The truth of the Moderns and the deception of the Ancients: Heavenly motions and the biblical hermeneutics of Paolo Antonio Foscarini

Franco Motta
University of Turin; franco.motta@unito.it

Abstract
Paolo Antonio Foscarini is among Galileo's most frequently named correspondents. His case revolves around the well-known treatise he wrote to defend the Copernican system, the *Letter concerning the opinion of the Pythagoreans and Copernicus about the mobility of the earth and the stability of the sun and the new Pythagorean system of the world*, published in January 1615 and listed in the Roman Index only a year later. It was this book that tipped the scales of Roman censorship towards a condemnation of heliocentrism; moreover, the remarks written to the author by Cardinal Bellarmine on receiving the book, insisting that heliocentrism may be considered and treated as a hypothesis but not a fact, anticipated the official attitude of the Catholic Church towards the new astronomy until the early 19th century. Analyzing two further writings by the same author, this paper shows that Foscarini's *Letter* must not be considered, as it has generally been, as an extemporaneous and ingenuous proposal, but rather as part of a wider, systematic project of renewing theology and natural philosophy, that has to be read within the dynamic context of the Italian scientific culture in the years that preceded the condemnation of Copernicus.

Keywords
heliocentrism, decree of 1616, biblical interpretation, correspondents of Galileo

How to cite this article
Motta, Franco. "The truth of the moderns and the deception of the ancients: heavenly motions and the biblical hermeneutics of Paolo Antonio Foscarini". *Galilæana* XXII, 1 (2025): 23-56; doi: 10.57617/gal-59

Article data
Date submitted: June 2024
Date accepted: September 2024

Among Galileo's correspondents, one of the most frequently named is the Carmelite Paolo Antonio Foscarini, whose case revolves around the letter he wrote to defend the Copernican system, published in January 1615 and listed in the Index only a year later. It was Foscarini's *Letter concerning the opinion of the Pythagoreans and Copernicus* and Galileo's *Letter to the Grand Duchess Christina* that tipped the scales of Roman censorship towards a condemnation of heliocentrism following a year of hesitation punctuated by contradictory rumors and signs. During that year, the uncertainties brought about by the new science plunged the theologians of the Roman Curia into deep crisis. Initially overcome in 1616 with a compromise (the expurgatory censure of Copernicus), in 1633 this crisis (with the condemnation of Galileo for his *Dialogue concerning the two chief world systems*) finally drove the Church into a long-lasting period of cultural entrenchment.

Foscarini suffered the most serious consequences of this move, early on. Copernicus' *De revolutionibus orbium coelestium* was corrected and recirculated together with Diego de Zuñiga's *Commentary on Jo*b, and Galileo resumed his scientific battle despite Bellarmine's admonition; the Carmelite father's *Letter* was instead banned without appeal. Unlike the other texts, it was officially listed in the 5 March 1616 Index decree and even had the unfortunate honor of providing the Holy Office's cardinals with the definition of heliocentrism as a "Pythagorean doctrine".[1]

The reason for this is commonly attributed to the fact that Cardinal Bellarmine, overseer of the case, perceived Foscarini's proposal as an open challenge to a centuries-old exegetical tradition according to which the Bible clearly established the Sun's motion around an unmoving Earth. This was part of a post-Tridentine theology that regarded the preservation of Tradition and the consensus of Church Fathers and Doctors as an indispensable line of defense against Protestantism. Not to mention that, unlike Galileo, Foscarini did not enjoy the protection of the Tuscan Grand-Ducal family with which Bellarmine had significant ties.[2] What is more, proponents of heliocentric astronomy

[1] The text of the decree in OG, XIX, 322-323. See Foscarini, *Lettera sopra l'opinione de' pittagorici e del Copernico*. Galileo's Copernican works and his letters on sunspots (OG, V), as well as his correspondence 1614-19 (OG, XII), approximately count fifteen passages from the Bible, the most critical being Joshua 10:12, Psalms 19:6, 93:1, 104:5 (modern numbering), Ecclesiastes 1:4-5.

[2] The condemnation of Foscarini cannot be separated from the "first trial" of Galileo and the censorship to Copernicanism, and is thus addressed by a very wide literature. Some key sources include Basile, "Galileo e il teologo Foscarini"; Caroti, "Un sostenitore napoletano della mobilità della Terra: il padre Paolo Antonio Foscarini"; Blackwell, *Galileo, Bellarmine, and the Bible*, 87 and following (with an English translation of the *Letter* in the *Appendix*, 217-251, with the title *A Letter […] Concerning the Opinion of the Pythagoreans and Copernicus About the Mobility of the Earth and the Stability of the Sun and the New Pythagorean Systema of the World*. This translation is used in this article); Bucciantini, *Contro Galileo. Alle origini dell'*affaire, 53 and following;

themselves posthumously blamed the Carmelite friar for having unduly attracted the Inquisitors' suspicions by incautiously publishing the letter in Italian.[3]

Now, for the reappraisal of the *Letter concerning the opinion of the Pythagoreans and Copernicus* I would like to propose, we need to take a step backwards. As described above, following the 1616 decree Foscarini was perceived as responsible for a measure that, already at the time, was seen as incongruous and fraught with unpredictable consequences. The Carmelite had supposedly attracted the Inquisition's attention by "spreading this opinion among the people with a writing published in Italian".[4] This view doubtless made sense to observers of the time, as the *Letter* was the only text mentioned *ad titulum* in the censorship decree and to that date the only printed text expressly focused on reconciling heliocentrism and biblical accounts: in my view, however, it contained both plausibility and misunderstanding, a misunderstanding that went on to condition interpretations of Copernicus' condemnation for the time to come.

The element of plausibility refers back to the problem of language and, perhaps even more so, the form of the text. Foscarini's book was a vernacular work deliberately dealing with biblical hermeneutics: it thus circumvented, as it were, the firm disciplinary distinctions according to which Latin, the language of the theologians' guild, enjoyed a monopoly over topics of faith. Catechisms and devotional books were an exception, of course, but they represented a careful distillation of the content to be transmitted to the laity. Furthermore, being written in epistolary form, the *Letter* shrugged off the methodological requirements applied to treatises (largely still linked to the procedures of scholastic theology with its division into *quaestiones* and *articuli*) and giving the au-

Kelter, "A Catholic Theologian Responds to Copernicanism: The Theological *Judicium* of Paolo Foscarini's *Lettera*"; Beretta, "Une deuxième abjuration de Galilée oú l'inaltérable hiérachies des disciplines", 25-28; Pesce, "La ricezione dell'ermeneutica galileiana. Storia di una difficoltà nel distinguere ciò che è religioso da ciò che non lo è"; Damanti, Libertas philosophandi. *Teologia e filosofia nella* Lettera a Cristina di Lorena *di Galileo Galilei*, 77 and following; Ponzio, "Teologie e copernicanesimo: Bellarmino, Campanella, Foscarini"; Frajese, "Il decreto anticopernicano del 5 marzo 1616"; Omodeo, *Copernicus in the Cultural Debates of the Renaissance. Reception, Legacy, Transformation*, 297-303; Motta, "Nature, Faith, and the Judge of Faith. Some Considerations on the Historical-Political Context of Copernicus' Condemnation"; Bucciantini, *The strange case of Paolo Antonio Foscarini*, 255-266. As for biographical notices on Foscarini, see the valuable Boaga, "Annotazioni e documenti sulla vita e sulle opere di Paolo Antonio Foscarini".

3 Remo Quietano to Kepler, 13.VIII.1619, in OG, XII, 481. Regarding Kepler's hostility towards the dissemination of the new astronomy outside educated circles, see Bucciantini, *Contro Galileo*, 124-125. Michael Maestlin expresses the same opinion about Foscarini in his 1621 introduction to the second edition of Kepler's *Mysterium cosmographicum*: Fabbri and Favino, *Introduction*, XV.

4 Remo Quietano to Kepler, see note 3 (also cited in Bucciantini, *Contro Galileo*, 59).

thor greater freedom to arrange his arguments and choose his expository style.[5] As I will show below, Foscarini clearly availed himself of the rhetorical possibilities offered by the epistolary genre, and the peculiarities of his language and format undoubtedly took on a certain prominence in the critical eyes of Cardinal Bellarmine and the other theologians charged with examining it.

I believe there is also an underlying misunderstanding, however. The rationale for banning Copernicus and condemning heliocentrism as "false and altogether contrary to divine Scripture" (as the Index decree reads, a moderate solution in considering that the Holy Office advisors had judged it much more severely as "foolish, absurd in philosophy and formally heretical") stemmed not so much from the Roman Curia's hasty reaction to Foscarini's *Letter* and his ill-advised proposal of heliocentric exegesis. Rather, the rationale derived from a lengthy, careful examination of Galileo's writings, probably his *History and demonstrations concerning sunspots* and almost certainly his *Letter to Castelli* and *Letter to the Grand Duchess Christina*.[6]

The key point was Galileo's demand, imbued with implicit yet substantial theological-political significance, that experimental philosophy has its own space in knowledge production free from the judicial authority of the Roman magisterium. This claim paralleled the demands made in the same period by those theorizing the autonomy of the political realm from the religious one, and thus clashing fiercely with the papacy, such as James I of England in the 1606 debate on the Oath of allegiance to the Crown imposed to English Catholics, or Paolo Sarpi and the theologians of the Republic of Venice during the 1606-7 Interdict controversy.[7] On both occasions, it goes nearly without saying, Bellarmine stood out as an authoritative and tireless defender of ecclesiastical prerogatives.

In other words, I believe that most of the factors coming together to drive the Roman Church to ban heliocentrism "as a thesis" (*ut thesis*) lie beyond the *Letter concerning the opinion of the Pythagoreans and Copernicus* itself, and even beyond a pure matter of discordance between heliocentric astronomy and literal interpretation of the Bible, as has generally been argued.[8] In a different context, decades earlier, there were no legal repercussions

5 Extensive research shows the importance of the epistolary genre in the early modern evolution of knowledge; for a summary, see Torrini, "Epistolari e rivoluzione scientifica", emphasizing that "the letter becomes the elective form of new knowledge" (349).

6 The judgment of the advisors of the Holy Office and the decree of the Index are published in OG, XIX, 320-321 and 322-323 respectively. The *Istoria e dimostrazioni intorno alle macchie solari e loro accidenti*, as well as the *Lettera a Don Benedetto Castelli* and the *Lettera a Madama Cristina di Lorena Granduchessa di Toscana* in OG, V, 71-249, 280-288 and 309-348 respectively.

7 Regarding this point, see my article *Nature, Faith, and the Judge of Faith*.

8 In addition to the studies already mentioned in footnote 2, on this topic see Lerner, "L'hérésie heliocentrique: du soupçon à la condamnation"; Finocchiaro, *Defending Copernicus and Galileo. Critical Reasoning in the Two Affairs*, 138 and following. The broader issue of the Church's authority in controversial matters, even beyond the letter of the Bible, is instead addressed by

stemming from Diego de Zuñiga's "Copernican" exegesis of Job 9:6 or the dedication of Copernicus' *De revolutionibus* to Pope Paul III; on the opposite side, the same was true of Giovanni Maria Tolosani's *De coelo supremo immobili*, the first accusation of heterodoxy leveled at heliocentrism to come out of Rome (without further consequences). It was precisely this lack of precedents Sarpi had in mind when expressing his dismay after the 1616 condemnation: "The suspension of the book [by Copernicus] cannot but provoke surprise, because of the novelty of suspending an old book, seen by the whole world, and which in the past had not been censored either at the Council of Trent or in Rome".[9]

Reactions to Bellarmine's 12 April 1615 letter to Foscarini and Galileo seem to support my argument. The cardinal is known to have written his remarks on receiving Foscarini's book along with a handwritten note, later corrected and circulated under the title *Defensio epistolae super mobilitate terrae*, of which two copies survive. Bellarmine's text is so famous, suffice to reference its key points: heliocentrism may be considered and treated as a hypothesis but not as a fact; the Copernican interpretation of Scripture is opposed to the common consensus of both Church Fathers and recent commentators, and contrary to the Council of Trent rulings; there is still no physical evidence to prove a moving earth and fixed sun and unlikely to be any in the future, so we should rely on the common empirical datum showing that the sun moves in the third heaven.[10] His recommendation exactly prefigured the Index's decision slightly less than a year later: indeed, the Church's approach to Copernicanism in the 17th and 18th centuries was based precisely on this distinction between a purely mathematical conception, *ex hypothesi*, of heliocentrism, and a philosophical, realistic one.[11] Hence the widespread historiographical idea that Bellarmine had already concluded the matter as early as April 1615, and the banning of the *Letter* was simply the translation of these previous theoretical premises into legal regulations.[12]

Reinhardt, "Il concilio di Trento e le scienze naturali: la controversia fra Bellarmino e Galilei come paradigma".

