

# Chapter 11

## Other structural and artefactual evidence in the underground quarries

### Introduction

This chapter is in two major parts, the first focussing on aspects such as the after-use of shafts and, and those parts of the workings that were non-quarrying in the technological sense, together with wells. These features were all prolific providers of artefacts, which, along with the many examples of graffiti also included here, inform us of social aspects of the life of quarrymen and Combe Down people as well as their work. These were recorded in the archaeological survey simply as contexts, though the term 'large find' would be equally appropriate.

The second part concerns what were defined for recording purposes as 'small finds' which have been the subject of specialised post-excavation reports. These covered metal, stone, wood, glass, pottery, and bone. One of the most unusual items found was a revolver and bullets found in the surface-derived material dumped within a former vertical shaft located on the Firs Field, which now has a Chestnut Tree growing from it. However, after being photographed (see Figure 7.15) the revolver and bullets were handed over to the Avon and Somerset Police and destroyed before further examination was possible.

All the finds have intrinsic interest, and in some cases have a wider application, such as the recovery of numerous 18th-century clay pipes, which now form a major part of the reference collection for Bath (Lewcun 2009). These, as well as the pottery and graffiti are particularly important in that they help determine the chronological dates of workings and quarrying and also can suggest the periods where quarrying operations ceased. Graffiti, for instance, can not only indicate when the initial quarrying began but also where secondary Bath Stone episodes were carried out underground. Other artefacts, such as the quarrymen's tools and equipment or examples of the carved stone itself can also determine periods of working and the different quarrying methods used to extract the stone. Graffiti and some artefacts and other features tell us something of the miners and their activities and interests, or of social conditions in the neighbourhood, such as in the Second World War.

### Non-quarrying features and quarry after-use

#### *Wells, disused shafts and drains*

Several wells were identified and more are known to have existed. Only four were open the full depth to water and only three could be examined in any detail, one only by camera through a small hole made in the lining. Shafts observed to go below the quarry workings were considered as wells even though not open to water, to avoid confusion with the narrower ventilation shafts. The shafts were usually lined with rubble above and below the underground quarry workings. Several wells were collared in the workings by circular stone packs, in one (presumed) case by the helter-skelter pack referred to earlier (see Chapter 10), presumably to prevent adulteration or accident. At least three were associated with Public Houses reflecting that brewing was once usually done in-house: the Carriage Inn, Hadley Arms and the William IV. Others served private houses or groups of houses. The Carriage Inn well may have done this too, and possibly also watered horses as its top stood close to the wooden railway.

A well that seems to have been sunk for a house in about 1818 (Irving 2005) but which became Job Salter's Brewery and, later the Hines Brewery, had a prominent circular stone pack-wall which was located on the cartway under what is now the William IV Public House (Fig. 11.1). It is thought to have post-dated the quarry working (504) where it had been constructed. The internal parts of the pack were inaccessible to survey as it was filled with post-quarrying surface-derived materials. The pack was constructed of well-coursed rubble stone throughout and had larger blocks, some sawn, placed to form an opening or door within the eastern extent. The lower extents of the pack had a darker patina on the rubble stone, with the upper four courses above the door a much lighter shade. Several of the courses around the door and at the same level around the structure were partially bonded with mortar. The presence of the door within the quarry suggests that water was accessible to the quarrymen for application during sawing, and/or that it was convenient to the brewery for cleaning the well of debris as this part of the quarry was easily accessible from the surface.

*'Finished Labour of a Thousand Hands'*

The well was preserved *in situ* on the edge of the Bat Preservation Area and was laser-scanned as part of the archaeological survey.

The most important well for dating purposes was at surface, located between the backyards of the Bank and Langham House near the junction of Church Road and The Avenue. It would formerly

have served the Carriage Inn and the Old Rank of Allen cottages. Underground it lay within Quarry Area 2347. The well was marked on the 1st Edition OS Map but is believed to be of early 18th-century origin as grey clay, probably the Fullers Earth clay, was raised from it and dumped in the adjacent working underground. This and an adjacent



*Fig. 11.1 Job Salter's well, later the Hines Brewery well, in West Byfield, under the present William IV Public House yard*



*Fig. 11.2 The Carriage Inn well, in the pre-Allen E4 stub workings, (Central Firs, Quarry 2347). The two pump rods and pipes are visible, but the pumps themselves appear to be buried*

deposit from a drain contained pottery of early to mid 18th century (see pottery report below). The well was lined with medium to large limestone rubble both below the quarry floor and above the quarry roof (Fig. 11.2). A circular stone pack of stacked rubble largely surrounded the well. The quarry roof was some 4 m below the slabbed cap, and 15.45 m from the roof to the bottom of the well, with about 0.3 m of water at the bottom. There were two pump pipes and two rods down the well, but neither of the pump barrels was visible, indicating the bottom was partially infilled with clay, either washed or squeezed in. This suggests the original total depth from surface was about 20 to 21 m. The well was at the northern extent of the probable pre-Allen (Phase I) working, but whether the working or the well came first is uncertain.

Another example of a previously known well in the Byfield Quarries was just east of Ralph Allen Yard, located within the 18th-century Quarry Area 911. The well is thought to have served a house above and was open to water at the base. Its protective stone wall was visible in the workings as an irregular, slightly conical feature made of thin, tile-like stones. This was the outside of a lining placed from the inside (Fig. 11.3). It was possible only to safely pierce this to allow a camera and the distance measurer to be inserted (Fig. 11.4). Photographs showed the inside to be fairly smooth-lined, about 1 m in diameter, but bellying-out somewhat.

A well was located at the top of Combe Road in the side road to the remaining Byfield entrance (now the bat entrance). The well was about 1 m in diameter and passed through the double-height workings of Quarry Areas 508 and 512. It was lined with rubble throughout its depth, was circular in profile grading to oval, and bellied-out after a metre or two. It also had a protecting rubble pack in the quarry workings to stop materials entering the water below.

It was sunk through the lower Combe Down Beds (Ragstone) and into the clays of the Fullers Earth formation below, with this clay dumped over a small barrow-way which previously served the lower Quarry Area 512. The deposit may have been dumped over the barrow-way in a well-clearing operation that post-dated quarrying as no other shaft sinking debris was present. It would be attributable to the house that the well served, probably dating to *c* 1829.

Another well-shaft in Quarry Area 2219 on the northern side of North Road east of Stonehouse Lane, belonged to early 18th-century houses so possibly pre-dated the underground quarrying. A debris cone largely obscured a protecting, low, rubble pack-wall around it as it passed into the lower beds, but a pump rod and pipe were visible, hanging in the upper part of the shaft.

One of the deeper wells was located within Quarry Area 2330 close to Richardson Place on the surface. It had an internal diameter of 1.40 m between the rubble lining. The depth was 16 m and



Fig. 11.3 The well in Byfield (Quarry 911) just east of Ralph Allen Yard, was sunk through pre-existing workings but, unusually, had been lined from within the well shaft, resulting in the 'inside-out' pack seen here

the depth from quarry floor to an infilling in the base was 9 m. There was an opening of 1.5 m from the quarry floor to the roof and a further 5.5 m from mine roof to upper surface where the shaft had been covered with a tin sheet. The shaft was lined throughout with fairly level courses of small to medium sized limestone rubble. The well is shown on the 1884 OS map and contained late 19th- and early 20th-century material derived from the surface.

#### *Drains*

An 18th-century drain was located a few metres to the north of the Carriage Inn well. It measured 1.10 m east-west and 0.70 m north-south and had been lined with sawn blocks throughout its height. The drain continued up towards the surface for 1.50 m before surface-derived grey ash and blocks restricted a view.

In the area close to the Hadley Arms (Quarry 2337) sewage had been allowed to drain into the



*Fig. 11.4 The Byfield well inside the pack shown in Fig. 11.3 was not seen other than via this photograph. It was taken with the camera pushed through a small hole made in the pack*



*Fig. 11.5 The probable drain in Quarry 2392 in Far East Firs, projecting through the roof. Made of thin-sawn stone slabs, there was no sign of it ever having been used*

workings, though the actual drain itself was not inspected. In Far East Firs Quarry 2392 a chute-like feature made of thin sawn slabs projected down into the workings, but there was no trace of water, effluent or deposited solids below it (Fig. 11.5).

### *Disused shafts*

There seem to have been three possible fates for shafts after their quarrying usefulness disappeared. Some were capped over, others were filled with what appears to have been quarry waste, and those left open became the village refuse amenity. Most smaller shafts were capped over, though sometimes only with a thin cover of corrugated metal sheet, more often with stone slabs. Larger shafts, perhaps especially where they were fenced, were commonly used for refuse disposal.

Two shafts which seemed to relate to the end of Phase II in East Firs had particularly spectacular caps, shallow domes, seen from the underside. One adjacent to the branch cartway from Central Firs into East Firs in Quarry 2203, had a cap c 3.5 m across, which arched only some 70 mm measured from the centre to the outside. The stone blocks used in its construction were arranged in the form of repeated squares. There was no sign of how the arch was supported during its construction. The second shaft was a short distance further east. The two shaft caps were so similar and both had the same relationship between apophygate and corbelled pillars that they surely belonged to the same period of construction and possibly were the work of the same mason (see Figure 9.9). Only one other shaft cap had a similar domed form, but it did not display the same fine construction. The shafts are believed to date to the first half of the

19th century. Other caps were barrel-arched or, if more recent, of concrete, as under the Garage in The Avenue and, in the form of beams, at the Firs Shaft.

Shafts filled with rubble included several ranging north of the Ralph Allen Yard (Jones Quarry) entries, towards North Road. They seemed to have a clean clay and stone fill, possibly derived from nearby surface quarries. The southernmost had a circular pack (see Figure 10.19) surrounding the base so the fill could not be seen.

At least two shafts beyond the Firs Shaft ranging towards the Hadley Arms were filled with rubbish and probably a third and fourth also. This was derived from the surface and attributable post-quarrying debris, including much village rubbish, such as bottles, tins, car parts and the revolver and different gauge bullets, which had formed into cones of deposits which completely obscured the quarry floor below. They apparently filled the shafts, one of which still has the chestnut tree growing from it and is situated close to the War Memorial on Firs Field. Firs Shaft itself had considerable rubbish on the floor 2 m or so deep, but did not appear to have been filled. It too had a tree growing over it until blown over by a storm. This may suggest a cap of timber had been installed before rubbish could fill the shaft, or that the rubbish had got hung-up in the shaft, forming a platform.

After quarrying had ceased, Irvings Incline into Quarry 504 with its link to the workings associated with Quarry 503, may have provided an access for the benefit of the William IV Public House. This (or its brewery predecessors) also had an entry to the workings in the pub yard via a shaft, and also had a vehicle way (c 1870) located immediately behind



Fig. 11.6 The Irvings Incline, a slope entry into the West Byfield, Hulonce Quarry (504) made early in the 19th century and variously used for storage and an air-raid shelter after quarrying finished

Tor House to the incline. It is possible that beer brewed there or brought in was stored underground. There was plenty of space for this but no obvious remains (Irving pers. comm.). The incline appeared to have long been used for storing items such as bottles, tins and old tyres, but during the Second World War the incline (Fig. 11.6), which gave access to the immediately adjacent part of the Byfield Quarry, (503) served as an air-raid shelter, particularly during the Baedeker bombing raids of April 1942. These hit Bath severely and left a trail of bomb craters a short distance away across the back of Foxfield. A line of screwed metal eyelets placed in the roof of the incline and extending into the quarry, originally provided support for an electric cable from the surface for lighting during the raids. Heating was provided by 'Coal Devils', and both were apparently provided by Mr Vernon Bishop.

It is possible the other Byfield Mine entry, now the grilled bat access, was similarly used. The floor of this had also been cleared for 'industrial' use, reportedly for storing mushroom boxes. Today this whole area of West Byfield is a bat reserve, including a heated breeding conservatory, with the two original accesses open but grilled. The inside areas, however, have largely been concreted over. The Irvings Incline arch and the Hines Brewery well have both been consolidated.

The area of Firs Mine under the Hadley Arms was briefly used in the late 20th century for 'partying', with a somewhat inconvenient access via the Hadley Arms steps. The area was fitted with a number of floodlights.

## **Graffiti and inscriptions**

### ***Introduction***

As well as features and artefacts directly related to the quarrying activities, there were also many examples of graffiti, some related to quarrying, some of miscellaneous character. The graffiti took the form of lettering, pictures and marks that had been written, drawn or scrawled on surfaces. Inscriptions were far rarer, either initials and dates or surveying marks carved into the rock. Both provide, with due caution, a useful source of dating evidence as well as providing valuable insight into the social context in which the quarrymen worked and lived.

All the graffiti observed was recorded, whether contemporary or post-quarrying. Selected samples were either recovered by sawing-off the slab on which they were drawn, or stripped off using a silicone rubber 'peel' (the methodology is described in Chapter 1). As in limestone quarries elsewhere, the graffiti varies in its subject matter, style, form and ways reflecting the period when it was done. The survey of the surviving graffiti at Combe Down has captured material which was originally written either by the quarrymen contemporaneously with

stone extraction, by visitors to the quarries during their various operations, or by visitors in the subsequent post-quarrying periods.

### ***Graffiti drawing materials***

The graffiti was mainly drawn with a soft coal marker then locally available, or with soot produced from the tallow candles and/or oil and acetylene lamps which were used for lighting. The ship graffiti (see Figure 11.12) used a dark brown mud for the masts and later graffiti included chalks and sprays for colour. The position and materials used to draw the graffiti partly determined both the survival and the clarity of an image. For example, graffiti formed with candle or lamp soot, which tended to be written on the rough surface of the roof of the quarry, generally had wider lettering, and had more blurred edges than the lettering performed by hand-held markers that have a narrower writing surface and are easier to use. Typically such marking was done on smooth, vertical, sawn faces.

Graffiti included drawn or incised or scratched crosses on the pillars of limestone, probably survey marks, used to determine locations or calculate areas worked. In some cases this was very neatly done, perhaps not surprising in a quarrying district. Examples include survey crosses which seem to have been introduced in the early 19th century and have been noted within Firs Quarry Areas 2344, 2211 and 2342. As a modern comparison, the Hawkins survey identified pillars by sector and number, and survey points, using spray paint.

