

Trading Maritime Knowledge

The Circulation of Nautical Expertise among Seafarers, Artists, and Scientists

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When Cardinal Richelieu took office as *grand maître, chef et surintendant général de la navigation et commerce de France* on 1 October 1626, he pursued two main objectives: Domestically, the aim was to bring French hydrography up to the same level as that of the admiralties of Spain and Portugal or the offices of the Dutch and English trading companies. In terms of foreign policy, the goal of expanding France's overseas trade was to contribute to the further erosion of Habsburg power. However, as influential as French politics and culture were in 17th-century Europe, French hydrography remained insignificant in the survey of the seas. Spain and Portugal had discovered the seas as trading areas in the 15th and 16th centuries before the Dutch and English extended those to West Africa, East India, and the Arctic in the 17th century.¹

With the firm intention of better representing the colonial interests of France in the future, after 1626, Richelieu successively took over all influential offices until the entire French naval command was subordinated to him; the adoption of the Code Michau (1629) proved particularly significant.² In 430 articles, it reorganised the rights of the military, its administration, and maritime trade and reformed many legal and social provisions of the Ancien Régime. Further measures of Richelieu's were collecting good charts, standardising the training of French hydrographers, re-surveying the coasts, and collecting the existing

- 1 Günther Schilder and Hans Kok, *Sailing for the East, History and Catalogue of Manuscript Charts on Vellum of the Dutch East India Company (VOC), 1602-1799*, Houten, 2010, pp. 109-133; Clé Lesger, *The Rise of the Amsterdam Market and Information Exchange: Merchants, Commercial Expansion and Change in the Spatial Economy of the Low Countries, c. 1550-1630*, Amsterdam, 2006; Alison Sandman, "Spanish Nautical Cartography in the Renaissance", in *The History of Cartography*, David Woodward (ed.), vol. 3, part 1: *Cartography in the European Renaissance*, Chicago/London, 2007, pp. 1095-1142; Franziska Hilfiker, *Sea Spots: Perception und Repräsentation maritimer Räume im Kontext englischer und niederländischer Explorationen um 1600*, Köln, 2019.
- 2 James Russell Major, *From Renaissance Monarchy to Absolute Monarchy: French Kings, Nobles, and Estates*, Baltimore, 1997, pp. 220-236.

knowledge in an up-to-date encyclopaedia of seafaring.³ The *grand maître* commissioned Georges Fournier, one of the last representatives of the Norman Hydrographers—a group of practitioners and marine cartographers, who tested the latest measuring techniques, instruments, and mathematical theories in Dieppe and its surroundings beginning in the 1530s.⁴ However, until Fournier’s compendium appeared in 1643 under the title *Hydrographie contenant la théorie et la pratique de toutes les parties de la navigation*⁵, only a few maps and sea manuals suitable for daily use at sea were available in French. One explanation for this may be that, until 1600, France did not have a central institution to systematically collect hydrographic data and information comparable to the observatory in Sagres, under Henry the Navigator, or the hydrographical office of the Vereenigde Oostindische Compagnie (VOC) in Amsterdam.⁶

It seems that, in Normandy, outstanding practitioners had joined together to exchange and share their technical, geographical, and mathematical knowledge on a local level beginning in the 1530s. Twenty of them are known to us by name, and 37 works have been preserved, which show significant stylistic and technical similarities. In this respect, Sarah Toulouse rightly speaks of a school of Norman Hydrographers.⁷ Unfortunately, most of their records and maps have not been preserved due to the lack of an archive. Only a few names remain for research, among them Pierre Desceliers and Jean Rotz (Roze), who later worked in the service of Henry VIII, as well as Nicolas Desliens and Jean Cossin, of whom we only know their signatures. However, the much younger Fournier, who praises his colleagues in the encyclopaedia, was particularly well received. Thus, it is worth looking at domestic production to find out why Dutch sea manuals were so successful in France from the 1590s onwards. For this reason, two icons of French hydrography have been selected as examples: Pierre Garcie dit Ferrande’s *Grant Routtier et pilotage de la mer* (1520) and Jean Rotz’s *Boke of Idrography* (1529).

Garcie was a pilot and had been familiar with maritime practices since childhood. He recorded what he had learnt from his father, drew the coasts he had personally visited and identify dangerous spots. This early book, written in French, is deliberately written in the language of seafarers to introduce them to

3 Sarah Toulouse, “Marine Cartography and Navigation in Renaissance France”, in *The History of Cartography*, David Woodward (ed.), vol. 3, part 2: Cartography in the European Renaissance, Chicago/London, 2007, pp. 1550–1588.