9 Sarpi, *Sopra un decreto della congregazione in Roma in stampa presentato per l'illustrissimo signor conte del Zaffo a 5 maggio 1616. 7 maggio 1616*, 603.

10 OG, XII, 171-172. English translation in the *Appendix VIII* to Blackwell, *Galileo, Bellarmine, and the Bible*, 265-267; this translation is used in this article.

11 We know it was the accusation of having transcended this distinction by surreptitiously defending the Copernican system that led to Galileo's 1633 condemnation and his *Dialogue* to be listed on the Index. Agostino Oreggi's opinion, expressed as part of the special theological commission convened by Urban VIII to examine the *Dialogue*, also highlights this point. This text was recently discovered and published by Leonardo Anatrini, "The Theologian's Endgame: On the Recently Discovered Censorial Report on Galileo's *Dialogue* and Related Documents".

12 As is well known, the first to stress the importance of Bellarmine's letter to Foscarini was Pierre Duhem in 1908, in his *Sauver les apparences. Sózein tà fainòmena. Essai sur la notion de théorie physique de Platon à Galilée*, 144 and following.

Actually, if read at the time it was written, in April 1615, rather than after the promulgation of the decree condemning Copernicanism, Bellarmine's letter could be considered to leave some scope for negotiation. Indeed, I do not claim that the cardinal *really* credited Galileo and Foscarini with the possibility of a demonstration in physical terms of the earth's mobility – especially given that Aristotelian physics showed the exact opposite.[13] I argue only that, at that time, in the absence of a compelling doctrinal definition on Copernicanism and with the entire world of scholars (including the astronomers of the Roman College) pondering the nature of the "celestial novelties", the cardinal's words could be *understood* as a partial opening for discussion.[14]

Of course, there remains the problem of understanding what Bellarmine meant by the term "demonstrate". Generally speaking, in mediaeval and early modern science this concept fell within the semantic sphere of logical, mathematical or physical proof, as in the case of the *demonstratio potissima* elaborated by 16th-century Paduan Aristotelian philosophers.[15] More specifically, according to Baldini, Bellarmine could have meant it either in the sense presupposed by the deductive method of Aristotle's *Analytica posteriora*, that is, on the basis of a concatenation of syllogisms that proceeded from a general proposition to a series of particular propositions – the method proper to the Aristotelian natural philosophy of the time – or in the sense proper to Renaissance mathematics (this will be mentioned in a moment), which aspired to achieve the status of demonstrative sciences.[16] It is true that Bellarmine himself, in 1572, in his Louvain lectures on Aquinas (the *Lectiones Lovanienses*), rejected the idea of the immutability and solidity of the heavens on the basis of the letter of the Bible, showing that he put Mosaic cosmology before adherence to

[13] I have already addressed this issue in *Epistemologie cardinalizie. Ipotesi, verità, apologia*.

[14] Ugo Baldini, who like few others has devoted documented studies to the scientific method in the Society of Jesus, notes how mathematicians at the Roman College were aware that Andreas Osiander's preface to the *De revolutionibus* was apocryphal, and that Copernicus should not be interpreted in hypotheticalist terms. For example, Father Christoph Grienberger, writing to his Brother Giuseppe Biancani about this latter's *Cosmographia*, writes that Copernicus "undoubtedly tries to prove that the system of the world is such as he imagined it to be", and mentions a conversation he had with Bellarmine on this subject: Baldini, *L'astronomia del cardinale*, 288. Besides, as Baldini argues (300, n. 18), when Bellarmine writes in his letter to Foscarini that "Your Reverence and Sig. Galileo should act prudently [see above, note 13] in being satisfied with speaking in terms of assumption and not absolutely, as I always believed Copernicus spoke", the latter phrase can also refer to "absolutely", and not necessarily to "in terms of assumption", as has generally been assumed. In his English translation Blackwell (265) adds an "also" ("as I always believed Copernicus also spoke") that is not present in the Italian original.

[15] A brief overview of this topic can be found in Lohr, *Aristotelian Theories of Science in the Renaissance*.

[16] Baldini, *L'astronomia del cardinale*, 291-293.

orthodox Aristotelianism.[17] But the very tenor of his letter to Foscarini makes it possible to categorically reject the possibility that he expected from the latter, and from Galileo, convincing proof of heliocentrism on the basis of scriptural exegesis.

In other words, Bellarmine's answer to Foscarini seems to me a weak and dilatory response. It offers an extrajudicial compromise ("it appears to me that Your Reverence and Mr. Galileo should act prudently in being satisfied with speaking in terms of assumptions [*ex suppositione*] and not absolutely"), leaves room for rebuttal ("I will not believe that there is such a demonstration [of the earth's motion] until it is shown to me")[18] and essentially reveals more hesitant uncertainty than implacable rejection by the Cardinal Dean of the Holy Office.

At least that is how Galileo's correspondents in Rome received it. On 18 April, Cardinal Barberini informed Monsignor Piero Dini that "I do not hear anything more being said about Galileo", and two days later an unnamed Jesuit father rejoiced with him that "the Galileo matters are settled".[19] Dini, writing again on 2 May, framed it as a success, "a point already gained, that is, that one can write as a mathematician and in order to hypothesize"; Benedetto Castelli expressed the same opinion a few days later. On May 16, Dini invited Galileo to do "the last revision of that writing [the *Letter to Christina*] that he says he has drafted", adding that "regarding the letter by the Carmelite friar, I am told by Prince [Cesi] that he will soon see other authorities, for more clarity in interpreting it".[20]

On 20 June, more than two months after Bellarmine's reply, Prince Cesi, diligent patron of the Copernican cause in Rome, continued to express full confidence that Foscarini would be able to resume his undertaking thanks to the "full and widespread treatise in Latin" he was drafting: "The work of the Father [Foscarini] will soon arrive, and will be so well equipped [...] that I believe it will suffice to quieten the negotiation forever and settle it".[21] Cesi then arranged to transmit what Galileo had sent him to the Carmelite "with all diligence".[22]

17 Excerpts are published in Baldini and Coyne, eds., *The Louvain Lectures (*Lectiones Lovanienses*) of Bellarmine and the Autograph Copy of his 1616 Declaration to Galileo*.

18 I depart here from Blackwell's translation of "I *do* not believe that there is such a demonstration, *for it has not been shown* to me". The original Italian uses the future tense, "io non crederò che ci sia tal dimostratione, fin che non mi sarà mostrata", hinting his opinion on the matter might possibly change in the future. Likewise, the original "*facciano prudentemente a contentarsi* di parlare *ex suppositione* e non assolutamente" must be translated with "*should act* prudently" instead of "*have acted* prudently", as in Blackwell's translation.

19 Dini to Galileo, 18 and 20.IV.1615, in OG, XII, 173-175.

20 Castelli to Galileo, 6.V.1615, *ibid.*, 177-178; Dini to Galileo, 2 and 16.V.1615, *ibid.*, 175-176, 181.

21 Cesi to Galileo, 20.VI.1615, *ibid.*, 189-190. See Damanti, Libertas philosophandi, 94 and following.

22 Cesi to Galileo, 25.VIII.1615, in OG, XII, 196.

This is not to say that Foscarini's *Letter* did not provoke strong perplexity and indeed very harsh reactions in Holy Office circles. The anonymous text *Iudicium de epistola F. Pauli Foscarini de mobilitate terrae* shows it was immediately given to the consultants of this congregation, or those of the Index, to examine and that they found a series of passages worth censoring.[23] Another consultant's comments in the margins of a copy of the book leave no room for doubt: "Nova philosophia non potest non esse falsa et periculosa" ("The new philosophy cannot be but false and dangerous") the censor notes next to the passage where Foscarini invokes "a new philosophy, and astrology based on the new principles".[24]

As mentioned above, however, the fact that the thesis of the sun's centrality was not defined as formally heretical in the 5 March 1616 censure decree indicates that the Holy Office and the Index chose to proceed on two different levels: a strictly theological one, scrutinizing the propositions with the usual severity, and what we might call a "political" level comprising more cautious considerations. Monsignor Giovanni Ciampoli feared that Foscarini's text would run a "great risk" at the Holy Office's late April 1615 meeting, but even this one ended so with such little apparent outcome that Benedetto Castelli was prone to hearty optimism: "As for the letter by the Carmelite Father, I was sure that the Church's most holy judgment would lead to no further deliberation".[25]

Let us now analyze Foscarini's case and text. First, the *Letter* should be read not as a spontaneous outpouring by its author but as part of a wider, systematic project of updating knowledge that he had developed in those years. His work can only be fully understood, therefore, as part of its broader framework, announced under the ambitious title *Institutionum omnis generis doctrinarum Syntaxis* alongside the second, twin text *Trattato della divinatione naturale cosmologica, over dei pronostici e presagi naturali*.

This premise should not be taken for granted. So far, historians have ordinarily dismissed Foscarini's *Letter* as an extemporaneous attempt to advance a biblical exegesis based on the idea that only revelation can confer an ultimate foundation of truth to Copernicanism, which according to the means offered by mere natural reason can instead only be considered a hypothesis. On the contrary, in this article I would like to show how Foscarini embraces a realist perspective in natural philosophy, that is, that he is convinced of the possibility of knowing phenomena in their reality through observation and reasoning, and, subsequently, of correctly interpreting the most obscure biblical passages regarding the constitution of the world.

[23] The vote is reproduced by Berti, "Antecedenti al processo galileiano e alla condanna della dottrina copernicana", 72-73, and analyzed by Kelter, *A Catholic Theologian Responds to Copernicanism*.

[24] The copy with notes is at the Biblioteca Casanatense in Rome, Vol. misc. 75.

[25] Ciampoli to Galileo, 21.III.1615, in OG, XII, 160-161, and Castelli to Galileo, 6.V.1615, *ibid.*, 178, respectively.

Most scholars who have dealt with the case have devoted only a few lines to the *Letter*, without considering Foscarini's other writings, and thus without contextualizing his proposals on the interpretation of Scripture within his broader vision of natural philosophy. For example, Stillman Drake in his biography of Galileo mentions Foscarini only in very few lines, assigning the exposition of the contents of his booklet to the concise words of Federico Cesi.[26] So too do Annibale Fantoli, Richard Blackwell, William Shea and Mariano Artigas and John Heilbron, as well as Bruno Basile, Stefano Caroti, Michele Camerota and Paolo Ponzio.[27]

None of these authors mentions the works of the Carmelite that will be examined below, and all at the same time (with the exception of Blackwell) agree that he would have accorded absolute preeminence to Scripture as a source of truth, thus embracing a hypotheticalist position in conclusions deduced from natural reason alone.[28] We find a partial exception to this interpretation in Massimo Bucciantini, who places Foscarini's stances within the framework of Renaissance naturalistic encyclopedism, Maurice Finocchiaro and Pietro Daniel Omodeo, who analyze Foscarini's writings in more detail.[29]

Foscarini's *Syntaxis*, published in Cosenza in 1613, is actually the carefully-considered index of a complex, seven-volume treatise that the Carmelite was drafting. It is also the manifesto for a program of pedagogical modernization he envisaged taking the form of an encyclopedic handbook summarizing the sacred and profane sciences for a very broad, varied audience of teachers, learners and knowledge mediators, enabling them to "quickly

[26] Drake, *Galileo at Work. His Scientific Biography*, 244-251, 244-245: "On 7 March Cesi sent Galileo the book of the stanzas by 'Salvi', mentioned previously, and with it 'a book that has just come out; this is a letter by a Carmelite father who defends the opinion of Copernicus while saving all the scriptural passages […]'. The Carmelite was Father P.A. Foscarini of Naples [*sic*], whose little book was perhaps the crucial factor in Galileo's decision to support Copernicus openly, against the advice he had received from Cesi, Ciampoli, and Barberini to keep the battle on more general grounds".

