

Cattewater Wreck: Developing the archive Second Interim Report

1.0 Introduction

This Project aims to improve the long term care and management of the Cattewater Wreck Excavation Archive held by Plymouth City Museum and Art Gallery (called the City Museum from now on). The project has received funding from English Heritage's National Heritage Protection Commissions Programme (Project Number: 5439 MAIN) under the provisions of Section 45 of the Ancient Monuments and Archaeological Areas Act 1979. Stage 1 of the project (involving archive consolidation of the documentary archive) was completed in October 2010.

Stage II followed on from Stage I and was mainly concerned with Archive consolidation of the Material Collection. This was due for completion on 24th December 2010, but due to illness of the Project Manager this was not able to be achieved and a formal variation extended the completion date to 15th April 2011.

2.0 Stage I: Archive consolidation: documentary archive

2.1 Repackage the documentary archive

The plans/sections were unrolled in Stage 1 and have been flattened over several months in the City Museum. A number of the plans/sections have still not reached a satisfactory level of flattening, tending to roll up if laid flat. They have all been stored in the plan chest where flattening will continue under weights. Several larger plans/sections are too large for the plan chest and their ultimate storage location will be decided by Museum curatorial staff.

2.2 Conservation

Several plans had small self adhesive labels attached, some of which were becoming detached. Four of the plans showing finds distributions had a large number of these labels and have been transferred into large Melinex sleeves on inert boards for temporary storage.

It was hoped that the City Museum Conservator (Paper) would be able to assess the conservation requirements of these plans during Stage II but, due to her heavy exhibition workload, this has not been able to be included in her current work programme. It is hoped that the assessment will be carried out in the near future.

2.3 Strengthening the documentary archive and consolidating the collection

Stage I included the listing and indexing of the present documentary archive.

There was insufficient time to include correspondence and notes relating to the conservation and display of the Cattewater gun (2002-9) also present in the City Museum files. These will be added at a later date.

Mark Redknap has added documentary material from his files relating to Guns, Textiles, Animal Bone, C14, Dendrochronology, Samples, Biological

remains, Conservation, Geology, Leather, Pottery, Finds Register, Wood, 1973 Timber, Gunpowder & CWC minutes. This amounts to about 300 sheets of paper and, apart from the Finds Register and the CWC minutes, all of this material has previously been absent from the Archive.

Peter Holt has passed on paperwork recovered from Alan Bax's flat in Fort Bovisand and photos from Berit Mortlock (original co-excavator). Martin Dean (who conducted the survey of the site in 1976) has recently added 10 photographs, probably of the 1976 survey.

Chris Preece, a member of the original project, has a substantial number of slides relating to the diving on the site. These are at present being copied prior to being added to the Archive.

3.0 Stage II: Archive consolidation: Material Collection

3.1 Material archive audit

The artefacts from the 1973 excavations were given individual finds numbers (running from 1 to 36), but the subsequent survey and excavations (1976-8) restarted the sequence (running from 1-474). Some extra numbers were included, not belonging to the sequence (such as several finds marked 77 CW VI NE). As well as small finds the sequence includes structural timbers, environmental samples and some other samples.

The following find numbers are void:

CW77 132, CW77 138 & CW77 419 have no finds associated with them in the Finds Book. CW78 473 is a duplicate of CW73 6 (complete composite gun). CW78 197 was a modern leaf, CW78 445 was an aluminium strip and CW78 460 was modern plywood.

Some finds now present in the City Museum collection are not listed in the Excavation Finds Book (e.g. CW77 122 wooden treenail, CW77 154 Tile, CW78 254 animal rib, CW unstrat wooden peg). CW77 220, which consists of several pieces of pottery and tile, is not only absent from the Finds Book, but the numbering is inconsistent with the date allegedly recovered.

Another problem is that during the 1977 excavations many finds numbers consist of several different finds. This is due to all the artefacts from a single dive, often of several different materials, being given the same finds number. Thus CW77 133 is described in the Finds Book as a 'mixed box' containing tile, ceramic, bone, glass and luting.

