

THE HISTORIC WOODWORK

D M Goodburn

Introduction

An unusual site

The Combe Down Stone Mines were a principal source of the building stone for Georgian Bath. During the longest period of working the stone was extracted using subterranean galleries in the manner of a mine rather than an open quarry. The date range of the woodwork considered in this report spans the mid 18th to mid 19th centuries. Apart from gallery areas where the stone was dug out, the quarrymen constructed route-ways for extraction, barrow-ways and cart-ways. Some stone was also actually worked and cut to shape below ground. The representative sample of woodwork analysed and reported here was associated with various aspects of the mining, working and extraction of stone.

The unusual preservation conditions within the mine

The quarries were humid, cool and dark. Some areas were sufficiently damp to preserve timbers, but in other areas the woodwork decayed to a peaty mush. In many cases of the perishable sapwood of timbers had decayed, leaving only heartwood. Where woodwork was in close proximity to metalwork, as in the case of an iron reinforced wheelbarrow, the timber nearest the metal was partly preserved whilst the rest was only a peaty residue (Figure 1. Plan 155 of collapsed abandoned barrow [2305]). Another factor in preservation was the relatively young age of the timbers, at between approximately 250 to 100 years.

Methodology

The recovered woodwork was a representative sample of material encountered during the recording of various areas of the mine. Conventional plans, sketches and photographs were made of some woodwork *in situ* (Figure 1, Wheel barrow [2305]). Other examples were moved to the cool, dark conditions of the site storage shed as they were recovered, and were partially covered with polythene. There it was predicted that slow air drying would result in some material remaining in displayable condition without requiring 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.

A selection of the more solid worked wood and timber was lifted and taken to the project stores where it was recorded on timber sheets and notes and photographs made. 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’ and several barrowing planks were also recorded. The priorities were to examine and preserve by record the larger timbers so that the least well preserved material could then be discarded.

At this stage suitability for dendrochronological analysis was also assessed and 14 samples taken. In recent years English Heritage has supported a programme of attempting to date softwood samples from comparatively recent sites with some success. However, because the Combe Down samples were from relatively young trees, tree-ring dating proved to be impossible for the coniferous timbers (softwood) samples. In the case of commonly dated species such as oak, the Combe Down pieces recovered were too small.

The 14 samples were also used in species identification, the results of which are presented below and reflected in this report.

The change to the use of coniferous timbers

It is likely that some of the softwood recovered from the mines was locally grown, judging by its irregularity and small size, whilst woodwork derived from other, larger trees was imported. It was during the period of quarrying at Combe Down 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 outside 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).

The Woodwork

Stone Gauge SF 465

A simply made wooden stone gauge cut from a thin plank of softwood measuring 0.45 m long has 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" (Figure 2 **scale in inches as well as m**). This implement was used for measuring stone sizes when preparing dressed stones to imperial dimensions. It was recovered from Archaeological Area (1202) (check context details). Phase III-IV.

Iron-reinforced wooden wheelbarrow SF 525

The partially decayed remains of a wheelbarrow were found *in situ* close to a shaft in Archaeological Area (214), Quarry Area [2330], object 2305, which has been phased to the late 19th century (Phase III-IV) (Figure 1). In its complete state it would have been approximately 1.65 m long and 0.7 m wide and a wheel diameter of *c.* 0.42 m. The wooden framework was reinforced with two iron tie rods, one at the front and one at the rear of the box areas. Other smaller sections of iron work such as straps were found close to the wheel knave. The wheelbarrow would have been used for carrying quarried stone and quarry waste.

Structural Shoring Timbers

Phases III/IV Sprags

Diagonal shoring timbers, locally known as 'sprags', were used underground to support the roof of the mines. Most examples recovered were minimally trimmed timber in log form. It is clear from the regular whorls of branch knots and strong differences between the spring and more resinous summer wood that the timbers examined were taken from a coniferous species (in timber trade terms a 'softwood'). Identification of a substantial sub-sample of the sprags confirmed them to belong to pine species (Challinor this report). The most likely pine to have been exploited in this region during this period was Scots pine (*Pinus Sylvestris*), of imported or perhaps more likely local origin (see 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 1.9 m long and 0.23 m tapering to 0.21 m in diameter (Figure 3). The timber was knotty with regular whorls of knots left by snedded branches *c.* 0.5m a part. It was also fairly fast grown, having approximately 50 annual rings. Sample 11 was the largest diameter sprag lifted from the site, as diameters of *c.* 0.16 m are more typical for the pine

examples (eg sprag sample 4), and some had a diameter as small as 0.11 m. Lengths generally varied between 0.9 to almost 3 m, but the smallest diameter sprag, a rare example of a deciduous log sprag (sample 14) was *c.* 0.85 m. 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 inches (75mm, Edlin, 1947, 135).

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

Although native pine survives in northern Scotland as a natural woodland tree it had become extinct during 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 led 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 at about 1770 a short distance to the south in the New Forest (Mitchell 1988, 88).

It seems probable that fast grown softwood in the knotty and sometimes crooked, rough form as was used for the Combe Down Mine sprags was of local origin as 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 southwest of England. The date of plantation of at least some of the pines used at Combe Down 50 years prior to their felling and use would presumably fall before 1750, predating the New Forest plantings. Coniferous trees are now well established over much of southwest 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 evidence of local reintroduction of pine in the Bath area at the time is the name Firs Quarry applied to part of the mine complex.

