

Wreck of the Barque *Antoinette* Camel Estuary, Padstow, Cornwall

Undesignated Site Assessment and Emergency Recording



Historic Environment Projects

Wreck of the barque *Antoinette*, Camel Estuary, Padstow Cornwall

Undesignated site assessment and emergency recording

Client	English Heritage
Report Number	2010R101
Date	14/03/2011
Status	Final
Report author(s)	Charles Johns, Kevin Camidge and Peter Northover
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Acknowledgements

This study was commissioned by English Heritage and carried out by Historic Environment Projects, Cornwall Council and maritime archaeologist Kevin Camidge.

Help with the emergency recording was provided by Rob Atkinson, the Padstow Harbour Master, who also kindly provided copies of photos of the wreck. Help with the historic research was provided by the Cornwall Studies Library and by Richard Larn who kindly provided the photograph of the *Antoinette* and copies of his notes on the wreck.

Within the Historic Environment, the Project Manager was Charles Johns. The emergency recording was carried out by Kevin Camidge, Charles Johns, Phil McMahon (EH IAM), Francis Shepherd and Jo Sturgess.

The views and recommendations expressed in this report are those of Historic Environment Projects and are presented in good faith on the basis of professional judgement and on information currently available.

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Cover illustrations

Clockwise from top left: the Camel Estuary wreck (photo: Padstow Harbour Master); demolition of the wreck (photo: Kevin Camidge); a wooden knee recovered from the wreck (photo: Kevin Camidge); photograph believed to be that of the *Antoinette* (Richard Larn)

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Abbreviations

AGSV	Area of Great Scientific Value
DBA	Desk-based Assessment
CNCS	Cornwall Nature Conservation Site
EH	English Heritage
GPS	Global Positioning System
HER	Cornwall and the Isles of Scilly Historic Environment Record
HE	Historic Environment, Cornwall Council
IfA	Institute for Archaeologists
NGR	National Grid Reference
NMR	National Monument Record, Swindon
OS	Ordnance Survey
PRN	Primary Record Number in Cornwall HER
RCG	Royal Cornwall Gazette
SMP	Shoreline Management Plan
UKHO	United Kingdom Hydrographic Office, Taunton

1 Summary

This report describes the results of the emergency recording and undesignated site assessment of the possible wreck of the barque *Antoinette*, Camel Estuary, Padstow, Cornwall carried out by Historic Environment, Cornwall Council and maritime archaeologist Kevin Camidge for English Heritage in 2010.

The wreck had been exposed early in 2010 by shifting sands upon Town Bar at the entrance to the Camel Estuary, which is sited close to a navigational channel (NGR centred at SW 92650 75380). The Padstow Harbour Master proposed to remove the wreck as a hazard to shipping in the week commencing 1 March 2010; given the size of the remains, the use of explosives was proposed, along with the possibility of dismantling the wreck with a dredger-mounted crane and barge. Emergency recording of the wreck was therefore carried out on 28 February and a watching brief undertaken during demolition when some of the vessel's timbers were recovered and recorded.

The results of the emergency recording and the desk-based assessment indicate that there can be little doubt that the wreck is the middle part of the Canadian barque *Antoinette*. The *Antoinette* was wrecked on the Doom Bar on 2 January 1895 bound for Santos from Newport, Gwent with a cargo of coal. Part of the wreckage was carried by spring tides on to Town Bar where it became a hazard to fishermen and ferrymen and the remains became buried by sand following unsuccessful attempts at demolition using explosives.

The wreck is an historic asset with considerable evidential, historical and communal value but because it only represents a part of the whole vessel, because that part has twice been damaged by explosives, and because the extent and degree of survival of the rest of the wreck is unknown it is not recommended that the wreck should be designated as a protected wreck under the Protection of Wrecks Act, 1973.

The main issue with the Camel Estuary wreck is that it is a hazard to shipping, and, because of shifting sand and rapid turning tides, it is potentially dangerous to visitors who may be tempted to examine the wreck.

However, further demolition work is likely to be less destructive and will consist only of sawing off of some protruding iron fittings and then marking the wooden remains with a buoy, this is currently planned for the big tides around 21 March 2011 (Padstow Harbour Master pers comm).

2 Introduction

2.1 Project background

Early in 2010, shifting sands upon Town Bar at the entrance to the Camel Estuary exposed a wreck sited close to a navigational channel (NGR centred at SW 92650 75380). Because of an account in ‘Cornish Shipwrecks: Volume 2 The North Coast’ (Carter 1970) this was thought by the Harbour Master to be the possible wreck of the Canadian barque *Antoinette*, wrecked on the Doom Bar on 2 January 1895 while bound for Santos from Newport, Gwent with a cargo of coal. According to Carter, part of the wreckage was carried by spring tides up the estuary on to Town Bar where the remains became buried by sand following an unsuccessful attempt at demolition using gelignite (Carter 1970, 155).

However, because the NMR record for the site differed from Carter’s, there was a significant doubt that the wreck was definitely that of the *Antoinette*. The *Antoinette* is recorded by the NMR as monument SW 97 NW 271, unique identifier 906121. The Cornwall HER PRN is MCO55838.

The Padstow Harbour Master proposed to remove the wreck as a hazard to shipping. Given the size of the remains, the use of explosives was proposed, along with the possibility of dismantling the wreck with a dredger-mounted crane and barge.

The urgency of the proposed assessment was underlined by the fact that demolition was proposed for the week commencing 1 March 2010, to take advantage of favourable tides and to clear the site before the advent of the spring and summer leisure sailing season at Padstow and Rock.

English Heritage South West Region therefore produced a *Brief for Archaeological Services* aimed at securing emergency recording of the wreck prior to demolition, undertaking a watching brief during demolition, and ensuring the retrieval of vessel timbers for dendrochronological assessment (McMahon 2010). The fieldwork element of the work was to be followed by desk-based assessment and analysis. The results of the work will inform English Heritage’s stance if further demolition of the wreck is proposed and result in an updated record for the site in the Cornwall and Scilly Historic Environment Record (HER) and the National Monument Record (NMR).

2.2 Aims and objectives

2.2.1 Emergency recording objectives

- To secure a record to Level 2 of the Institute for Archaeologist’s *Standards and Guidance for Nautical Archaeology Recording and Reconstruction* (2008): ‘Basic overall dimensions with a record of hull-form, scantling, fittings and fastenings, accompanied by an extensive photographic record with scale drawings of significant features, fittings, and/or ancillary components. This record will allow correct interpretation of the vessel or parts thereof and may allow a simple reconstruction of the vessel or parts thereof’. However due to limited access and tide times the only opportunity to undertake this work was during 3-4 hours of low tide on Sunday 28 February. Given this very restricted window, it was accepted that the full objectives of the emergency recording set out in the Brief might not be achieved.
- To carry out a watching brief during demolition of the wreck.
- To identify and retrieve wreck timbers thought to be suitable for dendrochronological analysis.

Primary Objectives

The primary objectives of the emergency recording were to:

- Confirm the position, extent, and character of the site, and confirm location with reference to the 12- nautical mile limit.
 - Locate and accurately position any visual archaeological material.



Fig 1 Location map, the red arrow points to the location of the Camel Estuary wreck

- Produce a structured record of field observations; including a photographic record of the site and a basic site plan. Key wreck timbers and fittings were to be subject to detailed examination and recording (taped measurements, photographs, and video and written database entries).
 - Assess the site against the non-statutory criteria used for Designation under the Protection of Wrecks Act 1973.
 - Identify suitable candidate timbers for dendrochronological assessment for retrieval during demolition work, in agreement with the Harbour Master (see below).

Secondary objectives

The secondary objectives of the emergency recording were to:

- If possible (and without excavation) assess the likely depth of deposit on the site, estimated by the angle of any frames and the height of any ballast/cargo/artefact mound material.
 - Supplement the recording of the core of the site by recording profiles across the main axis of the site.
 - Undertake documentary research as appropriate to inform the assessment.

2.3 Methods

The methodology for the project followed the specifications in the *Brief for Archaeological Services* (McMahon 2010) and was carried out according to the agreed Project Design (Johns 2010), consisting of seven main stages of work:

1. Emergency recording (fieldwork)
2. Watching brief
3. Dendrochronological assessment
4. Archiving
5. Desk-based assessment
6. Copper analysis
7. Report Production

2.3.1 Emergency recording

- The recording took place during 3-4 hours of low tide on Sunday 28 February. Access to the site was facilitated by the Padstow Harbour Master's barge. In the event the tide was not low enough to allow for Level 2 recording, and the wreck proved to be surrounded by soft sand and many scour pits up to 2m deep. The methodology for the emergency recording is described below in Section 3 of this report.

2.3.2 Watching brief

- The project team secured a basic photographic record and video footage of the demolition work on Monday 1 March in negotiation with the Harbour Master.
- The Harbour Master undertook retrieval of the wreck timbers and other fittings on Tuesday 2 and Wednesday 3 March. For Health and Safety reasons it was not possible for an archaeologist to be on board but a written, drawn and photographic record was made of selected recovered timbers and fittings, which were marked with tags. Those timbers thought to be suitable for dendrochronological assessment were set aside on Padstow quay sampling by Nigel Nayling for the EH Scientific Dating Team.

2.3.3 Dendrochronological assessment

- HE Projects arranged with the Harbour Master for the storage of suitable timbers, pending removal/sampling as described above.
- Nigel Nayling inspected the timbers on Thursday 10 March, but they were not suitable for analysis, as they were all too fast-grown and had less than the minimum number of rings to make analysis worthwhile. Consequently no further dendrochronological work was undertaken for this project.

2.3.4 Archiving

During this phase the results of the emergency recording were collated for archiving. This involved the following tasks.

- Cataloguing site drawings and photographs.
- Digitising field drawings.
- Editing video footage.

2.3.5 Desk-based assessment

- Due to the unique circumstances of this project, the desk-based assessment (DBA) of the wreck site to determine the provenance of the wreck and its heritage significance took place following completion of the fieldwork.
- The DBA followed the IfA's Standards and Guidance for desk-based assessment (2008b).
- The approach to the assessment of heritage significance took its lead from English Heritage's 'Conservation Principles, Policies and Guidance' (2008); the site was also assessed against the non-statutory criteria used for Designation under the Protection of Wrecks Act 1973.
- The main sources consulted are the Cornwall HER, the United Kingdom Hydrographic Office (UKHO), the National Monument Record (NMR), early maps and photographs, published histories and grey literature reports. These are listed in Section 8.

2.3.6 Copper analysis

The copper fastenings on the wreck are of particular interest as these indicate that the vessel was copper-sheathed. Copper hull fastenings were only used below the waterline when copper sheathing was used on the outside of the hull. This is because the traditional iron fastenings, which are stronger and cheaper, corrode very quickly due to electrolysis if the hull is copper-sheathed. A sample was taken from one of the copper fastenings by Kevin Camidge and quantitative compositional analysis and elemental analysis was undertaken by Peter Northover at the Department of Materials, University of Oxford, to determine whether it is pure copper or copper alloy and help ascertain the date of the vessel.

2.3.7 Report

The main product is this report which describes the results of the desk-based assessment and the nature of the emergency recording undertaken, the circumstance and conditions under which it occurred and the results that were obtained.