[27] Fantoli, *Galileo. Per il copernicanesimo e per la Chiesa*, 173-179; Blackwell, *Galileo, Bellarmine, and the Bible*, 87-110; Shea and Artigas, *Galileo in Rome. The Rise and Fall of a Troublesome Genius*, 67-69; Heilbron, *Galileo*, 210-212 (calling him incorrectly as the author of an encyclopedia); Basile, *Galileo e il teologo Foscarini*; Caroti, *Un sostenitore napoletano della mobilità della Terra*; Camerota, *Galileo Galilei e la cultura scientifica nell'età della Controriforma*, 282-291; Ponzio, *Teologie e copernicanesimo*, 96-102.

[28] According to Blackwell, *Galileo, Bellarmine, and the Bible*, 92, "[The] notion of scriptural hegemony seems to express one side of Foscarini; namely, his role as an obedient theologian. On the other hand there are numerous passages in the *Lettera* where Foscarini indicates that it is possible for natural knowledge, and specifically an astronomical theory, to attain full certitude".

[29] Bucciantini, *Contro Galileo*, 53-58; Finocchiaro, *On Trial for Reason. Science, Religion, and Culture in the Galileo Affair*, 96-99, 212-214; Omodeo, *Copernicus in the Cultural Debates of the Renaissance*, 297-303. According to Bucciantini, *The strange case of Paolo Antonio Foscarini*, 265-266, in Foscarini's view "human reason [...] can only achieve a level of possibility, not of truth".

find all those things that are necessary to them, in every kind of subject".[30] Both sacred and profane knowledge, it bears repeating: in fact, Foscarini viewed the unity of knowledge as the epistemological foundation of this work ("All doctrines are a single doctrine, divided and distributed into parts, such that whoever possesses it in its entirety possesses nothing but the knowledge, of every kind and unique, of all the things treated individually by each doctrine").[31]

Foscarini's program for rearranging and divulgating knowledge soon converged with Galileo's in proposing a new heliocentric cosmology conceived as the starting point for establishing a new order of knowledge, even while remained profoundly distinct from Galileo's epistemology. As Massimo Bucciantini points out, Foscarini's project was linked "to the construction of a typically Renaissance-style encyclopedia of knowledge, strongly influenced by the philosophy of Telesio and, perhaps, Bruno as well" and that even displayed "commonality and intellectual proximity" with the mathematical and Pythagorean program Niccolò Antonio Stelliola had presented in Naples.[32]

In other words, Foscarini's "modernity" had different features from Galileo's: it was philosophical, deductive and encyclopedic, rather than methodological and experimental. Nonetheless, it converged with other efforts to construct new systems of knowledge about nature and grow the tree of scientific fields proliferating between the 16th and 17th centuries. Think for instance of Bruno's work but also Patrizi's *Nova de universis philosophia*, or even earlier of Telesio's *De rerum natura*, and later Gassendi's writings, all aimed at dismantling the Aristotelian system of sciences in favor of a natural philosophy that would provide new underpinnings for knowledge of the world.

Leafing through Foscarini's preface, the profusion of Platonic quotations and evocations is so striking as to cast the work as a veritable anthem to Platonism and the mathematical method as the key to properly understanding reality in its multiform manifestations. And this vision is applied not only to physics and Aristotelian natural philosophy more generally, but also to moral philosophy, the military arts, medicine, visual arts, and theology. Even theological questions can be illuminated by physical demonstrations

[30] *Institutionum omnis generis doctrinarum tomis VII comprehensarum syntaxis. Qua methodus et ordo, in tradendis omnibus disciplinis servandus explicatur, ut demum ad perfectam solidamque sapientiam perveniri possit*, *Praefatio*, 1*r-v* (not numbered).

[31] "Omnes doctrinae sunt una quaedam doctrina, quasi per partes secta ac distributa, quam qui possederit universam, nil aliud possederit, quam rerum omnium, quae sigillatim a singulis pertractantur omnimodam atque unam cognitionem": *ibid.*, 2*r* (not numbered).

[32] Bucciantini, *Contro Galileo*, 57. Regarding the parallels between Foscarini and Stelliola ("accomunati dall'idea eliocentrica copernicana, ma anche dall'aspirazione di superare i rigidi e obsoleti schemi di una scienza qualitativa per costruirne una nuova, che si esprimesse col linguaggio della matematica") see Gatto, *Tra scienza e immaginazione. Le matematiche presso il collegio gesuitico napoletano (1552-1670 ca.)*, 96-97.

based on the mathematical method, he suggests: "For it is clear to all [the interpreters and expositors of scholastic theology and Scripture] that many things in theology are proven on physical grounds, as with [the existence of] God, eternity and similar matters, or are supposed to be proven as a physicist would prove them".[33]

It is evidently impossible, without those texts that never saw the light, to determine whether such an emphasis on the universality of the mathematical method should be considered mostly a mere homage to the Platonic vogue of the time or whether instead Foscarini really felt involved in the *quaestio de certitudine mathematicarum*, the controversy over the epistemic status of mathematics that in the second half of the 16th century developed among Italian scholars, investing also the Roman College. Here, in particular, the confrontation was played out between Christoph Clavius and Benito Pereira, who held the chair of natural philosophy, respectively for and against the possibility for mathematics to achieve conclusive demonstrations of reality. Precisely in 1615, moreover, the same year in which the *Letter* was published, the issue was reopened within the Society of Jesus by a pupil of Clavius, Father Giuseppe Biancani, who defended the certainty of mathematical conclusions in the appendix to his *Aristotelis loca mathematica*.[34]

Foscarini managed to print only two sections of his promised *Syntaxis*, the *Trattato della divinatione naturale cosmologica, over dei pronostici e presagi naturali* and the *Letter* itself, both published in 1615 by the Naples-based Lazzaro Scoriggio printing house. The first volume's dedicatory letter, addressed to the Archbishop of Cosenza Giovanni Battista Costanzo, is dated 5 May 1614. This text must have been delivered and printed shortly before the *Letter*, seeing as, in his depositions for the trial against him brought by the Archbishop of Naples Decio Carafa, Scoriggio stated that he considered the Neapolitan archiepiscopal curia's *imprimatur* for the *Trattato* to be valid for the *Letter* as well.[35]

These works must indeed be considered coeval, the first completed in Foscarini's native Montalto Uffugo in Calabria *Citra* in May 1614 (date of the dedication to Costanzo), the second written in Naples, in his Carmelite convent residence in January of the following year. The two texts correspond, respectively, to the first chapter of the sixth treatise in the second book of the third volume ("De sympathia, et antipathia rerum, ex qua magia natu-

[33] "Nam omnibus [theologiae scholasticae, et Sacrae Scripturae interpretibus ac concionatoribus] iam perspectum est, multa rationibus physicis in theologia, vel probari de Deo, de aeternitate, et similibus, vel ut a physico probata supponi": *Institutionum omnis generis doctrinarum tomis VII comprehensarum syntaxis*, 5*v* (not numbered).

[34] On the *quaestio de certitudine mathematicarum* see Romano, *La Contre-Réforme mathématique. Constitution et diffusion d'une culture mathématique jésuite à la Reinaissance*, 153 and following; Gatto, *Matematica e ortodossia nel tardo '500. L'esempio dei gesuiti napoletani*. On the involvement of Pereira see De Pace, *Le matematiche e il mondo. Ricerche su un dibattito in Italia nella seconda metà del Cinquecento*, 75-120; Blum, *Studies on Early Modern Aristotelianism*, 119-122.

[35] Boaga, *Annotazioni e documenti sulla vita e sulle opere di Paolo Antonio Foscarini*, 194-195.

ralis divinativa resultat") and evidently – albeit not explicitly – the second chapter of the first treatise in the fourth book of the second volume ("De ordine partium sphaerae mundi inter se, et singularum motu, vel immobilitate"). The complex architecture of these sections of the *Institutiones* suggests that Foscarini's overall project was very ambitious indeed. These two texts' status as parts of the same work is also indicated visually by using the same allegorical frontispiece, a frame juxtaposing the symbols of the *trivium* and *quadrivium* on the left with allegories from the Old and New Testament on the right so as to establish an immediate relationship, and harmony, between sacred and profane knowledge.[36]

To begin, it must be underscored the author's choice to publish vernacular versions of these works destined to be translated and included in the broad Latin synthesis of the *Institutiones*: "Seeing as, in this genre, many hold this treatise would be more useful if written in our common Italian language, I agreed to publish it in the vernacular first, in the hopes that it would be published later as part of that great work in Latin".[37] I noted above that the choice of Italian probably contributed, at least in part, to bringing this letter to the negative attention of the Holy Office. Why, however, did Foscarini decide to publish the *Trattato* and the *Letter* before they had been translated, and moreover out of synch with the *Institutiones'* planned progression of topics? This is a key point for reconstructing the origins of the *Letter concerning the Opinion of the Pythagoreans and Copernicus*.

We might imagine this choice reflected the author's desire to take active part in the debate triggered on one side by the astronomical wonders exposed in Galileo's *Sidereus nuncius* and the subsequent discussion on sunspots between Galileo and Apelles-Scheiner and, on the other, by the magmatic turn-of-the-century growth of a multiform array of naturalistic disciplines, from alchemy to botany, that sought to achieve synthesis and come together under the umbrella of an updated natural philosophy. Indeed, the *Letter* explicitly cites Galileo's work on sunspots and in particular the arguments of the *Second letter on sunspots*, August 1612, supporting the thesis of the fluidity of the sky and continuing with a description of the relativity of motion ("although it is true that one simple body has only one simple motion, this motion is always a circular motion. For only by a circular motion can any simple body remain in its natural place, be united with itself, and have a

[36] *Trattato della divinatione naturale cosmologica, over dei pronostici e presagi naturali, delle mutationi dei tempi etc.*, 6. In the closing part of the *Letter*, 63-64, Foscarini declares that he is close to having the first two full tomes of the *Institutiones* printed; relying on P.T. Pugliese, *Antiquae Calabrensis Provinciae ordinis Carmelitarum exordia et progressus* (Naples, 1696), and Elia D'Amato, *Pantopologia Calabra* (Naples: Ex Typographia Felicis Mosca, 1725), Boaga states that "the manuscripts, preserved until the 18th century, were later lost" (198).

[37] "Perché in questo genere è paruto a molti dovere giovar più questo trattato se si scrivesse nella nostra commune italiana lingua, perciò ho voluto consentire che così volgarmente uscisse prima fuori, con speranza che appresso debba uscire nel suo luogo in quell'opra grande in latino": *Trattato della divinatione naturale*, 7.

motion properly 'in a place'. This happens because what is moved still remains united with itself, and although it is in motion, it still remains at rest in the same place").[38] At the same time, it should be recalled that, in the years between the *Sidereus nuncius* and the condemnation of Copernicanism, Prince Cesi strove to modernize natural science by bringing his Naples associates into the Lincei cenacle, trying to make this city the second main hub of erudition in Italy after Rome.[39]

In 1604, during his brief stay in Naples, Cesi had met the elderly Giovanni Battista Della Porta, supreme investigator and master of ceremonies for the *mirabilia* of the world – his *Magia naturalis* first published in 1558 was repeatedly translated throughout Europe – and Ferrante Imperato, the great collector of findings from the three kingdoms of nature; Imperato's *Historia naturale* (1599) was structured as a boundless catalogue of simple and compound elements, their qualities and actions. Della Porta joined the Lincei in 1610 (Galileo joined the year after, during his second trip to Rome), followed by the botanist and naturalist Fabio Colonna and the above-mentioned Niccolò Antonio Stelliola.[40]

The Lincei "Neapolitan colony" soon lapsed into inactivity after Della Porta's death in 1615, but it produced a final, important manifesto: Stelliola's *Encyclopedia Pythagorea*, published in Naples under the patronage of the Lincei in December 1616, nine months after Foscarini and the "false [...] pythagorean doctrine" were condemned. Stelliola's text was similar, at least in the form, to the Carmelite's *Institutiones*: a reasoned index of a work to be published in the future, guided by the principle of the unity of knowledge and displaying a strong anti-metaphysical bent.[41]

Divided into twelve books, the *Encyclopedia Pythagorea* appears – since all we have is a scanty summary of titles – to be largely distant from traditional didactic layouts and, therefore, both from the *Institutiones*' programmatically discursive and classificatory aims and their extension to profane and sacred knowledge. Apparently, the *Encyclopedia* was instead an illustration of the characteristics and effects of the numerical quantities of bodies, ranging from celestial motion to animal physiology, alchemy, optics and applied mathematics to disciplines such as commerce, architecture and military science. Yet what the *Encyclopedia* and Foscarini's known texts shared is a common inclination toward the

38 *A Letter [...] concerning the opinion of the Pythagoreans and Copernicus*, 241. See *Seconda lettera delle macchie solari*, in OG, V, 116-141, 133 and following.

