

2nd draft

ANALYSIS SUMMARY OF THE HISTORIC WOODWORK
LIFTED DURING OXFORD ARCHAEOLOGY INVESTIGATIONS
AT THE COMBE DOWN STONE MINE, NR BATH;
Site Code CODOM 01

(Also includes summary notes on the general type of vessel depicted in an incised ship image from the mine.)

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NB Any block of text marked with an * is for internal circulation only and needs checking and / or omitting.

BACKGROUND TO THE CONTEXTS THAT YIELDED HISTORIC WOODWORK

The unusual site

Here readers should refer to the main report text by N, Redvers –Higgins for both the historical, developmental and archaeological overview of the mine and its various sections, fittings and finds. Here we may just note that the mine was a principal source of the building stone for Georgian Bath. Unusually, the stone was extracted using subterranean galleries in the manner of a mine rather than an open quarry. The subsidence now occurring has resulted in a need to in fill and strengthen the mines, leading to the Oxford Archaeology survey. The date range of the remains we are concerned with here runs from * (please double check latest dating) mid 18th to mid 19th century (N R-H Pers Com.). Apart from gallery areas where the stone was dug out, route ways for extraction of the produce were also made, barrow ways and cart ways. Some stone was also actually worked and cut to shape below ground in the mine.

The woodwork discussed here is a representative sample of what was found in the mine and was all associated with different aspects of the mining, working and extraction of the stone.

The unusual preservation conditions in the mine

The mine was humid cool and dark, in some places wet enough to preserve timbers. But in other places the woodwork decayed to a peaty mush. In many cases, in timbers with perishable sapwood this had sometimes decayed away leaving only heartwood. Where woodwork was in close proximity to metal work, as in the case of an iron reinforced wheel barrow the timber nearest the metal work was partly preserved whilst the rest was only a peaty residue (Suggested fig 1. Plan 155 of collapsed abandoned barrow [2305]). Another factor was the fact that the timbers were not of very great age between approximately 250 to 100 years * (NRH, please amend if needed). Selected material was moved to the project storage shed, a cool dark space, and partially covered with polythene. There it was hoped that slow air drying of the comparatively recent woodwork would result in some material being in displayable condition without having to undergo costly prolonged conservation. Slow air drying is a method used to stabilise relatively recent woodwork that is not too degraded and has been used with some success in the Netherlands and London with partially waterlogged post-medieval and industrial age ship timbers.

RECORDING THE WOODWORK

A representative sample

Here we are concerned principally with the lifted woodwork that was moved to the project store at the surface as a representative sample of what was encountered during the recording of the various areas of the mine. Conventional plans sketches and photographs were made of some material in situ (see

Suggested fig 1, Wheel barrow [2305] -main site report by N, R-H). A selection of the more solid worked wood and timber was lifted and taken to the project stores where this writer was able to scan the selected material and add to the recording and sampling already carried out. A total of 20 pieces of worked wood or composite assemblies such as barrow wheels were examined. Eleven of these timbers were shoring timbers or 'sprags'.

Methodology and nature of the records

The selected sub-sample of the woodwork was examined during a one day visit on the 22/7/ 08, additional timber record sheets were filled out and aid memoir sketches and notes were made together with additional photographs (see site archive). This summary of the material derives from that brief recording programme. Recommendations about the detailed drawing of some of the more complex items such as the decayed timber and iron wheelbarrows were also made at the time (see section by Lyn Willies including an image of a mining wheel barrow from an early mining treatise or equipment catalogue? * Please also check spelling of mining specialists name.).

During the visit to the project stores the priorities were to examine the larger timbers and complete recording so that once 'preserved by record' the bulk of the less well preserved and potentially less displayable material could be discarded, greatly easing storage problems. Thus, the main focus was to complete the recording of lifted shoring timbers (mainly diagonal struts = 'sprags') and large items such as the barrowing planks. Another key concern was whether any of the material was suitable for tree-ring dating.

