Chapter 10

André do Avelar and the Teaching of Sacrobosco's *Sphaera* at the University of Coimbra

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Abstract André do Avelar was the mathematics professor of University of Coimbra from 1592 to 1616. During his lifetime he published two astronomical works: a popular vernacular book called *Reportorio dos tempos* (1585) and *Sphaerae vtrivsqve tabella* (1593). Avelar's *Sphaera*, composed for use at the university, was the only Latin version of Sacrobosco's work ever published in Portugal. Avelar's book was inspired by Sacrobosco's work and followed it closely, but it might be regarded as a new work, because he changed the wording and the order of presentation of the topics, added new information and several tables. After his retirement, Avelar was accused of Jewish beliefs and practices, and was condemned by the Inquisition in 1620, dying in prison. This paper analyzes Avelar's life, his work at the University of Coimbra, the content and role of his *Sphaera*, his career, and his trial by the Inquisition.

1 Introduction¹

All over Europe, the *Tractatus de sphaera* by Johannes de Sacrobosco (died ca. 1256) remained the most widely known astronomical textbook for centuries. Four versions of Sacrobosco's *Sphaera* were published in Portugal in the sixteenth century. Three of them were in Portuguese, and only one in Latin (do Avelar 1593) (Fig. 10.1).

The title page of the Latin version contains some biographical information about the author, André do Avelar (1546–ca. 1623): born in Lisbon (*Olysipo*, in Latin), he was a Master of Arts and Philosophy (to be exact, in theology), and at the time of

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Fig. 10.1 Title page of André do Avelar's commentary on the *Sphaera*. From (do Avelar 1593, fol. 1). Courtesy of the Biblioteca Universidad de Sevilla

the book's publication he was a professor of mathematics at the University of Coimbra. As one can see on the title page, the work was published with the permission of the Inquisition. The elliptical emblem contains the expression "Flectimur sed non frangimur" (we are bent, but not broken), meant to exhibit a proud and defiant attitude in the face of adversity. Here, on the very first page of the book, we find the main topics to be addressed in the following paper: a Latin commentary on the *Sphaera*; its author's biography; the teaching of the *Sphaera* at the University of Coimbra; and the involvement of the author in the Inquisition.

2 Pedro Nuñez and the *Sphaera* at the University of Coimbra

The first Portuguese university was created in Lisbon in 1290 (Rodrigues 2006). During the fourteenth century it moved to Coimbra, then back to Lisbon, back again to Coimbra, and once more to Lisbon (1377), where it remained until 1537, when it

was permanently relocated to Coimbra by King João III (1502–1557). Only after this final move was the university endowed with its earliest chair of mathematics, which was first occupied by Pedro Nuñez (1502–1578) in 1544 (da Fonseca 2001; da Fonseca 2004).

The Society of Jesus was officially approved by Pope Paul III (1468–1549) in 1540. In the same year, two Jesuits arrived in Portugal to begin their religious and educational work. Their first school in Portugal was the Colégio de Jesus in Coimbra, founded in 1542. The Colégio do Espírito Santo began its activities in Évora in 1551, and it officially became the second Portuguese university in 1559 (Dias et al. 2012, 117). No other university was created in Portugal until the twentieth century.

Pedro Nuñez studied medicine at the universities of Salamanca and Lisbon, obtaining his title in 1525. During his medical studies he became deeply involved with mathematics and astronomy, and in Portugal he obtained the position of “Royal Cosmographer” in 1529 (da Fonseca 2004). From 1531 onwards, he was the tutor of two of the younger brothers of King João III: Luís, Duke of Beja (1506–1555), and Fernando, Duke of Guarda (1507–1534). Later on, he also taught the prince and future king Dom Sebastião (1554–1578). Some noblemen also benefited from Nuñez’s teachings during this period, including Dom João de Castro (1500–1548), who became famous for his navigations and was later viceroy of Portuguese India.

In 1537, Nuñez published his first book, containing a Portuguese translation of the *Sphaera* with commentary as well as a partial translation of Georg Peurbach’s (1423–1461) *Theorica planetarum* and other tracts (Nuñez 1537). It was dedicated by his author to Prince Luís. This was not the first Portuguese translation of Sacrobosco; another one, by an anonymous translator, had been published twice before 1520 (Bensaude 1912; de Albuquerque 1965) (Chap. 7).

It is clear that Nuñez’s translation was not intended to be nor ultimately used as an academic textbook, because the statutes of the university prescribed the exclusive use of Latin as the official idiom for teaching (Leite 1963, 314). The language and content of Pedro Nuñez’s first book show that his envisioned audience included people associated with navigation (pilots and cosmographers). That is what the author himself stated in the preface of his book:

Having seen that the treatise on the *Sphaera* and the theory of the Sun and the Moon, and also the first book on the Geography of Ptolemy, contain those principles that must belong to any person who wants to know something about Cosmography, I translated them into our language so that those who do not know Latin would not be deprived of them. (Nuñez 1537, 5)

Nuñez had taught philosophy at Lisbon University (1531–1533), and became its initial professor of mathematics after it was moved to Coimbra (da Fonseca 2001; da Fonseca 2004). He certainly used Sacrobosco and Peurbach as the basis of his astronomical teaching. Another of his books was possibly produced for the use of his students: *Astronomici introductorii de sphaera epitome* (Nuñez 1940, vol. 1, 244–67). It is a very short version (twelve pages) of the first three books of the *Sphaera*. There is only one known copy of this book and it lacks the title page; for that reason, its place of publication, publisher, and date are uncertain. Some historians (including Joaquim Bensaúde) claim that it was written before the translation of the *Sphaera*; others (such as Rodolfo Guimarães) suppose that it was composed

later (Nuñez 1940, vol. 1, 329–33). It is doubtful that it could be of any use outside the academic environment. Hence, I think that it was composed for use at the university, probably after 1544. This book was published only once in the sixteenth century and was not reproduced in Nuñez's *Opera* (printed in 1566, 1573, and 1592), although that work contained his comments on Peurbach's *Theorica planetarum*.

In 1547, Nuñez was appointed as the first “cosmógrafo-mor” (high cosmographer) of the Portuguese kingdom, holding that position until his death in 1578 (da Mota 1976, 54). The duties of the high cosmographer during this period are not well known. The oldest official regulations about the *cosmógrafo-mor* were established in 1559, but they are unknown; only the directives of 1592 survived. Those were established under Spanish rule, and might have been widely different from their predecessors.

Pedro Nuñez taught mathematics only from 1544 to 1557, with frequent calls by the king to Lisbon. In 1557, he took a leave and moved to Lisbon for 4 years, possibly because of the needs of his position as high cosmographer. He retired from the university in 1562, shortly after his return to Coimbra (da Fonseca 2004). It is odd that his chair was not assigned to any other professor for three decades. Mathematics had been a relevant part of the Liberal Arts curriculum in all European universities since the Middle Ages, and it was also required for the study of medicine because of its astrological components. It is known that there were temporary teachers of mathematics in some periods after Nuñez's retirement; but the chair remained vacant until 1592.

3 Mathematics at the *Colégio das Artes* of Coimbra

The extended absence of a mathematics professor at the University of Coimbra can be explained, however, by the fact that this discipline was taught at another institution. In 1542, King Dom João III also founded the *Real Colégio das Artes e Humanidades* (Royal School of Arts and Humanities), a preparatory school in Coimbra, which was attached to the university. Its aim was providing the prerequisite studies for the main university courses. It was created as a general college for grammar, rhetoric, poetry, logic, philosophy, mathematics, Greek, and Hebraic. Its faculty numbered sixteen, one of them a professor of mathematics (Teixeira 1899, 4–5).

Its activities began in 1547 under the direction of André de Gouveia (1497–1548), who had formerly been the dean of the University of Paris. André de Gouveia brought from France several outstanding teachers and the school soon gained prominence (Hopkins 2016, 165). One of the foreign teachers brought by Gouveia to Coimbra was Élie Vinet (1509–1587), who became a friend of Pedro Nuñez and helped to disseminate his works abroad. In 1555, Dom João III decided to hand the direction of the *Colégio das Artes* to the Company of Jesus (Dias et al. 2012, 118).

Several archival documents of the 1550s refer to the professor of mathematics (Teixeira 1899, 282, 305, 403, 407), although there is no information about who occupied the chair. The directive of the *Colégio das Artes* was contained in the 1559 statutes of the University of Coimbra, which ascertained that the students of arts should have lessons on arithmetic, geometry and perspective during the third term of the second year, and during the third term of the third year they should read the *Sphaera* (Leite 1963, 317–18). Perhaps the subjects that were lectured on were not so different from the curriculum taught at other Jesuit schools. Jerónimo Nadal (1507–1580) wrote the statutes of the Jesuit School of Mesine and included the following mathematical topics in the study of philosophy: some books of Euclid (died 285 BCE), practical arithmetic, the *Sphaera* or the cosmography of Oronce Fine (1494–1555), the astrolabe of Johannes Stoeffler (1452–1531), and the astronomy of Georg von Peurbach (1423–1461). In 1552, Nadal proposed a general plan of study for all Jesuit schools, including a more complete program of mathematics, adding to the previous list the study of the theory of music and perspective; all the students of philosophy should study mathematics for 3 years (Fuentes 2012, 136–37). Baltasar Torres (1518–1561), the first professor of mathematics at the *Collegio Romano*, wrote two poposals for the teaching of mathematics at the Jesuit schools that were similar to those of Nadal (Fuentes 2012, 139). It is unlikely, however, that the teaching of mathematics at the *Colégio das Artes* was so complete. Nadal himself visited the school of Coimbra and complained in his report that only the students in their second and third years received lectures on mathematics, which lasted only half an hour each day (Fuentes 2012, 141).

Christophorus Clavius (1538–1612), one of the most famous mathematicians of late sixteenth century, studied at the *Colégio das Artes*. When he was 16 years old, he entered the Society of Jesus in Rome, and the next year he was sent to Coimbra, where he remained as a student from 1556 to 1560. It is unlikely that he was ever a student of Pedro Nuñez, and we do not know who could have been his mathematics professor at the Jesuit college, so he was probably a self-taught mathematician (Lattis 1994, 14–15; Baldini 1998, 214). In 1561, he went back to Rome, and in 1563, he began teaching mathematics at the *Collegio Romano*.

Sometimes the philosophy teachers of the *Colégio das Artes* provided their students with the necessary mathematical and astronomical knowledge by introducing the study of the *Sphaerae* in their courses on natural philosophy, between the lessons on Aristotle's (384–322 BCE) *Physica* and the study of his *De Coelo* (Baldini 1998, 205). Some manuscripts of such mixed lectures are extant, the earliest one from 1570, written by the Jesuit “Ioannis Gomesii Bracharensis,” that is, João Gomes of Braga—an otherwise unknown philosophy teacher at Coimbra. A similar manuscript by another Jesuit priest, Luís de Cerqueira (ca. 1552–1614), who taught philosophy at Coimbra from 1581 to 1585, is also preserved, as are analogous manuscripts by three Jesuits teaching at Évora in the decade of 1580 (Baldini 1998, 235).

Philosophy, not mathematics, was the main focus of the professors of the *Colégio das Artes*. From 1592 to 1606, they published the eight volumes of the famous *Cursus Conimbricensis*, containing the best commentaries on Aristotle produced at that time. These underwent several editions and were used throughout Europe (Casalini 2017).

It seems that the first Portuguese Jesuit mathematician was João Delgado (1553–1612). He joined the Jesuit order in 1574 and 2 years later was sent to Rome to study at the Collegio Romano, where he learned mathematics under Clavius. He remained there for 9 years and returned to Portugal in 1585 (Leitão 2008, 46). He intended to go to Brazil as a missionary,² but for unknown reasons he remained in Coimbra, where he taught mathematics from 1586 to 1589. The manuscripts of his lessons corresponding to 1586/7 and 1587/9 have been preserved (Baldini 1998, 229). From that time onwards, the influence of Clavius in Portugal was remarkable (Carolino 2006).

In 1590, Delgado began to teach mathematics at the Colégio de Santo Antão in Lisbon. This Jesuit school had begun its activities in 1553 and it was initially dedicated to the teaching of Latin, Greek, rhetoric, ethics, and religion. Mathematics was taught there occasionally, but at the end of 1573, the cardinal Dom Henrique asked the Jesuits to include in their curriculum the study of subjects related to navigation. The agreement was only fulfilled many years later, under the Spanish domain. João Delgado became the first mathematics teacher of Santo Antão, starting in 1590 with the *aula da esfera* (lessons on the sphere) (Leitão 2008). He was sometimes substituted by another priest, Francisco da Costa (1567–1604). Several manuscripts of Delgado's courses have been preserved, some of them on astronomy (especially Sacrobosco and Peurbach), but also including astrology (Silva and Ferreira 2008, 103–08). The manuscripts of Francisco da Costa that have been preserved show that he lectured on geography and hydrography—that is, the science of navigation (Silva and Ferreira 2008, 113–20). The mathematician Christoph Grienberger (1564–1636), who had also studied under Clavius, also taught at the Colégio de Santo Antão in the period 1599–1602, returning afterwards to Rome. Hence, from 1590 onwards, the Jesuit Colégio de Santo Antão in Lisbon became an outstanding center for the study of mathematics, and especially astronomy (Leitão 2008).

