

# Chapter 13

## Quarrying at Combe Down – consideration of the evidence

### *Introduction*

In the foregoing chronological analysis and illustrative case studies, historical sources and archaeologically-derived information have, where possible, been deduced to support and test each other. This section seeks to synthesise them to provide an overall account of developments within the area of the ecclesiastical parish of Combe Down after 1854, and in the context of the City of Bath after 1912 so far as the links with quarrying justify.

Although localised quarrying must have existed previously in the region, notably in Roman times, three centuries ago the area known as Combe Down or Greendown was still largely devoted to sheep grazing, occupying an elevated plateau and circumscribed by a precipitous rim. Modern Combe Down coalesced from the amalgamated distant parts of Monkton Combe, Lyncombe and Widcombe, and Claverton parishes. The new settlement formed around the core quarrying settlement set up by Ralph Allen which began to expand, comparatively rapidly after his residual estate was finally sold around 1803 onwards. Underlying this development was the excellence of the Combe Down oolitic limestone for building, and the proximity of a market, the City of Bath, which then, as now, depended on the stone for its buildings. Although the central area saw decline in its quarries after *c* 1840 and the underground quarries almost ceased after *c* 1860, quarrying at surface in the surrounding area of Combe Down continued to be a substantial part of the village economy well into the 20th century. By then Combe Down had come under the administration of the City of Bath, its suburbanisation emphasised by the electric tramway link along North Road.

### *Freestone quarrying*

Prior to the 18th century available information is fragmentary and hard to ascribe to specific localities. It is clear that the larger quarrying area supplying Bath with its building stone was further west at what is today Odd Down where communications with Bath were more direct down the old Fosse route. Although small-scale quarrying was certainly taking place in Monkton Combe, Lincombe and Widcombe's Combe Down or Greendown, the documentary evidence for quarrying before Ralph

Allen's time is minimal. However the published history about subsequent quarrying within the context of village history was usefully summarised by Addison (1998) little more than a decade ago and the present study, effectively begun by Pollard in 1994, with his preliminary assessment of the underground quarries can add substantially to their accounts, not just for the quarries, but also for the origins of and relations of quarrying with the modern settlement.

The phasing of underground workings map (inside rear cover) based on the archaeology allows some very approximate levels of underground production to be estimated, which, invites caution in regard to approximations occasionally drawn from historical sources alone. This is summarised in the following table:

*Table 13.1: Estimated output by phase for the core area underground workings of Combe Down*

<i>Phase</i>	<i>area worked (sq. m)</i>	<i>area worked (adjusted) (sq. m)</i>	<i>output (tons)</i>
I	9610	5189	64863
II	24930	13462	168275
II and III	11136	6013	75162
III	15651	12677	158463
III and IV	11711	6324	79050
IV	54359	29354	366925
IV and V	14364	7757	96963
V	6737	3638	45475
V and VI	33494	18087	226088
VI	6818	3682	46025
Total	18.881 ha.	10618 ha.	1,327,289

### *Notes*

The area worked is based on a computer calculation of the area of the individual quarry areas (see inside rear cover) attributed by the archaeologists to each phase. This has been reduced (column 2) by 10% for the pillars and a further 40% for the proportion left behind as spoil to allow calculation of useful output. The tonnage calculated is based on five metre depth of average working, and a specific gravity of the freestone of 2.5. Considerable caution is needed in interpreting these figures. For comparison purposes below, half the buffer zone figure of the inter-phases (above and below) is attributed to the phase between.

### *How much stone?*

In the table the most reliable figures are the overall area worked underground in the central area of Combe Down, about 18.9 hectares, for which the main Byfield and Firs quarries were about 18 hectares, with the remainder mainly in outliers, notably Foxhill. The total production is far more of an estimate, as we do not accurately know the size of each pillar (only a few have been seen full-height), nor the depth worked. We know, for example that the Three Acre Quarry as seen generally, exceeded five metres, and that areas in the Far East Firs – mainly small scale ventures – were often well below this. But the overall production of saleable stone was probably around 1.33 million tons, about 7500 tons a year average over the two centuries involved. Below the possible tonnages are considered under each phase.

### *Early quarrying: Phase 1 – Pre 1728-30*

Around 1725 there were some half dozen quarrymasters or freemasons at work under the Monkton Combe portion of Greendown or Combe Down while, as the archaeology suggests, there were possibly more operating in the adjacent area of Lyncombe and Widcombe, at (Greendown or Quarr Down). With underground workings, frequently there is a mismatch between what seems reliable documentary evidence and archaeological findings. Such was certainly the case for Richard Irving, (2005 and pers. comm.) who was disconcerted to find, a year after his publication on the Byfield Quarry, that some of the early underground quarrying in Lyncombe and Widcombe extended completely under his house. It also raised the probability that Allen's paired accesses were placed either next to pre-existing underground access and associated ways, or actually drove through them.

It was similarly surprising for the present writers, on analysis of the distribution of early workings, to realise that early working had taken place on three sides of the Sheeps House Quarry at Rock Lane, including the possible entry for the John Pitcher working. Thus quarrying was most likely taking place here too before Allen drove his two almost parallel cartways north from it. There he probably avoided the bulk of earlier workings, but still utilised existing surface facilities for his access. It will not be possible to prove the same thing happened east of The Avenue, since surface quarrying has removed all evidence of the original frontage, and it was not possible to approach the front internally during stabilisation, but, given the evidence of two of his other sites, it must be a strong possibility. The archaeology thus suggests that pre-Allen, Phase I underground and possibly associated surface-working on a small scale was more widespread than previously considered, both at the southern scarp margin and 50-100 m back from it.