Sampling of the lifted timbers

Unfortunately tree-ring dating the woodwork encountered would be extremely difficult if not impossible and the historical dating and dating of other finds will have to be relied on. This state of affairs arises because nearly all of it was found to be coniferous timber ('softwood'), or if of commonly dated species such as oak the pieces were too small. It is likely that some of the softwood was locally grown due to its irregularity and small size, and other converted material derived from larger trees, was imported. In recent years English Heritage has supported a programme of trying to date softwood samples from comparatively recent sites with some success. So on that basis 14 samples were taken though they were from relatively young trees. These samples were also serviceable as species ID samples. For reasons explained below the identification of a sub-sample of the samples has shed considerable light on the appearance and nature of the landscape in the vicinity of the Combe Down mine and the Bath area at a time when it was undergoing great changes at the beginning of the Industrial Age.

The great change to the use of coniferous timbers which are still dominant today in construction and mining timber

It was at this time that species of coniferous timber became dominant for construction and industrial use in England. Although the widespread use of imported softwoods started at the end of the 16th century and grew in the 17th in some port areas like London (Goodburn in Milne 1992), it was not commonly used for structural purposes until the later 18th century in more rural areas when most of it was from countries fringing the Baltic (Astrom 1981). This dramatic change in raw materials for construction and industry out side sea ports was greatly facilitated by the building of the canals and improvements in river navigations and transport systems in the late 18th to early 19th century (Rose 1937,16).

NOTES ON THE WOODWORK EXAMINED BY THIS WRITER
BY BROAD PHASE

The dating of the phases is discussed in the main analysis report, here the outline phasing has been used to loosely group together woodwork.

* Here the annotated list of woodwork deals only with material examined directly by this writer, generally the better preserved material in each group. Neville may wish to add notes on other items?? Could insert Wood Species Id table by D Challanor Here?. *

WOODWORK FROM PHASES III –IV

A Stone Gauge SF 465

A small handle-like object cut from a thin plank of softwood was examined that was initially thought to have been a tool handle, possibly some form of axe handle (NR-H Pers Com) . It is 0.45m (18”) long and had a series of shallow, step-like notches on each side set at round inch distances from the narrower end at 9”, 10”, 12”, and 14” (suggested Fig 2....drawing or photo with scale in inches as well as mm?). It seems certain that it was a simply made wooden gauge for measuring the stone sizes, that would have been used in preparing dressed stones to imperial inch dimensions. The timber seemed in good condition and had almost completed slow air drying. Such a simple wooden tool would be easily understood by the public and it is a strong candidate for display at the intended visitor centre dealing with the history of the stone mine.

WHEELBARROWS AND WHEELBARROW WHEELS NOTES ONLY (*TEXT SECTION TO INSERT BY Lyn Willies, backed up by illustrations of the decayed, collapsed wheelbarrow [2305] in situ Fig. 1, plan 155 and photos with dimensions of the two barrow wheels SF 449 and SF 435)

Fragments of an iron reinforced wooden wheelbarrow [2305] SF 525 (unrevised earlier notes only)*

When found the decayed remains of this wheel barrow were largely in position (as shown on plan No 155) and with more study of the surviving fragments orientated as per the plan and in situ photographs, it may be possible to reconstruct its form in detail. This would be aided by comparison with other historic wheel barrows especially those surviving from broadly contemporary sites and by reference to 18th century iconography of industrial scenes (From LW?*- from memory Iron Bridge Blists Hill Museum made replicas of 19th century wheel barrows). From the plan it would appear to have been c. 1.65m long with a width of c. 0.7m and a wheel diameter of c. 0.42m. The wooden (sp may be identifiable on closer examination of the fragments, - elm, oak and softwood are known from late 19th century barrows) framework was reinforced with two iron tie rods one at the front and one at the rear of the box areas and other smaller sections of iron work such as straps orientated towards the wheel knave.

