**MEDIEVAL SHIP EXHIBITION – RIVERFRONT THEATRE**

- **By Mike Lewis**

When the Riverfront Theatre opens in October public will have access to the subterranean gallery designed to house the ship once it has been conserved. The project to conserve the ship is going to take a considerable time so in the meantime the exhibition space will be used to interpret the ship find using the information we have found so far.

The first thing that will strike visitors is the depth of the gallery underground. The floor of the gallery is at the same level at which the ship was abandoned and subsequently found. The space is also just a few metres from the excavation site. It is intended to try and convey a sense of hallowed space through the exhibition.

The exhibition will use the latest evidence to interpret the ship find, but of course it will not be possible to make any authoritative statements about the ships origins. Rather the exhibition will present the evidence we have and let visitors make their own mind up.

A number of the objects recovered during the excavation will be displayed and will include the medieval shoe, cannon balls, coins, pottery and the archer’s wrist guard. It will not be possible to display some of the wooden objects because they have to undergo a long conservation treatment, but the intention is to display everything as it becomes available.

Central to the exhibition will be an audiovisual presentation that will tell the story of the ship’s discovery. A number of the Friends of the Newport Ship will feature in the presentation which will focus on the importance of the popular campaign in getting the ship excavated. The presentation will end with a virtual full size rendering of the ship.

The exhibition will open approximately two years after the ship excavation was completed, and will be the first in step in interpreting the find in a traditional exhibition format. However we appreciate just how little we know, and over the life of the ship project, the information available will increase. We want to ensure from the outset, that this exhibition will be able to be reconfigured to ensure that new information is interpreted as it becomes available.

The opening of this exhibition will coincide with the first steps of the Ship Project being taken as recording work begins in earnest in the autumn. With these two endeavours we will start to see the realisation of a project that is set to be increasingly recognised as an internationally important endeavour. Members of the original 505 campaign and the Friends of the Newport Ship were invited to participate by the City Council and the Ferris Bistro and St. Woolos. Fame at last!

The exhibition will present the evidence we have and let visitors make their own mind up. After all, this ship is older than the “Mary Rose” in Portsmouth or the “Vasa” in Stockholm.

We are also grateful to the society for putting pressure on the council to save the ship for future generations and for mobilising the outposting of interest and of pride in the city. We should all support them in any way we can.