The survey in 1976 used unique finds numbers and there is a note at the top of the 1978 finds lists saying that each object was to be given a unique number. Even so, several finds of the same material from a single dive were often given the same finds number. These can now be seen to be from totally different objects, e.g. CW78 215 which consists of a fragment of a SW France chafing dish and two fragments from a Dutch glazed tripod pitcher now incorporated within the rebuilt base of the vessel along with several other finds numbers. Two samples of ballast stone (CW78 422, CW78 423) consisted of eleven fragments of different stone types (limestone, granite, flint, etc) between them.

The process of marking finds seems to have taken place at a later date as several finds have the wrong year. There is a note in Wenmoth (1973) 'some sherds are marked 77 when they should be 78'. A few sherds are also marked CW77 when they should be CW76.

Table 1: Audit of Cattewater Wreck material archive

Material	Finds Nos.	No. Disposed	No. Missing	No. in Museum
Structural timber	19	0	18	1
Wood	72	11	33	28
Leather	21	1	5	15
Textile	13	2	0	11
Rope	13	5	4	4
Metal	18	0	5	12
Ceramics	78	3	30-32	43-5
Brick/Tile	60	13	?0	48-53
Clay pipe	19	0	19	0
Glass	10	0	8	2
Stone	16	0	9	7
Concretion	112	73	35	3
Misc	4	0	4	0
Total	455	108	170-172	174-181
Environmental Samples				
Bone	104	0	37-42	62-67
Shell	20	0	20	0
Total	124	0	57-62	62-67
Samples				
Stone	1			
Gunpowder	1			
Misc	4			
Wood samples	17			

Due to the loss of approximately 60% of the original finds, the true number of individual finds excavated can never be known. However, using a combination of the Finds Book and the listing of individual finds by material (Wenmoth 1982), a total of 455 individual finds can be calculated (see Table 1). If samples and environmental samples are included this would give a total of 602 find numbers (579 finds, if samples are excluded). This should be looked at as a minimum due to several different finds of the same material being given the same finds number. Examination of the ceramics in the City Museum provides at least 6 examples of this.

Using the figure of 579 finds, the audit of the Material archive in the City Museum shows that approximately 40% of the original finds are in the collection, the rest being disposed of during or after the excavation by the excavators (approximately 18%) or subsequently lost (approximately 40%).

This conceals the fact that sometimes only a proportion of the fragments listed under any particular find number are still extant e.g. CW78 422/CW78 423 together consisted of eleven ballast stone fragments of which only six are now in the collection.

Index of material Archive?

3.2 Artefact identification

Most finds in the Archive were in present in plastic or paper bags with identifiable finds numbers. However, there were a few items which required further investigation.

A box of stone ballast samples (CW78 422 & CW78 423) had some labels with Roman numerals which were mostly decipherable under a hand lens or with the use of UV light. Using a combination of a report identifying the geology of these samples and City Museum curatorial staff it was possible to confidently identify the fragments. Three concretions were also found in the stone box, without labels, which have proven impossible to identify.

A cardboard box of wooden finds included 9 objects with reliable finds numbers and 33 unlabelled objects or fragments in bags without numbers or just lying loose in the bottom of the box. A lot of time was spent trying to reconstruct individual objects from these fragments (using their colour, decay, shape and breaks) and eventually they were grouped into 20 objects. Six of these were identified (or probably identified) from published drawings and a list of wood which had been sampled for wood identification (several had rectangular sections missing). One fragment was found to be part of a labelled find (CW77 145 treenail). The remaining 13 wooden finds include several tentatively identified as bungs and treenails. These may be identified in the future from a combination of the Finds Book and artefact drawings, but the Archive lacks any wooden artefact drawings at present.

A plastic bag of rope fragments labelled 360 could not be found in the finds book, but has been tentatively identified as CW78 260.

3.3 Missing artefacts

There are estimated to be 227-234 finds numbers missing from the Archive in the City Museum (excluding samples). This is an underestimate of the loss due to only a proportion of the fragments under a particular finds number in the Finds Book now often being present in the Archive (particularly ceramics).

There are a number of reasons that have been recognised for material to be absent from the archive:

Large numbers of finds were disposed of during the excavation (108 finds numbers or approximately 18% of the total assemblage). Often they were identified as being modern material, but also included a large proportion of the concretions (73 out of 112 find numbers), which was apparently fairly standard practice at the time.

Some of the wooden objects and a couple of other finds that were described as being disposed of in the Finds Book are actually in the City Museum. For instance, a wooden object found unlabelled at the bottom of the wood box can

be fairly confidently identified as CW77 129 Keg end from the published drawing.