Given the gathering of a little more information from early treatises and possibly early tools and equipment catalogues, it may be possible for a reconstruction drawing to be created. In due course it might then be possible to commission a replica from a competent historic joiner, for hands-on public display next to illustrations of the original remains. The wheelbarrow fragments span the phases III-V.

* Above must be checked and added to by LW and NRH who hopefully have access to early treatises and possibly tool catalogues from the late 18th to early 19th ?*

A SUB-SAMPLE OF THE MAIN STRUCTURAL SHORING TIMBERS

Samples of shoring timbers ‘sprags’ from phases III/ IV

The lifted diagonal shoring timbers, locally known as 'sprags', used to support the mine roof sections were nearly all of minimally trimmed timber in log form (No doubt a general illustration to show how the sprags were used occurs in the main report? and should be referred to here). It was also immediately clear that they were nearly all of a coniferous species (in timber trade terms a 'softwood') from the regular whorls of branch knots and strong differences between the spring and more resinous summer wood. The site observations were verified when the species ID of a substantial sub-sample were checked microscopically and found to be of one of the pines (Table by D Challoner below). The most likely pine in the region at this time was Scots pine (*Pinus Sylvestris*) of imported or perhaps more likely local origin (below).

Sprag sample 11 was a round pine log cross-cut with an axe and de-branched or 'snedded' with an axe type tool. It was 1.9m long and 230 tapering to 210mm in diameter (*? Could produce some kind of figure from measured sketches on the back of the timber sheets for the sprags?? Poss Fig 3 or Photo with scale?...). The timber was knotty with regular whorls of knots left by snedded branches c. 0.5m apart. It was also fairly fast grown, having a total of c. 50 annual rings.

Sprag log sample 11 was the largest diameter sprag lifted by far with diameters of c. 160mm being more typical for the pine examples (eg sprag sample 4), although some went down to c. 110mm. Lengths varied between c. 0.9-nearly 3m. Whilst the smallest diameter sprags went down to c. 85mm in the example of a rare deciduous log sprag sample 14. For comparison the rules of thumb proportions for pit prop timbers in the mid 20th century were that the top small end diameter should be about equal to 1/12th the length down to a size of c. 3" (75mm, Edlin, 1947, 135).

Early evidence for the local growing of pine ('fir') timber?

Although native pine survived in northern Scotland as a natural woodland tree it had become extinct far back in prehistoric times in Southern England. By the post-medieval period interests in producing tall, straight, and light coniferous timber for ship spars and other purposes lead to experiments in reintroducing pines and eventually other conifers to southern England. Pines were often commonly called 'firs' until quite recently in England. Scots pine is documented as being planted in northern Hampshire as early as 1660 whilst it was planted on a large scale around 1770 in the New Forest just a little further south (Mitchell 1988, 88).

It seems probable that fast grown softwood in such a knotty and sometimes crooked, rough form as was used for the Combe Down Mine sprags was of local origin. Transporting such low value material any distance would have been uneconomic. But even today mine support timber is often of very low grade next only to firewood. If local growing was the case and some of the material was cut from trees at least 50 years old then the pine timber may well have been some of the first grown in the SW of England (NRH to check dates**). The date of planting of at least some of the pines 50 years prior to their felling and use, would presumably be before 1750 and thus earlier than the New Forest plantings. Coniferous trees are now well established over much of SW England and are not remarkable landscape features but they would have been quite distinctive and unusual in the area of the mine in the late 18th century. Further clinching confirmation of the local reintroduction of pines in the area at the time is the name Firs Quarry applied to part of the mine complex (N R-H Pers Com).

It is possible to reconstruct the approximate size and form of the parent pine trees used to make the shoring timbers (Fig 4 See rough draft fig included with hard copy of text.). The supply of mine support timbers was part of the essential infra-structure for mining and in this case was clearly a ready market for second and third quality logs and thinnings from the local pine woodlands. Sample sprag 11 was one of the larger more regular log sprags but even that was clearly not the highest value 'butt log' from the parent tree. Other from phase III/ IV include smaller diameter more knotty logs such as SF 7 and SF 4 which must have come from higher up the parent tree and would have been of such limited value that they it would not have been cost effective to move them any distance. Even today mines will often take

timber of barely more than firewood quality in terms of knottiness, timber in compression being tremendously strong

Deciduous wood sprags early evidence of the introduction of another exotic sp or a durable dense variety of elm?

