

Chapter 7

The Iberian and New World Circulation of Sacrobosco's *Sphaera* in the Early Modern Period



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Abstract The aim of this paper is to reconstruct the circulation of Sacrobosco's *Tractatus de sphaera* in early modern Iberian Peninsula and New World printing. We will present a survey on the locally active printers and publishers who contributed to the circulation of the *Sphaera* thanks to the information now offered by the *Iberian Books* database. This will be followed by a general discussion about the professional profile held by the printers and publishers who took part in the publication and circulation of the text in the Iberian Peninsula and America. Both markets were probably related through Seville. With this group of printers and publishers in mind, we will analyze what can be inferred from their production in terms of their approach to publishing, what audience were they generally targeting, their commercial scope, and how the *Sphaera* fit into their general production and commercial plan.

Keywords Early Modern printing · Iberian peninsula · New World · *Iberian Books* · *Tractatus de sphaera*

1 Introduction

The printing press arrived in the Iberian Peninsula in 1472 thanks to the printer Juan Párix (Johannes Parix) (1430–1501) and the patronage of the educational institution the Estudio General de Segovia. Shortly thereafter, in 1475, the printing of scientific books began with the publication of a medical tract in Barcelona, which was a Catalan translation of a Portuguese text. This first example demonstrates one of the main characteristics of the scientific publications of the time: the predominance of vernacular languages over Latin, as shall be examined below. Despite its early appearance, the scientific sector of the publishing industry was of little importance in the Iberian Peninsula during the early modern period and was mainly linked, albeit not

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exclusively, to the printing industry based around the universities, in which, particularly during the sixteenth century, Johannes de Sacrobosco's (fl. 1256) *Tractatus de sphaera* became a manual for the study of the theoretical and practical sciences.

The aim of this article is to reconstruct the circulation of the *Tractatus de sphaera* in the context of the printing press and the publishing industry of the Iberian Peninsula and the New World during the early modern period. In this context, we shall present, first of all, the results of our research on local printers who published Sacrobosco's work in Latin or in a vernacular language and who contributed in such a way to its circulation on local, Peninsular, and extra-Peninsular levels. Furthermore, we shall examine the professional profile of the printers who participated in the publication and circulation of the text both in the Iberian Peninsula and in America. Then we shall analyze the work they produced, the target audience, the scope of their commercial activity, and how the tract fit in with their production as a whole and with their commercial plan. The data provided by *Iberian Books*¹ and the examination of the analyzed editions of Sacrobosco's text will help us to determine where and when the editions were published, the frequency with which they were reedited, and how popular the text was according to the number of editions. However, neither this bibliographic tool nor the editions themselves can tell us with any degree of precision where the books ended up, at which markets they were aimed, or in which markets they had greater success. To answer some of these questions we can rely on the invaluable postmortem inventories that list the estate of the deceased and, therefore, make it possible for us to establish the belongings of booksellers and owners of private libraries during the early modern period, among which, of course, their books can be found. As Bartolomé Bennassar has pointed out, these are "the most valuable documents when exploring intelligent, written culture, in order to know which books were owned and read in a certain age and by certain people" (Bennassar 1984, 141). In this way, these inventories will help us to establish a more accurate perspective of the success of Sacrobosco's text in the Iberian Peninsula. Last of all, we shall deal with the issue of the circulation of the Peninsular editions of Sacrobosco in America, thus enabling us to speak about international markets.

2 On the Distribution of the *Tractatus de sphaera* in the Iberian Peninsula (1472–1650)

There is much evidence that the *Tractatus de sphaera* was a fundamental work in Spanish education in the Golden Age for the teaching of astronomy in the *quadrivium*. However, it was also important in international expeditions, and in the private sphere as a reference manual held in private libraries for learning about the sky and the stars.

¹ The objective of the digital repository *Iberian Books* (<https://iberian.ucd.ie>. Accessed June 8, 2021) is to produce a foundational listing of all books published in Spain, Portugal, and the New World or printed elsewhere in Spanish or Portuguese during the Golden Age, 1472–1700, as well as to create a suite of digital search tools to permit their investigation.

This can be explained by the simplified presentation of the Ptolemaic system offered by Sacrobosco with the aim of presenting his students with an introductory astronomy text (Gómez Martínez 2013, 40–41). In the context of universities in the Iberian Peninsula, it is possible to note an increase in the demand for astronomy throughout the sixteenth century—in both its theoretical and practical aspects—perhaps due to the influence of navigation (Bonmatí Sánchez 2002, 1410).² It is interesting to contemplate, in this sense, the controversy that arose around the professorship of astrology of the master Juan de Aguilera of the University of Salamanca on January 9, 1552, between supporters of the reading of the *Sphaera* of Sacrobosco and those who supported the *Theorica planetarum* (Hurtado Torres 1982, 50). The controversy concluded with a vote before the vice chancellor; the work of Sacrobosco was chosen, as is stated in the text of the document:

while lecturing at his chair of astrology with a great number of pupils, the mentioned doctor and treasurer Juan de Aguilera, recognized differences among them. Some asked him to read the *Sphaera*; others asked him to read the *theorica*. Because of this difference, the mentioned bachelor Cristobal de Perea, vice chancellor..., assigned him what he had to read [on the basis of a] *vota audientium*, and most of the said generals and listeners voted that he should read about the sphere... And the said doctor accepted it and said that accomplish the task in that way.³ (Hurtado Torres 1982, 50 n. 6)

Also of note is the information offered by the *Lecturas de la Cátedra de Astrología* of the University of Salamanca for the years 1560–1641, which mentions several authors, one of whom is Johannes de Sacrobosco (Hurtado Torres 1982, 50). The influence of Sacrobosco's text in the field of education in the Iberian Peninsula is also shown by the fact that the humanist Antonio de Nebrija (1444–1522) wrote a dedication to him in his book *Introductorium Cosmographiae* (Nebrija 1498), a book in which he pointed out the former's mistake in calculating the total circumference of the Earth, despite noting him as a source of authority in many other parts of the text (Bonmatí Sánchez 1998, 513).

Also worthy of note is the mention made of Sacrobosco's text in the *Recopilación de leyes de los reinos de las Indias mandadas imprimir y publicar por la magestad católica del rey Carlos II nuestro señor*, originally published in 1681, in relation to works that should be read by cosmographers and mathematics professors of the Council of the Indies:

To the cosmographer, who, as professor, teaches mathematics, we order that he lectures in that location that was indicated or that will be indicated in our house and palace, and following the Council of the Indies, a whole hour in the morning every day in winter from nine o'clock to ten o'clock, and in summer from eight

² As Kathleen Crowther has explained, a “major reason for interest in the *Sphaera* in Spain and Portugal was that the basic astronomical and geographical knowledge contained in this text could be used for navigation” (Crowther 2020, 162).

³ Author's translation here and in the following.

o'clock to nine o'clock, changing the hours when the aforementioned Council changes them, and taking holidays for two months in July and August, and at Easter, given by the Council, with no others to be taken. Regarding the readings, the following order is to be kept: in the first year, which shall begin in September, from the beginning of the month until Christmas, Sacrobosco's *Sphaera* is to be read.⁴

Therefore, Sacrobosco's work was employed as a textbook and work of reference for various audiences from the thirteenth century up to the seventeenth. For this reason, it was printed both with and without commentaries on at least seventeen occasions in the Iberian Peninsula. It is interesting to consider, in this sense, the taxonomy established by the members of the research project *The Sphere: Knowledge System Evolution and the Shared Scientific Identity of Europe*, which distinguishes five types of books among the different editions preserved in their database: (a) original treatises, (b) annotated originals, (c) compilation of texts, (d) compilation of texts and annotated originals, and (e) adaptations (Valleriani 2020). The Iberian editions belong to the second, third, fourth, and fifth categories. Five of these editions were published in Latin between 1472 and 1650:

Sacrobosco, Johannes de, Pedro Ciruelo and Pierre d'Ailly. 1526. *Opusculum de sphaera mundi*. Alcalá de Henares: Miguel de Eguía (Sacrobosco et al. 1526).

