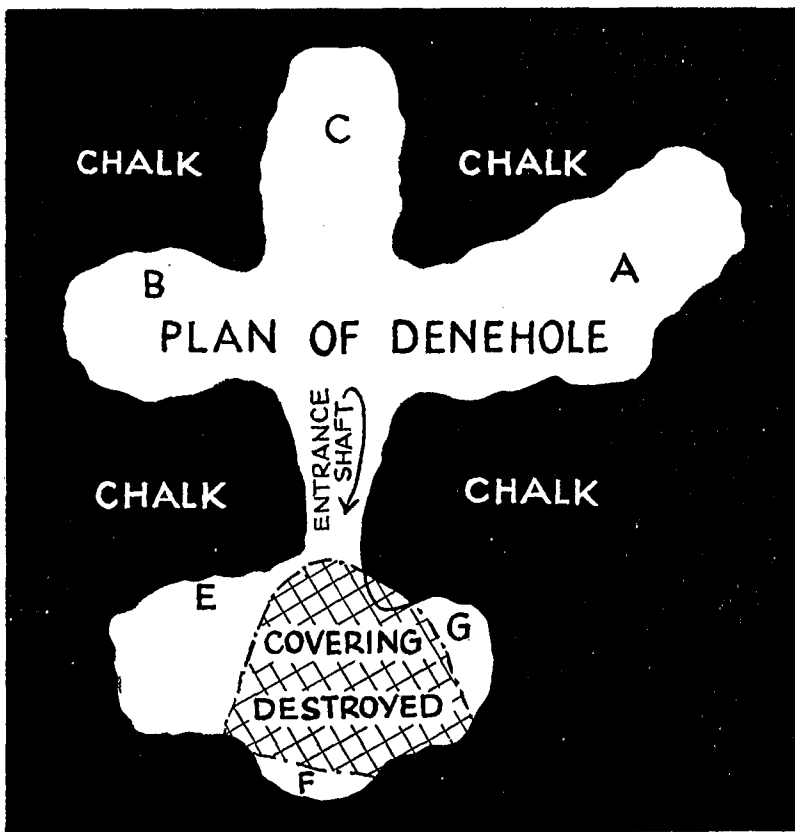


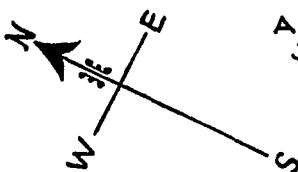
# A DENEHOLE AT HAMMILL NEAR EASTRY

BY JOHN ARCHIBALD, L.R.I.B.A.

IN July 1935 a denehole of the typical double trefoil type was accidentally discovered by some of the employees of the Hammill Brick Company, Ltd., who were excavating brick earth with a grab.



SCALE  
 $\frac{1}{8}$  INCH = 1 FOOT



JOHN  
ARCHIBALD  
JULY 1935

This excavation left only a thin layer of brick earth which after a heavy fall of rain collapsed and exposed the smaller section.

Mr. G. V. Parker, Works Manager of the Company, at once kindly communicated this discovery to me and through this gentleman's courtesy I was enabled to visit the site within a few hours after it had been found and on several subsequent occasions I again visited it and made a sketch plan of the denehole. Mr. W. P. D. Stebbing and other archæologists have also examined it.

In plan and character it is not dissimilar to other deneholes in Kent and cannot be classed as a chalk well. The floor of the holes is approximately 28 feet from the surface, the entrance shaft (now completely stopped up by bedded layers of fine or stony loam) is excavated through brick earth.

The roof of one of the bays in the larger section exposed the loam, and the cone of accumulated debris immediately under the shaft was formed of this material and contained no chalk. The springing of the domes and all the walls and floors are of chalk. The chalk roofs of the bays give in cross section pointed arches similar to those found in Early English architecture.

The respective heights of the bays are approximately :

Bay " A " 6 ft. 8 in. (Fig. 1).

Bay " B " 5 ft. 9 in.

Bay " C " 7 ft. (Fig. 2. This shows a part of the entrance shaft).

Passage 8 ft.