3 Results of the emergency recording

By Kevin Camidge

3.1 Introduction

The remains of a vessel became exposed on Town Bar outside Padstow Harbour earlier this year. The remains were deemed a hazard to shipping by the Harbour Master, and removal using explosives was scheduled for Monday 1 March. The wreckage is only visible on very low spring tides therefore Sunday 28 February was the only date available for recording of the wreckage.

A team of five was assembled by HE Projects and taken out to the Town Bar in the harbour launch. Low tide was predicted for 11.33am and the team were led to believe that the wreck would be exposed for about two hours either side of low water. Sadly, probably due to the very strong northerly wind, the wreck did not dry out over the low water – only the tops of some of the iron knees and timbers were exposed, the shallowest part of the wreck at low water remaining covered by approximately 1m of water. The wreck was also surrounded by scour pits and very soft sand which restricted access to most of the wreckage. This prevented the detailed recording of the wreck which had been planned. However, by wading in the water

it was possible to take GPS position fixes on the wreck and to make a few measurements to establish the main dimensions of the exposed wreckage.

The GPS fixes were taken using a Garmin 76CX handheld GPS unit. The unit was EGNOS enabled and each fix was produced from an average of 25 readings taken over 25 seconds. The position for the centre of the visible wreckage was SW 92650E 75380N. Five temporary control points were established, two of which A1 and A3, were on structural elements of the wreck (see Figure 3 below).

Control Point	Sheet	Easting	Northing	Comments
A1	SW	92660	75382	Taken on an iron knee (extreme NE)
A2	SW	92656	75392	Taken on underwater wreckage detected by probing
A3	SW	92647	75372	Taken on an iron knee (extreme SW)
A4	SW	92621	75368	Aligned with NE line of knees
A5	SW	92626	75358	Aligned with SE line of knees

Fig 2 Table of GPS fixes on temporary control points A1 to A5. The control points are shown on the site sketch plan (Figure 3 below)

The visible elements of the wreck consisted of two, roughly parallel lines of wrought iron bars (parts of iron knees or knee riders) standing partly exposed in the water and a small area of timber consisting of timber frames, lodging knees and other, unidentified timber structural elements. As it was not possible to approach the remains due to the depth of water around them it was impossible to identify or accurately draw them (see sketch plan Fig 3). The exposed wreckage was approximately 20m long and 11m (beam) wide. This probably represents the centre section of the vessel, the bows and stern being either not exposed or elsewhere.

The visible remains were photographed, including overhead photographs taken by attaching the camera to the top of a 5m Sopwith staff. The overhead photographs were rectified in AutoCAD to provide a plan. The remains were also recorded using a Panasonic 3-chip handheld video recorder.

3.2 Wreck dispersal

The wreck was broken up with explosives by the Royal Navy bomb disposal team from Plymouth on the 1 and 2 March (Fig 7). Apparently this was not as successful as anticipated and further work to break up the wreck has been scheduled for the next extreme spring tides in September 2010.

3.3 Recording of the recovered timbers

Material recovered from the wreck by the harbourmaster was recorded on the quay in Padstow harbour. A total of 23 items were recovered. These were placed in a large pile on the quay; the items on the bottom of the pile could not be examined properly as many of them were too heavy to move manually (Fig 9). A catalogue of all the items was made and selected items were drawn. Tentative identification of the timbers suggests that they comprise eight lodging knees, seven beams (probably deck beams but possibly hold beams), four fragments of frame timbers, one plank and two other structural elements – a possible deck ledge and a possible stringer. In addition to the timbers there was a single iron knee fragment and an unattached iron bolt (see Figure 10).

3.3.1 Knees

The recovered material included nine knees, eight timber lodging knees and part of an iron hanging knee. Knees are brackets, roughly right-angled, and originally made from timber fashioned from the junction of a major bough and the trunk of the tree. As time went on, these became harder to find and knees began to be made from iron. By the 19th century it was common for merchant vessels to have iron knees. There are a number of different types of knee depending on where they are used.

Vertical knees are often called hanging knees, with one arm attached to the deck beam and the other to the frame(s) on the inside of the ship. Knees used to fasten the deck beam to the side of the ship in the horizontal plane were called lodging knees (Goodwin 1987).

3.3.2 Timber lodging knees

Two of these CE1 and CE3 were drawn. CE1 appears to be two lodging knees fastened together (Fig 11). The lodging knees on the merchant ship *Jhelum* (built 1849) are similar to this. On the *Jhelum*, however, these are only deployed at the bow and stern, the centre of the hull employing patent iron lodging knees (Stammers and Kearon 1992). CE3 is a single lodging knee (Fig 12). In each case there is evidence of iron bolts and treenails used as fastenings.

3.3.3 Iron Knees

The wreck itself exhibits two parallel rows of iron knees, fastened on the inside of the surviving timber. However, only one fragmentary iron knee was recovered, CE4 (Fig 13). This is a partial, approximately right-angled wrought iron ‘bracket’ with a cross-section of 0.11 x 0.09m. This may have been deployed as a hanging knee, fastened by iron bolts to the underside of the deck or hold beams and to the frames on the inside of the vessel. This conforms to the knee shown in figure 1 of Stammers’ proposed typology of iron knees (Stammers 2001).

3.3.4 Beams

A beam is a transverse timber which supports the decks and gives lateral rigidity to the hull. A main beam will connect to both sides of the vessel (hence the expression ‘on her beam ends’). There were seven recovered timbers identified as possible beams. All but one of these (CE2, Fig 14) were of a size commensurate with deck or hold beams, all approximately square in section and varying between 0.20 x 0.20m and 0.27 x 0.30m (for details see Fig 10).

3.3.5 Frames

Frames define the shape of the hull. Usually they were made of timber, but from the middle of the 19th century iron was also used (for example in the composite clipper ships such as *Cutty Sark*). They ran from the keel of the vessel to the top of the hull. They were usually formed from several pieces of timber (futtocks) joined together. The outer and inner hull planking was fastened to the frames with treenails (wooden dowels).

Four fragments of frame timbers were recovered. Two of these (CE5, Fig 15) were still attached to a longitudinal piece of timber, probably an outer hull plank or wale. Of particular interest are the copper fastenings present as these indicate that the vessel was copper-sheathed. Copper hull fastenings were only used below the waterline when copper sheathing was used on the outside of the hull. This is because the traditional iron fastenings, which are stronger and cheaper, corrode very quickly due to electrolysis if the hull is copper-sheathed. Even where copper sheathing is used, iron fastenings will be employed above the waterline (Lavery 1987) - as seen in CE1 and CE3.

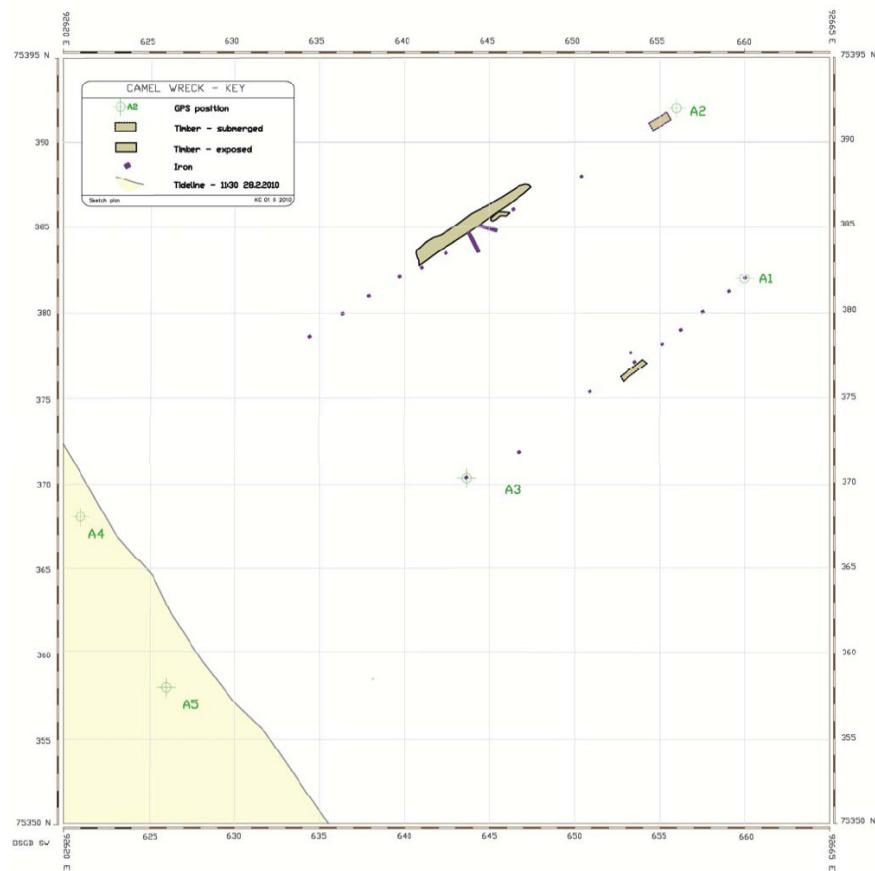


Fig 3 Sketch plan of the exposed remains as visible at 11:30am on 28 February 2010. The plan was produced from a rectified overhead digital photograph and the five temporary control points fixed by GPS positions



Fig 4 The exposed wreckage at low tide (11.33) on 28 February 2010. Taken with a camera attached to a 5m Sopwith staff (photo: Kevin Camidge)



Fig 5 The exposed wreckage just before low tide, the wading figure gives an indication of the water depth around the wreckage (photo: Kevin Camidge)



Fig 6 Detail looking north-east showing the exposed timber, note the iron knees in the background (photo: Kevin Camidge)



Fig 7 Using explosives to break up the wreck (photo: Kevin Camidge)



Fig 8 Removing elements of the wreck after use of explosives Seen here, a mechanical excavator on the site at low tide on 2 March lading timbers on to one of the harbour launches (photo: Kevin Camidge)