39 Olmi, "La colonia lincea di Napoli", 27; Paolella, "Giambattista Della Porta's *De aëris transmutationibus*: Natural philosophy and the Earth sciences", 83 and following. More generally, the importance of Naples intellectual circles in contributing to the development of experimental science in early 17th-century Italy is framed by the editors in their introduction to the volume, *The science of early modern Naples: A missing city*, *ibid.*, 1-25.

40 *Ibid.*, 33-34, 39 and following.

41 *Encyclopaedia Pythagorea, All'Almo Collegio salernitano*, 2. See on this work Gatto, *Tra scienza e immaginazione*, 97-98.

suggestions of Pythagoreanism, in which at the time was seen the possibility of rewriting natural sciences in the light of mathematical and quantitative method.[42] Giordano Bruno's *Cena de le ceneri* in particular was one of the first books to introduce the topic, detailing the entire line of ancient and modern followers of Pythagoreanism, from Heraclides Ponticus, Ecphantus, and Niceta Siracusano to Nicola Cusano and Copernicus. All of these authorities were also mentioned in the *Letter concerning the opinion of the Pythagoreans and Copernicus* as well as in Kepler's powerful synthesis, in particular the 1609 *Astronomia nova*.[43]

One of the founders of an academy "degli Inculti" in Montalto Uffugo, Foscarini served for less than a year, between 1601 and 1602, as regent of the Studio of the Carmine Maggiore in Naples, and in this period he likely encountered some of the above-cited figures, or at least their work. He again stayed at the Carmine Maggiore between 1614 and the beginning of 1615, while on his way to Rome; in the papal capital he then held the office of Lenten preacher at the Carmelite church of Santa Maria in Traspontina until returning to Calabria towards the end of April.[44]

It is not surprising, therefore, that Foscarini appeared on the stage of the learned world, accompanied by two printed treatises and an unspecified number of writings undergoing reorganization, during precisely those few years in which, from Paris to Prague, Florence, Rome and Naples, mathematics, naturalistic disciplines and knowledge of the divine seemed on the verge of uniting in a new synthesis that would transcend the Aristotelian consensus. It was in this period that the Lincei were devising "a strategy to respond to the great question of the moment: science and religion" and, in Prince Cesi's palace in Rome, discussions revolved around "various matters of mathematics, philosophy and theology" in an explosive encounter among "Peripatetics, Paracelsianists and Telesians".[45]

The time seemed ripe for discarding the body of knowledge contained in the framework of Aristotelianism and the affirmation of heliocentric astronomy played a key, even symbolic, role in this process. It proved that the findings of experimental astronomy and

[42] Cirino, "La divinazione naturale in Paolo Antonio Foscarini", 164-165.

[43] Casini, "The Pythagorean Myth: Copernicus to Newton", 183-199. See Bruno, *La cena de le ceneri*, third dialogue, 232. A short list of the "followers of Copernicus [who] saw him in the role of revivalist rather than revolutionary, and in company with Copernicus himself [...] acknowledged the debt to Pythagorean astronomers", including, alongside Foscarini, Zuñiga, Galileo and Kepler, also Anton Deusing, Ismaël Boulliau, Pierre Gassendi, and Joseph Moxon, can be found in Heninger, *Touches of Sweet Harmony. Pythagorean Cosmology and Renaissance Poetics*, 130-131 and 144-145, n. 131.

[44] Boaga, *Annotazioni e documenti sulla vita e sulle opere di Paolo Antonio Foscarini*, 183; Damanti, Libertas philosophandi, 77 and following.

[45] Ricci, "I Lincei: l'invenzione della mediazione accademica. Nuova scienza, religione, vita civile", 208; Francesco Ingoli to Bonifacio Caetani, 9.VIII.1613, in Bucciantini, *Teologia e nuova filosofia. Galileo, Federico Cesi, Giovambattista Agucchi e la discussione sulla fluidità e corruttibilità del cielo*, 411-412.

physical theories asserting homology between the sublunar and supra-lunar worlds were capable of subverting an image of the world based on a centuries-old tradition and sense-based impressions. In the last edition of his commentary on Sacrobosco's *De sphaera*, printed in 1611, a year before his death, Father Clavius – strict ruler of Jesuit mathematical studies – was himself obliged to pay homage to the *Sidereus nuncius* in his description of Venus *corniculata* ("horned") and its apparent orbit around the sun, leaving to his successors the task of redefining celestial orbits "to save these phenomena".[46] Foscarini is careful to mention this detail in his *Letter*, emphasizing that Clavius, who "rejects the Pythagorean opinion", nonetheless admits that astronomers "are forced to try to provide some other system, which he exhorts them to do with strong encouragement".[47]

Foscarini's desire to personally engage in the frantic evolution of this cultural transition, recognized by all his contemporaries, can be read in his texts. He sought to acquire legitimacy as an expert in theology, an up-to-date connoisseur of natural philosophy and, in some ways, a philosopher even more than a theologian. Some clues of this stance can be found in his *Trattato della divinatione naturale cosmologica*.

The aim of the treatise is "to address as fully, and distinctly as possible the natural omens of the mutations of the times, and consequently of many other natural predictions": a synthesis of a meteorological prognosis method that would help in deciphering the complex universe of signs forecasting "the rains, winds, storms, heat, cold, snow, frost, earthquakes, serenity, tranquility, drought, abundance, famine, or sterility, pestilence, and infertility".[48] The *Trattato* lists the various types of phenomena indicating imminent change in the weather as well as geological events and morbidity, from the appearance of celestial bodies to the behavior of animals and dreams, but always "naturally and without superstition".[49]

Regarding clues "gleaned from the sun, moon, or stars", for instance, Foscarini's treatise "does not include those pertaining to their influences, but [rather] to their appearances and colors, and other impressions of them caused by the interposition of terrestrial va-

[46] *In Sphaera Ioannis de Sacrobosco commentarius*, *In cap. I Sphaerae*, 75. See on this late edition of Sacrobosco's *Sphaera* James M. Lattis, *Between Copernicus and Galileo. Christoph Clavius and the Collapse of Ptolemaic Cosmology*, 106-144. On Clavius and his astronomical school see also Baldini, ed., *Christoph Clavius e l'attività scientifica dei gesuiti nell'età di Galileo*.

[47] *A letter […] Concerning the Opinion of the Pythagoreans and Copernicus*, 222.

[48] "L'intento nostro è di trattare più pienamente, e distintamente che sia possibile, de' presagii naturali delle mutationi de' tempi e per conseguenza di molte altre predittioni naturali, come de' segni che preannunciare possono e sogliono le pioggie, i venti, le tempeste e le procelle, il caldo, il freddo, le nevi, i geli, i terremoti, la serenità, la tranquillità, la siccità, l'abbondanza, la carestia, ovvero sterilità, le pestilenze, et infertilità […] molto tempo prima ch'elle avvengano, con assegnare le cagioni filosofiche e i fondamenti da' quali derivano, e provengono simili presagii": *Trattato della divinatione naturale*, cit., 1-2.

[49] *Ibid.*, 6.

pors, or other element[s], between our sight and their bodies, i.e. by their eclipses, or by comets".[50] It goes without saying that this is a liminal territory, a shadowy ground, in which insights from experimental physics and astronomy are rather superficially combined with a vision of the world as a repertoire of phenomena referring reciprocally to the action of common causes (cited sources include the *De rerum varietate* by Girolamo Cardano and the *De rerum praenotione* by Giovanfrancesco Pico della Mirandola).[51]

This methodological declaration may be read as the foundations of the ambitious endeavor of the *Institutiones* which, as mentioned above, were strategically anticipated by the *Trattato della divinatione naturale cosmologica* and the *Letter concerning the opinion of the Pythagoreans and Copernicus*. This point is supported by an anonymous letter delivered to Galileo in 1615 or 1616 that Antonio Favaro (undoubtedly correctly) attributed to Foscarini. The writer announces he is working on a cosmographic text that will "discuss the shape and figure of the world, its integral parts, number of elements and the sky, and whether we should consider the sphere of fire or multitude of orbs to be celestial bodies, the distinction between the matter of the sky and the elements, and similar matters".[52] In fact, the layout closely resembles the planned structure of the fourth book of the second volume of the *Institutiones*, the first astronomy treatise: "The first chapter will be devoted to the subject of cosmography, namely the mobile sphere of the world, its figure and parts, both according to the accident determined by its center, axis and pole, and according to the substance, which is determined by the spheres of the heavens and planets".[53] Foscarini even announces his forthcoming commitment to writing a treatise in the form of a dialogue, "a dispute or discussion [...] between Ptolemaics and Copernicans, or Peripatetics and Pythagoreans", thereby introducing an idea Galileo himself later realized.[54]

In his anonymous letter, Foscarini then lingers on the methodological approach devised for the *Institutiones*, closely resembling that of the *Trattato della divinatione naturale cosmologica*, with physics arguments sided by topics taken from a polychromatic doxographical *corpus* encompassing ancient mythology, oracles and hieroglyphics, the consensus of Pythagoreans and modern authors, as well as scriptural sources; finally, he concludes with an argument that both conveys the planned endeavor's high ambitions and accounts its following, real-life disastrous results: "At the end, [I will deal with] the danger that may come to the sacrosanct authority of the Vicar of Christ from deciding and deter-

[50] *Ibid.*, 2.

[51] *Ibid.*, 80. For more detailed considerations see Cirino, "La divinazione naturale in Paolo Antonio Foscarini", 161-175. In the same perspective, Basile, *Galileo e il teologo Foscarini*, 44, draws Foscarini and his "late Renaissance program" closer to the philosophies of Telesio, Campanella, and Robert Fludd.

[52] OG, XII, 215-220, 215.

[53] *Institutionum omnis generis doctrinarum tomis VII comprehensarum syntaxis*, 45.

[54] OG, XII, 215.

mining whether or not some things in natural matter and depending on sense belong to faith or not, where occasionally, in the long run, time may prove the contrary".[55] Yet the heart of the letter's message is the claim that natural philosophy is chief among all forms of knowledge of the world. This assertion appears to be an attempt to gain the validation of the leading exponents of the new science: "All these things [the foundations of the Copernican system], in relation to that which most comes to contra[dict] Aristotle and common philosophy, will open the way for me to treat the method and real reason of philosophizing, [...] and the extent to which one must search for the naked truth in everything".[56] It is telling that Foscarini asked Galileo's opinion regarding the possibility that the uniform and constant East-ward winds sailors encounter at equatorial latitudes could be caused "by a slight resistance of the air, when it encounters the motion of the earth".[57]

Galileo, displaying his usual reserve – and probably because he had doubts about this hypothesis, so evidently in contrast with his core idea of the earth's inertial system – did not respond. Yet the very fact that Foscarini addressed a long letter to him outlining this program shows the credibility the Carmelite had already gained among the Roman Lincei. In fact, the *Letter concerning the opinion of the Pythagoreans and Copernicus* – which, although already published, was supposed to come immediately after the planned text as the second chapter of the same treatise – did succeed in ensuring its author was well received when he arrived in Rome around February 1615. Reading between the lines, we clearly see to whom the Epistle was really dedicated: "I believe that considerable appreciation will be expressed by those who are studying this issue, and especially by the most learned GALILEO GALILEI […], by the most learned JOHANNES KEPLER […] and by all the illustrious and most virtuous members of the Academy of the LYNX, who universally accept this opinion (if I am not mistaken). And indeed I have no doubt that these and other learned men could easily find similar reconciliations with the passages of Scripture".[58] Prince Cesi likely saw Foscarini as the appropriate interlocutor for initiating a dialogue with the Roman authorities to defend Copernicanism from the Dominicans' accusations: an interlocutor who was institutionally entitled to tread in the delicate sphere of the exegetical fallout of the heliocentric system theory, and, at the same time, declaredly in favor of a radical renewal of natural philosophy.