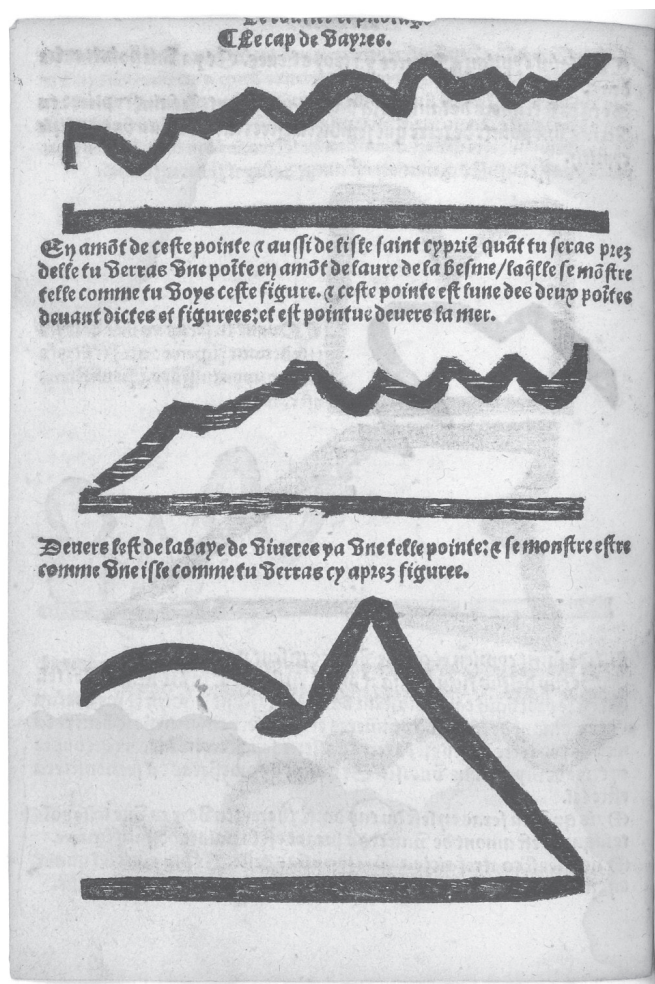
4 Sarah Toulouse, “Norman Hydrographers”, in *The Golden Age of maritime maps. When Europe Discovered the World*, Catherine Hofmann, Hélène Richard and Emmanuelle Vagnon (eds.), exh. cat., National Library of France, Paris, 2013, pp. 136–147; Catherine Hofmann, “Publishing and the Map Trade in France, 1470–1670”, in Woodward, 2007 (note 3), pp. 1569–1588.

5 Georges Fournier, *Hydrographie, contenant la théorie et la pratique de toutes les parties de la navigation*, Paris, 1643.

6 Patrick van Mil and Mieke Scharloo (eds.), *De VOC in de kaart gekeken. Cartografie en navigatie van de Verenigde Oostindische Compagnie, 1602–1799*, Gravenhage, 1988.

7 Toulouse, 2013 (note 4), p. 136 (FN. 3).

- 1 Pierre Garcie dit Ferrande,
Grant Routtier et pilotage de la mer,
1531, page with geological
formations



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the basics of navigation and to describe the main coasts extending from southern Portugal to Ireland and along the North Sea and the Mediterranean. The text is accompanied by woodcuts that abstractly depict striking geological formations in thick lines (fig. 1). In their strong fragmentation, the lines demand considerable interpretative effort from navigators to recognise the actual natural features from the pictogram-like sign. If Garcie also dispenses with maps showing these hotspots, this explains another advantage of the Dutch sea manuals, which will be explained in more detail later.

The manuscript by Rotz, who worked in Dieppe as a cartographer and navigator, was written between 1535 and 1542 and is illuminated with gold applications, making it more elaborate than Garcie's work.⁸ His *Boke of Idrography* (also

⁸ Richard Pfloderer, "Seamen and Scientists: The Practical vs. the theoretical", in id., *Finding their way at sea: the story of portolan charts, the cartographers who drew them and the mariners who sailed by them*, Houten, 2012, pp. 39–46, p. 43.

known as the Rotz Atlas), published in folio format, also describes numerous non-European coasts the author was familiar with from his own travels. In 1529, Roze probably took part in the expedition from Dieppe to Sumatra under the command of Jean Parmentier, who travelled to Guinea and Brazil in 1539, allowing him to study both the African and South American coasts. However, the reason Roze went into the service of the English Crown in 1542 and dedicated his atlas to Henry VIII that same year remains unclear to this day.

Garcie's and Roze's sailing instructions represent two very different prototypes: an archaic and an opulent one, which set an example in France. These were the foundations on which Guillaume Brouscon's *Manuel de pilotage ... à l'usage des marins bretons* (1548) and Jacques de Vaulx's famous *Manuel de pilotage* (1584) were built. Both writings represent an important link in the transfer of knowledge, as they refer to their French predecessors and show parallels to the Dutch rutters published at the same time: the foreword and the dedication to the reader are followed by basic instructions on navigation, various navigation methods, differentiated coastal descriptions, and explanations of several types of ships. Despite these structural similarities, the French manuscripts were already valuable single copies at the time of their publication, while the Dutch editions appeared in large print runs.