4 André Do Avelar's *Reportorio dos tempos*

After the disappearance or death of King Sebastian I (1554–1578) during the battle of Alcácer Quibir, his great-uncle, Cardinal Henry (1512–1580), assumed the throne. His death led to a succession crisis, and the Portuguese crown was seized by the Spanish king Phelippe II (1527–1598). He was called Phelippe I in Portugal, where he was king from 1581 to his death. During his reign, the University of Coimbra received new statutes.

They were signed by the king in 1591, with immediate effect. This decree declared as vacant the mathematics chair and established the *modus operandi* for the election of a new professor (called “lente,” or reader). The new statutes of the

²Jesuit priests sent to distant places as missionaries were required to study mathematics (astronomy, geography, cartography etc.). For more information, see (Baldini 1998, 196–203).

university required that candidates for the chair of mathematics should read two lessons, one about Euclid and the other on the theory of the planets (Universidade de Coimbra 1593, fol. 77r).

There was only one candidate for the job: André do Avelar. In January 1592, he was examined and presented his lectures, and the selection commission decided to bestow him the chair of mathematics, because there was no other candidate (“opositor,” that is, opponent) and because he was “one of the greatest men in this science” (Almeida 1967, 47–48). The university Dean (“Reitor”), who played a part in the decision, was Dom Fernão Martins Mascarenhas (1548–1628); he later became the General Inquisitor of Portugal in 1616 (Martins 2011).

Who was André do Avelar at this time? The documentation of his selection only states his name (penned as “Andre dauellar”), that he was poor (so that the university would have to pay his taxes) and a “foreigner” (probably meaning that he was not from Coimbra). Also, the selecting commission knew that he was knowledgeable in mathematics (de Almeida 1967, 47–48).

Very little is known about his life previous to his entrance into the University of Coimbra.³ Most of the available biographical information about him comes from the documents of the Inquisition.⁴ He was born in Lisbon in 1546 to a family of converted Jews (“cristãos-novos,” or New Christians). His father was called Galás do Avelar, and his mother was Violante Fernandes. He had four brothers and three sisters. He studied in Salamanca and Valladolid, obtaining the degree of Master of Arts; he also studied theology. He married Luiza de Faria, and they had six children, three sons, and three daughters (Baião 1919, 134–35).

We have no information about his way of living before he became professor of the University of Coimbra, and at that time he was 45 years old. There is, however, a relevant event in this period: in 1585, he published his first book (Fig. 10.2), called *Reportorio dos tempos*—an untranslatable title; it means something along the lines of a repertory or collection of information concerning time.

This is a peculiar work, belonging to a category of books on astronomy, calendars, and astrology, which became common in Spain and Portugal from the late fifteenth to the early seventeenth century (da Costa 2007, 75–79). They usually received the names *Chronographia* or *Reportorio dos tempos* (or *Reportorio de los tiempos*, in Spanish). They were different from the almanacs found all over Europe in several respects. They were large books (sometimes with a few hundred pages), not cheap and disposable items; they were intended to function as general non-technical treatises of permanent significance. They were always written in vernacular in order to reach a wide public. The oldest example was Andrés de Li’s *Reportorio de los tiempos*, published in Zaragoza in 1495. This small work was printed several times in Spain and in Portugal, where it was translated and improved by Valentim

³There is only one publication describing Avelar’s life (de Almeida 1967) and, although it transcribes relevant documents, it is very sketchy and does not deal with Avelar’s religious involvement and the Inquisition process.

⁴Avelar presented his biographical information to the Inquisition on March 23, 1620 (Braga 1892–1902, vol. 2, 603–04; Baião 1919, 134–35).

Fig. 10.2 Title page of André do Avelar's first book, *Reportorio dos Tempos*. Notice that it contains an emblem very similar to the one that was published in his *Sphaera*, in 1593. From (da Costa 2007)

Fernandes (died ca. 1518). It inspired successively larger works with similar titles and content, the most famous being Jerónimo de Chaves's (1523–1574) *Chronographia o reportorio de los tiempos*. The last known works of this type were composed in Portugal by Manuel de Figueiredo (1568–1630) and in Spain by Rodrigo Zamorano (1542–1620).

This highly popular class of works represents a nice example of a blend combining various approaches and interests (Cardoso and Martins 2018). Its chronological part included information required by priests to calculate the religious calendar and the correlation between the hours of each weekday and the planets, according to astrologers; it described the division of day and night in natural and artificial hours; the heavenly spheres, and the astrological influence of each planet; the Zodiac was described both from the point of view of its influence on the sublunary world and

regarding the details of the sun's motion along the ecliptic, and the duration of the days and nights. This kind of work included a fairly detailed description of the universe and its parts, of the heavenly circles and their terrestrial counterparts, introducing the zones and climes. The religious calendar, with the names of Catholic saints connected to each day, was combined with recommendations concerning what should be done or avoided in each lunar phase, for each month. A considerable part of the book was devoted to astrological medicine, explaining the four humors and temperaments, and the astronomical choice of treatments according to the temperament and the configuration of the heavens. Eclipses were described both as purely astronomical phenomena, providing tables of their occurrences, and as astrological causes of storms, wars, and other calamities. The treatises dealt with the influence of the moon on the weather and on crops, and they sometimes presented information concerning navigation and tides.

The encyclopedic character of works of this kind shows that it was not aimed at a particular public with a specific interest—indeed, any person of that time could profit from reading some part of the book. This circumstance probably explains the wide circulation and popularity of those works.

André do Avelar's *Reportorio dos tempos* was not an exception; it was typical for that kind of literature. As with many other works of this type, it drew heavily from earlier *Reportorios* without citing them. However, the author also consulted many other calendrical, astronomical, and astrological works, besides books on geography and navigation, to update and improve his own composition. In the successive editions of his book, Avelar always added new information. The first edition (do Avelar 1585) had 297 pages, from the title page to the end of the work; the fourth edition (do Avelar 1602) had 575 pages, with a slighter larger mean number of characters per page. Hence, the fourth edition was about twice the size of the first one.

Avelar's *Reportorio dos tempos* was described by some authors as a mere Portuguese translation of a similar Spanish book called *Chronographia, o, Reportorio delos tiempos, el mas copioso y preciso que hasta agora ha salido a luz*, by Jerónimo or Hieronymo de Chaves. This was the most successful book of its kind. It was first published in 1548 and was reprinted twelve times in the sixteenth century, seven times as a posthumous publication. There are, of course, many similarities in content between Avelar's book and Chaves's work, as was the case with analogous publications of the time. The charge of plagiarism was dismissed, however, by a careful comparison between the two works done by Adalgisa Botelho da Costa (da Costa 2007, 81–143).

The full title of Avelar's book contained a misleading advertisement: the most copious that has hitherto been brought to light ("o mais copioso que ate agora sahio a luz"). As a matter of fact, it was smaller than Chaves's *Reportorio*.

The first edition of the book was dedicated to Dom Manoel de Castelbranco, or Castello Branco (1560–1614), Second Earl of Villa Nova de Portimão (Avelar 1585, fol. Iir). Several members of this family, including Manoel, participated in the Battle of Alcácer Quibir (1578) when the King of Portugal Sebastião I (1554–ca. 1578) was killed or disappeared. Manoel was then 17 years old and was captured by the moors. Afterwards he was released and returned to Portugal. His father, Dom João, and his grandfather, Dom Martinho, died in this battle (Bayão 1737, 706).

Why did Avelar dedicate his book to this young earl? The inscription found on the book does not elucidate this. It only mentions that the Castelbranco family had “many titles of honor and greatness.” We may presume that Avelar knew Dom Manoel personally, because it was not acceptable to dedicate a work to a person without his or her permission. It is also likely that the subject of the book had some significance to the earl. A single source describes Dom Manoel de Castelbranco as a “distinguished mathematician” (*Encyclopedia e Dicionario Internacional* 1933, vol. 4, 2264) and Diogo Barbosa Machado stated that “he applied himself exceedingly to the study of mathematical disciplines” (Machado 1741–1759, vol. 3, 217–18).⁵ Was he a private student of André do Avelar? Was Avelar his astrologer? Any further interpretation of their relationship would be mere guesswork.

The context of the composition and publication of Avelar’s *Reportorio dos tempos* is not evident. In his preface, he tells a tale about Diogenes the Cynic (ca. 412–323 BCE) to justify why he wrote the book:

There was a time when it was said that King Philip of Macedon would come with his army against the city of Corinth. All the dwellers of that city, in a hurry, became busy with all the things that were necessary for its defense. Some refurbished arms, others carried stones, some mended old walls, others strengthened towers and places to fight. But Diogenes, seeing the hustle and care of that people, and having nothing to do because nobody gave him any occupation, put his cloak over his arms and, in a hurry, began to roll his tub up and down the Craneum mount.⁶ One of his friends asked him why he was doing this, and he answered: I also move and roll my tub, so that among all those who are busy and hurried, I do not remain the only idle one, having nothing to do. I [André do Avelar] say this because facing this multitude of writers and books that every day come to light, I should not be the only one who does not do his part, as Diogenes intended with his tub. Farewell. (Avelar 1585, fol. IIv)

This story about Diogenes was not invented by André do Avelar; it was reported by Lucian of Samosata (ca. 125–180), in his work “The way to write history,” where the anecdote is introduced to provide Lucian’s own support for writing that work (Lucian 1905, 110). Of course, this is not an adequate justification for writing and publishing a book; it could only be an excuse for some useless occupation. Why did Avelar present Diogenes as his prototype? Did he see himself as a philosopher? Was he really as idle as Diogenes, having no job and nothing to do? No, we know that he was married and had already one daughter (Tomásia) to take care of (Carvalho 1990, 333). Perhaps the true motive for writing the book was an attempt to get some money. And the book was successful indeed, as it underwent four editions (do Avelar 1585, 1590, 1594, 1602).⁷

⁵The Jesuit priest António de Castello Branco, who imparted lessons on the *Sphaera* at Évora in the decade of 1580 (Baldini 1998, 235) was not his relative.

⁶Avelar wrongly understood the *Craneum* as a mount. It was a gymnasium, that is, a place for physical exercise.

⁷The website of the University of Coimbra described and made available for download a book published in 1590, with the title: “Reportorio dos tempos muito curioso acrescentado e emendado de nouo...conforme a noua constituição do sanctíssimo Papa Sixto quinto que tirou os abusos,” attributing it to André do Avelar. The book was published in Coimbra by António de Barreyra, the

A large part of the book was concerned with astrology. Judicial astrology, that is, the prediction of future events in the life of a single person, had been condemned by the Roman Church because it was understood as conflicting with human free will (Chap. 3). Avelar was well aware of that, and at the beginning of the book he added a poem, which stated: “understanding that everything that be said of the properties of the signs and planets will not remove the freedom of man, nor win over free will, nor bring necessity to human activities; and the whole [content of the book] is subject to correction in obedience to the sacred motherly Roman Church” (do Avelar 1585, fol. IIv).

As stated before, Avelar’s *Reportorio dos tempos* is not a mere translation of the similar work published by Jerónimo de Chaves. It seems to have drawn information from a variety of sources, and this leads us to a relevant question: How did Avelar have access to the books he needed, since he and his family were not rich? There were no public libraries in Portugal at that time. The university library had moved to Coimbra. In Lisbon, where Avelar lived, there were only libraries belonging to wealthy families, rich professionals (such as physicians), and those of religious institutions. Therefore, we may assume that he had access to some of these. From the dedications of his books, we may guess that he had access to the libraries of noblemen.

The second edition of the *Reportorio dos tempos*, published in 1590, was dedicated to Dom Álvaro de Lencastre (1540–1626), third Duke of Aveiro. At the beginning of Avelar’s inscription to the Duke of Aveiro, there is a relevant piece of biographical information:

Last year (when I bade farewell to your excellency to read on the chair of mathematics at the University of Coimbra by order of his Majesty) I promised to your excellency that any of my works that was first brought to light would be put under your protection and support. However, I had a different intent, that of [dedicating to you] the books on the *Sphaera* and its use, that I have [ready] to print at the said University. Nevertheless, in the mean time, as I should not be idle to the curiosity of the mathematical studies [não me soffrendo estar ocioso a curiosidade do studo Mathematico], and, on the other hand, desiring to show to your excellency a first gesture [towards fulfilling] this offer and promise, I made in this recast of the treatise on the times [tractado dos tempos] a particular [addition] on the prognostic of the changes of the air, with some principles related both to natural philosophy and to rural astrology, and some brief but compendious rules for sowing, the culture of trees, and the breeding of animals. Besides those reasons, I was impelled [to dedicate this book to you] by seeing that your highness is so fond of the countryside and of its care. (do Avelar 1590, fol. IIv)

printer of the University of Coimbra. This book, however, is not an edition of Avelar’s *Reportorio dos tempos*. It is a different work compiled by the printer. Notice that the title page of the 1590 Lisbon edition of Avelar’s *Reportorio dos tempos* stated that the printer had received the royal privilege for ten years. Therefore, no one else could publish it during this period. The Coimbra edition contains no declaration of privilege, and the prologue to the reader implies that the printer had produced a compilation taken from different works to compose the book.