Aristotle and Pedro de Espinosa. 1535. *Philosophia naturalis Petri a Spinosa artium magistri*. Salamanca: Rodrigo de Castañeda (Aristotle and Espinosa 1535).

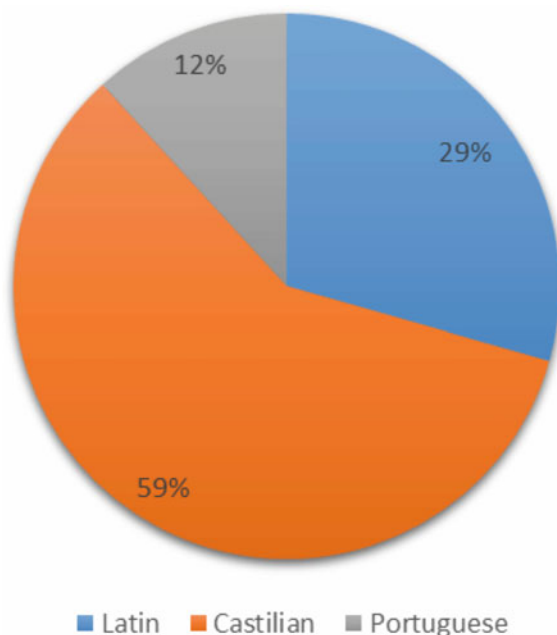
Sacrobosco, Johannes de and Pedro Espinosa. 1550. *Sphaera Ioannis de Sacro Busto cum commentariis Petri a Spinosa*. Salamanca: Juan de Junta (Sacrobosco and Espinosa 1550).

Avelar, André do. 1593. *Sphaerae utriusque tabella, ad Sphaerae huius mundi faciliorem enucleationem*. Coimbra: Antonio de Barreira (Avelar 1593).

While twelve editions were published in vernacular languages (either Portuguese or Spanish), also between 1472 and 1650, thereby indicating a preference for the vernacular languages (Fig. 1):

⁴ The quote belongs to a law enacted in 1636 during the reign of Philip the Fourth (1621–1665). In 1681 Charles II, who was King of Spain between 1665 and 1700, sent to publish the *Recopilación de leyes de los reinos de las Indias mandadas imprimir y publicar por la magestad católica del rey Carlos II nuestro señor*, which contained laws enacted from the sixteenth century until his reign in relation to the Indies. I followed an edition from 1841 for the quote. The original text reads: “El cosmógrafo, que como catedrático leyere la cátedra de matemáticas: Mandamos que lea en la parte que le fuere señalada o señalare nuestra casa y palacio, y cerca del consejo de las Indias todos los días que le hubiere, una hora entera a la mañana en invierno desde nueve a diez, y en verano de ocho a nueve, mudando las horas cuando el dicho consejo las mudare, y gozando de vacaciones los dos meses de julio y agosto, y las de las pascuas que gozare el consejo, y no pueda tener ni tenga otra mas; y en lo que toca a las lecturas guarden el orden siguiente. El primer año, que comenzará por setiembre, desde principio de él hasta la Navidad, ha de leer la esfera de Sacrobosco” (Recopilación de leyes 1841, 207).

Fig. 1 Languages in which Sacrobosco's text was published in the Iberian Peninsula, 1472–1650. Author's plot based on data provided by the repository *Iberian Books*



Sacrobosco, Johannes de. [1510–1512]. *Tractado da Spera do mundo tirada de latim em liguagem portugues*. [Lisbon: Germam Galharde] (Sacrobosco [1510–1512]).

Faleiro, Francisco. 1535. *Tratado del Esphera y del arte del marear*. Sevilla: Juan Cromberger (Faleiro 1535).

Sacrobosco, Johannes de and Pedro Nunes. 1537. *Tratado da sphaera com a Theorica do Sol et da Lua*. Lisbon: Germam Galharde (Sacrobosco and Nunes 1537).

Sacrobosco, Johannes de and Jerónimo de Chaves. 1545. *Sphaera del mundo*. Sevilla: Juan de León (Sacrobosco and Chaves 1545).

Sacrobosco, Johannes de and Jerónimo de Chaves. 1548. *Tractado de la Sphaera*. Sevilla: Juan de León (Sacrobosco and Chaves 1548).

Cortés, Martin. 1551. *Breve compendio de la sphaera y de la arte de navegar*. Sevilla: António Álvarez (Cortés 1551).

Cortés, Martin. 1556. *Breve compendio de la sphaera y de la arte de navegar*. Sevilla: António Álvarez (Cortés 1556).

Sacrobosco, Johannes de and Rodrigo Sáenz de Santayana y Espinosa. 1567. *La sphaera de Iuã de Sacro Bosco nueva y fielmente traduzida de Latin en Romance*. Valladolid: Adrián Ghemart (Sacrobosco and Santayana y Espinosa 1567).

Sacrobosco, Johannes de and Rodrigo Sáenz de Santayana y Espinosa. 1568. *La Sphaera de Iuan de Sacrobosco Nueva y fielmente traduzida de Latin en Romance*. Valladolid: Adrián Ghemart for Pedro de Corcuera (Sacrobosco and Santayana y Espinosa 1568).

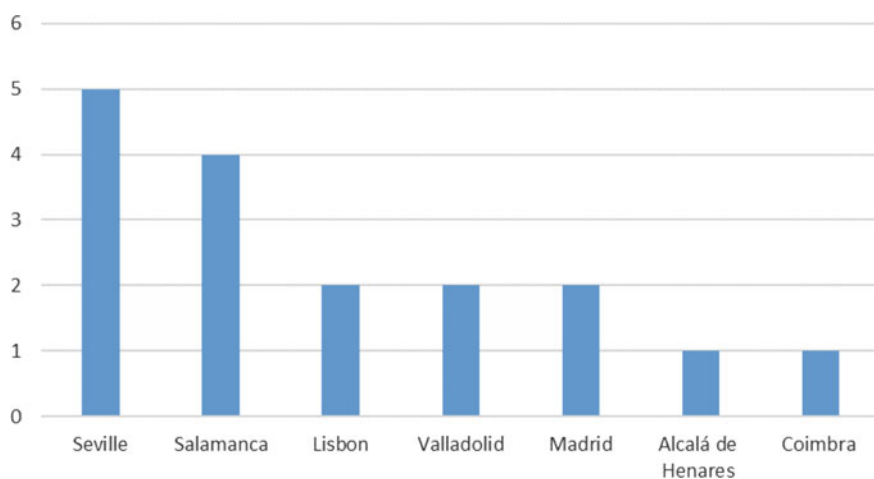


Fig. 2 Places of publication of Sacrobosco's work in the Iberian Peninsula, 1472–1650. Author's plot based on data provided by the repository *Iberian Books*

Rocamora y Torrano, Ginés. 1599. *Sphaera del universo*. Madrid: Juan de Herrera (Rocamora y Torrano 1599).

Sacrobosco, Johannes de, Christoph Clavius, Francesco Giuntini and Élie Vinet. 1629. *Exposicion de la Esfera de Iuan de Sacrobosco*. Salamanca: Jacinto Taberniel (Sacrobosco et al. 1629).

Sacrobosco, Johannes de, Cosme Gómez Tejada de los Reyes and Aristotle. 1650. *El filosofo. Ocupacion de nobles, y discretos contra la cortesana ociosidad*. Madrid: Domingo García Morrás for Santiago Martín Redondo (Sacrobosco et al. 1650).

Among the places of publication, Seville and Salamanca stand out (Fig. 2). The former was linked to the Casa de Contratación and trading with America, whereas the latter was a seat of university education.

2.1 *Printers and Publishers of the Tractatus de sphaera in the Iberian Peninsula (1472–1650): Latin Editions*

In the context of the Iberian publishing industry, Sacrobosco's text was published in 1526 for the first time in the Peninsula in Latin by Miguel de Eguía (ca. 1495–1544), a printer from Alcalá de Henares (Sacrobosco et al. 1526). Later, two further editions, also published in Salamanca, can be found: in 1535 by Rodrigo de Castañeda (fl. 1533–1537) (Aristotle and Espinosa 1535) and in 1550 by Juan de Junta (fl. 1526–1558) (Sacrobosco and Espinosa 1550). Only at the end of the century, in 1593, was it printed in Coimbra (Avelar 1593). It is important to consider that the three cities in which the Latin text was published during the sixteenth century had been active

university cities since the previous century. Indeed, if we examine the editions that came out of these publishing houses, we observe that all four cases are printers whose production, although not exclusively specialized in academic texts, was characterized by texts mainly aimed at the students and lecturers of the universities of their towns.

