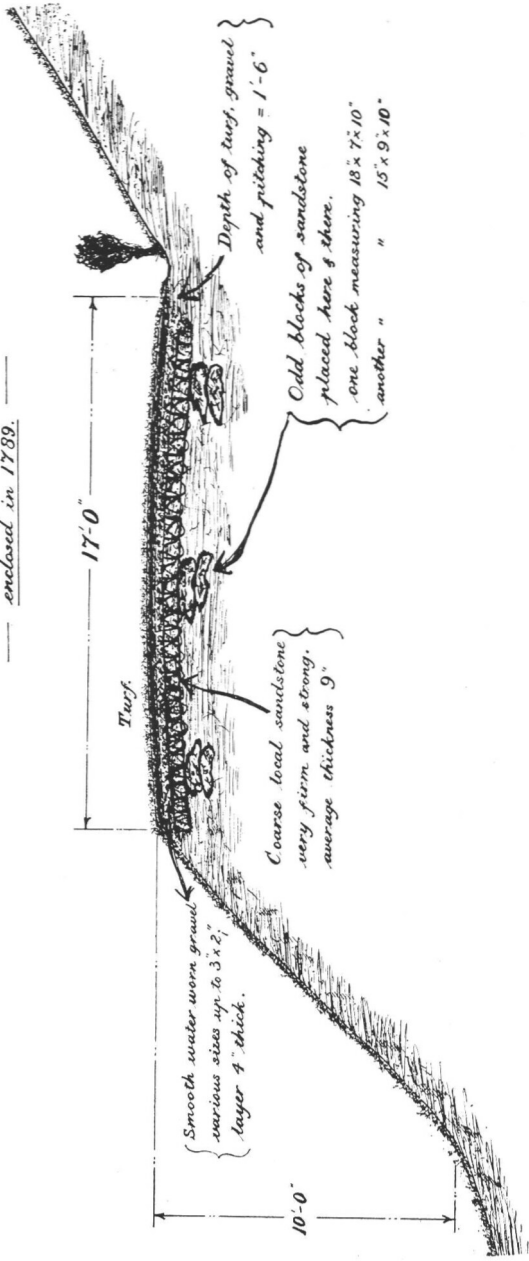


PLAN NO. VI.

— Cross section of road at —

— Duffield Bank. —

— enclosed in 1789. —



Smooth water worn gravel
various sizes up to 3" x 2"
layer 4" thick.

17'-0"