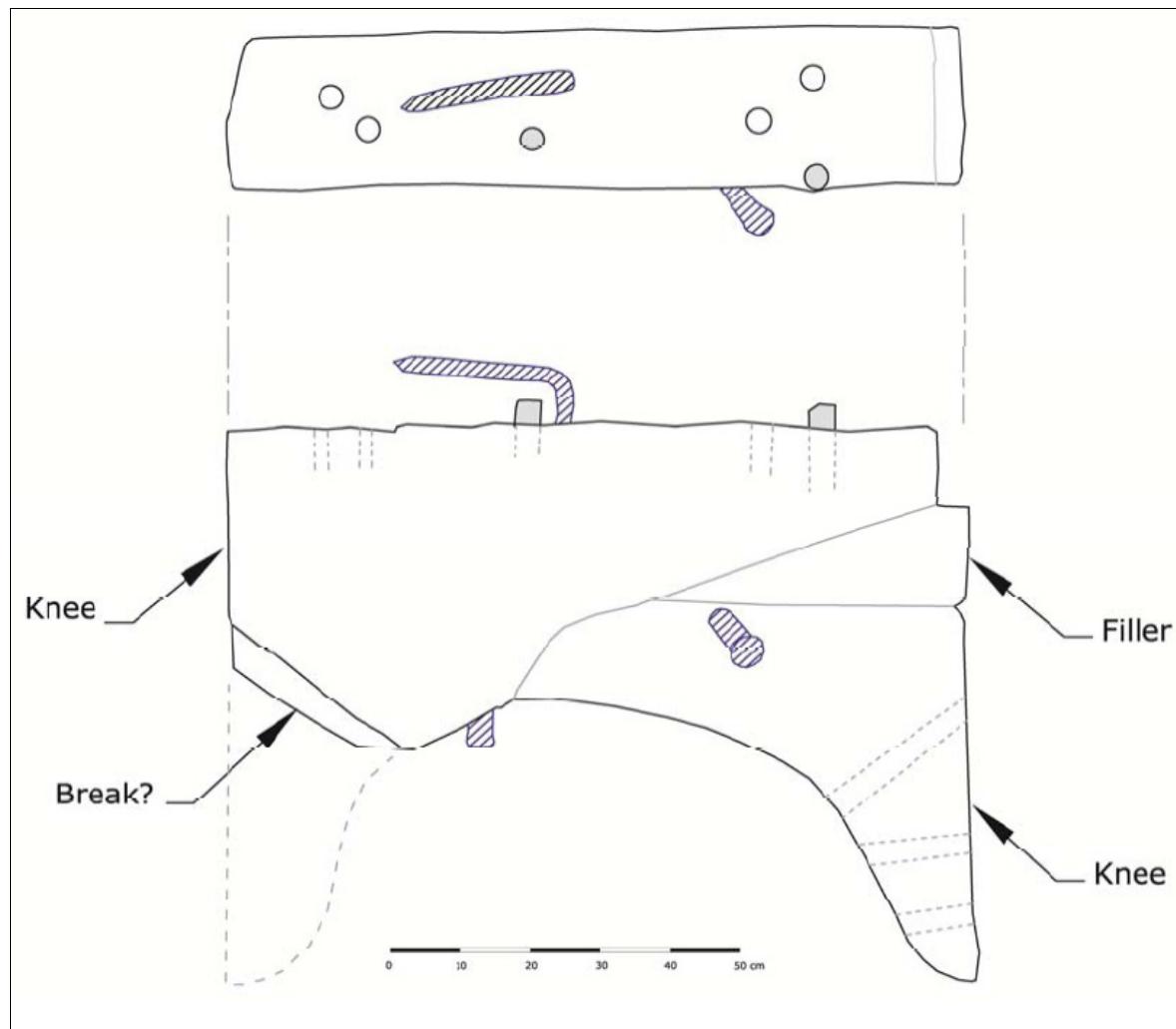


Fig 9 The items recovered from the wreck on the quay in Padstow harbour Note: the stacked timbers in the background are modern railway sleepers (photo: Kevin Camidge)

No	Type	Dimensions	Photos	Sketch	Comments
1	Timber lodging knee	1.07x0.81x 0.22m	CE1	✓	A pair of timber lodging knees still fastened together with <i>in situ</i> bolts. Includes a filler piece. Note width defines the distance between (deck?) beams
2	Deck ledge beam?	1.33 x 0.13 x 0.15m	CE2	✓	Broken at both ends – has iron fastening bolt and treenails in place.
3	Timber lodging knee	1.26 x 0.92 x 0.25m	CE3	✓	A single knee – probably a lodging (horizontal) knee.
4	Iron knee (rider?)	1.36 x 0.11 x 0.09m	CE4	✓	Not complete, both ends missing. Appears to be made from wrought iron. Recommend recovery.
5	Frames (2) and plank	2.13 x 1.32 x 0.69m	CE5	✓	Two part frames attached to outer hull plank.
6	Deck beam?	1.85 x 0.20 x 0.20m	CE All		Beam in good condition
7	Deck beam?	0.90 x 0.22 x 0.18	CE All		4 treenails (0.04 Ø)
8	Lodging knee	0.95 x 0.33 x 0.17	CE All		Some iron bolts and 2 treenails
9	Lodging knee	0.80 x 0.75 x 0.22	CE All		5 iron bolts (0.03 Ø)
10	Frame (part)	1.03 x 0.24 x 0.32m	CE All		8 treenails (0.04 Ø)
11	Stringer?	1.40 x 0.23 x 0.15m	CE11		4 treenails (0.04 Ø) 1 iron bolt (0.03 Ø)
12	Deck beam?	2.57 x 0.27 x 0.25m	CE12		Broken both ends 14+ treenails (mostly 0.04 Ø) On one face others \$\$\$
13	Lodging knee?	1.20 x 0.58 x 0.22m	CE13		3+ heavily concreted iron bolts
14	Deck beam?	1.85 x 0.18 x 0.22	CE All		One end squared, other broke. 2 treenails (0.04 Ø)
15	Deck beam?	0.73 x 0.23 x 0.25m	CE All		One end sawn, the other broken. 4 treenails (0.04 Ø)

No	Type	Dimensions	Photos	Sketch	Comments
					4 treenails (0.03 Ø)
16	Frame (part)	1.25 x 0.32 x 0.34m	CE All		Part of a frame timber. 9 treenails (0.04 Ø) all cut into the moulded edge
17	Deck beam?	2.40 x 0.27 x 0.26m	CE17		Timbers mostly buried under other timbers. Copper alloy bolt (0.028 Ø) –sample of copper bolt taken.
18	Deck beam?	2.00 x 0.30 x 0.28m	CE All		Timber mostly buried under other timbers. Several treenails visible.
19	Lodging knee	1.22 x 0.92 x 0.22m	CE All		6 concreted iron bolts. 2 treenails all in moulded face.
20	Lodging knee	1.20 x 0.95 x 0.22m	CE All		Iron bolts and treenails in moulded face.
21	Iron bolt	0.45 x 0.05 Ø	CE All		Heavily concreted iron bolt.
22	Lodging knee	1.20 x 0.91 x 0.21m	CE All		Partly obscured by other timbers. Has iron bolts and treenails.
23	Plank	2.75 x 0.17 x 0.03m	CE23		Thin plank – probably too thin for outer hull planking. Has coating of fibres with bituminous material on one side.

Fig 10 A catalogue of the material recovered by the Padstow Harbourmaster



KEY	
■ Iron	● Treenail
□ Wood	● Copper alloy
○ Treenail hole	

Kevin Conidge 12/11/2010

Fig 11 CE1 Timber lodging knees from the Camel Estuary wreck

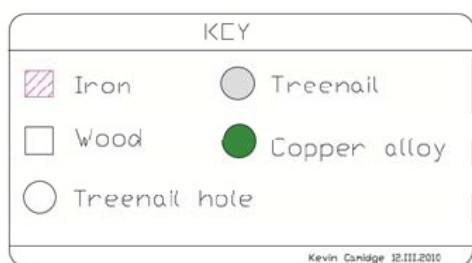
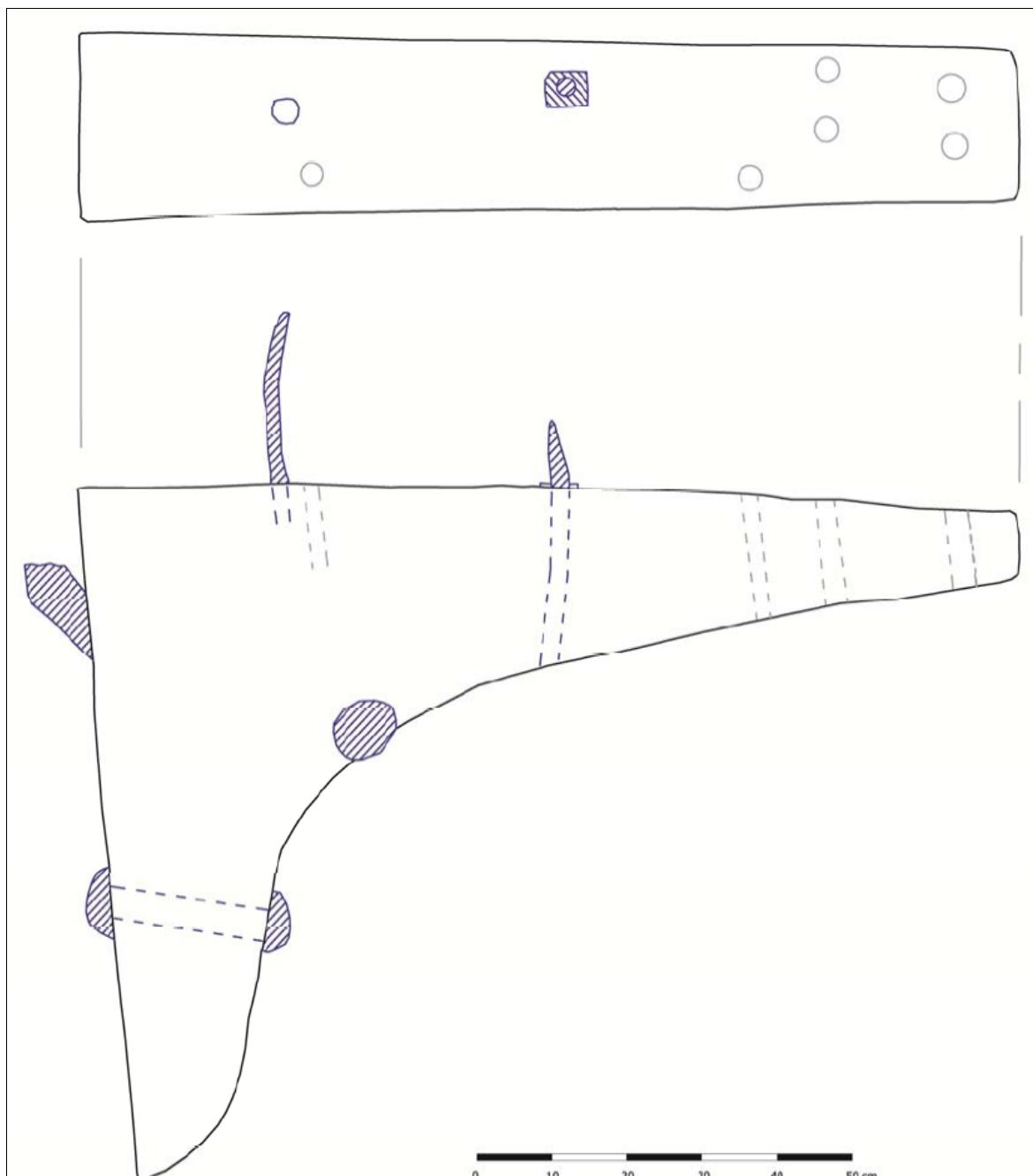