As stated above, the first edition of the Latin text was published in Miguel de Eguía's print shop in Alcalá de Henares (Sacrobosco et al. 1526), one of the foremost printing centers and the seat of the prestigious university founded by Francisco Jiménez de Cisneros (1436–1517). Miguel de Eguía was not only a prolific printer but also a “cultured man and a notable humanist who was a follower and advocate of the doctrines of Erasmus” (Fuente Arranz 2018, “Miguel de Eguía”). He produced his first printed works in Logroño in the workshop of Arnao Guillén de Brocar (fl. 1490–1524), with whom he formed a partnership in 1518 after marrying Brocar's daughter, María Brocar, who died at a young age. In 1511, he moved with his father-in-law to Alcalá de Henares and, in 1523, inherited Brocar's business after they had collaborated on such important projects as the printing of the *Biblia políglota complutense* (Brocar and Cisneros 1514). The *Iberian Books* database counts 197 editions of Eguía. Based on the same source, we can confirm that although he cannot be classified as a specialized printer, and books on religious matters occupy—as was typical in this period—the first position in terms of production (eighty-eight editions listed under Religious and eleven under Bibles), we may observe that his production, according to the *Iberian Books* database, was relevant to the common reading matter of the university at that time. In this respect, we cannot forget that the database classifies editions under these subjects: Classical Authors (nineteen editions), Educational (eleven editions), Sciences (ten editions), Philosophy and Morality (nine editions), Histories (eight editions), Linguistics and Philology (six editions), Literature (four editions), Dictionaries/Language Instruction (three editions), Poetry (three editions), Dialectics and Rhetoric (three editions), Astrology and Cosmography (two editions), Music (two editions), Agriculture/Veterinary (one edition), and Medical (one edition). As concrete examples, we note the many editions of the works of Antonio de Nebrija (1441–1522), the publication of classical Latin texts, and the first grammar reference of the Hebrew language (*Introductiones artis grammaticae hebraice*) by Alfonso de Zamora (1476–1544), printed in 1526 (Zamora 1526). Therefore, it can be stated that textbooks were of prime importance in Eguía's output (Martín Abad 1991, Vol. I, 79), although he also punctually published editions belonging to other subjects, such as Ordinances/Edicts (nine editions), News (five editions), Funeral Orations (one edition), and Military Handbooks (one edition). It should not be forgotten, however, that this edition of the *Sphaera* was undertaken by Pedro Ciruelo (1470–1554),⁵ a Spanish mathematician and theologian who was a tutor of King Philip II (1527–1598) (Chap. 13). Therefore, in this case as well, Sacrobosco's text must be understood as an academic one, probably offered by Eguía to the students of Alcalá. It must not be forgotten, however, that he divided his time between printing in Alcalá and doing typographical work in Logroño, Toledo, and Burgos (Delgado Casado 1996, Vol. I,

⁵ See (Lanuza Navarro 2020) for more information about Ciruelos's commentary on Sacrobosco's *Tractatus*.

199). It is possible that this circumstance may have favored him when establishing relationships with businesses outside of Alcalá for the sale of Sacrobosco's text.

It is also necessary to highlight the typographical perfection and innovative nature of his work, achieved through the innovation of types and decorative elements (Martín Abad 1991, Vol. I, 80). However, there was a clear influence of works printed abroad on some of Eguía's editions. One good example in this regard is, without doubt, the titlepage of his edition of Sacrobosco's *Opusculum de sphaera mundi* (Fig. 3), on which the use of a typographical tabernacle of foreign origin can be observed. This may be attributed to the fact that he had been employed in Paris by Simon Vostre (fl. 1486–1521) many years before (Martín Abad 1991, Vol. I, 81).

In 1535, a new edition appears to have been published by the printer Rodrigo de Castañeda from Salamanca (Aristotle and Espinosa 1535). He was an extremely unprolific printer (with just seventeen editions listed in the *Iberian Books* database) despite having been active from 1533 to 1551. Although, as in the previous two cases, books of a religious nature are situated at the head of his output (five editions listed under Religious), certain works related to university reading matter, such as the edition of Sacrobosco, also came off his printing presses. Among them, the database counts editions on the next subjects: Jurisprudence (two editions), Philosophy and Morality (two editions), Sciences (two editions), Ordinances/Edicts (one edition), Literature (one edition), Educational (one edition), Classical Authors (one edition), Bibles (one edition), and Astrology and Cosmography (one edition). Thus, his workshop was often chosen by “the authors of rank (university lecturers, ecclesiastic authorities, or the university itself) in order to disseminate their writings” (Mano González 1998, 72) because of his way of working, which was in the Renaissance style (Ruiz Fidalgo 1991, 59). He worked closely with Pedro de Espinosa (fl. 1551), a sixteenth-century mathematician and astronomer, who prepared the edition of Sacrobosco.

The final Latin edition came off the presses of Juan de Junta in 1550 (Chap. 8). This printer, of Florentine origin, belonged to a family of printers and booksellers. It is believed that he arrived in Spain in 1514 and set himself up as a bookseller in Salamanca. However, he moved to Burgos shortly thereafter to assist the printer Isabel de Basilea (fl. 1517–1525), whom he later married. Around 1532, they moved to Salamanca and set up a second print shop (Fuente Arranz 2018, “Juan de Junta”), which produced, according to the *Iberian Books* database, at least 106 editions until 1552.⁶ It should be noted that, after setting up the print shop in Salamanca, Junta left the business in the hands of Alejandro de Cánova (fl. 1569–1573) for the almost twenty years that he spent outside the Iberian Peninsula. Therefore, although Junta's is the name on the colophons, Cánova would have been responsible for selecting the books to be printed and for “taking on apprentices under his responsibility, agreeing

⁶ It is important to consider that we are referring to those editions in whose imprints the name “Juan de Junta” appears as printer. It is also important to consider the importance of his very large library, well studied by William Pettas through his inventory, which includes up to 15,827 volumes (Pettas 1995, 9).



Fig. 3 Titlepage of (Sacrobosco et al. 1526). Universidad de Sevilla, Callnumber: 1294. Courtesy of HathiTrust. <https://hdl.handle.net/2027/ucm.5320774244>

and signing printing contracts and for the organization and supervision of the tasks carried out by the different members of the workshop” (Mano González 1998, 71).

The workshop went through different stages: the first had a moderate level of production, the second saw an increase in output, and finally there was a period of decline (Mano González 1998, 71). Its output is related with the publication of the works of new writers (five editions under Literature listed in *Iberian Books*), missals, breviaries, manuals for the local church (thirty-three editions under Religious and four under Bibles), pamphlets to commemorate historical events, and booklets of laws (thirty-one editions under the subject Ordinances/Edicts and four under Jurisprudence).

This set of works was, therefore, “in general of little scope, with a low cost and rapid and assured distribution, which, although it did not make it possible to obtain large profits, at least covered the costs of the investment made in terms of time, staff and material” (Mano González 1998, 73). Only occasionally did certain figures related to the university request the services of this print shop. In this respect, we found editions in Sciences (four), Philosophy and Morality (three), Linguistics and Philology (three), Classical Authors (three), Dialectics and Rhetoric (two), Economics (two), Educational (two), Agriculture/Veterinary (one), and Astrology and Cosmography (one) listed in *Iberian Books*. It is perhaps in this context, and as an exception to its common tasks, that we can situate the edition of Sacrobosco’s *Sphaera*. It should also be recalled that the work of printing was only a complement to the selling of books, which was the fundamental commercial activity for the Junta firm, not only in Salamanca but also in Burgos, as mentioned above. This would have considerably broadened his center of sales and, therefore, of the distribution of the editions he printed, a circumstance that might have encouraged sales of his edition of Sacrobosco outside of Salamanca.

