

Conclusion: Five Connected Histories of Knowledge? Portugal, Spain, France, England, the Dutch Republic, and Secrecy Policies

Abstract

This chapter discusses the reasons for the overwhelming intensity and extension of Iberian maritime knowledge circulation among its maritime rivals (England, France, and the Dutch Republic) as early as the 16th century, in a process that intensified throughout the 17th century. It discusses why there is no reason to seriously consider the existence of a successful Iberian secrecy policy regarding maritime knowledge, and why those policies failed in most cases. Finally, it also argues that the dissemination of Iberian maritime knowledge contributed to the rise of early modern science.

Keywords: secrecy policies, maritime knowledge circulation, globalization of nautical knowledge, science

*"I have at times seen him somewhat impatient at the delay,
but this is a condition natural to those of this nation."*

(Letter from the duke of Sesa to King Philip III of Spain, 1602).¹

With these words, the duke of Sesa, the Spanish ambassador in Rome, informed King Philip III of Spain (1598–1621) of the behavior of the Portuguese sailor Pedro Fernandes Queirós (1565–1614). The comment was in reference to Queirós's previous proposal to the pope and to the duke of Sesa regarding

¹ Kelly, "Pedro Fernandes de Queirós," 295–96.

an expedition to explore and colonize *Terra Australis*. Queirós ultimately completed the expedition under the Spanish flag and made important geographical discoveries in 1606. Queirós's story is little different from episodes detailed throughout the chapters of this book. The news of his discoveries made a profound impact across Europe. In October 1615, the Dutch commander Jacob Le Maire (1585–1616), sailing the Atlantic under harsh conditions, was able to calm onboard tensions with the announcement that the Dutch fleet would head for a new continent that the Portuguese Queirós (who died some months earlier) had recently charted. By the 18th century, the British navigator James Cook (1728–79) was also inspired to sail to Australia by the simple reading of Queirós's report of his voyages.² Sesa's passage on Queirós's impatience as being natural to Portuguese sailors, and Le Maire's and Cook's references to Queirós, eloquently evoke what David Waters has described as the Portuguese contribution to the emergence of modern science in Europe.³

Sesa was correct in observing Queirós's eagerness to make geographical discoveries, as it was a trait and widespread image typical of Portuguese seafarers' behaviors dating back to the 15th century. In addition to designing new nautical instruments and composing a manual of navigation at Sesa's request, Queirós also made a sound argument to King Philip III to secure support for his voyage. In his memorial to the king, Queirós remarked that he was proposing his journey after having sailed the oceans of the globe for twenty years and traversed some 20,000 leagues, a feat that neither Christopher Columbus (1451–1506), Vasco da Gama (1469–1524), or Ferdinand Magellan (1480–1521) could claim when they set sail on their famed maritime voyages.⁴ Queirós's "Portuguese" pride and keen awareness of the pivotal role his nautical knowledge could play in Spanish designs in the Pacific Ocean during the early 17th century resemble several other documented histories in this book. It was precisely pride and a sense of technological superiority (based on Iberian maritime knowledge), evident in Queirós's words and action, that could be traced in Portuguese sailors who defected to Spain (such as Ferdinand Magellan), France (João Afonso), or England (António Eanes Pinteado). Although in all these cases there was also an element of typical Renaissance self-fashioning,⁵ these Portuguese characters

2 Kelly, "Pedro Fernandes de Queirós."

3 Waters, "Portuguese Nautical Science," 165–91.

4 Kelly, "Pedro Fernandes de Queirós," 301–2 and 311–12.

5 Stephen Greenblatt, *Renaissance Self-Fashioning: From More to Shakespeare* (Chicago: Chicago University Press, 2005).

connected their activities with the competencies tied to their nationality. This sense of superiority likewise directly influenced Portuguese overseas rivalries with Spain, France, England, and the Dutch Republic, as described throughout the chapters of this book, even leading to important *Mare Clausum* disputes, accusations, and “unofficial” wars between the Portuguese and their maritime rivals. Still, this did not preclude the acceptance of such experts in foreign service. Spain, France, England, and the Dutch Republic readily recognized the value of Portuguese maritime knowledge, whether it be in the form of great sailors, pilots, cartographers, cosmographers, or important nautical rutters or nautical treatises.

