

Second Report on the Excavations at Sun Hole, Cheddar

THE PLEISTOCENE LEVELS

BY E. K. TRATMAN, O.B.E., M.D.S., F.S.A.

The first report (Tratman and Henderson, 1928) dealt with levels above, or more recent than, the Pleistocene. A few additional notes are needed for these upper levels. The base of the upper levels comprised a hearth containing Beaker pottery and some sherds of Neolithic-A pottery. One of the latter was described as being the base of a round-bottomed bowl (1928, p. 91). Piggott who examined the pottery at a later date concluded that this particular piece was in fact the bowl of a Neolithic spoon and he has described it in detail (Piggott, 1936). This rare specimen has fortunately survived enemy action when most of the material from the upper levels of the cave was destroyed. It is shown in *Fig. 9*.

Further consideration of the human bones suggests that they truly, in the main, belong to the Neolithic-A-Beaker horizon in which they were found. This level was called the First Hearth in anticipation of finding other hearths at lower levels. The human remains do not represent burials. The bones recovered were only a very few of the total that could have been present from the minimum of three persons represented. One of the skull fragments had been partially burnt in a fire. Some of the bones are fragmentary but do not seem to have been broken up in quite the same way or extent as the bones of food animals found in the same deposit but this does not exclude occasional cannibalistic practices. Conclusive evidence of such practices is wanting, but certainly the bones scattered in the hearth with the food animal bones bespeak a total disregard for the dead contrary to the evidence of Neolithic and Beaker burial sites. Yet, after all, the burials at known sites can only represent a minute fraction of the people who died during the period and we have no knowledge of the disposal of the remainder. In the present case the missing bones, like those of the animals, were probably flung out of the cave to roll down the steep slope to the Gorge and be lost. Not every site provides such an excellent natural refuse pit.

The base of the First Hearth rested upon and was partly incorporated in the top of the layer below, which comprised a red rubble cemented with relatively soft stalagmite into a breccia. The breccia layer was not complete over the whole of the hearth area inside the cave and was even more deficient on the platform beyond the cave mouth. This rubble, which turns yellow

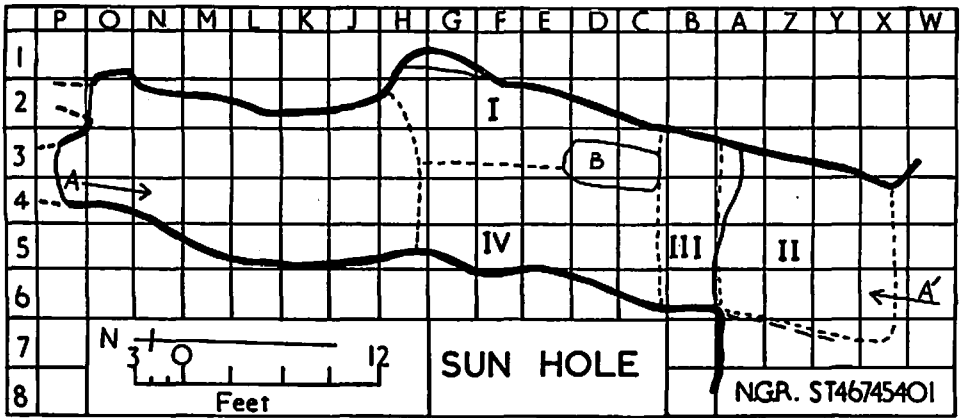


Fig. 7.—Plan showing area of excavations. I-IV areas dug to depth of 3, 5, 8 and 18 ft. into the Pleistocene respectively.