### ***Incised graffiti***

The earliest incised graffiti found were located below the end of the Avenue and Church Road junction in Quarry Area 2347. This included a pillar with the initials 'JM 1725', the 'J' in the form of a crossed 'I'. A few metres to the south of this a floor-to-roof stone pack contained incised graffiti on two sawn blocks, one with the initials 'RJ', the 'J' again a crossed 'I', carefully placed at eye level either side of the pack. A further sawn block, placed less conspicuously at the side of the pack, was lightly inscribed with 'XX IX', just possibly indicating a date (see Chapter 12, Case Study 2). There is a possibility that the RJ stood for Richard Jones. Some years before 1725 he had been apprenticed to John Pitcher, who had leased a quarry at Combe Down from about 1715. As described in Chapter 5, Jones in 1729 began to work for Ralph Allen, becoming his clerk in 1731, and effectively manager of Allen's stone quarrying and masonry business. A somewhat equivalent graffiti, though drawn rather than inscribed, was found in Far East Firs near the Brow. This had the name 'Francis Oliver' and a 'June 1730' date (Fig. 11.7). There seemed to be no reason to doubt the dates inscribed and the two sets of graffiti were important in establishing the dates of working in

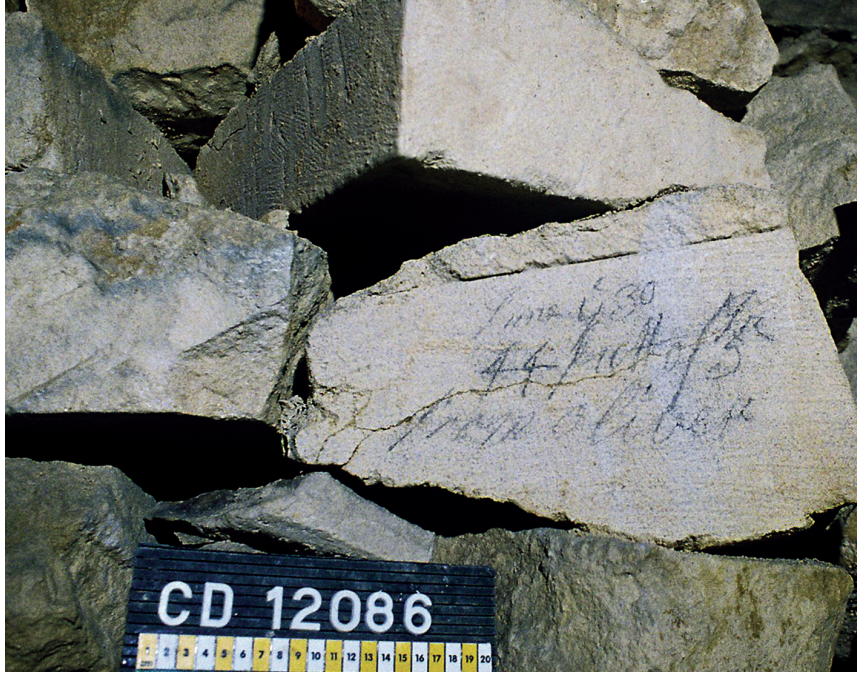


Fig. 11.7 Francis Oliver graffiti of 1730 in Quarry 2339 (Far Eastern Firs), strongly suggesting a pre-Allen date for the workings there



Fig. 11.8 Tapered pillar in north-east Byfield Quarry (308) with a wide range of inscriptions including the date 1816 (faint and high to the right), giving a fairly reliable earliest date for the sawn face and other activity in the area

these areas in association with the methods used. Apart from surveyor's crosses, inscribed graffiti subsequently was very rare and it was not possible to confidently assign 18th-century dates to any other graffiti found.

***Graffiti becomes common***

The earliest saw-cut workings are located in areas dated to around the early 18th century but are rare and it was not until the introduction of stone saws in the early 19th century, leaving plane surfaces,

that graffiti became more common. One of the earliest examples of written graffiti dated to 1816 (Fig. 11.8) and was noted on a sawn face in north Byfield, although generally graffiti dates ranged from around the 1830s and 1840s and later. Two other early examples of dated pillar faces were noted in Quarry Area 500, for 13th September 1823, and September 1823. The pillar faces have subsequently been used for later graffiti ranging from the later 19th century, and continuing into the later 20th century with visitors from post-quarrying periods leaving their initials and impressions (Fig. 11.9).



Fig. 11.9 Layers of later graffiti on a sawn face in West Byfield Quarry near the entrance



Fig. 11.10 Successful stripping of the Knowles and Prescott graffiti using silicon rubber. Far East Firs (Quarry 2363)



In the later periods names and initials of individual quarrymen occur, some recognizable as local, for instance Arthur Knowles and Charlie Prescott, June 19th 1900, who lived and probably quarried near Gladstone Road. Their graffiti was used for a (successful) trial of the silicon-stripping method of preservation (Fig. 11.10). Well-known national figures appeared; one dated to 1845 recorded the name and social comments relating to 'Black Jack', possibly the same man as was employed as Queen Victoria's 'rat catcher and mole executioner extraordinary' in the mid 19th century. He was featured in Henry Mayhew's (1851) *London Labour and the London Poor*, which was being serialised in the 1840s ([www.wikipedia.com](http://www.wikipedia.com)).

At the Foxhill quarry which commenced in the 1870s, an assemblage of graffiti includes one which was simply a list of numbers from 1 to 19. This seems most likely either to be practice in arithmetic, relating to a personal lesson. The modern equivalent used on the Stabilisation Scheme was the 'toolbox talk' with skills being imparted for personal working skills improvement.

#### Cartoons and sketches

There are a substantial number of cartoon-types or caricatures, presumably often images relating to men then working in the quarry. A recovered item of graffiti from Foxhill Quarry 2380 depicts a quarryman with pipe and hat (Fig. 11.11) and dates from the late 19th century. 'William Bishop 1898' appears above the graffiti and may have been attributable to the image. Several other images of quarrymen, appearing to be in the same artistic style, are noted within the vicinity. The Bishop family lived in the village. The name and image



Fig. 11.11 Graffiti of man with hat and pipe (Foxhill Quarry 2380)

seems likely to be William Vernon Bishop, the great grandfather of Steve Bishop of Combe Down who worked on the Stabilisation Scheme for several years.

The finest of all the images found was probably 'The Ship', a three-masted vessel, possibly a type that came up to Dolemead on the Avon Navigation (Fig. 11.12). The slab it was drawn on was sawn out and preserved. It was clearly a labour of love, with the masts coloured with a brownish clay. The vessel is towing a small tender which, it was initially suggested, might be a Severn trow. However, as depicted, it has three masts which identifies it as a lugger, a more glamorous craft which carried less cargo but made more speed. Goodburn (2009) describes the image as primitive, stylised and of two phases of production combining engraving

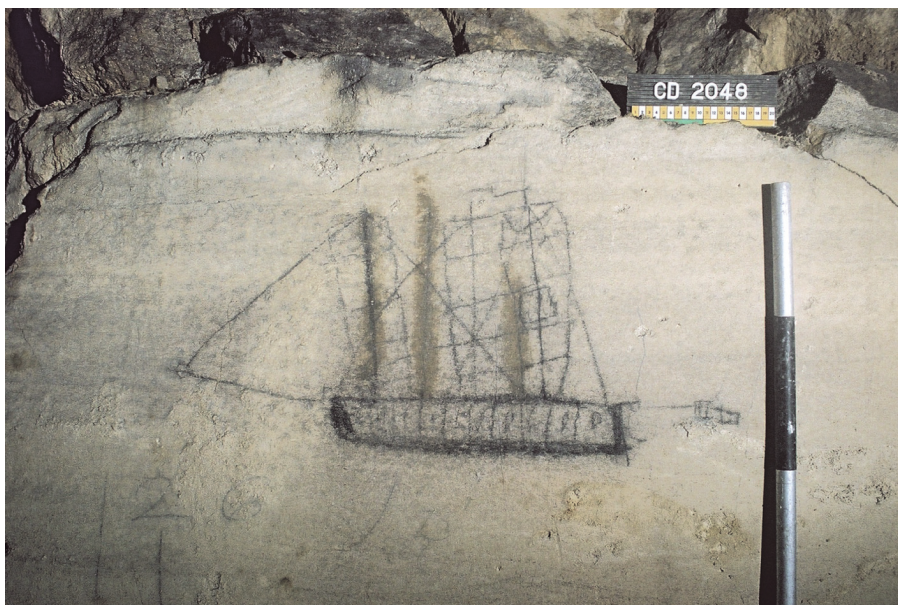


Fig. 11.12 'Ship' graffiti, depicting a lugger, a type active in south-western waters, including perhaps, the Avon Navigation. Other graffiti in the area is dated from the 1830s (Eastern Firs, Quarry 2203)

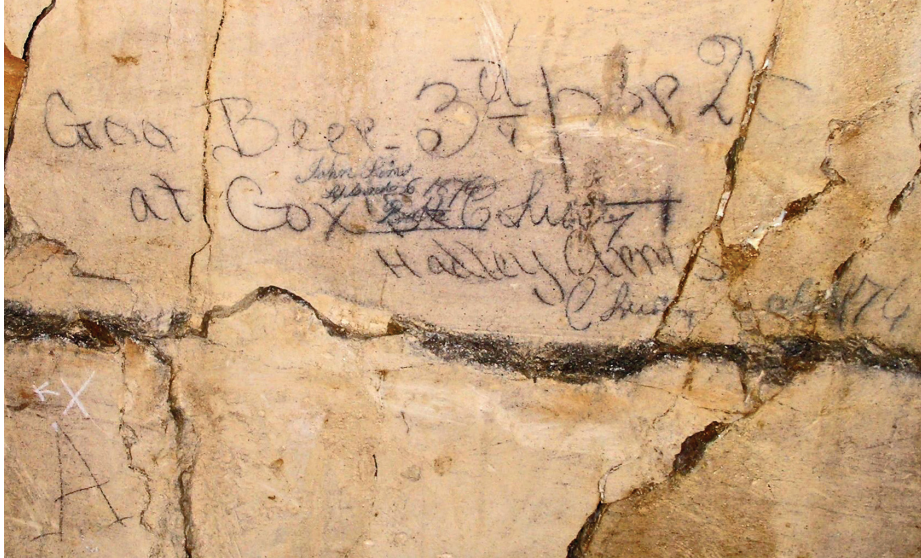


Fig. 11.13 The Hadley Arms graffito, dating to after the building of the pub in 1845-46 (Central Firs, Quarry 2202)

with smudged-on pigment. There are three masts, the largest set in the middle or aft (on the right side of the image) with a four-sided rig of sails on each mast, and a long bowsprit set for'ad for a triangular head sail. The apparent letters along the side may indicate cargo owners' space in the hold. Luggers were renowned as fast seagoing ships in the channel and western approaches. Goodburn suggests that, as an association of tunnels and shipping was commonly linked to smuggling in the late 18th to the early 19th century, it might be part of Georgian Bath's black economy. A smoked candle version of a ship of a much cruder application, was also found under the roof in Phase I workings under the south end of the Avenue.

**Beer, sex and politics**

Beer, sex and politics were as attractive to the common people as they are today. One graffito apparently involves an argument over the respective prices of beer at Cox's and Cluny and/or at the Hadley Arms pubs (Fig. 11.13). Coxes may have been on Bradford Road, possibly the establishment now called the Foresters. The Hadley Arms was built about 1845-6 (Hadley Arms Papers), so the graffito will post-date this. Probably the same individual who discussed the price of beer also commented on the price of the local cigars on an adjacent pillar, though the latter was not accessible to photograph due to a substantial roof fall. The John Sims section may have been added later.

Good Beer 3 <sup>3</sup> / <sub>4</sub> d per qt'	Good Cigars
at Cox & Cluny (?)	1d/4 each"
Hadley Arms"	

John Sims  
September 6 1876  
Bath



Fig. 11.14 'Holly' graffito, Eastern Firs (Quarry 2206)



Fig. 11.15 Graffiti possibly based on 'Jane' the mid 20th-century *Daily Mirror* cartoon character (Foxhill Quarry 2380)

and that when pay came the gangers always got their money from the quarrymen first. The quarrymen ran up slates in the pubs, and they sometimes used the pillars in the quarries for reckoning how much they owed (Hall 1984, 92), though this last has not been identified at Combe Down.

Several items are slightly risqué and, perhaps because of this, their discovery attracted attention from the *Bath Chronicle* and *The Times* and *Daily Mirror* national newspapers. 'Holly' appears to be the name of a buxom and well-dressed young lady seen in two graffiti (Fig. 11.14) in East Firs, and what may be a scantily-dressed 'Jane' from the mid 20th century *Daily Mirror* cartoons (Fig. 11.15) occurs in the Foxhill underground quarry. An undressed lady, nicknamed 'The Naked Lady', shows a full frontal figure and details with emphasized mammaries and sexual organs on a large sawn face in Central Firs (Fig. 11.16). The graffiti may have formed part of young quarrymen's informal sex education, although its educational value may not have been the original intention. A present-day formal mining equivalent can be found at the Bulga Pit near Sydney, Australia, where, *The Times* informed us, classes for mine staff include advice on sexual foreplay which are available to help keep miners happy (Steele, 2007, 2). The graffiti was preserved *intacto*.

The name and date 'Sumsion, 1836' had been scrawled over the Naked Lady, which suggests the face was sawn and the graffiti added around the end of John Burgess and Son's working of the nearby Three Acre Quarry. The Grand Canyon's

long incline for dumping spoil ended very close by. There is no data for Sumsion, a local quarrymaster working within this area, though Isaac and Giles Sumsion had surface quarries on the north side of North Road, and near Shaft Road.

Another graffiti, located within Quarry 518 was a caricature of a top-hatted but otherwise naked gentleman smoking a cigar (Fig.11.17). The cartoon,



Fig. 11.16 The 'Naked Lady', dated 1836 or earlier by a scrawled date over it (Central Firs, Quarry 2201)



Fig. 11.17 Graffito of top-hatted but otherwise naked man, probably early 20th century (Central Byfield, Quarry 518)

probably from the first decade of the last century, may suggest class antagonism and could be directed at a member of the local (quarrying) business establishment. It was within James Riddle's quarry. He was a small independent quarrymaster, and it may, just possibly, have been poking fun at Isaac Sumsion, chairman of the then dominant Bath and Portland Stone Firms.