Alan Bax is reported to have said that the remaining missing elements of the material archive were thrown away. Boxes of artefacts were apparently left in unsecured areas of Fort Bovisand and may have been taken by divers for souvenirs.

It is now understood that rooms/areas at Fort Bovisand were cleared out in the early 1980s and it is on this occasion that items in one casemate used as a conservation laboratory and the timbers in the Conservation tanks (containing most of the structural timbers), which had stood outside the conservation laboratory casemate, are believed to have been disposed of. Some wooden timbers (including part of the keelson) are thought to have been burnt and the remainder of the keelson thrown over a cliff (later to be recovered by the Archaeological Diving Unit and added to the Archive in the City Museum, see below).

Large numbers of finds were described in 1982 by Barbara Wenmoth (employed as the project conservator) as being taken Mark Redknap, Berit Mortlock and Martin Dean in 1979. Some of these are now in the Archive, but many are not, and this list may not be entirely accurate. Correspondence with Berit Mortlock suggests that as at least one group of finds could not have been taken by her as she was doing her University exams at the time. Martin Dean has no recollection of taking any material.

Finds described as being taken and still missing are a number of animal bones, ceramics, concretions, leather, wood, stone, miscellaneous and all of the clay pipes. Most of the stone ballast samples that were described as having been taken by Berit up to Ian Morrison in Edinburgh for analysis are present in the Archive, though some are still missing (Mark Redknap may have some of these, see below). All the clay pipes were supposed to have been taken for further analysis and drawing by Martin Dean (along with some animal bone), but he has no recollection of this (though he was interested in clay pipes at the time, so it is possible that he did take them away).

Some finds are described in the 1982 document as being located in the 'room under stairs'. This is believed to be a space in Alan Bax's flat at Fort Bovisand used for storage. Finds of ceramics, concretions, glass, leather, wood, rope, metal, stone and miscellaneous were apparently located here. Some of these finds are now in the Archive, but most are still missing. This was where most of the leather finds which have now been recovered were described as being stored. A box of leather was recovered from the flat and kept in the stores of the Joint Service Sub Aqua Diving Centre (JSSADC) added to the Archive in 2009. A small box of leather was recovered some years ago and taken to Wessex Archaeology. This was added to the Archive in October 2010. It is unknown what happened to the remainder of the material from this storage area.

This room was examined, along with the rest of Alan Bax's flat, in December 2009 but no further Cattewater Wreck finds were located, though some documentary archive material was recovered (see section 2.2 above).

A City Museum listing of the finds in the Archive from 1995 has the iron breech chamber (CW78 450) as being present. This can no longer be found in the City Museum and it is unknown if this was an error in 1995 or if it has been subsequently mislaid. The 1995 list also includes CW78 336 wooden bung as being in the Archive. This can no longer be found, but may be the unnumbered wooden find given the temporary number Temp 6.

Other finds (CW78 201 green stone & CW77 144 Tree nail) are also listed as present in the 1995 list but can also no longer be found.

One mystery has been cleared up. CW78 223 was originally identified as being a horn core point in the Finds Book, but was conserved as being made of horn and is in the 1982 and 1995 listings as such. The find was correctly identified and published in Redknap 1984 as a curved wooden marlinspike (or similar) and is present in the Archive.

3.3 Recording artefacts on City Museum database record forms

Whilst repackaging was taking place, the finds were recorded on the inputting forms used by the City Museum prior to their entry into their Micromusée database. The forms for ballast stone finds were fully filled in, including taking measurements, but this took too long and would have multiplied by three the amount of time set aside for repackaging. As this work had not been included in the work programme the amount of data that could be entered was limited to Object numbers, Identification, Production and Material. However, the opportunity was taken to identify on the forms the contexts for the finds where they were identifiable.

There is no list of find numbers with associated contexts within the documentary archive. Most of the published finds in Redknap (1984) are given with their context, but not all. Some are grouped together with all their associated contexts (e.g. rebuilt Dutch Tripod Pitcher from contexts 4/5 and unstrat).

It was felt that time could efficiently be spent during repackaging to associate finds with their context and add this to the bag labelling and inputting forms.