De Vaulx's manual is dedicated to the king, though he addresses the 'simple sailors' in the foreword. However, by his introduction to astronomy at the latest, he would have completely overwhelmed exactly this clientele. Even if one ignores the significantly lower literacy rate in France compared to the Netherlands, understanding this book required not only proficiency in reading but also prior knowledge of astronomy, which neither a French nor Dutch practitioner would likely have had. Nevertheless, de Vaulx skilfully summarises the cartographic knowledge of his time and responds to the challenges of modern seafaring. In addition to declination tables on the position of the sun, he describes measuring methods and looks for explanations to the major astronomical questions of the time in a chapter on the new moon. In artistic-narrative scenes, he describes the necessity of ancient and modern navigation techniques to the reader before displaying magnificent maps, pictures, and diagrams that flank the written observations.⁹

A comparative examination quickly reveals that the state of knowledge among hydrographers in Dieppe or Rouen was similar to that in Amsterdam or Leiden.¹⁰ All the works of the Norman Hydrographers known to us make the decisive

9 David Watkin Waters, *Science and the techniques of navigation in the renaissance*, 2nd ed., London, 1980 (Maritime monographs and reports 19).

10 For the intellectual network in Leiden around 1600, see: Carolus A. Davids, *Zeewezen en wetenschap. De wetenschap en de ontwikkeling van de navigatietechniek in Nederland tussen 1585 en 1815*, Cambridge, 1988 (History of Science 6); Gerhard Wiesenfeldt, *Leerter Raum in Minervas Haus: Experimentelle Naturlehre an der Universität Leiden, 1675–1715*, Berlin/Diepholz, 2002.

step from the medieval portolan to the modern sea manual without, however, separating themselves from the medium of the manuscript (except for Garcie's). The manuscripts, mostly commissioned and executed on parchment, were not made for a bourgeois audience but a wealthy, aristocratic, and sometimes even royal one. However, if the intended addressees of these compilations of knowledge were limited to such an exclusive group, their circulation would be low to negligible. This is precisely where the Dutch nautical cartographers—first and foremost, Lucas Janszoon Waghenaer in the 1590s—come in. His *Spiegel der zeevaerdt* (1584)¹¹—translated into French in 1590¹²—was explicitly aimed at (hobby) pilots who enjoyed the description of the Atlantic coast and the English Channel and made good use of them.¹³ The idea that the provision of this knowledge in France could also be used against the two country's common archenemy, Spain, may have been a welcome side effect after the separation of the States General from the Habsburg Netherlands in 1581.

Private Investment in the Northern Netherlands

The *Spiegel der zee-vaerdt* owes its success to its author, Waghenaer, “weytberuembter Pylot und Schiffs-Steurman zu Enckhuysen”,¹⁴ and copper engraver Johannes (Jan) van Deutecum the Elder, who realised the enclosed maps extremely precisely and aesthetically.¹⁵ Part I of the book was published in 1584 by the renowned printer and publisher Christophe Plantin, who had emigrated from Antwerp to Leiden only a few months before; the following year, in 1585, the second part of the marine cartographic work followed from the same hand. Both parts are characterised by a proven knowledge Waghenaer had acquired at sea over several decades before he settled in 1579 and wrote his uncommissioned sea manual as a private entrepreneur, suffering considerable financial privation. The manual, aimed at navigators of the northern seas,

11 Lucas Janszoon Waghenaer, *Teerste deel vande Spiegel der zeevaerdt, vande navigatie der Westersche Zee [...]*, Leyden, 1584, URL: <http://objects.library.uu.nl/reader/index.php?obj=1874-210220&lan=en#page//97/59/68/975968627713623071013013179717434337.jpg/mode/1up> [accessed: 20.11.2019].

12 Id., *Le Nouveau Miroir des Voyages Marins de la Navigation de la Mer Occidentale & Orientale (...)*, 2nd ed., Amsterdam, 1600.

13 Cornelis Koeman, *Atlantes Neerlandici*, vol. 4, Amsterdam, 1970; Hofmann, 2007 (note 4), pp. 1569–1588, p. 1613 (FN. 181).

14 “Teerste Deel vande Spiegel der Zeevaerdt, van de nauigatie der Westersche Zee. Innehoudende alle de Custen van Vranckrijck Spaignen ende t’principaelste deel van Engelandt, in diuersche Zee Caerten begrepen, met den gebruijcke van dien, nu met grooter naersticheijt bij een vergadert ende ghepractizeert Door Lucas Iansz Waghenaer Pilot ofte Stuijzman Residerende Inde vermaerde Zeestadt’ Enchuijsen. Cum Privilegio ad decennium. Reg. 1583 Ma.^{is} et Cancellarie Brabantie.” Ghedruct tot Leyden by Christoffel Plantijn, voor Lucas Janssz, Waghenaer van Enckhuysen. Anno M.D.LXXXIV, quoted in URL: https://dbnl.org/tekst/wagho01spieo1_01/colofon.php [accessed: 27.11.2019].

