REPORT ON THE EXCAVATION OF ASH TREE CAVE, NEAR WHITWELL, DERBYSHIRE, 1949 TO 1957.

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THE excavation of this cave has been conducted by the writer, assisted by Mr. Horace Jones, Dr. Arthur Court and Mr. W. H. Hanbury. The work having reached bed rock across the central area, a maximum depth of 14 ft. 6 ins. below datum level, it is now possible to summarise the results and to give a comprehensive picture of the archæological history recorded in the cave.

Ash Tree Cave is situated at the NW. side of a dry U-shaped valley known as Burntfield Grips, near Whitwell. Excavations commenced there in 1949 and have been carried on systematically each season since. Prior to excavation the cave consisted of a small chamber, triangular in plan, approached by a short passage approximately at right angles to the long axis of the cave. The centre and rear of the chamber was occupied by a mass of tabular fragments of rock loosely compacted by black loamy earth, noticeably higher in the centre, which fell away in a slight talus towards the rear. This debris was assumed to have fallen from the roof, but at a depth of 1 ft. 6 ins. excavation revealed that the stones had been piled there to cover deposits of human bones; typical Neolithic collective burials. The first of these comprised remains of at least two individuals, but were mainly those of a youth of slender build and good physique, aged eighteen to twenty years. Much of the skeleton was present, but no pelvic bones, skull, or mandible. To the right of this deposit and six inches lower, was a second collection consisting of a clavicle, several phalanges and vertebrae, a mandible of exceptionally robust type and

the mandible of an infant; also a number of molar teeth, some of which proved to belong to the large mandible. It was clear that these remains were not part of the group first uncovered and that they represented a prior deposit.

The mandible is an interesting specimen because of the primitive characters it exhibits; particularly in the width of the ascending ramus, the shallowness of the sigmoid notch, and general robustness. It is also abnormal in the dentition, having possessed only three, instead of four incisor teeth. Professor R. W. Lovel, of King's College, Newcastle, has examined the mandible and is of opinion that the missing incisor is a central one and may have been lost early in life, although there are only three sockets now present. Sir Arthur Keith, who also examined it, said "congenital absence of the lower central incisor is a very rare occurrence . . . but, to me, congenital absence is the more likely explanation". He also stated that the features of the mandible indicated a young and strong man of about twenty-four years of age. The specimen has been presented to the British Museum (Natural History), South Kensington.

Beyond these collective burials and 16 ft. from the entrance, the cave appeared to terminate in a fissure, 1 ft. 6 ins. wide, blocked at the base with stones and debris. Removal of the filling, however, revealed a considerable overhang of the walls on both sides of the cave and a rear passage entirely blocked to roof level with rubble and tabular limestone, compacted, as before, by infiltrated black loam. On the left side of this passage, 20 ft. from the cave entrance, a cist of sub-megalithic type was found containing some of the bones of at least two individuals. These had been deposited in a dry cove beneath the overhanging roof and enclosed by a semi-circular wall of limestone slabs, some placed vertically, to fill the space between the floor and the overhang and thus form a cist-like structure. It was observed that the cavity appeared to have been filled entirely with brown sandy loam at the time the bones were deposited, and that infiltration by the black loam was confined to a small area near the top and between some of the enclosing stones.

The remains included the right half of a pelvis, the sacrum, a tibia, a few ribs, numerous phalanges and vertebrae, and a mandible retaining most of the teeth. The teeth are well preserved and exhibit considerable, but not excessive, wear. The mandible is of a robust type, believed to be that of a male aged about thirty years and is an interesting pathological specimen because of the distortion in form and surface contour of the left condyle, apparently due to severe osteo-arthritis. The right condyle is normal in all respects. The blocking up of the rear passage with stones appeared to have been done deliberately, after sealing the cist, as additional protection. This burial clearly ante-dated the two found previously, but not necessarily by any considerable length of time. No pottery or artifact accompanied any of the burials, but in each case crumbs of charcoal and flakes of flint were present.

In the upper portion of the rocky debris and black loam which composed the floor of the cave prior to excavation, recent rubbish was found together with sherds of Roman and Iron Age pottery, "pot boilers" and a few flint flakes. In places sherds of the pottery, both ancient and modern, had infiltrated to a depth of a foot and more between the stones. Artifacts of flint and bone, stone pounders, animal bones, pot boilers, charcoal, and other evidence of occasional use of the cave, were abundant down to the base of the Neolithic zone, where the black loam merged into brown loam, which marks the Mesolithic horizon.