Only at the end of the century, in 1593, was a version of Sacrobosco’s text, entitled *Sphaerae utriusque tabella ad sphaerae huius mundi faciliorem enucleationem*, printed in Portugal (Avelar 1593). This task was carried out by the printer Antonio de Barreira (fl. 1579–1597) in Coimbra, where the university had been established in 1537. This printer was only active between 1579 and 1597 and had a low output (seven editions) according to *Iberian Books*. In his production, we find mention of editions that belong to the most successful subjects in the market of the time—books of Religion (two editions) and those related to the Law (two editions under the category Ordinances/Edicts). It is known that he had connections in Salamanca, given that he financed at least the publication of one book in the city, and that he was related to the University of Coimbra, for which he published its charter. Part of its production may therefore have been limited to this area, which is why we find editions under subjects related with this field in the *Iberian Books* database: Sciences (one), Astrology and Cosmography (one), Dialectics and Rhetoric (one), Medical (one), Music (one), News (one), and Poetry (one). His edition of Sacrobosco’s text could be related to his shop’s work for the university.

As Gómez Martínez has explained, the inventories preserved from the old Spanish libraries demonstrate that in the first quarter of the sixteenth-century Venetian printers and booksellers—and then the French, particularly from Paris and Lyon—supplied

the majority of Latin texts that students in the Iberian Peninsula needed for their education; only occasionally, as mentioned above, can Spanish printers be found to have produced Latin texts for students and lecturers (Gómez Martínez 2006, 197). In this regard, it should be recalled that “Spain was peripheral in the geography of the printing press, which could never compete with the great pioneering centers of the rest of Europe (Germany, France, and Italy) and was always relegated to the task of supplying, almost exclusively, the local markets” (González Sánchez and Maillard Álvarez 2003, 20).

This began to change around the end of the fifteenth century, although it would not be until the sixteenth century that, in Europe as a whole, a greater importance would begin to be assigned to the vernacular languages. There can be no doubt that the Spanish humanist Antonio de Nebrija (who considered the Spanish language to be a unifying factor for the various territories of the Catholic monarchs) contributed, with many of his works, to this paradigm shift in the use of the Spanish language. This circumstance may have contributed to the appearance of many translations of Sacrobosco's text produced by Spanish workshops for the local market. To this it must be added, as detailed below, that the Portuguese and Spanish editions of Sacrobosco's text were not only aimed at university students, but were also printed for the training of cosmographers and navigators who worked for the courts and who did not always have an in-depth knowledge of Latin.

The existence of translations of the text in different parts of the Peninsula raises the question of which language was used in university teaching in the sixteenth century. As explained by Gómez Martínez, “it is commonly held that the teaching of astronomy and cosmography during the sixteenth century was mainly carried out in Latin in the universities and in Spanish in other educational institutions focused on a more practical type of education, such as the Casa de Contratación in Seville and the Academia de Matemáticas in Madrid” (Gómez Martínez 2006, 206). However, it should be taken into consideration, on the one hand, that there are translations into Spanish dating from the end of the fifteenth century, of which at least one was made by a lecturer from the University of Salamanca, Diego de Torres, and, on the other hand, that, in accordance with the charter of the University of Salamanca, in the sixteenth century the use of Spanish was preferred for the teaching of certain laws and in the subjects of music and astrology—in other words, in *applied* subjects (Gómez Martínez 2006, 206). To this circumstance must be added the gradual increase in production of translations of works in other Romance languages, which was a common phenomenon throughout Europe and a demonstration of the progressive acceptance of the vernacular languages in the teaching of the sciences.

Some authors have stated that versions of the text in vernacular languages were few and late, given that it was an academic text (Ortiz Gómez and Menéndez Navarro 2004, 141). However, the figures indicate that the publication of the text in the vernacular languages was more common than in Latin; there were twelve editions in Portuguese and Spanish published in the sixteenth and seventeenth centuries.

2.2 *Printers and Publishers of the Tractatus de sphaera in the Iberian Peninsula (1472–1650): Editions in the Vernacular Languages*

The first Sacrobosco translation into a vernacular language of the Iberian Peninsula (Portuguese) was published in 1516 and came off the printing press of Germão Galherde (fl. 1519–1561) in Lisbon (Sacrobosco [1510–1512]). The same workshop printed the text again in 1537; however, the two texts are actually quite different in content (Sacrobosco and Nunes 1537).⁷ The translator of both editions was Pedro Nunes (1502–1575), a cosmographer of King John III of Portugal (1502–1557). This would indicate, perhaps, that the primary aim of this translation was not academic, as was the case in previous examples, but rather administrative and connected with Portugal's international relations. It should be mentioned here that new lands were discovered in Asia and that the colonization of Brazil began during the reign of King John III.

The first information about Nunes dates from 1519. He probably continued working until 1557. Compared with the other cases analyzed above, astrology and cosmography played a greater role in the workshop of this printer (seven editions listed in the *Iberian Books* database); nevertheless, Religion and Ordinances remain the most important subjects (sixty-three editions listed under Religious, one mentioned under Funeral Orations, one mentioned under Bibles, thirty-eight mentioned under Ordinances/Edicts, and two under Jurisprudence). However, he also paid attention to other fields such as News (two editions), the Book Market (one edition), Texts for Education (eight editions under Histories, six editions under Educational, five editions under Sciences, four editions under Classical texts, three editions under Music, two editions under Medical), and Literary Texts from different genres (seven editions under Poetry, three editions under Drama, and three editions under Literature).

The first printed translation into Spanish would not arrive until the middle of the sixteenth century. During this period, four editions were printed in Spanish. The first two, published in Seville in 1545 and 1548, were made by Juan de León (Lyon) (fl. 1545–1555), a printer of French origin who was active between 1545 and 1555 (Sacrobosco and Chaves 1545, 1548).⁸ His workshop was located in Calle Real and he used new typesets and ornamental elements of high quality. It is interesting to note that in 1549 he was named printer of the University of Osuna by the Count of Ureña, Juan Téllez de Girón (1494–1558), who also employed him as his personal printer (Ruiz Jiménez 2015). The translation was made by Jerónimo de Chaves (1523–1574), professor of the Art of Navigation and Cosmography in the Casa de Contratación in Seville. Therefore, it is possible that these editions were not destined for academic institutions such as the Casa de Contratación alone, but also for the count. Indeed,

⁷ A description of this edition, see (Crowther 2020, 171–173).

⁸ For a description of the 1545 edition, see (Crowther 2020, 173–175). The 1548 edition is a reissue of the one printed in 1545.

we shall later refer to the presence of Sacrobosco's text in the book collections of the Spanish nobility.

In the timeframe mentioned above, Juan de León published only sixteen editions divided between the subjects indicated hereafter. Perhaps the restricted nature of his production is due to the fact that he published for very specific audiences: it is possible that those editions classified in *Iberian Books* as Astrology and Cosmography (three) were destined for the Casa de Contratación, while perhaps the other editions he published could have been commissioned by the count himself and destined for him or the University of Osuna. Among them we find the following according to *Iberian Books*: News (three), Philosophy and morality (two), Poetry (two), Religious (two), Bibles (one), Histories (one), Literature (one), and Music (one).

Twenty years later, in 1567, Rodrigo Sáenz de Santaya y Espinosa made a new translation, which was printed by Adrian Ghemart in Valladolid and reissued in 1568 (Sacrobosco and Santayana y Espinosa 1567, 1568).⁹ Adrian Ghemart (fl. 1550–1573) was a bookseller and publisher based in Medina del Campo, another significant printing center in the Iberian Peninsula during the sixteenth century. Later, around 1562, it is believed that he set up a shop as a printer in Valladolid, where he stayed, according to the colophons, until 1573 (Pérez Pastor 1895, 493), albeit without abandoning his main activities as a bookseller and publisher (Delgado Casado 1996, 273). He also appears in relation to the publication of certain editions in Alcalá de Henares (Delgado Casado 1996, 274). In his case, editions on religious and legal matters were also at the head of his output (eleven editions under Religious and two under Jurisprudence), while scientific works were merely incidental (two editions under Astrology and cosmography), given that the only examples are two editions of Sacrobosco's text. We must not lose sight of the fact that, as is typical in the Iberian publishing market at this time, this printer also welcomed the publication of works linked to the educational sphere (two editions under Government/Political theory, one edition under Dialectics and rhetoric, one edition under Educational), as well as literary texts (one edition under Literature and one under Poetry). The broad network of relationships created by this bookseller-printer working in both Valladolid and Medina del Campo should be noted, as it enabled him to distribute his work more widely.

