

Cattewater Wreck Archive Project (5439 MAIN)

End-of-Project Report

“This report should be lodged in the project archive and presented to the Sponsor. Where key lessons learned may assist in the planning of future projects, they should be circulated more widely.”

1.0. Introduction

This Final Report is based on the structure given in the English Heritage publication ‘Management of Research Projects in the Historic Environment: The MoRPHE Project Manager’s Guide’ (English Heritage, 2006, p.49). It has been amended, as directed, to include summaries of the previously submitted Interim Reports.

The Final Report should also be read in association with the shorter ‘Summary Statement’ and ‘Closing Statement’ submissions.

2.0 Project Summary

The Cattewater Wreck Archive Project aimed 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 was grant funded by 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.

The original Project Design set out two phases, or stages, of work:

Stage I of the Project, involving archive consolidation of the documentary archive, was due to be completed on 17th September 2010. However, due to an unforeseen conservation issue an official variation was granted until 18 October 2010.

Stage II 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. By email agreement, this completion date was re-arranged to 15th April 2011.

As a result of successful Project outcomes at Stages I and II, a third Stage was proposed. This was subject to an additional formal variation request; this was approved by email prior to the delayed exchange of official paperwork in early June 2011.

Stage III was an extension to the Project Design. It was concerned with incorporating new material - additional to the original Cattewater Archive and generated as a given objective of the Project. There was a delay in commencing Stage III due to other professional commitments and priorities impacting on key members of the Project team. Stage III was completed by 15th June 2011.

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The following Stage summaries are collated from the 'Interim Reports', submitted to English Heritage during the Project. They have been re-edited here, but there is some repetition of information where that information is relevant to the successive Stages.

2.1. Stage I: Archive Consolidation

2.1.1. Sort, Order and Re-file the Documentary Archive

The plans/sections were unrolled and flattened prior to plan chest storage. Several plans had small self adhesive labels attached, indicating the positions of small finds on the site, some of which were becoming detached. This was an unforeseen issue and not taken into consideration in the Project Design.

The assessment and management of the problem was necessarily scheduled to fit in with the workload of the City Museum Conservator (Paper), so as to enable the stability of a small number of plans to be ensured. The work was done in addition to, and at no cost to the Project. Four of the plans, showing find distributions, had a large number of these labels and were therefore transferred into large Melinex sleeves on inert boards.

The importance of the relationship of the sticker positions to other information on these four plans was discussed with several maritime archaeologists. The need to create a 'moment-in-time' photographic record of the plans, pending any longer term conservation was agreed. The opportunity was taken, during the photography of the artefacts, for the four most unstable plans to be photographed (totalling sixty-five photographs). For the purpose of photography, these plans were given numbers starting with '2001' to ensure that they are certain to be distinguished from finds numbers. This extra photography was funded by the City Museum.

In addition to the unplanned, remedial conservation work associated with the archiving of the plans and drawings, various minor preventative conservation works were undertaken on the Documentary Archive. These minor works took place during the sorting, ordering and re-storage, and generally involved the removal of staples, pins and cellotape from documents. Selective photocopying of documents took place to ensure that the relative positions of documents attached by cellotape were recorded.

The Documentary Archive has been repackaged in archival quality folders and boxes in accordance with Plymouth City Museum & Art Gallery's 'Deposition of Archaeological Archives, 2007'. The repackaging of the *original* Archive used seven boxes and fifty-two folders.

2.1.2. Documentary Archive Index

The listing and indexing of the *original* documentary archive was completed. It included 249 items separately listed, including a Masters dissertation, several books/booklets and over 1096 pages of documents and correspondence.

Some documents were added to the Archive from associated files in the City Museum. These include correspondence relating to a Cattewater Wreck model / diorama donated by Mark Redknap, and correspondence relating to research into the finds by Andrea Hamel for her 2007 University of Southampton Masters dissertation 'Life at Sea' (a copy of which has been included in the Archive).

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Some more recent and still current papers relating to the ongoing conservation and display of the Cattewater gun (circa 2002-9) are still present in the City Museum files. In Museum terms, these constitute an object history file and were therefore not considered in the Project Design. However, it is still the Museum's intention to add them into the Archive structure at a later date.

2.1.3. Archive Audits

An audit of the Documentary Archive was carried out. Items identified as missing include drawings and some sections.

A draft audit was also carried out on the Material Archive (required during Stage II of the Project). Excluded from this was the concretion removed during conservation and subsequently passed on to the City Museum by English Heritage.

It was noted that the artefacts from the 1973 excavation had been given individual find numbers, but the subsequent excavations restarted the sequence from 1, leading to potential numbering confusion. Another problem identified was that, during the 1977 excavations, many find numbers consist of several finds. This means all the artefacts from a single dive, frequently of different material type, have been given the same finds number. A survey of the wreck completed in 1976 used unique finds numbers, and there is a note at the top of the 1978 finds list saying that each object was to be given a unique number. However, even in 1978, several artefacts of the same material (generally ceramics) were given the same finds number – and were only later recognised to be different artefacts.

The process of inking finds numbers onto artefacts also seems to have taken place at a later date, and several have the wrong year.

The original finds numbers recorded in the Cattewater Archive are, therefore, to some extent misleading. The finds number can sometimes relate to up to five fragments (particularly for ceramics). There are instances where only one or two of these fragments are now present in the Material Archive.

2.1.4. Artefact Records and Digital Photographs

All existing Cattewater artefacts were recorded on the City Museum's database record forms, in preparation for later transfer of the data to the Museum's Micromusée database. It is the City Museum's intention that this electronic database will eventually become web accessible, with images attached, in conjunction with ongoing work on other Museum collections.

Digital photograph/s were taken of each item. These were captured and formatted to pre-agreed City Museum standards, to fit in with their database and catalogue / recording system. In total, 744 photographs were taken of 150 artefacts and, in some cases, groups of artefacts. For example, where reconstructions of ceramics or sherds from the same ceramic are grouped together and stored in one finds bag, these were photographed together.

The leather finds recovered from Fort Bovisand in 2009 had mostly been stitched to cardboard backing and wrapped in Clingfilm. The Clingfilm was removed during photography – the items re-stored in inert polythene bags. The subsequent leather finds

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from Wessex Archaeology were found and delivered to the City Museum stored together in a box, separated by paper. These objects too were re-bagged and re-boxed. (Please see: 2.2.6. *Improvements to Storage - Material Archive*, below).

In consultation with English Heritage it was agreed that it was not necessary to photograph bulk environmental samples (i.e. animal bones).

For the purpose of photography, unlabelled finds were given numbers starting with 1001 – to ensure that they are certain to be distinguished from actual find numbers.