Thus, as has been demonstrated, Portuguese nautical expertise circulated widely across Europe during the 16th century. In the first chapter, it was argued that the first phase of Portuguese nautical knowledge circulation had already begun during the 15th century between Portugal and Spain. As Portugal was the first European realm to launch a systematic overseas expansion and Spain the second, it was somehow natural that the Iberian powers became the first global competitors with regard to maritime knowledge in the late 15th and early 16th centuries. However, the Portuguese-Spanish nautical interchange affected France, England, and later the Dutch Republic as well—the intra-Iberian circulation of expertise was not long confined to the Iberian Peninsula. If, for England, it was only from the 1550s onwards that a systematic overseas expansionist process can be detected, this does not mean that, as argued in chapter 2, there were no key instances of Anglo-Iberian nautical knowledge interchange before that. Some of these episodes even took place in the 1490s and early 1500s, albeit with a deceleration at the beginning of King Henry VIII's (1509–1547) reign. Nonetheless, the true roots of the Anglo-Iberian nautical and maritime knowledge interchange that is analyzed in chapter 4, lie in the late 15th century, when the pattern of the circulation of Iberian nautical experts and knowledge to England is unmistakable.

For France, the process of overseas expansion began earlier, but the Valois monarchs did not consistently implement a systematic policy. As France aimed to emulate Iberian overseas expansion and challenge the Iberian *Mare Clausum*, it sought to acquire Iberian nautical knowledge. However, during King Francis I's (1515–47) reign this did not involve a coherent overseas program; such a program is more rightly situated during King Henry II's (1547–59) reign. The most serious French overseas contests against Portugal and Spain, *France Antarctique* in Brazil and the efforts in Florida in the 1550s and 1560s, took place during, or as a consequence of, King Henry II's policies, as contended in chapters 3 and 4. A full process of

maritime knowledge transfer between Portugal and France was consequently identified in chapter 3, particularly with regard to Jean Nicot's embassy in Portugal between 1559 and 1561. As detailed in chapters 2 and 4, the Portuguese Crown's concerns with respect to the sensitivity of the nautical knowledge entering France and England from the 1550s onwards, motivated serious maritime espionage and counter-espionage endeavors via Portuguese diplomacy in both France and England.

The chronological coincidence between Queen Elizabeth I's (1558–1603) overseas policies, themselves a continuation and intensification of processes already underway under Queen Mary I's (1553–58) reign, and Admiral Gaspard de Coligny's (1519–72) maritime leadership in France, meant that Portugal had to fortify its *Secret Science* policy, as described in chapter 4. However, these attempts were largely unsuccessful, as had previously been the case with Spain and would later be the case with the Dutch Republic in the 1580–90s. The nautical knowledge exchange between the Dutch and the Iberians during this time was unique in that it was a result of the 1580 Iberian Union, rather than solely a Portuguese or Spanish endeavor. This phenomenon was documented in chapter 5, with Jan Huygen van Linschoten's career in the Iberian world and the impact of the publication of the *Itinerario*, not simply in Dutch overseas expansion, but also in England and France at the beginning of the 17th century. Despite varying historical contexts, there are several commonalities that must be considered when evaluating the attempted secrecy policies in these connected histories of maritime knowledge transfer during the 16th century.

