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Medieval Ships and Seafaring

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Abstract and Keywords

Seafaring in northern waters and the Western Approaches developed in a different way from that in the virtually landlocked Mediterranean and Black Seas. This article describes seafaring over different regions during the fourteenth and the fifteenth centuries. Most seafarers during the fourteenth century were involved in commercial trade. During a warfare situation, most ships carried some kind of arms. There were some changes in the rigging of the ships and design of the vessels in the fifteenth century. By the end of the fifteenth century CE, however, these changes were much less pronounced. For use inshore, for fishing, or for the transport of small local cargoes, all kinds of craft existed, exhibiting special adaptations for particular local circumstances. The mingling of seafarers from all the leading maritime powers of the Mediterranean in Iberian ports provided for great advancements science of navigation during the fifteenth century.

Keywords: seafaring, warfare, navigation, Mediterranean Sea, Black Sea, commercial trade

Introduction

To the Romans the Mediterranean was the *Mare Nostrum*, “our sea,” and this familiar, almost cozy term perhaps reflects the way in which seafaring, whether by traders or by imperial fleets, was not seen as something extraordinary. In this the Romans followed the example of the Greeks, who for the most part lived in close contact with the sea, ships, and mariners. Europeans living in the confused and difficult times after the end of the late Antique period had more varied and complex relations with the maritime world. These relations changed gradually, particularly in the period between 1000 and 1500 CE. Many Europeans never saw the sea or had contact with any vessels other than river craft;

others were skillful and careful ship builders and navigators gradually acquiring the skills and the confidence to make long voyages that by the end of the fifteenth century would span half the globe. Still others owed their living to the sea, whether as fishermen or traders, viewing the sea and ships in a practical and empirical way. Underlying these attitudes were the stern facts of geography and the natural world. Differences in the nature and conformation of the coastline and in climate, ocean currents, and prevailing winds all influenced humans' relationship with the sea. For these reasons, until around the mid-fifteenth century, seafaring in northern waters and the Western Approaches developed in a different way from that in the virtually landlocked Mediterranean and Black Seas. Each region will therefore be considered separately.

(p. 427) Northern Waters

The Vikings

In northern waters, especially once the Roman authorities had withdrawn, it would be easy to characterize seafaring as lawless and violent, an arena beyond the reach of any law where might was right. Long before the emergence of the Vikings as an identifiable group, robbery at sea was commonplace, widespread, and beyond the power of rulers to control (Haywood 1999: 41–81). It was probably hard to define exactly where legitimate trade shaded into robbery; this was an uncouth age when self-help was of more use than any appeal to rulers and their courts. Yet particularly in the world of the Norsemen, the sea and ships were a source of wonder, longing, and adventure. The poetry of the sagas is full of images of seafaring and the exhilaration of being on board a ship. A mariner's spirit "roams beyond the enclosure of the heart" and is drawn irresistibly to follow "the whale's path / over the sea's expanse" (Exeter Book, "The Seafarer," lines 58–60, quoted in Rose 2007: 1–2). At the same time, the Norsemen were skilled navigators and excellent boatbuilders. Their ability to voyage safely across the North Sea from Scandinavia to Shetland, Orkney, and the Faeroe Islands and then farther to Iceland, Greenland, and the enigmatic Vinland demonstrates this.

The archaeological evidence, provided by the well-known vessels excavated from burial mounds and others recovered from sites like Roskilde fjord, reveals the design and construction methods of Viking longships. There are clear differences in the details of hull design and rigging between those used as ceremonial or war craft, like the Oseberg or Gokstad ships, and those used for various trading purposes, like the vessel known as Skuldelev III (Crumlin-Pedersen 2002: 303–338; Ravn et al. in this volume). All, however, belong to the same tradition of shipbuilding, being clinker-built with a double-ended hull. The freeboard was lower on the warships intended to be rowed into battle than on vessels intended to carry cargo. These were normally sailed using one square sail on a mast stepped more or less amidships. There was a single steering oar at the stern. Written

records complement this evidence. The Norse Sagas not only describe sea battles and raids but also give indications of the way the ships were sailed and navigated on long voyages (Marcus 2007: 35–99). The dismay caused by the state known as *hafvilla* is well described. The term meant that the ship's master and navigators had become completely disoriented and could no longer determine what course to follow. This occurred when the wind dropped or became fluky and uncertain, the sky was obscured by clouds so that no heavenly bodies could be seen, or a fog descended. Experienced seamen like the Vikings from at least the tenth century used the Pole Star and the Sun as direction-finding aids. They may have had some fairly crude way of estimating their northing or southing. They certainly were expert in the interpretation of small indications of their whereabouts, like the presence of seabirds and cloud patterns (Marcus 2007: 100–118). Other documents, such as the Anglo-Saxon Chronicle, make plain the fear inspired by the incursions of Vikings, so that coastal areas became dangerous and (p. 428) the sea a source of terror (Whitelock 1961: 85–86). Attempts made at defense included, in southern England, the organization of a small squadron of ships owned by the Crown (Rodger 1997: 7–17). This force had some success in encounters in bays and estuaries. More important was the acceptance of the idea by the beginning of the eleventh century that all seamen and ship owners had an obligation to contribute to the defense of the realm (Rodger 1997: 23–25).

Ship Types and the Maritime Community, 1100–1500 CE

The Bayeux Tapestry, made circa 1080 CE, after the cessation of Viking raids, depicts William the Conqueror's army embarked for the invasion of England on vessels much like some of those excavated at Skuldelev. The images of boatbuilders at work and their tools, also included, seem to belong to the same tradition (Thorpe 1973: figs. 37–46). It is probable that all along the shores of the North Sea and the Channel, Viking influence on ship design persisted for some time. The existence of a community of seafaring men with much in common, unaffected by the varying fortunes of realms and rulers, may lie behind the way in which many specialist terms relating to the building or equipping of ships can be found in a closely related format in many of the languages spoken in the same area. Sandahl (1982: 3–4) called such terms "Channel words." Examples are (in modern English spelling) "luff," "helm," and "bowline." Another indication of the cohesion of a specifically maritime community from the twelfth century are the many versions of the Laws of Oléron; this collection of "case law" relating to the duties of shipmasters and the rights of crewmen and other matters relating to the operation of ships can be found in almost all the languages of seafaring nations from this period (Ward 2009).