Fig 12 CE3 Timber lodging knee

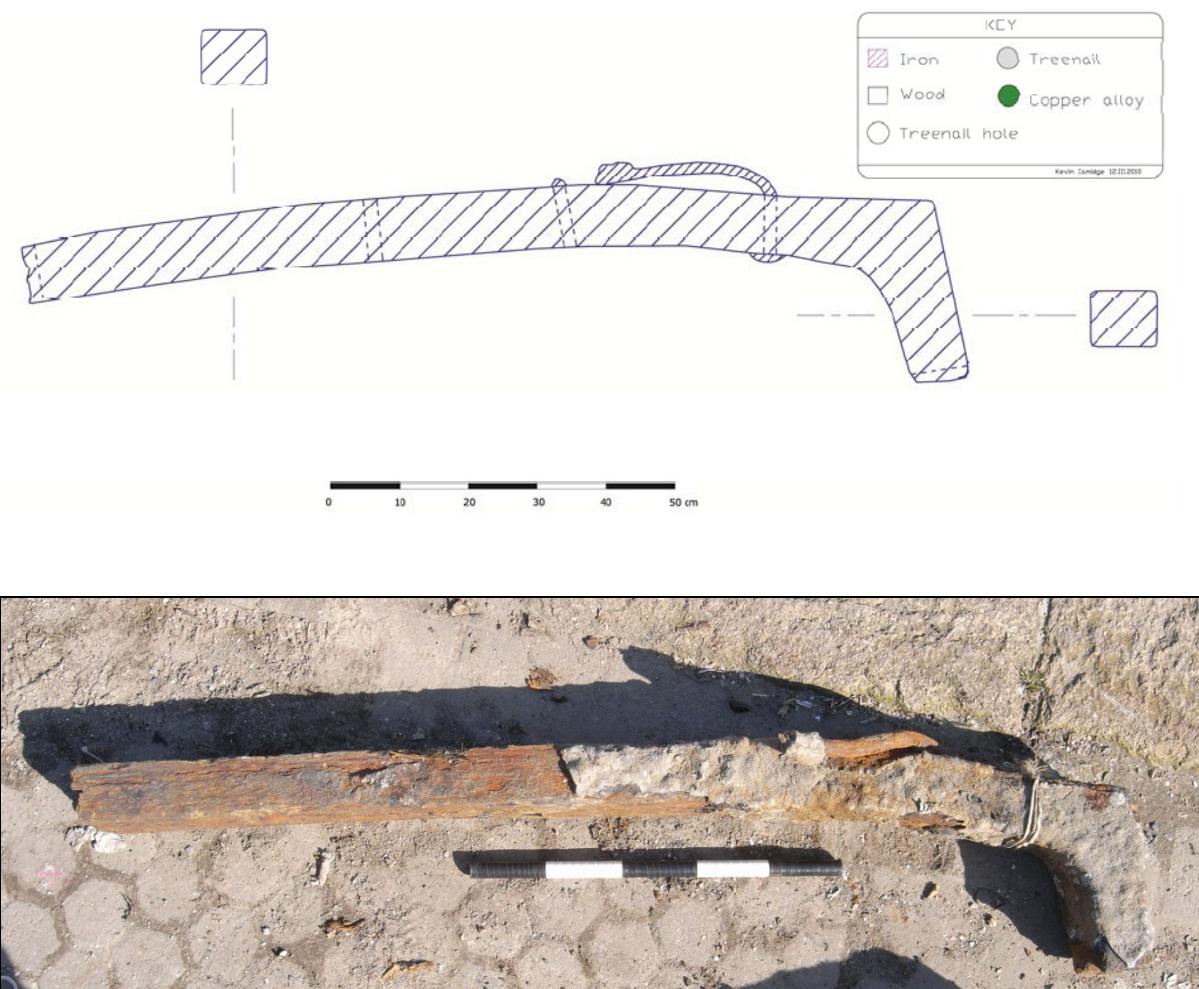


Fig 13 CE4, a wrought iron knee: note the bolt holes and the surviving iron bolt

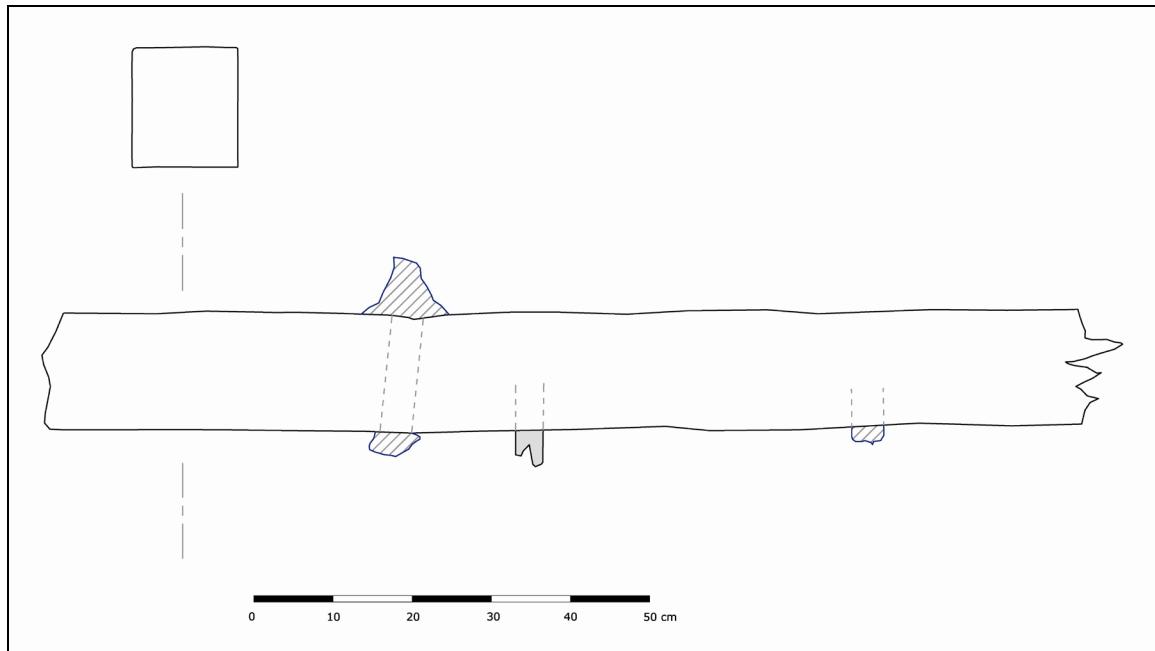


Fig 14 CE2 a beam with iron bolts and treenail fastenings

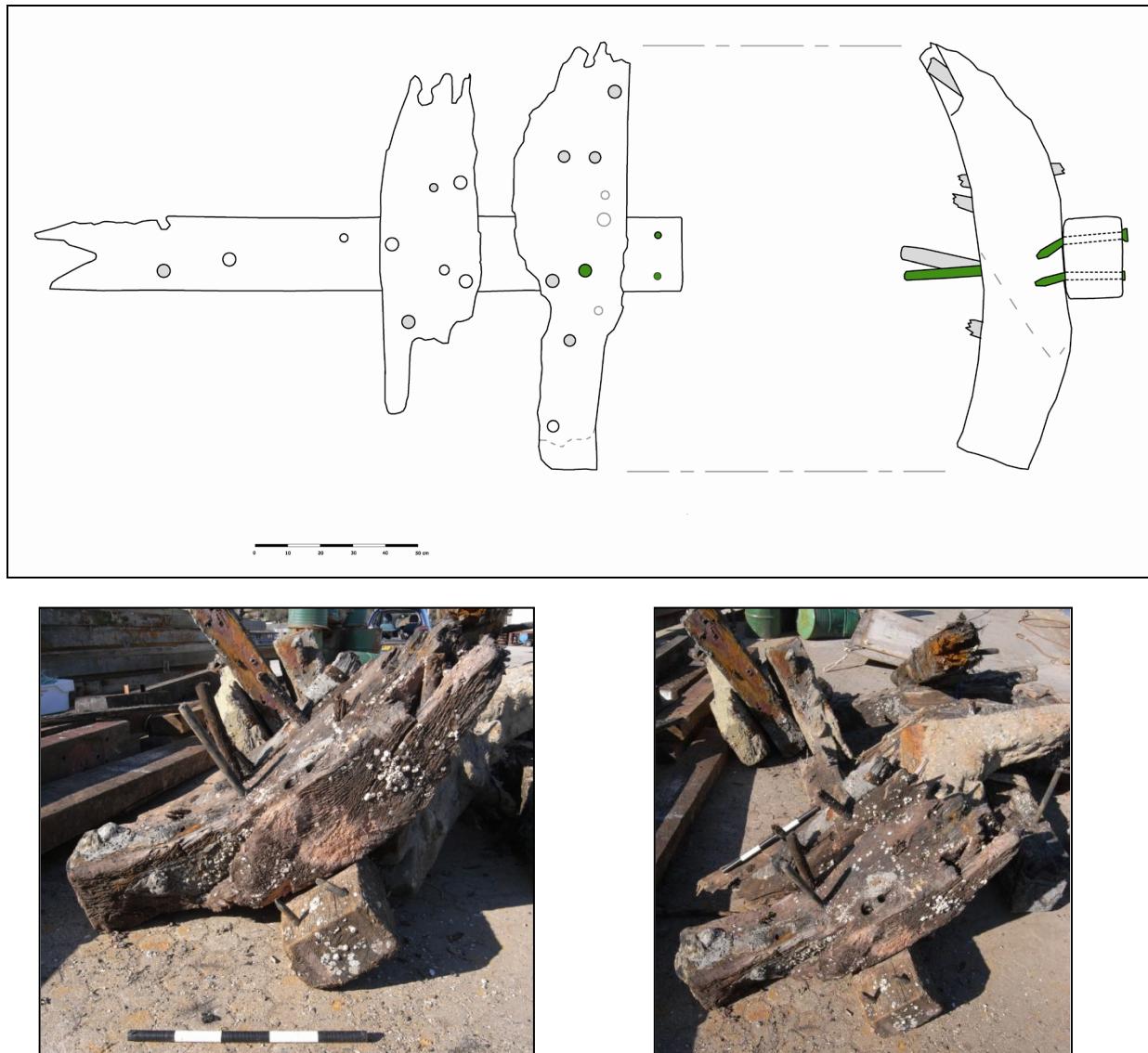


Fig 15 CE5 Two frame fragments and attached plank; includes copper fastenings and treenails. Note the two 'wedged' copper spikes (also called dumps) in the end of the plank – these were common in the 19th century



Fig 16 1839 survey of the Camel Estuary (UKHO L234)