Mesolithic. Sieving of the surface layer of the brown loam yielded, to a depth of two to three inches, evidence of casual use of the cave in early Mesolithic times. This consisted of a scatter of utilised fragments of split bone; stones suitable for use as pounders, but seldom bearing definite signs of use; sling stones; small split quartz pebbles; artifacts of flint and chert, a few microliths and microlithic flakes. The evidence was sparse, and the technique of the artifacts as a whole, with individual exceptions, was poor and suggested production for temporary use. Patches of wood ash indicated camp fires and there was a general scatter of charcoal crumbs over the area; probably spread by wind action.

The Brown Loam Layer. This deposit was clearly of glacial origin, therefore its presence in the cave is of both geological and archæological importance and significance. In nature the material was a compact sandy loam, very calcareous, somewhat sticky, yellowish brown in colour, and contained fragments of abraded limestone, Bunter pebbles and other erratics. It was archæologically sterile, except for the surface layer of Mesolithic artifacts, and at the centre of the entrance, where a hole had been scooped into it to receive a deposit of incinerated human remains. As already stated, the long axis of the cave is approximately at right angles to that of the short entrance passage. At the entrance the loam was 2 ft. 6 ins. in depth, decreasing to 1 ft. 6 ins. at the wall opposite. Down the length of the cave it rapidly thinned out and 10 ft. from the entrance merged into the red cave earth, over which it had entered. It was apparent that this loam had flowed into the interior of the cave in a sludged condition either as glacial drift, or, more probably, as drift redistributed by the action of solifluxion. This assumption was subsequently confirmed by trial excavations at three points in the valley, which proved that the loam in the cave was the same in composition and character as the upper of two layers of material which masks the base of the cliffs bordering the valley and give to it its "U" shape. Both of these layers are the same composition, but they differ in colour, the lower being a dark brown and more compact, and the upper layer yellowish brown. The thickness of the latter varied from 2 ft. 6 ins. to 5 ft. in the sections dug. The lower appears to be glacial drift *in situ,* and is of unknown depth. The upper layer is apparently the same drift which at a later date has been subjected to solifluxion and leaching and redistributed; by which action the layer was introduced into the cave. The period of its introduction is definitely proved by the archæological evidence, as it rested upon, and sealed, a Creswellian occupation level and was capped by a Mesolithic one. It can therefore be correlated with the intensely cold and wet period which marks the Last Glacial 3, registered in the Pin Hole Cave, Creswell, by the deposit of the thick bed of stalagmite which sealed the Creswellian deposits there and marks the end of the Pleistocene. It can

also be correlated on similar evidence, with the solifluxion layers which covered the latest Creswellian living sites on Lincoln Ridge, above Willoughton, and upon Risby Warren.[1]

Creswellian Horizon. The red cave-earth of Pleistocene age, upon which the brown loam rested, was a stratum 4 ins. to 8 ins. thick and throughout its depth contained evidence of casual, but apparently never prolonged, occupation by man. Patches of wood ash indicated hearth sites and tiny fragments of charcoal were widespread. It yielded flint artifacts of Creswellian type, including three microliths similar to those found in the lowest Creswellian level of Whaley (no. 2) Cave; also a few bone tools, utilised split bones, sling stones, stone pounders bearing signs of use and numbers of "pot boilers". The associated fauna included horse, bison, sucking pig, reindeer, rhinoceros, bear, badger, hyena, fox, polecat, field mouse, vole and lemming. These were chiefly represented by teeth and jaws. Large bones were absent, but fragments of split bones were frequent. The whole of this horizon was stripped and examined before proceeding to excavate the underlying yellow cave-earth.

The Lower Cave Earth and Mousterian Horizons. The lower cave earth, approximately 7 ft. 6 ins. in depth, proved to be abnormal in character being exceedingly compact, calcareous, very stony, and exhibiting evidence throughout of successive waterlogging; a creamy yellow in colour and inclined to be sticky when damp. The stones are fragments of tabular limestone derived from the roof and walls by disintegration, due to frost and water seepage. The Magnesian Limestone in which the cave has been formed is exceptionally irregular here in its stratification, the beds varying in thickness from less than an inch to five inches; they are also discontinuous and of varied thickness horizontally, and criss-crossed by vertical fissure planes. These are factors favouring rapid disintegration and the abundance of fragments contained in the cave earth suggest that it was constantly active until the thick, and more homogeneous, bed was reached which

[1] See the Prehistory Section of the British Association "Scientific Survey" for Sheffield.

forms the existing roof of the cave. The contained fragments ranged in size from a few inches in area to slabs with an area of two square feet and more. It was noticeable that most of the large slabs were inclined in the cave earth at angles from 30 to 70 degrees, with the heaviest ends at the bottom, suggesting that they fell and settled thus when the deposit was waterlogged and in a sludged condition.