2.1.5. Feature / Context Descriptions

- A context record form was completed for eleven contexts (using a pro-forma kindly supplied by Mr Kevin Camidge). This was added to the Archive.
- Plan matrix and overall site plan: Site plans from the 1970s surveys and excavations and more recent geophysical surveys have been added to a GIS assembled by Mr Peter Holt. This has included some corrections to the original plans and correct orientation. This data has already been made publicly available initially via the 3H Consulting website.
<http://www.3hconsulting.com/SitesCattewater.htm>
- A Harris matrix was completed showing the interrelationship between contexts and added to the Archive (see Harris_Matrix.doc).

2.1.6. Strengthening and Consolidating the Archive

One of the aims of the Project was to trace or locate items relevant to the Archive - ideally to re-unite such items with the City Museum's Cattewater Archive holdings.

In support of this aim, interviews were held with Cynthia Gaskell-Brown, Steve Roue, Dr Richard Merritt, Paul Dart and Peter Holt. Email correspondence was instigated with the original excavation Director, Mark Redknapp, 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. Cynthia was responsible for collecting together most of the surviving 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 - again in the early 1980s.

Cynthia had organised a group to recover the timber in 1983, but only a part of the keelson was salvaged, moved partially up the cliff and left on a shed. This section of the keelson was subsequently recovered by the Archaeological Diving Unit in 1990, and is now in the archive in the City Museum. The area where the keelson was disposed was re-located, but there was no evidence of any further remains. Subsequently, reliable, verbal information was received that the lost elements of the keelson were broken up and burnt on a fire.

Two fragments of wood in the Museum Archive, labelled 'CW Ariadne', have now been identified as being part of the keelson. These had been separated and used in drying experiments (documented in Carpenter *et al* 1974).

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The conservation tanks, containing most of the structural timbers recovered during the excavations, which had stood outside the conservation laboratory in Fort Bovisand, are now known to have been broken up in the early 1980s, with the timbers sadly disposed of.

It has not been possible to confirm if Alan Bax was wholly correct in reportedly saying that the remaining missing elements of the archive were all thrown away. Boxes of artefacts were left in unsecured areas of Fort Bovisand, and it seems likely that some material may have been taken by visiting divers as souvenirs.

Boxes of artefacts were also kept in Alan Bax's flat in Fort Bovisand. Some of this material has now been recovered, notably the box of leather from Joint Service Sub Aqua Diving Centre (JSSADC), added to the Museum archive in 2009. A second box of leather finds was salvaged by Wessex Archaeology whilst surveying the Fort.

It is unknown what happened to the remainder of the missing finds.

2.1.7. Recovered Material

A small box of leather, containing three finds (CW78 344 fragment, CW78 382 x4 and CW78 371 fragment), was recently added to the archive in the City Museum. This was in fact recovered by Messrs. Peter Holt and Simon Adey-Davies approximately five years ago - and taken away to Wessex Archaeology. The box was eventually passed to the City Museum by Wessex Archaeology (together with some unrelated non-Cattewater Wreck documents from Alan Bax's personal archive).

All relocated leather finds were received in time to be included in Stage I of the Project and photographed.

Mark Redknap kindly forwarded a batch of documentary material to the City Museum from his files. This included copies of original reports and correspondence relating to guns, gunpowder, textiles, leather, animal bone, pottery, wood and timber samples, Carbon 14 dating, dendrochronology, geology, biological remains, and matters of conservation. In total there were approximately 300 sheets of paper and, apart from a copy of the Finds Register and selected Cattewater Wreck Committee minutes, all of this material was previously absent from the Archive.

Peter Holt 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) submitted ten photographs, assumed to be of the 1976 survey.

Chris Preece, a member of the original project, had a substantial number of slides relating to the diving on the site. These are still in the process of being copied and will, in due course, be added to the Archive.

NB. The formal inclusion of recovered Documentary Archive material was addressed at Stage III.

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2.1.8. Still Missing Archive

A notice was published in the November 2010 newsletter of the International Maritime Archaeology & Shipwreck Society (IMASS) appealing for information on missing parts of the Archive. A similar appeal was included in Project publicity sent to local media, and also distributed via the Plymouth and District Archaeological Society. No responses have been forthcoming.

It should be noted that Mark Redknapp retains a file of his original pencil drawings of finds. He also has plate negatives and bromide prints of drawings. The drawings include unpublished material on concretions, the leather (with annotated notes on stitch spacing etc), and drawings of the breech chamber (CW78 SF450). Mark Redknapp also 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.

It is understood that Mr Redknapp's intention is to publish a new edition of his Cattewater Wreck report. It is his intention to donate / transfer everything to the City Museum Archive, in due course. The archive he retains is, at present, stored in his office at the National Museum Cardiff, Cathays Park, Cardiff. There is one box file (BW prints and bromides) and two storage boxes (letters, related research files, drawings, samples). The B/W negatives are in one negative ring binder. There are thirty-one hanging files containing 35mm colour slides, stored in a filing cabinet.

The following historic leads have so far proved negative:

- Three wooden items - 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 (NMM) in 1979 for conservation, along with some samples for analysis. The objects were apparently conserved but never collected. There is a chance these objects might still be located and Mark Redknapp kindly offered to follow this up.
- Documentary evidence suggests that a box of clay pipes were taken by Martin Dean in 1979, for further examination and reporting - but were never returned. He now has no recollection of this and has been unable to locate such material.

2.2. Stage II: Archive Consolidation - Material Collection

2.2.1. Material Archive Audit

Issues and problems associated with finds numbering have already been summarised above (see: 2.1.3. Archive Audits), but are relevant here too. The Project has enabled the following to be noted and put on record.

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.

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The following finds numbers are void:

- CW77 132, CW77 138 & CW77 419 have no finds associated
- CW78 473 is a duplicate of CW73 6 (complete composite gun)
- CW78 197 was a modern leaf
- CW78 445 was an aluminium strip
- 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 unstratified wooden peg). Finds No. 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.

As outlined previously, (see 2.1.3. *Archive Audit*, above), another problem is that, during the 1977 excavations, many Finds Numbers consist of several different finds. Thus, CW77 133 is described in the Finds Book as a 'mixed box' containing tile, ceramic, bone, glass and luting.

Also, 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). Between them, two samples of ballast stone (CW78 422 and CW78 423) consisted of eleven fragments of different stone types (limestone, granite, flint, etc).

The process of marking finds certainly appeared to have taken place at a later date. There is a note in Wenmoth (1982) stating that "some sherds are marked 77 when they should be 78". A few sherds are also marked CW77 when they should be CW76.

