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MEDIEVAL SHIP GRAFFITO IN THE PALAU REIAL MAJOR AT BARCELONA

By Lawrence V. Mott

A SHIP reflects the political and economic constraints under which it is employed. It also can mirror some of the changes a society is compelled to undergo due to external forces. A drawing of a medieval ship on the back wall of the chapel of Santa Agata in the Palau Reial Major at Barcelona reflects some of the forces changing Catalonia in the 14th century, and provides insights into ship construction during this period as well.

The second half of the fourteenth century was a turbulent period in Catalan history. Under the crown of Aragon, Catalonia had gained control of all the western Mediterranean islands including Sicily, and in the eastern Mediterranean had established trading colonies in Beirut, Damascus, and Alexandria. This brought her into conflict with other Mediterranean states, particularly Genoa, France, and Castile. This expansion of trade and political power in itself profoundly changed her society. But Catalonia, like the rest of Europe, was also under siege from the Black Death, which would have an extraordinary effect not only on culture and trade, but also on the ships which were used.

THE SHIP GRAFFITO

The ship graffito is part of a group of graffiti drawn on the wall behind a balcony located at the back of the chapel of Santa Agata. Besides the ship rendering, other drawings include scenes of Sant Jordi and the Dragon, knights, noblewomen, letters and musical notes. Some of the graffiti were done with red ochre while others, such as the ship, were executed in charcoal. The ship drawing gives a perspective view of the vessel from above showing a part of the deck (Fig. 1).

The hull of the ship appears to be double-ended with stem and stern posts which curve upward until they are nearly vertical. The perspective view of the ship hints at a hull which was relatively long and narrow in comparison to the cogs and roundships of the period, which had length-to-breadth ratios of less than 4.1. The ship represented is of a type known as the *keel,* a common vessel type in northern Europe, particularly in England and the Bay of Biscay. A small forecastle is mounted on the bow with the stem post passing

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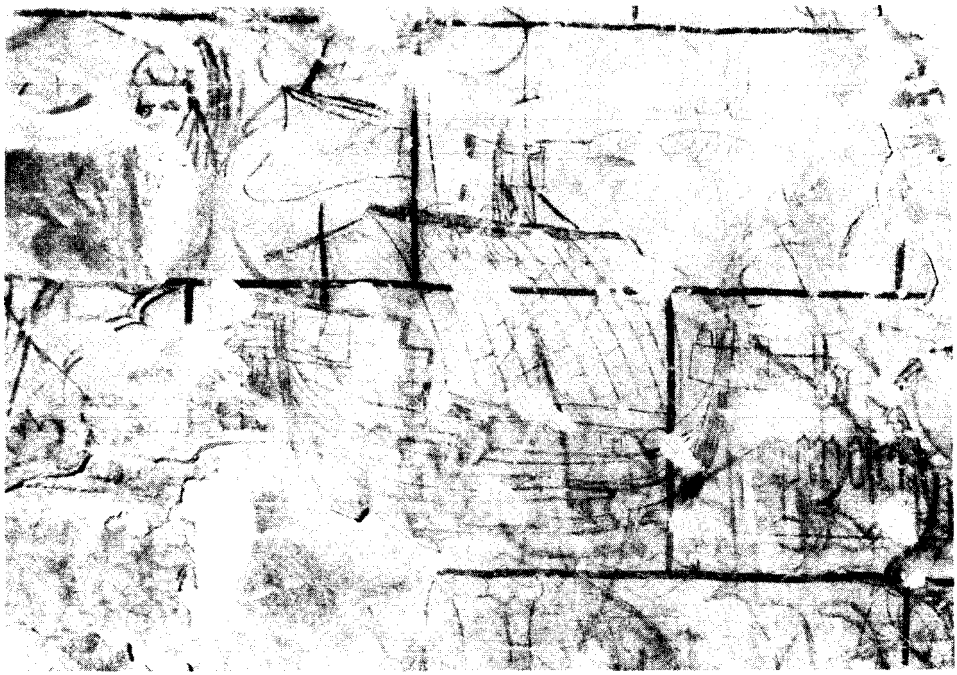

Fig. 1. Charcoal ship graffito on the back wall of the chapel of Santa Agata in the Palau Reial Major. Note the similarity between this drawing and the ship on the seal of Faversham, Kent in Figure 2.

through it and rising above the castle's sides. The forecastle is drawn as a rectangle without an internal vertical line, indicating the forecastle was a simple boxlike structure and was not like the polygon-shaped forecastles which were beginning to appear on Mediterranean ships.