At the beginning of March, shortly after Foscarini arrived in Rome, Cesi sent Galileo a copy of the *Letter* which the Carmelite himself probably gave him *brevi manu*, judging it to be "a work that could not have come out at a better time".[59] On April 9, Castelli deliv-

55 *Ibid.*, 217.
56 *Ibid.*, 216.
57 *Ibid.*, 217.
58 *A letter […] concerning the opinion of the Pythagoreans and Copernicus*, 223. Capitalization is in the Italian original.
59 Cesi to Galileo, 7.III.1615, in OG, XII, 149-150.

ered a second copy to Galileo; he commented positively on the text even while noting it was not yet sufficient to settle the matter ("I believe there is still enormous space for the considerations of Y.E., much higher and truer"), and listed the passages he found most effective; Castelli also informed Galileo that the archbishop of Pisa, Monsignor Bonciani (previously highly suspicious of this theory), "having seen that finally the theologian friar printed, and with great solemnity of crucifixes and saints, in defense of this opinion, remained astonished [...]. Now he begins to say that Copernicus was truly a great man and great intellect".[60] At the same time, Foscarini and Galileo began a direct correspondence; as mentioned above, Cesi also kept Galileo informed about the progress of the Carmelite friar's work until at least the end of August. In this respect, Foscarini's enterprise appears to have been unquestionably successful for much of 1615. What helped him earn the trust of Cesi and Benedetto Castelli, the latter the most active defender of Copernicanism among Galileo's correspondents?

To answer this question, let us finally turn to analyzing the content and structure of the *Letter concerning the opinion of the Pythagoreans and Copernicus*. The text is known to be based on a concordist hermeneutics, i.e. a biblical vision according to which the sacred text contains recurring statements that are not only religiously true but valid also for history, geography and the natural world; as such, they must by definition accord with the findings of the secular sciences – and therefore, in the specific case of the world system, the conclusions of natural philosophy.

This does not mean, however, that the *Letter* is entirely devoted to a direct heliocentric interpretation of the biblical passages mentioned at the beginning and which constitute the main object of debate. There are some explicit statements of this kind, such as the miracle of the sun stopping in the sky to allow Israel to annihilate the Amorites (*Josh* 10:12-14) or the golden candlestick that God orders Moses to make (*Ex* 25:31 and following) that he interprets as possibly containing the allegory of a sun-centered world system.[61] Moreover, Galileo had made a similar move in his *Letter to Castelli* (286 and fol.), repeating it in the *Letter to Christina* (346 and fol.) when he argues that Joshua's miracle is more in agreement with the Copernican system than the Ptolemaic one even though the conceptual core of Galileo's two texts, and their extraordinary modernity, lies in the assertion that the scientific method is fully independent of religion, and that the sacred sciences and natural philosophy thus belong to wholly distinct spheres.

If Foscarini's text touches only marginally on Copernican exegesis that is because it has a different aim, in relation to which all its arguments are mustered: to demonstrate that the natural reasons on which the Copernican system is founded are much more solid

[60] Castelli to Galileo, 9.IV.1615, *ibid.*, 165-166. See Damanti, Libertas philosophandi, 86 and following.

[61] *A letter [...] concerning the opinion of the Pythagoreans and Copernicus*, 236, 247-249.

than those underpinning the Ptolemaic system, seeing as the latter demands consensus by virtue of a habit of thought. Such habit is deceptive, he argues: "This is caused completely by old habits, strengthened over many centuries. Once a habit is established and men are hardened into opinions which are trite and plausible, and which are part of everyone's common sense, then both the educated and the uneducated embrace them and are hardly able to be dislodged from them. The force of habit is so great that it is said to be another nature".[62]

Hence his idea that Scriptural authority should not be forced to embrace a geocentric reading; rather, judgment on the matter should be suspended until natural philosophy produces incontrovertible evidence as to the true constitution of the universe (evidence that, in Foscarini's opinion, could only demonstrate the earth's motion around the sun). This helps explain why the *Letter* was not immediately censored in April 1615 when the opinions of the Holy Office consultants were being evaluated even though, as noted above, these opinions were all extremely negative. The text does not openly defend a thesis using theological reasoning; rather, it shows that the new science's astronomical findings put biblically based insistence on geocentrism on shaky ground. Moreover, although geocentrism had historically enjoyed widespread support, at the time it was not actually supported by any doctrinal definition issued by a council, pope or the Holy Office itself. The Roman Curia did not take an official stand on the matter until nearly a year later although, as noted above, it was probably Galileo's Copernican letters that led to the final decision to condemn Foscarini.

The *Letter* is organized into three parts. The first provides a preliminary but detailed overview of how celestial innovations have advanced our vision of the cosmos, closing with a list of the most problematic biblical passages – the ones commonly invoked to support geocentrism – divided into six classes. The second and most substantial section proposes a set of exegetical norms to adopt in interpreting the cited passages and, more generally, any passage potentially speaking of natural truths: the "opposing passages which contain all the weapons and arguments which present the gravest opposition and test to the Pythagorean opinion" are thus countered by "six principles […], which are like the firmest bastions made of impregnable material".[63] This part is interesting because Foscarini's "six principles" (or, better, "foundations", *fondamenti*) are mainly a reasoned review of the philosophical arguments supporting heliocentrism; this section, the *Letter*'s longest and most structured one, can thus also be understood as a condensed explanation – quite likely, specifically *ad usum theologorum* – of the Copernican system. The third part, the shortest and most exegetical, presents an allegorical interpretation of two biblical images referring to the natural order: the above-mentioned candlestick in

62 *Ibid.*, 218.
63 *Ibid.*, 226.

Ex 25 and the fruit of the tree of knowledge in *Gen* 2:16-17, fruit Foscarini assumes to be Indian fig, or pomegranate. These fruits, with their "many seed particles", hard core and softer outer part seem to resemble the earth, "which in its center and neighboring parts is stony, metallic, and solid, while as one goes closer to the circumference, its parts are more rare and soft".[64]

The *Letter*'s first section reviews the biblical passages traditionally deployed against Copernican cosmology, divided into six classes. First come the verses affirming that the earth is stable (*Ps* 92 [93]:1 and 103 [104]:5; *Qoh* 1:4), second those describing the motion of the sun (*Ps* 18 [19]:6; *Qoh* 1:5-6; *Isa* 38:8; *Sir* 48:26; *Josh* 10:12), third those who locate the heavens above and earth below, that is, at the universe's center (essentially paraphrasing *Acts* 2:19 "dabo prodigia in caelo sursum, et signa in terra deorsum" of Joel's prophecy, *Joel* 3:3, "dabo prodigia in caelo et in terra"); fourth are the authorities placing hell at the center of the world and thus the earth's center (and here Foscarini cites not biblical passages but "the common opinion of theologians"), fifth those contrasting heaven with earth, the earth implicitly understood as the lowest place in the universe and therefore central and stable (*Gen* 1:1; *Ps* 115 [113]:15; *Matt* 6:10; 1*Cor* 15:47; *Col* 1:16 and 3:2) and, sixth, those holding that after Judgment the sun will stop in the east, a belief "taken from the Fathers and the theologians rather than from Sacred Scripture".[65]

In itself, this catalog of biblical geocentrism represents a reordered version of an anti-Copernican corpus that was circulating at the time in a more or less complete form; the most comprehensive example is the conclusion of Ludovico delle Colombe's pamphlet *Contro il moto della terra*, written between 1610 and 1611 and circulating in manuscript form among Florence's anti-Galilaean circles.[66] What is interesting about Foscarini's use of this list of *auctoritates*, however, is that he cites it not to establish an unquestionable *status quaestionis* – the world's geocentrism as described by Scripture – from which to set off in formulating a new exegesis of these biblical passages but rather to show that the accepted tradition involves a distorted reading of the Bible, founded on the ideas of the ancients and expressed by Aristotelian astronomy in its Ptolemaic synthesis. This is why the issue of accommodation – that is, the fact that authors inspired by the Bible used simplified language to 'accommodate' the common limits of less-learned people ("to accommodate the skills of the very rough and undisciplined", as Galileo states)[67] – that is so central in the *Letter to Castelli* and *Letter to Christina* appears more secondary in Foscarini's *Letter*, introduced only a third of the way through the treatise

[64] *Ibid.*, 248.
[65] *Ibid.*, 225.
[66] Reproduced in OG, III/1, 251-290. Delle Colombe sent a copy of his work to Clavius in May 1611. See Damanti, Libertas philosophandi, 12-13.
[67] *Lettera a Cristina*, OG, V, 315.

to present the first foundation of the exegetical method and even borrowed, implicitly but quite evidently, from the *Letter to Castelli*.[68]

It thus seems to me that Foscarini treats the question of the Bible's status as truth in relation to cosmology somewhat differently. In some cases, he suggests, the prophets did write about the sun's motion around the earth so as to adapt statements about the structure of the cosmos to popular common sense; in other cases, however, it was people's blind acceptance of the ancients' authority and idea of a geocentric universe that made them misguidedly interpret some biblical passages as references to the natural world when that was not the prophets' intention. Although this distinction may seem subtle, I nonetheless see it as significant and certainly useful for understanding the intentions and peculiar epistemic structure of the *Letter* as more than a naive attempt to take the Scriptural passages used to prove geocentrism and reread them in a Copernican sense.

In this perspective, the opening of the *Letter* sounds very interesting. Foscarini devises it under the light of the philosophical dispute between ancients and moderns, holding that the historical, incontrovertible fact of the discovery the American continent and the sub-equatorial lands is a proof of the latter's superior knowledge of the natural world ("the experiments of the moderns have on some particular issues closed the venerable mouth of the ancients"). "The mobility of the earth – he notes – is no more paradoxical and strange than the notion of the antipodes or the notion that the torrid zone is inhabitable, views discussed by many ancients of great and respected authority. The former notion was thought by many of them, and the latter by all of common sense to be impossible, and was flatly denied. Nevertheless by their considerable diligence and courage, rather than by authority, the moderns have shown […] that both of these notions are quite true".[69] In the opening pages that set the tone for the rest of the text, a string of arguments unfold from this point to revolve around the opposition between truth derived from observation and experience vs. a scaffolding of abstractions ("the many dreams of Aristotle, and other ancient philosophers") people only believe out of respect for tradition. Foscarini thus distinguishes between a domain of factual truth, governed by observation, and a domain of metaphysical illusion plunged into crisis by the "celestial novelties": "If they [the ancients] could have seen and observed what the moderns have

[68] "Elsewhere in a thousand places he is said to walk, to depart, to look at, to rush; also to have bodily organs, eyes, ears, lips, a face, a voice, a countenance, hands, feet, a stomach, clothes, arms; and also to have many passions, like anger, sorrow, regret, etc.": *A letter […] concerning the opinion of the Pythagoreans and Copernicus*, 227. See Galileo's *Lettera a Castelli*, in OG, V, 282-288, 282: "So [in Scripture] not only do various contradictions appear, but also serious heresies and blasphemies; for it would be necessary to give God feet and hands and eyes, and no less bodily and human affections as anger, repentance, and hatred". Translated into English from the original Italian.