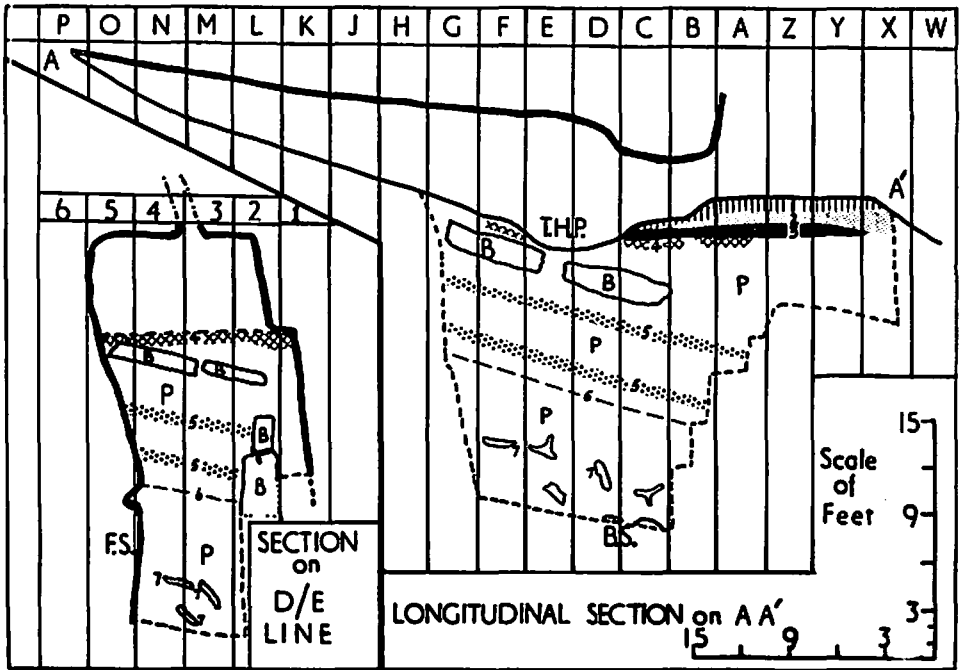


Fig. 8.—Sections of excavations. B, Boulders, only the principal ones are shown. BS, Boulders with air spaces between them. FS, Frost-shattered rock. P, Pleistocene deposits. THP, Treasure Hunter's Pit. 1, Humus and stones. 2, Brown earth and stones. 3, First Hearth. 4, Breccia layer, not continuous. 5, Bands with scarcely any earth content. 6, Zone of transition to more earthy material. 7, Pieces of old stalagmite floor (only the main pieces are shown).

on exposure to the air, marks the top of the Pleistocene deposits as it contained such fauna as lemming, cave pika and *Lepus anglicus*. Thus in the first foot level the Pleistocene material may have been contaminated by more recent remains.

The pre-1939 records of the work of this Society were destroyed by enemy action. Fortunately the finds from the Pleistocene levels nearly all survived with their labels. This information was supplemented by personal recollections of several members, who had dug at the site, and by further quite extensive excavations in 1951-3. These made it possible to tie in the previous work to the new and gave additional information.

Disposal of the spoil from the excavations at this cave always presented great difficulties, lying as it does about 100 ft. above and not very far back from the road through Cheddar Gorge. In the winter of 1927 a large pit was dug to the west of the cave and a trench dug from it east to the cave mouth at a level 6 ft. below the top of the deposits. The material from these and the accumulated spoil was sent down to the Gorge by means of a chute (1928, *Plate IIa*) and then removed by a haulage contractor. The pit and trench were filled during 1928 and emptied again in the winter. A tiresome and expensive process. In 1951 when excavations were begun again with the sanction of the new owners of the site, the National Trust, such a procedure was quite impossible and all spoil had to be stored in the trench and pit, and when that became full, over parts of the site that had already been excavated.*

The plan and sections (*Figs. 7, 8*) show the extent of the excavations. It will be noted that the excavations were carried outwards on the platform at the mouth of the cave to the edge of the steep slope down to the Gorge to a depth of 5 ft. to 8 ft. just inside the entrance and finally in a trial pit to a depth of 18 ft. into the Pleistocene deposits. These have a slope from the back of the cave towards the front and a lesser slope from the west side down to the east. Against the east wall the deposits, especially at the cave mouth, were looser than elsewhere due to the natural undercut of the cave wall. Here some slipping down of objects from a higher to a lower level in the Pleistocene was possible.