In 1838 Chartist supporters had met in Combe Down's Widcombe Field for a mass meeting to hear Henry Vincent (Swift 2006, 61) and graffiti suggesting the reading of Mayhew's articles in the mid-century and the above anti-capitalist cartoon may reflect a continuing radical tradition at Combe Down not unusual in mining and quarrying communities, especially in times of economic stress.

### *Tally graffiti*

Another type of graffiti underground was the 'tally tables' or 'tally graffiti' which record the different sizes of the blockstone and the amounts of block produced by the quarrymen. A catalogue with the relevant illustrations of the recovered tally blocks is located on the web site. Quarrymen used ready reckoners, referred to as 'cubing books' to calculate the volume of the extracted blocks (Pollard, 1994, 39). This was especially important to the quarrymen as the amounts of block and the sizes of the blocks produced determined the wages of quarrymen as they were paid by 'piece work', their wages determined by the amounts of blockstone produced and sold.

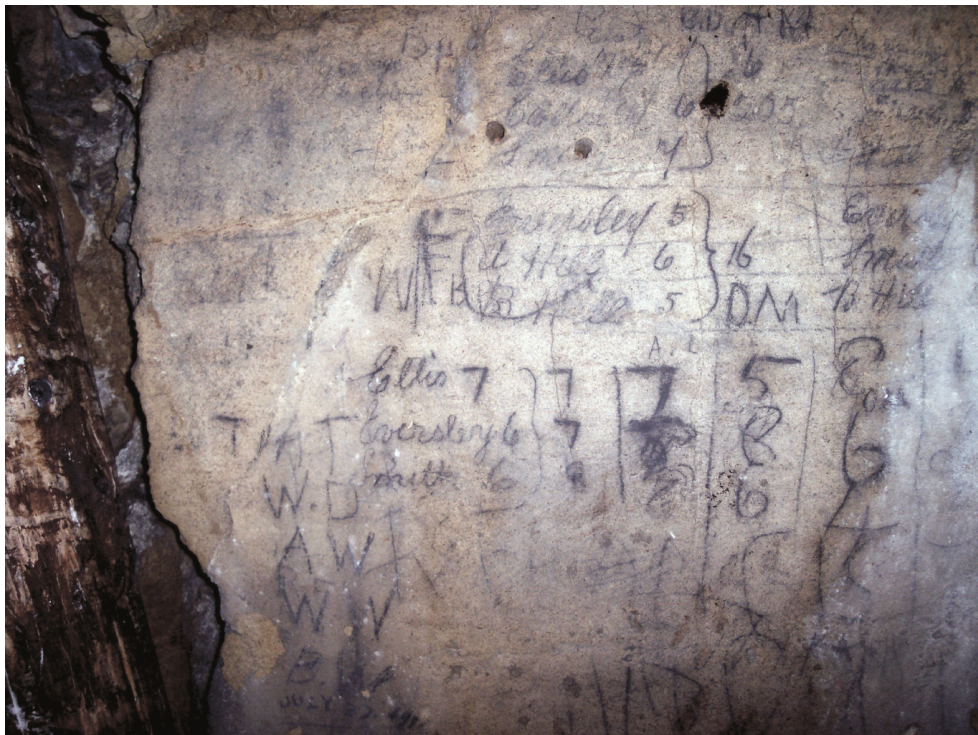


Fig. 11.18 Tally graffiti, early 20th century, near to the West Byfield entrance in Quarry 501



Fig. 11.19 Graffiti of tabulated form of types of stone produced or to be produced, c 1820s (West Byfield Quarry 501)

Tally boards recovered were generally in a poor condition and were often smudged where they had lain within the spoil or were otherwise faint and often illegible. Where they can be read, often they include a simple arrangement of vertical columns with a single horizontal line at the top for separate information or title, or they can be arranged in a chequer board way.

Two good examples of the type of tally graffiti seen on the sawn pillar faces appeared in West Byfield near to the entry to Quarry Area 501. The first dates to the early 20th century (Fig. 11.18) thus long post-dating the main primary extraction. The names of several quarrymen including Ellis, Smith and Walters are depicted and there are accounts of the amounts of blockstone that were produced, with other initials of quarrymen. The same pillar face was used several times to tally the amounts of blocks produced and some of the same individuals were also recorded a number of times. The second example dates from about the 1820s (Fig. 11.19) and was set out in table fashion with columns indicating the quantities and the types of blockstone and wrought stone that were produced, including listed 'Block', 'Coping', 'Pillar' and 'Ridge' Stone, and the rows below listing what is thought to be the dimensions of the stone produced, measured in inches. This table would seem not to have been used for any great period of time as many of the columns remain empty. The rows within other similar tally tables often have the name of the individuals that have cut the stone. The tablature form of tally graffiti is less common than smaller lists of tally numbers on sawn pillar faces, although both forms probably indicate similar types of information. The lists have not been fully interpreted but are generally thought to be either dimensions of individual

blocks produced or the size of the blocks of sawn material to be recovered prior to cutting of the block, and may sometimes be recorded in (cubic) feet of blockstone.

Tally graffiti were probably most commonly seen on small pieces of sawn block again depicting the names of the quarrymen and the amounts and the size of the blocks produced. An example of an early sawn stone block containing tally graffiti was recovered from a stone rubble pack near to a small contemporary masons' working area, in Far East Firs, Quarry 2352. The area contained numerous sawn blocks that had been stacked ready to extract to the surface via an entry located a few metres to the south. The graffiti block possibly of 1730 date, reads: 'June 7 30 44 cut offs 75? Frank Oliver'. The '44' and '75' may refer to the amount of blocks cut or produced.

Some also note the type of stone that was being produced and examples have included: 'block' stone, and 'coping' and 'roof ridger' stone used for the apex and pitches of the house roofs in Bath. Another includes '46 of Banker', possibly referring to banker masons. One tally board had a depicted hangman image but no additional tally information.

#### The Dowling graffiti

A few names and initials were repeated: one or several John and James Dowlings got to most places in the quarries, and inscribed their name(s), all with a fine copperplate hand. J. Dowling also left his inscribed signature on the Palladian Bridge in Prior Park (Tom Davies pers. comm.).

A Dowling graffiti dated 1886 was a version of the tally graffiti. It had seven rectilinear boxes drawn on a pillar face with each box containing

numbers written internally and externally. Pollard (pers. comm.) has suggested it could be listing the dimensions of the blocks within the boxes, with the two figures in each indicating the dimension of each block in increments of inches, with the number of the blocks produced, written externally on the right hand side of the boxes.

It seems certain that a 'Je. Dowling' was a quarryman who worked in several parts of the Byfield and the Firs Quarries. His signature has also been recorded at the Foxhill quarry complex, and has close associations with the quarryman W. Hole, with his signature being seen in many instances on the same sawn pillar face. The majority of the sawn pillars containing the signatures of Je Dowling and W J Hole were located on pillars which had already been partially worked and were therefore easily reworked. They were generally located on the principle cartway routes. In other words, they were part of a pillar robbing enterprise worked in conjunction with later small-scale quarrying. Dowling and Hole graffiti were also located within the Foxhill Quarry 2381, one reading 'Je Dowling W. Hole June 18th 1882'. The graffiti may indicate contemporary primary quarrying activity as this quarry is thought to have been operating between 1875 and 1884. This is one of their earliest recorded graffiti dates and in the later 1880s Dowling's name is especially common in the Firs Quarry. The latest known piece of graffiti containing both their names is thought to represent pillar robbing activity or a small quarrying operation at the northern end of the Firs Quarry 2211 and includes the names 'Walter Jeo.rd', 'Je Dowling', 'A. Moody', 'W.J.Hole and 'Diamond Jubilee 1897'. The Diamond Jubilee was officially celebrated on 22 June 1897.

### *Post-quarrying graffiti*

Grffiti dating to post-quarrying periods are also numerous throughout the quarries, especially at places underground which were easily reached. The graffiti ranged from the names of individuals and members of school parties to caving clubs and even an army regiment. A Foxhill Quarry (2382) example relates to the Bristol Exploration club and was dated 1944. The date has been useful in determining the period in which the Foxhill quarries were accessible from the surface and are thought to have been infilled soon after it was written. Members of the same club have been recorded within the main Byfield quarry entrance dating to the same period. One of the underground quarry enthusiasts who left his signature was John Richardson, who regrettably passed away in 2008. He and his associates Dave Bishop and Rob Jones passed their 1970s and 1980s photos and surveys to us. Other graffiti from post-quarrying periods record the details of visitors from the 1940s to the present day, including those who assisted in the survey of the quarries before the Stabilisation Scheme began. There were also the unsurprising collections of sexual images and crude

profanities. A 'rather hermaphroditic' female form, as she was described by the recording archaeologist, Peter Burge, was found near the Byfield entrance and it is clear that in some respects graffiti art has changed very little over the last century or two.

### **The artefactual evidence**

#### *Introduction*

In collecting artefacts, which in some cases involved very large numbers of similar items, the aim was to form a representative collection suitable for dating, exhibition or which told a specific story relating to Combe Down miners, families and the wider society. Most were recovered through Stabilisation Scheme operations, and though the (modern) miners were increasingly aware of the need to preserve the contexts of finds, this was not always entirely practicable; it was not, for example, usually feasible to excavate dumps so as to preserve the stratigraphy, so a 'whole dump' context was often all that was possible.

The largest collections were of pottery, metals and glass, clay pipes and wrought stone, with wood in much smaller quantities. These have been examined, partially during archaeological recording, but mainly after its end, with the results presented in a series of specialist reports that are available in full on the website: ([www.combedown-stoneminesproject.com](http://www.combedown-stoneminesproject.com)). There follows summaries of these reports. The illustrated items in the figures (11.20-27) represent a selection of the full archive of illustrations available on the website. The identifying numbering in each category is that of the full archive.

*Metalwork* by Ian Scott  
including *Metallurgy* by Chris Salter

#### *Introduction*

Some 581 metal finds were examined (Scott 2009) of which 398 were tools and 286 were related to mining, a further 21 were probably masons' tools. Some tools clearly had nothing to do with quarrying: a scythe, fishing reel, a revolver and darts, probably part of the domestic rubbish discussed earlier.

All the tools were found within the mines. Because the finds were not sealed stratigraphically or buried, but rather found lying discarded within the workings, it is possible that tools and other items had been moved after their original deposition. Some finds were recovered from debris dumped into old workings and in some but not all cases it was possible to date the dumping episodes. Any dating based on location must be viewed with caution and data available on tools is generally too limited to date the workings.

The mining tools, masons' tools and general tools are considered first, and then the finds associated

with moving and manoeuvring the quarried stone, and finally equipment, such as lamps, tinder boxes and bottles, used by miners themselves.

There are examples of mining tools from each stage of the process. The most common finds in terms of numbers were chips, wedges and triangular files, but while this reflects the numbers of these tools used, it also reflects the fact that both chips and wedges regularly broke and were discarded, and that files wore out or could be easily misplaced.

#### *Picks*

Only five examples of pick heads have been found. The included three large examples which had curved tines of a type used for general (including non-quarrying) use. One example and a broken tine are slightly smaller and are likely to have been specifically designed for quarrying (or mining), for example, for cutting jad slots. The sample of surviving picks, however is too small to give a true picture of the potential variety of picks used or of any possible changes in the forms through time.

#### *Saws and associated objects*

A single probable razzar saw has been recovered and at least eleven frig bob saws. The latter range in length from 920 mm to 1850 mm. The width of the blades also varies from a minimum of 245 mm to a maximum of 303 mm. Some variation in width is undoubtedly due to wear in use. The probable razzar has a blade which was probably a worn-down frig bob blade.

The razzar and most of the frig bobs that were recovered lacked handles, but had mounting plates for the attachment of handles. In most cases these were formed from a strip of metal folded and riveted to the end of the saw blade. The outer end of the folded strip was formed into a tube into which the handle could slide. The one exception has its handle plate, which was not riveted, attached to a tongue extending from the back edge of the saw. The attachment then formed a tube into which the handle could slide. The frig bobs were all from Phase 6 locations; this is consistent with its known widespread use from the 1840s (Fig. 11.22).

In addition to the complete or near-complete saws, a number of saw blade fragments were recovered and also vertical saw handles from stone-cutting saws. The handles could have been fitted to frig bob or razzar saws but their form was quite different from the handle fittings on the extant razzar and frig bobs. These wooden handles were attached by tangs to plates which were slotted onto the ends of the saw blade or were slotted and riveted directly to the blade. All were vertical handles and the evidence suggests that they were attached to the top edges of the saw blades. The finding of a pair of handles may indicate that these were used together on one saw, but this is by no means certain. The fact that these handles came from earlier workings dating to Phases 2 to 5,

suggests that they *could* be handles of earlier forms of stone cutting saw, predating the frig bobs.

Three saw-setting tools, all of quite different forms, were found, one from a Phase II location. Fifty one files of triangular cross-section used to sharpen large stone cutting saws were found in some numbers and were mainly datable to later phases of quarry working. The files are all very similar although they do vary a little in length.

#### *Wedges and chips*

These were the two most commonly found mining tools, used together to split rock.

Sixty-six wedges or possible wedges were recorded. 16 were fragments, mainly pieces from the battered heads of wedges or broken off blade ends. It is clear that they broke frequently in use, for not only were there the broken fragments, but one was split at its head or striking end. Four of the possible wedges are not identified with certainty; they may be too small or their form suggests that they may have served another purpose.

The remaining 46 examples can be divided into five types. Type 1 is parallel-sided but has a square end. The most common form is Type 2, which is parallel-sided and has a rounded end. Type 3 is similar to Type 2 with parallel sides and a rounded end, but differs in that the top is chamfered and slightly narrowed. Both Type 2 and 3 can be found in long and short forms. The shorter examples are about 200 mm and the longer are usually between 230 and 250 mm. Chronologically Types 2 and 3 may have been used at Combe Down at the same time. Price (2008, 96-7) writes that at Whittington underground quarries, near Cheltenham, three types of wedge were found. One form was like Type 1 with the square end. The two other Whittington examples differed from Types 2 and 3 at Combe Down in having rough points instead of rounded ends. Type 4 had a narrowed and chamfered top, with a square ended blade and was slightly narrowed. Type 5 was large with a round end, narrowed with a chamfer to the head. These two latter were each represented by a single example. It is possible these variations were local, perhaps even to specific suppliers, and that the last two types were less commonly used at Combe Down.

Chips were by far a more common find, with 168 examples being recovered. They are remarkably uniform in appearance, probably because they are very plain and simple in design. Many of the chips were broken, the majority of them being split down the middle, which means that the overall length of many of the chips cannot be measured. Less than half could be measured across the full width.