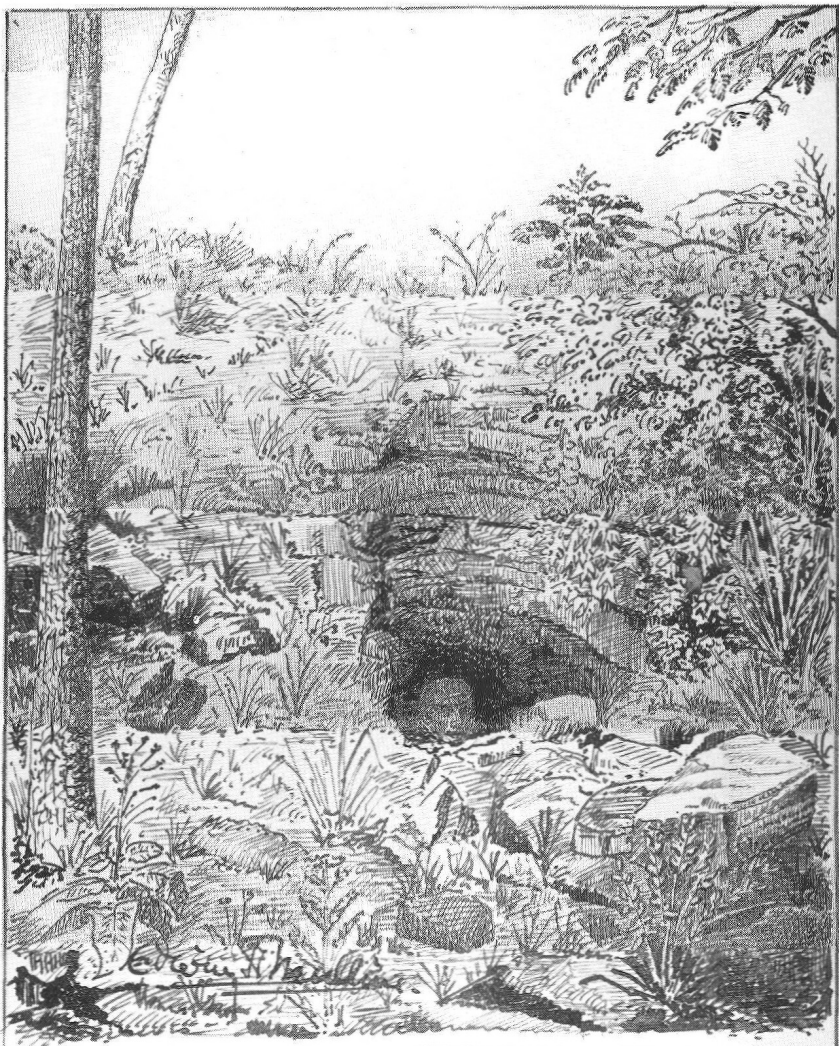
Turf

Coarse local sandstone
very firm and strong.
average thickness 9"

Depth of turf, gravel
and pitching = 1'-6"

Odd blocks of sandstone
placed here & there.
one block measuring 18" x 7" x 10"
another " " 15" x 9" x 10"

10'-0"



Sketch of Langwith Cave
as in 1903.

LANGWITH CAVE.

The Ossiferous Cade at Langwith.

By REV. E. H. MULLINS.



NARROW strip of magnesian limestone crops out on the north-east side of Derbyshire, and forms an escarpment to the west, overlooking the valleys of the Doe Lea and Rother Rivers.

It is bounded on the south (from Pleasley) and east (round to Steetly) by the county of Notts., and on the north by Yorkshire.

The map of the Midland Railway Time Tables shows two lines from Mansfield to Staveley Town, one via Pleasley and Bolsover along the Doe Lea Valley, and the other via Langwith, Creswell, and Clowne, which may serve to give a good idea of this area, although not very exact, which forms undulating tableland of from 300 to 600 feet above sea-level. The River Meden, which is the actual boundary on the south side, has cut its way through a valley, called Pleasley Vale and Little Matlock, and passes under the Midland Railway into Nottinghamshire between Mansfield Woodhouse and Shirebrook Stations. The River Poulter also rises on the side of the escarpment near Palterton village, and flows east past Scarcliffe and Langwith, passing out of the county at the latter place. There is also a small stream flowing east through Creswell Crags into Nottinghamshire.

The outcrop of magnesian limestone in this district has a dip to the east, and the underlying coal measures have the same, and show themselves further west in the Doe Lea Valley, cropping out on the surface, while the Bunter Sands also form

another escarpment a few miles to the east in Nottinghamshire.

The only records of more recent formation in this area are small patches of drift-gravel on some of the highest points, while in other parts pebble-gravels and boulder-clay are believed to exist.

It is well known that, both at Creswell Crags and in Pleasley Vale, very interesting ossiferous caves and fissures have been found and described, and as the Langwith and Scarcliffe portion of the Poulter Valley is only three miles distant from either point, it seemed to be probable that similar deposits might be found near here if search were made at the base of the rocks, whose outcrop can be seen on the flanks of the hills on either side the Poulter Valley.