The same dedication is reproduced in the third edition of the *Reportorio dos tempos* (do Avelar 1594, fol. IIR). The fourth edition is also offered to the Duke of Aveiro, but it contains a different inscription (do Avelar 1602, fol. A2v).

Hence, André do Avelar was already teaching mathematics at the University of Coimbra in 1589 (and maybe before that year), although he only became a regular professor (“lente”) in 1592. The above citation also shows that in 1590 Avelar had already written his *Sphaera*, probably intending to use it at the university, since it was ready to be printed there.

The citation also exhibits a friendly relationship between Avelar and the Duke, once more suggesting that he was on good terms with some noblemen and could probably profit from their favors and access to their libraries. That a dedication to Dom Álvaro de Lencastre appeared in the three editions from 1590 to 1602 (and the last one was not a reproduction of the first) proves that the relationship between them was enduring. It is possible that he also received patronage from the Duke of Aveiro during that period.

Around 1600, Avelar was better known for his *Reportorio dos tempos* than for his *Sphaera*.

5 “Flectimur Sed Non Frangimur”

The first three editions of the *Reportorio dos tempos* and the only edition of Avelar’s *Sphaera* have in the title page a peculiar emblem (Fig. 10.3). The same woodcut was used in the three editions of the “Reportorio.” The woodcut used for the *Sphaera* (Fig. 10.1) was a bad copy of the Lisbon original.

Venâncio Deslandes (Deslandes 1888, 127) described the emblem and suggested that it was a representation of the four elements. He wrongly transcribed the phrase appearing on the emblem as “non frangimur sed flectimur.” (Fig. 10.4).

The emblem of reeds in the water, being bent but not broken, with the motto “Flectimur non frangimur” (we are bent but not broken) or “Flectimur non frangimur unde” (we are bent but not broken by the waves) had been used since the fourteenth century by two Italian families, Colonna and Acquaviva (Gelli 1916, 286–87). In the fifteenth century, the Pope Alexander VI, born Rodrigo de Borja (1431–1503), banished from Rome the Cardinal Giovanni Colonna (1456–1508) and other members of the family, who took refuge in Naples and Sicily. They then assumed the emblem again (Fig. 10.4), and this was meant as a warning: although the Colonna family was bent by pontifical persecution, the Pope should not consider them dead and buried; they were still alive and powerful, and hoped sooner or later to grow even stronger than before and get pay back (Gelli 1916, 287; Palliser 1870, 73–74). Both the emblem and its history were well known in the sixteenth century and were included in the work “Symbolorum & emblematum” of Joachim Camerarius (1500–1574) under number “95” (Camerarius 1590, fol. 97r).

Fig. 10.3 Title page of the third edition of André do Avelar's *Reportorio dos tempos*. From (do Avelar 1546). Courtesy of the National Library of Portugal

Fig. 48.—Colonna Family.

Fig. 10.4 The emblem of the Colonna family, with the motto “Flectimur non frangimur undis.” According to Mrs. Bury Palliser, the emblem was created by Jacopo Sannazaro (1458–1530). From (Palliser 1870, 74). Public Domain Mark

Why did Avelar incorporate this emblem in his books? Had he suffered some personal persecution? Did he hope to rise from a defeated, humble condition to a higher one? Lack of knowledge about his personal history prevents us from giving any well-founded answer. However, one may conjecture that the emblem was related to his family situation: they were of Jewish origin, and there was a social stigma oppressing this class. As is well known, all Jews had been expelled from Spain in 1492, and from Portugal in 1497. Any Jew willing to remain in Portugal after that time was compelled to become a Christian. The pejorative name “New Christian” was applied to those Jewish converts and to their posterity. Perhaps Avelar yearned for a time when the New Christians would rise once more to their deserved social status or would be allowed to become Jews again.

6 Avelar's *Sphaera*⁸

The only edition of Avelar's *Sphaera* was published in 1593, the year after he became the official reader of mathematics at the University of Coimbra. The title of the book is highly peculiar: *Sphaerae vtrivsq[ue] tabella, ad sphaerae huius mundi faciliorem enucleationem*, meaning "Tablet of both spheres, for easier explanation of the sphere of this world." Here, "tabella" does not mean "table," but a little board or tablet. In the aforesaid title, it meant a summary or abridgment. The word appeared with the same meaning, for example, in the title of one of the books of Louis de Blois (1506–1566): *Tabella spiritualis alias sacellum animae fidelis nuncupata: continens brevem institutionem vitae Christianae* (de Blois 1583). However, Avelar's book cannot be interpreted as a summary of Sacrobosco's work, because it is indeed larger than the medieval treatise. It could be understood as a short version of the *Sphaera* only when compared to the large commentaries that had become usual by the end of the sixteenth century.

The phrase "both spheres" (*sphaerae utriusque*) used in this book was unusual. The only astronomical work I have found with a title that might have inspired Avelar was *De mundi et sphaerae: ac utriusque partium declaratione cum planetis et variis signis historiatis* by Gaius Iulius Hyginus (ca. 64–17 BCE), which was printed several times in the sixteenth century.

Avelar's *Sphaera* was dedicated to Dom Ferdinando (or Fernão) Martins Mascarenhas, the Dean (*Reitor*) of the University of Coimbra and adviser of King Philippe who became General Inquisitor two decades later. After the dedication, the author addressed the students of mathematics that comprised his intended public. After that, we find several poems dedicated to the readers and to the author of the book by the priest António Velloso of Braga; by Pedro Mendes, professor of Latin and Greek; and by Dom Jorge de Castro (do Avelar 1593, fol. IIr–VIr). Unfortunately, it was impossible to find information about them.

Avelar's *Sphaera* does not cite the name of Sacrobosco at any point, although he closely follows the medieval text. Of course, every reader knew that the book was a new version of Sacrobosco's, therefore Avelar could not have held the expectation of being regarded as the original author of the ideas contained in the book.

Many of the commentaries on the *Sphaera* contained Sacrobosco's full original text, set in a clearly distinct typography and intermixed with elucidations. That was the style followed, for instance, by Pedro de Espinosa,⁹ a professor of the University of Salamanca, who published a Latin commentary on Sacrobosco that underwent two editions (1535, 1550), a commentary that might have been read by Avelar when he was a student (de Espinosa 1550). The famous and massive commentary produced by Christophorus Clavius (Lattis 1994) also followed the same structure. Avelar, however, did not follow the example of those predecessors. It is simply

⁸This following section is an expanded and corrected version of (Martins 2003b).

⁹The name "Pedro de Espinosa" was rather common in Spain in the early sixteenth century. There is no reliable information about the dates of birth and death of the author of this commentary on Sacrobosco (Díaz Díaz 1987, v. 3, 68–69; Delgado 1983).

impossible to identify, by any typographical hint, where he was simply transcribing Sacrobosco’s text and where he was presenting his own contribution. Indeed, the style of Avelar’s book is that of a paraphrase of Sacrobosco’s *Sphaera*.

Sacrobosco started his first chapter with definitions of the geometric sphere by Euclid and Theodosius (347–395). Avelar referred initially to the “material sphere,” that is, the armillary sphere, the instrument used to explain the structure of the universe. Immediately afterwards, however, Avelar applied Theodosius’s definition to that sphere and introduced the concepts of axis and pole exactly as Sacrobosco had done. In the citations shown below, the corresponding parts are underlined.

Avelar	Sacrobosco
Sphaera materialis est instrumentum quoddam rotundum, compositum ex variis circulis, quibus coelorum motus, totiusque mundis situs, commodissime explicantur, <u>in cuius medio punctum est, à quo omnes lineae rectae ad circumferentias circulorum ductae sunt aequales: & illud punctum dicitur centrum sphaerae, linea vero recta transiens per centrum, applicans extremitates suas ex utraque parte ad circumferentiam circa quam sphaera voluitur dicitur axis sphaerae: duo vero puncta axem terminantia, dicuntur poli mundi.</u> (do Avelar 1593, fol. 1r–v)	Sphaera etiam a Theodosio sic describitur: sphaera est solidum quoddam una superficie contentum, <u>in cuius medio punctus est, a quo omnes lineae ductae ad circumferentiam sunt aequales: & ille punctus dicitur centrum sphaerae. Linea vero recta, transiens per centrum sphaerae, applicans extremitates suas ad circumferentiam ex utraque parte, circa quam sphaera voluitur, dicitur axis sphaerae. Duo vero puncta axem terminantia dicuntur poli sphaerae.</u> (Vinet 1561, fol. 9v)

The underlined parts show that Avelar, for the most part, just copied Sacrobosco’s text without substantial changes. Differences concerning the order of the words, punctuation, and even changes to some terms are not noteworthy, since similar differences appeared in different printed editions of Sacrobosco’s own text.

After the definition of the sphere, Avelar presented the main circles of the heavenly sphere, a subject that appeared only at the second part of Sacrobosco’s text. The explanation of the greater and smaller circles is slightly different.

Avelar	Sacrobosco
De circulis sphaera materialis. Cap. II Sphaera autem materialis componitur ex decem circulis, quarum haec sunt nomina scilicet aequinoctialis, zodiacus, colurus solstitiorum, colurus aequinoctiorum, meridianus, horizon, tropicus Cancri, tropicus Capricorni, circulus Arcticus, circulus Antarcticus. <u>Horum vero circulorum, quidam sunt maiores, quidam minores:</u> priores sex maiores dicuntur, seu maximi: posteriores quatuor minores appellantur, sive non maximi. <u>Maior circulus in sphaera is dicitur, qui idem centrum cum sphaera obtinet: ipsamquae, in duo hemisphaeria dividit:</u> minor vero circulus est ille, qui diversum centrum a sphaera centro possidet, ipsa sed in duo segmenta inaequalia partitur. (do Avelar 1593, fol. 2r–v)	Capitulum secundum. De circulis, ex quibus sphaera materialis componitur: & illa supercoelestis, quae per istam imaginatur, componi intelligitur <u>Horum autem circulorum quidam sunt maiores, quidam minores,</u> ut sensui patet. <u>Maior autem circulus in sphaera dicitur, qui descriptus in superficie sphaerae super eius centrum, dividit sphaeram in duo aequalia.</u> Minor vero, qui descriptus in superficie sphaerae, eam non dividit in duo aequalia sed in portiones inaequales. (Vinet 1561, fol. 20v)

André do Avelar did not follow the text of Sacrobosco and did not treat it as a sacred or immutable astronomical revelation. The original *Sphaera* was, of course, his point of departure, but he felt free to produce his own work. In this respect, his approach was uncommon, although there had been several precedents, including Galileo Galilei's (1564–1642) unpublished textbook on the *Sphaera* (Galilei 1656; Martins and Cardoso 2008; Martins and Cardoso 2017).

Avelar's book was divided into four parts like Sacrobosco's work, and it included essentially the same content, but with an inversion of the order of the first and second parts. The first part of Avelar's *Sphaera*, "On the material sphere and the circles of which it is composed," containing twelve chapters and one table and occupying nine numbered leaves, presented the main circles of the celestial sphere and their terrestrial counterparts. The sequence and content are almost identical to the second part of Sacrobosco's *Sphaera*, with some slight differences. For instance, Avelar used $23^{\circ} 30'$ for the obliquity of the ecliptic, a better estimate, at that time, than Sacrobosco's value of $23^{\circ} 33'$.

The second part, called "On the sphere of the world, or natural [sphere], and its parts," was divided into eighteen chapters and one table, filling forty-five numbered leaves. It is similar to the first part of Sacrobosco's book, but some parts were put into a different order. For instance, Avelar discussed the size of the earth before presenting the celestial structure (ether, motions, and form of the heavens). He mentions the theory of trepidation and the need for ten heavenly orbs, instead of the nine mentioned by Sacrobosco, following, at this point, the proposal that had been introduced by King Alphonso X, el Sabio (1221–1284). Besides this change, Avelar added some quantitative data and some tables. One of them provides the declination of the sun throughout the year, essential information for the determination of latitudes. There are other relevant differences. Avelar introduced several mentions of the *Astronomica* of Marcus Manilius (fl. 1st century), a book that was seldom cited in commentaries on Sacrobosco's *Sphaera*. The outlook of Manilius's work was mainly astrological, and references to his contribution betray Avelar's deep involvement with astrology. Accordingly, in the second part of his *Sphaera* he presented some astrological information about the signs and established relationships between the four elements, the four humors, the seasons, and the four ages of mankind. This part of the book also mentions new information that became available because of the Iberian navigations, such as knowledge of the Southern Cross (Fig. 10.5), dark nebulae, the Magellanic Clouds, and a new evaluation of the size of the earth.