The longest example measured 170 mm, and the shortest 95 mm. The average length is 132.6 mm and the majority of the measured chips (n = 87) is between 120 mm and 140 mm long. Their width ranged from 55 mm to 98 mm; the average width is

78.3 mm, and most (n = 7) are within the 66 mm to 86 mm range, with only two measuring between 55 and 57 mm and six between 90 and 98 mm. Chips were predominantly found in Phases 3 to 5. Nearly half the examples are unphased or are of uncertain phasing.

A small number of sledgehammers were found, four complete and one fragment, ranging from 154 to 170 mm long and between 80 and 88 mm wide. A further small hammer was found in a domestic dump context.

*The tools used for cutting and handling freestone blocks*

The following is a description of the methods used in the 19th and early 20th centuries, and a selection of illustrations of tools recovered from the quarries. The full photographic archive is available on the website: ([www.combedownstoneminesproject.com](http://www.combedownstoneminesproject.com))

The first stage was for a picker to prepare a breach at the working face, that is creating a slot at the top of the stone about 6 in (15 cm) thick to a depth of about 5 ft (1.5 m) using picks of different lengths. Then the sawyer would use a razzor saw with a shallow blade to start the downward cuts of the stone blocks. Once a good depth of cut had been achieved a larger frig bob saw with a blade up to 8 ft (2.4 m) long would be used. Water was dripped into the saw cut from a can for lubrication.

Once the saw cuts had been made, the first block (the wrist stone) was removed by using wedges and chips (also called feathers) to break between the beds. The block would then be dragged out using a chain and Lewis bolt fixed to a Lewis hole cut in the front face of the block. The back of the block would then be cleaned up with a scappling axe. The back of the cut where the wrist had been removed would be cleaned up using a pick, then the remaining blocks could be removed by sawing down at the back with a razzor saw, and then breaking the blocks from the bed with wedges and chips.

The cut blocks could be manoeuvred using pinch bars and crow bars, and trimmed and tidied using scappling axes. To lift and transport the blocks Lewis bolts were employed. A Lewis hole was cut into the block into which a Lewis bolt was inserted. The block could then be lifted by a crane onto a wagon or truck or dragged by chains and winches.

A selection of tools found in the stone mines is illustrated in Figures 11.20-22, including:

**Wedges** (SFs 35, 530) of varying sizes for splitting blocks from stone beds in combination with chips or feathers

**Chips (or feathers)** (SF 455) used in combination with wedges to split stone from beds.

**Sledge hammers** (SFs 93, 624, 807) used with wedges and chips for splitting blocks and with chisels for trimming block and cutting Lewis holes

**Frig bob saws** (SFs 445, 196), for cutting away large stone blocks, maintained using

**Saw setters** (SF 5998)

**Scappling axe** (SF 614) used for trimming and tidying stone blocks

**Pick axes** (SF 779) used in preparing the cutting operation and for trimming and cutting faces

**Spokeshave** (SF 870) for shaping a moulding on a stone block

**Three-legged Lewis bolt** (SF 474) used for lifting blocks of stone by crane using –

**Chain and hook** (SF 1029) dragging blocks by a winch

**Horse bit** (SF 519) for occasional use of horse and cart for transport underground

**Small oil lamp** (SF 281) Typical source of illumination underground

*Comment*

Other than chips and wedges, the number of iron tools found was remarkably low. Partly this may be because wedges and chips and files are fairly small when compared with sledgehammers, picks and crowbars. A further possible reason has been put forward during a conference discussion, in respect of the few hammers and large numbers of gads (pointed wedges) found in mines near St Marie-des-Mines, France: the gads, which required regular smithing, belonged to the masters and the hammers belonged to the men. Since a substantial number of chips were used to tighten roof-supporting sprags, this may suggest wedges and chips were supplied by the masters, and the hammers crowbars and picks were provided by the workmen themselves, and accordingly taken care of more assiduously.

*Metallurgy of wedges and a saw* by Chris Salter (Oxford Archaeological Research Laboratory)

Seven of the wedges and a fragment of a frig bob saw were examined. All the wedges were of phosphoric wrought iron, indicating the original iron ore was derived, most likely, from a Coal Measure ironstone source, rather than, for instance, the nearby Forest of Dean or more distant Furness District. The consistent levels of sulphur in all samples points towards coal-fired smelting, a process initiated in 1709, at the cast iron stage rather than the charcoal blast furnace process. Such iron then required refining to produce wrought iron.

There had been no attempt to harden the faces or 'cutting' edge by carburizing. The use of phosphoric iron would have made an attempt to do so difficult, as phosphorus slows the diffusion of carbon into iron. In most cases, the hardness of the combination of phosphorus content and work-hardening would have improved the properties considerably above those that would be obtained from a plain wrought iron.

Two of the wedges which came from earlier (Phase I and II) contexts had a higher level of potassium which probably derived from charcoal ash used in the finery furnace, where the iron and charcoal were placed together. A third sample was



indeterminate. The other four, with much lower potassium probably derived from the coal fired puddling process of c 1783-4, where the iron was kept in a separate hearth from the coal. The wedge composition and production process for the two 'early' samples are thus consistent with an origin of prior to soon after 1783-4 when Cort's puddling and rolling process begun to predominate because of much reduced costs. They may thus belong to Phase I, II or III though a later re-use of the metal is not entirely precluded. The other four samples will all date after the introduction of puddling.

A number of the samples showed one of the problems with the very directional nature of wrought iron, which is cracks and corrosion running along the planes of high slag inclusion density. Mostly this was in the form of cracks running back from the blade. However, one sample suffered transverse cracking and subsequent corrosion along the slag inclusions exposed. The transverse cracking is likely to have been a result of the heavy mechanical misuse that this sample has suffered. It had been bent in the plane of the wedge, no doubt due to the wedge having been used as a lever rather than a wedge.

Given the size of the sample it is difficult to determine if a phosphoric iron had been deliberately selected for the manufacture of these wedges, or if it was used because it was the cheapest local supply to the manufacturer. The use of phosphoric iron would have certain mechanical advantages as long as the wedges were used in the manner intended (in compression).

The fragment of frig bob saw was the only artefact made of steel which was studied. Two possible interpretations are offered, the first that it may be a high carbon shear steel, which was commonly used in edge tools, and produced by piling and forging blister steel produced in the cementation furnace.

The second and possibly more likely interpretation offered is that it was the product of a liquid steel-making process (cast steel) from iron produced in a coke-fired blast furnace, which must be after 1709, but as the iron from the early coke-blast furnace was not considered suitable for steel making the saw is likely to have dated from much later. The fact that there was a high proportion of silicate and other non-sulphide inclusions present and that there was not enough manganese to entirely prevent the formation of iron sulphide would suggest a mid to late 19th-century date for this sample which would possibly have been made from a form of blister steel produced from puddled iron, remelted to give it a more homogenous composition. Use of the much higher quality crucible steel was probably too expensive for such a lowly artisan's tool.

The relative softness of the rock would have made harder grade materials unnecessary for successful use as wedges. Cast steel was introduced in quantity in the late 19th century, but until then it

would have been substantially more expensive than the traditional wrought iron. As an explanation for the absence of steel wedges in the last phase of working, it is possible that any steel wedges introduced and used were more highly valued, and less damaged and thus more cared for.

The use of cast steel for the frig bob was probably not without an alternative, especially in the earlier part of the 19th century. Converting to steel by carburisation, would have involved the cementation process to convert wrought iron to a steel in which harder, higher-carbon layers provided a cutting edge. Cast steel at an earlier date might also have been derived from the Huntsman process, but this was comparatively very expensive, though it began to be used for hard rock-cutting tools about 1840. It is more likely that either Bessemer or Siemens-Martin steel, both bulk liquid steel processes, was used for the late 9th-century saw.

The use of saws in the quarries seems to become fairly frequent around about 1820 and common by the 1840s. Possibly this was due to searching for new markets by the Sheffield industry after the end of wartime demand after 1815. The use of different forms of iron and steel for quarrying tools is a suitable subject for further research, preferably on better stratigraphically secure examples than those used here.

### *Illustrated finds (with archive catalogue numbering)*

*Fig. 11.20 Splitting the stone from the bed*

- 39 Wedge Type 3, large with slightly tapered blade, round end; Narrowed and chamfered at the top below battered head. Fe. L: 363 mm; W: 83 mm. Sf 530, Mine area 514 or 2221, Phase 3 or 4. [ID 251]
- 51 Chip, complete. Fe. L: 124 mm; W: 78 mm; Th: 12 mm. Sf 455, Mine area 2337. Phase 4. [ID 228]
- 52 Chip, complete. Fe. L: 123 mm; W: 76 mm; Th: 12 mm. Sf 455, Mine area 2337. Phase 4. [ID 229]
- 35 Wedge Type 2, complete, with round end. Fe. L: 217 mm; W: 83 mm. Sf 623, Mine area 2217, Stub C15, context 1200. Phase 4 or 5. [ID 478]
- 59 Small sledgehammer head, oval eye. Fe. L: 165 mm; W: 57 mm. Sf 93, post quarrying from Shaft 4031 (G2 supply shaft) context 4034. [ID 42]
- 57 Sledgehammer head with circular eye and body tapered to a narrow striking face. Fe. L: 168 mm; W 86 x 85 mm. Sf 624, Mine area 2359, Stub O10. Phase 3 or 4. [ID 462]
- 58 Sledgehammer head with circular eye and broad striking face. Fe. L: 168 mm; W: 88 x 76 mm. Sf 807, Mine area 917 tipping? Stub R8. Unphased. [ID 487]

*Fig. 11.21 Stone cutting and shaping*

- 11 Frig bob, long blade. Complete blade with curved worn cutting edge. Now lacks handle mount, but has at least two rivet holes. Fe. L: 1795 mm; W: 265 mm. Sf 445, Mine area 2379, localised quarry, context 1002. [ID 348]
- 18 Pair of vertical saw handles probably from a two-person saw rather than from frig bob or rizzer saws. Wooden handles attached to tanged iron fittings and secured with collars. Fe and wood. L: 290 mm.

*'Finished Labour of a Thousand Hands'*

- |    |   |    |  |
|----|---|----|--|
|    | Sf 196, Mine area 2217, context 1089. Phase 4 or 5. [ID 20]   |    | area 2365, Stub M14, Context 11022 Phase 4 or 5 [ID 476]   |
| 27 | Saw setting tool, pointed handle or tang and round bade with 3 keyhole shaped slots. Fe. L: 182 mm; W: 78 mm. Sf 598, Mine area 2200, Stub A30. Phase 2. [ID 469] | 1  | Jadding pick, with short stout tines. L: 500 mm. Sf 779, Unlocated. Unphased [ID 557]  |
| 64 | Scappling axe head, complete, with part of handle in situ. Fe. L: 314 mm; W: 125 mm. Sf 614 Mine  | 89 | 'Spoke shave', with U-section central blade. Tapering pointed arms, one with right angle bend at the end. Fe. L: 320 mm; Sf 870, Mine area 2369, Stub D29 Set (7) LH side. Phase 2. [ID 430] |



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51 and 52



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58



1:4

Fig. 11.20 Metalwork: Splitting the stone from the bed



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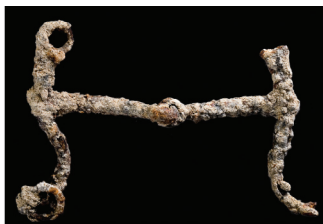
89



Fig. 11.21 Metalwork:  
Stone cutting and shaping

*Fig 11.22 Haulage and lighting*

- 128 Bridle bit with hinged two-piece mouth bar with S-shaped side bars. Fe. L: 190 mm; 128 mm. Sf 519, surface debris from Quarryman's Court, Stub E4. Unphased. [ID 254]
- 160 Crane hook with attached length of chain with 6 extant links. Five smaller links (L: c 80 mm) and one longer link (L: 100 mm). Fe. Hook L: 210 mm; W: 135 mm. Sf 1029, Foxhill, Mine area 2380, Road. Phase 6. [ID 530]
- 169 Three-legged Lewis, comprises hooked yoke, one side leg, the central leg and the connecting pin. One leg missing. Fe. Overall L: 614, Hook L: 320 mm. L: 614 mm; 186 mm. Sf 474, Mine area 2215, Context 1127. Phase 4 or 5. [ID 354]
- 191 Small hand held tinware oil lamp, comprising sheet metal saucer with sloping sides and holding a low cylindrical oil reservoir with domed lid. There is a small hole in the lid for the wick. The lamp has a sheet metal loop handle. Fe. D of saucer: 104 mm; L with handle: 124 mm; Ht: 30 mm. Sf 448, unlocated. Unphased. [ID 465]
- 192 Small tinware benzolene lamp, with simple loop handle. Domed reservoir/body with slight moulding. The central hole lacks its threaded collar. Slightly recessed base, joined to body with a soldered and rolled seam. Fragment of cloth (wick?) inside reservoir. L: 110 mm; D: 98 mm; H: 42 mm. Sf 281, Shaft Road Quarry Mine area 2372, Context 5000. Phase 6. [ID 138]



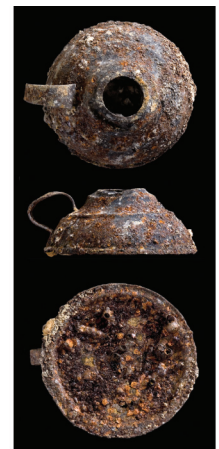
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0 250 mm

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*Fig. 11.22 Metalwork: Haulage and lighting*

**Wood finds and identification of species**

by D M Goodburn

Timber examined was relatively young, between 100 and 250 years, for which the humid, cool and dark conditions had aided preservation (Goodburn 2009). However many examples were either reduced to heartwood, or to a peaty mush. Proximity to metalwork aided preservation of the adjacent timber. A total of twenty pieces of worked wood or composite assemblies such as barrow wheels were examined of which eleven were sprags or planks. Dendrochronology proved impossible for the young coniferous material, and normally datable species such as ash had too small samples. Species identification (Challinor 2009) showed three sprags were of pine (*Pinus* sp.), two were of spruce (*Picea* sp.), and another was elm (*Ulmus* sp.).

**Tools**

A simply made wood gauge was made from a plank of softwood measuring 0.45 m (18 inches) long with a series of 1 inch-long notches set in its side at 8, 10, 12 and 14 inches. Its likely use was to measure stone sizes.