2.2.2. Finds Numbers

Due to the vagaries of the finds numbering systems, the true number of individual finds originally excavated will 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, below). If the numbers of *Environmental Samples* are added (see Table 2), this would give a total of 579 finds. *Sacrificial Samples* (see Table 3) of larger structural timbers were also given finds numbers.

The figure of 579 should therefore be considered as the minimum number of finds. However, due to several cases of different finds of the same material being given the same finds number, the actual number of individual finds is likely to have been a little higher. An examination of the ceramics in the Cattewater Archive provides at least six 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 survive in the Cattewater Archive. Approximately 18% were disposed of during or after the excavation by the excavators with approximately 40% subsequently missing or lost. These figures conceal the fact

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

Table 1: Audit of Cattewater Wreck Material Archive

Material Finds	Target Number	Disposed	Missing	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	43-45
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
Miscellaneous	4	0	4	0
TOTALS	455	108	170-172	174-181

Table 2: Environmental Samples

	Target Number	Disposed	Missing	In Museum
Bone	104	0	37-42	62-67
Shell	20	0	20	0
TOTAL	124	0	57-62	62-67

Table 3: Sacrificial Samples

	Target Number
Stone	1
Gunpowder	1
Miscellaneous	4
Wood samples	17

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2.2.3. Problems of Artefact identification

Most material finds in the Archive were 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. The labels were mostly decipherable under a hand lens or with the use of UV light. Using a combination of a report which identified the geology of these samples, coupled to the expertise City Museum natural history curators, it was possible to confidently identify the ballast fragments.

Three concretions were found in the Cattewater 'stone' box, without labels. These have sadly proved impossible to identify.

A cardboard box of wooden finds included nine objects with reliable finds numbers and thirty-three unlabelled objects or fragments in bags without numbers and/or just lying loose. Much extra, un-programmed, time was required to reconstruct individual objects from these fragments (using their colour, decay, shape and breaks) and eventually they were grouped into just twenty objects. Six of these were identified (or probably identified) from published drawings and a list of wood which had been sampled for wood identification (i.e. several had rectangular sections missing). One fragment was found to be part of an existing labelled find (CW77 145 treenail).

The remaining thirteen wooden finds include several tentatively identified as bungs and treenails. It is hoped that it may be possible to better identify these in the future from a combination of the Finds Book and artefact drawings - but, at present, the Archive lacks any drawings of wooden artefacts.

A plastic bag of rope fragments labelled '360', recovered with the leather from Fort Bovisand and added to the archive in 2009, could not be found in the Finds Book. However, this has been tentatively identified as CW78 260.

2.2.4. Missing Artefacts

There are estimated to be between 227 and 234 find numbers missing from the Archive held by the City Museum (excluding Samples). This is considered an underestimate of the total loss, given only a proportion of the fragments under a particular finds number in the Finds Book are often now extant in the Archive. This applies, in particular, to ceramics.

There are a number of factors that help explain why material is absent from the Archive - but also why some material believed to be missing is in fact present. The following is a summary:

- 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 this figure also included a large proportion of the concretions (73 out of 112 find numbers). This is believed to have been fairly standard practice at that time.

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- 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 further understood that many rooms / areas at Fort Bovisand were cleared out in the early 1980s. It is on this occasion that items in the casement being used as a conservation laboratory are believed to have been disposed of. The conservation tanks, containing most of the structural timbers, stood outside the conservation laboratory and were dismantled at the same time.
- Some wooden timbers, including part of the keelson are now thought to have been burnt - with the remainder of the keelson thrown over a cliff. Happily a section of this was later recovered by Cynthia Gaskell-Brown and the Archaeological Diving Unit and added to the Archive in the City Museum.
- Large numbers of finds were described in 1982 by Barbara Wenmoth (employed as the project conservator) as having been removed by Mark Redknap, Berit Mortlock and Martin Dean in 1979. Some of these can now be shown to be present in the Archive, but many are not. Of course, Wenmoth's list may not be complete or entirely accurate. Subsequent correspondence with Berit Mortlock suggests that 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 Cattewater 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 excavated clay pipes.
- Most of the stone ballast samples that were described as having been taken by Berit Mortlock up to Ian Morrison in Edinburgh, for analysis, are in fact present in the Archive. Some are missing – though 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. (Martin Dean was researching clay pipes at the time, so there remains the possibility that he did take them for study, but has since forgotten about this).
- Mark Redknap retains 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.
- 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.

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- As previously stated, 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 (by Ginge Crook, Martin Read and Peter Holt) but no further Cattewater Wreck finds were located, though some documentary archive material was recovered and has subsequently been added to the archive by Peter Holt.
- A City Museum listing of the finds in the Archive from 1995 has the iron breech chamber (CW78 450) as being present. This was not found at Project completion but has since (26 July 2011) been located, stored in a 5% Sodium Hydroxide solution in a sealed container. The 1995 list also includes CW78 336 wooden bung as being in the Archive. This can no longer be found, but it may possibly be the unnumbered wooden find given the temporary number 'Temp 6'.
- Two other finds (ref. CW78 201 green stone & CW77 144 Tree nail) are also listed as present in the 1995 list, but can also no longer be found.
- In contrast, some of the wooden objects and a couple of other finds that were described as being disposed of in the Finds Book are actually present in the Archive. For instance, a wooden object found unlabelled at the bottom of the wood box can be fairly confidently identified from the published drawing as CW77 129 - Keg end.
- A find misidentification has also been identified. CW78 223 was originally identified as being a horn core point in the Finds Book. It was conserved as being made of horn, and is listed in the 1982 and 1995 Archive listings as such. However, the find was correctly identified and published in Redknap (1984) as a curved wooden marlinspike (or similar). It is present in the Archive.

2.2.5. Recording Artefacts on City Museum Database Entry Forms

Whilst repackaging of the material archive was taking place, the opportunity was taken to systematically record details on the in-putting forms used by the City Museum and ahead of future data entry into the Micromusée collection database.

Individual entry forms for ballast stone finds were completed in full, including the taking of measurements. Subsequently, and because this work was not included in the Project Design, only basic inventory level information was recorded. (i.e. Object number, Identification, Production and Material). However, the opportunity was taken to identify and record on the datasheet entry forms and the storage bag labels the contexts for the individual finds, where they were identifiable. This will help address the fact there is no full list of find numbers with associated contexts within the documentary archive.

Most, but not all the published finds in Redknap (1984) are given with their context. Some are grouped together with all their associated contexts (e.g. rebuilt Dutch Tripod Pitcher from contexts 4/5 and unstratified). Contexts for those finds not included in Redknap (1984) were sought out from the Excavation Finds Book. This sometimes has

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an associated context, but often this consists of only U/S (unstratified) or 'in ballast' (presumably contexts 4/5). From the Finds Book, it is usually possible to work out the dive on which a find was recovered and relate it to the Dive Log. The Dive Log sometimes gives a context, but again usually only unstratified or 'in ballast'. Finds recovered on the same dive as published finds could sometimes be given their context by association.