The sternpost is curved and continues upward to become part of the sterncastle. The sterncastle extends over the stern of the ship and continues forward for approximately one quarter of the vessel's length. The forward end of the sterncastle has an indentation in it before it descends to the deck. This indentation and the location of the mizzen mast denote the presence of a quarterdeck with the horizontal line of the notch being the level of the quarterdeck itself. A series of vertical and horizontal lines drawn on the side of the sterncastle suggest the side was covered either with canvas or an open wood lattice.

The rudder is stern-mounted, but it is only faintly drawn, and the lower part was destroyed when part of the mortar flaked away from the wall. For this reason it is impossible to tell whether the rudder was hung vertically with deadwood filling in the space between the rudder and sternpost, or was curved to fit the form of the sternpost as was a common practice in the Mediterranean. The artist drew the rudder as being constructed of a main piece and back piece with the head of the rudder protruding through the tiller. The tiller extends under the quarterdeck and the mizzen mast indicating that the

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mizzen mast was stepped on the quarterdeck and not on the main deck or keel.

The main deck has three hatches of equal dimensions arranged along the centreline, with the ship's boat stowed between the forward and middle hatches. The forward hatch has a semicircular device drawn on it while the middle hatch has a circle inscribed on it. It is difficult to say what the function or significance of these circular objects might be. The hatch arrangement is of particular interest as there are no other 14th century representations of ships showing the deck and hatch locations. Ship reconstructions for this period have generally assumed that only a single large hatch, located either forward or amidships, was used to gain access to the hold. The graffito suggests, however, that some ships were constructed instead with a series of smaller hatches. The use of a group of hatches instead of a large single one may be due to a perception by either the shipwright or vessel owner that the smaller hatches were more secure and seaworthy and less likely to give way during a storm. It is also possible the arrangement was for use with a specific type of cargo which was more easily stowed or removed through several small hatches than through a single large opening. The use of several hatches would remove the problem of having to manhandle bulk cargo, such as bales of wool or large wine barrels, long distances below deck in order to trim the ship.

The mainmast is only visible directly below the round fighting top and is drawn in association with a series of other near-vertical lines, which may represent shrouds. Directly in front of the mast and above the main yard is a dark line which appears to be the forestay but which does not continue past the mainsail down to the stem. The main yard is a single spar with a square mainsail drawn as a series of rectangular strips. The reticulated pattern on the sail is the result of the common southern practice of stitching pieces of canvas back-to-back to produce a sail of double thickness. Below the yardarm there are a series of curved lines suggestive of the folds of a top-reefed sail. The mainsail is almost fully set and yet does not have bonnets or lower reef points on it. The fact the artist omitted these details and yet took the time to draw the sail's reticulated pattern and the curves below the yardarm suggest that he was indeed trying to sketch a top-reefed sail. If this is a drawing of a sail reefed from the top it is by far the earliest representation of a sail shortened in this way. The seal of La Rochelle, dated to the 12th century, has reef points but these are located on the lower part of the sail for furling it from the bottom up. The earliest representation other than this that even suggests top-reefing is the seal of Rye dated to the fifteenth century. This method of reefing is then not seen again until the middle of the 17th century, which has been the generally accepted date for its introduction. In view of this graffito that date may have to be revised. However, it is obvious from medieval iconography that furling from the sail's foot and the use of bonnets were the

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preferred methods for shortening sails. This is probably due to the absence of other rigging developments which enhanced top-reefing. Medieval ships lacked both footropes and reefing tackle thus making this form of reefing a dangerous proposition. The seamen would have had no mechanical means to help them haul the canvas in and without footropes they would have lacked any way to brace themselves from being pulled over the yard if the sail filled suddenly. Yet the drawing suggests the possibility that top-reefing at the very least was being experimented with by the mid 14th century.

The mizzenmast is substantially shorter than the mainmast and is supported by two stays on either side. It carries a yard with a completely furled sail. One imagines the mizzen was lateen-rigged, but this must remain uncertain. The earliest drawing of a square-rigged medieval ship with a mizzen is on the atlas of Pizigani dated to 1367. That ship carries a lateen-rigged mizzenmast as do ships in later representations.