Phase 1, prior to Allen, based on the areas on the Phasing Map, appears to have produced some 65,000 tons overall. But this includes workings since possibly the end years of the 17th century, with some probably continuing for a time after Allen started, which we were unable to differentiate. This is a level of only a few hundred tons per year, divided amongst several freemasons, enough for just a few houses, a whole order of production below that produced by Allen.

### *Allen's quarrying: Phase II – 1728-30 to 1764*

The basic story of Ralph Allen is well known. He became Bath's premier citizen in the mid 18th century, either the town's own 'Squire Allworthy' (Boyce 1967, 183) or 'the one headed corporation' (Peach 1895b, 180), depending on preference, with a rise from humble beginning to a vast fortune within a few years. Both his biographers cited above seem to consider his stone business a major success. The only doubt seems to have been a near-contemporary comment by Philip Thickness, that whereas people considered he had earned his fortune from 'picking up stones' underground, it really came from his postal business (Peach 1895b, 98). Any contemporary or biographical lack of appreciation of this was and is understandable, since the two businesses grew together after 1727 (when the post business was probably still unprofitable). But while the post business was dispersed over a large part of the country and run from a small office in Bath, the stone business was intensely local. The stone was conveyed in large quantities and was probably only too visible on the roads and construction sites within the city. However, analysis of the price structure for his stone business shows that a true profit including cost of capital was likely to be modest when the full picture is examined and that, given his consumption pattern, it is probable that the postal profits were indeed very substantial, as Thickness implied. It was probably convenient for Allen to allow the misconception, if it really existed, to continue.

Even if the stone business was not especially successful in financial terms, it remains true that it was both very innovatory in terms of its approach to production and was technically successful. Ralph Allen and his clerk Richard Jones, who was responsible for the whole of his stone business, provided an unprecedented combination of capital provision and industrial organisation in setting up an integrated quarrying, masonry and stone building and export business. Innovations included the ways quarries were operated, in the way they moved stone, and in the way Allen advertised it to what he saw as his major markets, whether in Bath or potentially, in London.

The business used the new Avon Navigation connection to Bath for both long- and short-haul movement and provided a wooden gravity railway a mile and a half long to the quarries from it. There

were cranes for loading outside the quarries and a crane for loading on board ships on the Navigation and a roll-on-roll-off barge system to convey stone across the river and on to building sites in the City. He provided houses for his key underground staff and his stoneyard masons, and regular work and shelter for the latter in his yards. By his improved transport he reduced the price of stone in Bath by a full quarter. Wood the architect and friend of Allen complained that Allen's competitors then reduced it a further sixpence. Wood was more receptive to the reduction in masons' wages by 10%, which followed reducing the masons' loss of time (and their wages) in scurrying between their quarries and their building activities in the city by concentrating their work in his stoneyards.

Allen used advertising techniques for selling stone, which could well have been an exemplar for the later methods used by Wedgwood and Bentley for marketing quality pottery. This included the building of his Prior Park house for entertaining the noble and the fashionable, where, even Thickness agreed, he maintained a generous table. In combination with John Wood the architect (and later Wood's son John), he played a major role in the building of 18th-century Bath. In contrast, he found his export of blockstone had difficulties due, substantially, to the disruption caused by the war with France and this certainly disappointed him.

While Pollard's study (1994) had identified the essential features of some of Allen's underground working, the extent of Allen's working and many details were still a puzzle. The archaeology showed, however, that Allen's phase (II) of quarrying could be distinguished. Two of his sets of paired entries were well established from the estate plan, and underground his work was distinguishable, largely by the type of pillars used and by the organisation of the workings. The use of what we termed apophygate pillars was entirely conventional and can be seen in a number of other underground quarries both locally and further afield, but the use of pairs of, rather than single, cartways penetrating directly into the freestone beds under the Down was unusual. The disposition of these apophygate pillars and a later corbelled form about the cartways at the two known entrances led to the realisation that there were probably two other sets of entries with similar characteristics dating to this phase of quarrying. This understanding was reinforced by a realisation that documentary sources pointed to two further cranes to equip them and that the limits of his work may well be at shafts in all four instances, each having similar relationships with the cartways and pillars. This regular use of similar techniques both at surface and underground within the workings with the same adaptation of new methods seems to us to be a product of systematic management ensuring the best methods were introduced as fast as possible. The final and most convincing discovery, of grooves from cables running down via each of the four shafts, to haul stone or wagons to

the shaft bottom, seemed to be both the last piece of the jigsaw and the innovatory hallmark of his phase of working. It allows the likely extent of his phase of working to be fairly reliably placed on the survey map, but with a still substantial proportion listed in the 'buffer zone', that is classified as Phase II or III.

Simple as this all was in principle, at both surface and underground it was substantially more capital-intensive than usual and clearly designed to enable a substantially larger scale of production by greatly increasing the number of working faces in what was still a young quarry, and by multiplying this output by having four separate units in operation (five if the Masons Crane House working is included).