The third part of Avelar's *Sphaera*, containing fourteen chapters and several tables encompassing thirty-nine leaves, closely follows the structure and the content of Sacrobosco's third chapter. It deals with the rising and setting of the stars and constellations, the yearly motion of the sun, the diversity of duration of days and nights, and the climates. Avelar added to this part some quantitative tables, one of them showing the degrees of the equinoctial corresponding to each of the zodiacal signs, both in the case of the right sphere and the oblique sphere and, in particular, for the latitude of Lisbon. In his discussion of the climates, Avelar stated that Claudius Ptolemy (died 160) had described twenty-one parallel circles and seven climates, but the recent authors had introduced twenty-three climates and forty-nine parallel circles. He provides a table with the data for those climates and the

Fig. 10.5 Representation of the Southern Cross (“Cruzeiro”) and the Magellanic Clouds, according to Avelar. From (do Avelar 1593, fol. 12v). Courtesy of the Biblioteca Universidad de Sevilla

variation of daylight length during the year. Following Sacrobosco, Avelar presents copious literary citations from Publius Vergilius Maro (70–19 BCE), Publius Ovidius Naso (43 BCE–18), and Marcus Annaeus Lucanus (39–65).

The fourth and last part of Avelar’s *Sphaera* is quite short: six chapters and a few tables, encompassing eleven leaves. Like Sacrobosco’s fourth chapter, it deals with the motions of the sun and the moon, of the planets, and of the eclipses. Avelar provided a more detailed theory than Sacrobosco, mentioning the contributions of Alphonso X and presenting data relative to the motion of the moon.

7 The Sources of Avelar’s *Sphaera*

André do Avelar certainly consulted other works besides Sacrobosco’s to write his *Sphaera*. It is difficult, however, to find out which sources he used. Part of this difficulty is due to Avelar himself, who did not have an inclination to name his authorities. It is possible to notice this tendency in his *Reportorio dos tempos*: Chaves had provided a number of references in his *Chronographia o reportorio de los tiempos*, but Avelar did not reproduce this information, even in the cases where he was clearly translating Chaves’s book (da Costa 2007, 91–93). Note that in the late sixteenth century, several authors of academic books provided specific references to authors, the title of their works, and their relevant parts or chapters. Sometimes those references appeared inside the text, but there was an increasing use of marginal notes, the

antecedent of our footnotes. One may find a profuse employment of this kind of resource in the *Comentarii Conimbricensis*, the commentaries about Aristotle's works produced by the Jesuit teachers of Coimbra (Casalini 2017).

In his *Sphaera*, Avelar usually only reproduces the meager information contained in Sacrobosco's work: vague allusions to Aristotle, Ptolemy, Alfarganus (805–870), and other authors, without any hint as to which books the stated ideas are drawn from. He did, however, mention a few other authorities. One of them was king Alphonso X (1221–1284) (do Avelar 1593, fol. 26v, 96v), who was never cited by Sacrobosco, since the *Sphaera* was written earlier. Because of the importance of Alphonso X as a reformer of medieval astronomy, he was cited in many of the commentaries on the *Sphaera*. It was natural, therefore, that Avelar should include this authority in his book.

Another author cited by Avelar but not by Sacrobosco was Marcus Manilius, who is explicitly referred to in four distinct passages (do Avelar 1593, fol. 10v, 21r, 30r, 34r). The sixteenth century commentaries on the *Sphaera* seldom cited Manilius.

Since Avelar's book was composed for use at the University of Coimbra, it could completely avoid subjects related to navigation such as the tables of declination of the sun, used for ascertaining the latitude. This was an expected subject in the teaching of the *cosmógrafo-mor* or at the *aula da esfera*, but not at the universities. However, he did include such information, as well as data provided by navigators. He did not point out, however, which sources he used to describe the Southern Cross and the Magellanic Clouds (do Avelar 1593, fol. 11v–12v). At another point, he remarks on the visible signs of Earth's roundness and the new measurement of the geographical degree, amounting to 17.5 leagues, as determined by the “navigators of Spain” (do Avelar 1593, fol. 16r–17v).¹⁰ He also referred to “more recent” authors who had expanded Ptolemy's division of the earth from seven to twenty-three climes (do Avelar 1593, fol. 88v), but nowhere did he present the source of this information.

Although Avelar was a successor of Pedro Nuñez at the mathematics chair of the University of Coimbra, he never cited his writings (Leitão 2002, 27). In contrast, the many editions of Élie Vinet's *Sphaera Joannis de Sacro Bosco Emendata* contained Nuñez's analysis of the climes (Valleriani 2017); and the Portuguese mathematician was also cited in other commentaries, such as Clavius, where his name appeared in nine different places (Knobloch 1999, 347).

8 Literary Citations

Sacrobosco's *Sphaera* contained a significant number of poetic quotes from Virgil, Ovid, and Lucan. One of the reasons for the introduction of those classical citations was the need to elucidate the literary works themselves: many passages of those

¹⁰At this time, Portugal was part of Spain, under Phelippe I.

Latin authors could not be understood without an adequate knowledge of astronomy (Martins 2003a).

Avelar's *Sphaera* kept seventeen of the twenty-one original poetic references. He dismissed only three from the *Georgica* of Virgil and one from Lucan's *Pharsalia*. It is quite clear, however, that he did cherish those literary quotations. Indeed, in several cases he presented a larger number of verses than Sacrobosco did. For instance, when he quoted Ovid's *Metamorphoses*, Avelar reproduced seven verses (do Avelar 1593, fol. 54r); in most of the editions of Sacrobosco's work we find only four verses. He also added to his work three quotations from Ovid and one from Lucan (do Avelar 1593, fol. 30r, 36v, 56v, 78v) that were not used by Sacrobosco. The several quotations of Manilius presented by Avelar were also probably introduced for aesthetic reasons.

Avelar also incorporated in his *Sphaera* five additional literary quotes that have no counterpart in Sacrobosco's work. Only one of them was identified by Avelar himself (do Avelar 1593, fol. 35v): a citation of *In sphaeram Archimedis*, from Claudius Claudianus (ca. 370–404). Sacrobosco did not include any quotation from Claudianus in his *Sphaera*, but he did so in his *De anni ratione*, or *Computus ecclesiasticus* (de Sacrobosco 1550, fol. L 4r).¹¹

What do those additions tell us about Avelar and his sources? At first sight, they suggest that the author was familiar with Latin poetry and that this allowed him to add several quotations to those that Sacrobosco had used in his *Sphaera*. There is, however, another explanation. Maybe Avelar just made use of some commented editions of the *Sphaera* where those passages can be found. Indeed, several of the extracts used by Avelar can be found in the very popular *Sphaera Joannis de Sacro Bosco emendata*, edited by Élie Vinet (1509–1587). Observe that Élie Vinet was professor of the Colégio das Artes in Coimbra from 1547 to 1549. He was a friend of Pedro Nuñez and helped to make some contributions of the Portuguese mathematician known in Europe, introducing them in his own edition of the *Sphaera*.

Some specific instances will be examined in the following section. The seven lines of Ovid's *Metamorphoses* transcribed by Avelar were contained in Vinet's edition (Vinet 1561, fol. 87r). There we can also find one of Avelar's citations from Ovid that does not appear in Sacrobosco's work (do Avelar 1593, fol. 56v; Vinet 1561, fol. 72v) and the additional quotation from Lucan (Avelar 1593, fol. 78v; Vinet 1561, fol. 33r). Two of the four citations of authors who were not identified by Avelar were also contained in Vinet's *Sphaera* (do Avelar 1593, fol. 26r, 57r; Vinet 1561, fol. 20r, 61v).

Hence, we see that Avelar did not require considerable erudition to insert the additional poetic quotations of his *Sphaera*. Some of those literary addenda were not taken from Vinet's work, but they might have been copied from some other commentary on Sacrobosco's *Sphaera*.

¹¹ Unlike Sacrobosco's *Sphaera*, his treatise on the calendar called *Computus ecclesiasticus* or *De anni ratione* has been scarcely studied by historians of science. Some information about that work and its genre can be found in papers published by Lynn Thorndike (1954) and Jennifer Moreton (1994).

The quotation of Claudianus had been published by Francesco Giuntini (1523–1590) in his commentary on the *Sphaera* (Giuntini 1578, 347). Clavius's commentary also contains the Claudianus's verses that were used by Avelar (Knobloch 1999, 9). The same quotation also appeared in the first edition of Clavius's commentary (Clavius 1570, 24).

One particular literary addition by Avelar should be emphasized: it was part of a poem by Philip Melanchthon (1497–1560) on the rising and setting of the stars: “Mane vehit supra terram tibi Cosmicus ortus Sidera, sed Phoebi lumine tecta latent. Mane dat Heliacus quaedam subvecta videre Astra, sed Achronicus nocte videnda trahit” (Avelar 1593, vol. 26r; Melanchthon 1579, fol. Q5v). Melanchthon was an outstanding intellectual leader of the Lutheran Reformation and an author prohibited by the *Index librorum prohibitorum* since 1559 (Lenard 2006, 55–56) (Chap. 9).

Notice that before the publication of the *Index*, many commentaries on Sacrobosco's *Sphaera* contained as a preface a piece written by Melanchthon in 1531 in praise of astronomy (Gingerich 1988). That was also the case of the early editions of Élie Vinet's *Sphaera* (the 1552 edition of Elie Vinet's *Sphaera*, for instance, contained Melanchthon's preface.)

After the proscription of Melanchthon's works by the Inquisition in 1559, the editions of the *Sphaera* containing his preface were partially censored in Catholic countries. In several cases, only Melanchthon's name was effaced, cut or crossed over while the preface was kept. In some later Italian editions, the preface was kept but as an anonymous text (Gingerich 1988, 269).

Philipp Melanchthon's epigram quoted by Avelar had been included, without any allusion to its author, at the end of the fourth chapter of Sacrobosco's *Sphaera* in the first edition printed in Wittenberg, which also included Melanchthon's preface (Sacrobosco 1531, fol. F Iir). It was reproduced in successive publications of the book in several cities, usually at the same point (although its subject had nothing to do with the fourth chapter of the *Sphaera*) and without any declared authorship (see, for instance, de Sacrobosco 1547, fol. E [V]r; de Sacrobosco 1550, fol. G2r).¹² Sometimes it was moved to the third chapter, where its theme would fit more naturally (de Sacrobosco 1545, fol. D [V]r).

Philipp Melanchthon's verses were also published in some editions of the *Sphaera Ioannis de Sacro Bosco emendata* that contained Francesco Giuntini's comments (de Sacrobosco 1564, 116; de Sacrobosco 1573, 88) at the end of the fourth chapter of the *Sphaera*, as in the first Wittenberg edition. It was later included in Francesco Giuntini's long commentary on the *Sphaera* that was part of his *Speculum astrologiae* (Giuntini 1581–1583, vol. 2, 767).¹³ In the later work, Giuntini moved the quotation to the third chapter of the *Sphaera*, where its content is more appropriate.

Most of the editors and authors who reproduced this epigram were probably unaware of its authorship; and it was not explicitly disapproved by the Inquisition,

¹² I am grateful to Matteo Valleriani for pointing out those occurrences of Melanchthon's citation.

¹³ I am grateful to Elio Nenci for pointing out this occurrence of Melanchthon's quotation.

although all of Melanchthon's works had been condemned. Indeed, although Giuntini's *Speculum astrologiae* had been heavily censured, as witnessed by a copy that belonged to a Jesuit institution—that now can be found at the Library of the University of Sevilla (A Res. 03/3/13–14)—the epigram was not crossed out by the person who “corrected” that book, although several lines on the same page and on the following one were scored out (Fig. 10.6). It is possible that Avelar copied Melanchthon's verses without knowing their authorship.

9 Manilius's *Astronomica* and the *Sphaera*

Marcus Manilius's *Astronomica* is the earliest surviving classical astrological work. It is a lengthy Latin poem, written between the year 10 and 20 under the reign of Augustus and/or Tiberius (Goold 1977, xii; Folk 2009, 4). It is likely that part of the work was lost. In its present form, it contains five books. The first one presents a general description of the universe, the celestial circles, stars, constellations, the Milky Way, planets, and comets. The subject of the second book is the Zodiac, its movement relative to the earth, its signs and their influence upon the human body. The third one teaches how to draw a horoscope and describes the lots, the ascendant, and the influence of the stars on man. The fourth book presents the decans of the Zodiac and contains an astrological geography, providing a description of the heavenly influences upon places and people. The last book explains the variable influence of the planets according to their position and motion, describing the influence of constellations that do not belong to the Zodiac.