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Figure 19.1 The matrix of the seal of Rye, one of the leading Cinque Ports, dating from the fourteenth century. It shows the type of standardized ship image often found on the seals of port towns at this date. Reproduced with the kind permission of the author.

By the thirteenth century there is more visual and documentary evidence of changes in ships and seafaring. Images of ships are common on the seals of port towns, while illuminated manuscripts often include pictures of ships illustrating the lives of saints or incidents in chronicles (Flatman 2009) (Figure 19.1). Official documents include shipbuilding and repair accounts, orders assembling fleets and giving directions to their commanders, and the particulars of customs accounts, which often include details of merchant shipping such as tonnage and crew numbers (Friel 1983). Vessels may be described simply as *batella* (boat) or *navis* (ship) or by other apparently more specific terms, such as “hulk” or “cog.” The excavation of the Bremen Cog and of the ships found in the Ijsselmeer has provided extensive and important information on the design and construction of fourteenth- and fifteenth-century workaday vessels (Gould 2000: 178–187; Hutchinson 1994: 15–21). However, it is still hard to relate the terms used in documents with precision either to images of ships or to those excavated. The image and inscription on the seal of New Shoreham has led to the conclusion that “hulks” were distinguished by their hull shape, in which the planking curved upward at both stem and stern, creating almost a banana-shaped profile.[1] On the other hand, the term “cog” can be found as early as the ninth century describing a Frisian vessel and as late as 1513–1516 CE in the customs accounts of Chichester (Burwash 1947: 193). It is used both of trading ships (p. 429) and warships. Clearly, it would be strange if developments in ship design did not take place during this span of time, making the term “cog” perhaps no more specific than *navis*. Looking at the iconographical record and excavated remains from the whole period, however, some common features do emerge. Cogs had hulls that were much beamier than Viking ships’ had been. They were clinker-built, with a single mast supporting a yard with an oblong sail. The sail could be adapted to changing weather conditions either by reefing points or, later, by the use of bonnets, an extra strip of sail cloth attached at the foot of the sail. Gradually, from the late thirteenth to early fourteenth century the side rudder or steering oar was replaced with one hung on the sternpost. Temporary raised platforms, or castles, at the stern and the bow designed either to provide cabins for elite passengers or to be used in sea battles were also incorporated into the superstructure of some vessels. There could also be a top

castle at the masthead for use as a lookout or from which missiles could be thrown (Gardiner 1994: 8–9). Ships like this could range in capacity from under 40 to over 300 tuns (that is, the standard Bordeaux wine barrels that were used to measure the capacity of a vessel). They were seaworthy, robust, and (p. 430) well suited to conditions in their home waters. Oared vessels, sometimes called galleys, also existed but were neither identical to the galleys of the Mediterranean nor as much favored by mariners as beamy "round" ships.[2]

Ships and Trade

Click to view larger

Figure 19.2 Map illustrating seafaring routes along the North Sea and the Baltic Sea.

Most seafarers of this period were involved in commercial trade. Some vessels might carry passengers; this could be a major part of their employment in a few places, like ports on the Kentish coast with regular crossings to France and Flanders, or for the shipmasters who carried pilgrims to the great shrine of St. James at Compostela. Their main business, however, was the transport of goods, whether coastwise from port to port, or across the Channel and the North Sea, through the Sound into and out of the Baltic, or southward to the ports on the north coast of Spain and on to Seville and Cartagena (Figure 19.2). Chaucer's description of the Shipman, one of the Canterbury Pilgrims, lists his ports of call—Gotland to the Cape of Finistere and then on to creeks in Brittany and Spain—and thus in fact gives a good idea of the range of English ships and mariners at the end of the fourteenth century (Coghill 1974: 28). The fleets of the Hanseatic towns regularly visited Iceland, Bergen, the League towns in the Baltic, and English ports (especially London and Lynn), and also sailed westward to Biscay for salt (Mackay and Ditchburn 1997: 211). Most voyages were fairly short, along well-used trading routes. Across the Channel to Normandy, Flanders, or (p. 431) Calais were the routes taken most frequently by English vessels (Rose 2007: 64–75). The longer and more demanding voyage from England or Flanders to Bordeaux for wine was normally made only by the larger ships, often traveling in convoy for fear of pirates, who, as in earlier times, infested most coasts.

Warfare at Sea

In this situation, more or less all ships, except the very smallest fishing boats or coastwise traders, carried arms of some kind. There was no real distinction between warships and commercial ships. Although, especially in England, any vessel in port might find itself arrested for service in a royal fleet, this commonly involved the logistical support of a royal expedition overseas, perhaps transporting soldiers and victuals north for Edward I's wars in Wales and Scotland or, later, across the Channel during the Hundred Years' War. Virtually every inlet capable of sheltering a ship could contribute to such fleets, while major ports like Sandwich, Southampton, Dartmouth, and Bristol were home to many vessels. A similar situation existed in Brittany and the coast of northern France. Sea battles were a rare occurrence that usually happened in sheltered coastal waters. This was the case at Sluys: in 1340 CE, Edward III managed to trap a French fleet in the shallow waters of the Scheldt estuary and won a crushing victory; he celebrated by issuing a gold noble featuring an image of himself on board his *Cog Thomas*. His fleet included a small group of "king's ships" whose role was, perhaps, to lead the arrested ships into battle and stiffen the resolve of their crews (Rose 2002: 63–65). The French Crown had initially attempted a different approach to acquiring a navy, setting up a galley-building yard at Rouen at the end of the thirteenth century, but this was not a great success; vessels from this yard were disregarded in favor of galleys hired from the Castilians and the Genoese (Rose 2002: 13–16). These vessels were well suited to mounting raids on the southern coast of England, a tactic that caused much destruction and also much fury in places like Winchelsea and Southampton (Rose 2002: 68–71). All seamen and merchants trading in these waters complained frequently and vociferously about losses to sea robbers, but often they, on other occasions, were guilty of the same crime.