Contexts for those finds not in Redknap (1984) were looked for initially in the Excavation Finds Book. This sometimes had an associated context, but often this consisted of only U/S or 'in ballast' (presumably contexts 4/5). From the Finds Book it was usually possible to work out the dive where a find was recovered. Again the Dive Log sometimes gave a context, but again usually only unstratified or 'in ballast'. Finds recovered in the same dive as published finds could sometimes be given their context by association.

Using this combination of sources a substantial number of finds could be given a context or located within the ballast (context 4/5). A large number of finds were still unable to be given a context and have been left blank in the inputting forms and finds packaging until more time can be spent examining the dive logs and associated paperwork.

4.0 Strengthening the archive and consolidating the collection

One of the aims of the Archive Project has been to trace or locate finds and material relevant to the Archive and to re-unite them with the City Museum Archive.

In support of this, interviews have been held with Cynthia Gaskell-Brown, Steve Roue, Dr Richard Merritt, Paul Dart and Peter Holt. Email correspondence has taken place with the original excavation Director, Mark Redknap, his co-director, Berit Mortlock and Martin Dean who conducted the 1976 survey and was part of the excavation team.

A visit to Fort Bovisand took place in early August 2010 with Cynthia Gaskell-Brown, formerly Keeper of Archaeology at the City Museum, who collected together most of the remaining archive from various sources in the early 1980s. The aim of the visit was to try to locate where the keelson had been thrown over the cliff in the early 1980s. Cynthia organised a group to recover the timber in 1983, but only part of the keelson was moved partially up the cliff and left on a shed. This part of the keelson was subsequently recovered by the Archaeological Diving Unit in 1990 and is now in the City Museum Archive. During the visit, the area where the keelson was disposed of was found, but there was no evidence of any further remains of the keelson and it was thought very unlikely that any other wooden finds would remain in this location.

Three wooden finds - CW78 363 Bucket lid (NMM 5292), CW78 336 Plug (NMM 5293) and CW78 312 Parrell ball (NMM 5294) - were sent to the National Maritime Museum in 1979 for conservation (along with some samples for analysis) and never collected:

Attempts are being made by Mark Redknap to see if the NMM can find these items and it is hoped that these objects can still be located.

Mark Redknap has a wooden find, CW78 334, and is trying to prove that it is part of an arrow shaft. He also has a number of ballast samples. These will hopefully be added to the Archive at some point.

Two fragments of wood in the museum archive labelled 'CW Ariadne' have been identified as being part of the keelson (CW73 2). These had been separated and used in drying experiments (Carpenter *et al* 1974).

It is doubtful that many more finds will be located. A note went into the November 2010 newsletter of the International Maritime Archaeology & Shipwreck Society (IMASS) appealing for information on missing parts of the archive, but nothing has resulted from this. Another note will go into the newsletter of the Plymouth and District Archaeological Society but, again, not a great deal is expected to result from it.

4.1 New information for the archive

A direct result of this project has been that the fish remains were sent up to Dr Jennifer Harland at the University of York who identified the remaining bones and estimated the approximate length of the fish they came from (Harland

2010). Dr Harland also sampled some bones in order to measure the ^{13}C and ^{15}N values of the cod bone collagen to identify the approximate region of catch. DNA samples were also taken for analysis. At the present time no results have been received. This work was funded by the City Museum.

5.0 Improvements to the storage of the material collection

Most of the finds are believed to have been repackaged by the City Museum at some point and were present in thin polythene bags in cardboard boxes. Some finds were still in their original fragmenting paper bags, particularly the animal bone. The leather finds recovered from Fort Bovisand in 2009 had mostly been stitched to cardboard backing and wrapped in clingfilm, whilst those with Wessex Archaeology were in an old film box with what may originally have been acid-free tissue.

The clingfilm on the leather was removed in Stage 1 during photography and replaced by inert polythene bags as were the finds from Wessex archaeology.

Those finds that can be have now been repackaged in perforated polythene bags with inert foam backing and support. One rebuilt ceramic vessel (CW77 100+), too large to be placed in a bag, has been left loose in the ceramics box, supported by inert foam. The two small fragments of keelson (CW73 2 Ariadne) have similarly been left loose in their box.