Bay " D " roof broken through by excavations and now open to the sky.

Bay " E " 7 ft. 8 in.

Bay " F " 7 ft. 6 in.

An interesting feature is the antler pick markings on the vaults of the bays (Fig. 3) and on the sides of the connecting passage.

The finds consisted of two skulls, parts of other skulls and a miscellaneous collection of small bones (Fig. 4).



*Photo, F. A. Archibald.*

Fig. 1.

BAY A, HAMMILL DENEHOLE.

The horizontal lines are flood water stains.



*Photo, F. A. A.*

Fig. 2.

BAY C, HAMMILL DENEHOLE.

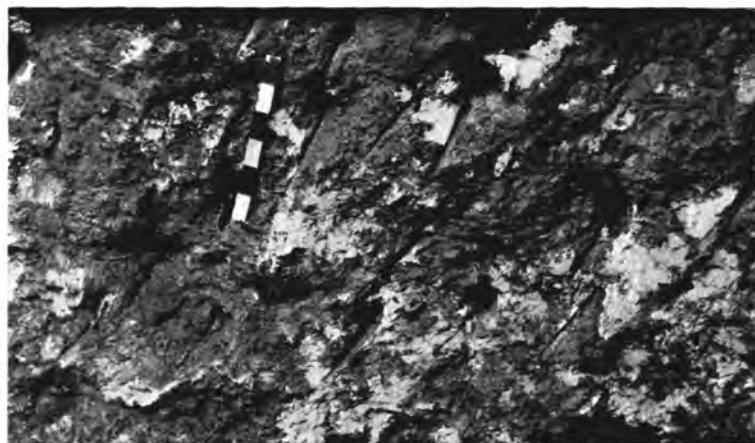


Fig. 3.

*Photo. F.A.A.*

PICK MARKINGS ON THE VAULT OF BAY E. HAMMILL DENEHOLE.



Fig. 4.

*Photo. F.A.A.*

BONES FROM THE HAMMILL DENEHOLE.

REPORT ON THE VERTEBRATE REMAINS FROM  
THE HAMMILL DENEHOLE.

Professor J. Wilfrid Jackson, D.Sc., F.G.S., of Manchester University, to whom Mr. R. F. Jessup, F.S.A., submitted the bones on Mr. Parker's behalf kindly reports as follows :

“The collection consists of the following :

**SHEEP.** A shank-bone measuring 115·5 mm. in length with a mid-shaft diameter of 13 mm. It is like that of a Highland horned ewe figured by Pitt-Rivers (Vol. 11, 1888, Plate 143, Fig. 11). It is more robust than Early Iron Age examples from Glastonbury and other places. In addition there is the right ramus of the lower jaw with a tooth-row measuring 74·6 mm. This is somewhat larger than the majority from Glastonbury. The left ramus is in pieces.

**Dog.** There is a left femur, a humerus, tibia, ulna and radius, all not quite adult, but probably belonging to the same animal. The humerus, radius and ulna are of the same limb. There is also the end of a smaller ulna and associated radius of a somewhat smaller dog than the above. In addition there are various foot-bones, an atlas vertebra, a much broken skull, lower jaws of five dogs, and the broken skull and pair of lower jaws of another dog. All the remains seem to belong to dogs similar to the fox-hound.

## REMARKS.

There is nothing in the remains to give a clue to their date, though, judging from the sheep bones (very few and fragmentary, it is true), I should think they are post-Iron Age, and later than Roman times.

Dog remains are of frequent occurrence in deneholes and these animals must often have dropped into such dangerous ‘pitfalls’.

I am sorry there is nothing to justify the suggestion of a Neolithic date.”

DENEHOLES AND SUBSIDENCES IN AREAS WHERE  
LATER DEPOSITS COVER THE CHALK.

BY W. P. D. STEBBING, F.S.A., F.G.S.