15 Lucas Janszoon Waghenaer van Enckhuysen, *De maritieme cartografie in de Nederlanden in de zestiende en het begin van de zeventiende eeuw*, exh. cat., Zuiderzeemuseum, Enkhuizen, 1984.

provides practical insights into terrestrial and astronomical navigation; describes sea routes in the Baltic Sea, the North Sea, and the Atlantic; identifies distinctive coastal sections in newly drawn silhouettes; and determines the depth of the water based on precise sounding data (fig. 2).

The information conveyed in the texts, pictures, and maps describes the sea and land as seen by the sailor from the waterside. To compress as much information as possible on just a few pages, author and engraver both varied the technique and projection method: chorographic views became cartographic overviews, and close-up profiles cut in wood turned into small-scale maps engraved in copper. What the lookout sees silhouetted against the sky is tilted flat on the plane of the chart. The prospect becomes a top view, and empirically gained insights become cartographic information. The quality of these charts and texts, updated almost annually, quickly increased the number of copies of the *Spiegel* in circulation. Until 1620, over 20 editions of the book were published in Leiden, Amsterdam, and Antwerp in Latin (1586), English (1588), German (1589), and French (1590).

In all these countries, the success of this first printed sea atlas was due not only to increased interest in nautical knowledge but also economic development, with more and more goods being transported along the continental coasts on ever-larger ships with greater draught. Geological and technical knowledge was indispensable for this inshore sailing. The northern shelf seas and the nautical instruments necessary for their crossing were fundamentally different from the Mediterranean and the equipment available to captains there.

The Mediterranean Sea is an almost tideless body of water, where correcting one's course is much easier. Once the starting point and destination have been determined, these points must be connected on the portolan. Based on the course thus determined, the Mediterranean navigator follows the course with the aid of his compass. On the northern seas, navigation is more complicated in that the navigated water surface cannot be assumed to be geometrically identical to the seabed.¹⁶ Strong swells, numerous shoals, and the tides pose the greatest challenges, which is why even Portuguese ships took Breton or Dutch navigators on board when circumnavigating Cape Finisterre or entering the English Channel.

The wealth of experience of individual seafaring families gathered over many centuries was documented in the publication of Waghenaer's sea manual and thus made generally accessible in the native language of the seafarers. Also included was information on navigating in poor visibility. If a visual bearing is no

¹⁶ Cornelis Koeman, *The History of Lucas Janszoon Waghenaer and his 'Spiegel der Zeevaert'*, Lausanne, 1964 (commentary, attached to the facsimile-edition of 1584/85); Albrecht Sauer, *Der 'Spiegel der Seefahrt' des Lucas Janszoon Waghenaer im nautik-geschichtlichen Kontext*, Deutsches Schiffahrtsmuseum Bremerhaven, n.d., n.p., in URL: <http://www.spiegel-der-seefahrt.de/geschichte.html> [accessed: 07.11.2019].



- 2 Lucas Janszoon Waghenar, *T'eerste deel vande Spieghel*, 1584, double page with chart of Brittany

longer possible, Waghenar recommends using the sounding lead to measure depth and determine the topography of the seabed in one of two ways: by coating the plumb in hot wax or the small opening on the bottom in talc. Both methods can be used to collect sediment from the seabed. This sediment then had to be closely examined, analysed, and categorised with the help of the book. Depending on whether the seabed was sandy or covered with shells, coloured grey, brown, or black, each property could provide information about the ship's current position. However, precisely this method clarifies that sailing on the northern seas was different from sailing on the Mediterranean. The everyday lives of fishermen were not shaped directly by homing (Mediterranean Sea) but by precise navigation along the continental coast. Technically speaking, sailing from one sounding point to another is a form of waypoint navigation that follows the same logic as medieval itineraries.¹⁷ However, even an itinerary does not measure an entire distance on land but divides it into sections determined by the distance a hiker can cover on foot or a rider on horseback in a set time

¹⁷ Axel Gotthard, *In der Ferne: die Wahrnehmung des Raums in der Vormoderne*, Frankfurt/Main, 2007, 142.

without luggage. The same applies to the distances given in Waghenaer's *Spieghel*: distances are based on the sum of their sections; coastal courses, from the juxtaposition of different settings; and oceans, from the compilation of differently fragmented general charts.

Waghenaer's *Spieghel* owes its success primarily to its 43 maps. However, strictly speaking, these maps are not maps at all since they are neither true to scale nor uniform in their projection. Landmarks necessary for the identification of the coastal section are greatly enlarged (up to fivefold), unspectacular coastal sections are compressed to a few millimetres, and port entrances are inflated many times to allow for the accurate inscription of the necessary navigation marks and sounding data. Waghenaer solves the spacing problem that nevertheless arises by separately reproducing important profiles along the upper edge. Comparable to a text whose vocabulary must be mastered to understand its meaning, the navigator must also recognize and identify the landmarks. Since this process is the deciphering of images, the author calls his visual testimonies "Description or Beschrijvinge" and not "Caerte" ("Beschrijvinge vande Zuyder Zee"). If Waghenaer rejects the notion of the map itself, Svetlana Alpers's¹⁸ and Margarita Russell's¹⁹ studies from the 1980s must be questioned critically. Both examine the *Spieghel* in the cartographic context of the late 16th century instead of attributing it to the same pictorial discourse as the marine paintings of Hendrik Cornelisz. Vroom, Willem van de Velde the Elder, and Jacob van Ruisdael.