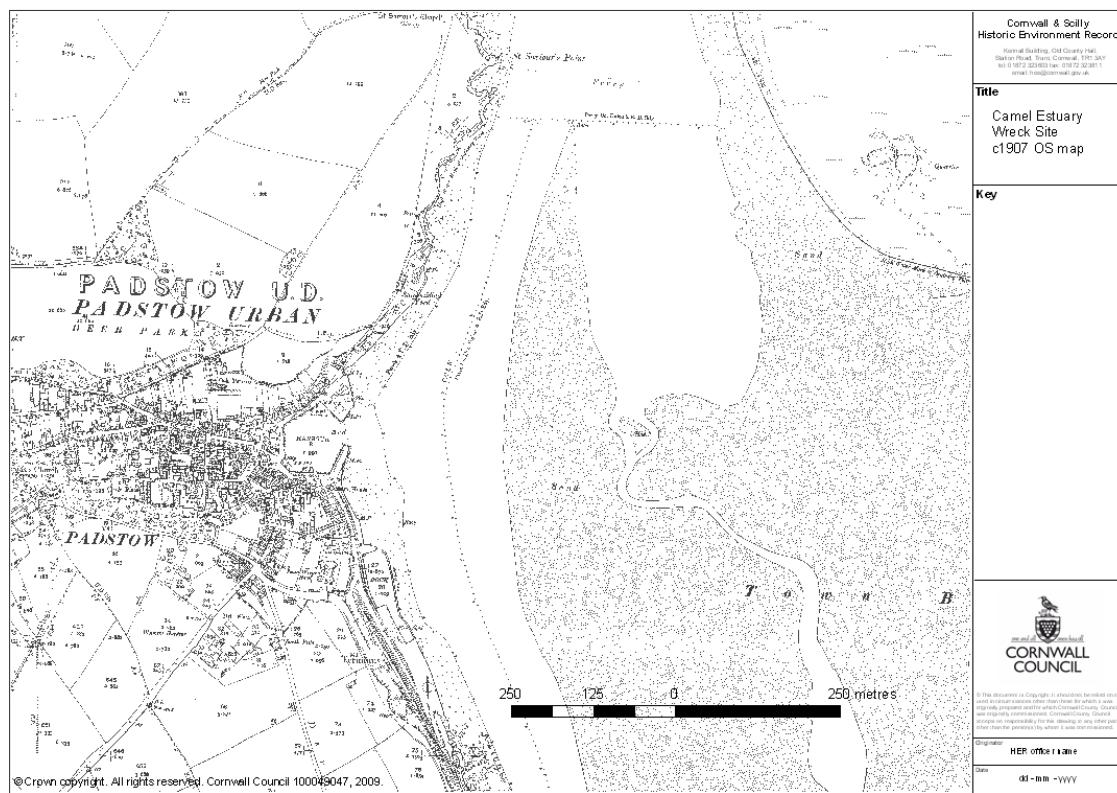


Fig 17 Detail from the c1907 OS map, since 1907 the main channel has shifted from the Padstow side to the Rock side of the estuary (compare with Figure 1)

4 Results of the desk-based assessment and analysis

4.1 Location and setting

The wreck is situated on Town Bar adjacent to Padstow harbour near to the entrance to the Camel Estuary. The Camel estuary is the largest and most sheltered inlet on the north Cornwall coast, protected from prevailing south-westerly storm waves by headlands such as Stepper Point to the west and Trevose Head to the east (Fig 1). The Camel is a shallow, sandy estuary deepening at the mouth with a narrow channel at low water that meanders from one side of the Estuary to the other. At low water a large area of the estuary comprises extensive intertidal flats, the outer flats being more sandy and mobile than the more sheltered innermost flats. Shelter to the bays within the estuary is provided by sand bars, Doom Bar at the estuary mouth and Town Bar by the harbour (Halcrow Ltd 1999, 51). According to Carter (1970, 136) nearly 300 ships have been wrecked on the aptly named Doom Bar since the early 19th century, although its name is derived from the more prosaic 'dune' or 'dun'.

4.2 Geology

The solid geology of the area is mapped as predominantly grey or purple and green slates of Middle Devonian age, with large east-west intrusions of dolerite (Geological Survey of Great Britain Sheet 335 and 336).

The Camel river valley was already formed before the glacial periods, but modified and deepened by erosion under periglacial conditions and meltwater following the end of the last glaciation (Halcrow 1999, 15).

Large areas of blown sand blanket the bedrock in the estuary; the average grain size of 0.2mm may relate it to offshore sands probably of late glacial origin and blown onshore at that time (Halcrow 1999, 47).

4.3 Historic landscape character

The site lies within an area characterised as 'Rivers and Navigable Creeks' (Cornwall Landscape Assessment 1996), that is rivers, mainly sunken valleys or rias, which have been used for ship, boat or barge transport. Most have wooded slopes and some have floodplains. Many are now literally backwaters, quiet places which see few visitors. Most of Cornwall's navigable rivers have been greatly shortened by the deposition of vast amounts of silt brought down from tin streamworks in the medieval and post-medieval centuries. Until the 15th and 16th centuries, Cornwall's communications systems will have been based on water transport to a much greater extent than the better-known history of the last two or three hundred years would lead people to expect. There will, for instance, have been a fairly short neck of land between the Camel and the Fowey, two rivers whose north-south line connecting the two coasts ran counter to the dominant east-west ridgeway route (now the A30). It is no coincidence that Cornwall's earliest important town, Bodmin, was established on this neck nor that many other medieval towns are located either at or near the highest navigable points of important rivers, connecting the Cornish heartlands with the sea

4.4 Statutory and non-statutory designations

The Camel Estuary wreck lies within an Area of Great Scientific Value (AGSV) and a Cornwall Nature Conservation Site (CNCS); these are non-statutory designations relating to local plans.

4.5 Physical environment

This section is mainly based on the Physical Environment Volume of the Round 1 Shoreline Management Plan (SMP) compiled by Halcrow Ltd in 1999.

The SMP notes that there has been a good deal of previous work plotting the migration of channels in the Camel Estuary, in particular the ebb-tidal Horseshoe Channel which is moving westwards and eroding the eastern margin of the sand bank upstream of Padstow at Town Bar. The rate of movement has varied from 25m a year to over 90m and was until recently predicted to arrive at the western side in a few years time, effectively cutting through Town Bar. The effect of this would be that the main navigable channel, currently on the eastern side near Rock would revert to the Padstow side with a dramatic improvement in navigability of the harbour, but with a loss of amenity on the Rock side (Halcrow Ltd 1999, 52).

It is known that the main channel has changed sides several times, the last being in about 1937 (see Fig 20) and before that in 1820; however observations made during the compilation of the SMP show that this process is slowing down, with a marked curvature of the northern end of the channel and reversion to a west-side main channel is now thought to be unlikely within decades (Halcrow Ltd 1999, 52).

Records over the last 200 years show that sand banks in the Camel Estuary have been moved by migrating channels in a generally cyclic manner. Beneath the estuary several ancient buried channels have been mapped geophysically, and traces of hard gravel were encountered in one borehole on Town Bar. While large-scale sand removal for agricultural use has been carried out for centuries, comparable amounts of silt were deposited by mine-waste discharges upstream until they were stopped in 1888 (Halcrow 1999, 47).

Today the main sediment input within the Estuary is likely to be from the sea, although the extent of fluvial sediment input from the upper Camel is unknown. It is thought that medium to fine sands are deposited within the lower estuary on Doom Bar, Town Bar and within Porthilly Cove. The silts and muds are deposited further upstream within more quiescent waters, east of Cant Cove. Any sediment which bypasses the sandbars in the lower estuary tends to be swept out to into Padstow Bay and deposited further offshore. One of the key points mentioned in the SMP is that the Camel estuary appears to be acting as a major sediment sink along the north Cornish coast, consequently, without positive intervention, the estuary will continue to silt up with marine-derived deposits (Halcrow 1999, 53-4).

Maintenance dredging and aggregate extraction from the Estuary over the years appears to have caused little effect to the Estuary regime which means that the 'sedimentary budget' (artificial output compared to natural or man-induced sediment input) is at present in equilibrium. The SMP recommends that, due to uncertainty over present rates of sediment extraction and natural loss to the outer estuary mouth stable areas of the Doom Bar, Town Bar, the Pool, the Harbour Channel and the Halwyn Bank (and its associated channels) should not be interfered with (Halcrow 1999, 54).

4.6 Historical background

4.6.1 The wreck of the Antoinette

The Padstow Harbour Master identified the wreck as possibly that of the Canadian barque *Antoinette* because of the account in 'Cornish Shipwrecks: Volume 2 The North Coast' (Carter 1970). The *Antoinette* was wrecked on the Doom Bar on 2 January 1895 while bound for Santos from Newport, Gwent with a cargo of coal. According to Carter, part of the wreckage was carried by spring tides up the estuary on to Town Bar where the remains became buried by sand following an unsuccessful attempt at demolition using gelignite. According to Carter the *Antoinette* was the largest ship wrecked on the Doom Bar (Carter 1970, 155).

Because the NMR record for the site differed from Carter's account, the Project Brief considered that there was a significant doubt that the wreck was definitely that of the *Antoinette*. Reproduced below is the description from the NMR record followed by the

account in the wreck of the *Antoinette* in Clive Carter's of shipwrecks on the north Cornwall coast (Carter 1970). According to Carter the *Antoinette* was the largest ship wrecked on the Doom Bar at Padstow.

The NMR record is based on the entry for the *Antoinette* in the 'Shipwreck Index of the British Isles' (Larn and Larn 1995). Richard Larn was contacted during the project and provided photocopies of his notes and the photograph of the *Antoinette* reproduced in this report (Fig 22). He had collaborated with Clive Carter on 'Cornish Shipwrecks: Volume 1 The South Coast' (Larn and Carter 1969), but did not know the source for Carter's account of the wreck breaking up and drifting on to Town Bar and the unsuccessful demolition attempt. These are not referenced in Carter's book.

NMR Record for the Antoinette

This barque was first sighted offshore from Padstow completely dismasted. The Padstow lifeboat put out to her, although still some 10 miles offshore, and were joined shortly after by the Port Isaac lifeboat and the steam tug *Princess May* and took her in tow. As they entered Padstow harbour they were struck by a severe NW squall and the tow rope had to be released. As a consequence the barque struck on Doom Bar and became a total wreck.

Her crew were taken off by the two lifeboats which stayed with her, landing them at Hawker's Cove. One of the survivors suffered a broken leg when the ship went ashore. The remains of the ship were auctioned at Padstow 19 January, the unsalvaged anchors, chains and large portions of wreck selling for £5.2s.6d.; the total value realised for sale of both wreck and cargo was about £125.

'Wreck of a Barque at Padstow'.

'Gallant Conduct of Lifeboat and Brigade Men'.

'Yesterday morning, between 9 and 10 o'clock, rockets were fired announcing that a ship was in distress in the channel. The lifeboat men and rocket brigade were within a few minutes at Hawker's Cove and launched the lifeboat and rocket gear under Mr. Bolt, the chief coast guard officer, who was also in readiness. It was soon known that it was a barque in distress, being seen from the shore dismasted. The lifeboat crew, although the ship was 10 miles from the shore, pulled towards her, and it was not long after the Port Isaac lifeboat was seen making for the ship as well.'

The steam tug *Princess May*, having steam up, she made also for the ship, and was the first to arrive there and took her in tow, the captain and crew being worn out, and the ship in great distress, having been struck in a squall about 5 that morning. The Port Isaac lifeboat was the first to arrive, they having seen her the first in the morning. The Padstow lifeboat soon after came, and the two boats remained with her until she was towed by the *Princess May* to the points entering Padstow harbour. Here a north-west squall struck both the little steamer and the barque, and the former had to part the tow rope. The consequence was the barque struck on the point of the Doom-bar, and there she remains and will probably become a total wreck. The crew of the two lifeboats, when she struck, took off the crew, 14 all told. The name of the barque was *Antoinette*, from St. John's, New Brunswick, bound from Newport, which they had left the previous day, to Santos, Brazill [sic]. She had on board a cargo of 1,800 tons of coal. She is a fine ship, but having experienced such a severe squall, it washed all on deck overboard, and the crew had enough to do to keep her afloat until rescued by the lifeboats and the steamer *Princess May*. Her sails, too, were blown to pieces, and she looked in a miserable state when nearing the points. One of the crew in the squall had his leg broken, and he was on landing quickly attended to by Dr. Harvey. Captain Nickerson, the captain of the barque, speaks in the highest terms of the crews of the two lifeboats and the crew of the V, who came to the barque's assistance and saved the crew just in time. The crews of the life-boats must, it

was thought, have pulled at least 20 miles in stiff squalls, and it was nearly 3 pm before the crew were landed in safety. The rocket brigades of both St. Minver (on the opposite coast) and Padstow were on duty all the time and worked their apparatus most splendidly.'