A partially decayed wheelbarrow, little more than a 'shadow' except where the wood was close to iron parts, was found in 19th-century workings (Fig. 9.16). Complete, and made of elm, it would have been about 1.76 m long and 0.7 m wide with a wheel diameter of 0.42 m. The woodwork was reinforced by iron tie rods, one at the front end and one at the rear of the box. Smaller strap sections were found at the wheel end of the nave.

**Oak and iron cart shaft**

This was a cruciform of two pieces of oak, c 1.78 m long and 0.4 m wide. The main beam is a box-quartered section of oak with bevelled corners, protected with thin iron bands fastened on with iron tacks. One end was broken. The cross-piece was plank-like with rounded ends, set 0.25 m from the rounded and iron-reinforced end of the beam in a through-mortice. The most likely function of the shaft was for controlling a two-wheeled handcart (Fig. 9.28).

**Barrowing boards**

The largest was 4.23 m long and 0.28 m wide, 0.07 mm thick, tangentially sawn along lines of three inches. It was cut from a slow-grown tree, one of the spruces (*Picea* sp.), and had about 150 growth rings but no clear sapwood or bark. This precludes a local origin, in favour of alpine or northern. The second plank was a little wider at c 0.3 m, 3.68 m long and slightly thinner.

**Shoring timbers – sprags**

A substantial proportion of the shoring timbers were of softwood, which, if imported or if locally grown would probably be the Scots pine, *Pinus sylvestris*, only minimally trimmed to log form using

an axe. The largest diameter sprag was 1.9 m long and 0.21 m diameter, which had approximately 50 growth rings. A diameter of 0.16 m was more typical, down to a minimum diameter of 0.11 m, a rare deciduous example. Lengths were between 3 m down to 0.85 m. Rule-of-thumb dimensions for pit props in the mid 20th century were one twelfth the length down to three inches (75 mm), which suggests these were comparatively stout timbers.

The fast-grown rather rough form suggests they may have been locally grown, especially since transport of such low-value material, second and third quality, only better than firewood, would have been expensive. Scots pine, known in England as fir, was unusual in south-west England in the 18th century and these trees were at least 50 years old at the time of felling. They may thus be partly from the extensive planting of firs by Allen in the 1730s onwards (hence the name The Firs). The wood used in the Phase III and IV quarries included the smaller diameter, more knotty logs derived from the tops of trees, and even the largest log was clearly not the highest value 'butt log' (first log cut above the stump).

Two of the smaller sprags were deciduous, and it was perhaps surprising that more use was not made of such offcuts from local timber yards. One sprag, 1.09 m long and 0.085 m in diameter was slightly crooked and made of elm. A further example of a sprag was distinctive in being manually pit-sawn, 0.94 long and 0.11 m thick. It may be a product of an estate saw pit.

**Worked and architectural stone** by Ruth Shaffrey**Worked stone**

There is a varied and extensive assemblage of worked stone, which has been divided into miners' equipment and worked stone intended for removal to the surface (Shaffrey 2009). It is described by artefact class and, where appropriate, in relation to individual quarry areas and phases. Quarrymen's equipment comprises storage boxes, candle holders, hones and 'graphite' markers which had been found throughout the quarries. Worked stone mainly comprises architectural stonework, internal and external domestic items such as sinks, water containers and staddle stones, or ashlar blocks.

**Boxes**

A total of 18 stone boxes were recovered, from all phases except Phase VI, ranging in size from small unfinished boxes, to more standard candle boxes and a single large box made of slabs (Fig. 11.23).

Most are fairly crudely worked, with evidence for the use of saws and scappling axes. No two boxes have identical dimensions and, although their overall range is limited, with the majority measuring between 300 and 400 mm in length and 200 and 300 mm in width, the variability suggests there was no template for their manufacture. They

may have been made on an ad hoc basis. The majority of the boxes are comparable to some found in the Whittington quarries near Cheltenham. These were probably candle boxes (Price 2007, 91), used to keep candles and the means to light them (flint, tinder etc) dry and away from vermin. The majority of the Combe Down examples are of an appropriate date, predating the invention of the match in 1829, after which dry storage for tinder gradually became irrelevant (Price 2007, 86). They would only have been effective, however, if they were sealed with lids, of which only one was recovered, suggesting that the primary purpose of the boxes was not to keep items dry. An alternative explanation is that they were intended to store small tools or a quarryman's or mason's belongings.

One box merits particular attention. Unlike the others, which were each fashioned from a single piece of stone, it comprised six individual slabs positioned together to form a single box. The two end pieces are the full width of the base and the longer side pieces fit in between. This was clearly constructed to provide a storage place and the presence of a lid, albeit only covering half the box, suggests it was intended to protect the contents, possibly from rats, if food were stored inside it.

#### *Candle holders*

Two stone candle holders were recovered from Phase III/IV areas in Far East Firs, Quarry Area 2330. One has a portable paddle-shaped holder. This has a socket in the centre of the paddle, presumably to secure the candle, but the entire surface of the holder was covered with a thick wax deposit, which has been left *in situ* (Fig. 11.23). The other is of squat cylindrical shape, offering no protection to the hands from the hot wax and was thus less practical for carrying around. It is likely to have been positioned in a semi-permanent location on a ledge. It is reminiscent of the single stone candle holder found in the Whittington quarries (Price 2007, fig. 66: 7.207).

#### *Markers*

Three 'graphite' markers were recovered. All demonstrate wear consistent with mark-making or writing and were probably used for tallying and similar purposes in the mine. One is from a Phase IV/V location, the others are unphased. David Pollard suggests these were made of a soft coal found in local mines (pers. comm.).

#### *Hones*

Two sharpening stones found in the mines would have been used to sharpen tools. One is an unmodified Pennant Sandstone or Old Red Sandstone slab with a deep groove from sharpening. Other slabs of the same sandstone were recovered but had not been used for sharpening, although it seems likely that they were intended for use in this way. A single whetstone is a smaller item, smoothed on its faces from sharpening.

#### *Comment*

With the exception of the boxes, which survive in good numbers, the assemblage of miners' equipment is relatively small given the overall size of the quarry complex. However, as published examples of most categories are rare, these are significant finds. The number of storage boxes suggests these were an important everyday item in the quarries, although their size would have made them easier to find than the smaller items.

The general lack of sharpening stones suggests that sharpening of tools was not generally carried out underground. However, the evidence indicates that saws were sharpened underground using a large stone with a longitudinal cut to hold the saw. Many saw-sharpening files and three saw-setting tools were found. It is likely that these may represent some relatively ad hoc sharpening, although as a rule the saws were systematically sharpened each week, and time for this process was allowed, for instance on a Saturday, for this task. The small numbers of stone candleholders suggests they were not particularly common.

#### *Architectural stonework*

The following summary report indicates the range of stonework found (Fig 11.24) and the phasing (where identified) of quarrying involved, with the conclusions which can be drawn from it.

#### *Moulded stonework*

A total of 24 pieces of decorative stonework were recovered, including pieces that may have functioned as elements of architraves, cornices or string courses. This type of stonework was found in all phases of quarrying activity. A single console support with cyma recta moulding was also identified. The mouldings survive in various stages of completion, including some where two pieces are still joined together in mirror image of one another. The profile of all the mouldings is complete and it is generally other sections of the stone that have not been finished; for example, on those that are rebated (see below) this section was removed last. The quality of workmanship varies significantly between pieces, with some demonstrating very few flaws and completed but abandoned, presumably because they were subsequently broken. Other pieces are unfinished but with clear lack of accuracy in the detail, which may have rendered them of insufficient quality for use.

There are four distinct groups of profiles within the architectural mouldings. The first group of six pieces have the distinctive S-shaped bolection profile; five of these were found in Phases III to V areas while a single slim piece with a partial S-shape moulding was the only piece found in an area attributable to Phase I. Some have a deep square rebate on one side, a common feature of sash

window embrasures in Bath, its function being to secure the weights, with the other half of the box being constructed by the joiner. The mouldings with the rebate were probably intended for use as window surrounds, while those without may have been architrave round doorways or possibly for an internal feature such as a fireplace. Although the bolection profile was used on some prominent buildings up to about 1720 it would have been considered old-fashioned well before Ralph Allen controlled the underground workings. Thus with one exception all the bolection profile mouldings were found in much later phases of the quarries than their usual period of use.

The second group has a more delicate and complex profile forming an approximate sequence from the top down: cyma recta; fillet; cyma recta; corona; small overhang; fillet; cyma recta. Such profiles have been recorded in use as cornices and also for architraves above doorways and round windows. One item is from a Phase II or III area of the quarry (913) and two are unphased, but this profile superseded those of bolection type. Early examples in Bath date to the early part of the 18th century, for example at Queen Square, built between 1728 and 1736; much later examples are also known – for example, Green Park Station, built in 1868-9.

A third group has four pieces of simple shape with concave moulding in one corner and with the opposing edge either flat or chamfered. These could have been used either as a simple string course or the cornice at the top of a wall such as that observed on Barton Buildings, Bath, built in the 1760s. Two of these are from Phase IV or V tipping in Far East Firs, one is from a Phase I context in south Byfield and the other is un-phased.

The fourth group comprises items with a simple sequence including either cyma or ovolo-shaped moulding and all rebated on the adjacent side, suggesting these were intended for use as sash window surrounds. All three were recovered from Phase II workings in Far East Firs. A small number of other pieces are associated with window architecture, including two window mullions and a small number of other shaped pieces of stone that may be sills and window surrounds. Of the two probable window mullions, one has ovolo moulding and one has chamfered moulding. The mullion with ovolo moulding was found in Central Firs Quarry 2347, Phase I, and is of a generally early type. Although mullioned windows were gradually superseded by sash windows, they continued to be used in the rear or side elevations of dwellings in Bath and do occur on late 17th-century buildings in Bath. A single pillar from Phase IV Quarry 504 may be a rough-out for multiple mullions having been made into a chamfered mullion shape and then abandoned. A number of stepped blocks were probably intended for use as sash window sills or simple door frames.

### *Columns/pillars*

Three column capitals were recovered from the mine. The two larger pieces were found together in Quarry Area 2347 belonging to Phase I. They do not present a known profile. In addition, three partly worked pillars or slim column shafts were also found. Each had been roughly fashioned into a cylindrical shape with a scappling axe. One is plain, the other has two sections of differing diameters and the third has two parallel grooves partially cut into the stone.

A single large pillar has a square cross-section with a rectangular socket on each of four faces, each measuring approximately 6 x 3 inches (180 x 90 mm). These may represent recesses for timber joists, although it is not clear in what sort of structural situation a pillar such as this might have been employed.

### *Balusters*

A total of 42 baluster segments were recovered, the vast majority (37) from pre-Allen Phase I quarry areas. Of these, 27 were found in south Byfield, Quarry 910. A further four are from Phase II areas of the far southern tip of the East Firs Quarry (2348). The remaining baluster sections were found scattered throughout the mine. All that remains of the vast majority of these are the end pieces, most with the lathe socket remaining in the base. Some survive only as the square end block with a short section of profile. On others only the circular section and part of the shaft survives. In one example the central portion survives without the socket and one example is fully perforated.

### *Ridge stones*

One of the most common components of the worked stone assemblage are the varied lengths of angled ridge stones and their wasters that were used to cover the ridges of roofs. Many of the waste pieces reveal consistent angles, as would be expected on long terraces with uniform roof lines. However, there are examples with shallower angles, which show that ridge stones were put to use on different types of roofs. Ridge stones are also represented by marked-out blocks, not yet separated into individual pieces, which provide a good view of the manufacturing process followed in making the ridge stones. Of two marked-out blocks, one has had the ends of each coping stone individually shaped prior to separation from the main block and the other still has vertical edges although the lines of each block are marked out.

### *Silt traps*

A total of eight large items with vertical sides and angled ends were recovered from Phases I to V contexts. These silt traps were used in the sewerage

system in Bath from the 1720s onwards. With the exception of one extremely large example, all the silt traps are of very uniform dimensions, varying from 350-400 mm length, 190-240 mm depth and 180-320 mm width. Silt traps were found in Byfield and all the Firs areas, and a group of them in various stages of completion was found in Far East Firs. All are in their final exterior form but they are at various stages of manufacture, with one interior not excavated, two partially excavated and the fourth fully excavated and crudely finished. It is not clear why these silt traps were abandoned partway through manufacture, as there are no apparent faults in either the objects themselves or in the stone.

### *Miscellaneous stonework*

These include internal and external fixtures as well as items of indeterminate function. Half a sink in two surviving fragments was recovered from Quarry 2001 although it was probably associated with Central Firs Quarry 2368. It is a shallow sink with internally sloping sides, one square and one rounded corner and a base that slopes down towards the missing end. Another trough is flat-bottomed internally and thus not a sink but may have been intended as a water container.

Other items include a ball, possibly for use as a marble and half a circular vessel measuring about 230 mm diameter by 200 mm high. It is quite crudely made and, although it has a lump on one side suggesting a rib and thus could function as a mortar, it would have been too soft for that purpose. It may have been intended for some use in the quarry rather than as an export, or perhaps as a decorative vessel. Three large circular stones were recovered, measuring approximately 600 mm diameter with one flat face and one slightly convex face leading up to a flat surface. The most likely interpretation is that these are staddle stone caps, as they have no obvious architectural function and are of an inappropriate material for millstones.

### *Ashlar blocks*

Over 80 ashlar blocks were recovered from the mine for analysis. These vary in size and finish and, although summarised here, were recorded in full on the archive database. A single block retained a possible Lewis slot (SF 681) (see Chapter 9). The ashlar blocks show no uniformity of size, varying from pieces of 'small ashlar' to much larger blocks, presumably intended to be cut down further. Some blocks retain evidence of this intention in the form of a scored line along the centre, marking out the intended division into two smaller blocks. Others have some marking-out for further development, and one is scored ready for cutting.

The ashlar has been worked and finished to varying degrees with evidence for a combination of sawing, scappling and combing. A total of 45 blocks

preserve saw marks on some or (rarely) all faces, as the principal method for producing ashlar. However, 33 sawn blocks also demonstrate the use of a scappling axe on one or more faces. Although very few surfaces survive sufficiently for the width of the scappling axe to be determined – blade widths of 2, 2.5, 3 and 4 inches could be identified. Fourteen blocks were also finished on one or more faces with a comb (mason's drag), of which numerous examples were recovered.