Although the steeples and town halls appear pictogram-like at first glance, they are nevertheless individually drawn based on personal inspections of the originals. Many (marine) artists appreciated this precision when they adopted the waterside viewpoint for their pictures. Proof of this is given by numerous paintings that quote coastal profiles from the sea manuals. One of them is Vroom's ship portrait *Two-Master in a Stiff Breeze before the Dutch Coast of Den Briel* (1614), which is backed not by a steeple but a lighthouse, prominently displayed in silhouette. Defiant, square, and made of stone, it was a landmark of Den Briel, clearly visible from afar. Anyone who knew the building would have immediately recognised it in the picture. Those who had not yet seen it could manage with the help of Waghenaer's or Joan Blaeu's sea manuals. In this way, the painter's scenery became verifiable and a guarantor of accurate reporting. A further convincing adaptation can be found in Vroom's *Aankomst van prins Frederik V van de Palts en de Engelse prinses Elizabeth Stuart* (1632)²⁰. While the titular act of state threatens to sink among the manifold actions in the foreground,

18 Svetlana Alpers, *Kunst als Beschreibung. Holländische Maler des 17. Jahrhunderts* [1983], 2nd ed., Köln, 1998, p. 247.

19 Margarita Russell, *Visions of the sea: Hendrick C. Vroom and the origins of Dutch marine painting*, Leiden, 1983, p. 42.

20 Hendrick Cornelisz Vroom, *De aankomst van prins Frederik V van de Palts en Elizabeth Stuart te Vlissingen op 29 April 1613, 1623*, oil on canvas, 203 x 409 cm, Frans Hals Museum, Haarlem, Inv.-No. os I-346.

the topographical classification helps locate the event precisely off the port of Vlissingen. These two examples suggest that the sea manuals were received not only transnationally but also across occupational groups.

Transmitting expertise

While the exchange between artists and hydrographers has been established, where both professional groups encountered each other remains to be clarified. Undoubtedly, they met in the harbour, on the fish market, in the offices of the trading companies, and on the shipyards, where marine painters like Vroom spent days drawing the complex rigging structures of the wooden giants. However, in Haarlem, the cradle of Dutch marine painting, there was another meeting place: the guild.

The Guild of St. Luke united all local artists over 21 engaged in any ‘arts and crafts’ trade. To be admitted to the guild, members had to read and write and pursue at least one of the trades represented in the guild.²¹ According to the (rejected) statutes of 1632, this included not only painters, sculptors, etchers, printers, and engravers but also mathematicians, surveyors, and cartographers. Artists such as Cornelis Anthonisz., Pieter Bast, Hans Liefrinck I, Cornelis Visscher, and Van de Velde pursued both artistic and cartographic professions. Others took over cross-genre activities, such as drawing, engraving, printing, and colouring maps. In this respect, the Haarlem Guild can undoubtedly be identified as one of the central places of communication, where compositional questions and technical problems were discussed and instructive books from various disciplines were circulated.

The same can be assumed for the many private and municipal training courses that introduced the basics of navigation and nautical science beginning in 1600. These courses were held by laymen as well as high-ranking scholars, such as Petrus Plancius and Aelbert Haeyen.²² Soon, their didactic skills were also influenced by the fact that during the Eighty Years’ War the Dutch States General aimed to professionalise inland and maritime navigation. As a result, demands on navigators—both seafarers serving the VOC and *trekshuite* owners—increased. They all had to acquire basic knowledge of astronomy, nautical science, and navigation and beginning in 1621, had to provide proof of

21 Karel Davids, *Guilds, guildsmen and technological innovation in early modern Europe: the case of the Dutch Republic*, Conference Paper, Guilds in Europe, 2000, online: URL: https://www.researchgate.net/publication/252456778_Guilds_guildsmen_and_technological_innovation_in_early_modern_Europe_the_case_of_the_Dutch_Republic [accessed: 04.10.2019].

22 Kees Zandvliet, *Mapping for money. Maps, plans and topographic paintings and their role in Dutch overseas expansion during the 16th and 17th centuries*, Amsterdam, 1998; Margret E. Schotte, “Transmitting Expertise: On the Deck, in the Classroom and by the Book”, in id., *Sailing School: Navigating Science and Skill, 1550-1800*, Baltimore, 2019, pp. 41-48; Johannes Keuning, *Petrus Plancius: theoloog en geograaf. 1552-1622*, Amsterdam, 1946.

a kind of boat driving licence. Due not least of all to this newly introduced examination, what was once expert knowledge was disseminated via highly ramified channels among broad sections of the middle classes. Within just a few years, the Dutch had established a non-hierarchical system of knowledge, which was programmatically preceded to the sea manual *Het Licht van der Zee-vaart* by Willem Blaeu, father of Joan Blaeu (fig. 3).

