Mapping the Northern Mediterranean: conceptions, commerce and cartography

Examining the cartographic history of the northern seas of Europe in the sixteenth through eighteenth century implies a comparison with what happened in the Mediterranean. Of course the analogy between the two regions is not a perfect one. It is always easy to find differences. The act of likening the two by itself, however, can bring into focus various features of both sides of the comparison. The development of nautical charts in the two European regions had a very different history before 1550. After that date the evolution of cartography in the North, indicated the emergence of a common understanding of how to describe the region and a common body of knowledge and perceptions shared by the peoples who lived around and sailed on the North Sea and the Baltic.

Maps are always interpretative. They are always a misrepresentation of the physical world since it is impossible to recreate the reality of land masses and the seas on a flat piece of parchment or paper. Maps are always ways of explaining with their own purposes and goals,
often highly practical ones, which are difficult to interpret. There are implications in what
cartographers choose to show and how they show it and those implications are invariably hard to
read. It is best to show restraint and give up digging deeply into what cartographers may have
been after. It is better to examine maps more generally, seeing them as expressions of the
contemporary state of knowledge and the graphic representation of that knowledge. Simplicity
makes the task easier, though at the cost of obscuring potentially revealing expressions of
common and uncommon cultural attributes.

To compare the history of mapping in the two regions of Europe the first step is to look at
how Mediterranean charting of the seas emerged at the end of the Middle Ages, second to
examine how at a later date mapping emerged in the North, and then to explore reasons for the
slower development of cartography in the lands around the North Sea and Baltic. Presumably
the results will show how the maps that survive reflect the cultural cohesion which emerged, at
least in navigation and ideas about navigation, in the North. Rather than making the sixteenth
century the starting point the period from 1550 to 1650 is more the proper end for a discussion of
mapping since it was by then that a common body of superior work existed in the North, work
significantly superior to that of southern Europe. The background to the northern cartographic
tradition, reaching back to the late Middle Ages, established the parameters and set the stage for
what emerged in the seventeenth century. The long term evolution of mapping does represent at
least one aspect of a common culture of the region around the North and Baltic Seas in the years
from 1550 to 1750.

Mediterranean mapping may well have had classical roots but it is not possible to prove
any direct connection. Classical periploi offered lists of sites along the coast in geographical
order. Medieval portolans were similar but included more with lists of compass directions and distances from port to port or between prominent features such as capes. Those small manuscript books dating from the twelfth century and perhaps earlier were presumably compilations of specific regional and local information jotted down by captains or pilots, drawn together in ever more comprehensive works to cover ever larger sections of the coast. The books relied on the use of the compass and some method of measuring distance. Since compilers relied on varied sources and copied their works from others they were consistent and even consistently wrong. Errors got repeated and there was little or no way for them to be corrected. The entrances to harbours or the sands of estuaries might change but the descriptions would remain the same for decades and even centuries (Oldham, 1925, 419-424). The next step in the evolution of map making was to accompany such portolans with graphic representations of what they described. Pilots and sailors may have started to produce sketch maps as early as the twelfth century (Gautier Dalché, 1995, 20-22). Certainly they were in use on board ship by the second half of the thirteenth century. The oldest surviving chart, the Carta Pisane, dates from around 1290 and it covered the entire Mediterranean and Black Seas [see figure 1]. The portolan charts, or just portolans, that still exist are not ones used by sailors. They are typically presentation copies, made to impress the recipient. They are more elaborate than the working versions that pilots would have damaged and worn out from use. The number of surviving Mediterranean charts is greater for the fourteenth century and even greater for the fifteenth and sixteenth centuries when Italian and then Catalan and Portuguese and Spanish cartographers started to produce atlases with sets of charts each covering a different part of the Mediterranean and later a different part of the world. As portolan chart making spread there was an increase in variation and in decoration.
The maps got animals and people and ships as well as views of towns and flags to indicate the overlords of those towns. The outline of the coasts, however, stayed much the same as did the area covered. The maps of the Mediterranean and the Black Sea, the standard scope for such portolans, were surprisingly accurate. Cartographers were slow to include new information, perhaps because they were limited by the size of the animal skins with which they had to work or perhaps because they were limited by the knowledge of Mediterranean sailors (Akerman, 1995, 15). No matter the reason one part of Europe which received little attention from southern cartographers was the North and Baltic Seas.

