

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Edmond Halley, responsible for the first edition of the *Principia*, had inserted a Lucretian ode at the very beginning of the book; five years later, in 1691, his candidacy for the Savilian chair of Astronomy at Oxford was rejected explicitly because of his religious heterodoxy. For the second edition, Halley’s Lucretian poem would be severely corrected by theologian and philologist Richard Bentley\(^{21}\).

We may assume, then, that Newton had powerful reasons not to publish the Classical Scholia. They would have provoked intellectual controversies in which his name would have been involved—a thing he most disliked, as his biography proves. In addition, the rather heterodox authorities he was mainly referring to in the Scholia, and specially Lucretius, could cast doubts over his orthodoxy. He ultimately proceeded according to the same principle of obliquity that Snobelen has detected in the composition of the *Scholium generale*: in confining his source research on the wisdom of the Ancients to seven discreet references in a footnote to the *Scholium*, he was concealing the controversial nature of his conclusions from most readers, while at the same time recording them\(^{22}\). With regard to the specific case we are discussing, it is possible to conclude that Lucretius does appear in the *Principia*. Through a detailed examination of the Virgilian references, one may perceive that Newton is not merely adding another example to support his statement that the Ancients believed in an omnipresent Divinity, but rather evoking the Lucretian cosmovision, corrected by the notion of a transcendent force that is responsible for the order of the universe.

This case of intertextuality, as far as I know, had not yet been pointed out for the study of this Newtonian text. I hope it will serve to provide a further example of the powerful influence of philology in the thinking and proceedings of early modern scientists, who were at the same time philosophers and theologians.


\(^{22}\) This subtle practice is frequent in Newton’s writings and has been deeply studied by Prof. Snobelen, cf. SNOBELLEN, «"To discourse of God": Isaac Newton’s heterodox theology and his natural philosophy», in P. WOOD (ed.), *Science and dissent in England, 1688-1945*, Aldershot 2004, 39-66, as well as «Isaac Newton, heretic: the strategies of a Nicodemite», *British Journal for the History of Science* 32, 4 (1999), 381-419.