Allen also operated surface quarries, probably mainly in the latter half of his time in the business, possibly since he had established a market for some of the Twinhoe ridding beds which continued to remain untouched underground. This included the surface working at Masons Crane House Quarry, in front of the Old Rank cottages, which was well established by the time of Robins drawing of 1759, extending through modern Quarryvale, and though its eastward extent is not exactly known, from near the present Ralph Allen Yard to somewhere east of the later church is likely. It also seems likely that the quarries behind (north of) the Old Rank also began being worked. In both cases this quarrying certainly continued after his death, but both sites were worked out by c 1800 or soon after.

He does not appear to have worked in Lincombe or Widcombe (except, perhaps, for a minor transgression underground due to poor identification of the boundary), nor in the area east beyond the Long Drung. From the Byfield entries at what is now Ralph Allen's Yard on Rock Hall Lane he worked north alongside his cartways to some 150-200 m from the North Road, at what probably became his largest single quarry. In Firs the distance of his cartways from the North Road was barely 50 m, though it was still largely undeveloped at the inner end. In the area east of The Avenue to the Long Drung, although more difficult to survey, he had probably penetrated some 100 m, but across a wider front with two separate quarry operations. These areas are shown on the plan of working phases (see inside rear cover).

In Chapter Five, historical data, based mainly on demand, was used to suggest possible outputs in Ralph Allen's time (Phase II, c 1730-64). The possible maximum level at peak periods may have amounted to 20,000 tons per annum, with a minimum of about 5000 tons and a possible average of about 12,500 tons. As well as underground production, Allen also had surface quarries, especially after the mid century, but even so, given the areas known (but not then calculated as above) it was considered this level was too high. As shown in the table, with the added 50% of the buffer zone, it seems likely his average underground production was only a little above 6000 tons per year. A very large proportion of this must have been the roughly

worked coursed rubble stone used in partition walls and backs, rather than the more expensive blocks intended for the production of ashlar. It also means that the export, claimed by Richard Jones, of 1800 tons of blockstone in what must only have been good years, is perhaps more impressive than has been implied.

This suggests several things. First that we may have underestimated the area attributed to Allen's phase of working, but inclusion of the entire buffer zone production would not substantially increase the amount. It may be that he had surface quarries working for much of his time whose outputs are not included here. It may be too that others also were producing, possibly from the Odd Down area, thus satisfying the overall demand. It could also be that in the latter part of his time Allen was producing at a much lower level than in the earlier, wooden-railway-monopoly years. Evidence for this is the contraction in working areas, back to the Central Firs workings only, as evidenced by the c 1764 Estate Plan sites. The figures show that the level of profitability of his quarrying enterprise was probably even worse than suggested in Chapter 5, and it is easy to see why Gertrude Warburton had no hesitation in lifting the track and putting the quarries out on lease after Allen's death in 1764.

However, his was not, as sometimes claimed, the only quarry on the Downs. The detailed archaeological study also allowed for the identification of underground working that were not attributable to Allen. He certainly had a monopoly in the area he set aside for quarrying, easily seen on his estate plan since he planted the surface with fir trees and rides through them from his house. It was a roughly triangular area – now the core of the Combe Down village. At least one other freemason, Thomas Greenway, was still working after 1730 beyond Allen's eastern boundary (a footpath known as the Long Drung), despite the land being in Allen's possession by 1737. It is possible from the evidence of three separate cartways that there was another quarry being operated, possibly by Milo Smith. Greenway was famous in Bath as an ornamental sculptor for the highly decorated house where 'Beau' Nash lived for a time. It was possibly his high and rare level of skill, and thus status, which caused Allen to tolerate him. However, even taking into account possible production by others at Odd Down and Entry Hill there is little doubt that Allen was indeed pre-eminent in the supply of stone in the mid years of the 18th century building of Bath.

Probably the very low marginal cost of moving his stone downhill to Bath was sufficient on its own to secure demand for his stone, and the ability to supply the vast amounts of stone needed for buildings like the Parades would certainly have established his position. Had he been able to establish a large London market too, in the way that was possible using long distance railway network between quarries and markets a century later, then it is possible this cause of his lack of substantial

profit could have been overcome or, at least, reduced. The original cost of his wooden railway had to be repaid (or lost) by the sole producer and user, unlike the Turnpike roads used by his competitors and, indeed the later public railway system, and this was the most likely reason for his likely poor financial performance.

Moreover, whereas he might have been expected to profit from his downstream activities, exporting and speculative building, his forced reductions in the cost of stone and the cost of masons in Bath were probably equally helpful to his competitors too. Whatever the cause, in his later years, after the mid 1740s, his attention seems to have turned towards his interest in social and political matters and management of his estate, all heavily subsidised from his postal business, as is evident in the cash-flow problems after his death, when the postal business contract ceased.

### *Assessing the success of Ralph Allen*

This story of Ralph Allen's stone business was not an unusual one in the 18th century and has many echoes in both contemporary and slightly later development in diverse industries such as mining, metallurgy, textiles, and pottery. In all these the scale of working and use of paid labour increased, the applied capital grew, and innovation in transport and advertising or other means of capturing markets played their parts in Britain's industrial revolution. However, unlike the achievements of Arkwright or Wedgwood, Allen's business remained stubbornly local. The reason for this, even disregarding the dislocation caused by wars with France, was largely lack of suitable inland water transport between Bath and London. Locally however, his success in lowering costs of the stone and of masons' work, and his not disinterested support for the vision of the Woods, played a fundamental part in keeping out alternative materials, such as brick and render, and in establishing the building of Bath with results so important to the image of the city today.