Changes in the Fifteenth Century CE

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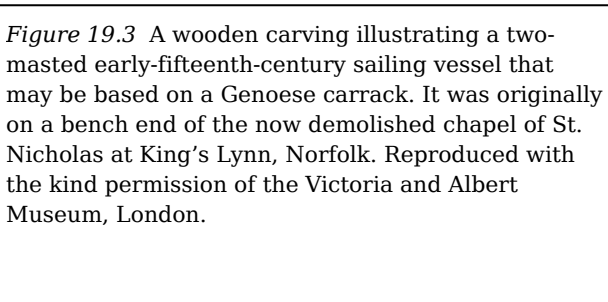

Figure 19.3 A wooden carving illustrating a two-masted early-fifteenth-century sailing vessel that may be based on a Genoese carrack. It was originally on a bench end of the now demolished chapel of St. Nicholas at King's Lynn, Norfolk. Reproduced with the kind permission of the Victoria and Albert Museum, London.

Closer and more regular contact with shipping and seamen from Genoa, Venice, and the Florentine port of Pisa may have been one of the drivers behind the beginnings of change in both northern ships and seafaring in the fifteenth century. Pictorial evidence as well as evidence from ships' inventories and accounts makes clear that gradually over the course of the century changes were made in the rigging of some ships (Rose 1982: 191–194). Two-masted vessels with a mizzen mast, likely lateen-rigged, similar to that carved on a bench end in a church in King's Lynn, appeared in the first decades of the century but were replaced fairly quickly by the better-balanced three-masted rig, whose extra foremast probably carried a square (p. 432) sail like the main mast (Hutchinson 1994: 42–44). The source of these innovations may have been the Genoese carracks that regularly visited the south coast of England and Flanders on trading voyages (Figure 19.3). Some were also captured during Henry V's campaigns in 1415–1417 CE and incorporated into his fleet of royal ships. Royal interest in shipping was considerable at this time, with the Clerk of the King's Ships running a sophisticated shipbuilding and repair yard at Southampton (Rose 1982).[3] This interest was not maintained under Henry VI, but from the 1440s, some (p. 433) of the most prominent noble families owned and built ships. This was especially the case with the Earl of Warwick, who in the 1460s and 1470s used them to advance his political aims with some tactical skill (Richmond 1998–1999: 1–19). The clinker-built hulls of the earlier period were now becoming obsolete as English shipwrights acquired the skills needed to build frame-first carvel hulls following the example of southern European shipwrights.[4] Cannon were also used at sea in small numbers, probably doing little more at first than adding to the noise and confusion of battles in which boarding an enemy vessel remained the major form of combat. Not until the final years of the century did Henry VII acquire ships carrying quite large numbers of guns of sufficient caliber to have at least the potential to be "ship-killing" weapons (Oppenheim 1896: 216–217, 261). Of the other rulers in northern Europe, the French Crown had ceased to have much interest in maritime matters. Its attention in the later years of the fifteenth century was focused on land warfare in Italy. In 1395–1400 CE, ships of members of the Hanseatic League conducted vigorous campaigns against the notorious *Vitalienbruder* pirates based in Frisia. Later in the century, the League also did its best to exclude English ships from the Icelandic trade and from trading directly with Baltic ports, largely through trade embargoes and the seizure of goods. There was little warlike activity in northern waters in the second half of the fifteenth century.

Long-Distance Voyages

This mention of the Icelandic trade, largely conducted by merchants from Bristol or Lynn who traded general goods for stockfish, indicates how English seamen were gradually becoming willing to sail farther afield, moving beyond the routes across the Channel or to Bordeaux. Some of the reasons behind this transition were political; the loss of Gascony to the French in 1453 CE ensured that the wine trade was no longer firmly in English hands. Seamen from Bristol or other western ports now looked more frequently to northern Spain and Portugal as alternative destinations. In 1457–1458 CE, Robert Sturmy of Bristol took three ships into the Mediterranean, probably with the intention of trying to break into the alum trade previously monopolized by the Genoese based in Chios. This voyage ended in disaster, but by the late 1470s other Englishmen were trading in the Mediterranean (Jenks 2006: 7–28). Improvements in ship design and seaworthiness, together with the spread of better navigational techniques, especially those developed by the Spanish and Portuguese, may have also increased the willingness of mariners to undertake longer voyages. Bristol records contain references that are not yet fully understood to voyages in the 1480s to somewhere called “the isle of Brasil,” while in 1497 CE Cabot set out from this port on the voyage that took him to Newfoundland and North America. It is possible that, even though there is no trace in the records, adventurous traders from Bristol, or other West Country ports or perhaps French or Breton ports had made their way to the Newfoundland Banks and its fishery well before Cabot’s journey (Rose 2007: 175). What is clear is that, although seamen in northern waters had been notable for their boldness in the centuries before 1000 CE, in the period around (p. 434) 1000 to 1500 CE most mariners in this region seemed to operate on a small scale, sticking to known routes and known technology. The sea was not seen or celebrated as a source of adventure or inspiration. For a more innovative and enterprising approach it is necessary to turn to seafaring and ships in southern Europe, in the Mediterranean and on the Atlantic coasts of Spain and Portugal.