It is possible to reconstruct the approximate size and form of the parent pine trees used to make the shoring (sprag) timbers (Figure 4). The supply of mine support timbers was part of the essential infra-structure of mine working and, at Combe Down there was clearly a ready market for second and third quality logs and thinnings from the local pine woodlands. Sample 11 was one of the larger and more regular log sprags, but even that was clearly not the highest value 'butt log' from the parent tree. Other logs from phase III/ IV quarry areas include smaller diameter, more knotty logs (SF7 and SF4) 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, as timber in compression is tremendously strong.

Deciduous wood sprags

Given that any local estate timber yard would have been producing second and third quality log off-cuts suitable for shoring, it is surprising that more of the sprags were not of local deciduous origin. Two small diameter sprags clearly not softwood were examined. Sample 14 was 1.09 m long and 0.085 m 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 found in the mine (above). The possibility was considered that the timber might

be False Acacia, also known as Robina and Locust (*Robina pseudoacacia*). This rot resistant tree species from the eastern United States was being experimentally planted 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 taken for species identification confirmed that it was some type 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 of elm varieties from the southeast of England previously examined by this specialist.

Phase V Sprag

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 only 0.94 m long by 0.120 m wide and 0.11 m thick. 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.* 1.5 ft (300-450 mm) of kerf. One can imagine a carpentry workshop and possibly a saw-pit being part of the infrastructure that supported the Combe Down Mines complex in its heyday.

Barrowing boards

Several barrowing boards of tangentially sawn softwood were encountered during archaeological recording. Barrowing planks would have greatly eased the manual work of moving small stones and rubble by reducing friction with the mine floor.

The two best preserved examples, sample 15 (SF 401) and sample 16 (SF 399), were examined. The largest SF 401, was lifted in two sections. It was 4.23 m long, 0.28 m wide and 0.070 m thick, probably sawn to lines marked at 3 inches. [Could use photo from site archive as Fig. 5 if required]. It was cut from a slow grown tree, one of the spruces (*Picea sp*) (see Challinor this report) and had *c*150 tree-rings but no clear sapwood or bark. The slow regular growth of the timber precludes a local origin and indicates an alpine or northern origin, and therefore an import. Barrowing plank sample 15 was a little wider at *c.*0.30 but only 3.68 m long and slightly thinner.

Composite structure of oak and iron (possible cart shaft)

SF 500 is an assembly of two pieces of oak forming a cruciform object *c.* 1.78 m long and 0.4 m wide (Figure. 6) (check with LW for 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. One of its ends was broken. A plank-like crosspiece with rounded ends was set *c.* 0.25 m from the rounded end in a through mortice in the main beam. The edges of the crosspiece were reinforced with iron strips. The function of this carefully made robust object is uncertain, but it may have been a shaft for controlling a cart (N Redvers-Higgins, pers. comm.). This reinforced oak construction may have been part of a two wheeled cart (rather than four wheeled wagon or truck), and its location on the surface of cartway [14003] reinforces the suggestion that it was a hand cart used on that route.

Notes on the Ship Graffito

The sailing ship or boat graffito was examined by this author from the point of view of an

active researcher in the field of vernacular watercraft of Britain, particularly local barges.. Initially the image was thought to depict a local sailing barge or ‘ Severn trow’, but on reconsideration, a larger, more glamorous craft was the model for this depiction. 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 type of rig the larger mast was set *for’ad* (*ie* it was a ‘ketch rig’). The largest type of sail used in these vessels was the four sided ‘gaff sail’ set behind the mast (Paget-Tomlinson 1979, 18, Finch 1976, 120). (Fig 7...A photo, B, tracing with scale,

A stylised depiction of a three-masted lugger

The sailing vessel image is primitive, stylised and of two phases of execution, combining engraving with smudged on pigment. The vessel had three masts, with the largest either in the middle or aft (*ie* to the right) (ref to Figure xx). Three-masted luggers were renowned as fast seagoing ships of the channel and western approaches (Goodburn 1984, and Goodburn xxx; Milne *et al.* 1998).

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. It survived later 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, possibly initials. If the letters are initials they might 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 commonplace. The association between the shop graffito and the quarry complex may suggest a smuggling connection. Bath was one of the most fashionable places to be seen in England during the 18th century and local demand for spirits and other heavily taxed fine goods must have been immense. Perhaps the image is a reference to the Georgian ‘black economy’ which was dependant on fast ships and secret places for stowing goods.

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 and for supplying the graffito of the ship.

References

[* incomplete - LYB]

Astrom, S, 1981 North European timber exports to Great Britain, 1760-1810, in P Cottrell and D Aldcroft (eds), *Shipping Trade and Commerce*, Leicester Univ Press, 81-98

Edlin, H, 1947 *Forestry and Woodland Life*, Batsford

Finch, R, 1976 *Sailing craft of the British Isles*, Collins

Leather, J, 1979 *Spritsails and Lugsails*, Alard Coles

Mitchell, A, 1988 *The Trees of Britain and Northern Europe*, Collins

Paget-Tomlinson, E, 1979 *Britain's Canal and River Craft*, Moorland

Rose, W, 1937 *The Village Carpenter*, A and C Black

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 photos?

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.