The frontispiece depicts an illustrious group of seafarers of different ages and ranks receiving instruction from Plancius in various measurement methods. They all practice reading the projections on maps, portolans, globes, and books. The training scene, reflecting the ambition of professionalising the Dutch sailors in maritime matters, is embedded in a fictitious pictorial program that pays homage to seafaring on multiple levels. Thus, while the statues of Neptune and Zephyr, standing in niches on either side, represent the divine powers of the sea and wind and warn of the mythical dangers of the sea, the central wall painting shows how seafarers successfully contend with those elements. The brightly shining lantern on top of the painting, for example, refers to a sea beacon, lighting the way for the navigator. At the same time, it also represents the light of knowledge—a symbol of the enlightened spirit to which, according to Waghenauer”, the rutter feels obliged.

The importance attached to the exchange between the ‘common’ seafarer and scientists like Plancius is not only shown in the frontispiece of Blaeu’s *Het Licht van der Zee-vaart* but also Waghenauer’s revised version of the (*Nieuwe*) *Spiegel* (1597) and its second French edition, *Le Nouveau Miroir des Voyages Marins* (1600) (fig. 4). Both editions demonstrate the increasing importance of knowledge transfer by taking it up on the title page and programmatically inserting figures prefixed to the text.

Surrounded by a yellow and black frame, the title cartouche and iconographic programme appear in two separate parts. In the upper section, an assembly of seamen, cartographers, and surveyors can be seen gathered around a globe. In an allusion to the book’s title, the sphere is also reminiscent of a large concave mirror reflecting light. The discussion group is surrounded by maps, vertically hanging sounding leads, and measuring instruments used for terrestrial and astronomical navigation. In addition, there are four globes on which no landmasses are depicted, only oceans and polar caps. The globes stand on four cartouches showing important trading ports in cartographic view (Enkhuizen and Lisbon) and chorographic panorama (Elsinore/Helsingør and Venice). With their extensive frames, the cartouches overlap the frame of the picture field below, in which a thunderous sea battle between Englishmen and Dutchmen is in progress. Once again, the horizon is lowered here so that the viewer can witness the events at eye level. The ships are precisely described as is the water in which they move. Even weather phenomena like clouds and sunlight convey a precise impression of the situational atmosphere, confirming the depiction’s authenticity.



3 Willem Blaeu, *Het Licht van der Zee-vaart*, 1608, frontispiece

What is fragmented in profiles and maps inside the book is synthesized in the spatial design of the boundless sea in the frontispiece. Waghenauer thus gives prospectus-like examples of the various cartographic modes of representation (inside) and foreshadows the genre of the seascape, which, at least in Dutch marine painting, would establish itself under Vroom 20 years later.

Another example of frequently used motifs in the genre of the sea manual is the 1598 edition of William Barents' *Caertboeck vande Midlandtsche Zee*²³, which was

²³ Willem Barentsz, *Description de la mer mediterrannee, a quel sont deliniees & descrites au vif toutes les costes de la Mer Mediterraine*, Amsterdam, 1599.



4 Lucas Janszoon Waghenaer, *Le Nouveau Miroir des Voies Marins*, 1600, frontispiece

- 5 Willem Barentsz,
Description de la Mer Mediterranee,
 1599, frontispiece



translated from Dutch into French in 1599 (fig. 5). The silhouette and top view are no longer shown in separate frames but in one continuous panorama with the city of Genoa in the background. The ships at the front are still shown from below; the harbour of Genoa, however, from a bird's eye view. The combination of both perspectives in one image creates the illusion of a vast, deep space, which is not a cartographic invention but rather owed to the design of an anonymous engraver. Barentsz. adopts Frans Hogenberg's famous city panorama from the *Civitates Orbis Terrarum*²⁴ in his frontispiece but changes the format from horizontal to vertical to extend the maritime foreground. The ships perform daring manoeuvres, whereby the artist lets his connoisseur's eye wander from one nautical detail to another. In its composition, the image thus anticipates the concept of the whole book: the initial mathematical and astronomical overview is followed by vivid maps and profiles, whose outline is based on the practical experience of sailors.

²⁴ Frans Hogenberg and Georg Braun, *Civitates Orbis Terrarum*, 6 vols., Köln, 1572–1618.

A competitive market

When a practitioner would write a nautical handbook on their own initiative, without a commission, they quickly had to seek compensation for their efforts. The manuals had to be advertised, circulated among experts, and promoted against comparable products.