Over time the central core of Mediterranean portolans remained constant but there were additions to recognize the expansion of geographical knowledge. Depictions of the coast of west Africa and the Atlantic front of Europe became more extensive and precise. While southern European cartographers depicted the coast north to Bruges and London with a degree of accuracy comparable to that of their depictions of the coast of Italy the shores of the seas much beyond the Strait of Dover left almost everything to be desired. Portolans garbled the shape of Scotland and Denmark but became even more imprecise when it came to the Baltic, for example, leaving the Livonian coast without any curve at all (Spekke, 1948, 44). North of Flanders the maps were schematic and hypothetical with few if any names of towns, islands, or natural features [see figure 2]. Presumably the gaps in knowledge were because Italian sailors and pilots did not venture beyond ports at the mouth of Scheldt or the Thames. There are very restricted signs of some increase in information and in accuracy over the course of the fifteenth century but the scope was limited (Lang, 1955, 32-33, 36-38). Even in the sixteenth century the Baltic coast was still crude (Waters, 1958, 15). Mediterranean portolans were not completely devoid of northern
sites. As early as about 1310 a portolan had a Scandinavian peninsula and even Novgorod turns up. Typically, though, charts produced in the western Mediterranean were sketchy and had errors about the North which subsequent chartmakers incorporated in their works, that well into the fifteenth century (von den Brincken, 1974, 49-51, 53; Winter, 1955, 45-46).

There was alongside portolan chart making a learned mapping tradition. Up to the late sixteenth century it functioned alongside the portolan tradition with little but slowly growing interaction and exchange (Akerman, 1995, 18). It too had trouble with depicting the North. Scandinavia appeared as an island as did Jutland in 1109 and Sweden only turned up, by name, in the mid thirteenth century (Brincken, 1974, 48). A schematic map of the North from between 1424 and 1439 by Claudius Clavus appeared in an edition of the Geography of Ptolemy, a popular work from the second century newly translated into Latin in 1406 and widely accepted as an authoritative source in the fifteenth century [see figure 3]. Clavus’ was the first modern map to be added to that classical book. While Clavus had some names for towns in the North he relied heavily on Ptolemy’s method (Lister, 1970, 88; Mingroot, van Ermen and Makrill, 1987, 17). Ptolemy, like all other classical cartographers, knew nothing about the North. He was largely wrong about the Baltic, the sea being little more than a straight line in the earliest medieval reconstructions of his map making techniques. The errors, or more precisely the absence of information, persisted. The prominent German-born theologian, mathematician and philosopher, Nicolaus of Cusa, made a map of the North between 1450 and 1464 based in part on what he learned from at least one Polish informant [see figure 4]. It was not published in his lifetime but later versions of 1491 and as late as 1572 circulated and left an impression on the mapping of the North (von den Brincken, 1974, 45; Buczek, 1966, 17-19, 26-29; Lang, 1955, 31-
The Polish cartographer Bernard Wapowski who was living in Italy in the opening years of the sixteenth century set to work completing the Nicolaus of Cusa map. His improvements appeared in new editions of Ptolemy's *Geography* in 1507 and 1508. Wapowski on his return to Poland produced other maps which were significantly more accurate and detailed than any previous ones of the region and so served as models for later cartographers down through the end of the sixteenth century (Alexandrowicz, 1985, 327-331; Buczek, 1966, 30-39). Eradicating the Ptolemaic tradition was a slow process as the 1532 Jacob Ziegler map of the North produced at Strasbourg shows. He did at least make significant additions to the understanding of the coasts of the Baltic and Gulf of Bothnia (Lang, 1986, 15; Lister, 1970, 88; Mingroot, van Ermen and Makrill, 1987, 7-10, 20; Winter, 1955, 48-54). After about 1535, though, there was an increase in the number of learned maps of the North and an increasing effort in southern Europe as well as in southern Germany to include information about the Baltic region (Spekke, 1948, 47). Progress was limited, however, as the work of the prolific Venetian portolan atlas maker, Battista Agnese, demonstrated (See Figure 5). His map of around 150 which included the Baltic was still extremely vague about anything east of Antwerp and north of the Tweed (Morgan Library and Museum MS M.460). The learned mapping tradition in Italy showed a profound ignorance about the geography and for that matter the ethnography of the North. Southern European cartographers got no help in expanding their knowledge from northerners since the evolution of mapping was so different in the two parts of Europe.