A first shared feature is the inescapable failure of the Portuguese (and sometimes Spanish) secrecy policies when it came to the transfer of nautical knowledge to maritime rivals. Despite the persistent misconception that Portugal successfully enforced its secrecy policy with regard to its nautical experts in the 16th century,⁶ early evidence suggests otherwise. It is important here to recall what Guido di Tomasso Detti, a Florentine merchant residing in Lisbon, wrote concerning Vasco da Gama's inaugural voyage of the India Run between 1497 and 1499. Reporting on Gama's return to Lisbon in 1499, Detti stressed that King Manuel I (1495–1521) had ordered the confiscation, on penalty of death, of nautical charts and rutters, so that no one could discover the secrets of the routes and become rivals of the Portuguese. Commenting on the Portuguese king's order, Detti wrote "I believe the king may do this, but everything will become known all the same." This prediction proved true, as notable accounts and reports of the

6 Cortesão, *A política de sigilo*; Diffie, "Foreigners in Portugal," 23–34.

first Portuguese voyages to Asia still exist in Italy today.⁷ Bearing in mind the intense knowledge circulation that Renaissance Italy fostered with all corners of Europe, it is worth remembering Italy's role when evaluating the circulation of Portuguese nautical knowledge. The same logic can be applied to Germany at the beginning of the 16th century, as Banha de Andrade's classic study, and more recent scholarship, demonstrate.⁸ Thus, by the first years of the 16th century, King Manuel I's secrecy policies were already flagging, even if the king approved a law in 1504 prohibiting cartographic depictions of the coast south of Congo.⁹ Circulation of Portuguese nautical knowledge only accelerated throughout the different contexts of the 16th century, as was documented in all chapters, with similar instances for Spain, England, France, and the Dutch Republic.

Regardless of the Portuguese Crown's attempts to enforce secrecy policies (which did exist, *de jure*, at certain times), it was impossible to fully control the circulation of nautical experts and knowledge. Notable examples include the migration of Portuguese sailors such as Ferdinand Magellan to Spain, João Afonso to France, and António Eanes Pinteado to England. However, these are just the best-known cases. Many others also occurred, albeit with less spectacular consequences. This raises an important question: if Portugal and Spain were aware of the value of their "national" experts' nautical expertise, and of how eagerly that expertise was sought by other maritime players such as France, England, and the Dutch Republic, why did they not make more of an effort to prevent this movement? In most cases, pilots, sailors, cartographers, and cosmographers were able to cross formal political boundaries without facing great difficulties. This can be observed in the movement of Columbus between Portugal and Spain, or of Sebastian Cabot (1474–1557) between England and Spain. Intelligence was crucial if a monarch were to halt such migrations, and this is why the attempts of ambassadors and spies to repatriate nautical expertise, best exemplified by Dantas in chapter 4, were critical.

7 On this topic see: Carmen Radulet and Luís Filipe Thomaz, *Viagens portuguesas à Índia (1497–1513): fontes italianas para a sua história. O códice ricardiano 1910 de Florença* (Lisbon, CNCDP, 2002); Francesco Guido Bruscoli, "A Carreira da Índia nos arquivos italianos," in *Memórias 2015* (Lisbon: Portuguese Navy Academy, 2016), 229.

8 Bruscoli, "A Carreira da Índia," 229–42. For more recent studies on knowledge exchanges with Germany see also: Marília dos Santos Lopes, *Writing New Worlds: The Cultural Dynamics of Curiosity in Early Modern Europe* (Newcastle: Cambridge Scholars Publishing, 2016) and Thomas Hoorst, Henrique Leitão, and Marília dos Santos Lopes, *Renaissance Craftsmen and Humanistic Scholars: Circulation of Knowledge between Portugal and Germany* (Frankfurt: Peter Lang, 2017).