Sacrobosco did not quote and was probably unaware of Manilius's work, since the *Astronomica* and his author were never explicitly cited by extant Roman authors and it was barely known during the Middle Ages. Manilius's poem was retrieved from obscurity in the early fifteenth century by Poggio Bracciolini (1380–1459), who obtained a copy of a manuscript version; it was published for the first time around 1473 by Johannes Regiomontanus (1436–1476) in Nuremberg (Folk 2009, 2). In 1474, it was also published in Bologna, and 10 years later it was commented on by Lorenzo Buonincontro (1410–ca.1500). It was reprinted several times in the fifteenth and sixteenth centuries, becoming a quite popular book. The first critical edition was published in 1579 by Joseph Justus Scaliger (1540–1609).

The *Astronomica* was therefore available to Avelar when he wrote his *Sphaera*, both directly and through indirect sources, as will be described. Let us first present four passages of that work quoted by Avelar.

Avelar's first quotation of Manilius appeared at the place where he described the axis of the universe (Avelar 1593, fol. 10v). These are the corresponding lines of the *Astronomica* (1.279–282) in a recent edition (Manilius 1977, 26):

Aera per gelidum tenuis deducitur axis
libratumque regit diverso cardine mundum;
sidereus circa medium quem volvitur orbis
aetheriosque rotat cursus, immotus....

Fig. 10.6 One censored page of the copy of Giuntini's *Speculum astrologiae* kept at the Library of the University of Sevilla. From (Giuntini 1581–1583). Courtesy of the Biblioteca Universidad de Sevilla

The verses were translated by George P. Goold as follows: "...an insubstantial axis runs down through the wintry air and controls the universe, keeping it pivoted at opposite poles: it forms the middle about which the starry sphere revolves and wheels its heavenly flight, but is itself without motion..." (Manilius 1977, 27).

Avelar's transcription of this passage is slightly different, not only because of the chosen orthography and punctuation, but also for more significant dissimilarities (see words in *italic*):

Aera per gelidum tenuis deducitur axis,
 Libratumque *gerit* diverso cardine mundum.
 Sydereus, *medium circa* quem, volvitur orbis,
 Aeternosque rotat cursus, *immotum*.... (do Avelar 1593, fol. 10v)

Avelar's second (and longest) quotation of the *Astronomica* appeared in his discussion of the position of the earth in the middle of the universe (do Avelar 1593, fol. 21r–v). These are the verses he cited (*Astronomica* I.194–206):

Nec vero admiranda tibi natura videri
 pendentis terrae debet, cum pendeat ipse
 mundus et in nullo ponat vestigia fundo,
 quod patet ex ipso motu cursuque volantis,
 cum suspensus eat Phoebus currusque reflectat
 huc illuc agilis, et servet in aethere metas,
 cum luna et stellae volitent per inania mundi,
 terra quoque aerias leges imitata pependit.
 est igitur tellus mediam sortita cavernam
 aeris, e toto pariter sublata profundo,
 nec patulas distenta plagas, sed condita in orbem
 undique surgentem pariter pariterque cadentem.
 haec est naturae facie:.... (Manilius 1977, 18–20)

Goold's translation of that citation is the following:

But the principle of the Earth's suspension should cause you no surprise. The firmament itself hangs thus and does not rest on any base, as is clear from the actual movement of its swift career; the Sun moves unsupported, as it wheels its chariot nimbly now this way and now that, keeping to its turning points in heaven; and the Moon and the stars wing their way through empty regions of the sky: therefore the Earth, too, in obedience to celestial laws, has hung suspended. Thus it is that Earth has been allotted a hollow space in mid-air, equidistant from every quarter of heaven's depths, not spread into flat plains but fashioned into a sphere which rises and falls equally at every point. This is the shape of nature;.... (Manilius 1977, 19–21)

Avelar's transcription of this extract is also slightly different from the modern edition (see words in *italic*):

Nec vero *admiranda tibi natura* videri
 Pendentis terrae debet, cum pendeat ipse
 Mundus, et in nullo ponat vestigia fundo:
 Quod patet ex ipso motu, cursuque volantis,
 Cum suspensus eat Phoebus, *cursuque* reflectat
 Huc, illuc, *agiles* et servet in aethere metas
 Cum luna et stellae volitent per inania mundi,
 Terra quoque *aereas* leges imitata pependit.
 Est igitur tellus mediam sortita cavernam

Aeris, e toto pariter sublata profundo:
 Nec patulas distenta plagas, sed condita in orbem,
 Undique surgentem pariter, pariterque cadentem:
 Haec est naturae facies.... (do Avelar 1593, fol. 21r–v)

The third quotation of the *Astronomica* in Avelar's *Sphaera* appeared at a point where he describes the Milky Way (do Avelar 1593, fol. 30r), a subject that was not included in Sacrobosco's original work. This is a modern version of the verses he cited (*Astronomica* I.699–703):

trisque secat medios gyros et signa ferentem
 partibus e binis, quotiens praeciditur ipse.
 nec quaerendus erit: visus incurrit in ipsos
 sponte sua seque ipse docet cogitque notari.
 namque in caeruleo candens nitet orbita mundo.... (Manilius 1977, 60)

It was translated by Goold as follows:

At two points it cuts the three middle circles and the circle which carries the signs and is as often cleft itself. One need not search to find it: of its own accord it strikes the eyes; it tells of itself unasked, and compels attention. It shines like a glowing path in the dark-blue of the heavens,.... (Manilius 1977, 61).

In the case of the third quotation, Avelar's transcription is also somewhat different from the modern edition (see words in *italic*):

Tresque secat medios gyros, et signa ferentem
 Partibus e binis, *quoties* praeciditur ipse,
 Nec quaerendus erit, visus incurrit in ipsos
 Sponte sua, seque ipse docet, cogitque notari:
 Namque in caeruleo candens nitet orbita mundo.... (do Avelar 1593, fol. 30r)

Avelar's fourth and last quotation of the same work, containing a single line, appeared at his description of the equinoxes (do Avelar 1593, fol. 34r): "Libra Ariesque parem reddunt noctemque diemque" (Manilius 1977, 180), which may be translated as: "Libra and Aries make equal night and day" (Manilius 1977, 181) (Chap. 2).

Manilius had sometimes been cited by astronomical authors of the late fifteenth and sixteenth centuries, before Avelar's work. Jacques Lefèvre d'Étaples (ca. 1450–1536), in his commentary on Sacrobosco's *Sphaera*, had a short quotation of Manilius's *Astronomica* that partially corresponds to Avelar's first citation: "Aera per gelidum tenuis deducitur axis / Sidereus: medium circa quem volvitur orbis" (de Sacrobosco 1499, fol. m Ilr). Later editions of Jacques Lefèvre's commentary contain the same two lines (de Sacrobosco 1508, fol. 57r; de Sacrobosco 1527, fol. 4v; de Sacrobosco 1531, fol. 128r; de Sacrobosco 1538, fol. 4v). Notice, however, that Avelar's quotation contained four lines: "Aera per gelidum tenuis deducitur axis, / Libratumque gerit diverso cardine mundum. / Sydereus, medium circa quem, volvitur orbis, / Aeternosque rotat cursus immotum" (do Avelar 1593, fol. 10v). It is quite odd that Jacques Lefèvre's quotation did not include the second verse (only the first and third ones); and hence that work could not be the source of Avelar's corresponding citation.

One of the authors who cited Manilius a number of times was Luca Gaurico (1475–1558), at several places in his 1531 edition of the *Sphaera*.¹⁴ At the beginning of the book, in his “Oratio de laudibus astrologiae,” Gaurico mentioned Manilius’s name and quoted his *Astronomica* several times (de Sacrobosco 1531, fol. a IIr; a IIIv; a IIIIv). However, none of those quotations match Avelar’s citations. At another part of the book, containing the commentaries of Prosdócimo de Beldomandis (ca. 1370/1380–1428) and of Bartolomeo Vespucci (fl. 1500) on Sacrobosco’s *Sphaera*, we find a long quotation of the *Astronomica* that contains Avelar’s second citation (de Sacrobosco 1531, fol. 15r). Gaurico’s unconventional quotation skipped some of the verses and changed the order of other ones, without warning his readers of those changes (he reproduced *Astronomica* I.194–204, 211–13, 215–17, 228–29, 230–31, and 235). Avelar’s corresponding extract (*Astronomica* I.194–206) included two verses that were not transcribed by Gaurico. Hence, this was not the source of Avelar’s second quotation of Manilius.

Hartmann Beyer (1516–1577), in his *Quaestiones novae in libellum de sphaera Ioannis de Sacro Busto*, quoted a single verse by Manilius that was also reproduced by Avelar: “Libra Ariesque parem reddunt noctemque diemque” (Beyer 1549, fol. 26v).

Cornelius Valerius (1512–1578), in his *Sphaera*, quoted some verses from Manilius’s *Astronomica* to illuminate the relation between the signs of the Zodiac and the parts of the human body (Valerius 1564, fol. 10r) and when describing the main winds (*ibid.*, fol. 18r). Those verses of the *Astronomica* were not quoted by Avelar.

Theodor Graminaeus (ca. 1530–ca. 1593), in his commentary on Sacrobosco’s *Sphaera*, cited Manilius’s *Astronomica* three times (Graminaeus 1567, 72, 91, 116). None of his quotations correspond to those used by Avelar.

Francisco Sánchez de las Brozas (1523–1600) published a Latin *Sphaera* where he presented two quotations of the *Astronomica* (Brozas 1579, fol. 3v; fol. 23v). They were different from those published by Avelar.

Those occurrences show that, before Avelar, several astronomical authors did quote Manilius; but none of those works could have been the source of the quotations found in Avelar’s *Sphaera*. Of course, Avelar could have drawn his citations from one of the several editions of the *Astronomica*; but there is a better explanation: he probably copied the quotations from Clavius.

It was quite unexpected to find out that the author who supplied Avelar’s citations of Manilius was Christophorus Clavius, since the Jesuit mathematician was not interested in astrology. The 1999 reprint of the 1611 edition of Clavius’s commentary on Sacrobosco’s *Sphaera*, edited by Eberhard Knobloch, contains a very useful addition: an index of cited authors and works (Knobloch 1999, 341–50). That index points to five quotations of Marcus Manilius’s *Astronomica* (Knobloch 1999, 9, 107, 126, 134, 185–86). Avelar’s four citations of Manilius are contained therein. He did not include in his *Sphaera* Clavius’s fourth citation, which describes the

¹⁴I am grateful to Angela Axworthy for calling my attention to this occurrence.

constellations of the Zodiac. The same five citations had already appeared in the first edition of Clavius's commentary (Clavius 1570, 25, 249–50, 284, 295, 377), with a single difference: the first one is incomplete in this edition (only two verses are quoted, exactly as in Jacques Lefèvre d'Étaples's commentary on Sacrobosco's *Sphaera*). The second edition, however, contained the four verses that appeared in Avelar's *Sphaera* (Clavius 1581, 18). Although I did not check the other editions, it is probable that they also contained the same quotations.

It is likely that Avelar copied his citations of Manilius from Clavius's commentary, since all the quotations he used were contained there. I could find no other work published before Avelar's book that contained all those citations except, of course, the editions of Manilius's poem. Had Avelar consulted the *Astronomica* itself, he would probably have chosen some quotations different from those published by Clavius.

Of course, Clavius's commentary on Sacrobosco's *Sphaera* contained references to many additional authors. Besides Manilius, there were eleven other authors quoted by Clavius five or more times: Alfarganus (al-Farghānī), Aristotle, Lucan, Pedro Nuñez, Ovid, Proclus (412–485), Ptolemy, Regiomontanus, Erasmus Reinhold (1511–1553), Averroes (ibn Rushd), (1126–1198) and Virgil. Only three of them were also mentioned by Avelar: Lucan, Ovid, and Virgil, who had been quoted by Sacrobosco himself. If Avelar did take his quotations from Clavius's book, then it seems that he made a careful selection of the citations he wanted to include in his own book. Perhaps the choice was made just for aesthetic reasons, or maybe he added the quotations from Manilius's *Astronomica* to his *Sphaera* because of his own deep involvement with astrology.

10 Avelar's Manuscripts

The only book published by André do Avelar for his teaching activities at the University of Coimbra was his *Sphaera*. It is not altogether clear why he decided to write that book. For his classes, he could have used any of the several editions and commentaries on Sacrobosco's *Sphaera* that were available at that time. The most popular ones were the *Sphaera Ioannis de Sacrobosco Emendata* produced by Élie Vinet and the massive *In Sphaeram Ioannis de Sacro Bosco Commentarius* by Christophorus Clavius.¹⁵ Perhaps he wanted to make a name for himself.