A central cross-section of the deposit, cut from the Creswellian horizon to bed rock of the cave, revealed three zones of Mousterian occupation comparable in general character and position with those of the Pin Hole Cave, but less well defined stratigraphically, the irregular settlement of the heavy slabs having disturbed the lower layers. Zone 1 occupied the upper portion of the deposit, Zone 2 the middle, and Zone 3 the lower portion to base level.

Zone 1 exhibited the least disturbance. At the top it merged into the Creswellian red cave earth and at the bottom rested upon an uneven surface of large stones which, in the area of the excavation, was not recognisable with certainty as a "slab layer" of the type found in the Pin Hole. An area of floor 3 ft. wide has, however, since been stripped to that level on the entrance side of the cutting, and has definitely established its character as a "slab layer". This exposure is a typical example of such a layer and has been left undisturbed for inspection.

Zone 2 was much disturbed by the settlement of the large slabs in the layer above, and rested upon a layer of jumbled and inclined slabs which, when exposed in section in the walls of the trench, were clearly seen to represent a lower slab layer.

Zone 3 was much less stony and large blocks less numerous, but these almost without exception, showed evidence of settlement in sludged material. Below 13 ft. it was noticeable that the cave walls and the stones contained in the deposit were disintegrated to a depth of one and a half inches, and the rock reduced to yellow sand. This condition was observed in the Pin Hole also, but occurred there to a much greater height. It was attributed there to waterlogging and long submergence in still water,

and the consequent dissolving out of the carbonate of lime. Its occurrence here is of geological interest as further evidence of events in the region during Mousterian times.

In each zone the evidence of occupation was scanty and indicative of only occasional use either by man or animals. The artifacts found are similar in type to those from corresponding horizons in the Pin Hole, but of inferior workmanship. Quartzite tools predominate, but few of them bear any secondary retouch, and as a whole they suggest production for casual use. Flakes of flint and chert were present, but few in number. One well worked flint point and a skilfully retouched scraper of black Derbyshire chert, are the most outstanding artifacts. Several bone awls were found, also portions of two bird tibias each perforated at the distal end for suspension, and believed to be personal ornaments, or amulets. These are similar to examples found in the Pin Hole, in Mousterian levels. Utilised split bones, small pebbles believed to be sling stones, and large quartzite pounders, were numerous in each zone. Upon the bed rock of the cave a hearth, approximately 2 ft. in diameter and 3 ins. thick, was found. This was indicated by a concentration of wood ash and crumbled charcoal, consolidated by, and enclosed in, the calcareous clay which forms the base layer of the cave, and is the product of leaching from the overlying beds. Splinters of animal bone were numerous at the base level and two heavy quartzite pounders were found on the floor, also a large portion of the humerus of a young rhinoceros.

The fauna of the lower cave earth included all the animals recorded in the upper cave earth, with the addition of mammoth, cave lion, cave bear, giant deer, and red deer.

Though the archæological material recovered in the excavation of Ash Tree Cave has not been large or spectacular, it has enriched our knowledge of the cultural life of the Pleistocene people and of Neolithic customs. The archæological and geological evidence found there duplicates and confirms that of the Pin Hole Cave and has provided valuable new evidence relative to climatic events in the area at the end of the Pleistocene.

It is desired to acknowledge with sincere thanks permission to excavate this cave, granted by His Grace the Duke of Devonshire; also, the permission and co-operation, of Mr. Blagge, of Highwood Farm, the tenant of the land where the cave is situated.

ADDENDUM.

During 1957, subsequent to writing this Report, removal of a remnant of the hearth in the centre of the section revealed that it was sited over a fissure, in the rock floor eighteen inches wide. This proved to be filled with carbonaceous matter and humanly split fragments of bone, in a matrix of sandy clay. The fissure has been excavated to a depth of two feet beneath floor level, but the bottom has not been reached. A Mousterian quartzite side scraper was found embedded in the fissure at a depth of twelve inches, and a deer antler awl, skilfully cut and trimmed at the point, was found beside the hearth on the floor of the cave. On the Mousterian I level, a further area of the upper slab layer has been exposed and left *in situ*.