The Mediterranean Region

Ship Types

In this region, seafaring clearly owed much to the mariners of Roman times; this tradition continued under the Byzantine Empire, which has been characterized as a thallasocracy (rule of the sea). It was also handed on to the Muslim rulers who, from the second half of the seventh century CE, after their capture of the Byzantine dockyard at Alexandria, commanded ships able to engage the Byzantine fleet (Unger 1980: 33–55, 96–102). Warships were predominantly oar-powered galleys that could be operated very effectively in these waters, despite their low freeboard and need for frequent halts in order to replenish the victuals and water needed by their crews. The design of these vessels, however, underwent considerable change over the period to 1500 CE (Figure 19.4). The bireme galleys of the later Roman period were replaced by the monoreme dromons of the

Byzantines (Pryor and Jeffreys 2006). For longer voyages, these vessels probably used lateen sails as well as oars, rather than the square sails of antiquity. They were also equipped, for use in battle, with a “spur” at the bows projecting above the water (allowing boarders to pour across into an enemy ship or for its banks of oars to be broken up) rather than the underwater ram used to sink or capsize enemy ships in Roman times (Gardiner 1995: 101–116). Byzantine and later Muslim vessels could also be fitted with some kind of siphon mechanism in the bows for delivering Greek fire, the inflammable liquid that could cause devastating damage to an adversary (Rodgers 1967: 41–45).

Accounts exist from around 1270 CE for the building of galleys for Charles I of Anjou. These documents include dimensions and the technical terms used for the components of the hull and rigging. There was a foredeck, a poop deck raised above the sternpost, and a gangway running the length of the vessel between the banks of rowing benches. The average crew for galleys of this type was around 108 oarsmen and 36 marines, usually armed with crossbows. There would also be two sailing masters, four helmsmen, and a couple of ship’s boys. A modern calculation has suggested that each crewman needed 22 kg of *biscotti* (the essential carbohydrate fuel for an oarsman) per month at sea. Nearly 70 liters of wine would also be provided per man for the same period. These requirements for a large crew and quantities of supplies limited the use of galleys (Gardiner 1995: 110–111).

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Figure 19.4 Two three-masted Mediterranean “round ships” in the background with a galley, mast raised, but no sail set. In the foreground off a rocky island are two galleys prepared for battle. The one in the rear is a Muslim (probably Turkish) vessel, while that in front is a galley of the Crusading Order of St. John of Jerusalem, which was based on Rhodes during the fifteenth century. The disposition of the armed men is clearly shown. From the Hours of Pierre de Bosredont. Reproduced with the kind

permission of the Pierpont Morgan Library, New York (G. 55, f. 140v).

(p. 435) Naval architecture manuals, or treatises, with directions for calculating the form of the frames that made up the skeleton of a carvel-built hull, including basic technical drawings, came into existence by the fifteenth century. These were produced by men with direct knowledge of the craft, even if the shipwrights themselves were reluctant to share their secrets. They reflect the practices of the galley-building (p. 436) yard of the Venetians, the Arsenale, easily the largest industrial enterprise in Europe. The best-known are those by Giorgio Trombetta (Anderson 1925) and Michael of Rhodes. By this date, in fact, Mediterranean galleys were successful and sophisticated vessels used to maintain regular trade routes running to a timetable. The trade network of the Venetians stretched from the port of Tana on the Sea of Azov to Sluys, the outport of Bruges in Flanders. The ships, of a standard design (described as “similar to each other as one swallow’s nest to the next” by a fifteenth-century German pilgrim) (Gardiner 1994: 2004: 148), had two or even three masts carrying lateen sails used in favorable conditions, while the oarsmen rowing *alla sensile* (three men on the same bench each pulling a separate oar) powered the vessel in unfavorable winds or on the approach to a harbor. The alternative *a scallacio* system (three or more men to a bench all pulling on the same oar) was not used until the sixteenth century CE (Gardiner 1995: 123–126). The Genoese, Florentines, and Aragonese all had galley fleets designed in much the same way. The degree of state control over shipping and the organization and success of war fleets varied between these maritime powers. Control by the authorities was strongest in Venice, where not only were galleys built in a state-owned yard but there was also a state-owned rope walk, a state-owned bakery for the *biscotti*, and state-owned forests to produce timber for shipbuilding (Lane 1973: 363). Venetian galleys sailed on dates set by the authorities, with precise orders regarding the ports to be visited and the goods to be traded (Lane 1973: 339–342).

Merchants and shipmasters from these ports also operated round ships, or “coche” beamy sailing vessels whose design from the fourteenth century shared some features with the cogs of northern Europe. This was particularly the case with the adoption of the sternpost rudder, said to have been introduced into the Mediterranean by raiders from Bayonne circa 1304 CE (Gardiner 1994: 69–76). The most successful of these round ships were probably the carracks of the Genoese. They were used in bulk trades for goods like corn and alum, a fixative used in the cloth industry. They also carried cargoes of mixed goods, everything from dried fruits, wine, and olive oil to items like gold dust and grains of paradise, on voyages to Southampton, where the details of the cargoes are recorded in the local port books (Cobb 1961). They were also engaged in trade with both Muslim and Christian states throughout the Mediterranean. Venetian round ships were not as closely controlled as the galleys, although the authorities did become involved if there was any danger of war at sea.

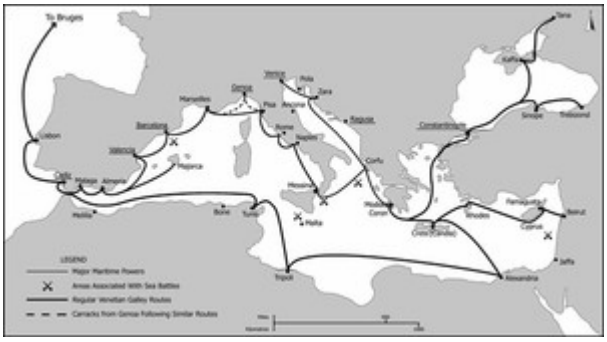

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Figure 19.5 Map illustrating seafaring routes along the Mediterranean Sea and Black Sea.