¹⁵There were thirty-three editions of Vinet's compilation, published from 1551 to 1620 in several countries, and 18 editions of Clavius's commentary between 1570 and 1618. See my survey of editions of Sacrobosco's *Sphaera*: <http://www.ghc.usp.br/server/Sacrobosco/Sacrobosco-ed.htm>. Accessed June 2019. For the list of treatises that contain the tract of Sacrobosco respectively authored by Christophorus Clavius, see <http://hdl.handle.net/21.11103/sphaera.100732> and for the list of treatises respectively authored by Elie Vinet, see <http://hdl.handle.net/21.11103/sphaera.100903>.

It seems that Avelar enjoyed writing scholarly treatises, some of them directly linked to his teaching activities at the University of Coimbra. Several of his manuscripts have been conserved (Fiolhais and Martins 2016, 714–15), and it is likely that he wrote a larger number of them. There are eight known manuscripts and digital copies of two of them are available on the Internet:

1. “Lectio[n]es Mathematicae,” dated 1595, Biblioteca Nacional de Lisboa, FG. Cód. 1894.
2. “In Theoricas Septem Planetarum Purbachii et Octavae Sphaerae eiusdem Apostillae recte explicate ad Preceptore meo Andrea d’Auellar,” Biblioteca do Escorial–Ms. RBME &–IV–9.
3. “Tratado do Uso da Esfera,” Biblioteca Municipal do Porto–Ms. 249
4. “Galatas de Curiosidades Matemáticas,” Arquivo Nacional Torre do Tombo, Lisboa–Manuscritos da Livraria, nr. 681.¹⁶
5. “Geographia Theorica & Practica,” Biblioteca Nacional de Lisboa–Ms. Cod. 2138.¹⁷
6. “Juízo que tirou em Coimbra Andre do Avelar Cathedratico da Cadeira de Mathematica sobre os effeitos do Cometa que apareceo no anno de 1607,” Biblioteca da Ajuda, Lisboa–Ms. 51–V–11.
7. “Discurso Astronomico & Astrologico do Cometa que apareceo por novembro de 1619 em Coimbra,” Biblioteca da Ajuda, Lisboa, Ms. 46–VIII–16.

José Pereira Osório cited another manuscript (Biblioteca Municipal do Porto, Ms. 669) that he did not describe, in which Avelar referred to Copernicus’s astronomical theory, rejecting it (Osório 1986, 120).

Those manuscripts display the intense scientific production of André do Avelar. Item (1), in Latin, contains notes of Avelar’s Coimbra lectures in the years 1594 and 1595. Item (2), also in Latin, contains notes made by a student concerning Avelar’s teaching of Peurbach’s *Theorica Planetarum*. Item (5), in Latin, is a large manuscript containing notes on geography and astronomy, probably also included in Avelar’s teaching activities at the university. The other tracts, in Portuguese, could not be intended for use at the University of Coimbra.¹⁸

A detailed study of all available manuscripts produced by André do Avelar is a desideratum. It will greatly broaden our perception of this Portuguese author.

¹⁶<http://digitarq.arquivos.pt/details?id=4461821> Accessed June 2019.

¹⁷<http://purl.pt/24925> Accessed June 2019.

¹⁸Although item (4) is usually attributed to André de Avelar, it is unlikely that he wrote it. The description of the manuscript on the website of the Torre do Tombo Archive states that the word “Galatas” in the manuscript title was a pseudonym of Avelar. However, I was unable to find any other source referring to this pseudonym; and at the end of the prologue of that manuscript, one finds the name “Frei Joseph de Jesus Maria Olisiponense [from Lisbon] Galatas.” Hence, instead of Avelar, the author of the manuscript could have been that priest. On the other hand, although Diogo Barbosa Machado, in his *Bibliotheca Lusitana*, mentioned several authors called “José de Jesus Maria” (Machado 1741–1759, vol. 2, 863–65), none of them could be the author of that work.

11 Avelar's Career at the University of Coimbra

Besides his teaching and research activities, Avelar became involved in several other occupations at the University of Coimbra. It seems that he had financial difficulties. The annual wage of a mathematics professor was 80,000 reis, according to the statutes of the university (de Almeida 1967, 48). One year after being admitted to the university, however, he asked for a supplementary yearly payment of 20,000 reis to help support his children. The king accepted his request and ordered the dean to pay this additional amount (de Almeida 1967, 49, 51). In 1593, Avelar sold to the university an astrolabe made of wood and a large world map in color for 2700 reis; two years later he sold another map for 3400 reis (de Almeida 1967, 50, 52). The astrolabe and maps were used in his classes and are directly related to his manuscript on practical and theoretical geography.

The statutes of the University of Coimbra had determined that there should be a proof reader for the books produced by its staff. In addition to this post, the proof reader would also become the keeper of the university's library, receiving for this work 30,000 reis each year (Universidade de Coimbra 1593, fol. 69r). In 1595, Avelar attempted to become the director of the library and corrector of the books published by the university, but his request was denied on dubious grounds: the university, it was claimed, had no library at that time (de Almeida 1967, 39, 53). It is likely, however, that the official document describing the decision meant to say that there was no place to keep the books. There is reliable information that the university did have a library. In 1536, before moving to Coimbra, it had 151 volumes, all of them attached to chains to avoid being stolen (do Amaral 2014, 20). After the transfer of the university to Coimbra, access to the books was made public to any person who wished to consult them (do Amaral 2014, 33). Around 1600, it already had 739 volumes, and many others were ordered by the university. The writer Pedro de Mariz (ca. 1550–1615) was afterwards chosen to organize the books, and in 1598 Avelar replaced him (de Carvalho 1990, 169). In the same year, Avelar was also granted the position of keeper of the notary's office, adding 12,000 reis to his annual income (de Almeida 1967, 40, 55; Braga 1892–1902, vol. 2, 245). In 1598, because of this additional job, Avelar produced the first catalog of the archive of the university (Brandão 1927).

Avelar's wife Luiza de Faria died around 1600. The six children of the couple were born in the following years: Tomásia 1581; Mariana 1591; Ana 1592; Luiz 1593; Pedro 1596; and Violante 1596 (de Carvalho 1990, 333). In 1600, five of them were under ten. Avelar, however, turned his widowhood to his own advantage. During his youth he had studied theology in Salamanca or Valladolid. Now, after the demise of his wife, he took religious vows and became a Catholic priest (Machado 1965–1967, vol. 1, 137–38; vol. 4, 15–16). After that, he applied for a position at the See of Coimbra.

The annual income of the See of Coimbra was 45,000 cruzados (Botelho 1873, 30). Around 1600, the cruzado (a gold coin with a weight corresponding to 3.55 g) was equivalent to about 400 reis (Fernandes 1856, 124; Lima 2005, 171). Hence, the

income of the See of Coimbra was 18,000,000 reis. Part of this huge revenue was divided between the priests connected to the See.

There were thirty-five canons attached to the See, and some were appointed by the university. One of them, who should be a Master of Arts, was “tercenário,” that is, he received one third of the full annual payment of an ordinary canon (Botelho 1873, 30). Miguel Vaz Pinto, the university professor who formerly held this position, died in 1601, and three candidates applied to replace him. One of them was André de Avelar, who was elected on account of his age and capacities (de Almeida 1967, 56). However, there were some doubts whether he should ultimately assume this position, because he was the descendant of Jews. The King consulted the Pope, who in 1603 authorized the appointment (de Carvalho 1990, 184; de Almeida 1967, 55; Braga 1892–1902, vol. 2, 492–93). It seems that this additional income solved his financial problems.

In 1612, after teaching for twenty years at the university, Avelar (now 66 years old) had the right to retire and receive two thirds of his wages (de Almeida 1967, 59). However, two months later he was reappointed to the chair of mathematics for an additional interval of four years, receiving during that time the full corresponding wages (de Almeida 1967, 60–61). He was employed again not only because of his good services and the satisfaction of his students, but because there was nobody who could replace him at that time (de Carvalho 1990, 211).

Notice that the benefits successively obtained by Avelar at the University of Coimbra suggest that he was on good terms both with the successive deans and with his colleagues.

In his old age Avelar had reached a privileged status. His poverty belonged to the remote past. He had published a popular book (*Reportorio dos tempos*) and another one not so successful, his *Sphaera*. He was a respected university professor and was still producing an abundance of manuscripts on mathematics, astronomy, and astrology. He had beneficial relationships with some noblemen who probably helped to boost his career. There was, however, a dark cloud lingering over him. His last years were to become a nightmare.

12 Inquisition in Portugal

The first aim of the Catholic Council of Trent, held between 1545 and 1563, was the development of strategies for fighting the growing influence of Martin Luther (1483–1546). In Portugal, Protestantism did exist (Bodian 2002) but never became popular. The rising inquisitorial wave found another target there: crypto-Judaism among the “New Christians,” the descendants of the Jews who King Dom Manoel (1469–1521) had compelled to become Christians in 1497 (Roth 1959, 27–29). The recently converted Jews and their offspring became a separate social class that was not fully accepted by the “Old Christians,” even after more than one century. There was a general suspicion that the “New Christians” or “people of the Hebrew nation” were Christians only outwardly, but kept the old practices of Judaism privately. A Jew who practiced Judaism could not become a target of the Inquisition, because it

was an internal institution of the Catholic Church; but a converted Jew who practiced the religion of his ancestors was classified as a heretic and could be prosecuted. So, in the second half of the sixteenth century, the hidden practice of Judaism turned out to be the main concern of the Portuguese Inquisition.

This was a peculiarity of Portugal. In Spain, after an early preoccupation with Judaizers, the Inquisition turned its attention to sexual offences (bigamy and “sexual deviation”), blasphemy, and specific heretical propositions. Between 1540 and 1700, only 10% of the Spanish inquisitorial processes involved Judaizers. In Portugal, before 1770, over 80% of the Inquisition trials dealt with people accused as Judaizers (Schwartz 2008, 95; Salomon 1998, 132). Among the forty thousand known inquisitorial processes held in continental Portugal, there were about seven thousand denunciations regarding witchcraft, but only about one thousand cases were prosecuted, and punishment was usually soft, as compared to northern Europe (Schwartz 2008, 97).

Around 1600, the Portuguese Inquisition was engaged in the suppression of crypto-Judaism, spreading a culture of religious and racial discrimination towards the New Christians. Other reasons might also have been relevant at that time for such persecution (Schwartz 2008, 105).

The situation became particularly strained in the early seventeenth century. After a few years of negotiation, a group of New Christians obtained from King Philippe III of Spain (1578–1621) (known as Philippe II in Portugal) the publication of a General Pardon in January 1605 signed by the Pope, which abolished all past religious faults and allowed them to leave the country with their property intact. In exchange for this bill, the New Christians promised to pay the enormous sum of 1,800,000 crusados, corresponding to over 6000 kilograms of pure gold. Because of this decree, on January 16, 1605, the Portuguese tribunals liberated 410 prisoners after imposing only a formal penance (Roth 1959, 40). There was an immediate public reaction against the royal act of mercy. In Coimbra, students attacked and killed some New Christians, setting their houses on fire (Curto 1997, 188; Braga 1892–1902, vol. 2, 493). Unfortunately, the New Christians could not pay the promised amount, and the pardon was revoked in 1610. There were new attempts to negotiate with the king, but they were not successful, and the situation of the New Christians deteriorated during that decade (Schwartz 2008, 116).

13 Avelar’s Involvement with Jewish Religion

Shortly after the General Pardon episode, an outstanding professor of law at the University of Coimbra, António Homem (1564–1624), began to organize a secret Judaic brotherhood.¹⁹ António Homem was the heir of a long Jewish family tradition.

¹⁹ Some historians of the past denied the existence of this brotherhood and stated that the Inquisition had falsely accused him. There is no doubt, however, that it was real. Those interested in this subject should consult the most careful research ever produced about António Homem and the Fellowship of St. Diogo, written by (de Carvalho 1990).

His great-great-grand father lived and died as a Jew. Some of his relatives had been sentenced as Judaizers by the Inquisition: his great-grandfather, his grandmother, and two of his uncles. His father had kept the Judaic religious tradition and taught it to all his children, without the knowledge of his wife, who was an Old Christian of noble lineage (de Carvalho 1990, i).

Up to 1607, António Homem kept his Judaic practices private. He knew several other New Christians who were also Judaizers or sympathetic to those practices. He probably thought that strong cooperation and organization were needed both to support and develop their religious faith and to defend themselves (de Carvalho 1990, 32). In September of that year, he organized at his own home a celebration of Yom Kippur, to which he invited several friends, including André do Avelar. Avelar started collaborating directly with Homem, using his astronomical knowledge to determine the right day for Judaic ceremonies (de Carvalho 1990, 37).

Avelar had been initiated in the Jewish faith at the age of sixteen by his maternal aunt, Brites Lopes (Braga 1892–1902, vol. 2, 603). However, his wife Luiza de Faria was an Old Christian, and he kept his belief to himself until her death. Only a few years later, after the General Pardon, did he disclose his faith to his children, who also became crypto-Jews (de Carvalho 1990, 169).