9 Alegria, Daveau, Garcia, and Relaño, "Portuguese Cartography," 1007.

But in the case of Portugal during the 16th century, efforts to repatriate pilots, sailors, cartographers, and cosmographers were often unsuccessful. One of the major reasons for this was that there was a market for competencies readily sought by all maritime players. Any nautical expert was liable to be purchased independently of their home countries' "national" interests. If Portuguese repatriation efforts often came to nothing, this is primarily due to the fact that by the time attempts were made, it was too late—defecting experts had already been offered better conditions abroad. This was documented in chapter 1 with Ferdinand Magellan, who, despite being approached by Portuguese agents three times while in Spain, nonetheless refused to return to Portugal. The same occurred in France with João Afonso, who was also approached three times, as detailed in chapter 3, and with António Eanes Pinteado, leading to the Portuguese agent's imprisonment, as discussed in chapter 2. All these cases, as well as the others documented in chapter 4 in connection to ambassador Dantas, easily prove that, during the whole of the 16th century, Portugal never solved the issue at the heart of the problem: providing all Portuguese sailors, pilots, cartographers, and cosmographers with conditions that were attractive enough to retain them in Portuguese service. Indeed, the emigration of Magellan, Afonso, and Pinteado, and of their many lesser known colleagues, were all motivated by quarrels with the Portuguese kings that could easily have been resolved in their earliest phases. Rather than appease their servants at the first signs of trouble, however, the Portuguese kings acted late, in most cases when experts were already abroad and had been offered attractive arrangements. Even when Portugal offered these experts better rewards than they had been offered abroad, they did not seriously consider returning to their homeland because of the perception of being a "traitor" to the Portuguese Crown. The fear of being killed when returning motivated figures such as Pinteado to remain in English service, as stated in chapter 2. Quite likely the same was true for other nautical experts throughout the book, as the Portuguese Crown's reputation for fierce attempts at secrecy was well-known across Europe in the 16th century. This factor decisively explains why successful repatriations were so rare (as chapter 4 demonstrates) and also elucidates why Portugal had to build up a full and increasingly intense network of spies in Spain, France and England throughout the 16th century. It also explains why the Portuguese Crown lacked a coherent secrecy policy, as the myriad negotiations with previous nautical experts suggest a pattern of adaptability rather than a monolithic approach.

The Portuguese intelligence machine, particularly as documented in chapters 2 and 4, was still surprisingly powerful and often accurate. The mere

existence of such an apparatus reveals that the Portuguese Crown was more than vaguely aware of foreign technical espionage on Portuguese maritime knowledge. It also demonstrates that the Portuguese government knew that controlling maritime knowledge circulation was almost impossible. This is the chief reason why the Portuguese Crown so often collaborated with the Spanish diplomatic and espionage network. But even utilizing intelligence from the Spanish, who obviously had more resources, Portugal still experienced failures. Thus, the Portuguese Crown did not hesitate to consider killing former servants whose nautical knowledge was deemed too dangerous to be shared with maritime rivals, as exemplified by the cases of Ferdinand Magellan in Spain and Portuguese cosmographer André Homem in France and England (discussed in chapters 2 and 4). The growing complexity of Portuguese maritime espionage in Spain, France, and England during the 16th century demonstrates the Portuguese Crown's recognition of both the difficulty of maintaining secrecy, and the interest of other maritime players in obtaining Portuguese nautical intelligence. Indeed, as early as the 15th century, Portuguese laws reflect such concerns. The same complexity explains the discretion and dissimulation employed by Spanish and French ambassadors in Portugal, as discussed in chapters 1 and 3, when acquiring Portuguese maritime knowledge to transmit to their homelands. As stated, this was another consequence of the Portuguese reputation of fierce attempts at secrecy that was no secret in 16th century Europe.

While it is undeniable that Portugal sought to control the transfer of its nautical experts to its maritime rivals on several occasions, due to attempts to enforce secrecy policies and the sensitivity of Portuguese nautical, cartographical, and geographical knowledge in the hands of Spanish, French, English, or Dutch stakeholders, it is important to reiterate that these efforts ultimately proved unsuccessful. The intention of these secrecy policies and their actual outcome should not be conflated, as has frequently occurred in past scholarship. I argue that, despite the Portuguese Crown's well-planned attempts at secrecy vis-à-vis their maritime rivals, it was simply impossible to prevent leaks, particularly as several of the exchanges took place via informal channels and in manuscript form. Moreover, no Portuguese king had the ability to control the movements and knowledge of their nautical experts, as all chapters in this analysis demonstrate.