The angular rubble under the brecciated layer has only a small admixture of earth and two thin bands, 5, 5 of *Fig. 8*, contain practically no earth. The base of the eighth foot marks a fairly abrupt change in the nature of the deposit. A true cave earth, red in colour, appears with relatively little rubble compared with the layers above and much more compact. The proportion of earth to stone continues to increase to the bottom of the trial

* It was a condition attached to the permission to excavate that no sign of the work should be visible from the road.

pit save right at the cave mouth where there are large boulders with air spaces between. Quite a number of large blocks were encountered in the digging* and had to be broken and removed. At a depth of 15 ft. fragments of a broken stalagmite floor begin to appear and continue right down to the bottom of the excavation. The thickness of the pieces varies from less than 2 in. up to 1 ft. The floor was laminated and the crystals relatively large. Some of the fragments are the right way up, some at varying angles

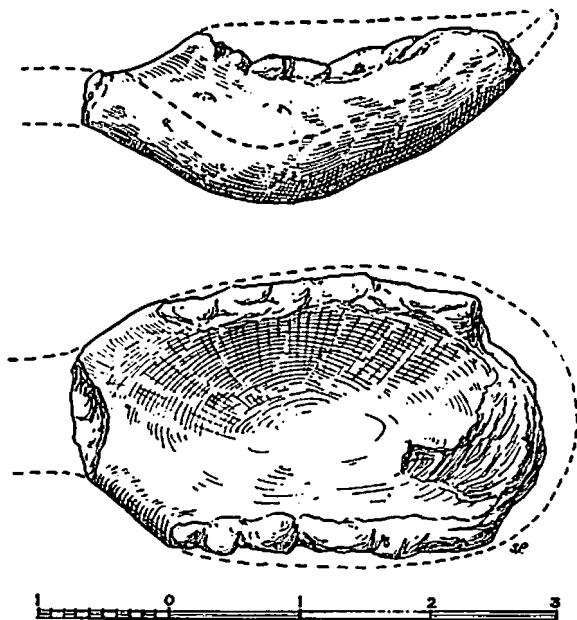


Fig. 9.—Pottery spoon from First Hearth (after Piggott). Scale in inches.

and some even upside down. From 15 ft. downwards it was noted that where the fragments of stalagmite and ordinary limestone blocks lay at the approximate slope of the deposits there was always immediately under them a thin layer of fine silt, not plastic, and similar to that found in many caves, sometimes alone or underlying Late Pleistocene deposits.

Meagre remains of Pleistocene animals were found in the first 4 ft. The quantity was slightly greater in the fifth and sixth feet but still not large. The seventh and eighth yielded very little indeed and thence to the bottom nothing at all. The majority of the few flint implements came from the

* Only some are shown in the sections in Fig. 8 in order to avoid undue complication of the drawing.

fifth- and sixth-foot levels, and from these levels some of the animal bones show much gnawing, too much to be the work of man and presumably the work of wolves as bones of this beast were found, but not *hyæna*.

Man himself is represented by a single canine tooth of a person aged about 30-40 years and part of a radius of a person aged about 18 years both from the fifth foot. No hearths were found throughout the Pleistocene levels. In all a disappointing outcome of these quite extensive excavations.

The exterior excavations and the trial pit showed that there was considerable shattering of the rock face of the west wall extending below the deepest levels reached. The main mass had not moved much as it was prevented from doing so by the natural slope of the cave wall. These excavations also showed that the roof of the cave had at this time extended several feet further out than its present line. The result would be that in the earlier stages of filling of the cave any falls from the cliff face would have rolled straight down into the Gorge. Even now falls from areas adjacent to the cave usually roll down there.

The interpretation of these facts presents some interesting features. The slope of the deposits indicates that they were formed by material entering the cave from the back and that the contribution by hill wash over the cliff face was comparatively small as most of it would have gone down to the Gorge.

The whole deposit is obviously a solifluction deposit produced under conditions of long cold winters with much frost action and short hot summers. The rock walls and roof of the cave near the entrance were frost shattered and from time to time blocks of all sizes fell from the roof and from the inward sloping east wall. Water came in bringing silt and other limestone débris. At the bottom of the eighth foot conditions changed fairly rapidly in that the proportion of fine silt decreased and that of angular limestone fragments increased. For two short sub-phases, layers 5 and 5 of *Fig. 8*, practically no silt at all was deposited. This type of filling is represented in many caves and shelters and also in the deposits at Walton (Palmer and Hinton, 1929) and at Brean Down. It seems to indicate a still colder and wetter period than the earlier deposits. Finally a rapid change took place to warmer conditions and a breccia floor began to form.* Before this had ceased forming Neolithic-Beaker period people started to live in the cave. From the beginning of the formation of the breccia only very little material came in through the back of the cave, perhaps because by then the passages were almost entirely blocked. A very small amount of fine red silt is entering at the present day very slowly by downward seepages through the lower,

