A BELL-PIT OR CHALK WELL AT LANE END

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During a routine visit to a former brickworks site at Moor Common, Lane End, in the garden of Mr. and Mrs. P.M. Blake, Andrew Pike learnt of the existence of a deep shaft in the garden. With the help of Brian Tilbury of the Ashford Speleological Group, a descent was arranged. Mr. Tilbury had previously visited the shaft in the company of Mr. Wilton-Jones and the latter had carried out a survey and written a short note on the site (Wilton-Jones, 1978). The survey is reproduced here by courtesy of Mr. Jones, with a few additional sketched details by the writer (Fig. 1).

The shaft lies on the margin of a former brickyard in existence until the early years of this century. After closure of the works a house was built on the site in the early 1920s and the area landscaped. One of the former brickworks' buildings survives in use as a garage. The shaft mouth (SU 8023 9095) had been concreted over and a small access hole subsequently broken through this cover. It is possible that some of the upper part of the shaft has been removed by landscaping.

The access shaft is approximately 1.6 m. diameter and lined with blocks of sandstone. This shields the superficial geological deposits behind, probably Reading Beds. About 5.5 m. below present ground level the shaft opens out, becoming a bell-shaped chamber cut out of the chalk, 11 m. from top to base, the mine being 16.5 m. deep overall. By the time of its abandonment, five short galleries had been worked leading off from the base of the chamber (Fig. 1). The galleries were about 3.5 m. high and all ended in vertical working faces, on which pick marks could be seen. At several points a beginning had been made on lowering the floors of the galleries. This would have been economical of effort since there would have been less distance to barrow the chalk to the access shaft than if the galleries had been extended. However, economy of effort was not the primary reason for abandonment of galleries 1 and 2, since both had met a fault in the chalk with a NNW/SSE strike, the fault plane dipping roughly WSW. The fault plane showed slight slickensiding, and was iron stained due to groundwater percolation. Gallery 3 was the only area which was wet, there being a constant drip from the roof which may have led to the abandonment of this gallery. There were several heaps of quarried chalk remaining in the galleries, and in some instances the wheel tracks of barrow runs were visible.

There was little direct evidence underground to provide a date for the period of operation of the mine. At the centre of the main chamber was a cone of debris that had been tipped down the shaft after the mine's abandonment, containing relatively recent rubbish. Resting on one of the heaps of chalk away from the tip cone was a length of steel hawser which may have been contemporary with the period of operation. A windlass would certainly have been the only way of raising and lowering the chalk up and down the shaft, and if the hawser was contemporary then the hoist

was obviously mechanically powered. Two iron nails driven into the side of the main chamber and a wooden spade or shovel scraper were the only other certainly contemporary artefacts, apart from a few fragmentary pieces of board. Mr. Jones (1978) records the presence of an oil lamp when he first investigated the shaft. Taking these slight clues together, a nineteenth century date seemed at first sight the most likely date for the operation of the mine, and this was subsequently confirmed locally.

There was no doubt that the shaft had been sunk to obtain chalk. Although bands of flint were present, they were widely spaced (roughly one metre apart), very thin, and the flint was of poor quality and shattered easily. In some places the floors of the galleries were of flint which had not been touched, despite a start having been made on further lowering the level of the gallery floor. At a very rough guess, the weight ratio of flint: chalk extracted could not have been greater than 1:30, although this is not to say that flint may not have been utilised as a by-product. The total amount of chalk and flint which had been extracted from the hole would have been in the order of 1,300 cubic metres, roughly 2,600 tons wet weight. The size of the chalk in the heaps compared with that near the working face (at A for instance), suggests that the quarried chalk was reduced in size below ground before being raised to the surface. There seems to have been no attempt to sort chalk from flint below ground.