Given that any local estate timber yard would have been producing second and third quality log off-cuts that could have been used for shoring timber it is surprising that more of the sprags were not of local deciduous origin. Two small diameter sprags (only one listed *) were seen in the stores that were clearly not softwood. One, sample 14, was 1.09m long and c. 85mm in diameter, a slightly crooked small stem of a dense, hard dark coloured wood species that appeared to have at least partly, interlocked grain. Visually the grain looked elm-like but the timber seemed harder and much less decayed than the elm barrow parts that were found in the mine. A suggestion was then made (by this writer) that the timber might possibly have been False Acacia, also known as Robina and Locust (*Robina pseudoacacia*). This is a rot resistant tree species from the eastern USA that was being experimented with by some English landowners in the early 19th century and is now common in London, several southern English towns and a few woodlands. However, samples that were taken to address this issue were microscopically analysed and found to be of some form of elm (*Ulmus* sp). Elm has many species and local varieties varying greatly in density character and rot resistance but this material was certainly atypical in this writers experience of elm varieties from the SE of England.

Barrowing boards from phase III-IV

Several barrowing boards of tangentially sawn softwood were found and the two best preserved examined by this writer sample 16 and sample 15 (SF 401, SF 399). The largest SF 401, was lifted in two sections and had a total length of 4.23m width of c. 280mm and thickness of c. 70mm (probably sawn to lines marked at 3", Could use photo from site archive as Fig. 5 if required.) It was cut from a slow grown tree , probably Norway spruce, and had c150 tree-rings but no clear sapwood or bark. On microscopic analysis the samples were indeed identified as one of the spruces *Picea* sp (Challoner above). The slow regular growth of the timber precludes a local origin and indicates growing in alpine or northern circumstances, ie the timber was imported. Barrowing plank sample 15 was a little wider at c.300mm but only 3.68m long and slightly thinner. The barrowing planks would have greatly eased the manual work of moving small stones and rubble enormously by reducing friction with the mine floor.

A sawn sprag from phase V

Timber sample 1 was distinctly different to the other sprag timbers having saw marks on three faces and a rectangular cross section. The timber was also short at 0.94m long by 120mm by 110mm. The pattern of the saw marks showed that the timber had been manually pit-sawn, rather than cut out with steam or water powered saws as the angle of the saw marks varied noticeably. In practice this subtle change of angle reflects the stepping back of the top sawyer after sawing a foot to c. 1 ½ ft (300-450mm) of kerf. One can imagine a carpentry workshop and possibly a saw-pit being part of the infrastructure that supported the mine in its heyday.

A MYSTERIOUS ASSEMBLY OF OAK AND IRON, PROBABLY PART OF THE SHAFT OF A CART?

SF 500 is an assembly of two pieces of oak forming a cruciform object c. 1.78m long and 450mm wide

(Fig. 6 drawing based on field drawing or Photo?, + does LW have any early images of hand carts used in mines?...*). The main beam is a box quartered section of oak with bevelled corners protected by thin iron bands fastened on with iron tacks, and had one broken end . Under 250mm from the rounded end a plank like crosspiece with rounded ends is set in a through mortice in the main beam. The edges of the cross-piece are also reinforced with iron strips. The function of this carefully made robust object is mysterious. Although a shaft for controlling a cart has been suggested (N, R-H Pers Com). On consideration it seems that this reinforced oak assembly was part of a two wheeled cart (rather than four wheeled wagon or truck) and its finding on the surface of cartway [14003] is perhaps suggestive of its use in a hand cart that was once used on that route.