In the Netherlands, handbooks were precisely tailored for their clientele and provided with an appropriate title page as early as 1600. The same was true for the revision of the *Spieghel*, which was reprinted in Dutch in 1596 under the title *Thresoor der Zeevaert*²⁵ (fig. 6) and subsequently translated into French as *Thresorerie ou cabinet de la Route Marineque*²⁶ in 1600/1601 (fig. 7). In 166 pages, the *Thresoor* contains all maps printed in the *Spieghel* plus the “Beschryvinghe van der Middellantsche Zee”; this additional part is missing in the *Thresorerie*, obviously because of the assumption that French seafarers already had access to better charts. The title pages of both editions were redesigned to challenge viewers’ ingenuity in a way similar to a picture puzzle.

Thus, before using the sea manual, the reader is confronted with a visual communication process that pointedly summarises the book’s message. While the same can be said for both editions, it becomes clear that the Dutch and French books set different emphases in transferring maritime knowledge. In the frontispiece of the Dutch *Thresoor* (Leiden 1592, 1596), the sailors from the first edition of 1584 are missing and with them the practitioners who knew how to deal with astrolabe, cross-staff, compass, and sounding lead (fig. 6). Instead, the reader is presented with a massive wooden cabinet, slightly raised on a foundation and backed by a large expanse of water. On the left, the ships enter the harbour; on the right, they debouch. The solid cabinet seems rather inappropriate for the storing of prints and more closely resembles a *Gelderse Kast*. A *Gelderse Kast* is a cupboard, mostly made of oak wood, found in many bourgeois households and used to store crockery, household goods, and large books. Stylistically, the furniture, with its rigidly symmetrical faceted design, carved decorations, and protruding attic, can be dated to around 1600.²⁷ The simple nautical compass, globe, and naval astrolabe, which lies on a thick book bound in red leather, date from the same period. Behind it, two Jacob’s staffs, necessary for astronomical navigation, lie crossed. When contemporary readers opened their new acquisition for the first time, their gaze fell on two closed doors of a locked safe without a key. The book merely gives an idea of the cabinet’s contents and a possible interpretation of the cartouches on the

25 Lucas Janszoon Waghenaeer, *Thresoor der zeevaart, inhoudende de geheele navigatie ende schip-vaert vande Oostersche, Noordsche, Westersche ende Middellantsche Zee (...)*, Amsterdam, 1596 (fig. 10).

26 Id., *Thrésorerie ou Cabinet de la route marinesque contenant la description de l’entière navigation et cours de la Mer septentrionale (...)*, Amsterdam, 1601.

27 Uwe Dobler, *Barockmöbel, Bürgerliche Möbel aus zwei Jahrhunderten*, Augsburg, 1992, p. 48.



6 Lucas Janszoon Waghenaer, *Thresoor der Zeevaert*, 1596, frontispiece



7 Lucas Janszoon Waghenaer, *Thresorerie ou cabinet de la Routte Marineque*, 1600/1601, frontispiece

right and left: a (re) “*armoire de la navigation [...] avec toutes les cartes marines necessaire[...]*”, drawn and corrected by the “*Ervarenen Pilot endt Stuyrma Lucas Jansz Wagenaer va Enckhuijse*”²⁸.

For the reader, the cabinet became the bourgeois equivalent of the cabinet of curiosities, in which knowledge of distant countries is stored in a non-hierarchically arranged collection. It contains geological curiosities, corals, and shells, allowing the reader to travel the world from their armchair. If one recognizes this second layer of meaning, the cabinet opens like a treasure chest, revealing its hidden wonders.

Another pictorial form is chosen in the French edition translated by Bonaventure d’Aseville under the title “*Thrésorerie ou Cabinet de la route marinesque*”,²⁹ published in 1601 (fig. 7). The characteristic feature of the edition, published in Amsterdam but printed in Calais, is an open cabinet. A wealthy, elderly gentleman, perhaps Waghenaer, is shown receiving the books from the hands of experienced seafarers. He keeps the knowledge collected in the books in the cabinet before another helmsman continues the chain of information, passing the book on to cartographers. The cartographers transpose the written data into maps and globes. While this all seems plausible, the intended reading direction of the scene is deliberately left ambiguous: here, what unfolds chronologically from left to right in the history painting can also be read diachronically. It is uncertain whether the helmsman on the right is delivering or receiving the book with both hands. If he is receiving it, it would mean the scene could be read in two ways: from left to right and right to left. The oblong format of the new edition, which is smaller and less imposing than the folio format of the original edition from 1584, accommodates both variants. The ambiguity becomes an indicator of an open, freely accessible repository of knowledge in the form of a library cabinet.

While the Dutch edition celebrates factual knowledge (the data itself), the French emphasises knowledge transfer (data transmission). The translation proudly refers to the empirical process of data collection: information is first assembled, then communicated, checked, and evaluated through exchange. What began as a one-man business in 1584 was clearly coming to an end four years before Waghenaer’s death in 1605/06.

Hydrographic knowledge had become too extensive for one book to hold and, in its diversity, could only be fed by a more extensive knowledge network. The

²⁸ Lucas Janszoon Waghenaer, *Thresoor der zeevaert*, 1596 (FN. 27, fig. 10).