Our knowledge of the shipping used at this period by the remnants of the Byzantine Empire and the Muslim rulers of the southern coasts of the Mediterranean is not so extensive (Figure 19.5). It has been pointed out that the prevailing seasonal winds, the sea currents, and the configuration of the coastline caused difficulties for mariners from the northern coast of Africa who wished to sail north (Pryor 1992: 12–24). It has also been suggested that aspects of the prevailing culture, especially in Egypt and Syria, were actively hostile to seafaring, seeing the sea as the abode of darkness (Hillenbrand 1999: 558–559). Evidence for this view is patchy. While Islamic rulers during the period of the Crusades were intimidated by Christian (p. 437) fleets, such as the one that attacked Alexandria in 1174 CE, fairly extensive port facilities were built by a Seljuk sultan at Alanya on the southwest coast of Turkey in the early thirteenth century (Hillenbrand 1999: 564–566). Saladin, moreover, pursued an active maritime policy against the Franks (Ehrenkreutz 1955: 100–116). The Mamluk kingdom does not seem to have been much involved in maritime matters after the final collapse of the Crusader states, but the rulers and inhabitants of the Maghreb were competent mariners both as pirates and in more legitimate trade.

Castile was able to extend its maritime power into southern waters only after its capture of Seville (1247–1248 CE) and finally Algeciras (1340–1344 CE) left the Moors without ports on the Iberian coast (Rose 2002: 117–118). Piratical attacks by both Christians and Moors on shipping in the western Mediterranean remained a problem throughout the medieval period and beyond. In the Red Sea, in the Persian Gulf, and along the coast of East Africa as far south as Lamu and Zanzibar, Arab trading ships remained as active as they had been for centuries. There is evidence from the first century BCE that seafarers in the region understood how to use the seasonal pattern of the trade winds to reach India and return (see chapters by Blue, and Gaur and Vora, in this volume). Until the arrival of Europeans in the Indian Ocean, the ships used by local traders were constructed without the use of iron. The hull planking was held together by a form of stitching using twisted cords made of coir (the husk of coconuts). These open boats were navigated with skill across the seas to India and the Malay Peninsula using charts, written sailing directions, and astronomical observations as early as the end of the tenth century (Hourani 1995: 87–113). Certainly, this traffic across the Indian Ocean up the Persian Gulf and thence overland to Baghdad was one of the routes by which Chinese goods reached the West.

(p. 438) Warfare at Sea in Southern Waters

The Crusades

Apart from the 1191 CE expedition of the Crusader Reynald de Chatillon down the Red Sea in an attempt to attack Mecca (Hillenbrand 1999: 293), the waters of the Gulf and the Indian Ocean were normally peaceful. The same cannot be said of the Mediterranean. Sea battles, organized attacks on commerce, and invasions mounted from the sea were relatively more common here than in northern waters and often reveal a more sophisticated appreciation of naval strategy and tactics. Both political and commercial rivalries could lead to conflict. The religious and cultural divide between Christian and Muslim regions, obvious from the late seventh century CE, was also a factor but one that could be overridden by more practical commercial concerns. It has been suggested that while Crusaders in the late eleventh century saw their primary purpose as the recovery of the holy sites in Jerusalem, their sometimes reluctant Byzantine allies were more interested in recovering parts of the empire lost to Islamic rulers (Riley-Smith 1996: 22–26). Similarly, Italian merchants were happy to maintain a trading base at Alexandria despite papal injunctions against trading with Muslims.

The early success of the Crusading project owed a great deal to the fleets of both Byzantium and Italian maritime cities. Ships brought reinforcements and vital supplies to the Crusaders. The long trek overland from Burgundy or Germany to the Middle East, especially the dangerous and difficult march through Anatolia, was soon largely abandoned in favor of traveling by sea to ports in Syria from Italy or France. It is significant that the commanders of both the First and the Third Crusades clearly understood the urgent need to capture and hold cities on the coast—Antioch, Tripoli, Acre, and Jaffa. During the First Crusade, the successful siege of Antioch, which was a turning point in the whole expedition, owed much to the arrival of a Genoese fleet with supplies in November 1098. The fall of Acre to Richard I in 1191 was essential to any further military action in the Holy Land during the Third Crusade (Rose 2002: 35–42).

The Genoese-Venetian Wars

The sea traffic to Outremer, whether carrying military supplies, pilgrims, or trade goods, soon became of great importance to most Italian maritime cities. This in fact became the first arena in which the long-running conflict between Genoa and Venice took place. It is worth considering the nature of this rivalry and how it was fought out largely at sea. Both cities were largely dependent on maritime trade for their survival. Both wished to extend their influence in the eastern Mediterranean, the source of many of the luxuries that found a ready sale in western Europe. Both needed to establish bases in the region for their merchants and for access to shipyard facilities for their fleets. The merchant elites and ruling classes of both cities also wished to be the dominant trading power in the region, particularly when it came to relations with the Empire in the East and its capital at Constantinople. (p. 439) These basic factors caused poor relations between the two cities, which at times flared up into open warfare fought out largely by attacks on each

other's commerce at sea and set-piece battles between their galley fleets (such as in the years 1257–1270, 1293–1299, 1350–1355, and 1378–1381 CE). Open warfare eventually came to an end not because either side had won a decisive victory or because the rivals had reached an acceptable compromise but because the advance of the Ottoman Empire altered the balance of power in the region. Genoa was forced to withdraw from the Aegean and the Black Sea, while Venice became in effect the leader of European opposition to the extension of Ottoman power (Dotson 2001, in Rose 2008: 427–439).