Under the leadership of António Homem, the growing clandestine Jewish community became the “Confraria de São Diogo” (Fellowship of St. Diogo), a name that was supposedly Christian, but was actually a tribute to a Judaic martyr, the Franciscan Friar Diogo da Assumpção (1571–1603), who spontaneously converted to Judaism in 1599. He tried to escape from Portugal to a country where he could become a Jew, but he was denounced and arrested by the Inquisition. Friar Diogo tried to convince the Inquisitors that he was right and that the Christian religion was false, and maintained this attitude for years during his imprisonment. He was finally convicted for the crimes of heresy and apostasy and was burned alive on the 3rd of August, 1603, without showing a sign of regret (Teixeira 1895, 217–64; Curto 1997, 181–88).

The underground Jewish activities of the Fellowship of St. Diogo were kept secret for a few years, and during this period Avelar suffered no harassment. The situation changed around 1620 for two reasons: official inspections of the University of Coimbra by the order of the King and the pursuits of the Inquisition.

The first royal inspection of the university in the seventeenth century was prompted by rumors of frauds and bad behavior amongst the students, professors, and other personnel of the institution (Baião 1919, 104). In 1615, the King appointed Dom Martim Affonso de Mexia (ca. 1570–1623), Bishop of Leiria (afterwards of Lamego), as “visitador e reformador” (visitor and reformer) of the university (Braga 1892–1902, vol. 2, 500). The Bishop spent several months hearing all types of allegations. António Homem was accused of bribery in the election of professors, and of protecting and favoring New Christians (Braga 1892–1902, vol. 2, 497). There was also a more serious charge. In May 1616, one of the canons of the Coimbra Cathedral named Alvaro Soares Pereira wrote a letter to an Inquisitor in Coimbra, denouncing António Homem for the sin of sodomy, pointing out the names of people who could be interrogated to confirm the accusation. He also identified one of the young lovers of António Homem: Jorge Mexia, nephew of the Bishop

(de Carvalho 1990, 54–65). At that time, any homosexual activity was regarded as a crime and could be severely punished both by the civil authorities and by the Inquisition (de Azevedo 1921, 141).

The Inquisitor who received the letter was Francisco de Brito de Menezes (ca. 1570–1631), a fierce enemy of António Homem with whom he had fought over a vacant canon at the Coimbra Cathedral in 1610. António Homem was chosen, although he was a New Christian and notwithstanding the support the defeated professor received from members of the Inquisition (Braga 1892–1902, vol. 2, 499). Now, Francisco de Menezes had a nice opportunity for revenge, but nothing happened, possibly for two reasons: first, António Homem was a friend and legal adviser of the Bishop Dom Martin Affonso Mexia (de Carvalho 1990, 64); second, it was not advisable to expose the nephew of the “university visitor” and Bishop.

After a brief investigation, António Homem was formally charged in November 1616 for only corruption and bribery. Although he defended himself, he was found guilty and had to pay a fine of 100,000 reis, more than the annual remuneration received by Avelar (de Carvalho 1990, 69; Braga 1892–1902, vol. 2, 506–11). António Homem’s punishment was light compared to that of other people. Another professor of law, Manuel Rodrigues Navarro, was found guilty of usury, corruption, and sodomy. In June 1616, he was expelled from the university *in perpetuum* and his name was struck off the university records. Afterwards, he was sentenced to deportation and the loss of his property. He went to Italy, where he lectured in the universities of Bologna and Naples (de Carvalho 1990, 70, 392). Many other professors received serious or light punishments.

Nothing happened to André do Avelar during the visitation of Dom Martim Affonso de Mexia, but all New Christians were regarded as highly suspicious after that time (Braga 1892–1902, vol. 2, 500). Besides that, the mood of intrigue and denunciations stimulated by the visitor would soon produce new difficulties.

14 Astrology and the Jewish Messiah

In the sixteenth century, the people who were more deeply interested in astrology and who understood its technical details were physicians (and other people involved with health issues, such as surgeons) and, of course, astrologers (sometimes called “mathematicians”). In old documents Avelar is not described as an astrologer, and he did not study medicine. However, there was a strong tradition in the teaching of astrology at the University of Salamanca, where he was a student. That might have been the origin of his deep association with this subject, as shown in his *Reportorio*.

During his involvement with the fraternity of Saint Diogo, Avelar made use of his extensive knowledge about the calendar and astronomy to choose an adequate time for the Jewish ceremonies performed by the group. We may conjecture that he was also interested in the astrological prediction of the coming of the Jewish Messiah, since this was a central interest of crypto-Jews and particularly of António Homem’s group. There had already been several outstanding attempts to use astrology as an instrument for predicting the coming of the Messiah in the preceding centuries.

At least since the tenth century, there had been Jews in the Iberian Peninsula who described their hope for the coming of the Messiah (Montenegro 2017, 23). Messianic belief involved both the idea of a religious-spiritual redemption and national and political independence (Sáenz-Badillos 1999, 178). The Jews used several methods for predicting the coming of the Messiah. The most common and earliest one was the interpretation of the Book of Daniel, alone or together with other Biblical texts. In the tenth century, Sa'adiah ben Yosef Gaon (882/892–942) interpreted the prophecies of Daniel as indicating that the coming of the Messiah would occur abruptly. His advent would be accompanied by many disgraces to the enemies of Israel: fire, stones, violent deaths, etc. The Jews would gather in Jerusalem and there would follow idyllic times of peace and happiness, without diseases or sorrows (Sáenz-Badillos 1999, 189).

Another method made use of comparisons between the different periods when the Jews were kept in exile, in Egypt and in Babylon. The third one was an analysis of the Torah using special numerical techniques for the interpretation of letters and words, such as gematria and Kabbala. Astrology was another independent method (Silver 1927, 243–59).

Although many early Jew authorities denied the validity of astrology in late Antiquity, taking inspiration from the Greeks and Romans, it became a highly significant belief. Its impact increased in the Middle Ages, due to the influence of Islam (Silver 1927, 255–56).

Two medieval Jewish authors who attempted to predict the coming of the Messiah by means of astrological calculations were Solomon Ibn Gabirol (ca. 1021–1058) and Abraham Bar Hiyya (ca. 1065–ca. 1140) (Ruderman 2001, 26; Sela 2010, 9). Gabirol was probably the first Jewish astronomer to attempt to predict the “end of days” using astrological techniques (Goldstein 2001, 42). Using astrological methods developed by Abū Ma'shar (787–886) and especially by Māshā'allāh ibn Atharī (762–ca. 815), those Jewish astrologers attempted to explain past historical events and to predict future ones by astral causes (Rodríguez-Arribas 2011, 14). Māshā'allāh's *Book of Eclipses* contained an astrological theory of world history and associated the great conjunctions of Jupiter and Saturn to the coming of great prophets and seers (Goldstein 1996, 14). Both Gabirol and Bar Hiyya linked the Saturn-Jupiter conjunctions in the sign of Pisces to the advent of the Messiah, because a historical conjunction of the same type was associated with the exodus of the Jews from Egypt. Actually, the detailed analysis of the astrological situation concerning the exodus was much more detailed and intricate (Rodríguez-Arribas 2005, 146–48). According to Bar Hiyya's calculations, the new deliverance of the Jews could happen in 1358 (the last of twelve great conjunctions) or in the years corresponding to the largest conjunction, 1448 or 1468 (Sáenz-Badillos 1999, 190; Sela 2010, 9–11).

Many Jewish authors denied the possibility of predicting the arrival of the Messiah by astrological calculation, saying only prophets could anticipate it. Two examples of scholars with this attitude are Saadia Gaon (882–942) and Abraham ben Meir ibn Ezra (1092–ca. 1167) (Rodríguez-Arribas 2011, 14, 17). Ibn Ezra accepted historical astrology and the relevance of the conjunctions of Jupiter and

Saturn (Goldstein 1996, 14), but criticized its use for predicting the coming of the Messiah (Rodríguez-Arribas 2005, 149–53).

One important Spanish kabbalist was rabbi Moshe ben Shem-Tov (ca. 1240–1305), known as Moses de León, who is regarded as the composer or compiler of the *Zohar*. Messianism is an important subject of that work, and the coming of the Messiah is described as the way to redeem mankind from evil, bringing harmony to the world. The coming of the Messiah would be accompanied by the death of the Pope and great wars, followed by the reconstruction of Jerusalem (Montenegro 2017, 33).

In the following centuries, the religious relevance of the Saturn-Jupiter conjunctions was discussed by other Jewish astrologers such as Levi ben Gershon, or Gerson (1288–1344), who studied the event of 1345 (Goldstein 1996, 18–19). He agreed with the prevailing Jewish view that the Messiah would come in 1355 or 1358. Christian authorities were also anticipating some dangerous religious upheaval. The cardinal Pierre d’Ailly (1351–1420) associated the coming of the Antichrist with a Saturn-Jupiter conjunction (Goldstein 1996, 19).

In the fifteenth century, the famous Portuguese-born Jewish philosopher Isaac ben Judah Abravanel or Abarbanel (1437–1508) used the same method employed by Bar Hiyya. The first conjunction of Saturn and Jupiter in Pisces had occurred in the Jewish year 2365, three years before the birth of Moses and eighty-three years before the exodus; the new conjunction, in the year 5224 (1464), might announce the birth of the Jewish Messiah (Cohen-Skalli 2006, 196–97). The redemption of the Jews would occur a few decades after that time, between 1503 and 1571, perhaps in 1531 (Lawee 2001, 18). There would be terrible wars involving the Jews, the Christians, and the Muslims; the Messiah would defeat their enemies and the Jews would return to Jerusalem (Rodrigues 2010, 98).

In the transition from the fifteenth to the sixteenth century, the Jewish astrologers Bonet de Lattes (1450–1514) and Abraham ben Samuel Zacut (1452–ca. 1515)²⁰ (Chap. 3) also made messianic predictions (Ruderman 1992, 308). Zacut made use of the calculation of eclipses and planetary conjunctions and predicted that the salvation of Israel would begin in 1503 or 1504 (Goldstein 1998, 182). In the early sixteenth century, the expectation was so strong that in 1521 an inquiry was sent from Rome to Jerusalem asking whether the signs of the approaching Messiah had not already appeared there (Silver 1927, 149).

Possibly because of the failure of those astrological forecasts, during the sixteenth and seventeenth centuries most of the Messianic predictions were made using biblical interpretation and gematria, not astrology (Silver 1927, 116–43, 183–92). Moses de León, the author of the *Zohar*, suggested a handful of dates: 1300, 1306, 1324, 1334, 1340, 1608, and 1648. In the seventeenth century, several Kabbalists and non-Kabbalists accepted the year 1648 as the date of Redemption (Silver 1927, 151); others, however, predicted different years, such as 1713 or 1725 (Patai 1988, 56). In 1648, the last date predicted by the *Zohar*, Shabbatai Zevi (1626–1676), a

²⁰ Samuel Zacut or Zacuto, born in Spain, was a highly influential astronomer and astrologer. His astronomical tables were used by Portuguese navigators (Goldstein 1998).

Jew born in Smyrna, became convinced that he was the Messiah and produced a strong commotion (Merrill 1973, 161; Patai 1988, xlv). That famous episode, however, happened after Avelar's passing.

Did Avelar get involved in astrological predictions concerning the Messiah? His published works display no clear hint about this subject. Luís Miguel Carolino and Carlos Ziller Camenietzki studied the two known manuscripts left by Avelar containing astrological predictions (Carolino and Camenietzki 2006). Both manuscripts described the effects of comets that appeared respectively in 1607 and 1618. Comets, in astrology, are usually a warning of bad occurrences, and Avelar's analysis of those comets was no exception. The 1607 event, according to Avelar, would produce the following effects:

...a king will almost die of a sudden death, and princes and nobles of the highest rank will die. A war will be waged in a nearby land, or rather many wars will occur in many places, and there will be the destruction of cities, shipwrecks, and great dangers and raids by pirates at sea, and their fleets will spread fear and do great ill at seaports. There will be great changes in religion and political affairs. There will be different and unexpected journeys and embassy missions. (Carolino and Camenietzki 2006, 38)

Predictions of the "end of days" usually described wars and the violent deaths of key persons, together with political changes, before the dawn of the new age brought by the Messiah. Therefore, Avelar's description of the effects of the 1607 comet was compatible with this scenario. However, although Avelar did mention great political and religious changes, there was no direct allusion in those manuscripts to the coming of the Jewish Messiah.²¹ If Avelar made any astrological prediction about this subject, it was probably kept secret.

Luiz de Avelar, son of André do Avelar, published a short dialogue on the 1618 comet (do Avelar 1619). He mentioned the usual injurious effects of comets, but he did not suggest any influence of that celestial occurrence on religious affairs.