DATE OF THE GRAFFITI

The Chapel of Santa Ågata in the Palau Reial Major has been mentioned in Catalan documents as far back as 1173, and evidence indicates that a chapel had existed there for some time prior to that. In 1291 Jaume II began renovations which were essentially completed in 1326 with the placement of the altar in the chapel. While other monarchs made minor alterations to parts of the chapel, the structure itself was complete by the start of the third decade of the 14th century.[1]

While the chapel records give us a lower limit for the date of the graffiti, a study of the graffiti themselves is necessary to obtain a closer approximation of when they were executed. The first clue comes from the musical notes, which have been dated by their form to either the 14th century or the first half of the 15th century.[2]

The ship itself is a *keel* and shows a stage of development of that ship type generally associated with the end of the 13th century or the first half of the 14th century. A *keel* depicted on the city seal of Faversham, Kent, circa 1300, has virtually the same hull form and superstructure as the graffito (Fig. 2). The only differences are the addition of the mizzenmast and the use of a stern-mounted rudder instead of the quarter rudders shown on the seal. The introduction of the mizzenmast on this type of vessel probably did not occur until the middle of the 14th century, yet the hull form is generally associated with vessels typical of the end of the 13th century or the first quarter of the 14th century. Together, the two attributes suggest the graffito was drawn no earlier than the second quarter but not later than the third quarter of the 14th century.

Another range of dates comes from the drawings of the knights, and of their helmets in particular (Fig. 3). Two of the knights are wearing great

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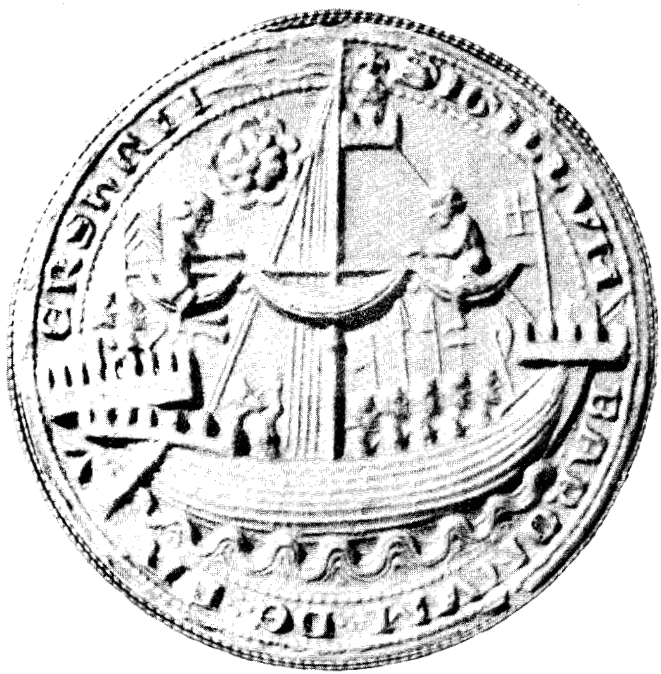

. 2. The seal of Faversham, Kent. The seal, *circa* 1300, contains a vessel called a keel. The only ferences between the ship graffito and the seal are the addition of a mizzenmast and a stern-unted rudder on the graffito. (National Maritime Museum, London).

Fig. 3. Graffito of knights on the back wall of the chapel with the ship graffito. The types of helmets worn by the knights are generally associated with the second and third quarters of the fourteenth century. (Photograph courtesy of Camilla González Gou, Museu D'Història De La Ciutat).

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helmets which have rounded crowns, reinforced faceplates and strengthened eye slits. The rounded crown for this type of helmet became popular at the start of the 14th century but by the second half it had been relegated strictly to jousting. Reinforced faceplates were used primarily for jousting, and jousting is also suggested by the elaborate crests attached to the helmets. Helmets with strengthened eye slits and faceplates virtually all date to the second and third quarters of the 14th century.[3] A third knight wears a helmet having similar features but a flat, instead of a rounded, top. This style of helmet went out of use in Europe shortly after the start of the third quarter. In fact, the great helmet had been generally replaced by the bascinet by the start of the fourth quarter, though the English and Germans would continue to use it with the bascinet until around 1390.[4]

Altogether the graffiti of the knights, musical notes, and the ship suggest that the graffiti were drawn sometime in the mid 14th century, possibly around 1350.

DISCUSSION

The start of the 14th century, besides marking a period of expanding Catalan influence, brought a change in the ships that were used to expand and consolidate that power. The predominant merchant ship in the 13th century had been the roundship, and while these ships could reach considerable size they had several drawbacks. The lateen rigs which the ships carried required large, and therefore expensive, crews to handle them. Also, the hulls were becoming too large for the use of quarter rudders, which made handling these unwieldy ships even more difficult.