At the end of the sixteenth century, in 1599, Ginés Rocamora y Torrano (1550–1614), alderman of Murcia and deputy in the court, offered a new translation of the text, which he included in his book entitled *Esfera del Universo*, which provided a summary of the explanations he offered during his stay in the court (Rocamora y Torrano 1599). It was published in Madrid by Juan de Herrera (fl. 1599–1614). We know of this printer's activity in the capital between 1599 and 1614. His output was extremely limited and was dominated by religious topics (five editions listed in *Iberian Books*); however, he also contributed to Jurisprudence (one edition), Literature (one edition), Military handbooks (one edition), and obviously to Astrology and cosmography (two editions). Yet again, the printing of scientific texts is limited—restricted in this case to the edition of Sacrobosco's texts.

⁹ For a description of this edition, see (Crowther 2020, 177–179).

The editions reviewed up to this point were published, as explained by Gómez Martínez, in relevant cities at the time,

due to having institutions dedicated to the teaching of astronomy and cosmography: in Salamanca there was the university, in Seville the Casa de Contratación, functioning since 1503, and in Madrid the Academia de Matemáticas, inaugurated in 1582. Furthermore, we know that in these educational institutions, not only were astronomy classes given, but the *Sphaera Mundi* was also used. For example, in the University of Salamanca, the subject of astrology, which was the main subject in the arts faculty of the university, included the teaching of both theoretical and practical astronomy, as did mathematics and geography over a three-year period, according to the charters of the University of Salamanca dating from both 1529 and 1538. However, the texts to be read by the professor are not specified. (Gómez Martínez 2006, 203)

However, we do have the university statutes of *Covarrubias*, dating from 1561, which offers a full list of the texts read on the subject of astronomy at the University of Salamanca during the sixteenth century. If we focus our attention only on those used for the teaching of astronomy, it can be stated that at least in 1577, 1580, 1588, and 1592 the *Sphaera* was read. Likewise, we know that Sacrobosco's text was used in the training of navigators and cosmographers in the Casa de Contratación in Seville (Gómez Martínez 2006, 204).

A good example in this regard is the edition by Francisco Faleiro (d. ca. 1574) from Portugal, published by Juan Cromberger (fl. 1502–1541) in 1535, in which part of the text is translated (Faleiro 1535).¹⁰ It is known that Faleiro arrived in Spain to join Ferdinand Magellan's (1480–1521) expedition, but he ended up staying in Seville to serve the Crown of Castile as a cosmographer in the Casa de Contratación. The significance of his edition lies in the fact that it is the first in a series of tracts on cosmography published in connection with the Casa de Contratación. It is of interest to note an idea presented by Faleiro in the prologue to his translation: he points out that his work is eminently practical and is aimed at navigators who, perhaps due to the fact that they did not have a high level of education, needed a translation in a Romance language, as they did not understand Latin.

Juan Cromberger was one of the most important printers in the Iberian Peninsula during the sixteenth century, both in terms of the span of his career and his great publishing output (205 editions listed in the *Iberian Books* database). The first mention of his activity was in 1525 and the last in 1540. During this period, he printed editions aimed at a very wide audience. His production too was led by books linked to religion (eighty-two editions under Religious and three editions under Bibles); these are followed by literature (forty-seven editions under Literature, five editions under Poetry, and four editions under Drama), an extraordinarily important area of his production. He also dealt with works that were perhaps intended for the educational sphere (sixteen editions under Histories, nine editions under Classical authors, eight editions under Philosophy and morality, four editions under Adages/proverbs,

¹⁰ For a description of this edition, see (Crowther 2020, 168–171).

two editions under Educational, two editions under Dialectics and rhetoric, and one edition under Music); he was also interested in science (seven editions under Medical, three editions under Astrology and Cosmography, two editions under Sciences) and, finally, Ordinances/Edicts (seven editions) and Culinary Arts (one edition).

A second example of the same circumstance is offered by the translation of Sacrobosco's text included with the text on the art of navigation written by Martín Cortés (1510–1582) and printed in Seville in 1551, then reprinted in 1556 (*Breve compendio de la esfera y de la arte de navegar*) by Antonio Álvarez (fl. 1544–1556) (Cortés 1551, 1556).¹¹ The latter was active as a printer from 1544 to 1556, during which time he mainly printed religious texts (eight editions listed in *Iberian Books*); he was however also interested in other topics, such as Astrology and Cosmography (two editions), News (one edition), Literature (one edition), Histories (one edition), Poetry (one edition), and Travel (one edition).

In the seventeenth century, we are only aware of one complete translation of Sacrobosco's work. It was made by Luis de Miranda (1600–1650) and published in Salamanca in 1629 (Sacrobosco et al. 1629) by Jacinto Taberniel (fl. 1628–1640).¹² Taberniel's output was mainly dedicated to religious books (sixteen editions listed under Religious and two editions under Bibles) and legal texts (eight editions under Jurisprudence and one edition under Ordinances/Edicts). Once again, the publication of an edition relating to cosmography (the *Sphaera*) is an isolated case (under Astrology and cosmography). Other subjects he was interested in were News (two editions), Histories (two editions), Panegyric (two editions), Educational (one edition), Military handbooks (one edition), Ordinances/Edicts (one edition), and Poetry (one edition).

Cosme Gómez de Tejada's seventeenth-century edition *El filosofo ocupacion de nobles y discretos contra la cortesana ociosidad sobre los libros de cielo y mundo, meteoros, parnos naturales, ethica, economica, politica de Aristoteles y esfera de sacro Bosco* should also be mentioned here (Sacrobosco et al. 1650). It was published in Madrid by Domingo García Morrás (fl. 1646–1699) in 1650 and includes an almost complete translation of Sacrobosco's text. García Morrás was one of the most prolific printers in the city of Madrid in the seventeenth century (332 editions listed in the *Iberian Books* database). He was active from 1643 to 1699, during which time he printed texts on a wide range of subjects. First of all, we must highlight religious works (141 editions, plus six editions under Funeral orations and one edition under Bibles are listed in *Iberian Books*) and other law-related matters (thirty-three editions under Ordinances/Edicts and twenty-eight under Jurisprudence); both subjects were the most successful at the time. Secondly, we must draw attention to the publication of news, imprints of great importance and easy to publish because of their customary

¹¹ For a description of these editions, see (Crowther 2020, 175–177).

¹² It can be noted that the various translations of the book progressively added additional explanations with a purely educational aim. In this regard, Luis de Miranda's edition is important as it significantly adds to and broadens the definitions of the terms included in Sacrobosco's text in instances when he considered a term particularly complicated. There is also a table of the cited terms (Gómez Martínez 2012, 97–98). In relation to the same topic, see (Gómez Martínez 2013, 39–58).

brevity (forty-nine editions under News). We cannot forget, however, that he also stood out for his publication of literary and historical texts (fourteen editions under Drama, nineteen editions under Histories, and seven editions under Literature listed in *Iberian Books*). He also dealt with texts intended, perhaps, for the educational field (three editions under Classical authors, two editions under Educational, and one edition under Dialectics and rhetoric). Texts belonging to the field of science are not particularly significant (three editions under Medical and one edition under Agriculture/Veterinary); neither are some occasional editions belonging to other areas that he published on an ad hoc basis. According to the *Iberian Books* database, these subjects are Memorial (ten editions), Adages/proverbs (three editions), Heraldic (three editions), Government (three editions), Military handbooks (two editions), Political tracts (two editions), Calendars and almanacs (one edition), and Economics (one edition).