All of this connects with the words of Sesa quoted at the start of this conclusion: a good Portuguese navigator or pilot would always find employment abroad because of his home country's renown for cultivating nautical skill in the 16th century. In the 1530s, D. Pedro de Mascarenhas, a Portuguese ambassador to Emperor Charles V (1516–56), wrote to King

John III (1521–57) from Antwerp with an unambiguous admonition: the Portuguese Crown needed to develop a policy for handling the sham nautical experts from Portugal that were appearing in Europe. This was a problem that Mascarenhas had encountered, having earlier been confronted with a Portuguese “pilot” who had been deceiving the French by claiming to possess all of the nautical knowledge inherent in being Portuguese. Despite the ambassador’s efforts, Mascarenhas stated that he was unable to prevent the foreign hiring of such individuals, as the reputation of Portugal abroad was that all pilots born in the country automatically possessed nautical skill.¹⁰ The story of Ambassador Mascarenhas is quite similar to that of the Portuguese pilots Antão Luís and Gaspar Caldeira (as detailed in chapter 4), who also attempted to “sell” their fake nautical expertise in Spain, France, and England, but were finally executed in Lisbon in 1568. Nevertheless, there is no indication that King John III ever followed this advice. On the contrary, the same Portuguese king exploited the “Portuguese pilot” archetype to deploy Lagarto (a false nautical expert and, in reality, a spy) to infiltrate King Francis I’s chamber, discuss the king’s plans for Canada and mislead him with incorrect cartographical knowledge. The continual hiring of Portuguese pilots by France and England, to say nothing of Spain, which was almost an established accepted reality for Portugal from the 1550s onwards, proves how this archetype prevailed.

This is precisely what has been documented in all chapters of this book: when the time came for Spain, France, England, and the Dutch Republic to launch their overseas expansion, Portuguese nautical knowledge was more than simply welcome: it was fully desired and needed. The continual hiring of Portuguese pilots by France, England, and Spain in the 16th century highlights the prevalent image of Portugal as a source of valuable nautical knowledge. This is further evidenced by the frequent hiring of Portuguese pilots by these maritime players even in disguise to avoid diplomatic conflicts with Portugal, as discussed in chapters 1, 3, and 4.

The problem of controlling the circulation of “national” nautical experts was not unique to Portugal. Other maritime powers, such as Spain, France, England, and the Dutch Republic, also faced similar challenges. Examples such as Sebastian Cabot’s move to England, Jean Rotz’s and Jean Ribault’s careers between France and England, and the English pilot John Davis in England and the Dutch Republic illustrate how this struggle was identical for all maritime rivals. Ironically, open maritime rivals were affected by processes of acquisition and betrayal of nautical experts. This in itself was another consequence

10 Arquivo Nacional Torre do Tombo (ANTT), *Corpo Cronológico* (CC) I–48–41, fl. 1.

of the fact that maritime milieus in Europe, already in the 16th century, were international by nature with several “nationalities” living alongside each other and sharing knowledge in several global port cities of Europe. Although the Portuguese kings were the first to face this challenge, their deep awareness of, and concerns with regard to, the consequences of nautical knowledge circulation were very similar to those of later monarchs such as Charles I and Philip II in Spain, Francis I, Henry II, and Admiral Coligny in France, queens such as Mary I and Elizabeth I in England, and Prince Maurice of Nassau in the Dutch Republic. In these processes of maritime knowledge circulation, formal maritime rivals were powerless to control the circulation of knowledge, whether it favored or threatened their interests. If this book has primarily examined this reality for Portuguese maritime knowledge circulation, the same could be applied to other European maritime players such as Spain, France, England, and the Dutch Republic in their own chronologies. Despite the power and influence of historical figures relayed in this book (such as Kings Philip II, Henry II, Admiral Coligny, Queen Elizabeth I, and Prince Maurice of Nassau), none were able to effectively control the circulation of maritime knowledge. Any attempts at secrecy, regardless of the context or motivation, were ultimately doomed to failure, a theme that has been consistently documented in the book.