'Padstow, Jan. 3. The barque *Antoinette* (reported yesterday to have stranded on Doom Bar in entering harbour) is a total wreck. Wreckage washing ashore.' (6) [No report published in this source in the preceding two days, but this report is written in the style of, and will have originated with, Lloyd's, and is therefore likely to represent the Lloyd's

List report of 03-JAN-1895, referring to the report of 02-JAN-1895.

' . . . On Saturday the hull [of the MARIA ELIZABETH] . . . were sold by auction . . . The salved and unsalved wreckage of the barque ANTOINETTE was sold by auction on the same day. The unsalved portion, comprising anchors, chains, and large portions of the hull, was disposed of for £5 2s 6d.'

The NR record is reproduced in full, with sources, in Appendix 2 of this report

Clive Carter's account

'The largest sailing ship wrecked on Doom Bar was the old Bluenose square-rigger *Antoinette*, launched by JM Gardener of Yarmouth, Nova Scotia, as a 1,118-ton wooden full-rigger in 1874 for J Bingay of that port. She was later reduced to a barque, sold New Brunswick way, and it was from under the registration of St John's NB, that she sailed from Newport on New Year's Day 1895, bound for Santos with 1,830 tons of coal and coke. The Christmas gales returned before the pilot was dropped off Lundy, and both fore and main topmasts carried away. At 5 o'clock next morning, 10 miles off Pentire, a heavy squall cleared her decks, broke a sailor's leg and left her unmanageable' (Carter 1970, 155).

'When dawn broke her flags and rockets brought out both Padstow and Port Isaac lifeboats, but the tug *Princess May* arrived first and transferred a hawser. The crippled New Brunswicker steered very badly and as they made the channel against the ebb tide soon after 2pm she broke loose and drifted into the surf. Captain Nickerson and 13 men were rescued by the lifeboats, and later that afternoon the Padstow boat rescued three pilots marooned on the wreck' (*ibid*, 155).

'The *Antoinette* broke up the next night, with debris choking every gully from Daimer to Pentire. Ropes, gear, timber, copper nails were collected up; there was also plenty of food on board, particularly apple rings which lay thickly around Trebetherick. One St Minver man salvaged a large box of tobacco which he hid in the furze before setting off to inform the coastguards. The box vanished, and many years later a farm labourer admitted that he had stolen it, and kept it hidden on a beam in one of the barns, where it provided him with a good many pipeful' (*ibid*, 155).

'One large piece of the barque's hull drifted into Harbour Cove, another on the lower beach, and an even bigger piece remained embedded on the Doom Bar. Three Cardiff tugs failed to shift it, and the next spring tide carried the jagged debris onto Town Bar. A miner named Pope was hired to destroy this navigational hazard; he poked a long oblong box packed with gelignite under the wreck and ordered the spectators clear. The explosion shattered scores of windows in Padstow, flung the timber high in the air, and left a column of smoke visible from Wadebridge, three miles up-river. But the wreckage was hardly dispersed and still lies deep in the sands together with many tons of coal. The *Antoinette*'s longboat, a handsome craft of Canadian oak and elm, built on the voyage over to Wales, was salvaged, and as the Padstow fishing boat *Kingfisher*, which lasted until 1960, when soon after being sold she was wrecked across the river at Rock' (*ibid*, 156).

4.6.2 Identification of the Camel Estuary wreck

Further study of the weekly editions of the Royal Cornwall Gazette for 1895, carried out for the project confirmed that by August wreckage from the *Antoinette* was carried onto Town Bar where it became a significant hazard for fishermen and ferrymen who petitioned for its removal. Attempts were made to blow up the wreckage with explosives in September, although fishermen were still complaining about the wreckage in November of that year. The relevant extracts from the Royal Cornwall Gazette are reproduced in Appendix 1 of this report.

Antoinette 1874 -1895	
Type	Barque (sail)
Dims	57.61 x 11.28 x 6.92m
Built	1874 M.Gardner, Yarmouth NS
Wrecked	02-01-1895 Padstow
Cargo	Coal
Salvaged	Yes

Fig 18 Vital statistics of the Antoinette (Larn and Larn 1995)

The Camel Estuary wreck is evidently the middle section of a large ship, which had been buried until exposed by shifting sands early in 2010. The *Antoinette* was, at 57.61m long, a substantial sailing vessel, and the published beam (width) of the *Antoinette*, (11.28m) accords very well with the recorded 11m width of the wreckage observed on 28 February 2010. All the features recorded on the recovered timbers accord well with a 19th century date for the vessel (see below Section 4.6.4) and analysis of the brass bolt suggests that it dates to the mid-19th century (see below Section 4.7). Subject to a more thorough study of what vessels have been wrecked in the vicinity, identification of the remains as part of the *Antoinette* seems reasonable.

4.6.3 Concordances

By Kevin Camidge

The *Jhelum*

A three-masted ship built 1849 in Liverpool, abandoned as a hulk in the Falklands in 1870/71; the *Jhelum* was 37.5m long, 8.26m beam and 428 tons. The wreck was surveyed in the 1980s by a team from Liverpool museum (Stammers and Kearon 1992). The *Jhelum* had iron hanging knees and a mixture of iron and timber lodging knees (The midships lodging knees were iron; those at bow and stern were timber). The *Jhelum* was copper-sheathed and had iron water tanks.

The *Diamond*

A protected wreck site; although designated as the wreck of the *Diamond* this is probably the wreck of an unknown 19th century sailing vessel approximately 44m long and of 500-800 tons. The ship had iron knees (or knee riders), was sheathed with copper alloy and was fastened with iron and copper alloy bolts. The vessel also had iron water tanks. Date probably after 1832. (Wessex Archaeology 2006)

The *Earl of Abergavenny*

The wreck of a very large East India Company ship excavated from 1980 onwards by the Weymouth Archaeological Group. Although earlier than the Camel Estuary wreck it is worth

looking at for the early use of iron knees. Dimensions are 53.9 x 13.4 x 5.3m, 1460 tons. The vessel had iron knees although the excavation did not establish how they were fitted. The knees were - at least in part - implicated in the loss of the vessel. There is some suggestion that they were made from inferior iron and there is some question of corrosion caused by non-ferrous fastenings (Cummings 2002)

The *Manacles* wreck

An unknown merchant vessel with iron knees was discovered on the Manacles off the Lizard, Cornwall in 2002. This vessel had knees of very similar appearance to those recorded from the Camel Estuary wreck. The size is unknown but was estimated at 750 tons, and the vessel had copper sheathing (Wessex Archaeology 2003).



Fig 19 Photograph of the Antoinette (Richard Larn)

4.7 Analysis and metallography of the ship's bolt

By Peter Northover

A section of a large copper alloy bolt from a wooden or composite ship was submitted for metallurgical study by HE Projects, Cornwall Council.

The bolt had been recovered from the Camel estuary and the purpose of the study was to identify the alloy used and to determine, if possible, a probable date of manufacture.

4.8 Sampling and analysis

A single sample, labelled #R3795, was cut from one end. The sample was hot-mounted in a carbon-filled thermosetting resin, ground and polished to a 1mm diamond finish. Analysis was by electron probe microanalysis with wavelength dispersive spectrometry; operating conditions were an accelerating voltage of 20kV, a beam current of 30nA, and an X-ray take-off angle of 40°. Seventeen elements were analysed as set out in the accompanying table; count times were 20s per element and pure element and mineral standards were used. Detection limits are typically 100-200ppm.

Eight areas, each of 30x50µm, were analysed on each sample. The individual analyses and their means, normalised to 100%, are set out in the table. All concentrations are in weight %.

After analysis the sample was examined metallographically in both as-polished and etched states; the etch used was an acidified aqueous solution of ferric chloride further diluted with ethanol.

4.8.1 The alloy

The bolt was produced from a high zinc brass with a measured 33.2% zinc, the highest individual measurement being 35.8%. The principal impurities were 0.07% iron, 0.06% nickel, 0.59% lead, and 0.05% cadmium. All other elements sought were close to or below their limits of detection; the silicon recorded may derive from either silicon carbide grinding debris trapped in the soft and corroded metal, or from the environment during corrosion.

As the metallography will show (see below) the zinc content will be modified by dezincification. As noted above, the maximum individual zinc concentration measured here is 35.8% which will be closer to the original value in the bolt: as made the zinc content was probably in the range 36-38%. The regular use of brass for ships' fastenings post-dates Muntz's second patent of 17 December 1832 Patent No 6,347 (McCarthy 2005, 115-121, 139-42) becoming common by the 1840s. It is therefore reasonable to conclude that the bolt analysed here will be little, if at all, earlier than 1840. For comparison there are a few published analyses of Muntz metal sheathing and bolts from ships (*ibid*) but few use as an extensive element set as was employed here, and not all take account of the effects of dezincification on the composition.

For a more detailed comparison the table attached to this report includes the compositions of brass bolts, nails and sheathing from an originally unidentified wreck on the Horse Sand in the eastern Solent. This wreck has now been provisionally identified as the *Flowers of Ugie* which sank in 1852: she was built in 1838 and refitted with "yellow metal", as Muntz metal was also called, in 1851. As can be seen from the table the iron, zinc and lead contents after corrosion are very similar to those from the bolt from the Camel estuary. Where they differ is in the nickel and arsenic impurities, the brass from the *Flowers of Ugie* having 0.01-0.02% nickel while the Camel estuary boat has 0.06%; the corresponding arsenic contents are 0.03-0.05% for the *Flowers of Ugie* bolts and 0.01-0.02% for the sheathing, and undetected for the Camel estuary bolt. Based on experience with the analysis of furniture mounts and similar objects from the

later 19th century, the decrease in arsenic and increase in nickel, small though they are, potentially indicate a date later than the 1850s: any time in the period 1860-1900 is plausible.

4.8.2 Metallography

Figures 20 and 21 show that the bolt has a fully recrystallised equiaxed grain structure with annealing twins but little visible cold work. An originally ab cast brass structure has become partially homogenised during hot rolling, and the remaining b phase has been penetrated by corrosion in the form of de-zincification. This appearance is also shown by the bolts from the *Flowers of Ugie*, although there the extent of dezincification is greater: there is a suggestion in the literature that dezincification proceeds more rapidly under anaerobic conditions and is accelerated by high chloride contents, and high temperatures (McCarthy 2001, 140-10. Dark particles are small oxide and lead inclusions.

4.8.3 Conclusions

The bolt is made from a yellow brass, implying a date no earlier than 1832, and almost certainly later than 1840. Comparison with other brass analyses suggests the date could well be other c 1860. The microstructure is also typical for the period, and shows the dezincification of the b phase in an ab brass.