3 On the Circulation of Sacrobosco's Text in the Iberian Peninsula via Inventories of Bookshops and Libraries (1472–1650)

Apart from the success enjoyed by Sacrobosco's text in the Iberian printing industry, which we are aware of through the printed editions we have reviewed, it is also necessary to make use of other bibliographic tools that enable us to examine in more depth the circulation, reading, and possession of the text in Spain, distinguishing, where possible, between different editions. In order to do so, we can first make use of the inventories of bookshops of the period. This is an area of research that, though it has been looked into (Dadson 1998), still requires a research project to organize the material in a systematic way, given that the information available is fragmented, therefore leading to fragmented conclusions. No mention has been found of Sacrobosco's text in bookshops prior to 1571. The first reference we can cite is the 1571 inventory of Martín de Salvatierra's bookshop, located in the city of Granada, reproduced in the 2001 study by Osorio Pérez, Moreno Trujillo, and Obra Sierra on the city's bookshops in the sixteenth century. Five copies of a Latin edition were found, along with five more copies of an edition in Castilian and one other edition of which no more details are offered (Pérez et al. 2001, 271–272). Secondly, we can cite the example of the bookseller Francisco García, the 1583 inventory of whose bookshop included a copy of an edition of "Sfera de Sacrobusto con comento" (Pérez et al. 2001, 362). The third example is that of the bookshop of the French bookseller and humanist Guillaume Rouillé (1518–1589) in Medina del Campo.¹³ Here, there

¹³ For the inventory of the bookseller Guillaume Rouillé as well as for the inventories of the private libraries of Pedro Díez Barruelo, Sebastián de Salinas, Pedro Enríquez, León de Castro, Antonio de Hormaza, Pedro Simón Abril, Mateo de Vargas, Lorenzo Ramírez de Prado, Pedro Gutiérrez Ramírez, Juan López de Fuentesdaño, Francisco López, Juan Flores Torrecilla, and Cristóbal Salas de León, it is not possible to specify exact bibliographic information. Such inventories were

are three generic mentions of the work, which could refer to three different editions in octavo. There were forty-two copies of the first, one of the second, and four of the third: “42 sphaera de sacrobosco 8° 5 r; 1 sphaera de sacrobosco 8° en pergamino 5 r;¹⁴ 4 sphaera de sacro bosco 8° 5 r.”

The final bookshop we can cite is that of Francisco de Aguilar (d. 1582) in Seville, whose inventory has been transcribed and studied by González Sánchez and Maillard Álvarez (2003, 92). In this shop, scientific imprints occupied nine percent of the total, with a total number of 389 editions recorded. Among them, medical editions stand out, a key discipline in the science of the early modern period. The remaining editions in the scientific-technical section consist of a set of works by significant authors, among which Sacrobosco's text is mentioned with one copy being cited in a Spanish edition and four possibly in Latin: “una sfera de Sacrobosco en romance” (González Sánchez and Maillard Álvarez 2003, 177) and “quatro esfera de Sacrobosco” (González Sánchez and Maillard Álvarez 2003, 182). It is not known which specific editions are referred to here, and given the date of the inventory the edition in Castilian could refer to up to nine different editions. It should be recalled, however, that by that time four editions had been published in Seville. Perhaps one of these was the edition on sale. Furthermore, it must not be forgotten that Francisco Aguilar's bookshop was located on Calle Génova, the same street as Juan de León's print shop, which had printed two editions, in 1545 and 1548. However, we must bear in mind that Aguilar did not only buy stock in Castile (with his connections with printers in Medina and Salamanca); to some extent, he also depended on foreign suppliers, mainly from the Netherlands (González Sánchez and Maillard Álvarez 2003, 43), whence it is possible that these four *Sphaerae* came (again, no information is given about their language). Aguilar also had connections in Portugal, more specifically in Lisbon.

Apart from the bookshop inventories, which merely serve to confirm the sale of Sacrobosco's text (at least in the sixteenth century), and the coexistence of editions in Latin and in Spanish, it is also of interest to review the inventories of private collections, which can offer an idea of the kind of people who owned, and perhaps read, the text. Sacrobosco's text is mentioned in inventories of private libraries belonging to members of the nobility and professionals, among whom can be found medical practitioners, university lecturers, humanists in close proximity to the field of education in the sixteenth and seventeenth centuries, and occasionally other members of the administration of the crown, such as members of the Council of the Inquisition.

published online by the historian Anastasio Rojo Vega, who passed away in 2017 (<https://investigadoresb.patrimonionacional.es>. Accessed June 8, 2021). Rojo Vega published hundreds of such inventories in transcribed form, often together with the electronic copies of manuscript folios from which he was retrieving the information. Unfortunately, however, none of these historical documents is accompanied by the bibliographic metadata and no one was apparently able to complete his work. We consider the website, hosted by the Real Biblioteca of Madrid, as well as its content to be trustworthy.

¹⁴ It is possible that this is a manuscript and not a printed edition. The presence of manuscripts in individual collections, or in this case a bookshop, may indicate a collection built on the sedimentation of previous collections.

We shall begin by looking at the private collections of noblemen of different kinds. First, we will mention the inventory of Don Alonso de Osorio Seventh Marquis of Astorga (d. 1582), dating from 1573, in which mention is made of “La espera de Juan Sacrobosco, traduçida de latín en castellano por Rodrigo Sanz de Santaparra (sic) y Espinosa,” which he most probably kept in his palace in Valladolid or in his fortress in Astorga (Cátedra 2002, 333). This is the first explicit mention of a specific edition beyond invocation of its language, as we saw in the inventories of the bookshops.

The inventory of the Count of Gondomar, Diego Acuña y Sarmiento (1567–1626) (Manso Porto 1996), dating from 1626, includes mention of some editions and commentaries of Sacrobosco’s book published outside the Iberian Peninsula (Sacrobosco et al. 1490; Sacrobosco 1538, 1546, 1551; Sacrobosco and Beyer 1552; Sacrobosco and Clavius 1585), though it also mentions those published in Alcalá de Henares in Latin in 1526 (Sacrobosco et al. 1526), one from Seville published in Spanish in 1545 (Sacrobosco and Chaves 1545), and one from Valladolid from 1568 (Sacrobosco and Santayana y Espinosa 1568). One octavo edition in Spanish, though it is not known which one, is mentioned in the inventory of the seventh Duke of Medinaceli, Antonio Juan Luis de la Cerda (1607–1671).

Without a doubt, the most significant book collection in this group is that of the Torre Alta del Alcázar of King Philip IV (1605–1665), the reconstruction of which we have thanks to Fernando Bouza Álvarez (Bouza Álvarez 2005) by way of the inventory carried out in 1637 by Francisco de Rioja (1583–1659), the King’s librarian. The inventory is divided by subjects that the king had the duty to know in order to rule well. One such area of knowledge was the *Sphaera*, which deals with “the celestial and, particularly, with its applications in navigation, although its twenty-four entries for twenty-six bodies bear a close relationship with the cosmographic works” (Bouza Álvarez 2005, 110). Sacrobosco’s *Sphaera* “appears alone...and in the adaptation by Jerónimo de Chaves...allowing its influence to be felt in the Hispano-Portuguese tracts, though always with a practical bias, by Pedro Nunes..., Martín Cortés..., Ginés de Rocamora...” (Bouza Álvarez 2005, 110). An edition in Castilian is mentioned—perhaps the one from Valladolid (1568)—along with a copy of Juan de León’s edition (1545), another from Lisbon (1537), one from Seville (Antonio Álvarez), and one from the 1599 edition from Madrid (Bouza Álvarez 2005, 110). In other words, this book collection held copies of the editions of the 1545 and 1551 Seville editions, the 1537 Lisbon edition, and the 1599 Madrid edition (Sacrobosco and Nunes 1537; Sacrobosco and Chaves 1545; Cortés 1551; Rocamora y Torrano 1599).