NOTES ON THE TYPE OF VESSEL DEPICTED IN THE SHIP GRAFFITI

The initial suggestion- a trow or local sailing barge

(*Illustrations supplied do not have scale bars so exact dimensions of the image are not certain- the copy of the copy of the tracing is marked with two different scales- please add correct dimensions here.)

An interesting sailing ship or boat graffiti was found in the mine and a photograph and copy of a 1:1 tracing were supplied to this author for comment from the point of view of an active researcher in the field of vernacular watercraft of Britain, particularly local barges (Fig 7...A photo, B, tracing with scale, Goodburn 1984, and Goodburn in McKewan, and Milne et al 1998). The image ismm long by High and was found in Dating to ???....). Initially the image was thought to depict a local sailing barge or ‘severn trow’ (N, R-H) but on reconsideration it can be seen that a larger more glamorous craft was the model. Severn trow barges came in two main forms the up-river version, a shallow craft rigged with a single square rigged mast and a much deeper hulled craft designed for estuary

use, rigged with one or more commonly two masts. In this rig the larger mast was set for'ad ie it was a 'ketch rig'. The largest type of sail used in the later case was the four sided 'gaff sail' set behind the mast (Paget-Tomlinson 1979, 18, Finch 1976, 120).

A stylised depiction of a three masted-lugger, renown as fast seagoing ships of the channel and western approaches

The sailing vessel image is primitive, stylised and in two phases combining engraving with smudged on pigment (colour.....please add.*), but it is clear that the vessel had three masts, with the largest either in the middle or aft ie to the right (Fig. 7). The tall, four-sided, rig on each mast protrudes forward of the mast and can only be interpreted as a 'dipping-lug sail', or more likely a set of two or three such sails set one above the other. A long bow sprit is also depicted protruding for'ad (to the left), which would have been used for setting triangular head sails. Small ships with this rig were known as fast effective sailors but needed large crews to handle the rig, part or most of which, was normally reset on each tack into the wind. This procedure required larger crews than for some other rigs. The crewing requirement did not suit bulk cargo vessels but was suited to naval, pirate and smugglers craft and scaled down fishing vessels, which had large crews for 'other reasons' (Leather 1979,19). The peak period for the use of vessels with this rig was the late 18th to early 19th century, later it survived in some English and French fishing craft, the last such in Britain being the small beach fishing luggers used from Beer in east Devon.

The hull of the vessel seems to have been divided by vertical lines, perhaps depicting areas of the hold allocated to individuals? Between most of these lines lie shapes which appear to be crude letters. Could they be initials? If the letters are initials they might possibly have depicted the cargo space allocated to individual traders, with the possible 'C' at the bow being crews quarters? The association of tunnels and shafts with smuggling in late 18th to early 19th century England is common place. Is it stretching this association too far to see that there may have been a smuggling connection here? Bath was one of the most fashionable places to be seen and noticed paralleling the west end of London today, and local demand for spirits and other heavily taxed finery must have been huge. Perhaps the image is a reference to the glamour and value of the Georgian 'black economy' which was so dependant on fast ships and places out of sight and out of mind?

Acknowledgements

Thanks are due to Neville Redvers-Higgins for introducing this writer to the project and assisting with the sorting through of the salvaged woodwork on the 22/7/08. Thanks are also due to N, R-H for supplying the graffiti image of the ship also discussed. Both L. Brown and N R-H are to be thanked for bearing with delays in producing this contribution to the analysis phase of the project.

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Leather, J, 1979 Sprintsails and Lugsails, Alard Coles

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Some suggestions for figures?

Fig.1 Detailed in situ plan of decayed and collapsed wheelbarrow [2305]

Fig.2 Pine stone size-gauge SF 465 dwg or photo

Fig. 3 Timber shore or 'sprag' sample 11

Fig. 4 Reconstructed pine tree such as those used for the pine logs used for most of the mine shoring 'sprags' Diagram.

Fig. 5 Barrowing boards Photo's?

Fig 6 Oak and iron cruciform object SF 500

Fig 7 A Photo of ship image in mine B scale copy of tracing of mine ship image.