* The climatic conditions that promote the growth of stalagmitic deposits near the entrance to a cave have not been determined but the cessation of frost fragmentation of the rock suggests warmer conditions than the Late Pleistocene but whether wetter or drier than at present has not been decided.

western, choked passage at the back of the cave. By Beaker times a true platform had developed beyond the cave mouth, which had receded, and débris from the cliff had begun to accumulate upon it. The rate of this external accumulation exceeded that from the back of the cave and eventually led to the formation of a step, about 18 in. deep, just inside the cave mouth. In this particular cave the material did not enter further because of the upward slope of the floor inside, and because of this also no appreciable increase in the deposit took place still further in and the First Hearth came to the surface in area E (*Fig. 7* and 1928, p. 86). A similar sequence is to be observed in several small caves and shelters in Ebbor Gorge and must be allowed for when considering the relative levels at which objects are found inside and outside the caves.

This interpretation of the deposits leaves out of account the broken fragments of a stalagmite floor. In Sun Hole there are remnants of an old stalagmite floor above the floor level as found by this Society in 1926. At that time and till these broken pieces were found it was assumed that the floor had been broken up and removed by the treasure-hunting diggers who had formerly worked in the cave.* It now appears that most of the stalagmite floor was broken up by natural agencies much earlier and that it was a floor of very early date, and that it is fragments of this early floor that have been found in the Pleistocene deposits. The fragments were all angular at their lines of fracture and so had not been transported by either water or ice action. The breaking up of stalagmite floors by natural agencies is a well-known phenomenon in a number of Mendip caves. An extensive example on the grand scale is to be seen in G.B. Cave (Goddard, 1944, and Donovan and Wallis, 1944). Here after a prolonged period of excavation by water action came a period of filling. Débris from the roof and walls and from the hillside outside accumulated to a depth of over 20 ft. in places and as water flow decreased became sealed with stalagmite wherever local conditions within the cave allowed. Later rejuvenation occurred in a vigorous manner and is still proceeding though less vigorously. The water went below the stalagmite and removed great quantities of the uncemented filling. Eventually masses, great and small, of the stalagmite floor and the immediately underlying cemented layer itself collapsed. A number of these larger masses can still be seen on the floor of the cave and shelves, the remnants of the old floor, extend for quite long lengths of passage high above the floor level. Some of these projecting shelves seem ready to fall at any moment.

This series of events in G.B. Cave seems to be analogous with those at

* Portions of stalagmite floors and flows have for long been items in a brisk trade in souvenirs at Cheddar.

Sun Hole. An explanation of them must be given. It is suggested that the period of filling represented in G.B. Cave began as the last glaciation locked up more and more water as ice and flow through the cave was lessened but the ground had not yet become completely frozen. As freezing continued all major flow through the cave ceased and stalagmite floors were formed over the filling. The period of rejuvenation (re-excavation) commenced with the thawing out of the ground after the last glaciation and the re-establishment of vigorous underground drainage.

In Sun Hole the initial period of rejuvenation removed all the earlier filling down at least as far as 18 ft. and part of the old stalagmite floor. Later the water flow became less, perhaps because of the location of the cave, and filling recommenced. During the early stages of this refilling portions of the old stalagmite floor, left as shelves above the cave floor, fell and became incorporated in the second filling. From the foregoing one reason why Sun Hole was not used as a normal habitation site in Late Pleistocene times is obvious. The cave was ordinarily too wet although at the present time considerable parts are pleasantly dry even in winter.