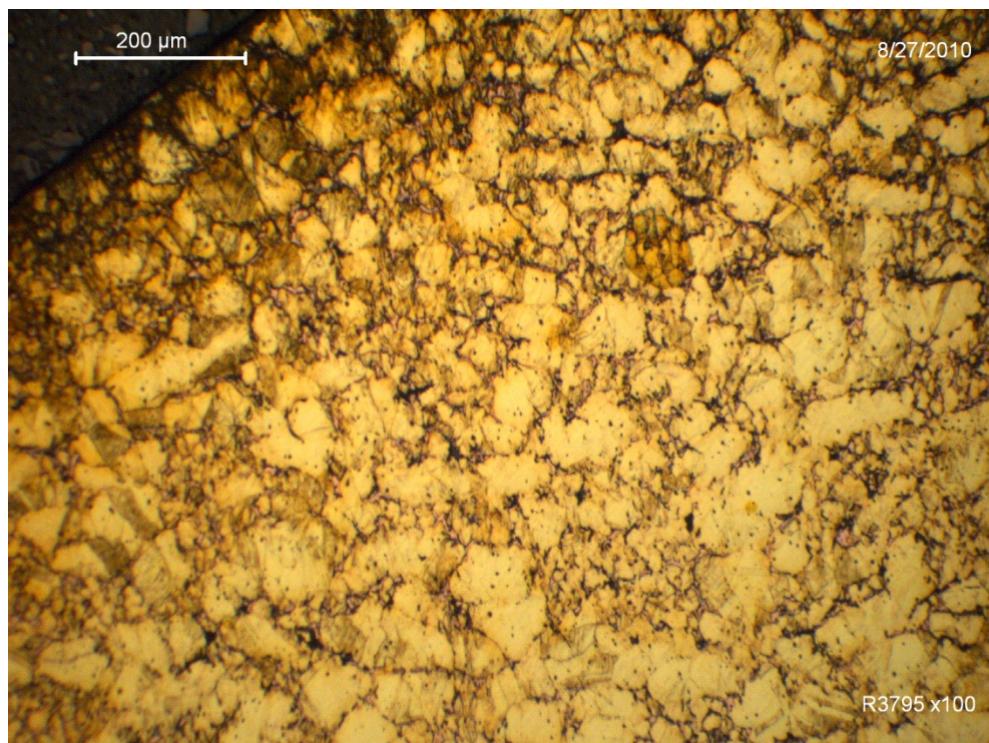


Fig 20 Brass bolt sample #R3795, etched

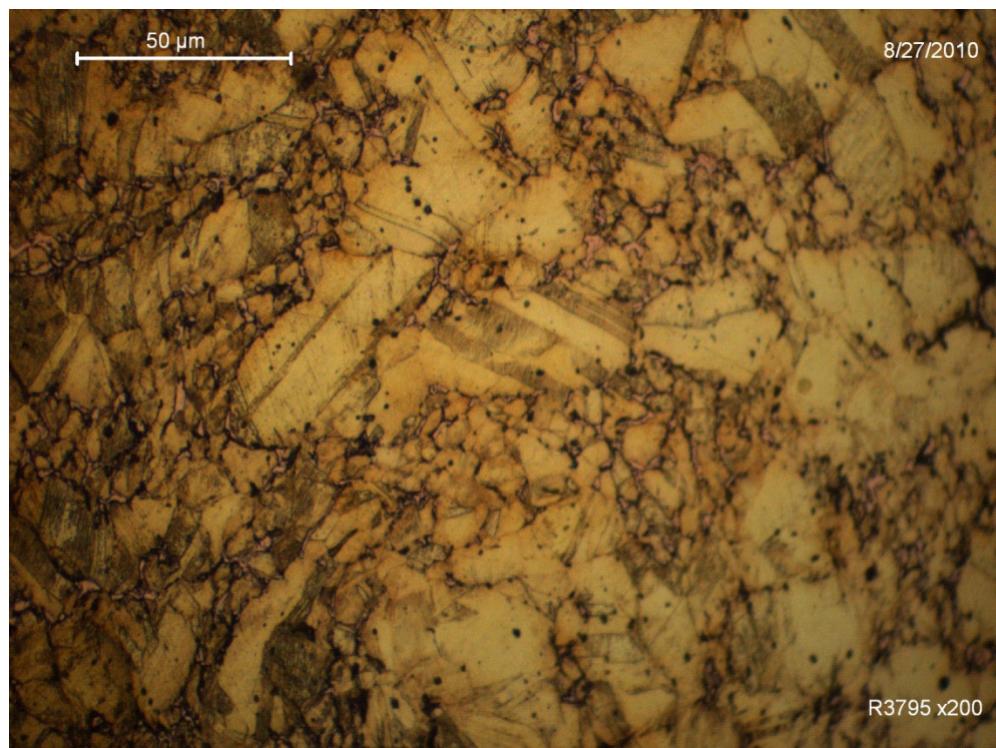


Fig 21 Brass bolt sample #R3795 etched

5 Assessment of significance

The approach to the Assessment of Significance takes its lead from English Heritage's 'Conservation Principles, Policies and Guidance' (2008) which informs the organisation's approach to the management of the historic environment, irrespective of whether any particular place meets the threshold for designation. The 'Conservation Principles' group heritage values under four headings and the purpose of this section is to define the heritage significance of the Camel Estuary wreck in accordance with these heritage values:

- *Evidential value*: the potential of a place to yield evidence about past human activity.
- *Historical value*: the ways in which past people, events and aspects of life can be connected through a place to the present – it tends to be illustrative or associative.
- *Aesthetic value*: the ways in which people draw sensory and intellectual stimulation from a place
- *Communal value*: the meanings of a place for the people who relate to it, or for whom it figures in their collective experience or memory

The site is also assessed against the non-statutory criteria used for Designation under the Protection of Wrecks Act 1973.

5.1 Evidential

The Camel Estuary wreck demonstrates a range of technology in her timbers, fittings and considerable potential to yield evidence about past maritime activity in the area and also about the materials and technology used in later 19th century shipbuilding. Study of these will contribute to the understanding this type of vessel, and to this vessel in particular. Although this is reduced by the quality of survival.

5.2 Historical value

Historical value tends to be illustrative or associative – the perception of a place or site as a link between past and present people- and is different from purely evidential. Illustration depends on visibility in away that evidential value (e.g. of buried remains) does not (English Heritage 2008, 28). The timbers are associated with a memorable event in Padstow's history – the largest vessel to be wrecked in the Camel estuary and an explosion which blew out many of the windows in the town.

Since being exposed and visible the wreck timbers have provided a chance for both professionals and the community to connect with the maritime past of Padstow and the Camel Estuary through the tangible physical evidence of the wreck timbers.

5.3 Aesthetic value

The exposed wreckage has certain poignancy, but is of interest for archaeological and historical reasons not because of its aesthetic value.

5.4 Communal value

Cornwall is a maritime county and Padstow, the main harbour on the north Cornwall coast, has a deeply imbued seafaring tradition. The exposure of the wreckage in the winter/spring of 2010 caused a considerable amount of public interest and speculation about the identity of the mystery wreck. The demolition work by the Royal Navy attracted large crowds of spectators and coverage by the local media. The reasons for the interest could be assigned to a combination of factors: people's interest in their maritime history, the mystery of the wreck's identity and the attraction of a public spectacle or event.

5.5 Assessment of non-statutory criteria

The Protection of Wrecks Act 1973 is in two sections. Section 1 provides protection for designated wrecks that are deemed to be important by virtue of their historical, archaeological or aesthetic value. Sixty-three wrecks around the coast of the United Kingdom have been designated under this section of the Act, of which only five date to later than the 18th century - the *Resurgam* (Rhyl, 1880), the Seaton Carew Wreck (Seaton Carew, 19th century), HM Submarine *A1* (Bracklesham Bay, 1911), The *Diamond* (Cardigan Bay, 19th century), the Wheel Wreck (Isles of Scilly, 19th century). The 1976 designation of the Rhinns of Islay Wreck dating to the 18th or 19th century was revoked in 1984. Section 2 provides protection for wrecks that are designated as dangerous by virtue of their contents three wrecks are designated under this section of the Act.

The following non-statutory criteria are used for assessing the importance of wrecks or the sites of wrecks, and for considering whether designation as a restricted area under the terms of the Protection of Wrecks Act 1973 is appropriate.

5.5.1 Period

The Camel Estuary site is the wreck of a large 19th century barque, tentatively identified as that of the *Antoinette* which originated as a square-rigger, so it is then a representative of a common form of vessel of the late 19th century.

5.5.2 Rarity

If the site is the wreck is that of the *Antoinette*, or even another late 19th century vessel, then it would represent a relatively rare survival from that period, of a category of vessel that is under represented in terms of protected sites.

5.5.3 Documentation

No original documentation has been traced other than the contemporary reports in the Royal Cornwall Gazette, and only limited desk-based research has been undertaken and therefore this criterion cannot be properly assessed at the present time.

5.5.4 Group value

According to Carter (1970, 136) nearly 300 ships on the Doom Bar in the last 200 years and these would form an important group on terms of geographical association. Insufficient evidence exists at the present time to make a direct link between this site and any other wreck, navigational hazard or shore facility, but it undoubtedly forms a significant part of the wider historic environment.

5.5.5 Survival/condition

The Camel Estuary wreck only comprises part of the whole vessel, that part has twice been damaged by explosives, the extent and degree of survival of the rest of the wreck is unknown. Other pieces of the wreck may lie buried in other areas of the Camel Estuary – their location and degree of survival is unknown, other parts of the wreck, fittings and cargo were auctioned. The ship's cargo of coal reputed to be buried with this part of wreck has not been revealed.

The timbers observed exhibit only slight attack by marine wood-boring organisms, probably indicating that they have only recently been exposed. Those timbers which are now exposed will be attacked by marine wood boring organisms and will begin to deteriorate. The timbers which were recovered by the harbour master are in very good condition except for recent mechanical damage, probably occasioned by their recovery and the use of explosives to break up the wreck.

In order to make a more complete appraisal of the condition access to the wreck at a spring low tide, or a diving inspection of the wreck at high tide would need to be undertaken.

5.5.6 Fragility/vulnerability

This site is highly vulnerable. Those timbers which are now exposed will be attacked by marine wood boring organisms and will begin to deteriorate. It was not completely destroyed by the Royal Navy's explosives in March 2010, no further demolition attempts were carried out in September 2010 but the Harbour Master is proposing to saw off some of the protruding iron fittings, possibly at the next low spring tide in February/March 2011.

5.5.7 Diversity

The site demonstrates a range of techniques and materials in her construction timber and iron knees, copper and iron nails and treenails. Evidence of copper sheathing has been found on most comparable vessels of this period.

5.5.8 Potential

Insufficient evidence is available to fully assess this criterion at the present time. However, the site is likely to provide a valuable opportunity to study wooden sheathing, site decay processes, as the exposed wreckage will now be vulnerable to attack by wood boring organisms, and the physical protection of shallow inshore sites. It is possible that more parts of this vessel may exist elsewhere in the Camel Estuary, although some of it was auctioned soon after the wreck. The site also has potential in terms of historical links with Canada and 19th century maritime trade.

6 Statement of significance

The results of the emergency recording and the desk-based assessment indicate that there can be little doubt that the Camel Estuary wreck is almost certainly part of the late 19th century barque *Antoinette*.