The way in which these wars were conducted forms a striking contrast with what has already been said about war at sea in northern waters, where it is hard to find any real strategic understanding of naval power. Northern rulers used ships in an almost casual way, with little continuity of purpose; there seems to have been the belief that at times of need suitable vessels would easily be found in the ports and pressed into royal service. There was no need for a continuous navy; ad hoc solutions to a crisis were sufficient.[5] Only in England during the reign of Henry V was there some indication of a different policy, expressed not only in the ships built for the Crown but in the mounting of regular sea-keeping patrols in the Channel until the Treaty of Troyes (1421 CE) made them redundant (Rose 1982: 47–52). In both Genoa and Venice, however, the continuing need for vessels able to fight at sea was well understood. Their solutions to the problem of how to organize and support such a fleet differed. Venice favored tight control by the state, while Genoa took a more "free enterprise" approach, but both were able to send strong, well-equipped fleets into battle.

John Dotson (1986, 2001), in a series of articles on the Genoese-Venetian wars, has emphasized the way in which the seasonal winds and trade routes of the Mediterranean allowed for a form of "control of the seas" by a well-led fleet. The galley fleet or the trading ships of the enemy could reliably be expected to be off certain narrows within a fairly short time span. For either city, attacks on its commerce were of much greater importance than the intermittent opportunistic piracy common in the English Channel—trading fleets were their lifeblood in a very real sense. Thus, for example the Venetians defeated Genoese galley fleets off Acre in 1258 CE, near Spetsai in 1263 CE, and at Trapani in 1266 CE, while the Genoese captured Venetian ships and the proceeds of a whole year's trade off Abydos (on the Gallipoli peninsula) in 1262 CE and a further four trading ships near Monemvasia. The most complex campaign in these years was probably that of 1264 CE, when the Genoese fooled the Venetians into thinking their fleet had sailed east to Pera when in fact it was lurking off Durazzo. On this occasion the Genoese successfully captured the entire Venetian galley fleet and the goods it was carrying. The only vessel to escape was a large round ship, the *Roccafortis* (Rose 2008: 408).

It is evident, however, from the way the Venetian-Genoese conflict waxed and waned that while each could do great damage to the other, each city lacked the ability to deliver a true knockout blow to its opponent. To do this, warfare at sea (p. 440) needed to be backed up by a campaign on land. The War of Chioggia (1378–1381 CE) brought Venice to the brink of disaster as the Genoese successfully recruited their Hungarian allies to attack by land. The Venetians in the fifteenth century suffered in a similar way at the

hands of the Ottoman Empire. The Venetians could not hold on to the island of Negroponte once the Turkish land army was ashore, nor could they defend their crucial Peloponnesian bases, Modon and Coron, once the Turks had conquered the interior of the peninsula (Rose 2002: 109–116).

Roger of Lauria and the Aragonese

War between the Venetians and the Genoese was based on commercial rivalry. On the other hand, Peter III of Aragon used naval forces very effectively during the War of the Sicilian Vespers (1282–1302), a conflict with its roots in political and dynastic rivalries. He and Charles I of Anjou were in dispute over the Crown of the Regno, a kingdom which at this date (the late thirteenth century) included Naples, the south of Italy, and the island of Sicily. Some action at sea was probably inevitable given the fact that Peter also ruled Catalonia and its capital, Barcelona, while Charles was based in Provence, with the major port of Marseille. The naval aspects of the war have attracted much attention because the commander of Peter's fleet was Roger of Lauria, who has been hailed as an admiral fit to stand beside the most prominent figures of later ages (Pryor 1983, in Rose 2008: 295–316). His success may have been due to no more than the fact that he and perhaps his crews had more experience in galley warfare than their opponents and were personally brave and determined. For this relatively brief period, Aragon could well consider itself a naval power in a way that was not possible for many other medieval states. It is perhaps not surprising, with this heritage, that mariners from the western Mediterranean—the Catalans, Aragonese, and Genoese—were responsible for many of the advances in maritime skills in the fifteenth century discussed below.

Navigation and Seamanship

The mingling of seafarers from all the leading maritime powers of the Mediterranean in Iberian ports may have provided the stimulus for the great advances in the science of navigation during the fifteenth century. Even in Roman times a basic form of sailing directions existed. The *Periplus of Scylax of Caryanda* dates to the fourth century BCE and gives directions for voyages in the Mediterranean. The *Periplus of the Erythraean Sea* from 60 CE gives not only sailing directions but also useful tips for those trading in the Red Sea and across the Gulf to Persia (see Blue in this volume). The earliest surviving medieval sailing directions are the *Compasso da Navigare* (1250 CE), which included precise directions for entering major ports. A text like this may well have been used in conjunction with a chart, although the earliest surviving example is the *Carta Pisana* from 1274 CE. The *portolani* (as this and similar maps were called) depicted reasonably accurate coastal outlines; courses could be set using the rhumb lines leading from the maps' compass roses. Using (p. 441) these and a magnetic compass, something which was now routinely in the possession of many shipmasters in this area, a suitable course could be laid off on the chart. More general mapmaking also made great advances during

the fourteenth century CE; the best-known family of cartographers, based in Majorca, produced major works like the Catalan Atlas of 1375 (Rose 2007: 51–56).