Most of the textiles have been temporarily repackaged by Morwena Stephens between sheets of acid-free tissue and with swages of acid-free tissue being used to reduce creasing. See separate textile conservation report by Morwena Stephens (Cattewater textiles storage improvements).

The animal bone has been repackaged in perforated polythene bags but generally without any support unless they were obviously fragile. Fish remains have been packaged in perforated polythene bags with inert foam support.

The complete composite gun and three woollen textiles are on display in the City Museum Uncovered gallery (CW73 6, CW78 272, CW77 118, CW78 468).

The keelson and the two fragmentary composite guns (CW73 2, CW73 4, CW73 5) remain on open shelving in the Museum Garage Store. An assessment and conservation plan has been produced for these finds (see separate report).

6.0 Identification of conservation/stabilisation requirements

Use has been made of a document in the archive 'Conservation Details', prepared by Barbara Wenmoth probably in 1982.

6.1 Stone

Condition:

Some physical abrasion of edges and corners due to storage without bags or cushioned support. Otherwise good.

Conservation:

none

6.2 Ceramics/Tile/Brick

These materials were desalinated in tap water after excavation to remove soluble salts (insoluble salts were removed using hydrochloric acid) with a final immersion in distilled water.

Condition:

Mostly in good condition. Abrasion for ceramics and tile appear to have been prior to excavation. Most of the erosion to be seen on the brick fragments seems to also to have been pre-excavation, but some surfaces are friable with brick dust in the bag.

No sign of soluble salts crystallising on the surfaces.

Conservation:

Some surface consolidation of brick could be useful if the material is likely to be handled (though they are not from primary contexts and are all post wreck), otherwise none.

6.3 Wood

Conservation treatment in the 1970s consisted of immersion in 4% hydrochloric acid solution, to remove iron staining, followed by washing. 'Dried' in two bath of acetone, for two hours, then consolidated in 10% PolyEthylene Glycol (PEG) 4000 in distilled water and heated at 60°C until only molten wax remained. Removed, washed in IMS and air dried. There are hints that wooden objects from 1976 may have been immersed in a different grade PEG for a longer period. Apparently some (or possibly all) of them were subsequently re-wetted in plastic bags.

CW78 223 was identified at some point as being horn, but is in fact a wooden marlinspike (or similar), and was merely cleaned and acetone dried.

Condition:

Some wood is in fairly good condition, but most are not and run from poor to fragmentary. There is some surface lifting and a lot of shrinkage and

distortion, There is a lot of cracking, both tangential and radial as well as surface. Some objects have split and others that have broken into fragments.

CW78 223 has a large split running most of the length, probably due to how it was originally conserved.

Conservation:

The original conservation treatment given was poor with insufficient time being given for PEG impregnation. It is unknown why acetone was used in an attempt to dry the wood immediately before putting them back into an aqueous solution.

The condition of finds probably relates as much to their original condition prior to excavation as to their poor conservation treatment. Treenail (CW77 145), flat wood (CW78 311) and a peg (CW78 345) are in fairly good condition, whilst a probable bung (CW77 154) is in poor condition with a very fragile surface.

Most appear fairly stable at present. Those that have been broken will mostly not benefit from being repaired due to the shrinkage and distortion.

Some may benefit from application of PEG solution to strengthen the wood surface (e.g. CW77 154? Bung?).

6.4 Leather

In 1978 the leather was immersed in an EDTA solution to remove iron and other salts, then into a bath of 2% hydrochloric acid followed by rinsing. Immersed in two bath of acetone, for one hour, then air dried. During this a leather dressing was applied, based on lanolin.

Condition:

Most of the finds recovered from Fort Bovisand were mounted on card and wrapped in 'clingfilm'. The clingfilm was removed and the finds placed in perforated polythene bags. The card was often stained with the migrating dressing applied to the leather.

The condition of the leather varied greatly and probably reflected variations in condition prior to excavation as much as any subsequent conservation treatment. Some are very dark and stiff with mud still adhering in places (e.g. CW73 21 heel lift) whilst others are quite light in colour, thin and flexible (CW78 382 goatskin codpiece). Some finds had surface cracking with fragile, fraying edges (CW78 382). Some splitting and cracking could be seen, with the separation of the surface layer (e.g. CW344 purse back). The edges around holes were often broken and splitting along the stitch holes (e.g. CW78 367 shoe sole) as a result these were left mounted on the card. In one case the mounting on the card using the stitch holes had resulted in the edge becoming detached (e.g. CW78 252A shoe ?vamp).