**John Hughes**
Chairman Organising Committee

Newport National Eisteddfod 2004

The Friends of Newport Ship lead the parade to celebrate the National Eisteddfod coming to Newport.
Medieval Ship and its significance for Welsh culture and maritime history. The bilingual exhibition will make its debut at the 2004 Newport Eisteddfod. It will then be shown at the Newport Ship Conservation Centre and other venues across Wales. The Friends have developed the stand with the support of local Newport Design consultancy Communicadia. This is the first grant the Friends have received. The Friends of the Newport Ship Chairperson S.C.Rutherford is delighted with the award, saying, "The new exhibition will showcase the significance of the Newport Ship – not only its immense historical significance, but it still occupies a place in the hearts of Newport people. The Friends of the Newport Ship are very grateful to Awards for All Wales for their help – the grant application was simple, A Merchant on the Newport Ship by Bob Trett - Curator of Newport Museum (retired) One of the most interesting discoveries made when sorting out the ‘odd’ pieces found inside the Newport ship was a short length of planking with a strange mark on it. I was shown the piece by Kate Hunter and it was immediately apparent that this was a merchant’s mark. Merchants’ marks were very common between about 1400 and 1700. In the Middle Ages there was a great risk of shipwreck or piracy, and individual traders were careful to put only a small consignment of goods in any one ship. By carrying their goods in several ships they reduced the chance of losing an entire stock. Therefore it was important that they could easily identify their own goods from the goods of other merchants, this by having their own distinct personal marks, like a present day logos. Merchants’ marks have been found on other early ships. There is one on a barrel lid from the Bremen Cog and others have been found on various artifacts on the Mary Rose. Merchant marks had to be fairly simple to apply and were often simple designs, based on runes. The Newport Ship mark has an upright stem on top of a double “W”, one of which is inverted. At the stop of the stem is a quartered circle. It is similar to some known from Bristol and elsewhere, but immediately apparent that this is of immense historical value. It is not known what the planking from the Newport Ship was part of, possibly a box, although the most common containers were barrels. It is just possible that one day we may find the name of a merchant that actually used the Newport Ship. A MERCHANTS’ MARKS 2004 (for the more things change the more they stay the same) by Emma Lewis – operations manager, Associated British Ports, Newport We have all noticed that brand-names have extended into the transport industries – where the drivers and staff used to advertise the shop or business they delivered for, hauliers now advertise themselves – with ‘Eddie Stobart’ lorries attracting ‘spotters’ just as trains do (‘EWS’; ‘Virgin’ etc, the likes). Those of you close to shipping routes may have noticed ‘UCC’ ships (unit Car Carriers), ‘P&O’ Ferries and ‘Jumbo’ ships (specialty heavy lift vessels) with these names painted prominently on their sides. It is almost odd now to find commercial transport without an owner or operator’s insignia on board. While these are all highly visible, they are not the equivalent of the traditional merchants’ marks. To find these, we must look a little further down the transportation chain – to the sides and tops of boxes of fish in the fish markets, of banana boxes in the supermarkets and of bakers’ trays delivered all over the country every morning. All these are re-usable (although the banana boxes don’t return to Jamaica or the Windward Isles), and all of them are purpose designed and made – just as the medieval equivalents were – and none of them have received as much style application as the craftsmanship involved as the modern, mostly plastic equivalent. That must be progress… The modern equivalent of the medieval barrel, for the purposes of transportation rather than storage, must be the international shipping container – which come in standard 20 foot and 40 foot lengths, by about 8 foot by about 8 foot. The standard size for anything from beer to chemicals there are ‘flat’, refrigerated and ventilated versions and so on, accommodating transportation of everything from cars to coal, computers to computer memory chips to chemistry weapons. They are standardised across the world to facilitate cheap, quick discharge and loading of lorries, ships and trains across the globe and all over the world. Many people in poorer countries live in them… They usually show the marks of the container owners, not the merchants, and here lies the major change from medieval trade – the sheer volume of world trade, and the perishability of some of it demands massive capacity and fearful efficiency, and competition is fierce. There could never be enough coopers, and the goods could not be packed, handled or unpacked quickly enough for barrels to work today. Barrels in the modern world – certainly in the western world – are mostly plastic, or used for beer or cider… the rest are relegated to gardens, pub car parks and museums, filled with water or crisp packets or planted with daffodils. This is a sad state of affairs, but our demand for cheap goods from all over the world has driven the changes – cup of coffee, anyone? Another Medieval Ship from Newport by Bob Trett - Curator of Newport Museum (retired) In the Customs Accounts for Bristol is the following reference: 17 February 1480. The arrival of the Christopher of Newport. The Master is M or ris Hagharr. He was carrying a cargo from Ireland of “herrings, pollack, hake, salt fish, scalpin, hides, mares, harberdene and shortings”. Scalpin refers to whiting, haburden (harberdine) is salted cod, and shortings are the skins of shorn sheep or the wool taken from such skins. The shipper was Richard Rich, John Parkyns, Walter Lincoln, William Kemes, John ap Prine and John Develyn. Whilst this ship cannot be the Newport Ship it is rare to find names of any medieval ships from Newport. It is also interesting to note that the excavations by the Glamorgan Gwent Archeological Trust produced evidence of fish scales on the Newport Ship.
The Medieval Settlement of Newport

By Dr. Spencer Dimmock

West-cyntaf, porty wy, and port the Severn.

Historical Context

The ship was laid up at Newport in the late 1460s. This was a particularly tempestuous time in the port's history. The English Crown's loss of the wine-growing region of Gascony in south-western France to the French in the early 1450s marked the end of the 'Hundred Years War'. Following this loss of lucrative territory the English aristocracy turned in on itself and almost immediately began the civil war known as the Wars of the Roses. The battles between several aristocratic houses lasted until the Tudors took the Crown in 1485. It was in 1469, during this time of lawlessness, assassination and piracy by the governing class, that the Earl of Warwick, one of the most powerful English lords, violently gained possession of Newport lordship from its previous lord, Sir William Herbert. Warwick possessed a fleet of ten ships with which he plundered others of diverse nationalities. This helped him to finance his political ambitions. In Newport he gained not only more territorial income, but also a strategically situated port and harbour capable of shipbuilding and accommodating the largest ships. However, Warwick would have required cooperation from the Newport's merchants, and they would have been wary of taking sides in such an unstable political climate. He was killed in battle within two years.