[69] *A letter […] concerning the opinion of the Pythagoreans and Copernicus*, 219.

seen and observed, and if they would have understood their arguments, then without doubt they would have changed their minds and would have believed these most evident truths. As a result there is no need to respect the ancients so much that everything which they have stated is believed to be established, and to hold it to be most certain, as though it were revealed and descended from heaven".[70]

It is in this epistemic perspective that we should read two specific passages of the *Letter*, passages that have in the past given rise to somewhat erroneous interpretations of Foscarini's thought. In the first, the Carmelite Father appeals to the primacy of the sacred pages as a source of truth, and this has been read as indicating that he was "fully convinced of the cognitive superiority of the scriptures, just as he is certain that human means are inadequate for knowing and fully understanding scriptural dicta".[71]

Foscarini does write that "what is central in this matter is that if something is found to be contrary to divine authority, and to the sacred words dictated by the Holy Spirit [...] then in that case one ought to abandon not only human reason but also sense itself".[72] Note, however, that these lines come immediately after the above-quoted statement about ancient astronomy's fallacious beliefs, thus making it clear that the "human reason" we must abandon is the one that formulated the Ptolemaic system with its fanciful correctives to account for the irregularities of planetary motion, the "innumerable difficulties and [the] patchwork of spheres [...], epicycles, equants, deferents, eccentrics, and a thousand other fantasies and chimeras".[73] On the contrary, Copernican theory stems from the evidence of the truth developed at the beginning of the age of the moderns ("When the opinion of Pythagoras and of Copernicus appeared on the world stage"). Exegetes should not cling to the cognitive superiority of divine word regarding nature, therefore, but rather harmonize such interpretation with the framework provided by new knowledge: "Hence, if the Pythagorean opinion is true, then without doubt God has dictated the words of Sacred Scripture in such a way that they can be given a meaning which agrees with, and is reconciled with, that opinion. This is the motive which has led me (given that that opinion already is clearly probable) to look and search for ways and means to accommodate many passages of the Sacred Scripture to it, and to interpret these passages, with the aid of theological and physical principles, in such a way that they

[70] *Ibid.*, 219-220. The comparison between ancients and moderns was a typical *tópos* of late mediaeval and early modern philosophical debates: see on this Del Soldato, *Early Modern Aristotle. On the Making and Unmaking of Authority*, especially ch. 5, 109 and following.

[71] Ponzio, *Teologie e copernicanesimo*, 97.

[72] *A letter [...] concerning the opinion of the Pythagoreans and Copernicus*, 220.

[73] *Ibid.* See also Blackwell, *Galileo, Bellarmine, and the Bible*, 91 and following, according to whom Foscarini's statements about the impossibility of achieving certainty in the knowledge of natural phenomena through reason play essentially a preventive and precautionary role in the *Letter*.

are not openly contradictory".[74] There is good reason to believe these statements are in line with Galileo's Copernican works.[75]

The second, closely related passage concerns Foscarini's supposedly hypothetical stance in attributing heliocentrism "only mathematical preeminence, which did not necessarily imply a realistic correlate, pertinent, that is, to the actual physical order of the phenomena".[76] As outlined above, however, Foscarini actually locates the roots of his own Biblical interpretation on the physical level (albeit in an empirical vision of phenomena and their causes that does not embrace the complexity of Galilaean experimentalism). The only part of the *Letter* to mention hypotheticism is the passage following Foscarini's critique of Aristotelians' "thousand other fantasies and chimeras": "The advocates of the common opinion [the Ptolemaic view] have confessed in their writings on the system of the world that they cannot guess or teach the true system, but can only study the one which is more probable and which, with good reason, can save the celestial appearances more conveniently".[77] In other words, Foscarini views this purely mathematical, hypothetical knowledge of the heavens not as the proper foundations for positioning the achievements of the new science, but rather as the outcome of Ar-

[74] *A letter [...] concerning the opinion of the Pythagoreans and Copernicus*, 222-223.

[75] See *Lettera a Castelli*, 283: "Since it is evident that two truths can never contradict each other, it is the duty of wise expositors to strive to find the true senses of the sacred passages, agreeing with those natural conclusions of which, previously, our manifest sense or the necessary demonstrations had made us certain and sure". It is of course possible that Foscarini references precisely these considerations in the quoted passage, as also affirmed by the principle according to which "one truth is not contrary to another" (*A letter [...] concerning the opinion of the Pythagoreans and Copernicus*, 222). Both Galileo and Foscarini, as noted by Beretta, "Une deuxième abjuration de Galilée", 15 and following, moreover here implicitly relate back to the principle sanctioned by the constitution *Apostolici regiminis*, issued by the Fifth Lateran Council in 1513, which mandated the rejection of the principle of the 'double truth'by affirming the need to concord philosophical truths with the truths of faith. This idea, in turn, relied on a vast theological background that found its first origin in Augustine's *De Genesi ad litteram*. The constitution was originally intended as a reaction to the principle of the double truth invoked by Alexandrinist Aristotelianism, particularly Pietro Pomponazzi, to support the mortality of the rational soul 'secundum saltem philosophiam', 'at least according to philosophy'; but if, as shown by Bianchi, *Pour une histoire de la 'double verité'*, 117-156, it did not get much hearing in this, nevertheless it was revived several times to deny the principle of double truth, particularly after its publication in the expanded edition of Nicolau Eymerich's *Directorium inquisitorum* edited by rota judge Francisco Peña in 1578. See also Constant, "A Reinterpretation of the Fifth Lateran Council Decree *Apostolici regiminis* (1513)", 353-379.

[76] Camerota, *Galileo Galilei e la cultura scientifica*, 283. In relation to this point, the author references analogous considerations by Basile, *Galileo e il teologo Foscarini*, 21, and Caroti, *Un sostenitore napoletano della mobilità della Terra*, 96.

[77] *A letter [...] concerning the opinion of the Pythagoreans and Copernicus*, 220-221.

istotelian astronomy's inability to adapt its observations of celestial movements to the theoretical assumptions of geocentrism. This is confirmed in the very next lines when he again depicts the advent of modern astronomy as a cognitive leap forward: "Then the invention of the perspective eyeglass occurred, and with firm sensation various beautiful things in the sky were discovered, all curious and unknown until these centuries".[78]

The text's second and most extensive part is also its most innovative. Here the Carmelite introduces what he defines as the "six foundations" ("six principles", in Blackwell's translation: but we find "fondamenti" in the Italian original) guiding exegetes to view Copernicanism without prejudice. Interestingly, in of all these rules for interpreting the sacred text in relation to astronomy, only the first one, the "first foundation", is actually methodological; the others are essentially questions of content, intended to lay out the Copernican system's philosophical rationales.

This "first foundation" is actually both the hermeneutic core of the *Letter* and the element most likely to have attracted Bellarmine's attention: indeed, this section contains the analogy (between the earth's motion and that of a boat setting sail) that the cardinal specifically referenced in his reply.[79] It also contains a reference – extemporaneous with respect to the overall text, yet explicit and clearly stated – to the issue of the Roman Magisterium's authority to pass judgement, in defense of which Bellarmine had spent his life studying.[80] This is also the part of the text that Castelli brought to Galileo's attention in his above-mentioned letter as the most relevant one, particularly in relation to the long passage ("worthy of great consideration", according to Castelli) in which Foscarini enunciates the idea of the Scriptures' exclusively salvific value ("their only purpose is to teach us the true path to eternal life"), thus reaffirming the separation

[78] *Ibid.* In this sense I agree with Blackwell, *Galileo, Bellarmine, and the Bible*, 87 and following, specifically that Foscarini recognized that studying natural phenomena could lead to a comprehensive understanding of reality.

[79] "You might tell me that Solomon spoke according to appearances, since it appears to us that the sun rotates when the earth turns, just as it appears to one on a ship who departs from the shore that the shore departs from the ship. To this I respond that, although to him who departs from the shore it does seem that the shore departs from him, nevertheless he knows that this is an error and he corrects it, seeing clearly that the ship moves and not the shore": Bellamine to Foscarini, in Blackwell, *Appendix VIII*, 267. See *A letter [...] concerning the opinion of the Pythagoreans and Copernicus*, 232: "The same thing happens when people are carried in a small boat on the sea near the shore; to them it seems that the shore moves and is carried backwards, rather than that they move forwards, which is the truth".

[80] "[God] also established one, infallible ruler, i.e. the Holy Church which is washed in his blood. The Church together with its visible head, the Supreme Pontiff [...] cannot err, in matters of faith and our salvation only. But the Church can err in practical judgments, in philosophilca speculations, and in other doctrines which do not involve and pertain to salvation: *ibid.*, 234-235.

between faith and science that Galileo had introduced earlier in his *Letter to Castelli* and went on to argue more extensively in the *Letter to Christina*.[81]

In the "first and most important principle", Foscarini offers four possible interpretations to use "when Sacred Scripture attributes something to God or to any other creature [thus including the celestial bodies] which would otherwise be improper and incommensurate": an initial metaphorical interpretation, a second interpretation based on human reason ("*secundum nostrum modum considerandi*"), a third according to common opinion, in line with the 'accommodation' invoked by Galileo ("*secundum opinionem vulgi*"), and a fourth depending on the way the Creator or creatures are perceived by man ("*respectu nostri*"), such the phases of the moon that exist only in the observer's perception.[82]

The author does not explicitly reveal the sources of these methodological indications in the *Letter*; however, we can see that they derive – albeit quite approximately – from the authorities cited in the Latin apology sent to Bellarmine and focused entirely on defending the methodological propositions set out here. Specifically, these include the preamble to book one of the *Commentarii et disputationes in Genesim* by the above-mentioned Father Pereira (1590), Cajetan's *In Pentateuchum Mosis* (1531) and Ambrogio Catarino Politi's *Enarrationes in quinque priora capita libri Geneseos* (1552), as well as the renowned *Loci theologici* by Melchor Cano (1563) – a group of authors characterized by (almost) crystal-clear orthodoxy (Cajetan, we know, had raised various concerns specifically on the issue of biblical interpretation and the possibility of diverging from the *doctores'* consensus, a position Pereira himself had branded "audax et correctione digna").[83] Foscarini probably drew on these more recent authors to identify the patristic, medieval authorities: primarily Augustine, *De Genesi ad litteram*, and Jerome, *Super Hieremiam*, as well as Aquinas (I-II, q. 98 a. 3, ad 2um), usually cited via the chain of their commentators according to the canons of scholasticism.[84]

What follows is the idea of a complex interpretation of the Bible, fraught with difficulties and constantly striving to distinguish between the apparent surface of the story, modeled on infinite discursive registers ("divine wisdom [...] adjusts itself to each thing according to its nature and capacity; it works naturally and necessarily with nat-

81 Castelli to Galileo, 9.IV.1615; see *A letter [...] concerning the opinion of the Pythagoreans and Copernicus*, 233.

82 *Ibid.*, 226 and following.

83 Pereira, *Commentarii et disputationes in Genesim*, I, 30. See the apology of Foscarini in Boaga, *Annotazioni e documenti sulla vita e sulle opere di Paolo Antonio Foscarini*, 204-214, 208 and following.

84 As is well known, these quotations also appear in the *Letter to Christina*. Regarding this point and the use of *De Genesi ad litteram* in the Copernican debate more generally, see Camerota, "Galileo e la *accommodatio* copernicana", 129-151.

ural and necessary causes, and freely with the free; for mighty people, nobly; for common people, humbly […]; and thus for all, it adapts itself to each one's style")[85] and an underlying layer that, ultimately, pertains only to the providential order, i.e. the divine plan for salvation ("his holy law, whose purpose is to enable us to come in the Word to a perfect knowledge and vision of the entire order […]. Then we will see distinctly and clearly, and will understand without difficulty, direct or indirect, the truth of all these curiosities which in this life have been left to the industry of human inquiry and investigation").[86]

Although this position is formulated with all the complexity required by the subtleties of testamentary exegesis, it essentially asserts that same autonomy of science at the heart of Galilaean hermeneutics. This affinity, both conceptual and discursive, is evidenced by Foscarini's use of certain similes to help readers understand the idea that the Bible speaks *respectu nostri*, according to our point of view. For example, Foscarini writes, the sun is said to rise and set "by virtue of extrinsic denomination", that is, due to the motion of the bodies receiving its heat, like "a fire burning in a fireplace […]. A man who is cold stands in front of the fire to warm himself. First he warms one part of his body; then he turns another part of his body toward the fire to warm it; turning thus in a circle, he warms his whole body";[87] likewise, Joshua's miracle can be explained in a heliocentric system as an interruption of the earth's rotation and thus an interruption of the "sun's splendor above the earth" in the same way that "if the hand is rotated around the light of a burning candle which is at rest, the light moves on the hand without the candle being moved".[88] These are sense-based similes that, in their simplicity, draw on the same rhetorical resources as Galileo's to feed readers' imagination and thereby lead them to recognize the credibility of the arguments. In this case as well, I believe, Foscarini proves himself much more of a "philosopher" than his reputation would suggest.