The wreck is a significant historic asset with considerable evidential, historical and communal value but because it only represents a part of the whole vessel, because that part has twice been damaged by explosives, and because the extent and degree of survival of the rest of the wreck is unknown it is not recommended that the wreck should be designated as a protected wreck under the Protection of Wrecks Act, 1973.

7 Recommendations

The main issue is that the Camel Estuary wreck lies close to a navigation channel and has been deemed a hazard to shipping, and, because of shifting sand and rapid turning tides, potentially dangerous to visitors who may be tempted to examine the wreck.

However, further demolition work is likely to be less destructive and will consist only of sawing off some protruding iron fittings and then marking the wooden remains with a buoy, this is currently planned for the big tides around 21 March 2011 (Padstow Harbour Master pers comm).

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9 Project archive

The HE project number is **2010025**

The project's documentary, photographic and drawn archive is housed at the offices of Historic Environment, Cornwall Council, Kennall Building, Old County Hall, Station Road, Truro, TR1 3AY. The contents of this archive are as listed below:

1. A project file containing site records and notes, project correspondence and administration and an information file containing copies of documentary/cartographic source material (file no 2010025).
2. Field plans and copies of historic maps stored in an A2-size plastic envelope (GRE 772).
3. Black and white photographs archived under the following index numbers: GBP 2149
4. Digital photographs stored in the directory ..\Images\Sites\Maritime\Camel Estuary Wreck 2010025
5. THE Cornwall HER number is MCO55838
6. English Heritage/ADS OASIS online reference: cornwall2-89948

This report text is held in digital form as: G:\CAU\HE Projects\Sites\Maritime\Camel Estuary Wreck Emergency Recording and Assessment 2010025

The wreck material has been disposed of by the Harbour Master. The iron knee and brass bolt are temporarily stored at HE's Truro premises. The documentary archive will be deposited at the Cornwall Record Office, Truro. The site code is CEW 10.

Appendix 1: Extracts from the Royal Cornwall Gazette 1895

The following extracts are mostly from the Padstow Notes section of the Royal Cornwall Gazette:

WRECK OF A BARQUE AT PADSTOW

GALLANT CONDUCT OF LIFEBOAT AND BRIGADE MEN

'Yesterday morning, between 9 and 10 o'clock rockets were fired announcing a ship in distress in the channel. The lifeboat men and rocket brigade were within a few minutes at Hawker's Cove and launched the lifeboat and rocket gear under Mr Bolt, chief coast guard officer, who was also in readiness. It was soon known that it was a barque in distress, being seen from the shore dismasted. The lifeboat crew, although the ship was 10 miles from shore, pulled towards her and it was not long after the Port Isaac lifeboat was seen making for the ship as well. The steam tug *Princess May*, having steam up, she made also for the ship, and was the first to arrive there and took her in tow, the captain and crew being worn out, and the ship in great distress, having been struck by a squall about 5 that morning. The Port Isaac lifeboat was the first to arrive, they having seen her after the first in the morning. The Padstow lifeboat soon after came, and the two boats remained with her until she was towed by the *Princess May* to the points entering Padstow harbour. Here a north-west squall struck both the little steamer and the barque, and the former had to part the tow rope. The consequence was the barque struck on the point of the Doombar, and there she remains and will probably become a total wreck. The crews of the two lifeboats, when she struck, took off the crew, 14 all told. The name of the barque was *Antoinette* from St John's, New Brunswick, bound from Newport, which they left the previous day, to Santos, Brazil. She had on board a cargo of 1,800 tons of coal. She is an affine ship, but having experienced such a severe squall, it washed all on deck overboard, and the crew had enough to do to keep her afloat until rescued by the lifeboats and the steamer *Princess May*. Her sails, too, were blown to pieces, and she looked in a miserable state when nearing the points. One of the crew in the squall had his leg broken, and he was on landing quickly attended to by Dr Harvey. Captain Nickerson, the captain of the barque, speaks in the highest terms of the crews of the two lifeboats and the crew of the *Princess May*, who came to the barque's assistance and saved the crew just in time. The crews of the lifeboats must, it was thought, have pulled at least 20 miles in stiff squalls, and it was nearly 3pm before the crew were landed in safety. The rocket brigade of both St Minver (on the opposite side) and Padstow were on duty all the time and worked their apparatus most splendidly (RCG 3 January 1895, 4).

'The wreck of the barque *Antoinette*, as stated in the Gazette last week this fine barque could not withstand the heavy seas which dashed over her on Wednesday night. Quarries have been filled up with wreckage and hundreds of people have been salving it. Mr Nicholls, auctioneer, Padstow, has sold the wreckage washed ashore, Mr R S Langford acted as agent for the owners in carrying out the other business connected with it (RCG 10 January 1895, 5).

'The salved and unsalved wreckage of the barque *Antoinette* was sold by auction on the same day [12 January]. The unsalved portion, comprising anchors, chains, and large portions of the hull was disposed of for £5 2s 6d (RCG 24 January 1895, 5).

'The barque *Antoinette* – Mr Millar of Trevone, the eminent artist, has a very large oil painting of this fine barque as she appeared at the entrance to Padstow harbour after having struck on the Doombar and was wrecked recently. It is an excellent painting and is now on view in Mr Derrick's window, Duke-street (RCG 31 January 1895, 5).

'At the suggestion of some and in the interest of the fishermen of the town I ask that those in authority over the harbour should remove the large pieces of wreck which are scattered about from the brig Antoinette, wrecked on the 2nd of last January, without further delay as the fishermen who pay the licences are greatly inconvenienced by at least two of the pieces and don't hesitate to say that were they the property of persons not connected with the Harbour Commission, they would have been removed long ago. It is believed that the Conservators of the Council ought in the interests of those to whom they grant licences to move in the matter' (RCG 15 August 1895, 4).

'Several determined and costly efforts have been made to blow up the large piece of wreck referred to in these notes several weeks ago lying on town bar, but as yet they have proved unsuccessful, although heavy charges of explosives have been used. The weight of the wreck, timber, iron and the coals enclosed in the hold must be enormous, and the difficulty of getting rid of the huge part of the vessel increases the longer she is allowed to remain, because it is gradually getting embedded deep, and deeper into the sand. The explosions which have come off have been witnessed by a large number of persons who have been delighted at the sight of pieces of wreck, coals and sand being forced in large quantity several hundred feet into the air. Fishermen, ferrymen and others will be greatly relieved when the river is rid of that huge mass of wreck' (RCG 12 September 1895, 5).

'Another effort to blow up the large piece of wreck on the town bar was made a few days ago, and was so far successful as to get rid of all the timber leaving the massive iron work to be got rid of by some other method' (RCG 3 October 1895, 4).

'Information has reached me that an address signed by many of the fishermen is to be sent to the Harbour Commissioners asking that the pieces of wreck which seriously impede successful fishing and does much injury to nets shall be removed. This is a proper and straightforward course to take, and it may be hoped that when the commissioners meet they will give peremptory orders that the reasonable appeal of the fishermen will be attended to, not only in the interest of the fishermen, but of the ferrymen as well, for they too regard the pieces of wreck on the town bar as dangerous (RCG 1895 13 November, 6).

Appendix 2: NMR Record for the *Antoinette*

NMR COMPLETE MONUMENT REPORT

ANTOINETTE		NMR Number: SW 97 NW 271	
Unique Identifier: 906121			
Recording Role: Inventory			
Location:	Address Status: Primary		
At Padstow, Doom Bar.			
North Cornwall (District)			
Cornwall			
Associated Named Locations: DOOM BAR NORTH CORNWALL	Date Of Loss: 02-JAN-1895 - 02-JAN-1895		
OSGB Grid Reference: 9168 7774			
Latitude: N 50 33.70	Longitude: W 004 56.50	Depth: (named location)	
Alternate Monument Names:			
Summary			
CANADIAN BARQUE, 1895			
Monument Periods And Types			
POST MEDIEVAL	1895 to 1895	REGISTRATION PLACE	
		ST JOHNS (NEWFOUNDLAND)	
		PROPELLION	
		WOOD	
		NATIONALITY	
		CANADIAN	
		MONUMENT TYPE	
		WRECK	
		MARITIME CRAFT TYPE	
		CARGO VESSEL	
		MARITIME CRAFT TYPE	
		BARQUE	
		MANNER OF LOSS	
		STRANDED	
		DESTINATION	
		SANTOS	
		DEPARTURE	
		NEWPORT (GWENT)	
		CARGO	
		COAL	
Parent Monument	There is no parent monument associated with this record		
Child Monuments	There are no child monuments associated with this record		
Associated Monuments	There are no monuments associated with this record		
Other Identifiers:	Admiralty Chart - 1123 26-12-80 Admiralty Chart - 1149 04-02-72 Admiralty Chart - 1156 17-08-73 Admiralty Chart - 1168b 14-02-86 Admiralty Chart - 1168c 14-02-86 Admiralty Chart - 1178 14-12-79 Admiralty Chart - 2649 18-08-78 Admiralty Chart - 2675 18-08-78		
Condition:	EVIDENCE	DOCUMENTARY EVIDENCE	
	LAND USE	COASTLAND 1 (MARINE)	
Monument Dimensions:			
LENGTH	58	METRES	U
BREADTH	11	METRES	U
DEPTH	7	METRES	U

NMR COMPLETE MONUMENT REPORT

TONNAGE	1160	TONNAGE	G
TONNAGE	1125	TONNAGE	N

Roles attached to Monument:

Compiler STEVEN WARING (SAW) 05-OCT-1994 - 05-OCT-1994

General Descriptive Text:

This barque was first sighted offshore from Padstow completely dismasted. The Padstow lifeboat put out to her although still some 10 miles offshore and were joined shortly after by the Port Isaac lifeboat and the steam tug PRINCESS MAY and took her in tow. As they entered Padstow harbour they were struck by a severe NW squall and the tow rope had to be released. As a consequence the barque struck on Doom Bar and became a total wreck. Her crew were taken off by the two lifeboats which has stayed with her landing them at Hawker's Cove. One of the survivors suffered a broken leg when the ship went ashore. The remains of the ship were auctioned at Padstow 19-JAN, the unsalvaged anchors, chains and large portions of wreck selling for 5.2s.6d.; the total value realised for sale of both wreck and cargo was about 125.

(2) gives the master as Nickerson and Registered at St Johns N B.

Year Built: 1874

Builder: J M Gardner

Where Built: Yarmouth, Novia Scotia

Owner: R C Elkin, St Johns

Master: H A Pickerson

Crew: 14

Date of Loss Qualifier: A

Additional sources cited in United Kingdom Shipwreck Index:

RCG.02 and 24.01.1895(Thu)(R); LR.1895 No.1658(A)

Sources:

- 1 United Kingdom shipwreck index [pre publication typescript], Page(s) N/a
WARING
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02-JAN-1985 No 17,889
WARING
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03-JAN-1895 No 17,890
WARING
- 4 Richard and Bridget Larn, 1995: Shipwreck index of the British Isles, volume 1 : Isles of Scilly, Cornwall, Devon, Dorset
Section 2, North Cornwall (AC)
WARING

Related Event Records: There are no related event records for this monument

Related Archive: There are no related archives for this monument.