It should be pointed out that, unlike the inventories of the libraries of the nobility, it is not possible to find detailed references on specific editions in professional libraries. First, we shall look at libraries belonging to university professors and lecturers. Chronologically, the first mention of a copy of an edition of Sacrobosco’s text, most likely in Spanish, is found in the 1558 inventory of books belonging to Pedro Díez Barruelo, professor of logic at the University of Valladolid: “esphera de sacrobusto yn folio en quatro reales.” In a later inventory—of 1572—of the professor of grammar and rhetoric of the same university, Sebastián de Salinas, one edition with commentaries by Ciruelo and another in Castilian are mentioned: “491. Sphera de sanobosto cum comento Ciruelo; 511. Sphera en romanze en 4.” Two editions are also

mentioned in the 1584 inventory of the book collection of Pedro Enríquez, a professor from Valladolid. One is the edition published in Seville in 1551 (Cortés 1551) and the other is probably a Spanish edition: “583. brebe compendio de la sphaera y arte de navegar fo.; 594. sphaera de sacrobosco.” Last of all, the 1585 inventory of a professor from the University of Salamanca, León de Castro (1505–1585), mentions an edition of the *Sphaera* with comments and another with Greek and Latin annotations: “203. sphaera con comento; 254. sphaera con anotaciones greçe et latine.”

Sacrobosco's text also sat on the shelves of the libraries of illustrious humanists. Antonio de Hormaza, humanist and archdean of the Bierzo, owned (according to his 1575 will) a Castilian edition of the text: “455. esphera en romance.” Another is mentioned in the inventory of Pedro Simón Abril's (1530–1595) book collection, dating from 1595. In the seventeenth century, there is mention of an edition in Castilian in Mateo de Vargas's 1623 book collection: “58. esfera del mundo en romance seis reales.” Finally, a copy of a commentary of Sacrobosco's text has been found in the postmortem 1662 inventory of the book collection of Lorenzo Ramírez de Prado (1583–1658), a Spanish humanist and bibliophile (Entrambasaguas 1954). More specifically, it is the *Commentaria in Sphaeram Sacro Bosco* written by Francisci Iunctini and published in two volumes in Lyon in 1577 (Sacrobosco and Giuntini 1577a, b) (Chaps. 6 and 8). It is also necessary to add the reference of Joaquín Entrambasaguas to the same book collection in which a copy of the edition from 1545 was preserved (Entrambasaguas 1954, Vol. I, 92): “La Esphera de Sacrobosco en romance por Gerónimo Chaves con el Alonso de Fuentes Philosophía—natural en Romance, Madrid 1545.”

This group is followed by the libraries of various members of the administration of the Crown of Castile, for example Pedro Gutiérrez Ramírez, a supplier of royal works, in whose 1617 inventory an edition in Castilian is mentioned (“113. otro libro intitulado esfera de sacrobera”). We can also mention the 1631 book collection of the inquisitor of Valladolid, Juan López de Fuentesdaño, which held a copy of the 1567 edition from that city (Sacrobosco and Santayana y Espinosa 1567).

Last of all, we can examine inventories of the libraries belonging to medical practitioners and surgeons. Those of Francisco López (1557), Juan Flores Torrecilla (1590), and Cristóbal Salas de León (1616) mention, with no further details, a copy of an edition of Sacrobosco's text, probably in Spanish: “13. Esfera; 92. otro libro esfera de sacriobosco; 188. sfera de sacrobosco.” The latter, however, quotes an edition published in Rome in 1581: “403. iten una sphaera de sacrobosco 4 perg roma año 1581” (Sacrobosco and Clavius 1581).

The few inventories that offer us data specific to the editions present in these libraries allow us to surmise that the two most popular editions were those by Antonio Álvarez, published in Seville in 1551 (Cortés 1551), and the edition printed in Valladolid by Adrian Ghemart in 1567 (Sacrobosco and Santayana y Espinosa 1567). It does not appear to be a coincidence that the first one was reprinted in 1556 (Cortés 1556), while there is a reissue of the second published in 1568 (Sacrobosco and Santayana y Espinosa 1568). These are followed by the 1537 Lisbon, 1545 Seville, and 1599 Madrid editions (Sacrobosco and Nunes 1537; Sacrobosco and Chaves 1545; Rocamora y Torrano 1599).

4 On the Circulation of the *Tractatus de sphaera* in America (1472–1650)

Not a great deal of information is available relating to the publication and dissemination of Sacrobosco's text in America. One important work on this topic is Pedro Rueda's monographic study of the book trade between the Iberian Peninsula and America (Rueda 2005). In this regard, Seville's monopoly on human trafficking and trade with the New World must not be forgotten. This situation "supposed an exceptional circumstance which was felt throughout the whole Ancien Régime, thanks, in part, to its geographically strategic position and a wide experience and tradition in long-distance trading" (González Sánchez and Maillard Álvarez 2003, 18). In 1503, the Catholic monarchs established the only (and obligatory) means of navigation and trade with America in Seville—the Casa de Contratación. From that moment on, the city underwent a deep transformation in every regard (González Sánchez and Maillard Álvarez 2003, 19). In 1550, faced with the advance of Protestant doctrine and in an attempt to block its penetration into the New World, King Charles V (1550–1558) gave the order to the officials of the Casa de Contratación in Seville that "when you have to take permitted books to the Indies, register them one by one, declaring the subject matter of each book, and do not register them wholesale" (González Sánchez and Maillard Álvarez 2003, 23). Therefore, merchants sending or taking books to the Indies were obliged to present a written and signed declaration with the specific number and title of the books to the officials of the Casa de Contratación who controlled intercontinental trading (González Sánchez and Maillard Álvarez 2003, 24). This strategy continued under later kings, which makes it possible for us to study, at least in part, the book trade between Seville and America. A significant part of Rueda's study mentioned above deals with the genre of books shipped to America and who sent them from Seville. Chapter XII deals specifically with practical and scientific literature (Rueda 2005, 411). With regard to this type of book, Rueda states that "the observations of the celestial phenomena of astronomy, which focus on the movement of the stars and planetary theories, have a lesser presence in the lists; it is easier to find works such as nautical books which make a practical use of the knowledge and techniques of this discipline" (Rueda 2005, 426–427). Rueda only located two shipments by the booksellers Ana Vernagli and Nicolás Antonio, in 1603 and 1609, respectively, which included two editions of Clavius's version of the *Sphaera* published in Rome in 1570 (Sacrobosco and Clavius 1570) and in Venice in 1601 (Chaps. 6 and 11).¹⁵ This enables us to confirm that, apart from the editions and translations of the works published in the Peninsula, there were also editions circulating in its overseas territories that came from international circuits, with Seville serving as a distributor of these editions to the American market. However, Ginés Rocamora's Spanish translation, published in Madrid in 1599 by Juan de Herrera, was also sent from Seville to Mexico (Rocamora y Torrano 1599). We know that this edition was

¹⁵ Two printings of the same edition of Clavius's commentary on *De sphaera* were put on the market in Venice in 1601 (Chap. 6): one by Isabetta Basa (Sacrobosco and Clavius 1601b) and one by Giovanni Battista Ciotti (Sacrobosco and Clavius 1601a).

sent in 1604 by the bookseller Fernando Mexía and in 1605 by the merchant Diego Correa. There is also evidence from 1640 indicating that Duarte Álvarez de Osorio took “2 Esfera de Rocamora” (Rueda 2005, 427, n. 44). It is therefore evident that the 1599 edition was still in circulation in Seville in 1640.

As these shipments show, Sacrobosco's *Sphaera* was known, and perhaps also read, in America. However, we have no proof that new editions were printed in the New World apart from the edition entitled *De sphaera* by the Italian mathematician Francesco Maurolico (1494–1575). Some authors have pointed out that although universities were established early in colonial America during the sixteenth century, certain teaching, such as in the faculty of astronomy, did not begin to function until the seventeenth century (Chang-Rodriguez 2002, 16). It would not be until this century that a new current would be felt in mathematical and astronomical studies, although in a very timid way (Mazin 2008, 71). On the other hand, one should not lose sight, in considering the teaching of the trivium and the quadrivium in New Spain, of the fact that both parts of the liberal arts had been well established in the cathedral schools and in the European universities since the late Middle Ages; however, “to think that these teachings could be taught completely in the schools of the mendicant friars is almost utopian” (Cuesta Hernández 2018, 108). We may imagine that the subject matter of Sacrobosco's treatise was less than prominent in the educational contexts of America, which meant that the work was less than successful at its printing presses.