Subsequent to the initial descent, Mrs. K. Hawes, whose father, A.C. Barnett, built Boundary House on the site of the former brickworks, told the writer that her father had in the late 1920s met one Dan Ansell, then about ninety, who had worked in the brickworks and could remember the shaft in operation. He had said that the chalk was used at least in part for roadworks. Mr. H. Hussey has pointed out that further infilled shafts, marked as 'quarries' on Ordnance Survey maps, lay a little to the east of the Boundary House shaft on Moor End Common itself, and at one time their occasional subsidence represented a considerable hazard to local traffic.

Chalk wells, as will be discussed further on, have a considerable history in the county, but in their final phase their operation seems to have been frequently linked with brickworks. Buckinghamshire trade directories provide several examples of this association. Pigot's directory of 1842, for instance, lists John Bigg of Wheeler End as 'brickmaker and limeburner', and Kelly's directory of 1877 lists H.R. Hewett of Bovingdon Green likewise.

Mr. R. Healy of Pennlands Farm, Hedgerley, whose family operated a brickworks there, recalls his father telling him that his sister descended one of the two wells then operating in the yard – this would have been a little before 1900. The chalk extracted from the Pennlands wells was burnt for lime, there being a kiln in the yard. Another well that, according to Mr. Healey, served a similar function still exists in Sanders Wood, about 500 m. distant. In Hertfordshire, the Geological Survey (Mems. Geol. Surv., 1922, 24) refers to a 'bell-pit' made at the old brickyard at Poorlands Farm, 1½ miles south of Tring, and another at the brickyard half a mile south-west of St. Mary's, Northchurch, which reached 'Hurlock' (chalk rock) at eighty feet. Other known Buckinghamshire shafts include a group at Hedsor shown on nineteenth-century Ordnance Survey maps associated with lime kilns, a single example at Hambleden, SU 7650 8747 (information from Miss A. Petrie), one at Naphill (Wilton-Jones, 1978), and a probable example at Speen, c. SU 8388 9979, whose backfill is said to include a circus lion that died whilst in the village (information from Mr. D. Eckles).