Towards the back of the cave, beyond the area of our excavations, and as far as M/N line (*Fig. 7*), quite extensive removal of deposits has taken place to a depth of 6-12 in. on the west side up to as much as 2 ft. on the east side. This is in addition to the area of disturbance marked T.H.P. in *Fig. 7* and also referred to in the 1928 report (p. 84). On both east and west walls are parts of stalagmite flows ending in narrow ledges above the present floor level on the east but in places below that level on the west side. The parts above the floor are now moss grown and are undergoing slow destruction. The hardness, layering, freedom from breccia and crystalline structure of these seem to be identical with the fragments found in the excavations and there is no reason to doubt that they formed the source of the fragments. On the west side also the breccia layer, 4 in *Fig. 8*, is superimposed upon the stalagmite where they occur together. On the east side the breccia layer lies in general below the stalagmite. The breccia layer can be safely dated as being very late Pleistocene. The original and much older filling must therefore have had a different slope from that of the later filling to account for this anomaly. Also the difference in the nature of the stalagmite cement component of the breccia and that of the older true stalagmite is most marked and bespeaks quite different conditions of formation. There are many factors that govern the growth of stalagmite formations so that it would be unwise to be dogmatic about the present case, but in general hard formations with large crystals do not occur close to the mouth of an open cave, so that it is reasonable to suppose that the true stalagmite was formed at a time when the cave mouth extended an appreciable distance beyond its present line.

The Treasure Hunter's Pit, *Fig. 8*, was dug about 1910. The earlier excavation must have been made at least eighty years ago as it was not done within living memory nor has any information about it been obtainable. Certainly the spoil must have been taken right out of the cave and beyond the limit of our excavations as no trace of it has been found. Perhaps it was thrown well down the slope south from the cave mouth and was removed when the foot of the slope was turned into a quarry.

THE FLINT INDUSTRY (*Fig. 10*)

The few flint implements recovered are typically late Creswellian in facies and can be matched from other Mendip sites and elsewhere. The degree of patination is very variable. A few flake blades are scarcely patinated at all but in general the patina is a dense white. There are several blades without secondary chipping. A selection of the finer implements is shown, comprising about half the total true implements found. The foot level from which each comes is given by the figure in brackets after the specimen number. Number 1 is a fine borer, 2 and 3 are typical penknife blades. There is one fine trapezoidal blade (number 4), as well as a single microlith (number 5). There are two end scrapers on old blades of which one is shown as number 6. It is possible that number 7 is another blade that was being converted to a scraper. Number 8 is a typical narrow blade. Also from the Pleistocene levels, but with their depth records lost in the war, come two narrow microliths of the blade type, another end scraper and a trapezoidal blade almost identical with number 4. The whole assembly bears a close resemblance to the implements from the first-foot level at Aveline's Hole (Davies, 1922), but the ones from Sun Hole are a little smaller and more poorly worked and true Gravette points are absent.

It is possible that the local limestone was sometimes used to make crude implements, but though this is suspected no undoubted implements have been found amongst the possible ones. The limestone does flake quite well to make blades with a fairly good cutting edge. These edges soon chip, become blunt and cannot be retouched successfully. A couple of hammer stones have been found but no bone or antler implements. The only evidence for the use of antler is the finding in the third foot of a tine of reindeer broken off the skull.

It will be noted from *Fig. 10* that the majority of the flint implements came from the fifth and sixth foot of the Pleistocene, the same levels that yielded most of the animal remains.

THE FAUNA

This is reported upon separately by Dr. Jackson for the mammals and birds and Dr. Davies for the mollusca. The mammals are the usual Late

Pleistocene assemblage. Mammoth, rhinoceros and hyæna are all absent as is to be expected in such late deposits. One phalanx of bear shows a large abscess cavity in it.