This aspect is even more evident in the following "foundations" which, as mentioned above, are not so much methodological principles as assertions of fact: the earth's fixedness must be understood in relation to the perpetuity of its governing laws, its immo-

[85] *A letter […] concerning the opinion of the Pythagoreans and Copernicus*, 233. I depart here from Blackwell's translation, which reads "divine wisdom [...] adjusts itself to each person according to his nature and capacity; for the natural and necessary scientists, naturally and necessarily; for the liberal arts, freely". Indeed, the original Italian text clearly refers not to "natural scientists" and "liberal arts", but rather to natural and liberal causes ("[La] sapienza divina […] con tutte le cose s'accommoda secondo la capacità e natura loro, onde con le cause naturali e necessarie opra naturale e necessariamente, e con le libere liberamente": *Lettera sopra l'opinione de' pittagorici e del Copernico della mobilità della terra e stabilità del sole*, 31).

[86] *A letter […] concerning the opinion of the Pythagoreans and Copernicus*, 234.

[87] *Ibid.*, 235.

[88] *Ibid.*, 236.

bility must be understood at times as immutability, at times as a static state within the inertial system, and at other times as elements aggregating around its center; finally, the earth's central position in the universe stems from the sun's proximity to the higher planets and sky of fixed stars.

Indeed, he explains these principles by illustrating the Copernican system's physical premises, particularly the idea that celestial bodies' natural motion is circular. The argument seeks to undermine the Aristotelian-Ptolemaic cosmos by showing that the Copernican system does not simply consist of replacing the sun with the earth in the third heaven, but also entails a completely different philosophical framework: "Although circular motion relates *to the whole*, and straight line motion *to the parts*, this difference does not make them opposite motions, such that the one is called straight and the other circular […]. For both can exist together and reside naturally in one body […]. Hence it is seen that this philosophy is as far removed from Aristotle's as the new cosmographical system is removed from the one commonly held up to now".[89] This conclusion is quite significant for the purposes of Foscarini's overall argument in that it denies the Bible's heliocentric cosmology of any possible foundation in Aristotelian mechanics, thus – as he already made explicit at the beginning of the text – rendering it nothing more than a system of thought, inherited from antiquity and supported out of habit, projected onto a sacred text.

In light of these points, I would draw two basic conclusions about the *Letter concerning the opinion of the Pythagoreans and Copernicus*. First, far from being a makeshift, naive attempt to force traditional biblical exegesis in a Copernican sense, it should be placed within the framework of the efforts to renew natural philosophy and the hierarchy of knowledge that, in the early 17th century, found expression in the multiform, sometimes contradictory, bundle of conceptions we see in discussions among the Accademia dei Lincei as well as in the other manifestations of anti-Aristotelianism.

Second, as stated above, that Foscarini's epistemology cannot be considered an example of Renaissance mathematical hypotheticism, as maintained by Basile, Caroti, and Camerota: [90] on the contrary, the *Letter* operates at the level of defending the reality of Copernicanism. Indeed, the text's underlying structure uses specifically physical evidence to argue for abandoning geocentric interpretations of Scripture.

Several recurring textual elements attest to this and, in my opinion, leave little room for doubt. First, Foscarini's above-quoted considerations about matching scriptural exegesis with new scientific findings: "The Pythagorean opinion is either true or false. If it is false, it is not worthwhile to speak of it or to take it into consideration. If it is true, then it is of little importance if all philosophers and astronomers in the world deny it; rather

89 *Ibid.*, 249. Italics in the Italian original.

90 See above, n. 67.

there would be, as a result, a need to formulate a new philosophy and astronomy based on the new principles and hypotheses which that opinion requires".[91] The alternative 'either it is true or it is not' clearly links this text to Galileo's realist theory and renders it antithetical to Bellarmine's admonition that thinkers "be content to speak *ex suppositione* and not in absolute terms".

This is not the only significant passage, however: the entire *Letter* is dotted with expressions clearly indicating Foscarini's conviction that Copernican cosmology represented the true structure of the universe. The ancient authors "rendered *probable*" Pythagorean opinion and they confirmed it "at least indirectly" (222); the passage of Gen 1:16 "fecit Deus duo luminaria magna" "is to be understood in relation to us and according to the vulgar opinion, and not according *to the true and real being* which these bodies have" (230). Since celestial phenomena "occur otherwise *in reality and in fact*" with respect to common understanding, "when they are found to be written in the Sacred Scriptures […] they ought always to be understood according to the vulgar sense" (232); "it is in no way my present intention to determine *the truth or falsity* of this position [on inertial motion], although I would maintain that it is most probable" (243); and, "the opinion of Pythagoras and Copernicus is so *probable* that it is perhaps more likely than the common opinion of Ptolemy. For from it one can derive the most precise system, and the hidden constitution, of the world in a way which is much more solidly *based on reason and experience* than is common opinion" (247).[92]

The recurrence of the adjective 'probable' may have led some readers to perceive in Foscarini's text a theory in which "every *mundi systema* is, after all, a hypothesis increasingly consistent with the truth, but never coinciding with that Truth which remains elusive to man and known only [...] through the *voluntas Dei*".[93] I believe what I have cited so far indicates the opposite, namely that Foscarini did not subscribe to such a transcendent meaning of ultimate truth and instead recognized the existence and accessibility of two forms of truth, scriptural and natural, and felt they could be brought into harmony thanks to the new science's invaluable insights.

It is the second form of truth, the one encompassing the fruit "of human quest, and investigation" and therefore the real constitution of the universe, that is translated as "probable" in theological terms. Indeed, in scholastic vocabulary "probable" indicates that which may be known by merely human means and thus does not enjoy the status of certainty (doctrinal and salvific certainty) characterizing revealed truths; this does not imply, however, rejecting a conclusion that reason paints as certain: "It does not mean a discouragement and skepticism of intelligence in facing the complexity of reality. [...]

[91] *A letter […] concerning the opinion of the Pythagoreans and Copernicus*, 222.
[92] All italics mine.
[93] Basile, *Galileo e il teologo Foscarini*, 21.

That which is probable is that which, thanks to the truth possibilities it holds, is worthy of garnering the adherence of the spirit".[94]

"Sacred doctrine – Aquinas explains in the *Prima* – can resort to the authority of philosophers where they have been able to know the truth through natural reason [...] Sacred doctrine resorts to these authorities as if they were extraneous and probable topics, while it resorts to the authorities of canonical scripture as if they were proper and necessary topics".[95] And this is the relevant gloss of one of the most influential commentators of Aquinas in the 16th century, Cajetan: "It should be known that the human reason spoken of here is nothing but the argumentation that draws strength from natural light alone. And this argumentation is twofold: some of its conclusions are necessary, and in this case we speak of demonstration, while others are probable, and in them there is greater uncertainty. Both types of argumentation are limited to the certainty of physical science, and consequently are foreign to the genus of theological knowledge, and in this case theology proceeds from human reason as from reasons extraneous to it".[96]

Later in that century, the "doctrine of probability" (*doctrina probabilitatis*), intended to guide the choice between several equally morally valid opinions, comes to life in theology (the matter Foscarini teaches at the Carmine maggiore). The theory belongs first and foremost to the sphere of moral theology, but more generally it also concerns how theology can draw on arguments derived from pure reason and human knowledge.[97] For Melchor Cano, another among the fathers of early modern scholasticism (*De locis theologicis*, 1563), history, based on human knowledge, is a probable *locus* from which arguments in defense of the faith can be deduced, though of course with a lower degree

[94] "Il ne signifie pas un découragement et comme un scepticisme de l'intelligence devant les complexités du réel. La probabilité du Moyen Age est au contraire toute pénétrée de l'idée de vérité. D'une *Est probable ce qui*, grâce aux chances de vérité qu'il porte en soi, *est digne d'obtenir l'adesion de l'esprit*": Deman, *Probabilisme*, 431 (italics in the text). This passage refers to the notion of probability in medieval scholasticism, but the author goes on to describe it continuing in the second scholastic phase, especially the School of Salamanca.

[95] «Auctoritatibus philosophorum sacra doctrina utitur, ubi per rationem naturalem veritatem cognoscere potuerunt [...] Sed tamen sacra doctrina huiusmodi auctoritatibus utitur quasi extraneis argumentis, et probabilibus. Auctoritatibus autem canonicae Scripturae utitur proprie, ex necessitate argumentando»: *Summa theologiae*, I, q. 1, a. 8 ad 2um (here in the *Leonina* edition, IV, 1888, 21-22; translation mine).

[96] "Sciendum est quod ratio humana de qua hic est sermo, nihil aliud est quam argumentatio aliqua ex solo naturali lumine robur habens. Et est duplex: quaedam necessario concludens, quae vocatur demonstratio; et quaedam probabiliter, quae magnam habet latitudinem. Utraque autem in aliqua certa scientia physica clauditur, et consequenter extranea est a genere scibili theologico; ac per hoc, theologia procedit ex ratione humana ut sic, ut ex extraneis": *Ibid.*, 23 (translation mine).

[97] Schuessler, *The Debate on Probable Opinions in the Scholastic Tradition*, 60 and following.

of certainty than the Word of God. Bartolomé de Medina, a prominent commentator of the *Summa theologiae* and considered the founder of probabilism, establishes a simple division between probable and improbable doctrines, where the former are "confirmed by strong arguments and the authority of the wise", and thus can be followed without doubt of error.[98]

In other words, in scholastic vocabulary 'probability' corresponds to ta very high degree of certainty human knowledge can achieve without divine revelation. And, as Foscarini explains, the divine Word has not chosen to gift man with explicit statements about astronomy. In his *Letter to Christina*, Galileo instead sets up "probable opinion" in opposition to "sure and demonstrated science". The fact that the Carmelite uses "probable" in the sense of 'the most we humans can know' rather than Galileo's sense expressed in the *Letter to Christina* – according to which the "probable opinion" is opposed instead to the "proven and assured science"[99] – likely has to do with his theological lexical instruments and certainly reflects that phase of knowledge transition, and consequently language, emerging from the great debate about new celestial findings.

[98] *Ibid.*, 72-79.

[99] "Delle proposizioni naturali alcune sono delle quali, con ogni umana specolazione e discorso, solo se ne può conseguire più presto qualche probabile opinione e verisimil coniettura, che una sicura e dimostrata scienza, come, per esempio, se le stelle sieno animate": OG, V, 330.

References

Abbreviations

OG = Galilei, Galileo. *Opere*. National Edition, edited by Antonio Favaro, 20 vols. Firenze: Barbèra, 1890-1909.

Sources

Anatrini, Leonardo. "The Theologian's Endgame: On the Recently Discovered Censorial Report on Galileo's *Dialogue* and Related Documents". *Galilaeana* 17 (2020), 219-288.

Baldini, Ugo, and Coyne, George V., eds. *The Louvain Lectures* (Lectiones Lovanienses) *of Bellarmine and the Autograph Copy of his 1616 Declaration to Galileo*. Vatican City: Specola Vaticana, 1984.

Baldini, Ugo. "L'astronomia del cardinale". In Legem impone subactis. *Studi su filosofia e scienza dei gesuiti in Italia 1540-1632*. Roma: Bulzoni, 1992, 286-303.

Baldini, Ugo, ed. *Christoph Clavius e l'attività scientifica dei gesuiti nell'età di Galileo*. Roma: Bulzoni, 1995.

Basile, Bruno. "Galileo e il teologo Foscarini". In *L'invenzione del vero. Studi sulla letteratura scientifica da Galilei ad Algarotti*. Roma: Salerno, 1983, 9-48.

Beretta, Francesco. "Une deuxième abjuration de Galilée oú l'inaltérable hiérachies des disciplines". *Bruniana et Campanelliana* 9/1 (2003), 9-43.

Berti, Domenico. "Antecedenti al processo galileiano e alla condanna della dottrina copernicana". *Atti della R. Accademia dei Lincei, Memorie della classe di scienze morali, storiche e filologiche* 10 (1881-82).

Bianchi, Luca. *Pour une histoire de la 'double verité'*. Paris: Vrin, 2008.

Blackwell, Richard J. *Galileo, Bellarmine, and the Bible*. Notre Dame – London: University of Notre Dame Press, 1991.

Blum, Paul R. *Studies on Early Modern Aristotelianism*. Leiden: Brill, 2012. https://doi.org/10.1163/9789004232198

Boaga, Emanuele. "Annotazioni e documenti sulla vita e sulle opere di Paolo Antonio Foscarini". *Carmelus* 37 (1990): 173-216.