The Medieval Maritime Trade

To buy a medieval ship cost on average £1 10s per ton of ship. This initial outlay could be returned within a year, although risk of wreck in storms, and piracy were high. Ships also incurred many taxes, and a crew of forty was needed for a 200 ton ship. Still, profits on merchandise were between 10 and 20 per cent. Wealthy Bristol merchant families such as Canynge and Strange owned ten ships or more, but shareholding by those of more modest means was typical. The trade of the Bristol Channel and Severn Estuary was mostly centred on the Bristol metropolis, the second largest English town. It drew Welsh products such as high quality wool, Welsh copper, hides and furs, Welsh ports, and wool, corn and beans from the inland ports of Gloucestershire and the west midlands of England. It then exported them to Ireland, France and the Low Countries. In return, Spain and Portugal traded luxuries such as salt, wine, olive oil, fruit and dried fruits such as raisins and spices from the east, cloth, dyeing products, and iron. France traded largely wine and dyeing products, and Flanders and Holland, high quality mercery and haberdashery. Grain, furs and timber products could be derived from the Baltic. The independence of the Welsh ports from royal customs made them popular for continental merchants, and ports such as Newport re-shipped continental merchandise in small trawls inland, along the Welsh coast, to Ireland.

Fast Adventures and Future Events

by Jerry Cross

Nigel Nayling was killed in battle, and we were determined to view more of Portsmouth's nautical attractions in the remaining time. Although many of the party were determined to view more of portsmouth's nautical attractions in the remaining time only a few had the willpower and moral fibre to pass some of the fine dockside taverns (well I did have just one). The few who did avoid being "Shanghaied" by the unscrupulous landlords of Portsmouth managed to view the "Warrior", the "Submarine Museum" or took a boat ride around the harbour leaving Charlie to try his luck selling prints and mugs of Newport ship to the crowds of bemused people queuing up to see the "Mary Rose".

Hands on sailing experience is I believe is important for our understanding of the Newport Ship and what better way to achieve this than being able to sail one of Thomas Stach's beautifully presented "17th" class, classic wooden yachts based on Cardiff Bay. Our first outing was in very strong winds sailing under the jib alone (that's the one at the front) giving us a very exhilarating experience and an opportunity to view the Barage at very close quarters - some viewed it closer than others but that is another story! Such was the demand for this event that we repeated it at the end of May and this time we were blessed with perfect sailing conditions allowing us to appreciate the qualities of these lovely vessels to the full. An event that has become popular with the membership is the trip up the river Usk. It seems incredible that there are no opportunities for the good folk of Newport to view their fair city (and their new arts centre) from the deck of a boat. To satisfy this need we chartered an angling boat in June and July and sailed off from Newport Docks we have ventured under the Transporter Bridge, past the site where the ship was found and up the river Usk to a little way above Caerleon Bridge. Bob Trett battled with the noise of the boat's engine and pointed out various historical features on the way. On our last trip we were rewarded with a magnificent sight of ten herons perched in a clump of trees waiting for their dinner and no doubt watching with some amusement as our boat, buoyed up by a large tide, scraped its way under the bridges on its way upstream. It was deemed impossible to return under the Newport to Pontypool railway bridge until the tide had dropped a little forcing us, against our will, to make an unscheduled stop at the St Julians pub and a unexpected rendezvous with Charlie who had mercifully left his prints and mugs of Newport ship behind.

I apologise to those who have expressed an interest in these trips but have no
managed to secure a place. Spaces on many boat trips are usually confined to only 12 because of Department of Trade regulations, however we will run these trips again. The forthcoming events are published below but after that who knows what we can do, trips to Steepholt, the National Maritime Museum, the Viking Ship Museum in Roskilde and courses in nautical archaeology run by the Nautical Archaeology Society are just some of the suggestions that have been put forward. Please tell us what you would like to see happen.

Saturday 29th September - Trip to Flatholm leaving Barry at 13:45 and returning at 18:00. Cost: £15.00 per adult and £8.50 for children. Please send a Cheque payable to The Friends of the Newport Ship to: Alan Smith, 21 Beaufort Road, Newport, NP19 7ND.