By using this combination of sources a substantial number of finds were given a context or located within the ballast (contexts 4/5). However, a significant number of finds could not be easily given a context. Further work examining the Dive Logs and associated paperwork may yield additional results.

2.2.6. Improvements to Storage - Material Archive

Most of the Cattewater Wreck finds are believed to have been re-packed by the City Museum on arrival. The small finds were in thin polythene bags, with all material stored in 1970s cardboard storage 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 I during photography and the leather was re-stored in inert, perforated polythene bags, as were the finds from Wessex archaeology.

All robust small find storage was upgraded; using inert and labelled perforated polythene bags, with inert foam backing inserts to give structure and support. Box storage too was upgraded, using fully non-acidic or acid buffered materials.

One rebuilt ceramic vessel (CW77 100+), too large to be placed in a bag, has been left loose, but well cushioned by inert foam in a finds box. The two small fragments of keelson (CW73 2 'Ariadne') have similarly been stored loose but cushioned in a dedicated box.

The textiles have been *temporarily* repacked by textile conservator Morwena Stephens; placed between sheets of acid-free tissue, with swages of acid-free tissue being used to reduce creasing. Please refer to Morwena Stephens' separate Cattewater textile conservation report "*Cattewater textiles storage improvements*". This was commissioned through the Project. It is appended here, but also submitted in digital format (as PDFs) on the Cattewater Wreck Archive DVD.

The animal bone has been re-packed 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.

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

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The keelson and the two fragmentary composite guns (Refs. CW73 2, CW73 4, CW73 5) remain stored on open shelving in the Museum Garage Store. A condition assessment and conservation proposal has been produced for these finds.

(See: 2.2.8. *Swivel Gun and Keelson - Assessment and Conservation Plan*, below).

2.2.7. Condition Checks & Future Conservation Proposals

In support of the following condition and conservation assessments, reference was made to the document 'Conservation Details' prepared by Barbara Wenmoth - probably in 1982. This document is in the Documentary Archive.

- **Stone**

Condition: Some physical abrasion of edges and corners due to storage without bags or cushioned support; otherwise good.

Future Conservation: None required.

- **Ceramics/Tile/Brick**

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

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 original storage bag. No sign of soluble salts crystallising on the surfaces.

Future 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 no conservation is necessary.

- **Wood**

Conservation treatment in the 1970s consisted of immersion in 4% hydrochloric acid solution, to remove iron staining, followed by washing. 'Dried' in two baths 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.

Object 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: Only some wood is in fairly good condition. Most items are not – with conditions ranging from poor to fragmentary. There is some surface lifting and a lot of shrinkage and distortion, There is a lot of cracking, 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.

Future Conservation: The original conservation treatment given was poor, with insufficient time being given for PEG impregnation. It is unknown why acetone was

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used in an attempt to dry the wood immediately before putting items 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.

Specifically: 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. Otherwise, most items appear fairly stable at present. Those that have been broken will generally not benefit from being repaired due to the shrinkage and distortion.

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

○ **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 the process a lanolin based leather dressing was applied.

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 mounting card was often stained with the dressing applied to the leather having migrated. The condition of the leather varies greatly and probably reflects variations in condition prior to excavation, as much as any subsequent conservation treatment.

Some items 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 stitch holes were often broken and splitting (e.g. CW78 367 shoe sole) - as a result these were left mounted on the card. In one case (CW78 252A shoe ?vamp) the mounting on the card used the stitch holes and this has resulted in the edge becoming detached.

Where possible the leather finds were carefully removed from the backing card, but this was not always possible due to fragility. 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.

Future Conservation: The leather needs the attention of a specialist conservator - and remounting. (Amanda Sutherland, another experienced object conservator, also looked at the finds and came to the same conclusion). This specialist work fell beyond the remit of the existing Project; the City Museum has provisionally approached a leather specialist with a view to prioritising this specialist assessment.

○ **Metal**

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

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Condition: Mostly good with most having no active corrosion.

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

○ **Glass**

Washed and stored in tap water. Iron staining partly removed by immersion in 4% Hydrochloric Acid solution, then washing. De-salinated 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 finds 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.

Future Conservation: None required

○ **Concretions**

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

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

Conservation: None required.

○ **Textiles**

Please see separate digital report:

“Cattewater textiles storage improvements”, by Morwena Stephens.

This was commissioned through the Project. It is appended herewith, but also submitted in digital format (as PDFs) on the Cattewater Wreck Archive DVD.

2.2.8. Keelson and Swivel Guns - Assessment and Conservation Plan

Keelson (CW73 2)

Consisting the two main / part sections, sawn through the pump seating
- with two much smaller fragments (labelled 'Ariadne').

The larger section is labelled as being part of the pump seating & checks/lands for floor timbers. The smaller section is labelled as being part of pump seating and thickening for

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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 surviving section was thrown off a cliff at Fort Bovisand. The smaller surviving section was used for some time as a Portacabin step at Fort Bovisand and a wiring clip is still attached.

Condition:

Larger section: dimensions 47cm x 28cm x ca.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 is 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 section: dimensions 47cm x 36cm x 81cm

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 2-3 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 would probably be better carried out by a specialist conservator, ideally with the support of the City Museum Conservation staff.

The two small 'Ariadne' fragments should be kept as part of the study collection or, possibly, sacrificed for experimental work - with no further conservation work being recommended at present.

Cattewater Wreck Gun Fragments

Both fragmentary guns are dry, and packed into light wooden boxes, padded with polystyrene sheeting and polythene bags filled with foam rubber chips. These are Guns A & B below.

The complete gun is currently displayed wet in a passivating solution. This is Gun C (CW73 6) below.

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

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Condition:

Gun A

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 the barrel 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 at 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 B

More complete than Gun A, with the iron barrel still in position on the wooden bed, and with the remains of two iron straps (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 C (CW73 6)

This is the most complete and the best preserved of the three guns. It remained stored in weakening sodium hydroxide solution – slowly diluted with rainwater and occasionally topped up with tap water until 2008. It underwent surface cleaning prior to gallery display in late 2008, in a tank containing an alkaline sulphite solution. The display solution is occasionally changed.

Conservation:

Gun A

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 would probably be better carried out by a specialist conservator, ideally with the support of the City Museum Conservation staff.