Other innovations included a system for estimating the course made good by a vessel set out in the *Toleta de Marteloio* and the eventual extension to seafaring of a method of determining the latitude of any point on the globe, originally devised in classical times for use on land. This method entailed the measurement of the altitude of either the sun above the horizon at noon or the Pole Star at night using a simplified astrolabe or other instrument. Calculations according to the rules and tables to be found in books like the *Regimento do Astrolabio e do Quadrante* were then necessary to establish a vessel's position in terms of latitude (Rose 2007: 56–59). Longitude presented greater problems, which would not be solved until the eighteenth century. Navigation in this way was becoming not just a matter of hard-won experience but a science based on astronomy and mathematics.[6] Mariners from the western Mediterranean became more confident in their ability to voyage farther afield, initiating settlement on the Canary Islands in the fourteenth century CE, Madeira in 1420 CE, the Azores in 1427 CE, and the Cape Verde Islands in 1456 CE. Some credit, at least for the steady accumulation of experience in more scientific navigation and for the making of more accurate maps and charts, may be due, according to some historians, to Henry the Navigator and his court, based at Sagres (Parry 1974: 113–129; Phillips 1998: 213–219). The ultimate outcome, was, of course, the discovery of the route around the Cape of Good Hope to India pioneered by the Portuguese Bartolomeu Dias (1488 CE) and Vasco da Gama (1497–1499 CE) and that across the Atlantic to the Caribbean first followed in 1492 CE by Christopher Columbus, a Genoese supported by the rulers of Castile.

Conclusion

At the beginning of this discussion of medieval seafaring, emphasis was placed on the way in which ships and seafarers in northern waters differed from those in the south. The stormy waters of the North Atlantic, the fierce tides and shifting sandbanks of the Channel, and the North Sea made for a harsher maritime environment than the more predictable seasonal changes in the winds and the weather of the almost tideless Mediterranean. By the end of the fifteenth century CE, however, these differences were much less pronounced. For use inshore, for fishing, or for the transport of small local cargoes, all kinds of craft existed, exhibiting special adaptations for particular local circumstances: the need to beach on a stony shore, or to launch into the surf; a rig adapted to long-reaching courses in steady winds, or one suited to short tacks into a narrow harbor. On longer voyages, however, a degree of (p. 442) consensus had been established as to the best and most practical design, which now became generally known as the caravel (Gardiner 1994: 91–98). Equally, shipmasters contemplating such a journey were expected to have at least some understanding of navigational instruments and their use at sea. The experienced but rough and ready mariner who as late as 1571 CE was

described by William Bourne as laughing at charts and astronomical observations and saying he could do as well as “star shooters” by keeping an “account upon a boord” was gradually being edged out of seafaring (Rose 2004: 176). The new exponents of mathematical navigation were better educated and increasingly of a higher social rank. Columbus and Cabot were both prepared and able to negotiate with monarchs for support. Drake and his colleagues in Elizabeth’s reign were familiar figures at court.

It is also the case that just as an earlier maritime community had spread knowledge of the Laws of Oléron widely along the sea lanes, mariners in both southern and northern Europe exchanged knowledge of techniques and courses. In 1477 CE Columbus probably made a voyage as far north as Iceland. Later in 1478 CE he traveled to Madeira and eventually married a close relation of one of the town’s first settlers. He did not set out across the Atlantic without some good experience in long-distance voyages and the prevailing winds (Fernández-Armesto 2000: 14–17). Similarly, in another linking of the traditions of the North and the South, the Italian Cabot (Giovanni Caboto) set out from Bristol in a locally built vessel. We might also observe that the enthusiasm for new experiences found in Viking sagas seemed to be reborn in the plans of the most prominent seamen of the late fifteenth century CE. Columbus could even declare in 1498 CE that he believed he was on the brink of discovering “the Earthly Paradise where no man may go save by the grace of God” (Fernández-Armesto 2000: 104). Such fantasies were, of course, a long way from the experience of most workaday seamen plying short routes. They served, however, to ensure that ships and seafaring had a renewed prominence in European affairs at the end of the fifteenth century CE, with profound consequences for the future development of the world and its peoples.

References

Anderson, R. C. 1925. Italian naval architecture about 1445. *Mariner’s Mirror* 11: 135–163.

Burwash, Dorothy. 1947. *English merchant shipping 1460–1540*. Newton Abbot, England: David and Charles.

Cobb, Henry S. 1961. *The local port book of Southampton for 1439–40*. Southampton: Southampton University.

Coghill, Neville, ed. 1974. *The Canterbury tales*. London: Folio Society.

Crawford, Anne. 1992. *The Household Books of John Howard, Duke of Norfolk, 1462–1471, 1481–1483*. Stroud: Alan Sutton.

Crumlin-Pedersen, Ole. 2002. *The Skuldelev Ships I: Topography, archaeology, history, conservation and display*. Roskilde: Viking Ship Museum.

Dotson, J. E. 1986. Naval strategy in the First Genoese-Venetian War 1257–1270. *American Neptune* 46: 84–90.

Dotson, J. E. 2001. Foundations of Venetian naval strategy from Pietro II Orseolo to the Battle of Zonchio 100–1500. *Viator* 32: 113–125. Dotson 1986 and 2001 are reprinted in S. Rose, ed., *Medieval ships and warfare*, 403–439. Aldershot: Ashgate, 2008.

Ehrenkreutz, A. S. 1955. The place of Saladin in the naval history of the Mediterranean Sea in the Middle Ages. *Journal of the American Oriental Society* 75: 100–116. Reprinted in S. Rose, ed., *Medieval ships and warfare*, 235–251. Aldershot: Ashgate, 2008.

Fernández-Armesto, Felipe. 2000. *Columbus and the conquest of the impossible*. London: Phoenix Press.

Flatman, Joe. 2009. *Ships and shipping in medieval manuscripts*. London: British Library.

Friel, Ian. 1983. Documentary sources and the medieval ship: Some aspects of the evidence. *International Journal of Nautical Archaeology and Underwater Exploration* 12 (1): 41–62.

Gardiner, Robert, ed. 1994. *Cogs caravels and galleons: The sailing ship 1000–1650*. London: Conway Maritime Press.

Gardiner, Robert. 1995. *The age of the galley: Mediterranean oared vessels since pre-classical times*. London: Conway Maritime Press.

Gould, Richard A. 2000. *Archaeology and the social history of ships*. Cambridge: Cambridge University Press.