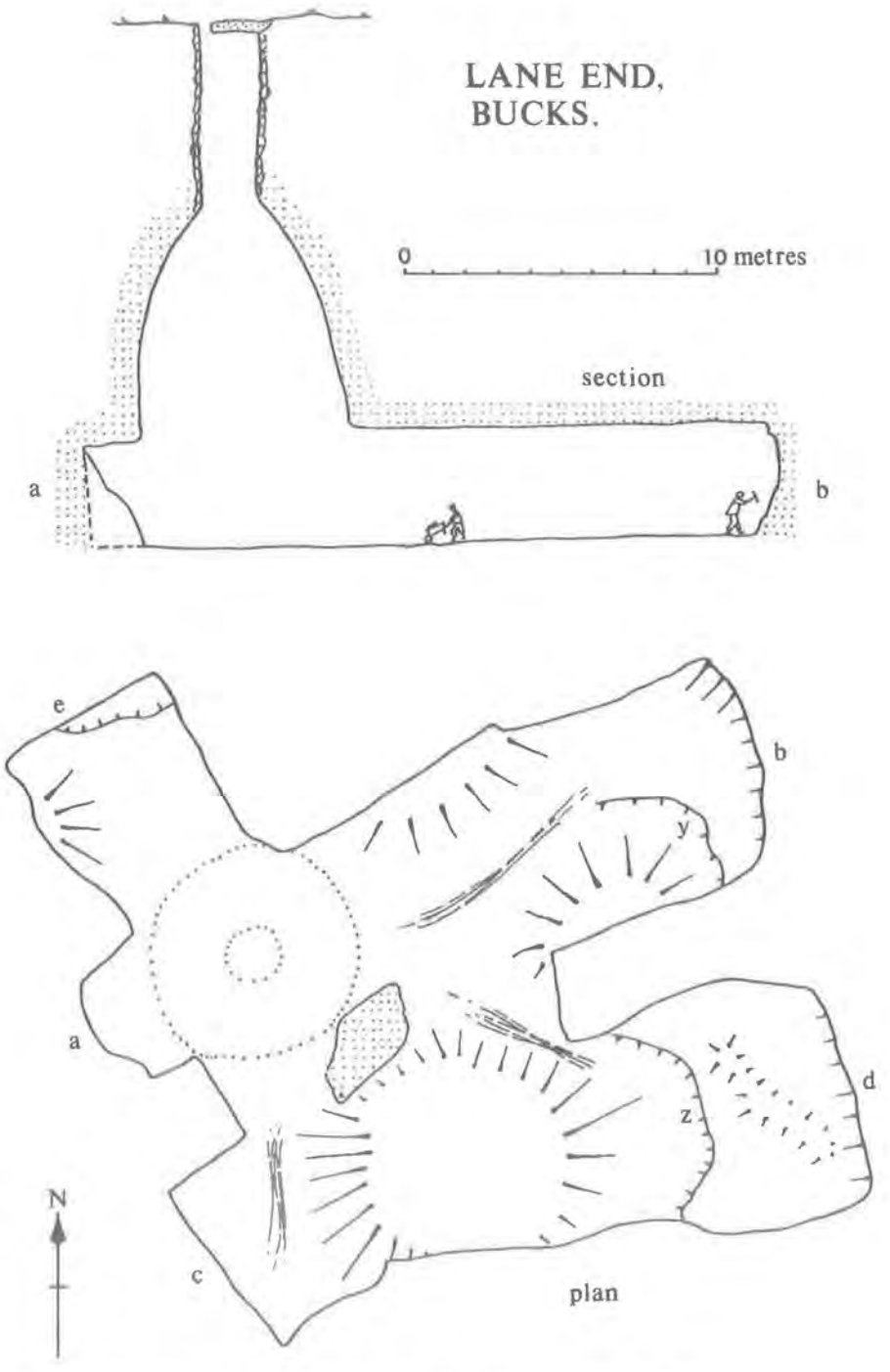

Fig. 1. Chalk well at Lane End, Bucks (after Wilton-Jones, 1978).

A chalk well may also be the source of a brief account of galleried shafts at Pitstone reported by Mr. Edwin Hollis (Bucks. Arch. Soc. Letter Books, September 1908), who discovered three gentlemen re-excavating them. These were located between Beacon and Steps Hill, but of course they could be much earlier than the others.

Many of the wells noted so far have been fairly late in date and associated particularly with the extraction of chalk for conversion to lime. They were in due course to be superseded by large open quarries such as at Chinnor and Pitstone. In an earlier phase, however, Chiltern chalk from similar, although probably smaller mines, was spread directly on to arable land in the vicinity of the shaft to improve its quality. The practice of 'chalking' is described in a number of agricultural works of the eighteenth and nineteenth centuries and was generally confined to areas where chalk lay concealed beneath other superficial deposits. Direct references to the practice in Buckinghamshire are not particularly common. The earliest noted so far is in William Ellis's *Chiltern and Vale Farming Explained* (London 1733),

p. 3, 'The Vale also is free from the exorbitant Charge of Chalking the Ground, or dressing it with Soot, Coney-clippings, Horn-shavings, Rags, Hoofs-hair and Ashes which are Yearly bought by many of the Chiltern Farmers'.

and p. 26, 'The Chalk Drawer finds a Wheel Rope Barrow, and all other Tackle, and also sinks the Pit for the price of eight Pence a Load, each Load, containing twenty Wheelbarrows full, which they also for that Money spread all about the Field'.

A few years earlier in 1727, the death of one William Dorset, a 'chalk drawer', is recorded in the parish registers of St. Mary's, Chesham. The writer is indebted to Messrs. A. H. Baines and H. R. Brackley for this reference.

In 1810, the Reverend St. John Priest, author of the *General View of the Agriculture of Buckinghamshire,* one of a series of county surveys of the early nineteenth century, wrote as follows:

> *'Chalk'* — The method of laying this manure upon the land, has been described by Mr. Young in his Farmer's Calendar, and others, repeatedly, viz. by sinking pits, drawing up the chalk by baskets, and carrying it out in barrows. The same method is pursued in Bucks. Chalking is done once in about 21 years, and costs at Wycombe 2 l., and 2 guineas, per acre, for 60 or 70 loads per acre'.