However, by the 14th century Mediterranean shipwrights were being influenced by northern ship designs. Northern ships had been introduced to the south during the Crusades but had not evolved sufficiently to offer any substantial advantage for shipwrights or merchants. However by the start of the 14th century the northern designs offered several advantages when compared to their southern counterparts. While smaller than the roundships, the northern ships' square rig required less crew to handle it, and the ships were easier to handle by virtue of their smaller hulls and the use of the stern-mounted rudder.

The earliest reference to the influence of northern ship designs dates to 1304 and is by a Florentine named Giovanni Villani, who made this observation: 'At this time some people passed through the strait of Sevilla (Gibraltar) with their ships, called cogs, with which they pirated on this sea and caused much harm. Since then the Genoese, the Venetians, and the Catalans have begun to employ cogs for their seafaring and have abandoned the use of their own larger ships in order to secure the seaworthiness and reduced costs of the cogs. This circumstance has constituted a substantial

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change in our concept of sailing'.[5] The fact that there are no iconographic representations of roundships in Catalonia which date later than the first quarter of the 14th century reflects how rapidly the 'cog' was adopted by merchants and shipwrights. These ships offered to the merchant a ship which, besides having good cargo capacity and reduced manning requirements, could also be easily defended because of its relatively high sides and the high castles in the bow and stern.

Another event influencing the rapid adoption of northern designs and construction techniques was the arrival in Catalonia of the Black Death in May of 1348. In that year Pedro IV reported 300 people died each day in Valencia, and by 1378 over 350,000 people had died in Catalonia, a loss of over one quarter of the population. The economic impact was immediate. The loss of skilled workers, including shipwrights, caulkers, carpenters and mariners, drove up wages to the point that the building and operation of a merchant vessel became extremely expensive. By 1349 Pedro IV was forced to order town councils to set wages in order to stop the spiralling inflation. This not only proved ineffective but also very unpopular with the town governments and the population in general.[6]

In the wake of the plague, merchants were confronted with not only higher operating costs but also a decrease in commerce as the Black Death ravaged the population of Europe. The northern ships provided a solution to the problem. Their aforementioned attributes meant they cost less to man and operate. *Cogs* were generally smaller than roundships, but this decrease in cargo capacity became acceptable due to the decline in overall commerce caused by the plague.

The ship graffito reflects these developments but also presents us with an anomaly. On the basis of the statement of Villani it has been generally assumed that the use of the word 'cog' referred to the type of ship favoured by the Hanseatic League at that time. Unlike the ship portrayed in the graffito, *cogs* were characterized by having straight stem and stern posts, and a box-like hull with a length-to-breadth ratio of a little over 3 to 1. While the *cog* was introduced and used in the Mediterranean during the fourteenth century, iconographic evidence from the Basque region, which included Bayonne, reveals that at the start of the century the mariners of the region were in fact using *keels* and not *cogs*. The council seals of Santander, San Sebastián, Pamplona, and Laredo, which date to the end of the thirteenth century show not *cogs* but *keels* like the ship graffito. This appears to conflict with the statement of Villani concerning the use of 'cogs'. However the term 'cog' as used in the fourteenth century was in fact often not specific, and frequently the term simply implied a large, single-masted, square-rigged vessel.[7] Viewed in this light the use of 'cog' by Villani makes more sense and it is likely that he was simply referring to large, square-rigged Basque ships and not to *cogs* as a specific ship type. This conclusion is supported by a

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Genoese document of 1232. In it the ship in the seal of La Rochelle, dated to around 1200, is referred to as a 'cog' when in fact the vessel is clearly a *keel.*[8] Further support comes from two documents in Lübeck dated to 1328 which refer to the ship on the city seal as a 'cog' despite the fact the ship resembled a *keel* and has none of the characteristics associated with a *cog.*[9]

The ship graffito at Barcelona appears to lend further support to the above conclusion. The ship is a conglomerate of both northern and southern traditions, for while the hull, the square-rigged main mast, and the stern-mounted rudder all reflect northern techniques, the reticulated sail and the presence of a mizzen mast at such an early date indicate southern influence. The combination of southern and northern attributes strongly suggests that the ship depicted was probably built in the western Mediterranean by shipwrights trying to mould the desired qualities of the *keel* with southern technological developments. The fact that a *keel* with Mediterranean construction features appears in a drawing that can be dated to around 1350 indicates that southern shipwrights were copying this type of vessel until at least the third quarter of the fourteenth century. This is not to imply that southern shipwrights did not know of *cogs* or experiment with their design. It simply suggests that other northern ship types besides the *cog* were being adopted and modified for use in the Mediterranean.