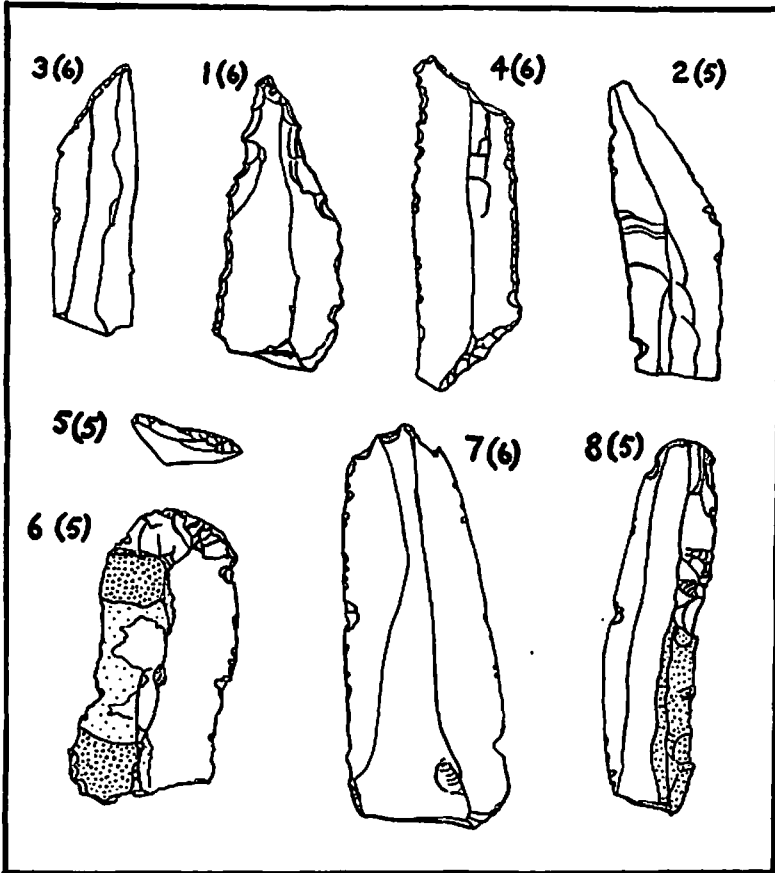


Fig. 10.—Natural size. Selection of flint implements from the Pleistocene levels. The number in brackets gives the depth in feet from which the implement came.

CONCLUSIONS

While the cave filling was accumulating from 18 ft. up to 8 ft. of the Pleistocene, the cave was too wet to have been used by man or beasts. Even remains of small animals are absent, so that the cave was not even the haunt of birds of prey such as owls, which are so often responsible for the collections of small animal remains at other caves.

Man and beast and also birds of prey used the cave in the next period up to the end of the Pleistocene (8-1 ft. levels of the Pleistocene). There was more extensive use of the cave by man while the fifth and sixth feet of the Pleistocene deposits were accumulating. These deposits are essentially a solifluction product and they accumulated relatively rapidly. Minor changes in climate are indicated by the variation in their nature.

The close of the Pleistocene was marked by a rapid change of climate when the entry of material through openings at the back of the cave practically ceased and roof drips produced an impregnation of large areas of the floor with relatively soft stalagmite to form a breccia. While this impregnation was still going on late Neolithic-Beaker people came to live in the cave for a considerable period. Subsequently there was occasional temporary occupation up to and including the Romano-British period.

Remnants of an old stalagmite floor are present. It is postulated that this was formed on the top of an original filling during the last glaciation. At the end water flow first removed the old filling and as the flow decreased began to fill the cave again. Parts of the old stalagmite floor still remaining at that time fell and became incorporated in the deeper parts of this second filling.

ACKNOWLEDGEMENTS

The Society would like to express its thanks to the National Trust for permission to excavate at this site again. I would personally like to thank all those members who helped in the excavations from time to time, the Prehistoric Society for the loan of the block from which *Fig. 9* is made, Miss Sheila Watts, who has drawn the flint implements for me, and Dr. Jackson, Mr. Davis and Mr. C. D. Ollier for their reports.

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REPORT ON THE MOLLUSCS FROM SUN HOLE CAVE, CHEDDAR

By A. G. DAVIS, F.G.S.

(The material submitted to Mr. Davis consisted only of specimens from the first 6 ft. of the Pleistocene deposits. No specimens were recovered from levels below this. Most of the specimens came from the east side of the excavations where the floor material was loose. As the excavations were made at varying intervals of time it was quite possible for recent species to penetrate below their proper horizon.—E. K. T.)