²⁹ Id., *Thrésorerie ou Cabinet de la route marinesque: contenant la description de l’entière navigation et cours de la Mer septentrionale d’Allemagne, d’Angleterre et d’Escosse, France et Espagne [...] / nouvellement mis en lumière par l’expert et renommé pilote Lucas Jansz. Wagenaer Auxquelles sont adjoutéz certains discours et véritables récits comme on peult navigant environner la terre. Item cinq moyens, routtes ou erres de mer pour venir en China, un traicté de la variation du quadran de mer, certaines questions concernant la navigation, le commerce des marchandises en l’Inde orientale et quelles denrées on apporte de là en ces pays par deça*, Bonaventure d’Aseville (ed.), Calais, 1601 (fig. 11).

expansion of the experts supplying information also explains why Waghenauer exchanged, sold, bequeathed, lent, and commissioned the engraving of new copper plates.

The *Spieghel/Thresoor* formats also changed constantly between 1585 and 1610. They became smaller and increasingly eliminated images and maps as their size decreased. While the first edition of the *Spieghel* still contained 43 nautical charts, the emphasis in the *Thresoor* of 1596 had already shifted, and the text was only sporadically illustrated. The scales of the maps decreased, and the coastal profiles were detached from the framework of the map. Beginning in 1596, profiles were only reproduced as pictures alongside the text. These developments culminated in another corrected edition—the *Enchuyser zee-caert-boeck*³⁰, published in 1598—in which not a single map appears on any of its 350 pages. Since that time, the description of the nautical world has mainly been expressed through text with the incorporation of a few profiles.

Conclusion

It is no coincidence that the visual representation of the maritime world disappeared from the sea manuals at a time when they were making their way into marine painting. Artistically ambitious seafarers first invented this genre in the northern provinces of the Netherlands by transferring their view of the land as seen from the sea to canvas long before marine painting established itself as an independent genre in the 1620s.

However, until oil-painted seascapes, with their impressive storms, conquered the bourgeois parlours, the competition for intellectual supremacy in the maritime sphere continued. While in the Netherlands, private merchants and trading companies secured their monopolies, France prepared itself for an absolute monarch, whose claim to power also included the prerogative to interpret science. From then on, the promotion, control and acceptance of scientific findings and the resulting descriptions of the world were subject to the head of state.

In 1643, the same year Louis XIV entered the world stage as the newly appointed heir to the throne, Richelieu's major hydrographic project came to an end: Fournier presented his encyclopaedia entitled *Hydrographie contenant la théorie et la pratique de toutes les parties de la navigation*³¹. It was the first systematic treatise of maritime knowledge in French. In its over 700 pages divided into 20 chapters, the mathematician, geographer, and Jesuit priest summarised the

30 Id., *Enchuyser zeecaertboeck, inhoudende de gheheele navigatie ende Schipvaert vande Oostersche, noordtsche, russche, moscovytsche, westersche, middellantsche of Levantsche ende voordere zeevaer (...)*, Amsterdam, 1598.

31 Georges Fournier, *Hydrographie contenant la théorie et la pratique de toutes les parties de la navigation*, Paris, 1643.

state of knowledge of his contemporaries (*modernes*), not failing to place it in a superordinate historical context (*les anciens*).

Though technical, geographical, and nautical information had been seamlessly linked before Fournier finally tried his hand at the scientific foundation of various ship designs, his was the first systematic treatise of maritime knowledge in French. In its over 700 pages divided into 20 chapters, the complexity of the presentation, the eloquence of his language, and the book's considerable size indicate that this reference work was never meant to board a ship.³² Fournier provided what Richelieu had commanded of him: a coherent overview of the hydrographic knowledge of the time. In this respect, however, the book serves a different clientele than the Dutch sea manuals, whose success declined continuously beginning in the 1620s. Falling sales and fewer editions indicated that the baton had been passed from the seafarers to the scientists. The practitioners' knowledge had long since become common knowledge. There was a demand for explanations that no longer described maritime phenomena but interpreted them. In the 1630s, natural philosophers, including René Descartes³³ and Francis Bacon, provided such explanations in their analyses of the structure of water, clouds, and air.

Waghenaer had set out with the aim of making maritime knowledge accessible to a broad audience. Indeed, his book filled a vacuum that would be filled in Holland and France 20 years later. In terms of the history of science, his practical knowledge forms an indispensable basis for hydrographic science, which initiated the long age of encyclopaedic knowledge in France as early as the 17th century.

32 See Larrie D. Ferreiro, *Ships and science: The birth of naval architecture in the scientific revolution. 1600–1800*, Cambridge (MA)/London, 2010.

33 For correlations between René Descartes' 'Meteore' and Francis Bacon's 'Historia Ventorum' see: Claus Zittel, *Theatrum philosophicum: Descartes und die Rolle ästhetischer Formen in der Wissenschaft*, Berlin, 2009.