### *Quarrying in the Allen Estate: Phase III – 1764 to c 1803*

Documentary and literary evidence is much more scarce for the Phase III, Allen Estate period of working. After Allen's death, the quarries, surface and underground, appear all to have been leased to independent quarrymasters or freemasons. Details of who they were and how much they produced are not available until near the end of the century, at which time the statistics, because of intense economic depression are unlikely to be representative. They did not have the use of the wooden railway, which was demolished in late 1764, but did a few years later gain much better access to Bath by the extension of the Turnpike across Combe Down. Despite competition developing at Crossways and

Entry Hill, and east of the Lawns, their cumulative output cannot have been much inferior to that of Allen, since the building industry in Bath remained fairly prosperous until just before the end of the 18th century, with some massive building projects under the younger John Wood.

In the underground workings, there is evidence of diversity in approach in this period. Two new methods of working seem to have been introduced, the Long Room System and the Long Wall, gullet and pillar, the latter eventually becoming dominant and widespread in this phase and later. The pillar plan (Fig. 1.9) shows the system in West Firs was applied with a regularity in the form and offset layout of pillars not seen before which suggest one quarrymaster at least had developed a controlled and systematic approach. The Long Room method was only applied over a limited area, but in part of it a system of hauling and loading stone was introduced using mast cranes, though this probably proved premature, requiring more space than was available with this method.

The extent of working in this phase can be fairly well deduced from information in a series of leases granted at the beginning of the following phase, when the Allen Estate sold its properties to new owners, who were as much involved with land speculation as quarrying. The Allen Estate freemasons or quarrymasters appear not to have worked in the surveyed areas of Byfield, except for a possible fairly small working operated by Richard Jones and son, and located just west of the Combe Road boundary and pillar (Quarry Area 2398). In Central Firs, the working was completed to some 25 m from the North Road (2200), and to the west of the Allen entries, two or three new entries were made, one of some 30-40 m length, to exploit the western portion of Firs. In East Firs, up to the Long Drung and immediately to the east of it (2339), Phase III working penetrated to within about 120 m from the apex near the Prior Park Gates. It is probable that at least some of these quarries continued into the next phase, under the same lessees.

Based on the Phasing map, Phase III appears to have achieved a production level somewhat higher on average than Allen's, at around 7000 tons. There was rising demand as Bath expanded, and the freemasons who took underground leases would not in general have had the same option as Allen had, that is to switch to surface production. Given the dreadful years at the end of the century when underground production sank back to a few hundred tons, the general level may have been even higher than suggested. There was a substantial rise in competition in these years from other freemasons in the wider area.

#### *The early 19th century: Phase IV – c 1803 to 1833*

Quarrying in the new century saw both a continuation of the old quarries together with old scale working, and the introduction of many new

quarries, notably at surface, but also a larger-scale quarry underground. Sale of the area in parcels to several land speculators, led to them in turn laying out quarries in regular areas typically of two to three acres each in total, to up to a dozen freemasons.

West of Combe Road in Lyncombe and Widcombe, Harry Salmon divided the area today known as Coxes Quarry and Byfield Mine into some six or seven blocks, with half a dozen quarry owners. Only two blocks had any archaeological evidence for workings underground. What is now the Bat Sanctuary was probably worked by three different owners and the other, John Scrace's quarry in the north-west corner (512), was probably difficult to work economically because of a bed of poor stone, and he went bankrupt. The surface quarries seem to have been much more successful, the southernmost owned by Samuel Nowell (no.1 on Figure 4.2), most likely flourishing because of his son Phillip's renowned abilities as a mason which probably led to orders for all the quarries. There were other family relationships there, notably between Street and the Nowells, which must have helped spread this prosperity, and Irving (2005), in his description of the area points to several examples of co-operation between freemasons which must have been mutually beneficial in what sometimes were particularly hard times. The area was substantially quarried over by around 1830, but it is possible that reworking at greater depth over part of the area took place for several more decades.

The area north and east of Allen's working in Central Byfield (505) was also let to several freemasons, with changes of lessee suggesting they found times no less hard. Their leases commenced 40 perches south from North Road (almost exactly 200 m), although this was probably nominal, interacting slightly with the older Allen-period workings. The tone of the leases suggest that shafts were initially not welcomed by the new landlord, Edward Layton, and a little later by his heir Nathaniel Hadley, even though at least two and possibly three had been made previously. Three more were indeed sunk, all in a single row and aligned to a length of cartway below. Shafts, cartway and a cable hauled system were here developed as an integrated system of quarrying which also, as seen in slightly earlier workings in Firs, may have involved the regular offset use of pillars for support. In West Firs previous working had been more extensive and the potential working life there and in the western part of Central Firs north of the Allen working was limited, even in 1803.

The largest underground working of this phase was however in the eastern side of Central Firs, overflowing in the north into the top of Combe Park and into the north-west corner of the area just east of the Long Drung. Here John Greenway seems to have put together a somewhat larger quarrying area than had his competitors, some three acres in Central Firs (2211) and just under two acres

immediately adjacent. This area was actually partially worked by John Burgess and son in a regular and apparently economic manner from around 1809 to 1838, including the Grand Canyon Quarrying Area 2209. It again had a central cartway running beneath wide shafts mainly under the north-east of Firs Field, some use of cable haulage and in particular higher faces of up to 8 m, more than seen in any other contemporary or earlier workings. Essentially this was the last substantial block of ground left near the village, and subsequent working in the core quarrying area was predominantly tidying-up.