Among the ashlar pieces are a number of oddities. These include three small ashlar blocks with curved tops that serve no obvious structural function. There are also triangular-shaped blocks and an arch-shaped stone.

### *Conclusion*

The assemblage of worked and architectural stone from the Combe Down underground quarries provides a valuable insight into quarry operations, particularly to what degree the stone was worked underground and how the process was organised. The variety and quality of the finish of the worked stone indicate that a whole range of stone working occurred underground including sawing, scappling, combing and the production of more detailed mouldings. The most intricately detailed stone is found in the form of architrave, and these date to most phases of the quarries' use. Although the underground quarrying areas were operated in different ways while they were open, these pieces are a clear indication that some stone was worked to a near-finished state underground.

In addition to revealing the extent of work that was carried out underground, the evidence also helps our understanding of how it was organised. Some areas of the underground quarries produced notable concentrations of worked stone providing the solid evidence that masons worked underground. The recovery of broad ranges of worked stone from single working areas indicates that where masons worked underground, they did so on a multitude of things and that the manufacture of different items was not segregated. Individual categories of worked stone were not generally concentrated in any particular quarry areas, with the exception of the balusters, which demonstrated a significant concentration, a large group of coping stones and wasters and small collections of other items such as the four silt traps found together. Analysis of the petrology of the utilised stone indicated very little variation and it does not appear that selections of stone types were made for different functions (Palmer 2009).

All the stones in this assemblage are either waste products or items that were either discarded or abandoned and in some cases, the reason for this is obvious. The stone of a few pieces was found to be flawed during manufacture. Some of the more detailed mouldings were badly made, with the long lines being poorly aligned for example. Other pieces



Chapter 11

Worked stone

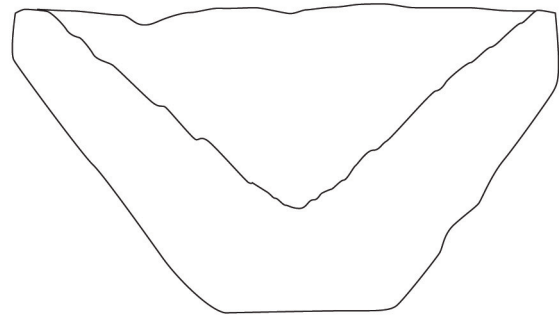


39



45

Architectural stone



36



8

0 250 mm

1:5

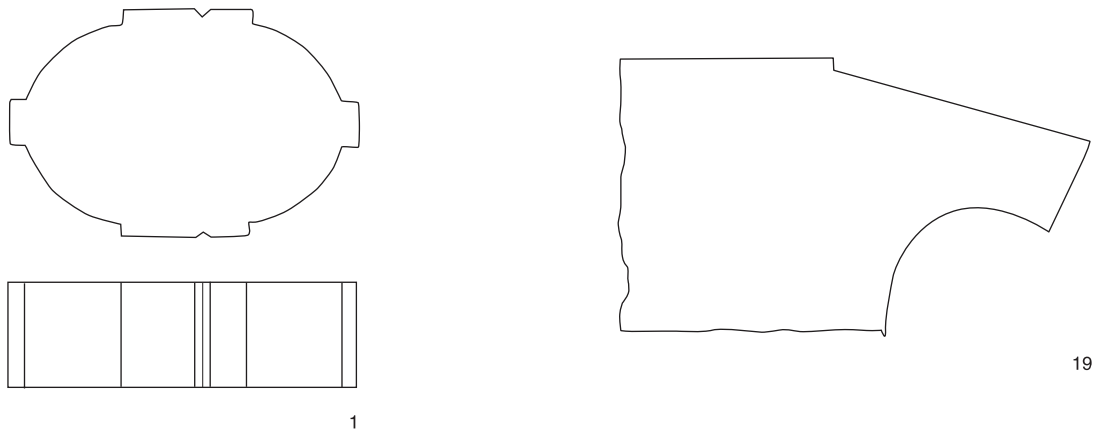
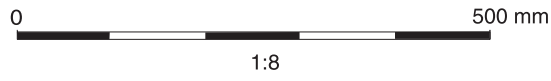
Fig. 11.23 Worked stone and architectural stone

Architectural stone



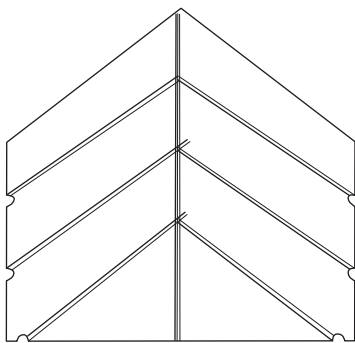
23

15



1

19



32

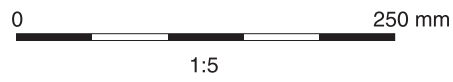


Fig. 11.24 Architectural stone

were probably broken or damaged during manufacture and then discarded. Some items, notably the silt traps, show no obvious reason for discard. This discarded stonework encompasses a broad range of types from simple ashlar blocks to complex architectural profiles. The vast majority of the stone is architectural as would be expected; however a full compliment of architectural stone is not represented. Simple pieces such as voussoirs are not present nor are any examples of distinctive ecclesiastical architecture. There are no examples of detailed carving such as friezes, scrolls and generally very little evidence for any sections of columns. It may be that more complex architectural features and carvings were carved on the building site rather than at the quarry. Certainly the finishing of pieces at the quarry meant there was more chance of them being damaged in transit, a risk no doubt increased for more complex pieces. In addition, higher profile, non-speculative projects may have had other controlling measures in place leading to stone being worked on site. The more skilled masons who were responsible for carving intricate pieces may not have been connected with the underground working at all, and employed directly by individual projects to work on site.

#### *Catalogue of illustrated items (with archive catalogue numbering)*

##### *Figure 11.23: Worked stone and architectural stone*

39. **Candle Box.** Long slim box, crudely formed. Wall thickness 15–30 mm. Measures 432 x 178 x 152 mm. SF 606. Phase 1 late 17th early 18th.
45. **Candle holder.** Shovel-shaped candle holder with oblong shaped handle and flat upper surface covered in thick layer of wax which still has indentation from where candle was positioned roughly in the centre. Measures 160 x 72 mm maximum width x 40 mm maximum thickness. SF 608. Phase 3 or 4 1768-1800 or 1800-1833. Quarry 2330, Far East Firs
36. **Silt trap.** Fully excavated with internal dimensions of 300 x 155 x 120 mm deep. Fashioned with the use of a scappling axe or hack except on the top face where it had been sawn. Externally it measures 360 x 240 x 210 mm deep. SF 662. Phase 4 or 5 1800-1833 or 1833-1867.
8. **Probable sash window surround.** Bolection moulding with rebate. Ashlar finish. Measures 265 x 254 x 150 mm. SF 35. Phase 3 1768-1800

##### *Figure 11.24: Architectural stonework*

23. **Baluster.** Partially worked. Square base with section of baluster above. The square corners are chamfered up to the circle. Flat on top with roughly finished edges to circle. The socket measures 24 x 24 mm. Measures 210 mm diameter across shaft and base x 160 mm high. SF 965. Phase 4 or 5 1800-1833 or 1833-1867. Quarry 2219
15. **Architrave/decorative moulding.** Roughly shaped but with complex profile commonly visible on standing buildings in Bath. One side, base and top neat, the rest damaged. Measures 340 x 220 mm. SF

774. Phase 2 or 3 1729-1768 or 1765-1800. Quarry area 913

1. **Window mullion.** Central piece with ovolo moulding. Measures 227 x 158 x 65 mm. SF 508. Phase 1 late 17th early 18th. Quarry 2347, Central Firs
19. **Cornice/string course.** Moulded stone with concave moulding. Sawn on each of the six faces and finished with a mason's drag. Measures 240 x 180 x 140 mm. SF 419.
32. **Ridge stone roughout.** Long block with marking out on the end and along the sides – quite deeply cut in. The waster is still present. Measures 300 long x 230 mm high to peak. SF 272. Phase 4 or 5 1800-1833 or 1833-1867

#### *Clay tobacco pipes by Marek Lewcun*

##### *Introduction*

The assemblage of clay tobacco pipes comprise not just those pipes recovered from the underground quarries during the Stabilisation Scheme between 2001 and 2008 but also a large quantity of pipes collected by the author in 1985 and deposited in the Roman Baths Museum. During 1985 a total of 355 bowls and over 1150 stems were excavated in the underground quarries, while 84 bowls and 132 stems were recovered during the Stabilisation Scheme. Together, this is a total of 439 bowls and over 1400 stems.

The majority of the pipes in 1985 came from the excavation by the author of silt in the area under and near the Carriage Inn on The Avenue (Quarry 2347); the others were recovered from the foot of steps below a shaft near Tynning Place (Quarry 2360). Those recovered during the Stabilisation Scheme were from throughout the stone mines. Whereas the 19th-century pipes are a fairly standard group of the period, the 18th-century pipes found between 1985 and 2008 are the largest group of complete bowls for that period found in the city and represent an important reference collection for Bath and the surrounding area.

##### *Date range*

The earliest two pipes in the assemblage are reliably datable to 1700-1710, based on the maker's date of death, while there are three pipes dating from after 1694 but no later than 1739, again based on the maker's date of death. The vast majority of the remaining pipes date to the period 1750-1790, and were excavated from Quarry 2347 in 1985; a smaller number dated to 1790-1810. Only a very small number of pipes from this latter period were found during the Stabilisation Scheme work. The other pipes found in 1985 came from the foot of the shaft steps at Quarry 2360 and date to the middle and second half of the 19th century, as also do most of the pipes found during the Stabilisation Scheme. A small number of pipes found between 2001 and 2008 might possibly date to the early 20th century.

### *Manufacturing sources*

The two earliest pipes from the mines were made in Norton St Philip, while those of the 1694-1739 period were made in Bath. The vast majority of the pipes from the second half of the 18th century were probably made in Bath, but there is one stem from Bristol (stamped WILL/NICH/LAS) dating c 1750-1776. Eight pipes from the period 1790-1810 with makers' marks attributable to Bath makers were found in Quarry 2347. The pipes from the first half of the 19th century were again most probably made in Bath, with just one bowl which can be positively attributed to Bristol. From around 1850 onwards there are a number of pipes which can be sourced to Bath by the initials 'JS' on the spur, while a small number might come from Bristol or further afield. Makers' marks and details of the makers are shown on the website.

Four cigar holders (part of finds reference context 5300, which represents a collection of pipes recovered by the stabilisation mining team from Quarry 2394, were identical to nine others found at the foot of the steps in Quarry 2360 and the only examples recorded in Bath to date. They might have been made in Bath, but could equally have been made in Bristol or elsewhere. Four porcelain pipes are of the Berliner Stummel type, normally mounted with a horn mouthpiece, and were made in Germany in the late 19th and early 20th centuries. These are the first known examples to have been found in Bath, and a fifth example, also from the quarries, is in the possession of a local resident. These would have been far more expensive than the average pipe, and with their inherent risks the quarries seem an unlikely place for their breakage to have been risked.

### *Decorated pipes*

A number of the pipes from the mines are decorated, ranging from no more than leaves along the mould seams on the front and back of the bowl to more elaborate designs such as the Bacchanalian scene on the back of some 18th-century bowls. The Bacchus pipes are unparalleled in Britain and twelve examples were found in 1985, with only a small number found elsewhere in the city. Ornamentation on pipes in the second half of the 18th century is uncommon, and decoration does not make a general appearance until the early years of the 19th century.

From the period 1810-1840 two bowls found during the Stabilisation Scheme are decorated. One has plain or stylised leaves along the mould seams, while a bowl from a pillar ledge has more detailed decoration of a form more commonly produced in Bristol. The latter bowl is one of three identical examples found in Bath, where it was more likely to have been made in this case. From around 1840 onwards decorated pipes become more common, and nine pipes from the underground quarries have better-defined leaves along the seams of the mould,

and there are nine with ribs on the sides of the bowl and one of a panelled style, all being types frequently found in Bath.

Slightly more elaborate styles of decoration appear on three bowls found during the Stabilisation Scheme. Moulds were being machine-cut during the later years of the 19th century and many are almost identical, and thus it is difficult to say whether these pipes were produced in Bath, Bristol or perhaps Broseley, where the Southorn family produced pipes which were sold throughout Britain, including Bath, as testified by advertisements in a number of editions of the *Bath Chronicle* newspaper. One bowl with hatched panels intersected by lines of beading is of a type described as a 'French Common Cutty' in a Manchester company's catalogue of c 1906. The bowl with the initials RAOB and buffalo horns of the Royal Antediluvian Order of Buffaloes is a common type in the later 19th and early 20th centuries. The Buffaloes, initially organised by actors and stage technicians in Drury Lane, London, were in existence by at least 1822, becoming a philanthropic and charitable body as time progressed. Pipes with the RAOB design were being produced by at least 1880, and probably would have been on open sale to anyone in the streets who had a liking for the design. The 'football' bowl is of a common form of which there are numerous variations dating from around 1880 onwards and into the 20th century; it would have been slightly more expensive to buy than an ordinary pipe.

### *Catalogue of illustrated pipes (with archive catalogue numbering)*

1. Stem, stamped RICH/GREEN/LAND, and remains of bowl c1700-1710. Made by Richard Greenland of Norton St. Philip, near Bath. SF61
2. Bowl with stem stamped RO/CARP/ENTER/BATH. 1700-1739. SF725
4. Bowl with Bacchanalian scene on the back and initials IS on side of spur. Made by Jeremiah Smith of Bath between 1762 and his death in 1780, but were more probably made in the 1770s. Context 6101
12. Decorated bowl with ribbed sides and chain below lip. 1810-1840 SF815
15. Ribbed or fluted bowl, spur embossed J/S, with remains of long stem. Made by Joseph Sants of Bath, c1850-1880. SF30
20. 'Football Pipe', c 1889-1920 SF194
21. Porcelain pipe of the Berliner Stummel type, made in Germany c 1875-1900. Upper half of bowl white, lower half dark brown. Complete. SF47
22. Porcelain pipe, probably made in Germany c 1875-1900, depicting church tower flanked by foliage and with path in foreground below. Remains of copper lid survive on rim of bowl. Complete. SF494

### *Glass* by Ian Scott

In total there were 184 sherds representing some 158 vessels or objects. The majority of the glass comprised 145 bottles and jars representing 19 wine bottles, and 113 other bottles, the base of a large jar



0 50 mm  
1:1

Fig. 11.25 Clay pipes

or bottle and 12 jars. The remaining glass comprised 9 stoppers or lids, fragments of 3 household vessels and 1 printed glass advertising sign.