ARCHERS AND THE NEWPORT SHIP

by Mike Jones

The bow and arrow along with the archer was an important part of medieval life at the time the Newport ship was constructed and also during her lifetime. It was not long after the battle of Agincourt and very close to the battle of Towton during the Wars of the Roses in 1461. The battle of Towton saw an archery duel as the opening strike, the battle of Agincourt and very close to her lifetime. It was not long after Newport ship was constructed and also time to get in close to carry out the hand to hand fighting. As part of the ongoing development of arms and armour throughout this period a range of arrow heads were developed for different purposes. The range of arrow heads covered armour penetration, hunting, and in the case of sea battles the development of arrow heads to cut through rope and sail. All males were expected to be able to use a bow and arrow and it may have been that the crew of the ship were all able to use the bow, or that the ship held a small group of archers / men at arms. The discovery of an archer’s wrist-guard with an inscription ‘armilla’ along with punched decorations of hearts and roses creates a clear connection with archers. The medieval re-enactment group Bowmen of the Rose, re-create the life and skills of the medieval archer, soldier and living conditions. The Friends of the Newport Ship are arranging for a demonstration to be provided for it’s members later in the year.

be that of an English merchantman sunk at the mouth of the river in 1435 (L’Hour & Veyrat 1994). It was the French authors’ hope to establish a dendrochronological series for the southern coasts of the Bay of Biscay though this is not yet realised. There are similarities to be seen in the structure of both vessels. Until 1451 the Duchy of Aquitaine had been within the King of England’s realm since 1204 with Bayonne a centre of shipbuilding. (Rose 2000). The writer believes it possible that the Newport Ship was built in that area early in the fifteenth century.

Conclusion

Dendrochronology has shown that the Newport ship survived into the sixteenth century, at which time she was presumably of no more use as a trading ship. She was therefore cut up for the building of a Dutch ship (Williams 1998). The archaeology of the New Forest has shown that the medieval ship was no less important than its later medieval counterparts. Indeed, the Newport ship was a very fine vessel during her lifetime. The battle of Towton, the battle of Agincourt and very close to her lifetime. It was not long after Newport ship was constructed and also time to get in close to carry out the hand to hand fighting. As part of the ongoing development of arms and armour throughout this period a range of arrow heads were developed for different purposes. The range of arrow heads covered armour penetration, hunting, and in the case of sea battles the development of arrow heads to cut through rope and sail. All males were expected to be able to use a bow and arrow and it may have been that the crew of the ship were all able to use the bow, or that the ship held a small group of archers / men at arms. The discovery of an archer’s wrist-guard with an inscription ‘armilla’ along with punched decorations of hearts and roses creates a clear connection with archers. The medieval re-enactment group Bowmen of the Rose, re-create the life and skills of the medieval archer, soldier and living conditions. The Friends of the Newport Ship are arranging for a demonstration to be provided for it’s members later in the year.

We inch across the uneven site and our guide shines the light of his large torch into the huge excavation. The floor is made up of the partly exposed and muddy keel, ribs and hull planking of a very large ship. Pieces of timber lie around in the bottom. It looks sad and magnificent. My very first view of The Newport Ship at 13:45; a date I neglected to note down. Typical. In these small ways the campaign to save the Ship began.

REFERENCES

Rose, S., 2000, Bayonne and the King’s Ships, 1204-1420. Mariner’s Mirror 86:2:140-147.

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What does the Newport Ship represent?

This is a large ship with echoes of Scandinavian techniques in her structure. However, the mass of timber built into the hull suggests a developing awareness of the need for greatly increased strength in a capacious hull used on the European Atlantic seaboard, from north Africa to Iceland, prior to the fifteenth century. Indeed the closeness of the frame spacing, the large sections used for the framing and the tightly fitted strong central would not be out of place in nineteenth century shipbuilding. The weaknesses persisting are:- (a) in the keel-stem scarph, having some similarities to that in the Maygor Pill boat, (Nayling 1998 fig.33) and (b) the small-sectioned keel combined with built-down garboards as the main source of centre-line stiffness in the absence of a kelson, supplemented by the edge-joined strakes of what is effectively, a monocoque hull.

During the final stages of dismantling the first piece of keel was lifted. Because of its seemingly unmarked and unworn condition the writer suggested at the time that the ship had been re-keeled but this possibility can only be addressed when recording takes place. Of greater interest is that it is of beech whereas the remainder of the ship is of unidentified oak. Similar details plagued the identification of the Aber Wrac’h wreck, thought to be from the same era as ours and thank of trading links with that part of the world that go back centuries, and I hope the future display facilities for the Newport Ship will do our ship ‘justice’ as the Germans have done theirs.