The production area for Phase IV, for the first third of the 19th century shows it was indeed the golden age. Because the Three Acre quarry was the main source of Phase IV and V output, probably terminating in 1838, the actual level is probably higher than the figures would suggest. The 12,500 tons calculated by using the usual calculation may have been, in actuality, as much as 14,000 -15,000 tons.

#### *The mid-century years : Phase V – 1833 to 1867*

By 1860, according to Tyte (1897 cited in Hemmings 1983), there was no underground quarrying in Combe Down. If so it was only a temporary period of inactivity, but it does indicate the marked reduction by then, and despite a little recovery after the turn of the century, it was generally avoided in favour of surface methods.

The production in this phase calculated from the table would suggest some 7600 tons output annually. However as the largest annual amounts were probably prior to closure of the Three Acre Quarry in 1838, the actual output after this probably fell below around 6000 tons, possibly well below that of Allen's period. It probably was well below this by 1860, when, by general agreement the central area of Combe Down was effectively worked out, leaving only small blocks for the future.

The unknown area is principally the far eastern area of Firs, under Gladstone Road and east to the boundary. Much of this area was not examined because of floor to roof spoil dumps (themselves suggesting that lower heights were worked) and the few areas where the roof to floor height was seen were only some 3 m high. The large area there probably exaggerates the production attributable to Phase V (and even more to Phase VI).

The few small parcels of unworked ground left after Burgess finished in 1838 were worked mostly by use of winches or cranes and by an increasing use of saws. To use these methods effectively, the Open Room method of working evolved. It is not entirely clear if this was copied from fast-growing areas around nearby Monkton Farley, and Corsham and Box in Wiltshire or whether it was a response to the fierce competition set up by them, though the former is probably more likely. However, surface quarrying had still a considerable advantage in the

closeness of Bath and the perceived better quality of Combe Down stone. In more distant markets Combe Down could not produce the quantity of stone, nor had the direct rail access needed effectively to compete. The Wiltshire stone, available in thick massive beds, was more easily quarried on a huge scale and the term Bath Stone, by this period, meant it was Oolite from anywhere but Combe Down, though it is unlikely most customers usually either knew or cared.

This did not mean the end of substantial quarrying. North of North Road, John Ovens Thomas had let out quarrying leases between Combe Road and what is now Popes Walk, which continued to benefit his descendants after his death c 1830, until the 1870s and after. This area was almost entirely worked at the surface except for a few small areas under the buildings at Stonehouse Lane (2219), and some small workings south of North Road in Central Firs, reached from the surface quarries to the north, including Quarry 2212. These underground sections continued to about 1880. Similarly surface workings at the Lawns (Lodge Style) and Shaft Road (Lodge Hill or Combe Quarries) on a very extensive scale continued operating well into the 20th century. Here and around Entry Hill and Crossways the growing activity was no doubt helped by the easy accesses to Bath by road, and after about 1810, to wider afield with access to either the Kennet and Avon or its branch, the Somersetshire Coal Canal.

#### *The late 19th and early 20th centuries: Phase VI – 1867 to 1938*

Though with a production of only some 1700 tons average annually in the central area of Combe Down, which as explained above may still be a little high, at last Allen's dream of Bath Stone being predominant in the market was achieved. *The Builder* (20 April 1895) wrote that it was used in immense quantities. Unfortunately it coupled this with the remark that it was also the 'gerry-builders stone par excellence', a statement not refuted by a comment from one supplier that they supplied whatever the customer needed, even calling it Portland. It is possible that Combe Down freestone, with diminishing supply and mainly used locally was somewhat freer of these problems, though John Wood, in his and Allen's time also decried such subterfuge.

By the end of the century, however, at surface, north of North Road, quarrying was retreating to the north limit of the Down, though a small narrow strip between Popes Walk and the Prior Park Drive (Ralph Allen Drive today) had finally been given over to the quarrymen, and the end near Combe Road was still quite close to the main road. Most of the effort was expended at and near Combe Quarry at Shaft Road, including Mount Pleasant. In 1887 several quarries were amalgamated under the Bath Stone Firms Ltd and it became easier to match output to fluctuating demand by temporarily

closing and re-opening quarries. The former seems to have happened about 1895 when *The Builder* reported that only Combe Quarry (east of Shaft Road) was active at the time.

Around 1895, underground quarries became active again, working where surface working would have adverse impacts. The underground workings at Shaft Road and at what was recently termed Freydings Shaft, but originally was probably part of Mount Pleasant Quarry, both seem to be active about this time, with another 'slope entry' nearby and with St Winifreds developing somewhat later. The Shaft Road workings exploited the area under that road, and successfully took stone from as little as a metre below the surface! At Foxhill, west of the extended Combe Road at what is now the Rugby Football Ground and the MOD establishment, a small late 19th- and early 20th-century quarry worked at surface at the former almost opposite the older Stonehouse Lane Quarry. Addison (1998) calls this Wilks Quarry and refers to the traditional use of barrows conveying the ridding on planks high across the gullet or working trench. Apparently blocked by the recent housing at the south side next to North Road, they took their working underground, undermining by an entry from the surface quarry. Adjacent to this, over the first 20 years or so of the new century, three more small workings were opened, including what Addison called Coxes Vertical Shaft Mine, near the MOD entrance. All these turn-of-century underground mines used a similar technology. Headings were rail-served and the rooms off either used winches and a snatch block for dragging stone blocks, or this was done by hand-operated post cranes, their original presence revealed archaeologically by chog holes in the roof. Almost identical technology (allowing for the fractured nature of the Combe Down freestone) can be seen in the Wiltshire Quarries though there the scale was usually very much greater. Hand saws were widely used, but large blocks were still more likely to be broken out by wedges.