No charts from the North survive from before the sixteenth century and indeed there are no signs of any such charts or any indication that any portolan charts were ever made in the region in the Middle Ages. By the last years of the fifteenth century there were maps describing
northern Europe produced in Germany connected to the ongoing learned efforts made in the South. They suffered from the usual problems with depicting the Gulf of Bothnia and differentiating islands from the Scandinavian mainland (British Library, Maps c.2.a.1). The lack of portolan charts in the North followed from the lack of sailing directions on which to base such charts. Sailors passed on information about the coasts orally. There were no summaries that map makers could use to guide them in making maps, especially cartographers removed from northern port towns (Lang, 1955, 34-35). Northern sailors had long used the compass so there was information circulating among pilots about directions and presumably about distances. One indication that mariners were transferring their knowledge to the written word in the fifteenth century was the appearance of ever more detailed and accurate depictions of the North Sea coast on some Mediterranean portolans (Lang, 1955, 35-36, 40-41). The written tradition of sailing instructions did produce a book that could and did circulate widely. *Das Seebuch* is a compilation of sailing instructions which had its origins probably in the fourteenth century. It covered the coast from Cartegena in the South to Reval in the eastern Baltic and included data on the Norwegian coast and the west coast of Ireland. The roots of the work are probably southern European and portolan authors in the South certainly used *Das Seebuch* as a source for what they wrote about the North. It was a new departure and the forerunner of a subsequently increasing number of books of sailing directions (Sauer, 1996, 8-12, 64, 73-80, 102, 178-180).

Rutters, the northern version of Mediterranean portolans, were small pocket books with courses between ports and distances but in addition they also had soundings and data on tides. Only a very few survive from before the early sixteenth century but their numbers rose sharply after 1500 when printers began to produce more of them and with longer pressruns (Waters,
The earliest books on the North Sea and Baltic coasts also, like Das Seebuch, included descriptions of the western front of Europe. Le routier de la mer ascribed to Pierre Garcie was printed in Rouen between 1502 and 1510 (Waters, 1958, 12). It was in the Netherlands, however, that printed sailing instruction, leeskaarten, about the northern seas enjoyed their greatest popularity and durability. The Low Countries were, as the sixteenth century progressed, a centre for the transmission of knowledge and a source of information for pilots throughout the North. Jan Severszoon's De Kaert van der Zee of 1532 was followed by an enlarged version in 1541 and then a series of new editions through to 1588. Translations into Low German were printed at Hamburg and Lübeck through into the early seventeenth century.

His work became the basis for many of the different books of the type that came from Amsterdam presses (Bruyns, 1984, 13-16; Burger, 1909, 1-15; Schilder, 1984, 3). A supplement to the written instructions were profiles of the shore, printed as part of the book with notes included giving names of different landmarks, natural and man made. Having illustrations to go with the directions started with Garcie's work (Berhmann, 1982, 46-47). The Amsterdamer Cornelis Anthonisz. in perhaps 1544 published a book based on the earlier works supplemented by his own experience sailing the Baltic and complemented by profiles of the coast [see figure 6]. The first and second editions of the book, the latter probably from 1551, do not survive so the work is only known through the third 1558 version. It too had a Low German edition from 1571 and a Danish imitation from 1568. There were no less than five Dutch, six German, two Danish and two English editions of the work, a total of 15 that are known. The profiles run from Flanders to Reval and broke new ground [see figure 7]. They were also accurate enough that they were not surpassed until well into the eighteenth century (Burger, 1909, 15-16 and 1910,
A number of other books of sailing directions or rutters came from presses in the Low Countries and especially Holland through the sixteenth century. The total and their coverage exceeded that in England where concentration was as much on the French and Irish coasts as those of the North and Baltic Seas (Schilder, 1984, 3-4; Waters, 1958, 12-13). Dutch works also were more common than those from presses in Germany and the Baltic and in fact served as the basis for books published further east.