Where possible the finds were removed from the backing card, but this was not always possible due to fragility and the following finds were left mounted on card:

CW73 10, CW77 151, CW77 158, CW77 174x4, CW78 252x2, CW78 256,
CW78 296, CW78 300x2, CW78 366, CW78 367, CW78 370x4.

Conservation:

The leather needs specialist attention and remounting. Amanda Sutherland, another experienced object conservator had a look at the finds and came to the same conclusion. As the repackaging and assessment took place right at the end of stage II of the project there has been no time to undertake this assessment.

6.5 Metal

Lead and copper alloy cleaned by electrolysis (lead in sulphuric acid and copper alloy in sodium hydroxide solutions) followed by washing in baths of distilled water. Most of the lead was then impregnated with paraffin wax.

Condition:

Mostly good with no active corrosion.

CW77 173 Brass Pin shaft is mounted on card and looks very fragile.

CW78 259 Lead lump has some active decay. The surface is breaking off and fragmenting with light grey powder underneath. This break up is post repackaging, but may reflect decay started previously as it was not stored in an organic acid-free environment. There may also have been insufficient washing to remove the acid solution used in the electrolysis.

Conservation:

The Brass pin (CW77 173) needs remounting or reboxing. This could be carried out by the City Museum Conservation staff or volunteers.

If the lead lump (CW78 259) is thought worth retaining, then it needs washing in tap water to remove any acids present and then probably surface consolidation or full immersion in Paraloid B72 solution. This could be carried out by the City Museum Conservation staff.

6.6 Glass

Washed and stored in tap water. Iron staining partly removed by immersion in 4% Hydrochloric Acid solution, then washing. Desalinated to remove soluble salts in baths of tap water with a final immersion in distilled water and then acetone dried.

Condition:

The original corrosion surface has mostly been lost, but the find number is written on the cleaned surface, so is not recent. Some original surface, particularly on the inside of the bottle and base of bottle. Some iridescence. No active loss.

Conservation:

None

6.7 Concretions

Mechanically cleaned and stored in tap water or changes of sodium hydroxide solution.

Condition:

One find has broken (or been broken in two). Nail voids can be seen. Some mechanical damage

Conservation:

None

6.8 Textile Conservation assessment and conservation plan

See separate report 'Cattewater textiles storage improvements' by Morwena Stephens

7.0 Swivel Gun and Keelson assessment and conservation plan

7.1 Keelson (CW73 2)

In two main fragments, sawn through the pump seating, with two small much smaller fragments (labelled Ariadne). The larger fragment is labelled as being part of the pump seating & checks/lands for floor timbers. The smaller fragment is labelled being part of pump seating and thickening for the mast step.

The fragments labelled 'CW Ariadne' became detached from the fractured end of the keelson during handling (Carpenter et al 1974) and were subsequently sawn in two and were used for drying experiments.

The oak keelson was stored wet wrapped in polythene at Fort Bovisand and is assumed that it was slow air dried. The larger fragment was thrown off a cliff at Fort Bovisand whilst the smaller fragment is believed to have been used as a step in Fort Bovisand.

Condition:

Larger fragment: dimensions 47x28xca.180cm

One sawn end, the other decayed with soil mixed in with it.

The core seems in fairly sound condition at the sawn end, though most of the surface has radial cracking, some going through to the middle of the core. There are some tangential cracking, following the growth rings. The wood surface is dirty and friable. The colour is mostly a very pale grey, though much darker at the decayed end. This is probably due to bleaching in the sun.

Smaller fragment: dimensions 47x36x81cm

Both ends are sawn.

The core seems in sound condition most of the surface is radially cracked, some of it deep (at one end large cracks go to the core). There is some tangential cracking, across the grain. The wood surface is dirty and friable,

with a few small fragments detached. The colour is mostly a very pale grey, probably due to bleaching in the sun.

Conservation:

The wood needs to be cleaned to remove dirt and soil (estimated 2 days).

A high molecular weight PEG solution should be applied to the surface and then heated in. This will help to consolidate and strengthen the surface and prevent accidental surface loss (estimate 2 days). Some further gap-filling and consolidation with wax may be necessary at the degraded ends of the larger fragment (estimate 1-2 days)

This work could be carried out by the City Museum Conservation staff.