One last blow was struck in the old core area, when James Riddle, operating using a petrol winch from the Allotment Shaft at the western side of Sheeps House Quarry in about 1905, began a similar operation on a small area left unworked there. By 1914 however, in that small area too, it was all over. In the other areas, working was reduced in scale. The Bath and Portland Stone Firms, as it became known eventually, ended business about 1937. Since then the single company operating has been Hancocks' Quarry at Lodge Style, who are still in business today.

#### *Growth of the Combe Down settlement and the relationship with quarrying*

The growth of the Combe Down settlement was not organic in the sense that it grew only to serve the quarrying community. What would nowadays be called a brownfield site, a mix of disused quarries

and potential quarries was not in itself immediately attractive for housing, either because the intrusion of housing makes quarrying activity more difficult, or because living in the immediate proximity of industrial-scale working quarries is not obviously desirable, except perhaps for the convenience of the workmen there. That the landscape was less damaged than it might have been was a consequence of the ownership of wealthy Ralph Allen whose house was nearby and who developed a tree-planted landscape designed to preserve and enhance its amenities. His successors in ownership however, saw its proximity to Bath and its fine outlooks and salubrious climate as a speculative building development opportunity.

Although the great house of Prior Park was omitted from the new parish of Combe Down, perhaps as it was seen as more important to Bath than to an outlying parish, it was the early ownership of the Down by the Allen Estate which defined the boundaries of modern Combe Down, and the core of its original quarrying activity defined the core of the modern village and ward. Allen had probably not foreseen this – his village or township was limited to some dozen houses for his key workers and a public house (he built a brewery too, but nearer the city). Others must have walked in to work from surrounding communities. Until just after 1800, the estate assembled by Allen remained substantially intact, connected by family links through his niece and heir Gertrude Warburton and, more tenuously, through the marriage of another niece, Mary Bennet, to Cornwallis Maude. He was soon to become the Earl de Montalt, was later created Lord Hawarden, and purchased the Allen properties stage by stage from Gertrude. Almost certainly undercapitalised and perhaps damaged by the depression of the mid 1790s, Hawarden sought the aid of two of Bath's land speculators, Harry Salmon and Benjamin Wingrove. Together they seem to have laid out the principle roads for modern Combe Down: The Avenue, Combe Road, Rockhall Lane, Church Road, Beechwood Road and even the path running south of the Church to Belmont Road. The most conspicuous development by de Montalt was Isabella Place, upgraded with the current polite three-story front built on to an older row of cottages. It was named after his wife, and complemented the changes also made to the Old Rank, which then became de Montalt Row. The construction of cottages down Rock Lane may also have been begun under him.

Lord Hawarden, as he had become by the end of the century, clearly saw a new type of settlement replacing the quarries in the central area, whose activities were coming to an end. It seems likely he saw his new buildings as largely for the middle class, but generally this *embourgeoisement*, today likely to affect even the smallest cottage in the old core area, came somewhat later. Hawarden's death in 1803 simply hastened what was already happening and the land was transferred to the two

speculators who quickly sold it on, both to individuals in small parcels and, as an estate to Edward Layton. Following his death, it became the Hadley Estate. This saw the first houses built on Combe Park, accessed from The Avenue but, more rapidly, the workmen's cottages on Summer Lane (Quarrybottom) were developed. The Hadley Estate probably either built a dozen houses, or sold land leasehold for building on in the next decade or so: among these was John Davidge's brewhouse down Rock Lane, giving his name to the bottom.

What land did not go to Salmon and Wingrove remained with the Prior Park Estate, but this too was sold on the death of the second Lord Hawarden in 1807, to another businessman, a Quaker, John Ovens Thomas. He came to live at Prior Park, but was no slower to see his opportunity and leased the areas close on the north of North Road beyond Pope's Walk for quarrying, which lasted over the whole of the 19th century. After his death in 1830 a family trust benefited. In conjunction with another speculator and surveyor, Henry Cotterell, he had the area east of the Long Drung as far as the boundary with the Lawns parcelled out for housing. The remaining unsold area was acquired by Cotterell after Thomas's death. This is the area known as the Tynning and Gladstone Road today.

The land here was sold in substantial parcels and some certainly attracted masons and small speculators who built both individual and rows of houses which, in the mid 19th century were mostly occupied by wage earners in quarrying or linked trades. This proportion of occupiers linked to quarrying appears to have diminished after 1860. The Tynning and Gladstone Road did not, however, have the crowded appearance seen today (which is largely modern infilling) and large areas seem to have been gardens or allotments, though there must also have been at least ten or so shafts to the workings below and possibly, small masons or builders yards associated with them still at work until near the end of the century.