CREATING AN ARCHIVE

by Sherrie Parker

We are all beginning to understand the enormity of the project before us. In the early days of our campaign to save this wonderful ship, all of us involved in the roadside vigil blithely spoke of the years that would pass before the ship would be ready to be displayed, but this possibility can only be addressed when recording takes place. Of greater interest is that it is of beech whereas the remainder of the ship is of unidentified oak. Similar details plagued the identification of the Aber Wrac’h wreck, thought to be from the same era as ours and thank of trading links with that part of the world that go back centuries, and I hope the future display facilities for the Newport Ship will do our ship ‘justice’ as the Germans have done theirs.

Many years of careful recording, planning and conservation lie ahead. Exciting findings will come to light during that time, and knowledge of world shipping history will increase as a result, but we must be mindful that, unless we keep up the pressure, interest will wane. As supporters of the ship we can all do our part to spread the word. There is one thing that we can do now, however, and it falls within the scope of all of the members of the Friends. We have been invited to put together an archive which will document our campaign to save the ship. We are hoping to gather together, whilst memories are still fresh and reliable, any and all material that you, the members, have in your possession. We would like you to send whatever you can to the Friends organisation at: c/o 7 Fields Park Avenue, Newport, NP20 5BG for inclusion in the archive. Our campaign has won the admiration of many respected historians and archaeologists worldwide. Nothing of its kind has happened before in the world of marine archaeology. In and of itself the campaign is an important part of the history of our ship, and should be recorded for posterity. Every memory, observation and experience you could share is valuable. Every photograph you could contribute could prove to be a vital aid in the final reconstruction of the ship. Please don’t dismiss your potential contributions as unimportant. However small a detail you remember, you may jog the memories of others. Your photograph of a muddy hole in the ground might show something that has been missed or overlooked. Please take some time to contribute to this endeavour. You are, after all, a crucial part of this piece of history. We will look forward to seeing and reading all you can send, and in turn, I’m sure that you will all, in time to come, be proud to have been a part of this campaign.
The discovery of a late medieval ship on a building site at Casnewydd/Newport in south Wales in 2002 raised public awareness of the fragility of such discoveries where they interrupt municipal building programmes. Within a tight schedule the ship remains were recovered and now await further work. The origins of the ship are unknown since the dendrochronology is as yet unmatched though the structure indicates Scandinavian and possibly Basque influences. Artifacts indicate trading with Iberia during the first half of the fifteenth century. Much of the ship had been salvaged at the end of her useful life about 1467.

Casnewydd/Newport is sited on the tidal Afon Wisg/River Usk in south Wales. The river flows into the Severn Estuary which itself broadens out to become the Bristol Channel. In June 2002 archaeologist Kate Howell of the Gwent & Glamorgan Archeological Trust, attending the site of a new construction project beside the river, stopped the industrial excavation when ancient woodwork was revealed. The Trust confirmed the presence of ship’s timbers and was given a week in which to record what they could. Despite the revelation of a large ship’s remains of apparent historic value, the Newport City Council was prepared to proceed with concreting over the site, designated for its new theatre and arts centre, unaware of the irony.

Many well known societies and international names from the sphere of nautical and land archaeology reacted to this through powerful correspondence with the City Council, the Welsh Assembly, Members of Parliament and the Press. At the behest of CADW the writer in June inspected what had been revealed during the first week and suggested fifteenth or sixteenth century as a likely period and emphasised the importance of the discovery. This enabled official civil service advice to be given to the Assembly. In the meantime powerful support had exploded in the face of the Council with meetings, deputations, press conferences and a newly formed Save Our Ship society co-ordinating the outcry against destruction of the ship. Bowing to such interest the site contractors established a viewing area which had constant use. Queues four-deep during one weekend led to an estimate of 30,000 viewers. An armada of yachts sailed up on the tide to add to the protest. The importance of this emotional ground swell to the successful recovery of the ship should not be underestimated. In a series of gradually extended periods granted to the Trust proper excavation and recording could be planned. Never-the-less, the still-limited time allowed required that the dig proceed with all the drive of a rescue operation. Frequent visits on site enabled the writer to gauge the tremendous pressure under which Kate Howell and her team of archaeologists worked and the enthusiastic commitment they gave to their careful work in very wet and dirty conditions. On the final November day allowed them, they worked into the dark to recover the last piece of the keel. In Newport they were the heroes of the hour!