The next step from sailing instruction was to give graphic representation to the data they contained. Oddly the first map to cover the North Sea and the Baltic and to incorporate some of the information in sailing instructions was made in Italy by a Swedish exile [see figure 8]. Olaus Magnus was on a mission for the church when Gustavas Vasa reformed the church in his kingdom. The cleric could not return to his native land and so, with the exception of diplomatic missions to the shores of northern waters, lived out his life in Italy. His *Carta marina et descriptio septentrionalium terrarum* was a summary of knowledge, geographical and ethnographic, about the North with abundant illustration and even a key of letters which directed viewers to written descriptions on the map or to translations from Latin into vernacular languages in an accompanying book (Lainio, 1985, 26-27; Nordenskiöld, 1897, 92). Olaus Magnus relied in part the 1532 Ziegler map and possibly on a chart of the North now lost as well as information gathered perhaps from pilots on visits to the North (Granlund, 1950, 35-40; Lang, 1986, 15; Lynam, 1949, 2-18; Spekke, 1948, 153; Winter, 1955, 54). A 1558 Low Countries edition of his map followed two Italian ones of 1539 and 1555 so despite or because of its size of 160 X 125 cms., that is in the first edition, it enjoyed wide circulation (Magnus, 1960, 3, 7-32; Voet, 1983, 1672-1676). The comprehensive nature of the work, its novelty and the new data on
northern coasts as well as the number of editions made it highly influential for a century (Lynam, 1949, 27-30, 34, 38-39; Spekke, 1948, 49).

In the North the first printed portolan charts, based directly on sailing instructions, date from 1520s. Jan van Hoirne did a map, printed Antwerp 1526, and there was another anonymous map of the Baltic from about the same time but only fragments of either survive. There are signs in those charts, though, of a good understanding of the shape of the Baltic coast (Bruyns, 1984, 13; Granlund, 1950, 39; Lang, 1986, 17; Schilder, 1984, 4). Clearly the trend toward greater knowledge of the North and a greater ability to represent it was generating improved maps and charts by the third decade of the sixteenth century (Lang, 1955, 41-43). It was the *Caerte van oostlant* of Cornelis Anthonisz. which brought portolan chart making to northern Europe and which summarized the emerging body of written as well as oral knowledge of sailing the waters of the North Sea and the Baltic [see figure 9]. It was the most comprehensive and by far and away the most accurate and informative map produced up to 1543 when the first and now lost edition appeared. The 1558 version does survive as does the book of sailing instructions designed to accompany it. The book was only about sailing east from the Low Countries. With Denmark placed in the middle the chart it covered all of the northern continental Europe (Bruyns, 1984, 16-17; Lang, 1977, 23-24; Lang, 1968, 12-15, 19-20; Schilder, 1984, 5). Portions of the map are very similar to Olaus Magnus' *Carta marina* but whether they had a common source or Cornelis Anthonisz. borrowed from the Swedish cartographer is impossible to say (Granlund, 1950, 38-39; Lang, 1986, 44-48; Lynam, 1949, 14-15). The *Caerte van oostlant* was not made for use on board ship. Cornelis Antonisz. made it on contract for the city of Amsterdam to aid them in a dispute with the monarchical authorities in
Brussels over duties levied on imported grain. Navigators on board ship apparently did not use charts in the early sixteenth century but his map shows that it was possible by the 1540s to make a useable and useful working chart (Lang, 1986, 13, 22-24; Waters, 1958, 16). As well as being an accomplished artist Cornelis Anthonisz. was an experienced sailor and his concentration was clearly on the sea with places on land getting little consideration, though the larger towns did have walls and towers. The map was most accurate for the coast of the Low Countries but as well it had extensive information about inland towns and villages in Denmark and a number of place names in Oslo Fjord suggesting Dutch ships frequented those sites in the period.

Apparently with each edition the map maker made improvements but even so the far eastern part of the Baltic remained vague (Lang, 1986, 26-35, 55-57). There were technical improvements in the method Cornelis Antonisz. used to makr the map it remained a plane chart just like the Mediterranean portolans. In fact it was very much like its southern predecessors. It was also highly influential, with many map makers producing new editions or imitations through the sixteenth century (Lang, 1986, 36-40, 49-54).