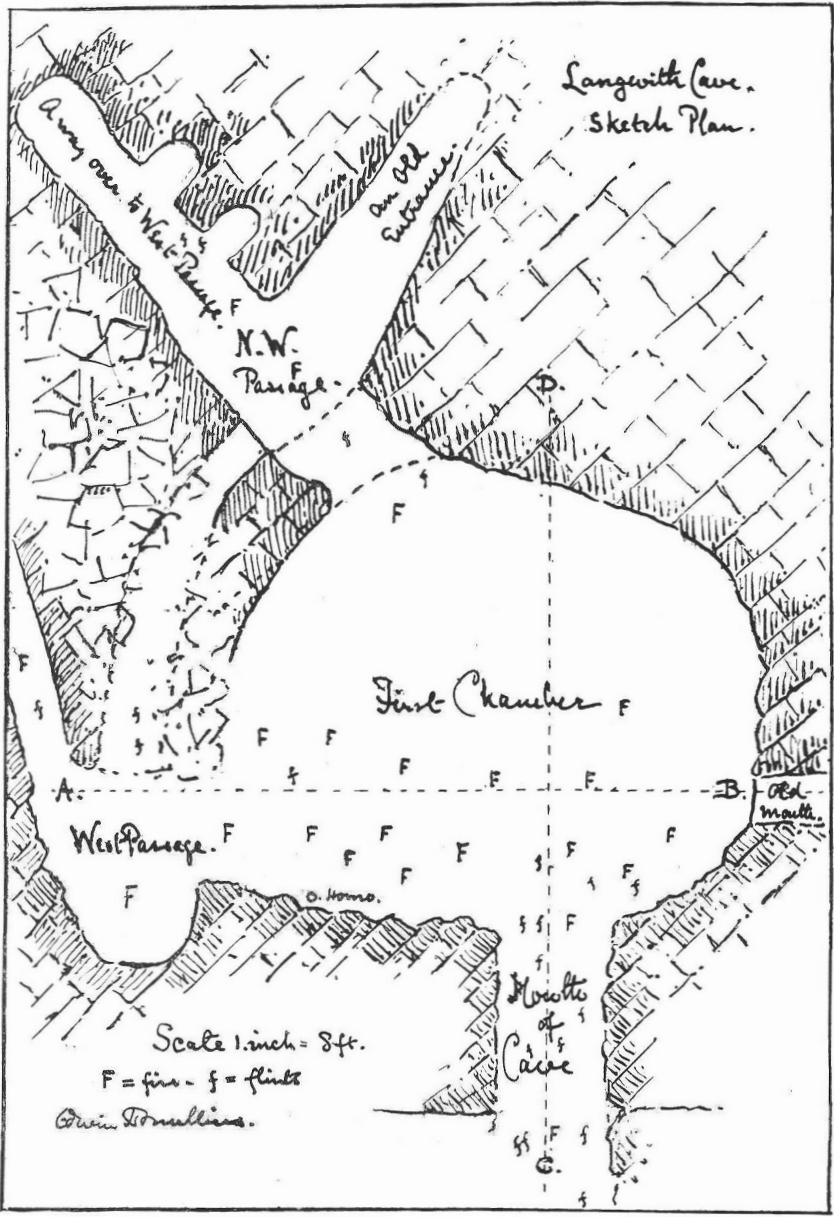
In Langwith there was a tradition of an old subterranean passage in the Poulter Valley, but careful investigation along the sides of the hills in 1870, and again in 1886, gave no result; no passage or any such opening could be found.

Some children from the village found an opening at the base of a low scarp of limestone near the summit of the hill, which had been hidden by nettles and brambles for years. It was an old fox-earth, stopped by a brick wall for the sake of the Rufford Hunt some years ago. It seems that not only did the fox run to earth here, but, to judge by many of the bones on the surface within, the fox had often used it as a safe retreat wherein to enjoy the spoil of the farms around.

It was on September 17th, 1903, that my son, A. F. Mullins, two school-fellows, C. B. Bing and G. A. Bing, and a young mining engineer, determined to attempt to find out whether this spot was the entrance to the traditional passage or not.

To enter they had to crawl on hands and knees over bricks and rubbish that had filled up the mouth to within 2 ft. 6 in. of the roof, and downward at an angle of forty-five for the first 6 ft., where there was a little swirl-hole in the roof, and then work forward in the same way for 13 ft. to the back of this part of the cave, which may be named "the first chamber." This cavity was roughly circular in plan, being

Langwith Cave.
Sketch Plan.



PLAN OF LANGWITH CAVE.

13 ft. from south to north, and 14 ft. from east to west, the space between the debris and the roof varying from 2 ft. to 1 ft. 6 in., and in some places was even less.

In order to determine whether a further passage could be found at the back, where the roof dipped down to the earth, the explorers made a shallow cutting across the chamber in which they could crawl more freely, and at the far end of it sank a small shaft, about 5 ft. deep, distributing the earth they removed round the sides of the cave, and using the stone as walling to support their cutting. Three feet down they found that the roof in front of them formed an arch. A way was then cleared 2 ft. high and 2 ft. wide. After tunnelling forward about a yard, they found an open space, into which they were able to crawl, and from which, by shallow cuttings here and there, they made a way down several passages of the inner cave, and brought out from the surface a number of bones of sheep, cats, and fowl, etc. It was possible now for them to form some idea of the size of the cave, for it was at once clear that it was not a passage but a cave that they had discovered.

Permission having been obtained from the Duke of Devonshire's agent to fence in and excavate the cave, a gate was erected and the entrance enlarged by clearing away the fallen debris, and some rough steps were then constructed down into the cave, although a headway of only three feet was at first possible.

At the beginning of 1904 work was again resumed in earnest. The upper four feet of loose soil was carefully removed, and was carried by hand in buckets up the steps and emptied out at the edge of the hill and carefully searched for the smallest specimens in the full daylight. A small "tip" at the top of the hill was created, on to which each bucket load was carefully spread out and searched by hand for any trace of bone, flint, bead, metal work, or shell. It became the custom to turn over the surface of this tip from time to time on the chance that some specimen that had been so cased in sand at first as

to escape the eye, might by weathering have freed itself. In practice this plan has proved to be successful, as the light bones of bats and jaws of voles have frequently rewarded such second investigation.