The two small Ariadne fragments should be kept as part of the study collection, with no further conservation work being recommended at present.

7.2 Cattewater Wreck gun fragments

Both guns are dry, and packed into light wooden boxes, padded with polystyrene sheeting and poly bags filled with foam rubber chips.

The following is mostly taken from Spriggs 2004 with additions by the Project Manager (a trained conservator)..

Gun A Condition

The remains of the iron barrel are separated from the wooden bed. Part of the barrel is still intact and completely filled with marine concretion. Much of it has broken up into fragments (consisting of a lot of large flakes with some coherent core).

The barrel and concretion appear to have been cut through with a mechanical saw or grinder and one end, possibly for analysis

The wooden bed is mostly in good condition with a few large cracks and is fraying at the edges in places.

Gun A Conservation

As the barrel is now completely separated from the wooden bed, they should be stored separately. In the short-term, the iron barrel remains should be repacked in dry storage conditions (below 15%RH using silica gel).

There is potential for display of the wooden bed, but not the barrel. The bed is otherwise in good condition and could be used to demonstrate the wood-working techniques used in the fabrication of a gun bed.

The bed would need some surface cleaning of iron corrosion products and also some gap-filling of cracks (estimated 1-2 days). A high molecular weight PEG solution should be applied to the surface and then heated in. This will help to consolidate and strengthen the surface and prevent accidental surface loss (estimate 2 days).

This work could be carried out by the City Museum Conservation staff.

In the long-term the barrel needs to undergo desalination in a conservation laboratory using baths of sodium hydroxide or sodium carbonate as the corrosion inhibitor. The wash solution needs the chloride levels monitored and the baths changed when the concentration stabilises.

Gun B Condition

More complete than Gun A, with the iron barrel still in position on the wooden bed, and with the remains of two iron staples (bands) holding the barrel in position. One end of the gun is eroded away. The ironwork is still actively corroding and there are many loose flakes of corrosion that have become dislodged from the surface.

Gun B Conservation

The barrel is not detached from the bed and would cause too much damage to try and separate them. The whole object should be stored in a dry environment (below 15%RH using silica gel) to slow the rate of corrosion. The wood is so heavily impregnated with iron corrosion products that it will probably remain stable at reduced humidities.

The many loose flakes of corrosion be refixed into position using a reversible adhesive where the original position of the fragments can be identified (estimate 1 day). This work could be carried out by the City Museum Conservation staff.

No further treatment is recommended and this gun should be kept as a 'research' object.

Gun C Condition

This is the most complete and the best preserved of the three guns and is on display in alkaline sulphite solution. This gun has not been examined and no conservation treatment is suggested.

7.3 Conclusion

The cleaning and consolidation of the Gun A bed along with the refixing of the iron flakes to Gun B could be carried out by the City Museum Conservation staff. Estimated total time for this work (including recording and photography) 8-10 days.

A professional conservation laboratory needs to be commissioned to provide a more detailed plan and quote for conservation work on the barrel of Gun A.

8.0 Listing of documents produced during this stage

Project_5439_MAIN_Material_Audit.doc

Project_5439_MAIN_Material_archive_index.xls

Artefacts recorded on City Museum inputting database record forms

9.0 References

Carpenter, A.C., Ellis, K.H. & McKee, J.E.G. 1974 *Interim Report on the Wreck Discovered in the Cattewater, Plymouth on 20 June 1973* NMM Maritime Monographs and Reports 13.

Plymouth City Museum 1995 Cattewater Wreck: PLYMG : AR1985.24 Archive Listing

Redknap, M. 1984 *The Cattewater Wreck: the investigation of an armed vessel of the early 16th century* National Maritime Museum Archaeology Series 8/British Archaeological Reports - British Series 131.

Spriggs, J. 2004 'Cattewater Wreck Guns – options for conservation' unpublished report for Plymouth City Museum and Art Gallery

Wenmoth, B. 1982 'Report on Cattewater Material 1973-1079' Unpublished report in Cattewater Wreck Archive

Harland, J. 2010 'Cattewater Wreck Fish Analysis' Unpublished report for Plymouth City Museum and Art Gallery

Martin Read
6th April 2011