Haywood, John. 1999. *Dark Age naval power: A reassessment of Frankish and Anglo-Saxon seafaring activity*. 2nd ed. Hockwold-cum-Wilton: Anglo-Saxon Books.

(p. 444) Hillenbrand, Carole. 1999. *The Crusades: Islamic perspectives*. Edinburgh: Edinburgh University Press.

Hourani, George F. 1995. *Arab seafaring in the Indian Ocean in ancient and early medieval times*. Princeton, NJ: Princeton University Press.

Hutchinson, Gillian. 1994. *Medieval ships and shipping*. London: Leicester University Press.

Jenks, Stuart. 2006. *Robert Sturmy's commercial expedition to the Mediterranean (1457–8)*. Bristol: Bristol Record Society.

Lane, Frederic C. 1973. *Venice: A maritime republic*. Baltimore: Johns Hopkins University Press.

Lockwood, Shelley, ed. 1997. *Sir John Fortescue: On the laws and governance of England*. Cambridge: Cambridge University Press.

Mackay, Angus, with David Ditchburn. 1997. *Atlas of medieval Europe*. London: Routledge.

Marcus, G. J. 2007. *The conquest of the North Atlantic*. 2nd ed. Woodbridge: Boydell Press.

Oppenheim, M. 1896. *Naval accounts and inventories of the reign of Henry VII 1485–8 and 1495–7*. London: Navy Records Society.

Parry, J. H. 1974. *The discovery of the sea*. London: Weidenfeld and Nicolson.

Phillips, J. R. S. 1998. *The medieval expansion of Europe*. Oxford: Clarendon Press.

Pryor, John H. 1983. The naval battles of Roger of Lauria. Reprinted in S. Rose, ed., *Medieval ships and warfare*, 295–332. Aldershot: Ashgate, 2008.

Pryor, John H. 1992. *Geography, technology, and war: Studies in the maritime history of the Mediterranean 649–1571*. Cambridge: Cambridge University Press.

Pryor, John H., and Elizabeth M. Jeffreys. 2006. *The age of the ΔΡΟΜΩΝ: The Byzantine navy ca 500–1204*. Leiden: Brill.

Richmond, Colin F. 1998/1999. The Earl of Warwick's domination of the Channel and the naval dimension of the Wars of the Roses. *Southern History* 20/21:1–19.

Riley-Smith, Jonathan. 1996. *The Crusades: A short history*. London: Athlone Press.

Rodger, N. A. M. 1997. *The safeguard of the sea: A naval history of Britain*. Vol. 1, *660–1649*. London: HarperCollins.

Rodgers, William Ledyard. 1967. *Naval warfare under oars 4th to 16th centuries: A study of strategy tactics and ship design*. Annapolis: Naval Institute Press.

Rose, Susan. 1982. *The navy of the Lancastrian Kings: Accounts and inventories of William Soper, Keeper of the King's Ships 1422–27*. London: Navy Records Society.

Rose, Susan. 2002. *Medieval naval warfare 1000–1500*. London: Routledge.

Rose, Susan. 2004. Mathematics and the art of navigation: The advance of scientific seamanship in Elizabethan England. *Transactions of the Royal Historical Society*, 6th ser., 14: 174–184.

Rose, Susan. 2007. *The medieval sea*. London: Hambledon Continuum.

Rose, Susan, ed. 2008. *Medieval ships and warfare*. Aldershot: Ashgate.

Sandahl, Bertil. 1982. *Middle English sea terms*. Vol. 3, *Standing and running rigging*. Uppsala: Acta Universittatis Upsaliensis.

Taylor, E. G. R. 1956. *The haven-finding art: A history of navigation from Odysseus to Captain Cook*. London: Hollis and Carter.

Thorpe, Lewis. 1973. *The Bayeux Tapestry and the Norman Invasion*. London: Folio Society.

Tinniswood, J. T. 1949. English galleys 1272–1377. *Mariner's Mirror* 35: 276–315.

Unger, Richard W. 1980. *The ship in the medieval economy 600–1600*. London: Croom Helm; Montreal: McGill-Queen's University Press.

Ward, R. 2009. *The world of the medieval shipmaster: Law business and the sea, c. 1350–1450*. Woodbridge: Boydell.

Whitelock, Dorothy, with D. C. Douglas and S. I. Tucker. 1961. *The Anglo-Saxon chronicle*. London: Eyre and Spottiswoode.

Notes:

(1) . The inscription read as follows: *Hoc hulci signo vocor os sic nomine digno* (By the sign of a hulk I am called Mouth which is a worthy name). This becomes comprehensible when one learns that New Shoreham was earlier called Hulksmouth.

(2) . The English Crown ordered the building of so-called galleys for defensive purposes at the end of the thirteenth and in the mid-fourteenth centuries. Little or nothing is known about the way they were used. Balingers, a ship type combining both oars and sails, enjoyed some popularity as fast transports or raiders up to the first half of the fifteenth century (Unger 1980: 171–172; Tinniswood 1949 in Rose ed. 2008: 25–68).

(3) . Full details of Henry V's naval activities, including a transcription and translation of the account book of the Clerk of the King's Ships for 1422–1427, can be found in Rose 1982.

(4) . The Household Books and other documents relating to John Howard, Duke of Norfolk, in the second half of the fifteenth century contain mentions of ships called carvels, e.g., a listing from 1468 CE in which 8 out of 22 ships are described as carvels (Crawford 1992: xliv).

(5) . Sir John Fortescue, in his *Governance of England* (written in the 1470s), pointed out that it was too late to build a navy when the enemy were already at sea, but no English ruler took much notice of this until the sixteenth century (Lockwood 1997: 96–97).

(6) . The whole subject of navigation from classical times to the eighteenth century is discussed in E. G. R. Taylor's *The Haven-Finding Art: A History of Navigation from Odysseus to Captain Cook* (1956). Parts III and IV are most relevant for the medieval period.

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