However, at the beginning of the 16th century, as Portugal was the realm that had already accumulated a century of nautical expertise and the other maritime players were starting to set out on their overseas attempts, the problem of the movement of Portuguese nautical experts to Spain, France, and England became much more acute for Portugal than the equivalent was for the other powers. This fact was inextricably connected to the global scale of 16th-century Iberian navigations, as some of the authors mentioned in the introduction have stressed. As Iberian sailors made voyages in the Atlantic, Indian, and Pacific Oceans, a routine exercise during this century, oceans became a global avenue for communication and exchange between different geographical spaces. When early French, English, and Dutch overseas projects took shape, they not only sought to emulate Iberian precedents, but drew benefit from this nautical interchange that was unfolding in Europe (chapters 1, 2, 3 and 4), overseas (chapter 5), and at sea (chapters 1 and 5).

The globalization process sparked by the first trans-oceanic voyages in the 16th century, which reached maturity during the 17th century, meant that the Global Ocean became synonymous with Global Knowledge. To master oceanic navigation, as the French, the English, and the Dutch quickly understood, required absorbing the Iberians’ accumulated experience and

the knowledge they had amassed in the form of nautical rutters, nautical cartography, important cosmographical and nautical treatises, and, if possible, Iberian nautical experts. Once these conditions were met, and once commercial or political support for the journey was forthcoming (for example for the English voyages to West Africa in the 1550s or the first Dutch voyages to Asia in the 1590s), success was within reach. Thus, nautical knowledge transfers became critical in the processes of maritime knowledge circulation but also in early attempts to emulate overseas voyages. It is precisely at this point that the contribution of the circulation of Portuguese nautical experts throughout Europe and its impact on early modern European science needs to be considered.

Now that the circulation of Iberian maritime knowledge has been conclusively demonstrated, the impact of these transmissions of Portuguese nautical expertise to the recipient maritime players can be assessed. In cases such as those of Ferdinand Magellan, João Afonso, António Eanes Pinteado, and Jan Huygen van Linschoten, clear examples were provided of how Portuguese knowledge affected the maritime players in question. Without Magellan, Spain would not have organized what became the first circumnavigation of the world. Without João Afonso, the establishment of the Dieppe cartographical school in France would have been delayed at best. Because of Pinteado's contributions, England was able to launch successful voyages to West Africa in the 1550s. Likewise, Jan Huygen van Linschoten jumpstarted Dutch overseas expansion. In each of these four examples (as with the others detailed in this book), the pivotal role of Portuguese nautical knowledge is unmistakable. This itself is another consequence of the process of globalization, triggered precisely by Iberian overseas navigations across the globe. This should also be factored into historiographical considerations concerning global maritime histories in the early modern period, the history of scientific knowledge interchanges between the Iberian Peninsula and the rest of Europe, and the rise of early modern science.