The firm basis Cornelis Anthonisz. gave chart making led to the work of Lucas Jansz. Waghenaer. The Enkhuizen pilot's Spieghel der Zeevaert of 1584 and 1585 offered a set of charts covering a large part of Europe including the shores of the North Sea and the Baltic [see figure 10]. He combined profiles and charts, all to more or less the same scale with the exception of a general map of Europe, and in a folio format. Pilots could use his body of charts alongside books of sailing instructions. Waghenaer solved the problem of having two kinds of guides in 1592 with his Thresoor der zeevaert which combined charts and instructions in a handy oblong format (Burger, 1910, 255-256, 259-262; Lang, 1977, 24-26; Schilder, 1984, 6-8;
Waghenaer, 1965). His works exploited copper engraving which did not necessarily make the charts cheaper but did offer more precise and finer lines than with manuscript or wood cut maps. The method also made possible changes from one edition to the next, and there were many editions of his chart books (Akerman, 1995, 23; Voet, 1983, 2416-2429). The Spieghel and Thresoor marked major advances in hydrography and in knowledge about northern waters. The former was reprinted and translated into English, French, and German so enjoyed circulation across northwest Europe (Waghenaer, 1964, v-ix). Waghenaer’s work set the pattern and standard for subsequent mapping of the northern seas [see figure 12]. The charts of the northern seas that came from Dutch presses in the seventeenth century, like the books of sailing instructions owed a good deal to Waghenaer, even to the point of some imprecision when it came to the northern reaches of the Gulf of Bothnia (Lang, 1968, 25-29; Schilder, 1984, 50, 55-70; Mingroot, van Ermen and Makrill, 1987, 12-13; Wieder, 1925, 7-8, plate 6). Contemporaries and successors competed with him but also owed a debt to him for the quality and comprehensiveness of his work.

Other books similar to Waghenaer's circulated at the same time. Aelbert Haeyen’s 1585 Amsterlredamsche zee-caerten was smaller, less expensive, less detailed, and had only five charts so proved less popular, going through only four editions in Amsterdam. It also concentrated on estuary entrances and on northern Europe and certainly was intended for use at sea (Burger, 1908, 37-53; Bruyns, 1984, 17; Voet, 1983, 1091-1093). Michel Coignet, born in Antwerp, in 1581 published a book in French on how to navigate which offered information from the rapidly developing learned science of navigation (Wauwermans, 1895, 278-281). Written instructions, sometimes supplemented by a few maps, increased in number and expanded
in scope. Netherlanders such as Govert Willemsz. and Adriaen Gerritsz. in the 1580s and 1590s produced more comprehensive and helpful guides (Burger, 1910, 256-259; Bruyns, 1984, 18). The true successor to Wagenaer’s Thresoor was Willem Jansz Blaeu’s 1608 Het Licht der Zeevaart [see figure 13]. Blaeu’s works in various revised forms set the standard for much of the seventeenth century (Schilder, 1984, 8). Blaeu was a printer and publisher and seller of books, gathering the latest information to incorporate into his work. Het Licht, in oblong format like Wagenaer’s Thresoor, went through no less than 20 editions by 1537. After he lost what amounted to copyright for the work in 1620 he created a new book, Zeespiegel, inhoudende een korte onderwysinghe inde konst der zeevaert... which covered the same northern waters but with 11 charts in place of the 42 in the first book. The Zeespiegel, expanded and improved in subsequent editions, became the prototype for pilot books for the rest of the century (Lang, 1968, 42-44; Schilder, 1984, 11-12).

At the same time as Amsterdam publishers were bringing out more and better books on sailing Europe’s northern seas they were producing maps of the lands around the Baltic from a more learned tradition. In a number of cases the maps were by Polish cartographers, working in the shadow of Bernard Wapowski. By the mid sixteenth century European cartographers were moving beyond precedent to produce works indicating a broader range of knowledge of northern Europe and especially the sea coasts of the North and Baltic Seas. Often printed in the Dutch Republic the maps of the region became more numerous, more complex and more complete through the second half of the sixteenth and the early years of the seventeenth century (Alexandrowicz, 1985, 331, 334; Buczek, 1966, 41-47, 57-58). Work like that of Blaeu and his contemporaries in Amsterdam made Dutch cartographer the best in Europe. Any gap with map
making around the Mediterranean was closed by 1650 or even 1600.

There was a number of reasons for the slow progress in the North in charting local waters and for the long term lag behind the south. Relative levels of commerce, the way pilots navigated in the North, the kinds of ships used in the North, external influences, and political conditions in the region all contributed to the evolution of mapping but also had lasting effects on the character of charts and the ideas behind them that emerged in the seventeenth century.