In conclusion, the ship graffito in the Palau Reial Major provides us with both technical details of a *keel* and historical data concerning the adaptation of northern construction techniques by southern shipwrights. On the technical level the drawing is the only known depiction of the deck layout of a *keel* and may well be the earliest artwork showing a square-rigged medievel ship with a mizzen mast. The graffito also suggests the possibility that top-reefing was being experimented with as early as the fourteenth century. On a historical level, the graffito forces us to review more precisely the relative impacts of the *cog* and the *keel* in the Mediterranean and to what degree either type of northern vessel technologically influenced the southern shipwrights. The existence of the graffito indicates that the introduction and adoption of northern techniques in the south may have been more complex than previously thought, and points to the *keel* as possibly playing a more important role in this transfer of ship technology.

Acknowledgments

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Footnotes

1 A. Duran I Sanpere, *El Palau Reial Major* (Barcelona: Museu D'Història De La Ciutat, 1980), pp. 13–16.

2 Per. Comm. with Prof. Eduard Carbonell, Director of the Department of Art, University of Barcelona.

3 Howard M. Curtis, *2,500-Years of European Helmets* (Hollywood: Beinfeld Pub., 1978), pp. 34–50.

4 P. Martin, *Arms and Armour from the 9th to the 17th century* (Rutland, Vt.: C. E. Tuttle Co., 1968), p. 132.

5 Josè Mª Martínez-Hidalgo, *Las Naves de Colon* (Barcelona: Editorial Cadi, 1969), p. 66.

6 J. F. O'Callaghan, *A History of Medieval Spain* (Ithaca: Cornell Univ. Press, 1975), p. 461.

7 R. W. Unger, *The Ship in the Medieval Economy 600–1600* (London: Croom Helm Limited, 1980), p. 139.

8 Detlev Ellmers, *Frühmittelalterliche Handelsschiffahrt in Mittel- und Nordeuropa* (Berlin: Walter De Gruyter & Co., 1966), p. 58.

9 Siegfried Fliedner, *The Cog of Bremen* (Bremen: Focke Museum, 1972), p. 23.

NOTES

'SUCCESS TO MR BARNARD'S YARD'

The National Maritime Museum, Greenwich, recently acquired a Chinese Export Porcelain Punch bowl, Qianlong period, *circa* 1785, inscribed with the message 'Success to Mr Barnard's Yard'. It should be on public display in the Spring of 1990. It is a classic example of the made-to-order decorated presentation Chinese porcelain bowls of the period. Its dimensions are 17 cms. in height with a diameter of 29.5 cms. The outer face of the bowl is painted with ships, seemingly on their building stocks, awaiting completion. The river background shows strong Chinese influence. The text, inscribed on the inner base, is set in a plain oval panel. Further decoration is added to the rim and foot in a traditional manner. The whole is in an excellent state of preservation with no restoration.

The giving of such bowls, with different motifs according to taste or commercial requirement, was commonplace throughout the eighteenth century, moreover punch bowls painted with ships were considered 'the ultimate in Private Trade special designs' (Geoffrey Godden). Futhermore the 'Success to . . .' text had been in use for many years prior to the date of the bowl. What, then, makes this particular bowl worthy of special attention? There are two prime factors. Firstly there is the somewhat unusual dedication to a merchant shipyard and secondly the source from which the Chinese artist copied his subject.

Until recently very little was known of the major role played by the Barnard family in building both for the Navy Board and for the owner managers of the HEIC. However, it may now be stated that the Mr Barnard referred to was William Barnard (1735–95), the third generation of the family which had sprung to prominence in East Anglia in the early days of the century. William Barnard, either on his own account or in partnership, built at least 69 vessels for the East India trade and some 23 vessels of war for the Navy Board. His yard occupied a site at Deptford Green situated at the southern extremity of Limehouse Reach on the left bank of the River Thames. A power station now covers the whole area.

With regard to the ships depicted on the bowl a casual glance might give the impression that they were but a figment of the artist's imagination. However it should be remembered that it was a traditional feature of these top quality bowls that any maritime scenes represented were expected to be as accurate as the medium on which they were painted would allow. The ships depicted in this case were no exception. Reference to Fredrick Henrick Chapman's 'Architectura Navalis Mercatoria', published in Stockholm in 1768 shows them to be exact copies of drawings in Plates nos. IX and XXXVI. Plate no. IX shows a hagboat (merchant vessel 2nd class) viewed from starboard looking aft. The vessel is