He then notes the practice of chalking at Missenden, Amersham, Chesham and at Chequers. The Hertfordshire *General View* (Board of Agric., 1813) is more detailed. It notes that chalk is considered to be:

> 'better the deeper it lies and the top chalk particularly, if it lies within 2 or 4 feet of the surface, very indifferent, and only fit for lime, or to be laid on roads, gateways, etc. . . . The flints also must be picked out from the chalk before it shall be carried on the land; for if the pit makers be not narrowly watched, they will chalk with both'

and the method:

> 'The under-mentioned method is pursued in chalking land, and the persons employed therein follow it as a trade: a spot is fixed upon nearly centrical to about 6 acres of the land to be chalked; here a pit, about 4 feet diameter, is sunk to the chalk, if found within about 20 feet from the surface; if not, the sinkers considering that they are on an earth-pillar, fill up the pit, and sink in fresh places, till their labour is attended with better success. The pit from the surface to the chalk, is kept from falling in by a sort of basket-work made with hazel or willow rods and brushwood, cut green and manufactured with the small boughs and leaves remaining thereon, to make the basket-work the closer. The earth and chalk is raised from the pit by a chalk rowl on a frame . . ., two wheel-barrows, a spade, a shovel, and a pick-axe, are all the necessary implements in the trade of a company of chalk diggers, generally three in number . . . The pit is sunk from 20 to 30 feet deep, and then chambered at the bottom, that is, the pitman digs or cuts out the chalk horizontally, in three separate directions; the horizontal apertures being of a sufficient height and width to admit of the pitman's working in them with ease and safety. One pit will chalk 6 acres, laying on 60 loads on an acre . . .'

The method was still in general use fifty years later and is noted by Read in 1856:

> 'Chalk is the only mineral manure extensively used in Bucks . . . It is most commonly applied to the land from pits or wells sunk in the fields. These pits are about 20 feet deep, and the chalk is drawn up in baskets by a wheel. From 90 to 120 loads, of 16 bushels each, is the usual dressing. The cost is now 5 d. per load, digging, drawing and barrowing out; 3 s. per 100 loads, spreading, and 4 s. per 100 loads levelling in the pits'.

By the first quarter of the twentieth century, the practice had generally ceased in Buckinghamshire although the Geological Survey noted that it was still carried out at The Lee (Mems. Geol. Surv., 1922, 55). This might account for substantial depressions which still exist at SP 899 046.

Although the earliest Buckinghamshire reference to chalk-mining so far noted is eighteenth century, subterranean chalk extraction in the Buckinghamshire Chilterns is likely to be much older than this. A glance at aerial photographs of many of the unwooded areas of the Chilterns will show numerous circular hollows, whose existence, for instance in Great Missenden parish and around Amersham, can be easily confirmed on the ground. Within Chilterns woodland there are also numerous conical depressions. Obviously each one must be considered on its merit – some may be purely geological in origin but it is probable that some at least are the collapsed cones of much earlier chalk wells. In Kent, chalk wells are known as 'dene holes', and have been the subject of extensive study. Pearman (1966), for instance, lists seventy-three 'dene hole' sites on the North Downs in Kent – as many as seventy shafts may be present at each site, and a number are demonstrably mediaeval in date. Recent discoveries in Kent and full

references are noted in Caiger (1972) and Garrod (1977).

Chalk wells or dene holes are commonest where chalk is capped by other geological deposits such as Thanet sand or clay-with-flints. Occasionally it is hard to see why a shaft has been sunk when a quarry could have been established at a more accessible outcrop in the side of a valley. The answer lies partly in the ease of access from the shaft to the field on which the chalk was to be spread, but also on the relatively minimal land disturbance caused by the access shaft which, unlike a quarry, produced no dead ground. The presumed higher quality of the deeper chalk, referred to in some of the works noted above, also has to be taken into account.

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