The majority of the complete or near-complete bottles and jars are of either 19th- or 20th-century date and most of these are either unphased or from post-quarrying deposits. Much of the glass comes from just five contexts, the result of dumping of domestic or retail establishment waste. Since much of the glass assemblage is not securely stratified the bottle and jar assemblage (described in the discussion and catalogue) is treated as a single group for the purposes of this report and is summarised below.

The glass that can be assigned a dated provenance during the working life of the stone mines is limited in quantity, but includes, from Phase 1, a single early free-blown flask or bottle, and from Phase 2, two wine bottles, one of which is an early 18th-century type and the other an early to mid 18th-century type. Undated free-blown bottles include three bottles that date to the early 18th-century, five further bottles of early to mid 18th-century date, three bottles of mid 18th-century date and six bottles of late 18th- or early 19th-century date. Bottles and other glass of a later date are unsurprisingly much more common, including identifiable items from both local producers and further afield.

Embossed beer bottles are all from local breweries or local suppliers, including the Bath Brewery, Cater, Stoffel and Fortt, and Sainsbury Brothers, or from Bristol breweries such as the Bristol United Brewery and the Ashton Gate Brewery. A bottle of the Cheltenham Original Brewery is made of colourless glass and probably a soda or mineral water bottle rather than a beer bottle. Another bottle is embossed on the base 'POWELL | & CO | BRISTOL' and was made in the 3-piece mould patented by Henry Ricketts of Bristol in 1821 (Weeden 1982, 89 and fig. 6). The bottle is probably a sherry bottle and was made in the 1850s. Another bottle made in the mid 19th century is a case gin bottle made in a dip mould with a hand-applied tooled finish. There are two bottles embossed for Frederick William Fuller (Cat. Nos 26-27), who was a Bath based wine and spirit merchant.

There are a number of soda or mineral water bottles embossed with makers' names, most of them local Bath or Bristol businesses. There are three codd-neck bottles, one embossed for Luke Bristow of Bath, another for Hansford & Co of Bristol and the third for Carters Ltd of Bristol. Luke Bristow traded briefly as a ginger beer manufacturer and mineral water manufacturer at the very end of the 19th century. The codd-neck bottle embossed with his name must date to that brief period. The codd-neck bottle embossed for Hansford & Co dates to the very end of the 19th or early 20th century. The third codd-neck bottle is probably embossed for H W Carter & Co, of Wilder Street, 'mineral water & soluble essence manufacturers' (*Kelly's Directory of Bristol 1902*, 242). Again the bottle dates to the late 19th or early 20th century. There are two bottles of

Wigmore & Son, Bristol who were mineral water manufacturers based in Bristol although with premises in Bath (*PO Bath Directory 1911*, 433, 457). The bottles both have internal screw threads and threaded rubber stoppers and date to the late 19th or early to mid 20th century. A torpedo or 'Hamilton' bottle embossed for Thomas Ekin of Grantham is an early form of soda water bottle and would fit well with a mid to late 19th-century date. Ekin was a 'manufacturing & dispensing chemist and mineral & soda water manufacturer' with premises in the Market Place, Grantham.

There are 23 pharmaceutical bottles from post-quarrying dumps. This is a large proportion of the total of 31 pharmaceutical bottles from the whole project. They include the base of a thin-walled free-blown cylindrical bottle of 18th-century date (context 717), and 10 small unlabelled pharmaceutical bottles of mid to late 19th- or early 20th-century date. Amongst them is a single patent medicine bottle. This a square section bottle with a short neck made in a 2-piece mould, with a hand tooled finish and cork closure. The bottle is embossed 'GUY'S TONIC'. Guy's Tonic was analysed by the British Medical Association and the results published in 1912. At that time the tonic sold for 1s 1d for a 6 fl oz bottle and was described as a 'rich cordial prepared from Vegetable Tincture and other curative agents found in the British Pharmacopeia . . .'. Although the advertising stated that it did not claim to be a 'cure-all' it was nonetheless recommended for 'Disorders of the Digestive System', 'Functional Derangements of the Liver', 'Disorders of the Blood', 'Nervous maladies', 'General Diseases' and 'Convalescence from Acute Diseases'. The BMA analysis suggested that the ingredients for a single bottle probably cost one halfpenny.

A wide range of glass jars and bottles illustrate the progressively wider distribution of branded items from the mid 19th to the mid 20th centuries, with manufacturers that are still household names such as Burdall, Boots and Bovril. The discussion in the full report includes details of the development of these and many lesser manufacturers.

The lack of secure stratigraphy means that, as is the case with the pottery assemblage, the glass is more important for what it can reveal about the developments in retail history and the social history of the Combe Down settlement than for its direct relevance to the Combe Down Quarries. The finds of blown bottles from the early and mid 18th century may have links with the glassworks which operated then at what is today nearby Odd Down, although confirmatory evidence is lacking.

#### *Catalogue of illustrated glass items (with archive catalogue numbering)*

- 19 **Beer bottle** embossed 'THE BATH BREWERY LIMD' Moulded bottle with hand tooled finish; and cork closure. Embossed 'P & R B' for the makers Powell & Ricketts Bristol. Complete. Dark green



Fig. 11.26 Glass vessels

- glass, moulded. Ht: 188 mm. Stub S3, Context 263. [ID 87]
- 20 **Beer bottle** embossed 'CATER STOFFELL & FORTT LD BATH'. Most of neck missing otherwise complete. Dark green glass. Made in three-part mould. Ht extant: 160 mm. Context 263. [ID 83]
- 21 **Beer bottle** embossed 'SAINSBURY BROS' 'BATH'. Complete. Screw cork closure. Dark brown glass, moulded. Ht: 257 mm. Post quarrying Context 189. [ID 23]
- 22 **Flagon** embossed: 'BRISTOL UNITED', nearly complete. Internally threaded closure for rubber screw cork. Dark green glass, moulded. Ht; c 295 mm. SF 1004, Foxhill, Mine area 2383, Rd 1.25 end. [ID 153]
- 23 **Flagon** embossed: 'ASHTON GATE / SUNRISE BRAND / BREWERY / Co Ld / BRISTOL'. Complete. Rubber screw cork in situ. Dark brown glass, moulded. Ht: 294 mm. SF 1004, Foxhill, Mine area 2383, Rd 1.25 end. [ID 154]
- 26 **Bottle** embossed 'F.W.FULLER, BATH' and on shoulders 'IMPERIAL' and 'HALF PINT'. Complete. Cork closure. Pale blue/green glass, moulded, with hand applied tooled finish. Ht: 186 mm. Post-quarrying, Context 189. [ID 21]
- 27 **Spirit bottle** embossed 'F.W.FULLER / BATH'. Complete. Cork closure. Pale blue green glass, moulded with hand finished rim. Ht: 180 mm. Context 68. [ID 62]
- 29 **Cylindrical bottle** embossed on base: 'POWELL | & CO | BRISTOL'. Neck missing. Dark green glass. Made in three-piece mould, Probably a sherry bottle rather than a wine bottle. Ht extant: 152 mm. SF 690, Mine area 2344 or post-quarrying, Stub 17. [ID 86]
- 30 **Codd bottle** embossed 'L. BRISTOW | PETER STREET | BATH', and embossed 'L.B.' on base. Complete. Pale green glass. Moulded bottle, hand tooled finish. Soda water bottle. Ht: 230 mm. Context 263. [ID 84]
- 32 **Codd bottle** embossed 'CARTERS LTD' and 'BRISTOL', and embossed on base 'DAN RYLANDS | BARNSELEY' '4' and 'SOLE MAKER'. Body only. Pale green glass. Moulded. Soda water bottle. Ht extant: 148 mm. Context 68. [ID 66]
- 33 **Soda water bottle** embossed: 'CHELTENHAM ORIGINAL BREWERY Co Ltd' around shoulder. Screw cork in place. The maker's name embossed on the base is 'DALE BROWN & Co SWINTON'. Cork embossed: 'CHELTENHAM ORIGINAL BREWERY'. Complete. Colourless glass, moulded. Ht: 264 mm. SF 1015, Foxhill Mine area 2382, Rd 3F set (44). [ID 150]
- 35 **Soda bottle** embossed 'WIGMORE | & SON | BRISTOL'. Complete. Pale blue green glass. Screw cork closure. Ht: 261 mm. Mine area 518 tipping, Context 342. [ID 75]
- 36 **Cylindrical bottle**, with rubber screw cork. Has wrythen decoration moulded on shoulders. Embossed: 'BROOKE & PRUDENCIO' around bottom of body and embossed: 'CTC (B & P) 1026' on base. The bottle has a screw cork embossed 'WAR GRADE'. Complete. Colourless glass, moulded. Soda water bottle. Ht: 295 mm. Post-quarrying, Context 189. [ID 13]
- 52 **Medicine or tonic bottle** embossed 'COMMANS & WILSON | BATH'. Complete. Very pale blue glass, moulded with hand tooled finish. Cork closure. Ht: 167 mm. SF 310, Mine area 2372, Context 5023. [ID 59]

### Pottery by John Cotter

Some 655 sherds of pottery were examined (Cotter 2009), with a date range from around 1680 or 1700, to a dated saucer fragment of 1942 with a few sherds likely to be post-1950.

The sequence of wares or pottery types recovered, for the period in question, was much as would be expected for a site in this part of the country and is not particularly different from many other post-medieval sites in England (Fig. 11.27). Commencing, as it does, around 1700, there is the usual scenario where local and regional earthenwares or coarsewares are gradually replaced by the rise of the Staffordshire potteries as the 18th century progressed. Initially, local glazed red earthenwares predominated – simple utilitarian forms such as storage jars and possibly a few bowls and jugs. These were supplemented by a small number of regional products including North Devon gravel-tempered wares, which generally came in the form of large robust storage jars and bowls.

Table 11.1 Breakdown of pottery types from the underground quarries at Combe Down

Pottery type	Date	No. sherds
Post-medieval red earthenwares (local)	c 1675-1925	65
Unglazed red earthenware (flowerpot etc)	c 1700-1925	2
North Devon gravel-tempered ware;	c 1675-1850	8
Donyatt slipware (Somerset)	c 1675-1900	8
Verwood-type ware (Dorset/Hants.)	c 1675-1925	1
English tin-glazed earthenware (Bristol/London)	c 1700-1840	13
French tin-glazed earthenware (Sarreguemines?)	c 1850-1925	1
Staffordshire/Bristol-type slipware	c 1675-1900	13
Midlands/Bristol iron-streaked earthenware	c 1690-1800	2
Refined red earthenware (Staffs.)	c 1740-1800	1
English brown stoneware (Bristol/Staffs./London)	c 1675-1850	23
Staffordshire white salt-glazed stoneware	c 1720-1780	15
Nottingham stoneware	c 1690-1800	2
Chinese porcelainc	c 1650-1900	9
English porcelain	c 1745-1925	18
Central European porcelain	c 1850-1925	4
Later Creamware ("Queensware")	c 1850-1925	40
Pearlware (Staffs, etc)	c 1780-1830	37
Refined white earthenwares (Staffs, etc)	c 1825-1950	342
Yellow ware (Staffs, etc)	c 1800-1900	3
Wedgwood-type dipped Blue Jasper ware	c 1800-1900	1
Wedgwood-type glazed black Basaltes ware	c 1825-1900	6
Brown teapot-type ware	c 1825-1925	4
Misc. coloured earthenwares	c 1825-1925	1
Modern English stoneware	c 1830-1940	33
Coloured stonewares	c 1825-1900	1
Pipeclay objects	19-20th C	2
TOTAL		655



A small number of decorative and utilitarian slipware forms were also acquired from the Donyatt potteries in south Somerset. A single jug probably from the Verwood potteries in Dorset completes the list of unequivocal regional wares – but this last piece is difficult to date closely and could be as late as the 19th century. Staffordshire products are present from *c* 1700, mainly combed slipwares, brown salt-glazed stoneware and later on in the century some Creamwares and Pearlwares. All of these however are difficult to distinguish from identical products copied by the Bristol potteries and the assemblage here probably comprises a mixture of both. Bristol, and neighbouring potteries at Brislington and Wincanton (Somerset), also produced their own tin-glazed earthenwares during the 17th and 18th centuries and these cannot always be distinguished from London tin-glazed wares. After *c* 1830 the flood of refined white earthenwares, many with transfer-printed decoration, can mostly be attributed to the Staffordshire potteries and other industrialised potteries of the Midlands and the North. Many whiteware preserve jars of the late 19th and early 20th century bear the mark of ‘MALING, NEWCASTLE’ and were made at the pottery there. Modern English stonewares, including those with glassy ‘Bristol’ glazes made after *c* 1835, were made at numerous centres in Britain but many of those from here bear the marks of London potteries while none is definitely from Bristol. The many ‘WP HARTLEY’ stoneware jam jars present were made at potteries in Lancashire and Glasgow in the late 19th and early 20th centuries – they may have been potted with jam at the factories in Lancashire or London before entering the retail chain and ending up in the shops of Bath, or, in fact, anywhere in the world.

Ordinary domestic pottery types, such as tablewares and storage jars, predominate although the presence of a pharmacist’s pestle, a stoneware bottle possibly used for acid or mercury storage, as well as a fairly high number of small ointment jars, might suggest that part of the assemblage may have come from a chemist’s shop or similar premises.

A total of 63% of the assemblage (including a high proportion of whole items), were mass-produced modern wares. Very little of this is likely to have been used in the quarries. The great bulk represented domestic rubbish dumping in abandoned shafts and other entrances.

From the viewpoint of dating the quarrying, the potentially most useful finds were from Quarry 2347 in the E4 stub. These were from a drain, from which a collection had been made in the 1980s, which seemed to establish the probability of pre-1750 quarrying there (Pollard 1994). The drain was associated with the road outside the former Carriage Inn on The Avenue. The deposit below the drain contained a number of Westerwald stoneware drinking mugs (see Pollard 1994, fig. 11.21), rarely imported after 1750. In the event, a pre-Allen, Phase

I dating for the quarry working was confirmed from other data, but the drain assemblage proved to also have had items of mid- to late 18th century date within the assemblage, making a deposition date of *c* 1770-1780 more likely. However the possibility remains that the deposit accumulated over several decades, leaving an early date of quarry-working still possible.