The volume of commerce in the North through the Middle Ages was, compared to the Mediterranean, by any measure low. Though there was travel in the early and high Middle Ages as the trading and raiding voyages of the Vikings showed there was little in the way of regular and consistent commerce. It was only with the slow development of trade in bulk goods starting in the thirteenth century that ships and their captains started to make regular trips forth and back from their home ports. A consistent flow of goods through the Skagerrak and Kattegat had to wait for the fifteenth century as Polish grain and forest products exports to Britain and the Low Countries increased the numbers of ships making voyages and with that increased the number of pilots needing sailing instructions. Trade expanded rapidly in the sixteenth century as Amsterdam became the entrepot for the East-West exchange and the sailing instructions and maps produced in the Low Countries, culminating with those of Waghenaer in the 1580s, met the demand for navigational information among Dutch sailors (Spekke, 1961, 55-56). The character of the maps and the increase in detail over time, for example of waters around Gdansk and along the Danish coast indicate response to the growing volume of trade and the increase in information that came back to Holland embodied in Dutch mariners (Lang, 1986, 32). It was not so much that more ships were making trips through the Baltic and North Seas as that they were
from a variety of different places with new people exploring new opportunities. In the Middle Ages small ships hugged the shorelines and the sailors of those ships were often people with a great deal of experience travelling the routes. By the sixteenth century the routes, the ships, and the sailors were more varied and could benefit from more easily accessible information.

Navigation in the North was different from that in the Mediterranean because of the prevailing physical conditions in the waters of the North. Most sailors operated predominately in places with limited depths. The shallow waters meant that depth soundings, especially when combined with observations of the colour of the water and the flights of birds, was good enough to chart a safe course. The principal instrument was the lead which gave the depth of water under the ship. It also indicated the character of the bottom by whatever stuck to it when it hit the ocean floor. The Prussian skipper Georg Joachim von Lauchen in 1539-1540 said that sailors in the Baltic and North Seas did things differently from those in the Atlantic, not using compass to find their way (Sauer, 1996, 180-182; Vogel, 1982, 150). He was not alone in pointing to a different sort of navigation in the North (Zandvliet, 1998, 15). One reason Mediterranean portolan makers did not render the northern coasts accurately is because pilots there did not create the same sort of information about distance and compass direction that southern European pilots did (Campbell, 1987, 410). Much of trade and travel remained coastal into the sixteenth century and sailing within sight of land meant that the memories of the pilot, especially if he only covered a limited range, were more than adequate to determine where the ship was. The angle of the sun, as indicated by the shadow cast from a mast, could supplement the mental representations of coastlines and when an open sea crossing was needed it could be done at night keeping a critical star in the same position relative to the bow (Ellmers, 1994, 40). Though pilots
knew about compasses they hardly had need of them. As northern sailors ranged more widely in the Atlantic and came to know about Portuguese and Spanish navigational methods they moved beyond reliance on just lead and line but through much of the sixteenth century in the confined waters of the Baltic and in coastal navigation there was no reason to adopt the practices that fostered portolan charts (Waters, 1958, 3-6, 14-15, 25). Sailors in the North were more interested in the times of tides than in having a chart. In the Mediterranean with no tides the chart was a more likely choice as an aid for pilots.

Navigation and the use of charts changed with the development of new ship types in the late Middle Ages, vessels which made possible and even forced sailors away from the shores and into the open seas. Big cogs, that is of 200 tons and more, of the fourteenth century and larger hulks descended from those cogs of the fifteenth and sixteenth centuries could not be run up on almost any beach as was possible with keels, descendants of Viking style vessels [see figure 14]. Though cogs may have originally been designed to settle on a beach by about 1300 and certainly by 1400 and hulks or cogs needed to visit ports and so pilots had to get the ships to a specific place [see figure 15]. With deeper draught those ships also needed to stay away from the shallows that were typically of much of the shore of the southern Baltic and North Seas (Sauer, 1996, 182). With the capability of handling open water the logic was to exploit the potential but that meant using different ways to navigate. As hulks got bigger and more numerous in the sixteenth century and gave way to full-rigged carracks the need to be able to get a ship from one port to another with some precision became even more pressing. Ships sailed and more and more out of sight of land and to do that it was often helpful to have a chart.