In the long-term, the barrel needs to undergo de-salination in a conservation laboratory, using baths of sodium hydroxide or sodium bicarbonate as the corrosion inhibitor. The wash solution needs the chloride levels monitored and the baths changed when the concentration stabilises. This work would need to be carried out by a specialist conservator.

Gun B

The barrel is not detached from the bed and it would cause too much damage to try and separate them. The whole object should be stored in a dry environment (below 15%RH

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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 should be re-fixed into position using a reversible adhesive where the original position of the fragments can be identified (estimate 1-2 days). This work could possibly 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 (CW73 6)

This gun was not examined and assessed as a part of this Project. No conservation treatment is suggested.

Guns A & B - Summary Conservation Conclusion:

The cleaning and consolidation of the Gun A bed along with the re-fixing of the iron flakes to Gun B could possibly be largely carried out by City Museum Conservation staff. Estimated total time for this work (including recording and photography) is 8-12 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. It might prove more practical to also seek quotes for the other conservation works recommended here for these fragmentary guns.

2.3. Stage III: Documentary Archive - Incorporating New Material

One of the aims of the Archive Project was to trace and/or locate items relevant to the Archive, ideally re-uniting them with the Cattewater Wreck Archive held at the City Museum.

New material was received from the archives of some of those involved in the original survey and excavation: Mark Redknap, Berit Mortlock, Martin Dean and Alan Bax and also Austin C. Carpenter. This includes correspondence and reports, drawings, photographic negatives and prints and digitised photographs.

2.3.1. New Documentary Archive Audit

All new material was fully assessed and rationalised prior to incorporation and indexing in the Archive. The following clarifies the process:

Mark Redknap

Included documents already present in the Archive. In total, eighteen pages of duplicate documents and correspondence were disposed of. This included a few copies of letters that were themselves duplicated, presumably whilst being copied by Mark Redknap. These second copies were not retained.

Redknap's copies of Cattewater Wreck Committee (CWC) Minutes were duplicates of originals retained in the Archive by CWC member James Barber. However, some copies of CWC meeting agendas were not present in the Archive. These were retained and incorporated.

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The Finds Register papers, though duplicate copies of those already present in the Archive have added written comments - presumably by Mark Redknap. These have all been retained.

Alan Bax

Some digital images were of photographic prints, drawings and plans represented in the Archive. These were digitised by Peter Holt and added to a CD with digitised photographs from the Berit Mortlock archive (the originals having been returned to Berit Mortlock). All this digital material has been retained in the Archive.

2.3.2. New Documentary Archive Indexing

The following Archive material received during the Project has been indexed and incorporated into the present Archive.

Mark Redknap archive material (totalling 259 pages) - incorporated into archive folders dealing with the following:

- Cattewater Wreck Committee Minutes 1974-9.
- Cattewater Wreck: Excavation and Publication Correspondence 1978-1985.
- Cattewater Wreck: Interim Reports 1976-8.
- Cattewater Wreck: Specialist Reports and Correspondence 1976-85 relating to Guns, Textiles, C14 dating, Dendrochronology, Samples, Biological remains, Conservation, Geology, Leather, Pottery, Wood, 1973 Timber, Gunpowder.
- Cattewater Wreck: Finds Lists 1976-1978.
- CD 1: Cattewater Images. 20 digitised photographs, including those of diving and excavation, timbers and small finds.

Alan Bax archive material - incorporated into archive folders dealing with the following:

- Cattewater Wreck: Photos. Eighteen prints including diving and excavation operations, drawings of finds, site plans and section. Four film negatives of plans.
- Drawing of swivel guns by James C. Thorn, Ancient Monuments Laboratory: Added to the rest of the Cattewater Archive drawings.
- CD 2: Cattewater Images. Eleven digitised photographs, including diving and excavation operations, drawings of finds and site plan.

Berit Mortlock archive material - incorporated into archive folders dealing with the following:

- CD 2: Cattewater Images. Sixty-four digitised photographs, including those of Fort Bovisand, Plymouth Sound and Cattewater, diving and excavation operations, timbers and personnel.

Martin Dean archive material - incorporated into archive folders dealing with the following:

- CD 3: Cattewater Images. Ten digitised photographs, including diving and personnel.

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Austin C. Carpenter archive material - incorporated into archive folders dealing with the following:

- Digital Tape: Containing Cattewater Wreck swivel gun reconstruction film and slides. Digitised by the South West Film and Television Archive in 2007 for Martin Read.

2.3.3. Cattewater Gun (Gun C / CW73 6)

As previously noted, (see: 2.1.2. *Documentary Archive Index*) documentation and notes relating to the more recent conservation and display of the Cattewater gun (2002-9) constitute a Museum Object History File, and have yet to be fully included in the formal Archive. These files are current and ongoing. This is post-publication material relating to Museum matters and, as such, it is not part of the primary Archive. It has been incorporated into the Archive and the folders indexed but a full listing will need to be added at a later date.

2.4. Project Annexes

2.4.1. Listing of Main Documents Produced

The electronic / digital material generated during Stages I, II and III have been included on the Project Archive DVD submitted to the Archaeological Data Service (ADS), York* and the National Monument Record (NMR), Swindon – as specified. An additional copy has been requested by English Heritage. (To be submitted under separate cover). The Digital archive includes the following key documents:

- Project_5439_MAIN_Documentary_Audit.doc
- Project_5439_MAIN_Documentary_archive_index.xls
- Project_5439_MAIN_Harris Matrix.doc
- Project_5439_MAIN_Material_Audit.doc
- Project_5439_MAIN_Material_archive_index.xls
- Digital photographs

** ADS have subsequently confirmed that the Cattewater Wreck Archive, material forwarded to them in digital format, fully meets their archiving standards and requirements.*

2.4.2. Materials Used

The following list summarises the principal conservation storage and other 'storage' materials used in support of the Project. Consumables like sealable polythene bags and acid free tissue have not been included. (See also 2.1.1. for materials used at Stage I).

- 12 buffered object storage boxes (three sizes)
- 10 archive boxes and 62 folders
- 4 Nicholas Hunter polyester sleeves (for photographic negatives)
- 2 Nicholas Hunter polyester wallets (for small photographic prints)
- 12 Nicholas Hunter polyester wallets (for larger photographic prints)
- 4 DVDs & covers (for copies of the digital archive to be sent to ADS, NMR, one to be retained in the Archive - and including additional one for English Heritage)
- 1 CD and 3 covers (for digital photographic images, 2 CDs being donated without covers) - using archival polypropylene CD cases

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2.4.3. Still Missing Archive - Latest

The second interim report detailed elements of the Archive, such as the finds, which are still missing (see 2.2.4. *Missing Artefacts*). Most are now assumed lost.