Bruno, Giordano. *La cena de le ceneri*. In *Opere di Giordano Bruno e di Tommaso Campanella*, edited by Augusto Guzzo and Romano Amerio. Milano-Napoli: Ricciardi, 1956, 179-287.

Bucciantini, Massimo. *Contro Galileo. Alle origini dell'*affaire. Firenze: Olschki 1995.

Bucciantini, Massimo. *Teologia e nuova filosofia. Galileo, Federico Cesi, Giovambattista Agucchi e la discussione sulla fluidità e corruttibilità del cielo.* In *Sciences et religions. De Copernic à Galilée (1540-1610)*. Actes du colloque international - Rome 12-14 décembre 1996, edited by Catherine Brice and Antonella Romano, 411-442. Roma: École Française de Rome, 1999.

Bucciantini, Massimo. "The strange case of Paolo Antonio Foscarini". In De mundi recentioribus phaenomenis. *Cosmologie et science dans l'Europe des temps modernes, Xve-XVIIe siècles*, edited by Édouard Mehl and Isabelle Pantin, 255-266. Turnhout: Brepols, 2022. https://doi.org/10.1484/M.DDA-EB.5.131452

Camerota, Michele. *Galileo Galilei e la cultura scientifica nell'età della Controriforma*. Roma: Salerno, 2004.

Caroti, Stefano. "Un sostenitore napoletano della mobilità della Terra: il padre Paolo Antonio Foscarini". In *Galileo e Napoli*, edited by Fabrizio Lomonaco and Maurizio Torrini, 81-121. Napoli: Guida, 1987.

Casini, Paolo. "The Pythagorean Myth: Copernicus to Newton". In *Copernico e la questione copernicana in Italia dal XVI al XIX secolo*, edited by Luigi Pepe, 183-199. Firenze: Olschki, 1996.

Cirino, Raffaele. "La divinazione naturale in Paolo Antonio Foscarini". *Bruniana & Campanelliana* 16/1 (2010), 161-175.

Clavius, Christoph. *In Sphaera Ioannis de Sacrobosco commentarius*, in *Christophori Clavii Bambergensis opera mathematica V tomis distributa*. Mainz: sumptibus Antonii Hierat, excudebat Reinhardus Eltz, 1611-12, III.

Constant, Eric A. "A Reinterpretation of the Fifth Lateran Council Decree *Apostolici regiminis* (1513)". *The Sixteenth Century Journal* 33/2 (2002), 353-379. https://doi.org/10.2307/4143912

Damanti, Alfredo. Libertas philosophandi. *Teologia e filosofia nella* Lettera a Cristina di Lorena *di Galileo Galilei*. Roma: Edizioni di Storia e letteratura, 2010.

Del Soldato, Eva. *Early Modern Aristotle. On the Making and Unmaking of Authority*. Philadelphia: University of Pennsylvania Press, 2020. https://doi.org/10.9783/9780812296822

Deman, Thomas. *Probabilisme*, in *Dictionnaire de théologie catholique*. Paris: Librairie Letouzey et Ané, 1931, XIII/1, 418-619.

De Pace, Anna. *Le matematiche e il mondo. Ricerche su un dibattito in Italia nella seconda metà del Cinquecento*. Milano: Franco Angeli, 1993.

Drake, Stillman. *Galileo at Work. His Scientific Biography*. Chicago: The University of Chicago Press, 1978.

Duhem, Pierre. *Sauver les apparences. Sózein tà fainòmena. Essai sur la notion de théorie physique de Platon à Galilée*. Paris: Vrin, 2003 (orig. 1908).

Fabbri, Natacha and Favino, Federica. *Introduction.* In *Copernicus Banned. The Entangled Matter of the anti-Copernican Decree of 1616*, edited by Eaed., VII-XXV. Florence: Olschki, 2018.

Fantoli, Annibale. *Galileo. Per il copernicanesimo e per la Chiesa*. II ed. Vatican City: Libreria editrice vaticana, 1997.

Finocchiaro, Maurice A. *Defending Copernicus and Galileo. Critical Reasoning in the Two Affairs*. Dordrecht: Springer, 2010.

Finocchiaro, Maurice A. *On Trial for Reason. Science, Religion, and Culture in the Galileo Affair*. Oxford: Oxford University Press, 2019.

Foscarini, Paolo Antonio. *Institutionum omnis generis doctrinarum tomis VII comprehensarum syntaxis. Qua methodus et ordo, in tradendis omnibus disciplinis servandus explicatur, ut demum ad perfectam solidamque sapientiam perveniri possit*. Cosenza: apud D. Andream Riccium, 1613.

Foscarini, Paolo Antonio. *Trattato della divinatione naturale cosmologica, over dei pronostici e presagi naturali, delle mutationi dei tempi etc.* Napoli: per Lazzaro Scoriggio, 1615.

Foscarini, Paolo Antonio. *Lettera sopra l'opinione de' pittagorici e del Copernico della mobilità della terra e stabilità del sole, e del nuovo pittagorico sistema del mondo*. Naples: per Lazzaro Scoriggio, 1615.

Foscarini, Paolo Antonio. *A Letter […] Concerning the Opinion of the Pythagoreans and Copernicus About the Mobility of the Earth and the Stability of the Sun and the New Pythagorean Systema of the World*. English translation in Blackwell, *Galileo, Bellarmine, and the Bible, Appendix*, 217-251.

Frajese, Vittorio. "Il decreto anticopernicano del 5 marzo 1616". In *Il caso Galileo. Una rilettura storica, filosofica, teologica*, edited by Massimo Bucciantini, Michele Camerota, and Franco Giudice, 75-89. Firenze: Olschki, 2011.

Galilei, Galileo. *Istoria e dimostrazioni intorno alle macchie solari e loro accidenti.* In OG, V, 71-249.

Galilei, Galileo. *Lettera a Don Benedetto Castelli*. In OG, V, 280-288.

Galilei, Galileo. *Lettera a Madama Cristina di Lorena Granduchessa di Toscana.* In OG, V, 309-348.

Gatto, Romano. *Tra scienza e immaginazione. Le matematiche presso il collegio gesuitico napoletano (1552-1670 ca.)*. Firenze: Olschki, 1994.

Gatto, Romano. *Matematica e ortodossia nel tardo '500. L'esempio dei gesuiti napoletani.* In *Sciences et religions. De Copernic à Galilée (1540-1610)*. Actes du colloque international – Rome 12-14 décembre 1996, edited by Catherine Brice and Antonella Romano, 281-293. Rome: École Française de Rome, 1999.

Gianfrancesco, Lorenza and Tarrant, Neil. *The science of early modern Naples: A missing city.* In *The Science of Naples. Making Knowledge in Italy's Pre-eminent city, 1500-1800*, edited by Iid., 1-25. London: Ucl Press, 2024. https://doi.org/10.2307/jj.8731495

Heninger, S.K. *Touches of Sweet Harmony. Pythagorean Cosmology and Renaissance Poetics*. San Marino (CA): The Huntington Library, 1974.

Kelter, Irving A. "A Catholic Theologian Responds to Copernicanism: The Theological *Judicium* of Paolo Foscarini's *Lettera*". *Renaissance and Reformation / Renaissance et Réforme*, 21/2 (1997), 59-70. https://doi.org/10.33137/rr.v33i2.11344

Lattis, James M. *Between Copernicus and Galileo. Christoph Clavius and the Collapse of Ptolemaic Cosmology*. Chicago: The University of Chicago Press, 1994.

Lerner, Michel-Pierre. "L'hérésie heliocentrique: du soupçon à la condamnation". In *Sciences et religions. De Copernic à Galilée (1540-1610)*. Actes du colloque international – Rome 12-14 décembre 1996, edited by Catherine Brice and Antonella Romano, 69-91. Rome: École Française de Rome, 1999.

Lohr, Charles H. *Aristotelian Theories of Science in the Renaissance.* In *Sciences et religions. De Copernic à Galilée (1540-1610)*. Actes du colloque international - Rome 12-14 décembre 1996, edited by Catherine Brice and Antonella Romano, 17-29. Rome: École Française de Rome, 1999.

Motta, Franco. *Epistemologie cardinalizie. Ipotesi, verità, apologia.* In G.M. Bravo and V. Ferrone, eds., *Il processo a Galilei e la questione galileiana*, edited by Gian Mario Bravo and Vincenzo Ferrone, 93-103. Roma: Edizioni di storia e letteratura, 2010.

Motta, Franco. "Nature, Faith, and the Judge of Faith. Some Considerations on the Historical-Political Context of Copernicus' Condemnation". In Fabbri and Favino, eds., *Copernicus Banned. The Entangled Matter of the anti-Copernican Decree of 1616*, edited by Natacha Fabbri and Federica Favino, 57-99. Firenze: Olschki, 2018.

Olmi, Giuseppe. "La colonia lincea di Napoli". In *Galileo e Napoli*, edited by Fabrizio Lomonaco and Maurizio Torrini, 23-58. Napoli: Guida, 1987.

Omodeo, Pietro Daniel. *Copernicus in the Cultural Debates of the Renaissance. Reception, Legacy, Transformation*. Leiden: Brill, 2014.

Paolella, Alfonso. "Giambattista Della Porta's *De aëris transmutationibus*: Natural philosophy and the Earth sciences". In *The Science of Naples. Making Knowledge in Italy's Pre-eminent city, 1500-1800*, edited by Lorenza Gianfrancesco and Neil Tarrant, 83-102. London: Ucl Press, 2024. https://doi.org/10.2307/jj.8731495.9

Pereira, Benito. *Commentarii et disputationes in Genesim*. Ingolstadt: apud Davidem Sartorium, 1590.

Pesce, Mauro. "La ricezione dell'ermeneutica galileiana. Storia di una difficoltà nel distinguere ciò che è religioso da ciò che non lo è". In *L'ermeneutica biblica di Galileo e le due strade della teologia cristiana*. Roma: Edizioni di Storia e letteratura, 2005, 117-173.

Ponzio, Paolo. "Teologie e copernicanesimo: Bellarmino, Campanella, Foscarini". In *Il caso Galileo. Una rilettura storica, filosofica, teologica*, edited by Massimo Bucciantini, Michele Camerota, and Franco Giudice, 91-107. Firenze: Olschki, 2011.

Reinhardt, Volker. "Il concilio di Trento e le scienze naturali: la controversia fra Bellarmino e Galilei come paradigma". In *Il concilio di Trento e il moderno*, edited by Paolo Prodi and Wolgang. Reinhardt, 485-501. Bologna: il Mulino, 1996.

Ricci, Saverio. "I Lincei: l'invenzione della mediazione accademica. Nuova scienza, religione, vita civile". In *Sciences et religions. De Copernic à Galilée (1540-1610)*. Actes du colloque international - Rome 12-14 décembre 1996, edited by Catherine Brice and Antonella Romano, 205-234. Rome: École Française de Rome, 1999.

Romano, Antonella. *La Contre-Réforme mathématique. Constitution et diffusion d'une culture mathématique jésuite à la Reinaissance*. Rome: École française de Rome, 1999.

Sarpi, Paolo. *Sopra un decreto della congregazione in Roma in stampa presentato per l'illustrissimo signor conte del Zaffo a 5 maggio 1616. 7 maggio 1616.* In Id., *Opere*, edited by Gaetano and Luisa Cozzi, 602-605. Milano-Napoli: Ricciardi, 1969.

Schuessler, Rudolf. *The Debate on Probable Opinions in the Scholastic Tradition*. Leiden: Brill, 2019. https://doi.org/10.1163/9789004398917

Shea, William R., and Artigas, Mariano. *Galileo in Rome. The Rise and Fall of a Troublesome Genius*. Oxford: Oxford University Press, 2003. https://doi.org/10.1093/oso/9780195165982.001.0001

Stelliola, Niccolò Antonio. *Encyclopaedia Pythagorea*. Napoli: appresso Costantino Vitale, 1616.

Thomas Aquinas. *Summa theologiae*, *Leonina* edition. Roma: ex typographia polyglotta S.C: de Propaganda fide, 1888-1906.

Torrini, Maurizio. "Epistolari e rivoluzione scientifica". *Rivista di filosofia neo-scolastica* 2 (2014), 347-359.