THE Denehole described by Mr. John Archibald at the Hammill Brick Works, and also reported on by Mr. R. F. Jessup, whose notes have been of much value, is one of some scores which have been noted in Kent and more particularly studied near Bexley and Gravesend.<sup>1</sup> The classic locality for them is Hangman's Wood at Grays Thurrock in Essex, but in every case known to the writer, with one exception noted below, the holes occur in areas where sands or loams cover the chalk to a greater or less thickness. The Hammill Denehole is only 28 ft. deep with a thickness of upwards of 20 ft. of re-deposited Tertiary and recent beds above the Chalk. At the junction with the eroded surface of the Chalk there is the usual Bull-head flint bed, succeeded by loamy brick-earths with a large Thanet Sand content and probably remains of the pebbly basement bed of the Woolwich Series. The loams run to 13 ft. in thickness but only 7 ft. is worked commercially. A Denehole at Dartford was 70 ft. deep, while those in Essex varied from 78 to 81 ft., with something like 55 ft. of sand and gravel above the chalk. The top beds of the chalk usually were not considered of any agricultural value<sup>2</sup> but at Hammill for some, probably economic, reason the excavation of the chalk, was begun almost immediately it was reached. This led, in one bay, to the collapse of the roof and the exposure of the overlying loam.

The earliest Deneholes almost certainly go back to a pre-Roman date, and some even may be Neolithic in origin when some form of arable farming began to be developed on those better uplands where Tertiary loams or later deposits covered the Chalk to some thickness. In many cases, and especially at Hammill where daylight observations could be made, the pick marks of the excavators on the upper part

<sup>1</sup> F. C. J. Spurrell, *Dartford Antiquities*, *Arch. Cant.*, XVIII, 317, 318.

<sup>2</sup> Arthur Young, *Agriculture of Hertfordshire*, 1804, pp. 158-164. Walter Johnson, *Folk Memory*, p. 220.

of the bays still remain as sharp as when the chalk was dug. Plasticine squeezes taken by Mr. Jessup showed quite clearly a series of striations which to him suggested deer horn picks, but he points out the difficulties involved in relying on those as an indication of date. On the lower part of the two opposite sides of the shaft there were also a number of fine parallel grooves which while indicating trimming down of the surface might have been made by a basket being hauled up.

The typical Denehole, such as that at Hammill, had a circular shaft of a diameter—2 ft. 6 in. at Hammill, one at Hangman's Wood about 3 ft.—suitable for a man by straddling to descend and ascend by foot holes cut opposite each other. A number of these still remained near the bottom of the shaft at Hammill. This shaft was sunk to the required depth and openings excavated from it on two sides. From each extension there branched the three lobes which gave the rude double trefoil plan. The small shaft made access easy from top to bottom, and the plan allowed the extraction in safety of the maximum amount of chalk. In the case of shallow excavations, where the surface deposits were thin, the simple method of belling out the shaft, when the chalk was reached, was followed. To get a larger quantity two or three bays might be driven in addition. This type of pit is obviously one to obtain chalk for dressing lime-free soils, and especially to save labour in carting<sup>1</sup>; and they were in use up to the time when farming leases still insisted on the spreading of so much chalk to an acre on the land.

What was the reason or reasons for digging these mysterious underground chambers of which many may be found in a small area, and so close to one another that at a later date holes have been broken through the dividing walls of two adjoining pits? The Denehole proper is always dug through a lime-free soil into chalk. It may, as at Hammill, be situated no great distance from a large chalk pit, and it may now be found in woodland as at Grays Thurrock, or on the edge of woodland as on the Surrey North

<sup>1</sup> Arthur Young, *Agriculture of Hertfordshire*, 1804, pp. 158-164.

Downs. Chalk rapidly dissolves when spread on the surface, and it has been noted that there is no trace to be seen in the immediate neighbourhood of the immense amount of chalk that must have been excavated from the fifty-one pits in Hangman's Wood.

A commonly held but discarded theory was that Deneholes were dug as retreats when the Danes were raiding the East Coasts and sailing up the Thames, but "den" is only another word for "pit". A second theory, and one which was strongly held by the late F. C. J. Spurrell<sup>1</sup> was that they were storage pits for grain and hay, forgetting that in the case of the latter there was in early days none available for winter feeding. The consensus of opinion now seems to be that the early tiller of the soil soon found that the application of a dressing of chalk on certain soils gave him better crops. In the course of centuries when there was little or no yard manure this dressing was found to be especially valuable on lime-free soils, but chalk was uneconomic in use if only available at a distance. Its utilization must therefore have started near where it was exposed. Later on it clearly was found worth mining for when soils in the immediate neighbourhood required a dressing.