In conclusion, the long-term effects of Portuguese nautical knowledge circulation on European overseas expansion are evident, particularly in the 16th century when Portugal reached the pinnacle of its maritime power. When Portugal lost its maritime hegemony to northern European powers in the 17th century, the impact of Portuguese nautical knowledge remained significant in French, English, and Dutch overseas enterprises. Portuguese nautical rutters and cartography continued to be eagerly sought across Europe. Théodore de Godefroy (1580–1649), one of King Louis XIII's (1610–43) archivists and historians, possessed nautical materials pertaining to the Portuguese and the Spanish, including a French translation of Vicente

Rodrigues's nautical rutter;¹¹ Melchisédech Thevenot, King Louis XIV's (1643–1715) librarian, was filled with Portuguese nautical knowledge;¹² in England, Robert Cotton (1571–1631) had a full collection of the main 16th-century Portuguese nautical rutters; and in the Dutch Republic, Gerard John Voosius (1577–1649), even at the end of 17th century, after a century of nautical and scientific development, openly praised Fernando Oliveira's nautical works and expertise.¹³ Other telling instances of Portuguese nautical knowledge being employed, quoted, and lauded have been identified for the 17th and the 18th century.¹⁴ Again, like so many other instances in this book, this is not a coincidence. Despite the defeat of its attempts at enforcing a *Mare Clausum*, Portugal's nautical knowledge remained valid and advanced for several geographical regions of the world.

If it is true that Portugal's geographical location in the extreme west of Europe was not the best to facilitate knowledge interchanges, unlike for instance France's, Germany's or Italy's central geographical position in Europe, it should be kept in mind that this did not prevent Portuguese nautical knowledge circulation in Europe. This circulation took the form not only of the movement of Portuguese nautical experts but also of the mailbags of those classical protagonists of the history of knowledge who, for any reason, like Van Linschoten, became interested in Portuguese nautical knowledge: travelers, spies, merchants, ambassadors, and seamen. Thus, the final conclusion that needs to be underlined once more is that Portuguese nautical knowledge was circulating within Europe with such intensity and in overwhelming numbers that it is simply impossible to consider that these processes did not have a direct influence on Spanish, French, English, and Dutch overseas expansion. There was no official systematic policy on the part of the Portuguese Crown that could prevent this type of circulation, and even in the periods when this policy can most easily be documented, Portuguese maritime knowledge circulation remained uncontrolled. As has been highlighted in several studies on the history of knowledge, this was an

11 Bibliothèque de L'Institut de France (BLF), *Godefroy* 68, fl. 98–127.

12 On Thévenot's writing collection of voyages see: Nicholas Dew, "Reading Travels in the Culture of Curiosity: Thévenot's Collection of Voyages," *Journal of Early Modern History* 10, no. 1–2 (2006): 39–59.

13 Voosius's reference to Fernando de Oliveira is found in the forthcoming critical edition of Oliveira's *Ars Nautica*, which will be published as the third volume of Oliveira's collected works. The edition will be produced by Henrique Leitão and José Carlos Lopes de Miranda and will be published by Gulbenkian in 2024.

14 On this topic see: José Manuel Malhão Pereira, *Os roteiros e a expansão marítima europeia* (offprint from Academia das Ciências, Lisbon, 2017).

inescapable result of the fact that knowledge is by its nature uncontrollable.¹⁵ With each piece of Portuguese maritime knowledge that moved to Europe in the 16th century, the seeds for the emergence of new maritime powers were sowed. In a way, these nautical knowledge exchanges also contributed to the rise and dissemination of scientific practices, especially on nautical matters, which in turn contributed to the emergence of modern science in Europe. Here, as all the instances presented show, the Portuguese example in terms of the mechanisms of maritime knowledge circulation and transmission reflects a reality that still needs to be researched more: not simply in the form of more studies on Portuguese exchanges with Europe, but also on other relevant maritime knowledge exchanges, such as the Anglo-French or the Anglo-Dutch.

Portuguese nautical knowledge circulated and deeply affected other maritime players, prompting them to emulate the Iberian model for overseas expansion. But to write this history (of which this book is merely the beginning), both maritime history and history of knowledge approaches must be brought into play. Only then can the interrelations between Portuguese (and more broadly, Iberian) maritime knowledge and its contributions to early modern science be brought into focus.

15 Secord, "Knowledge in Transit"; Burke, *Social History of Knowledge*.