The discovery lay within a T-shaped area delineated by a coffer dam which had been mechanically excavated to about 5m below ground level. The area was then liberally pierced with concrete piles. It was at this point that timber appeared together with the remains of a stone quay which had been noted on an early eighteenth century map of lands belonging to a long-gone monastery. The curious diagonal disposition of the ship’s remains within the coffer-dam ensured the recovery of most of them. Figure 1 is a sketch to an approximate scale showing the general arrangement of the site. Being heavily built up the site had ensured that parts of that side remained intact to the height of the sheer strake. The port side had been cut level to just above the ends of the floors which coincided with the level of the stone quay and presumably that of the ancient land level beside the river.

The Newport ship was uncovered to reveal a stripped-out hull even to the extent of a door-way being cut in the starboard side to make dismantling easier. A few holes had been hacked in the after bottom planking between the floors, perhaps to prevent the hull’s trying to float on a rising tide. Two sections of bow-shelving were recorded on the starboard side. Half of what may be a massive built-up deck beam, notched to lock over the side planking where it protruded, was recovered from the site together with what could be a hanging knee and the remains of a windlass. Two massive pieces of timber. It would seem that any part of the ship that could be re-cycled into the repair or building of other ships or even into local buildings had been removed. Probably the hull was left alone because of its having filled with the silt arriving with each tide. Evidence for its having reached the end of a long working life may be indicated by:- the split mast-step; repairs to split planking using battens and lead tingles; long, tapering, square-sectioned pegs replacing rivetted nails at some scarpes, driven in from both inboard and outboard; and attempts to repair a rider. Much of this is on-site deduction which may be confirmed later.

The ship was dried as far as possible up a creek off the river and to begin with would have leant with her port side against the bank. There are what probably were once shores or even temporary legs under her starboard side, which suggests that these have moved at a state of high tide had been trapped under the starboard bilge as the hull fell out from the bank. This scenario would have saved the starboard side from being levelled off. These shores or legs and other unrelated timbers found within the hull have become important for obtaining a date for the ship. Over the centuries the creek filled and the bank built up another 5m. A river wall consolidated it in the nineteenth century.

Provisional assessment of the structure

The remains are of a very large, clinker-planked ship, about 29m long and about 8m beam, her planking edge-fastened by iron nails, their tips nipped off and riveted down over square roves. Trenails fixed the planking to closely-spaced, heavy framing composed of floors and futtocks. A number of heavy, broad planks were scarphed and fitted as stringers. Between these were fitted the ceiling planks up to the deck beams. Forward and abaft the mast-step were fitted risers, shaped from found timbers having large dimensions, right into the hull’s ends. No kelson was fitted. Sixty-four incomplete frames, thirty-two starboard strakes and sixteen port strakes survived. The major eye-catching structure was the central mast-step which, because of its 10m length was joggled over all of the midships floors to resist the fore-and-aft strains imposed on it. The writer estimated the mast diameter to have been two-thirds of a metre at its base. As seen in Figure 2 there was a cut-out in the mast-step for the trunk of the bilge pump. Beneath this was found a wicker basket-type strum-box of a design closely comparable with that fitted by Newport Fire Service to the end of their force-pump’s flexible suction pipe when being towed possibly on the site. The pump’s leather plunger and its rods were recovered from deep in the silt which filled the ship.

As well as being locked in a fore-and-aft direction the mast-step was secured, adjacent to the mast, against sideways movement by shaped chocks of timber pinned to the floors. These acted as struts against the first, massive bilge-stringer each side of the mast-step.

This immensely strong arrangement was necessary because about thirty metres of mast, steadied only by stretching, hempen shrouds, would be required in the first, massive built-up deck beam and fore-and-aft against the fullwork of the deck structure at every roll. Such massive strains over many years may have been the cause of its split condition.

Between the mast-step chocks were fitted bilge-shutters which lay flush in the rebate cut into the edge of each chock. These boards were to close the gaps that would otherwise have let the bilges fill with detritus from cargoes, so blocking the pump. The concrete piles had pierced the ship in many places but one went precisely through the mast mortise without damaging the step but crushing the structure beneath, including the keel. The last few strakes from the bilge to the keel developed a steep reverse curve in the hull’s sections, to where the garboard strakes

**Figure 1.** Sketch plan of the general layout of the site (Owain Roberts).

**Figure 2.** Provisional sketch of the mast-step and adjoining structure (Owain Roberts).