Generally, building of houses, as in the core of the village, followed quarrying. The old Masons' Crane House Quarry soon housed the Quarry Vale cottages alongside Summer Lane. Claremont, the Unitarian Chapel and Hopecote Lodge developed after Burgess moved his operations underground, and finally the Church was built along what was then The South Parade and is now Church Road. The Vicarage and school, and larger houses such as Belmont (Mrs Cruikshank's house – heir of John Thomas) were built on Belmont Road as dumping of spoil from the Burgess' quarry above had also ended. This was also so, for instance, at Fars Lane before and around 1850, where, as the quarries retreated back away from North Road, houses began to develop one by one near the roadside on the spoil heaps. Something similar happened on the south side of North Road beyond Combe Road, as far west as the Foresters Arms, and also down Combe Road.

More houses and thirsty workmen led naturally to Public Houses being built. John Davidge had his brewhouse down Rock Hall lane, the William IV arose from Job Salter's brewery, later Hines Brewery, and the Hadley Arms (c 1845) may also have made its own beer. The Carriage Inn was probably still in business, another Public House was located down Rock Hall Lane and at least two others were built, one either end of the village on North and Bradford Roads.

The end of quarrying was delayed at Combe Park when Richard Lankasheer took a lease to quarry under it in 1856 but housing there was by then well under way. In the Tynning and Gladstone Road, Cotterell devised the ultimate selling point for house-plots, with plots sold with the stone underneath suitable for building them. Others found themselves in a similar situation accidentally – the back areas of Gay Staithe for example, had unexploited blocks of stone left underneath which was taken around or after the mid-century.

Though surface quarrying was clearly more favoured in the 19th century, this was not necessarily so to landlords or house owners, who gained the revenue from stone below their properties by letting it out for undermining while also collecting rents for the surface. Not all buyers of land under the Tynning and Gladstone roads were quarrymen. Others must have let out their rights to account for the very widespread mid and late-century undermining of stone which took place there, presumably to mutual advantage. In a few examples, rubble stone packs were built to support the roof underground beneath houses above, and other areas filled with spoil to the roof may also have had this in mind. Under the early 18th-century house at Stonehouse Lane, the adjacent quarry (2219) undermined the houses and the quarry access road some time after 1850. Possibly John Scrace's quarry (512) in the corner of Combe Road and North Road did much the same somewhat earlier. At Foxhill, undermining beginning at the junction with Combe Road continued parallel to the road westwards, while housing, by the 1920s began to extend eastwards from Foxhill Road. Here housing initially dominated, with the grandly named Ralph Allen Park, though in the Second World War this development was eclipsed by War Office and later defence needs.

## **The significance of the archaeology**

### *Interpreting the workings*

The archaeological recording of the underground structures allowed a plausible phasing of workings to be developed and provided a physical context for the historical narrative. Recording and interpretation of the detailed features associated with the quarrying process enabled a deep understanding of the working methods and how they developed, again enhanced by the historical setting.



### *Art and craft amidst the dumps: the finds*

The finds within the underground quarries were significant both for the interpretation of their working and the equipment used, and through the graffiti, of their attitudes and human preoccupations. Less expectedly, the finds also provided clues as to the consumption and disposal patterns of the community above.

Graffiti was useful especially in providing dates, which, with care, helped develop the chronology of the workings, notably the pre-Allen 1725 date from Quarry 2347, and also the approximate time of the introduction of the frig bob saw by dates on sawn faces. Help for dating also came especially from the study of clay pipes carried out by Marek Lewcun, which also provided evidence of the early workings in what became known as the E4 stub under the south end of the Avenue (2347). Pottery found there, deriving presumably from the Carriage Inn, while not proving an early date, certainly allowed for one.

One of the conundrums which faced the investigation was in the use of horses underground. Despite the wooden railway at surface, archaeological evidence suggests that Allen did not extend its use below ground. Probably because the distances were not large, horses were certainly not generally used either by him or later quarrymasters. However, the finds of remains of three horses or ponies, two of them remote from any shaft entry, together with several fragments of horse shoes and a possible cartway with hoof marks does suggest horses were, at least occasionally, used underground. Certainly their use would be very advantageous for bringing out especially large blocks.

A substantial range of stonework, such as for window and door mouldings and other features, was also found underground. It was widespread, and given that many areas of the mine were backfilled at later dates than they were worked, it may have been even more common. It showed, for instance, that banker masons' work was done underground under Allen, despite his having two surface stoneyards, and that smaller quarrying ventures fairly commonly must have done so. The stonework did not seem to include much of the more detailed work, perhaps because it would have been more susceptible to damage, but a fairly wide range was produced, some of which can easily be related to surviving buildings, some which cannot. Actual use of stone equipment within the quarries included candle holders, boxes for candles and perhaps tinder, and probably for protecting food against rats but overall use of worked stone for the quarry (only in regards to the Stabilisation Scheme and in general for the Byfield and Firs areas) and quarrymen was very small.

### *Artefacts and the community*

One of the results initially least expected to be revealed following the decision to record the

archaeology of the underground quarries was to be able to reveal some of the social aspects of the settlement. Graffiti, some of which can be seen as a form of vernacular art, has a long survival time compared with the surface, and under Combe Down there were very many examples. Much of it remains enigmatic, though, for instance, initials and signatures may gradually yield their secrets when combined with more research into village historical minutiae. The website contains a table of underground graffiti, in reference to known quarrymen, quarrymasters and stone producers). The table includes information already researched by NRH, David Pollard, Rosemary Simmons of the Combe Down Heritage Group and the acknowledged research by Peter Addison; further research was largely beyond the scope of the present study. What must be drawings of quarrymen and acquaintances were fairly common and sketches such as that of 'Holly' and the 'Naked Lady' yield an insight into what occupied the minds of mid 19th-century young men – much the same as today has to be the conclusion. There is evidence too of a radical frame of mind in two of the drawings, which might well be explored by further historical research.