Northern cartography changed under the influence from established Mediterranean
practice. Contact between northern and southern maritime realms began in earnest in the thirteenth century. Ships and with them sailors and pilots from the Mediterranean began to make regular appearances in the ports of Northwest Europe. The exposure to practices common in the South promoted the imitation of, among other things, the making of portolan charts. The techniques spread first to England and the Low Countries and then through those intermediaries eastward. The emergence of the Low Countries and specifically the northern Netherlands as the centre of map making and new navigational methods is not surprising given ties both political and commercial with southern Europe and ties with the Northeast through rapidly growing trade.

There was a general improvement in the quality of mapping and maps in sixteenth century Europe, most obvious in southern Europe, in places like Italy and Portugal. The rise in printing and engraving made for more and better maps distributed more widely and in ever greater numbers. Southern Europeans printed charts of northern waters and not just the *Carta marina* of Olaus Magnus (Nordenskiöld, 1973, 45; Nordenskiöld, 1897, 94). The examples from Italy helped to spread information and improve standards. There were improvements in mapping everywhere in the world and northern Europe first followed the general trend and then began to excel in the methods imported from elsewhere. The imitators became better than the originators.

Political conditions in the North acted to delay the development of chart making. There was no central or even powerful authority to direct or promote map making in the region. While the Italian merchant republics such as Venice and Genoa and later the Iberian kingdoms of Portugal and Spain to some degree performed that role in the South there was no analogous state or body of institutions created by states in the North. The loose confederation of a widely varying number of towns called the Hanse led by Lübeck was the only potential candidate for the
task in the later Middle Ages. The league of cities is all too often blamed for suppressing navigational information, of keeping southern sailors out of their trading area north of Bruges and London and so preventing cartographers from gathering information needed to make reliable maps (von den Brincken, 1974, 54; Lang, 1986, 14). The lack of interest or need for Italian shippers to venture further and the different navigational techniques of the North seem better explanations for the limited flow of geographical information southward. For Lübeck with trade concentrated in the Baltic the need for navigational aids such as charts was even less than for towns whose sailors operated in the North Sea. There was little or no learned tradition of geography in most of the port towns of northern Europe to promote an interest in maps and map making before the mid sixteenth century. Whatever work was generated to help sailors had to be produced by them for their own use, as was apparently the case with Das Seebuch, since no authority was prepared to step in and subsidize or sponsor the production and distribution even of sailing directions.

For commercial reasons already in the fifteenth century a Dutch fascination with the Baltic began to emerge. As trade through Amsterdam increased markedly in the sixteenth century that interest rose and found expression in the production of rutters and of maps. Cornelis Anthonisz. after all did the Caerte van oostlant under contract to Amsterdam so the city could lobby the central government about taxation on goods shipped. Maps could be and were used for political ends and the Baltic was understood, at least by Amsterdam, to be important to the politics of the Low Countries. The Dutch Revolt made for an even greater political interest in the Northeast if for no other reason than Baltic trade was critical for Amsterdam and Amsterdam had a central role in the politics of the new Dutch Republic. The oostvaert or moederhandel was
understood in Holland as necessary for the success or even the survival of the Republic. As time passed more and more Dutch people had been to the shores of the Baltic and also to the northern reaches of the North Sea and so were interested in having it represented on their walls or in books they bought. A knowledgeable Dutch public combined with large numbers of Dutch sailors created a market for descriptive maps of the North and preferably of high quality. Though the government of the Netherlands did not subsidize or direct the development of cartography of the North the market for maps did serve something of the same purpose promoting the production of accurate charts of the northern seas.

The maps of Lucas Jansz. Waghenaer in what amounted to atlases of European waters placed cartography on a new foundation in the North. Using the full range of new techniques in establishing the shape of land forms and in reproduction of knowledge of those land forms, his charts were a summation of the advances in all phases of mapping of previous centuries. There was still no projection so that the charts would reflect the curvature of the earth. Gerard Mercator dealt with that problem in the years that Waghenaer was drawing his maps but for the North Sea and the Baltic distances were small enough that compensating for the shape of the orb was not necessary. It was not until the nineteenth century that charts of the North and Baltic Seas took on Mercator's method of projection and became true maps rather than sketch charts. A 1646-1647 set of real maps of northern waters published in Florence was largely ignored as unnecessary (Lang, 1968, 1, 24-25). From the early years of the sixteenth century Dutch map makers dominated the field. Up to the mid seventeenth century Netherlanders enjoyed a virtual monopoly of northern map making (Lang, 1968, 8). Waghenaer's work became the standard, was widely distributed, translated into various languages, and used among sailors throughout
northern Europe. It and the mass of knowledge that his work embodied created a common
tradition of pilotage among all the sailors around the region. Waghenaer's Dutch successors
produced even better and more comprehensive works which reasserted Dutch dominance. Their
charts and books on sailing were the norm and touchstone to the 1650s and beyond. Those in
England and Scandinavia who started to produce charts and books of sailing instruction typically
imitated or just directly translated Dutch works.