Three wooden finds were sent to the National Maritime Museum (NMM) in 1979 for conservation and never collected. Mark Redknap offered to check further with the NMM, and it is hoped that these objects may still be re-located. No further reports have been received.

Mark Redknap has retained a wooden find, CW78 334, some wood samples and a number of ballast samples. He also has a number of photographs and slides and the originals of the documentary material that was copied and added to the Archive. This material will hopefully be added to the Archive at some point in the future. (See: 2.1.8. *Still Missing Archive* and 2.2.4. *Missing Artefacts*).

Chris Preece, a member of the original excavation team, has a substantial number of slides relating to the diving carried out on the site and of finds such as the keelson. We are advised that these are at present still being copied - prior to being added to the Archive.

2.4.4. New Information – Fish Bone Analysis

This new work was catalysed by the Cattewater Wreck Archive Project. The fish remains were sent up to Dr Jennifer Harland, Centre for Human Paleoecology, 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 ¹³C and ¹⁵N values of the cod bone collagen to identify the approximate region of catch. DNA samples were also taken for analysis. At the present time, results are still pending. This work was funded by the City Museum.

2.4.5. 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 1973-1979' Unpublished report in Cattewater Wreck Archive
- Harland, J. 2010 'Cattewater Wreck Fish Analysis' Unpublished report for Plymouth City Museum and Art Gallery

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3.0. Location of Project Archives

Plymouth City Museum and Art Gallery are the custodians of the main Cattewater Wreck Archive, consisting of both the Material and Documentary Archives)

- Plymouth City Museum and Art Gallery, Drake Circus, Plymouth PL4 8AJ

Copies of the digital archive are lodged with:

- Archaeological Data Service, York
- National Monuments Record, Swindon
- English Heritage

4.0. Project Closure Date

The Project was completed by Wednesday 15 June 2011. This was as per the second formal Project 'variation' dated 7 June 2011. This was received on 26 June 2011.

All agreed work and required outcomes, as covered by the Project Design and/or 'variation' changes to the original Design agreement, have been completed and fully documented.

For ease of reference here, the formal Project start date was 17 August 2010. The delivery of the Project was interrupted by illness, and there were two formal 'variations'. The agreed Project end date was adjusted from 24 November to 24 December and, subsequently, to 15 June 2011.

5.0. Lessons Learned

5.1. Project Design - Clarity of Instructions

The process of Project Design approval was not as clear as it could have been. The process is perhaps more easily understood by archaeological units and professional archaeologists, who perhaps have the benefit of experience, custom and practice. It is less easily picked up and understood by those with less experience of producing documentation for English Heritage.

It was often unclear precisely what English Heritage wanted in the document, and a lot of time was spent trying to work this out. Most of the Licensees for Protected Wreck Sites are not professional archaeologists, and though they may have access to some professional expertise, many might be daunted by the process - and some may give-up on trying to get a project design approved. This may mean that Protected Wrecks will have reduced access to English Heritage project funding compared to land sites.

In summary, the protracted evolution of the Project Design was in part explained by the Client and Project Manager's lack of experience in preparing such proposals. However, it was also affected by changes in personnel at English Heritage - and in one case by a change in an original stated aspiration of English Heritage (i.e. the original intention to use the Cattewater Archive as a model and template for organising other maritime

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archaeological archives was superseded during the Project's evolution (see 5.9. *Contents and Comparisons of Maritime Archaeological Archives*).

An occasional lack of clarity or understanding concerning the content requirements for certain sections of the Project Design remained confusing up to and after submission: e.g. the need to identify distinctive work tasks, even where these tasks were proposed to be completed by the same person - coupled to the fact that, although the same person was carrying out different tasks involving different skills, the hourly rate of payment had to apply across all tasks.

It may have been advantageous for the City Museum and the intended Project Manager to have met together, formally, with English Heritage representatives at the outset. This may have helped in better understanding the shared aims and objectives of the Project, and to clarify the Project Design requirements.

5.2. Project Timescales

It is probably fair to say that the time envisaged to complete certain tasks was more prone to underestimate than over estimate. Even with the experience of part implementing a particular phase of work, it was not always the case that the next similar batch of material would take the same and/or less time. Invariably, there were specific and often unforeseen problems.

Several lessons have been learnt during this Project on the value of taking much greater care in discussing and pre-planning work loads and better assessing and estimating the likely time needed to carry out archival work.

In order to successfully deliver this Project, it could be said that we have been over dependant upon the enhanced goodwill and commitment of all Project partners. The Project has certainly benefited from the shared ownership of the Project Design and a mutual desire to see the agreed outcomes effectively delivered.

5.2.1 A Better Understanding

Fifteen days were set aside for Documentary Archive consolidation, including repackaging, audit and indexing. The time estimation for the repackaging and auditing was a little low, but not by more than a few days. What had not been anticipated and estimated for was the need to better understand the archive - both to enable indexing to take place, but also to help in the location of missing elements. Almost all of the documentary archive was read thoroughly, particularly the reports and correspondence, which took quite a few extra days to complete (though the exact amount was not recorded as it was spread between carrying out other work).

The estimates to repackage the material collection of twelve days was fairly accurate, though extra time was spent putting together unidentified fragments of wooden finds and in attempts to identify these. The stone samples also took a couple of extra days to complete.

5.2.2. Large Plan Storage, Conservation & Photography

The Stage I aim was to repackage, audit and index the documentary archive. This was successfully achieved, apart from fully flattening a large number of plans / sections / drawings prior to being stored flat in the City Museum archive plan chest. For the most

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part, and since about 1984, the plans/sections/drawings had been stored, rolled, in cardboard postal tubes. With hindsight, it is perhaps unsurprising that they should have been so resistant to the flattening process. However, we had only expected and planned for the plans to be under boards for about four-weeks.

In the event the plans were being flattened for over three months. The process is continuing – with the plans now transferred to plan chest storage.

In addition, several plans were discovered to have small self adhesive labels attached, indicating the positions of small finds on the site. Some of these labels proved to be detaching. At short notice, arrangements were made to photograph just four of the plans - the four with the largest number of these labels. This work was not originally planned or programmed. The flattened plans were then transferred into large Melinex sleeves supported on inert boards for temporary storage pending further specialist attention.

On reflection, we should have allowed more time to unfold and study all the plans ahead of developing a simple number based estimate for the listing, documenting and re-storage process. We now also regret not having planned to include the digital photography of all the Cattewater plans as a part of the original Project Design. We would like to propose prioritising this work should there be a secondary phase.