Quarry 2346, which was on the North side of the Old Rank / de Montalt Place (specifically under the rear of 89 Church Road as it is today) had one of the larger pottery assemblages. It was known to have been partially infilled from the adjacent surface quarry, which had closed by *c* 1800 when the quarry was probably used as gardens. Most of the pottery was dated 1720-50 but with some salt-glazed stoneware of 1720-80, and some possibly intrusive material from the late 19th century. Thus the suspected late 18th-century date for the working of the underground and surface quarries is empirically confirmed.

The largest assemblage of 193 sherds came from below a shaft cone in Quarry 2201, but was associated with later Quarry 2370, where a late 19th-century working of a remaining substantial pillar cut through a probable Allen Phase II cartway. This was the only shaft cone debris that was excavated and recorded under archaeological conditions. It was similar to a typical Victorian bottle dump with mainly refined white earthenwares, modern stoneware, and a single fragment of Chinese porcelain. Two lower fills produced sherds datable to 1830-1850. The only earlier vessel is considered an heirloom piece. The assemblage was thus typical of a late 19th-century work, with the shaft left open for a shortish time to allow domestic refuse to be dumped in from nearby properties. The probable much earlier quarry cartway phase there was thus not represented, and the pottery assemblage gives an approximate date for the construction of the shaft capping at sometime after the mid 19th century.

Similarly, other pottery was useful in providing broad date ranges confirming the general age of individual workings, and, in case of dumps within shafts some indicative evidence of the date of their closure. Overall, however, for dating purposes the assemblages mainly reflect what was discovered or deduced from other data.

The perspective that the pottery gives into the social and economic history of Combe Down is considerable. There was a wide range of domestic wares, some of which have considerable exhibition potential in a local museum context, in emphasising the growth of factory-prepared foodstuffs and other household goods in a national and, indeed international context. Of particular interest is the saucer fragment dated on its underside to 1942, discovered at a location where shelter was taken from the Baedeker bombing raids. There was also a pair of ‘mystery’ objects in the form of two pipeclay items of which only a few other instances have been

*'Finished Labour of a Thousand Hands'*

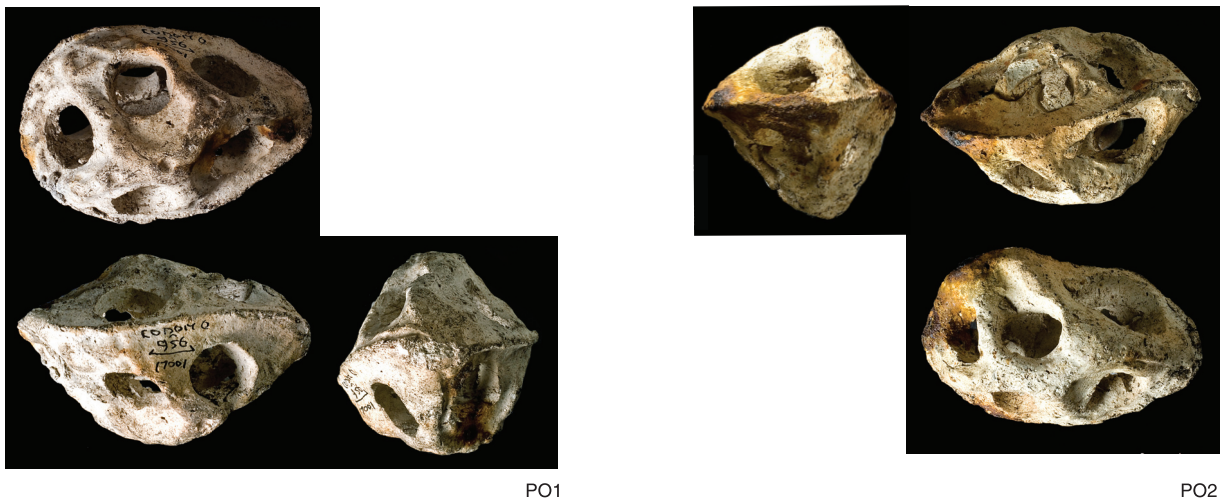
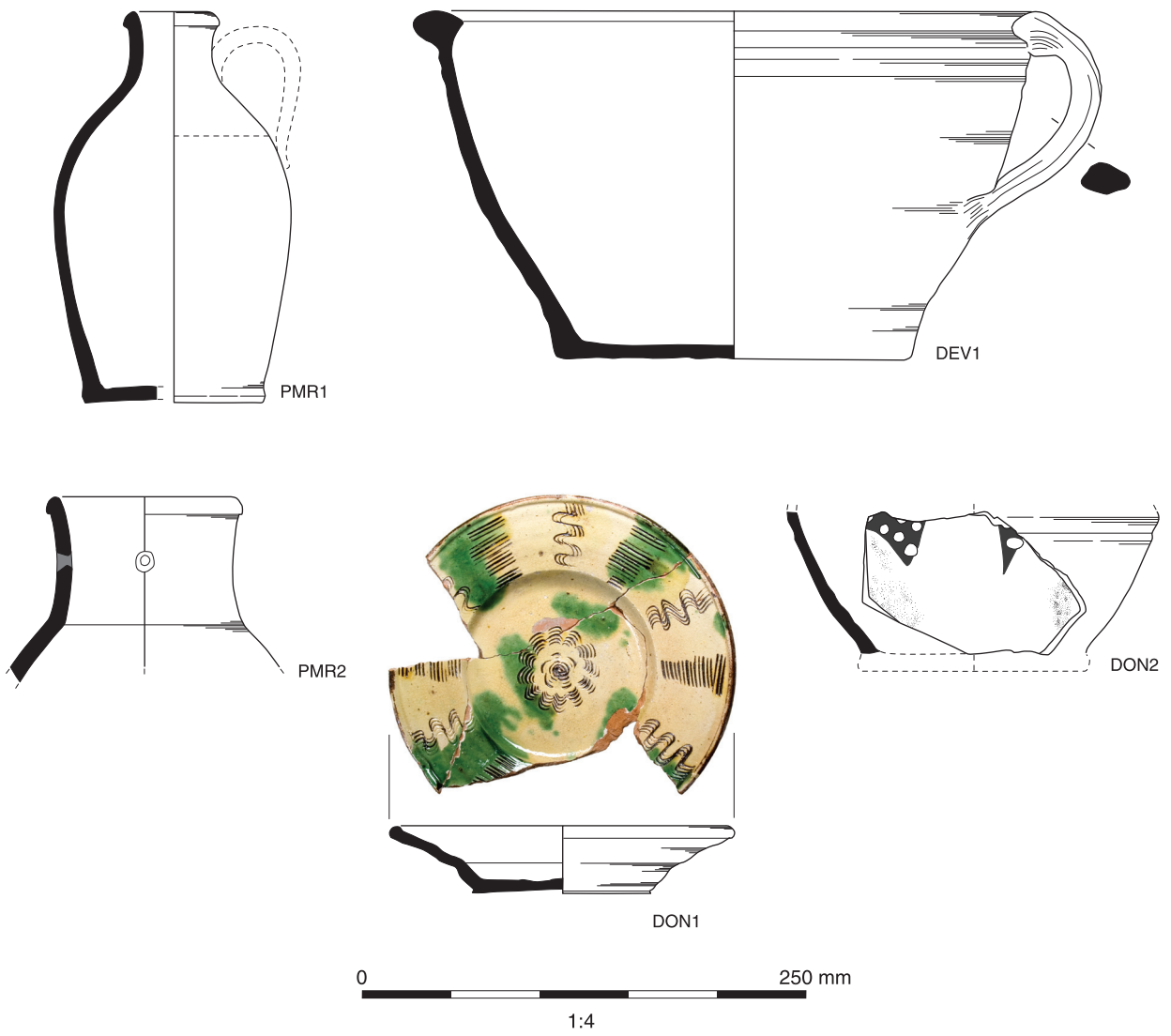


Fig. 11.27 Pottery

found in England and which have created some speculation as to their possible use (Fig. 11.27). The discovery of these in a context of dumped fire-hearth ashes at the Springfield Quarry (2374) may add support to one suggestion that they are a form of firelighter – porous enough to absorb paraffin and thus – when inserted among the kindling – providing a portable and reusable accelerant to encourage a newly-lit fire.

### *Catalogue of illustrated pottery*

#### Pottery

- PMR1 Post-med red earthenware. Bottle-like jug with handle scar. Light orange fabric with clear glaze all over int and on top ext. Rim diam 53 mm. L18-E19C
- PMR2 Post-med red earthenware. Jug/jar rim with hole bored through neck. Light orange fabric with clear glaze all over interior and in a band under rim exterior. Possible trace of handle? Possibly a 'bird pot'? Rim diam 110 mm. L18-E19C
- DEV1 North Devon gravel tempered ware. Deep bowl with handle. Rim diam c 360 mm. 18C
- DON1 Donyatt slipware. Dish profile. Rim diam 195 mm. 18C
- DON2 Donyatt slipware. Deep bowl body sherds. 18C

#### *Pipeclay objects*

- PO1 Pipeclay object or polyhedron. Max length 71 mm. Springfield Quarry. 19-E20C. SF956
- PO2 Pipeclay object or polyhedron. Max length 69 mm. Springfield Quarry. 19-E20C. SF957

### *Animal bone by Lena Strid*

Most of the small assemblage of faunal remains retrieved from the underground quarries at Combe Down were derived from waste stone layers and tipping contexts, but some intrusive bones were recovered from deposits originating from roof collapses or from entry via shafts. Generally, the on-site policy was not to retrieve animal bones which were known to have originated from surface deposits but this could sometimes be difficult to ascertain at the time of discovery. There was also potential for some finds to be post-quarrying intrusions.

Sheep and goat were identified to species where possible but otherwise classified as 'sheep/goat'. Ribs and vertebrae, with the exception of atlas and axis, were classified by size: 'large mammal' representing cattle, horse and deer; 'medium mammal' representing sheep/goat, pig and large dog; and 'small mammal' representing small dog, cat and hare. The minimum number of individuals (MNI) was calculated on the most frequently appearing bones for each species.

The assemblage comprised 83 bones, of which 95% could be identified to species. Apart from a single hare bone, all bones derived from domestic species. The faunal remains give the impression of a mix of kitchen waste and dumped material. The

bones were in a very good condition, over 85 % being grade 0 or 1. Rodent gnaw marks occurred on a hare tibia, but there was no evidence of gnawing by dogs. No bones were burnt.

Two articulated skeletons were recorded: one juvenile pig from Central Byfield (Quarry 916) and one cat in Central Byfield (Quarry 510). The pig was mostly complete, but lacked the metapodials and phalanges as well as the left femur. While the phalanges are small and easy to miss during excavation (especially in the conditions at Combe Down), the metapodials are usually of a sufficient size to be collected. This opens the possibility that the feet were removed from the carcass before deposition or that body parts were scavenged afterwards, although the lack of gnaw marks argues against the latter. The first permanent molars were fully erupted, but unworn, indicating an age at death of 4-8 months. The lack of butchering marks, in combination with its young age, suggest that the pig died shortly after birth, and was dumped in the mine.

The cat skeleton consists mainly of the upper front half of the body. Cut marks were absent, and it is likely that the bones represent a natural mortality. Apart from the distal humerus, all epiphyses were unfused, suggesting it died at c 8.5 months of age.

Cattle are represented by an atlas and three fragmented hind limb bones. Butchery marks were recorded on the atlas, which was split axially, and the femur, which had transverse cut-marks from filleting mid-shaft. Axial splitting of the carcass was a standard butchery procedure from the 17th to the 19th centuries. Epiphyseal fusing was recorded on the two tibiae, from animals of over 2.5 years old and less than 3.5 to 4 years of age respectively. Judging from surface structure, the other two bones were from sub-adults or adults.

The sheep/goat remains consist of a horn core fragment from a male sheep and a neurocranium fragment potentially from the same individual, as well as a radius fragment.

The disarticulated pig remains comprise a humerus fragment and a mandible from a boar. The third molar had erupted but only the enamel was worn, which indicates that the pig was 1.5 to 2 years old when it died.

The horse bones were found in three separate contexts and are therefore not likely to be from a single individual. With the exception of a skull, all elements present derive from the front limb. The bones were all fused, indicating an age at death of more than 3.5 to 4 years. Measurements taken on limb bones confirm that the bones are from horse, rather than donkey or mule. The calculated withers' heights suggest that one horse was a pony and one a small horse. The articulated phalanges in one example show exostoses laterally and medially: the first phalanx on the posterior side of the bone, and the second phalanx on the anterior side. These are likely to be ossification of muscle attachments and indicate muscle strains. The lateral metapodials

were fused to the metacarpal shaft. These pathologies are commonly seen among work horses and are linked to muscular stress in connection with traction. Some lipping was recorded on the coracoid process of the scapula on one example, suggesting wear on the joint. Although only parts of the horses were recovered, there was no evidence of butchery on those bones that were present.

A single hare tibia was collected. The absence of other bones suggests it represents the remains of a meal. After discarding, the bone had lain on the ground for a while, as evidenced by several rodent gnaw marks.

The faunal remains from Combe Down stone mine comprise food remains as well as dumped materials. The food remains, such as leg of hare, parts of long bones from cattle, sheep and pig, and medium mammal ribs, would have been left there by the quarrymen. The lack of gnaw marks, apart from rodents, is consistent with the nature of the site. Dogs would not have roamed loose there. The dumped materials consist of a juvenile pig, a sub-adult cat and at least three adult horses. The pig might have died from a disease; it would not be

considered suitable for eating and subsequently was dumped in the mine.

The horse bones, on the other hand, may feasibly have been remains of old ponies worked in the quarries. Although one of these may have been derived from the surface through a roof collapse, the location of the two other contexts containing horse bones were well away from access routes to the outside. While horses may have worked there underground, one would not expect their bones to remain there. Horse carcasses were generally extensively used in the 18th and 19th centuries: hides for leather, mane and tails for furniture stuffing, meat for pet food, fat for oil rendering and bone for buttons and glue making. The dumping of these bodies in the mine is therefore rather perplexing, since there would probably have been enough monetary value attached to a horse carcass to make it worthwhile transporting it out of the mine. Perhaps these horses were unofficially butchered and dumped in abandoned parts of the mine complex. Whether the cat was deliberately dumped underground or died a natural death there is unknown.