Species	Depth in feet from which Samples taken					
	1	2	3	4	5	6
<i>Cepea nemoralis</i>	6	4	5	1	8	6
<i>Cepea hortensis</i>	1	—	—	1	—	—
<i>Helicigona lapicida</i>	7	1	2	—	—	1
<i>Pomatias elegans</i>	7	3	2	—	—	1
<i>Discus rotundatus</i>	44	5	4	3	1	11
<i>Oxychilus cellarius</i>	8	10	4	8	3	24
<i>Retinella nitidula</i>	2	—	2	1	2	6
<i>Clausilia bidentata</i>	1	2	—	—	—	2
<i>Marpessa laminata</i>	—	1	—	—	—	—
<i>Carychium tridentatum</i>	1	—	—	—	—	—
<i>Arion</i> sp.	2	—	1	—	—	—
<i>Pupilla muscorum</i>	—	1	—	—	—	—
<i>Trichia hispida</i>	—	—	2	1	—	1
<i>Helicella caperata</i> *	—	—	—	—	—	2*

**H. Caperata*.—The mineral condition of these specimens clearly separates them from the remainder of the shells of this sample. They have an earthy look and colour and matrix and appear to be an introduction from the soil. It is a *post*-Roman invader in England.

C. Nemoralis.—The totals do not include fragments; if these are to be regarded the quantities of fragments may represent double the totals given.

There are no extinct species present nor are they diagnostic of Pleistocene age. All could be collected at the present day at the surface. The biotype suggested by the fauna of the 6-ft. sample is a calcareous soil with crumbly humus, and tall scrub vegetation. The cavern itself supported the large number of *Oxychilus cellarius*.

A molar of *Microtus* was found as an admixture in the 5-ft. sample and some small bones, probably *Microtus*, in the 2-ft. sample.

REPORT ON SAMPLES OF THE DEPOSITS

Five samples from the Pleistocene levels were examined by Mr. C. D. Ollier, to whom we are indebted for his results and comments. The samples were as follows:—

1. Seventeen feet below top of Pleistocene; about one foot above the bottom of the excavation.
2. Fourteen feet below top of Pleistocene.
3. Eleven feet below top of Pleistocene.
4. Eight feet below top of Pleistocene. Just above base of "weathered zone" (6 of Fig. 8).
5. Six feet below top of Pleistocene.

The samples were subjected to mechanical analysis and the resulting cumulative curves are shown in *Fig. 11*. The following notes on the coarse material have been compiled by Mr. Ollier:—

Sample 1.—Angular fragments of black limestone, mostly with a little stalagmite attached, and some limestone blocks cemented together. Some fragments of stalagmite, some of vein calcite. Some rod-like stalagmite.

Sample 2.—Black limestone dominant, less stalagmite than in *Sample 1*. Some blocks similar to Dolomitic Conglomerate.

Sample 3.—Mostly black limestone, some stalagmite and vein calcite.

Sample 4.—Nearly all black limestone, but there is a little stalagmite and vein calcite.

Sample 5.—Mostly black limestone, in angular fragments larger than those from the other samples. Minor amounts of stalagmite and vein calcite, and three or four large, irregularly shaped fragments of a mottled yellow limestone, the source of which is unidentified.

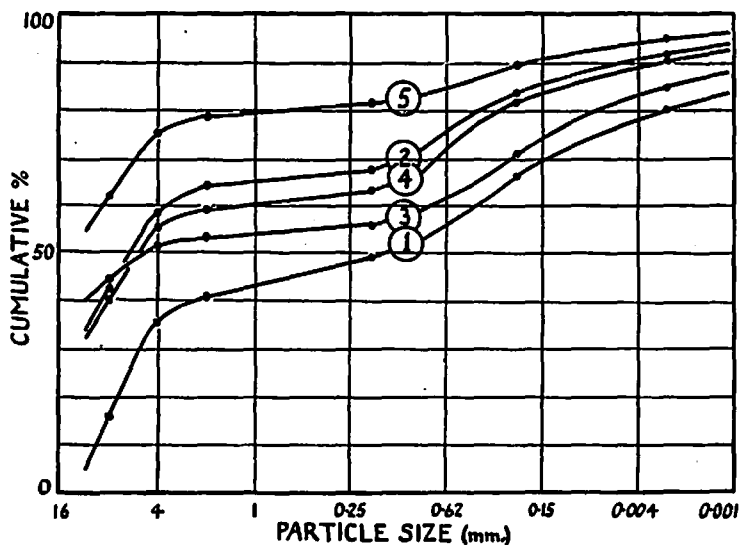


Fig. 11.—Cumulative curves showing particle-size distribution in five samples of the Pleistocene deposits from Sun Hole. The coarse fractions were determined by sieving, the fine by the hydrometer method of Bouyoucos. For the positions of the samples in the section, see *text*.