In any case, we must not lose sight of Maurolico's work, mentioned earlier, which was printed in Mexico by Antonio Ricardo (d. 1606) in 1578 (Maurolico 1578). It was financed, according to the colophon, by “Petri Nunnesij a prado” and published at the request of the Italian Jesuit Vincenzo Le Noci: “Rogatu R. P. Vincētij Nutij societates Iesu, and Rectoris D. Petri and Pauli Collegialum.” The edition is an adaption of Sacrobosco's treatise; this means that it is a work that significantly resembles to Sacrobosco's treatise in terms of content and structure, but does not include the original text. In this regard, Antonella Romano's work on the first scientific books published in New Spain is of great interest, as it considers the reasons why Sacrobosco's original, or annotated original, text was not published in America, with Maurolico's 1578 edition being preferred instead. In her research, Romano demonstrates that the publication of this text was carried out in the first decades of educational advances by the Jesuits in New Spain, thanks to the impetus of the Jesuit lecturer Vincenzo Le Noci. He was sent to Mexico in 1574 and had trained in Messina—the hometown Maurolico. It seems plausible, then, that Le Noci was a key factor in the printing of Maurolico's text in Mexico (Romano 2005, 115–116).

5 Conclusions

At the beginning of this study, we posed a series of questions regarding the circulation of Sacrobosco's text in the Iberian Peninsula, based on which it is possible to draw certain general conclusions.

First of all, it is interesting to note the peninsular preference for the vernacular languages when printing Sacrobosco's text. This circumstance can, perhaps, be attributed to the advancement of humanism in various European nations. However, we must not ignore the fact that printers offered editions in vernacular languages for those collectors and readers who may have needed them at least in part because the demand for Latin editions was covered by editions published in the Peninsula and in other countries with circulation in the Peninsula, as we have seen in reviewing the inventories of bookshops and libraries. Furthermore, the aesthetic influence of some of these foreign editions on those published in the Peninsula must be considered; foreign editions must have reached the hands of Spanish printers in some way. The connection between Miguel de Eguía's edition and that of Simon Vostre from Paris should be kept in mind.

It is also of interest to consider the main centers of the printing industry, Salamanca and Seville, and their respective connections with the university and the Casa de Contratación—the former a scholarly setting and the latter an administrative center. This provides us with a sense of the readership and collectors of Sacrobosco's text: students and members of the university administration, mainly navigators and cosmographers. As we have stated in this study, it was an obligatory text both for students and for navigators and cosmographers involved in the expeditions to America. In general, all of the editions studied were linked with these characteristics. We can recall here the examples of the Portuguese printer Germao Galherde, linked to the University of Coimbra, and Juan de León, who was the printer of the University of Osuna, although León also printed the translation made by the professor of the art of navigation and cosmography of the Casa de Contratación in Seville. We must bear in mind the debate between cosmographers and pilots in the central years of the century on the relative importance of theory versus experience—a debate in which cosmographers were important defenders of theory, of general rules, of universal truths, and of the systematic knowledge documented in the treaties of the period. This circumstance shortens, perhaps, the distance between two of the mentioned large groups of receptors of the work of Sacrobosco and the distance between students and cosmographers was perhaps not so significant after all. Maybe these two groups did not constitute two separate sets of receivers but a single one, if we take into consideration their interest in the theory expressed in treatises such as that of Sacrobosco.¹⁶

The dates of publication of the text in the Iberian Peninsula must be highlighted, given that, although the text appears to have had an extraordinary degree of success in the sixteenth century, only two editions are preserved from the seventeenth. It is possible that it was supplanted by other texts, which resulted in a lack of public interest. It should also not be ruled out that perhaps the market was saturated and the number of existing editions satisfied what academic interest might still have existed. Unfortunately, we have no reliable evidence of either circumstance. On the other hand, during the seventeenth century the Iberian Peninsula entered a period of

¹⁶ We cannot forget that the Casa de Contratación in Seville enjoyed, like other educational centers of the time, an intellectual atmosphere typical of the humanist period. For more information, see (Gulizia 2016, 131).

greater decadence, during which the era of great international discoveries was left behind.

We find ourselves faced with a group of printers who were not specialized in the publication of scientific books—books that, as we have mentioned, did not achieve great success in the Iberian Peninsula. However, in many cases the printers were familiar with the printing of academic texts of different kinds, such as grammar references, historical books, scientific texts, and literary texts by classical authors. The publication of Sacrobosco's text must be considered within this context.

It is important to take into account the mixed profile of some of the printers who published Sacrobosco's text. All of them were printers, but some also worked as publishers or booksellers and had access to a much broader commercial network. Some—such as the case of Juan Junta, who was part of a very large European family network—had international connections, while others had businesses in different cities, thus enabling them to sell in more places. Such was the case of Miguel de Eguía, who had businesses in Alcalá de Henares, Logroño, Toledo, and Burgos; Juan Junta, who had a print shop and traded books in Burgos and in Salamanca; and Adrian Ghemart, who worked in Valladolid and in Medina del Campo, where there was an important book fair. This event gathered and distributed books printed in Lyon, Paris, Antwerp, and Venice, as well as those published in different places in the Iberian Peninsula.

We should remember that, in some cases, Sacrobosco's text must have been one from which its printers made a profit, as it was a successful book. In this regard, we must recall the editions that were reprinted within a short space of time. The most striking is, without a doubt, that of Adrian Ghemart, published in Valladolid in 1567 and reissued only a year later. Also worthy of note is Antonio Álvarez's edition, printed in Seville in 1551 and reprinted in the same city in 1556.

The examination of certain inventories of Iberian bookshops in the sixteenth century has enabled us to observe that, although editions in Romance languages began to be published quite early, they did not substitute the Latin editions. Rather, they appear to have coexisted on the shelves of these establishments. Perhaps of more interest are the inventories of the private libraries of the sixteenth and seventeenth centuries. Their examination allows us to broaden the portrait of the readership and collectors of the text, given that copies were found in the libraries of the nobility and of professionals, such as university lecturers and humanists in the field of education, medical practitioners, and other members of the crown's administration. The sparse clear data available regarding the specific editions found in the inventories indicate that the most successful editions were those by Adrian Ghemart and Antonio Álvarez—the editions that were rapidly reissued and reprinted as mentioned above. Furthermore, it is possible to highlight, thanks to the libraries of the nobility, the circulation in the Peninsula of editions of Sacrobosco's text printed in other parts of Europe.

Finally, it is of interest to highlight that it seems that the original, or annotated original, text was not printed in America; however, we do have an adaptation of Sacrobosco's book published in Mexico in the sixteenth century thanks to the intervention of the Italian Jesuit Vincenzo Le Noci. It is interesting to point out that it was Italy

and not the Iberian Peninsula that promoted the publication of Sacrobosco's work in America, even though, as we have shown, the work traveled from the Peninsula to America on several occasions. We do know that Seville was the point of departure for editions published in the Peninsula, specifically the 1599 Madrid edition. Likewise, Seville also launched the shipment of foreign editions of the text, specifically those published in Rome (1570) and Venice (1601), which were sent to the New World by two Spanish booksellers.

This information highlights, yet again, the significance of editions imported for sale in the Iberian Peninsula from important European cities such as Lyon, Paris, Venice, and Antwerp. Thanks to its links with America, the trade from Iberia became a flourishing market that attracted the interest of both local and foreign printers. This is evident in the shipments through which Sacrobosco's *Sphaera* reached the New World in both Latin and Spanish.

Abbreviations

Digital Repositories

- | | |
|----------------------|---|
| Iberian Books | Wilkinson, Alexander S., Ulla Lorenzo, Alejandra, Cruz Redondo, Alba de la, eds. Dublin: University College, Dublin. Library https://iberian.ucd.ie/index.php . Accessed 07 June 2021. |
| Sphaera CorpusTracer | Max Planck Institute for the History of Science. https://db.sphaera.mpiwg-berlin.mpg.de/resource/Start . Accessed 07 June 2021. |

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