The range of pipes found has been particularly rewarding, though many of those reported here were recovered in the 1980s. The 18th-century range provides a reference collection for Bath, while the 19th-century samples included a range of Bacchus pipes unparalleled elsewhere in Britain. This may be a sign of comparative prosperity, as may also be a 'football' pipe. Whether this prosperity came from quarrying is difficult to assess.

Overall, however the surface-derived dumping which took place into open shafts and other surface quarry entries revealed mostly what might be expected in any Victorian bottle dump. What was mundane when these were dumped, however, can be a source of great interest and nostalgia today. Many items found will hopefully find a home in exhibitions and displays in the future. Some of the mass-produced pottery, in particular, provides a vivid insight into the growth of domestic food, cosmetic remedies and medical items some of which remain household names today.

### *Combe Down today*

Combe Down has gone, over three centuries, from 'sleight pasture' for sheep through extensive quarrying to a being a dormitory suburb of Bath. It has become obvious that everywhere in the core or old area of Combe Down village, almost every scrap of land has either been quarried from the surface or undermined from below. This is also true for very extensive areas adjacent on the north and east sides, and also for areas around Entry Hill and at Odd Down. This begs the question, why were some areas largely exempted? At least one is explicable: William Smith, the so-called 'Father of Geology', picked a quarry along a fault line which had

damaged the stone, though it was probably more his impatience to get on with his study of the national geology which prevented him driving on and eventually succeeding as a local quarrymaster.

Substantial areas remain unworked under the Foxhill Estate and south of it between the Bradford Road and Shepherds Walk. There were indeed a couple of small quarries of probable mid-19th century date, but these seemed to fail to grow like others. Possibly it was the geology, with either fractured ground, more clay layers, or calcitic vugs ruining the stone for monumental purposes. Though there was surface quarrying in the former Claverton part of Combe Down north of North Road it too only took out a restricted area and may have been more shallow-depth working (based on the limited time it seems to have been open) compared with west of Prior Park. We found the quality of at least the upper beds of freestone were deteriorating – thinner, more brashy – in the north-east corner of the underground workings near Gladstone Road, so this may offer an explanation for the nearby Claverton area too.

### **Conclusions**

The physical work of stabilising the underground quarries in The Combe Down Stone Mines project was largely finished by November 2008, after eight years effort. We have been fortunate in benefiting from an unprecedented opportunity to examine over 200 years of underground and surface quarrying archaeology in considerable detail, in conjunction with use of literary and documentary sources. In the first chapter we laid out the original and later modified aims of the archaeological project. There is now a very large body of digitised plans, contexts, photographs, videos and laser scans, with a substantial collection of artefacts which are archived and reported upon. This mass of data and results will go on to the website. This database has been used for this report and will be a resource for future interpretation and displays.

One of the benefits of such a long-term project has been the opportunity to get to know the local area very well, and to have many opportunities to follow up information in local libraries and archives. This is reflected in the considerable portion of this report being based on historical data. In conjunction with the archaeology, this has yielded a sum which is greater than the separate parts and, in particular, it has been possible to assess the role of Ralph Allen and his stone business in a way previously not possible, even though much of the basic information used was previously published. This reassessment of him will be, we hope, an important contribution to the 'Building of Bath'.

We hope it will also be a major contribution to quarrying history. It has certainly been the largest archaeological recording of any quarry or mine in the UK, and is rivalled by only a very few such projects in Europe. It has been in many ways a triumph of co-operation between contract managers, engineering consultants, contractors and archaeologists in overcoming the difficulties in working together in the difficult and potentially very hazardous conditions of the underground quarries. This was in part due to the initiative of the Bath & North East Somerset Council and English Heritage, but much more to the staff of the companies and their personal interest in the remains. Carrying out the recording required considerable innovation to discover the methods most appropriate to the circumstances.

There were obvious limitations to what was possible. The end of any project is likely to leave a sense that more could have been done or could yet be done and this is certainly true here. There is potential for further research notably into the social aspects of Combe Down quarrying; the detailed examination of housing at Combe Down and the relationship with quarrying is still only slightly explored, in particular who lived where and what they were involved in.

Many areas of the underground quarries could not be entered or even distantly seen, either because of safety, with the requirement always to be under modern engineered roof supports, or because they were already infilled with spoil. Possibly this amounted to over half the underground area. On the other hand, the overall area was so large and it was possible to observe repetition in what had been done in different parts of the workings giving confidence that overall we had a sufficient sample from which to draw valid conclusions.

The result has been a narrative which has been especially strong in dealing with the innovatory phase and area of Ralph Allen working, but which has also been able to identify working phases before and up to the early part of the 20th century. There are very extensive areas of underground quarrying in Britain, and some parts of these will be even older, but it is likely that nowhere else will be able to provide such detail for 18th-century quarrying (underground or surface) as it has been possible to assemble at Combe Down. It should, however, be possible to carry out 19th-century studies of equivalent potential in other areas.

*Lynn Willies  
Neville Redvers-Higgins  
Ianto Wain*