5.3. Sequence of Work

Another aim of Stage I was for full artefact recording to take place ahead of re-storage. This was to include the preparation of a brief description and confirmation of identification - along with the taking of digital photograph/s of each item. Although this aim was successfully achieved, the photography was necessarily carried out in Stage I to fit in with the workload of the preferred specialist photographer. In retrospect, it would have been better if the photography had taken place after the research and repackaging on the artefacts was completed at Stage II.

In effect, the sequence of work meant that some of the finds (stone and wood) were without find numbers when photographed. Subsequent to the work being carried out in Stage II - unlabelled and unnumbered wooden objects / fragments were re-configured and some identified (see 2.2.3 *Problems of Artefact Identification*, above). Similarly, stone ballast samples were also identified after they had been photographed.

Although a revised sequence of work may have been desirable - there were compensating benefits and efficiency gains through the engaging of our preferred, experienced photographer.

5.4. Un-planned Work - Material Archive Data Entry Forms

A task that had not been included in the original Project estimates was the need to complete the inputting forms used by the City Museum. This is in order to facilitate the subsequent entry of collection data onto the Museum's Micromusée database. In consultation with all partners, it was helpfully agreed that reconstructed / grouped ceramics and bulk animal bones only needed one form per group, rather than a separate form for each find number. In total, 208 data entry forms were completed.

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This form filling added two to three days to the total project time needed. It has been estimated (based on a trial with stone objects) that to complete a form for all these group finds, complete with measurements, collection records, bibliographic references, etc., would have taken an additional nine days – and even longer had they been treated individually.

The fact that this component was unplanned and un-programmed highlights a weakness in the depth and detail of early discussions between the City Museum and the Project Manager.

Although the Project has successfully delivered an up to date electronic inventory of the Find Archive, with photographs, it would have been advantageous to have also allowed for the formal entering of this data onto the Museum database, and the linking of photographic images to these records as an agreed outcome. This work will be included as a part of the City Museum's ongoing collection documentation.

5.5. Strengthening the Archive

An associated Project aim was to strengthen the Archive by tracing or locating other material of relevance. This has been part achieved, with documentary material being added from a variety of sources - as detailed in the Interim Reports and culminating in a second Project 'variation'. We had envisaged this as an ongoing process, but more time could have beneficially been earmarked to meet this objective, particularly at Stage I. It is evident too that that some additional re-located Archive material is likely to arrive after the Project end.

5.6. Project Risks

Illness caused a significant Project delay, and there were subsequent ramifications in terms of the conflicting demands on available staff time and Project working space. Because the Project was necessarily extended, to facilitate completion, annual leave and statutory holidays also impacted more significantly than was originally envisaged.

5.6.1. Timetabling of Project Work- General

In order to deliver the Project effectively, the issues of available staff-time and working space were always recognised as being important considerations by the City Museum in its role as contractor. Likewise, the availability of the Project Manager, wearing various hats, was always recognised as key to the success of the Project delivery. Necessarily, the Project schedule was planned around known Museum commitments and the Project Manager's term-time and marking commitments as a University lecturer.

Because the start of the Project was delayed a little, pending final formal approval, there was timetable slippage from the outset. This was compounded by a lengthy period of illness, which affected the ability of the Project Manager to work at the programmed times. The knock-on effect took the completion of Cattewater Archive work beyond the agreed Project end date and put the scheduling of the completion of work, and the availability of the necessary space, into competition with other Museum projects and work-time demands on key participants.

We should have been more aware of, and better prepared for, the possible risks to the delivery of the planned work schedule through illness - and the resultant problems and

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delays. Ideally, we should have given ourselves a longer window of opportunity to deliver the Project outcomes. There would have been no additional hours or cost, but by scheduling the Project to be completed over a more generous period of time, we would have better reflected and more easily accommodated these risks.

5.6.2. Conflicting Demands on Professional Time

The Project Manager's primary employment, and obligation, was as a University lecturer. Due to University commitments it was recognised, at the outset, that it would be hard to carry out Project work during term time. Due to a shortage of lecture rooms at the University of Plymouth, timetabling is a problem. Staff can be lecturing at any time from 9am to 7pm; often with no consistency from day-to-day or week-to-week.

It was, therefore, originally envisaged that this Project would take place during the summer break of 2010 - and, at the same time, it was recognised that the only time in which the Project Design could be written was again during the University breaks. Because the evolution of the Project Design proved rather more drawn-out than expected, this element itself took up much of the summer of 2010. This resulted in a delayed start to the actual Project, and conflicts with the commencement of the Autumn Term 2010.

Due largely to illness, and then a second 'variation' to include new material, the Project was only concluded slightly ahead of the University summer break of 2011.

The conflicting demands on, and priorities for, the professional time of all key Project staff should have been better identified as a more significant risk. This should have been done ahead of this Project, and better reflected in the Project Design – and it should be noted that this is likely to be an issue impacting on any project involving / relying significantly on University staff or student input.

Ideally, any future Summer Project Design would perhaps best be written in the Christmas and Easter break/s - allowing plenty of time for any revision to take place ahead of the final agreed Project start date.

5.6.3. Stop-Start Inefficiencies

There was a greater degree of stop-start work on the Project than was envisaged. A later start and the combination of illness and Project extensions led, in turn, to periods of increased and / or conflicting demands on available staff time, and reducing opportunities to prioritise Project work. Components of Project work were started and stopped and picked up and put down more frequently than planned, disrupting the flow of work. Inevitably, this also resulted in some inefficiency.

5.7. Payment of Sub-Contractors

Significant changes in the way in which Plymouth City Council approves the employment of sub contractors were implemented during the life time of the Project. At the time of the submission of the Project Design, sub-contractors working on relatively low total value contracts, as was proposed, could simply be commissioned by budget holders at the City Museum. This system changed during the life of the Project - with all sub-contractors required to register with 'Sell2Plymouth'- and for their application to be 'green flag' approved.

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The new system is not straight forward and puts additional requirements on sub-contractors, including the need for personal public liability insurance - even in cases where there is no obvious public risk from the work undertaken, and the work is undertaken on Museum premises. In cases where the sub-contractor has been obliged to incur additional and unforeseen costs in order to receive payment of pre-agreed and due fees it would have been helpful to have identified this additional cost within the overall Project budget.

Obviously, this is an internal City Council problem, but the inclusion of a small Project contingency budget might have been helpful in this respect. We were directed by English Heritage not to include a contingency heading at the Project Design stage.

5.8. Need for Better Excavation and Post Excavation Monitoring

Is there a requirement for better post Licence and excavation monitoring?

The Cattewater Wreck survey and excavation in the 1970s seems to have been run to a high standard for its time. However, what should have been the best archived excavation of its time resulted in only a partial archive being haphazardly deposited in the City Museum over time, and starting some years later.