Gradually through the seventeenth century the region escaped from the Dutch
cartographic monopoly. People around the North developed necessary skills by copying their
Dutch counterparts' methods in surveying and hydrography. Governments of the newly
emerging states among the kingdoms of Scandinavia and later Russia promoted map making.
Swedish claims to sovereignty over the Baltic, claims the growing navy was built to assert, led to
the making of charts by the 1670s to show what Sweden ruled and the waters Swedes needed to
navigate. At about the same time Danish cartographers set out to replace obsolete Dutch charts.
By the mid eighteenth century Prussian and Russian naval officers began to produce charts of the
Baltic as did the British Admiralty (Lang, 1968, 50-66; Lister, 1970, 90). By the mid eighteenth
century map making changed because of the actions of governments and because of continuing
improvements in hydrography in general. Up to that point, in the two centuries from 1550 to
1750, northern Europeans shared common navigational practices. That unity was expressed in a
number of ways. There were sailing instructions in a language or languages that all could
understand, the difference between Low German and Dutch being small. A more obvious sign
of the commonality of perception of and practice of navigation was the maps made in the North
covering the northern seas. Cartographic representation was of a consistent sort. The shared
graphic understanding emerged slowly and the pace was deliberate for many reasons. Whatever
the causes the result by the mid sixteenth century was a set of Dutch practices in mapping which
then evolved in combination with developments in the Netherlands and in many other places in
the waters around the North and Baltic Seas. The result by the early seventeenth century was the
maps of Willem Jansz Blaeu and his successor relatives that appeared in his atlases and books of
sailing instructions. The result throughout the period was the ever more accurate and
comprehensive charts, those practical documents used on board the ships which served as the
principal communication links by sailing the North and Baltic Seas.
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Figure 1: The Carta Pisana, c. 1290, the oldest surviving portolan chart, Bibliothèque nationale, Paris.
Figure 2: Portolan chart by Petrus Roselli c. 1450, Majorca?, The Newberry Library, Chicago, Ayer MS Map 3.
Figure 3: Claudius Clavus, map of the North, 1427, the first modern map in an edition of Ptolemy.
Figure 4: Nicolas of Cusa, map of Central Europe engraved at Edinburgh, 1491?
Figure 5: Battista Agnese, Portolan Atlas, c. 1550, *Morgan Library and Museum MS M.460*, New York, part of the fourth map of western and central Europe with the Baltic.
Figure 6: Cornelis Anthonisz., *Onderwijsinge vander zee...*, Amsterdam, 1558, title page.
Figure 7: Cornelis Anthonisz., *Onderwijsinge vander zee*..., Amsterdam, 1558, coastal profiles
Figure 8: Olaus Magnus, *Carta Marina*, 1539, detail of Scandinavia
Figure 9: Cornelis Anthonisz (c. 1499-c. 1556), *Caerte van oostlant*, Antwerp, c. 1560
Figure 10: Lucas Jansz. Wagenaer, *Spieghel der Zeevaert*, Leiden, 1584-85, view of herring buss off the coast of England
Figure 11: Lucas Jansz. Wagenaer, *Thresoor der Zeevaert*, Leiden, 1592, chart of eastern Finnish coast including the Gulf of Finland.
Figure 12: Lucas Jansz. Waghenaer, *Thresoor der Zeevaert*, Leiden, 1592, chart of the western part of the coast of Prussia, Pomerania and Mecklenberg.
Figure 13: Willem Jansz. Blaeu, *Licht der Zeevaert*, title page of the 1612 English translation published by the author at Amsterdam
Figure 14: Winchelsea town seal, thirteenth century, showing a keel.
Figure 15: Gdansk town seal, 1400, showing cog/hulk.