15 Avelar and the Inquisition. First Proceedings

Meanwhile, the Coimbra Inquisition was busy receiving denunciations, arresting, interrogating, and judging hundreds of suspects. The first known allusion to André do Avelar in a process of the Inquisition arose in 1612. A prisoner called Antonio Gomes accused Avelar and three other canons of the Coimbra See who were New Christians of practicing Judaism (Antonio Dias da Cunha, Chrispim da Costa and Fernão Dias). The second mention, much more serious, appeared early in 1619 in the process of Miguel Gomes, called "o Manco" (the lame one). In his deposition we find the first description of the Brotherhood consecrated to Friar Diogo, in which Gomes identified some of its members, including himself. He mentioned António

²¹ Luís Miguel Carolino, private communication, 22nd of June 2018. Carolino conjectures that Avelar would be very careful in his public prognostics because of his position as professor at the University of Coimbra and his status as a New Christian.

Homem, André do Avelar, Diogo Lopes da Rosa, António Dias de Almeida, Diogo Lopes de Sequeira, António Corrêa, Luiz de Sá, André Vaz Cabaço, Manuel Gomes Tasquinha, Francisco da Costa, Pêro Cabral, Francisco de Aguiar, Miguel da Fonseca, Fernão Dias da Silva, José Coutinho, and António de Oliveira (Braga 1892–1902, vol. 2, 511–12). In the following months, other members of the Brotherhood were successively arrested and interrogated.

By coincidence, in 1619, Francisco de Brito de Menezes, the opponent of António Homem, had a new opportunity to take vengeance: he was appointed the new visitor and reformer of the University of Coimbra as well as substitute dean, or intervenor (Braga 1892–1902, vol. 2, 516). Francisco de Menezes began his work in May 1619. He summoned students and professors at random and questioned them about the cases of immorality and corruption they knew. In a few weeks he had already obtained several depositions against António Homem, who was accused of bribery, corruption, and homosexuality (de Carvalho 1990, 82–85).

In October 1619, the promotor of the Coimbra Inquisition requested the arrest of António Homem and the confiscation of his estate, since there were three separate reliable testimonies against him by relatives; he was a New Christian and it was known that he had other relatives that had been convicted as Judaizers; and he had also been accused of moral offenses with male boys. He was arrested on Sunday, the 24th of November, and three weeks later was transferred to the Lisbon headquarters of the Inquisition (de Carvalho 1990, 90–93; Braga 1892–1902, vol. 2, 555; Baião 1919, 105). He would never be set free.

André do Avelar knew that he was also going to be arrested, but it was impossible to escape. Although his name had already been mentioned by several members of the Fellowship that had been seized previously, the formal charge against André do Avelar was made on the 1st of March, 1620, by the canon Crispim da Costa, who stated that once, when they were leaving the Coimbra See, they had confessed to each other that they followed the Jewish faith (Baião 1919, 134; de Carvalho 1990, 98). Avelar was arrested by the Inquisition on the 20th of March. He was seventy-four years old at that time. The next day, he asked to be heard and made a detailed confession. He stated that he had also disclosed his Jewish belief to other Judaizers and named António Homem, Miguel Gomes, Henrique de Aredes, Francisco de Almeida, Francisco Gomes, and others (Baião 1919, 134; de Carvalho 1990, 99; Braga 1892–1902, vol. 2, 602–03). The process of André do Avelar was unbelievably fast. A few days later, on the 29th of March, his sentence was read and he was ordered to abjure his mistakes. After doing so, he was “imprisoned” in Coimbra on the next day, though this meant in effect his release from detainment (Baião 1919, 135–36; Braga 1892–1902, vol. 2, 604).²²

It is difficult to understand the unusually gentle and speedy treatment received by Avelar on this occasion, but Avelar was not the only one to receive such mild treatment. Crispim da Costa, who had denounced him and António Homem, and Miguel

²² In the case of mild offenses, the sentence of incarceration *ad arbitrium* was interpreted as a temporary obligation to live in one’s own town, during a given number of months (de Azevedo 1921, 145).

da Fonseca, who had also denounced António Homem, were also allowed to abjure on the same day (29th of March 1620) and were afterwards released (de Azevedo 1921, 174). Maybe, at that time, the main interest of the Inquisition was obtaining additional evidence to convict António Homem.

16 Avelar and the Inquisition. Second Proceedings

Avelar only remained free until the next year. There were successive arrests of members of the Fellowship and the mathematics professor was now accused of being one of the heads of the group (Baião 1919, 136). On the 11th of February 1621, his son Pedro Homem de Faria (twenty-five years old) was arrested by the Inquisition at Lisbon. He had enlisted to serve in India and it was suspected that he was running away to avoid prosecution (de Carvalho 1990, 112). He was questioned but denied any involvement with Judaic practices and made no denunciation. The other son, Luiz de Avelar (twenty-eight years old), who was a Master in Arts, was arrested on the 10th of September (de Carvalho 1990, 115). He soon admitted his own guilt and accused his father, brother, and four sisters.

Three of André do Avelar's daughters were nuns at the Monastery of Santa Ana in Coimbra: Ana de Faria (twenty-eight years old), Mariana do Deserto (thirty), and Violante de Faria (twenty-five). They were all arrested by the Inquisition on the 17th of October 1621, in the morning. Soon afterwards, their sister Tomásia de Faria (fourty years old), who was married and had six children, was arrested at her home; the same happened to André do Avelar (de Carvalho 1990, 118). The whole family was now in prison. The youngest of the daughters, Violante de Faria, immediately confessed (de Carvalho 1990, 281), stating that she became a Judaizer under the influence of her father. She also disclosed the existence of a larger group of crypto-Jews at the Monastery of Santa Ana; they were arrested a few days later.

After being seized, André do Avelar first requested some time "to ponder his faults" because he was very disturbed by his arrest. One week later, on the 25th of October, he was heard and said that everything he had confessed in the previous year was false, and that he had never accepted the Judaic faith (Carvalho 1990, 119). Of course, given the weight of the accusations against him, this attitude could not be accepted by the Inquisitors (Baião 1919, 136). Two weeks later, on the 8th of November, he asked for an audience with the Inquisitor and declared that he was guilty and that his former statement was untrue. He knew that his sons had been arrested before him, but he may not have known that his daughters were also in prison; he possibly thought that he had been denounced by them and that he should disclose that the whole family followed the Judaic faith. He told the Inquisitor that he had withheld some information because of his love for his children, and declared that sometime after the General Pardon he had told them that he accepted the Law of Moses and instructed them accordingly (Baião 1919, 136–37). A few days later, two other daughters, Mariana do Deserto and Ana de Faria, made their confessions, blaming the father for their apostasy. They also confirmed the Jewish cult meetings at the Monastery (de Carvalho 1990, 121).

A few weeks later, on the 28th of November, there was an *Auto de Fé* in Coimbra where 174 people were sentenced, including three of André do Avelar's children: Ana de Faria, Tomásia de Faria, and Luiz de Faria. They had confessed, their faults were not severe, and they were condemned to prison and penitential dress *ad arbitrium* (de Carvalho 1990, 123–24). As a matter of fact, they were “detained” in Coimbra. Ana de Faria, like the other nuns who were pronounced guilty, could not return to the monastery, and the family estate had been confiscated by the Inquisition. She was entrusted to a widow and afterwards to her mother's relatives (de Carvalho 1990, 277).

Up to the beginning of 1623, André do Avelar did not confess to his active participation in the Fellowship of St. Diogo. Evoking his old age, Avelar alleged that his memory was worn out and that he did not remember the things they asked to describe (Baião 1919, 137–38; Braga 1892–1902, vol. 2, 605). He only admitted his prominent role in that Brotherhood on the 21st of February, naming António Homem as its High Priest (de Carvalho 1990, 131–32). He accused over twenty other people and made a detailed description of the ceremonies of the Fellowship, and of his own role in those meetings (Baião 1919, 139; Braga 1892–1902, vol. 2, 605–07).

However, his new confession was deemed incomplete. On the 20th of May 1623, he was admonished and then taken to the torture chamber, where he was stripped of his clothes and tied up (Baião 1919, 139). However, before the beginning of the torment, he asked to be heard and incriminated Father Diogo da Mata and his mother, but he had nothing else to add. On the same day, his sentence was decided: he should be kept for life in the penitential prison of the Inquisition in Lisbon to avoid his contact with other “people of his nation,” as he could corrupt them (de Carvalho 1990, 134–35).

Avelar, his two daughters Mariana do Deserto and Violante de Faria, and 136 other people were sentenced in the *Auto de Fé* that occurred in Coimbra on the 18th of June 1623 (de Carvalho 1990, 137). The two nuns were condemned to prison and penitential dress *ad arbitrium*, as were her other sisters (de Carvalho 1990, 285).²³ Avelar was condemned to perpetual imprisonment without remission, with the use of penitential dress with the insignia of fire (de Carvalho 1990, 137), meaning that his faults were so severe that he deserved to be burned, but he repented and was acquitted.

On the 20th of June 1623 André do Avelar was transferred from Coimbra to the Inquisition prison in Lisbon. At that time, he was 76 or 77 years old. There is no additional information about him after this day. It is likely that he died there, after a few years (de Carvalho 1990, 285).

António Homem, as the leader of the crypto-Jews of Coimbra, could have informed the Inquisition about everyone involved in his Fellowship. He made, however, a firm decision: he never confessed anything, he never accused anybody, he always denied every charge against him, and declared that he was innocent and a good Christian. He maintained this consistent attitude over more than three years,

²³ António Baião wrongly stated that he was sent to the Inquisition prison in Lisbon (Baião 1919, 147).

but the evidence against him was overwhelming. He was finally sentenced by the Inquisition, excommunicated, and “released to the secular arm.” At the last moment, before being burned at the stake, António Homem made a public declaration of Christian faith and chose to die as a Catholic. He was garroted, and his body was burned on the 5th of May, 1624 (de Carvalho 1990, 142–47).

The younger son of André do Avelar, Pedro Homem de Faria, did not cooperate with the Inquisition. He refused to admit any fault. In March 1624, three years after being arrested, he continued to deny his guilt, although several witnesses had presented depositions against him, including his relatives (de Carvalho 1990, 127). On the 3rd of May, Pedro Homem was informed that he would be handed over to the secular arm, that is, he would be burned alive. The next day, on the eve of his execution, he asked to be heard and confessed. His life was spared. In the same *Auto da Fé* in which António Homem died (Sunday, 5th of May 1624), Pedro Homem abjured, received absolution, and was sentenced to perpetual imprisonment and penitential dress with the insignia of fire, without remission, and penal servitude in the King’s galleys for five years, without payment. On the 17th of May, he embarked, with other convicted prisoners, on the ship “Madalena” (de Carvalho 1990, 142–44, 280, 288–89; Baião 1919, 153–54).

17 Concluding Remarks

André do Avelar’s *Sphaerae vtrivsqe tabella, ad sphaerae huius mundi faciliorem enucleationem* (1593) was the only Latin version of Sacrobosco’s *Sphaera* published in Portugal. It was written to be used by the students of the University of Coimbra, unlike Pedro Nuñez’s Portuguese translation of the *Sphaera*. The composition of Avelar’s *Sphaera* was similar to that of his *Reportorio dos tempos* in several respects. In both cases he took a successful, previously existing book and rewrote it, abandoning some parts, following a different arrangement, and adding new information without identifying his sources. Although the contents of the *Reportorio* and the *Sphaera* are quite different, Avelar introduced in his version of Sacrobosco’s work some information useful for navigators and also some astrological knowledge. The creation of both works required access to a variety of books that were possibly consulted by Avelar at the private libraries of the noblemen to whom he dedicated the *Reportorio dos tempos*. Avelar’s *Sphaera*, on the other hand, was dedicated to Dom Fernão Martins Mascarenhas, the dean of the university, who ironically became the General Inquisitor at the time when the mathematician was arrested and condemned.

It seems that Avelar’s Jewish ancestry was not a hindrance to his professional work at the University of Coimbra up to his retirement, because he obtained several new appointments that helped to complement his income, including the duty of a canon at the Coimbra cathedral. He led an exterior life of a Catholic, but he was really a Jew, to most effects, suffering the prejudices of the Portuguese against the New Christians and following the Law of Moses in secrecy. This situation was con-

ceivably the motivation for his emblem with the motto “Flectimur sed non frangimur.” However, he was finally bent and broken by the Inquisition.

The known association between Avelar’s astronomical knowledge and the activities of the Fellowship of St. Diogo consisted in the need to settle the adequate time for Jewish ceremonies. There is, however, another conceivable link between Avelar’s religious faith and his interest in astronomy and astrology. There was a general trend of Messianic thought among the Portuguese crypto-Jews in the sixteenth and seventeenth centuries, and it was even thought that the Messiah could be born among the New Christians at that time. António Homem was one of those believers who were preparing for the coming of the Messiah and who, in turn, would save the Jews from the oppression of Christians. We do not know whether Avelar personally tried to predict the time of the Messiah’s appearance by astrology, but it would be meaningful to search for that connection.

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