This was not intended. James Barber, Keeper of Archaeology (and later Curator), at the City Museum was a member of the Cattewater Wreck Committee. Mr Barber believed he had an agreement in place, during the excavation, for the Archive to be deposited at the City Museum. The failure to deposit the complete Archive in the City Museum seems, at least partly, due to a lack of supervision of the post-excavation process. The Cattewater Wreck Committee met for the last time in May 1979. Although they planned to meet again, this was never timetabled and no meeting took place. This is probably the key failure in the process of fully completing the excavation process to archive deposition stage.

Barbara Wenmoth, the site conservator at Fort Bovisand, appears to have looked after the finds, day-to-day. She seems to have been largely responsible for properly looking after the Archive at Fort Bovisand and monitoring the whereabouts of artefacts / samples as they were studied / processed. When Barbara left in 1979-80, after a period of extra unpaid work, there seems to have something of a vacuum in terms of the active monitoring and care of the Archive, particularly at Fort Bovisand.

For example, it was thought that a box of clay pipes was taken to Scotland in 1979 for further examination and reporting (see 2.1.8., above). There is now sufficient documentary evidence to suggest that Martin Dean did indeed take the box away to carry out this work. However, recent email correspondence confirms that he has no recollection of this - perhaps understandable after 30 plus years. Similar examples could be cited elsewhere. Someone actively monitoring the location of finds and samples, after Barbara Wenmoth had left, may have prevented this loss - and other losses - of archive material.

Although Mark Redknap continued to collect specialist reports up to c.1980, there then appears to be a significant gap in the Documentary Archive (apart from some correspondence concerning publications) until 1983. This was the date when the City

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Museum again made approaches with regards to any plans for the formal deposition of the Cattewater Archive.

Sometime between 1980 and 1982, a casement at Fort Bovisand was cleared for other uses and, at the same time, two Cattewater conservation tanks, containing structural timbers, were broken up. This appears to have been when another significant part of the Archive was lost.

After 1982, the City Museum became more active in locating the Archive and recovered some material from Fort Bovisand. The Museum also approached Mark Redknap, who kindly began the process of returning tranches of material being studied by him in preparation for his publication of the full Report. (It should be noted that Dr Redknap still retains some elements of the Archive, with the intention of completing a revised report. However, he has already returned significant Cattewater material to the care of the City Museum, and has plans to forward the remainder in due course).

The continued role of the Government Licensing Committee, with regards the Cattewater Wreck and the related post excavation process, is unclear. The Runciman / Advisory Committee on Historic Wreck Sites (ACHWS) did not seem to have taken a role in this process. When the City Museum approached ACHWS in 1987, they seemed principally concerned about the fate and conservation of the most complete swivel gun (CW73 6). The ACHWS seemed less concerned about the welfare of full Archive or the completion of the excavation process, and did not seem to recognise an active role for themselves in the post-excavation process.

Because both Survey and Excavation Licences are still only valid for a year at a time, this arguably limits supervision of post-excavation work and subsequent archive management. In order to avoid similar problems to that experienced with the Cattewater Wreck Archive, this issue should ideally be addressed by the new Licensing regime, under the devolved administrations.

5.9. Contents and Comparisons of Maritime Archaeological Archives

A significant difference between land and marine excavation archives appears to be the use of dive logs and daily dive summaries - rather than use of a site book. Without further comparison with other marine archives it is unknown how typical the Cattewater Wreck archive is of marine archives, past or present.

6.0. Post Project Evaluation

6.1. Meeting Stated Aims and Objectives

As the previously submitted Interim Reports and 'Closing Statement' have described, we consider the Cattewater Wreck Archive Project to have met both its primary and secondary objectives at Stages I and II

Subject to the second pre-agreed 'variation', a third stage was also completed. The aim of Stage III was to address the additional Archive material received through and during the Project, and to incorporate it into the completed Wreck Archive. This task has also been successfully achieved - with the new material added to the rest of the Documentary Archive and incorporated into the audit and indexing documentation.

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No new artefacts have been added to the Material Archive during the Project, though it is hoped that some artefacts may still be re-located – possibly at the National Maritime Museum. There are further leads to be followed up on other material sent to specialists and not returned, and/or on material retained by the excavators. Enquiries are ongoing to see if these can be located.

6.2. Processes, Procedures and Problems

The Lessons explored above (see: 5.0. *Lesson Learned*) examine some of the Project processes and the associated problems we encountered in more detail. We have tried to carry out this exercise honestly and in the light of our experience. We have definitely learnt lessons ourselves.

6.3. Post-Project Evaluation Plan

We consider the following to be the future priorities for the Cattewater Wreck Archive:

As reported at 5.2.2. (see above), there is still a need for further specialist conservation work on the plans and it is hoped that an assessment of the precise requirement will be carried out in the near future. Arrangements are in hand to programme this work with the City Museum conservators. Besides any conservation work associated with the problem of the detaching sticky labels - our priority is to try to fund and arrange the digitisation of all plans / sections/ drawings.

As stated at 5.4. (see above), the Project has successfully delivered an up to date electronic inventory of the Find Archive, with photographs. However, we need to prioritise the transfer of written information from the Collection Entry Data Sheets to the City Museum collection database – and attach links to the photographic images. Although the City Museum collection database is not publicly available online, we have instigated a programme of specific on-line collection catalogues. These are some examples.

<http://www.plymouth.gov.uk/homepage/creativityandculture/museums/museumpcmag/museumcollections/museumonlinecollections.htm>

We would like to prioritise the Cattewater Wreck Finds Archive for this treatment – improving public access to the outcomes of this Project.

The Stage I and Stage II Interim Reports served to highlight some future conservation requirements. These relate in particular to the leather, textiles, the two fragmentary swivel guns, the keelson and selected small wooden finds. The work proposed is likely to require additional grant funding - and would serve to benefit the longer term integrity, study and future display of these particular artefacts.

A longer term aspiration is to better publicise and provide information on the Cattewater Wreck and other Plymouth and Plymouth Sound shipwrecks to the general public. English Heritage has recently commissioned Cattewater related interpretation panels for display at Queen Anne's Battery and the Mount Batten Centre. The City Museum, the Project Manager and this Project all contributed to the content - and these are now in situ. A limited print run leaflet on local Protected Wrecks, and featuring the Cattewater Wreck was also produced and distributed.

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English Heritage might wish to consider making the panel artwork and leaflets available on-line via the Cattewater Protected Wreck web page.

<http://www.english-heritage.org.uk/discover/maritime/map/cattewater/>

In the future, it would perhaps also be desirable to consider a combination of web based material, free information leaflets and popular format publications (i.e. a well priced, well illustrated booklet).

END

Martin Read / Nigel Overton, 27 July 2011