The exceptional case of an artificial shaft in a bare chalk area came to light on October 30th, 1935, when two men employed by Mr. George Hogben, of Way Farm, were ploughing with a tractor. The site is above Way and immediately north of the Canterbury-Ramsgate road. The weight of the tractor caused a covering of soil to collapse exposing a rectangular shaft 37 in. × 42 in. dug through loam-free chalk. With the help and loan of tackle by Messrs. E. R. Dunn, of Ramsgate, the hole was descended, but found to have been filled up with the surface material and rubbish to within 35 ft. of the top. Footholes 5 in. deep and about 15 in.

<sup>1</sup> "Deneholes and Artificial Caves with Vertical Entrances," *Archæological Journal*, 1881, XXXVIII, 391-409, and XXXIX, 1-22. "Dartford Antiquities," *Arch. Cant.*, Vol. XVIII, pp. 317-18. See also "Report on the Denehole Exploration at Hangman's Wood Group, 1884 and 1887," T. V. Holmes and W. Cole. *The Essex Naturalist*, Vol. I (1887), pp. 225-276.



apart had been cut in the carefully trimmed down sides. It is possible that some clearing of the shaft might explain its meaning and age.

Much talk of the legendary origin of Deneholes, or theories accounting for them, is due to the former absence of communication and the impossibility of comparison between different districts; to the fact that when anything fell into disuse before written records—before the memory of man—its use was rapidly forgotten; and that observations made in other, perhaps far distant, places were drawn upon to account for something similar somewhere else, which otherwise seemed to have no meaning.

Rather improperly bound up with the intentional sinking known as a Denehole is that of subsidences in high-lying country with a chalk subsoil. The subject came into notice in Kent through Sir Thomas Hohler's letter, "A Cavity in the Ground," which appeared in *The Times* of June 7th, 1935. This led to a good deal of correspondence on these phenomena but hardly gave the geological reasons.

Chalk as one of the softest limestones and a pure form of calcium carbonate, is a very easily dissolved material under atmospheric conditions, and where rain water can act upon it. Like all limestones it has well developed bedding planes, and jointing more or less vertical to the bedding. It is also much fissured by earth movements. Owing to its porous and sponge-like character it is one of the finest water-bearing formations in this country, but, as in its present surface configuration it is typical elevated down and plateau country, the water table may be far below the surface. Where the Chalk is not covered by extensive deposits of the later Tertiaries, by redeposited beds, or by soils made up from the insoluble impurities remaining from its own destruction, rain falling on it disappears rapidly, taking up as it passes downwards a few degrees of lime. But if it is covered completely by other and more or less porous beds a section will show that the surface of the underlying Chalk, instead of being flat, shows V-shaped hollows of every size and depth filled with the surface

material; sometimes this retains its original bedding as it sank slowly downwards or, if it collapsed into a cavity, a structureless mass. This pot-holing is due to the water which soaks through from the surface and concentrates on some joint or fissure and enlarges it by solution till a definite cavity has been made. The covering deposits, if unconsolidated or irregular in character, may fill the cavity as it is formed. If homogeneous they may bridge over the slowly enlarging hollow for a long period, and then suddenly collapse. This seems to have been the case at Fawkham Manor. If the surface materials merely sink into the cavity as it increases in depth and size the only surface indication of what is going on may be a slight hollow with a crack round the circumference showing that movement is taking place.

Gravels or sands lying above a non-porous bed on the chalk often give rise to permanent or seasonal springs, the water from which disappears into the Chalk when it passes off the impervious stratum. At this point a definite swallow hole is found, which in a hard limestone district remains open but on the Chalk may be just a soak away unless in wet seasons the spot has been puddled with a thin coating of clay and a temporary pond is formed.