This dry-earth process has held its own against both sieving and washing, which, on trial, resulted in the destruction of the more tender specimens. The fact that Langwith Cave is only five minutes' walk from the investigator's home has enabled him to make choice of weather in which to work, in a way that in many cases would be impossible.

At first, the small stones were collected into buckets, carried out, and tipped to themselves, while larger blocks were tossed from hand to hand, or rolled, if possible, up the steps, and those too heavy to be so treated had to be buried for the time out of the way. But in 1905 it became possible to form a wooden tramway up the steps, on which the sand and stone could be cleared out in a small wheeled box by the aid of a rope and pulley blocks.

In 1909 a cutting through the hillside on a level with the cave floor was made, enabling a wheelbarrow to be used, and two new tips to be started, one for stone and the other for sand.

In the making of this cutting a part of the radius of rhinoceros was found only 2 ft. below the surface, and cats' jaws and bones 6 or 8 ft. down. Flints and bears' bones were unearthed at the lowest level, and also again with them cats' jaws.

PRESENT PHYSICAL CONDITION OF VALLEY.

Poulter Well, the head of the stream, is two and a half miles away in a south-westerly direction, and a little over 500 ft. above the Ordnance datum. The Poulter at the front of the cave is only 300 ft. above O.D.

The cave mouth, as found, would be about 320 ft. O.D., and the floor 308 ft. O.D., while the bed of the stream half a mile up the valley is given as 325 ft. O.D.

It does not seem as if we could account for the cave by any connection with the present surface stream. The present geographical conditions may perhaps hide the key to the position, for the hills to the right and left of the stream about a quarter of a mile above the site of the cave close in on each other so as to form a narrow V-shaped valley, where the 400 ft. contour lines approach each other to within 600 ft. The bottom of the valley here would be about 322 ft. above O.D., and the hillsides at 350 ft. are only 200 ft. apart. If, therefore, at this point a barrier existed in the past ages, a very large inland lake would be existent, and the water from it may have found its way through the limestone joint, and so formed the cave before the present deeper floor of the Poulter Valley had been eroded.

If, as seems probable, this part of the country bore its share of the glacial ice-sheet, it is possible that at the end of the "Great Ice Age" not only were any overlying strata denuded, but the Poulter Valley itself was eroded, and the cave in the magnesian limestone may have been "filled in" at the same time.

The excavation of the Langwith Cave, as far as it has at present proceeded, strongly suggests that the cave was filled in from the back or north-west direction, for the following reasons:—

1.—The largest blocks of stone were found within the entrance or south-east part of the first chamber, and the more important bones were found at the back or north side of them.

2.—The horizons of the deposits filling the cave, with the exception of the top one, were thicker towards the entrance than at the back.

3.—In the cutting outside the same points were noted, and also the same order of earth, stone, and sandy clay, as on the inside of the cave.

CONDITION OF CAVE AND METHOD OF WORKING.

The Langwith Cave, prior to the present exploration, unlike Creswell and some others, had remained untouched by man

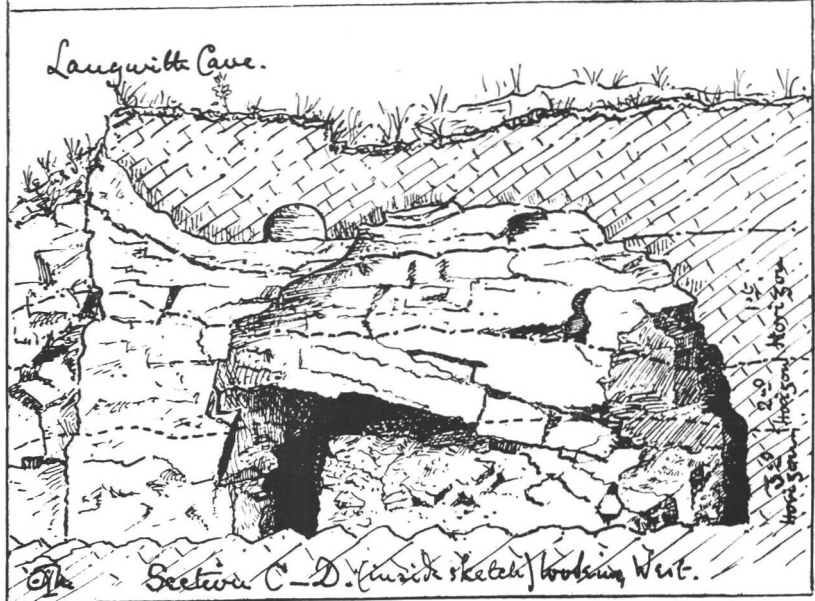
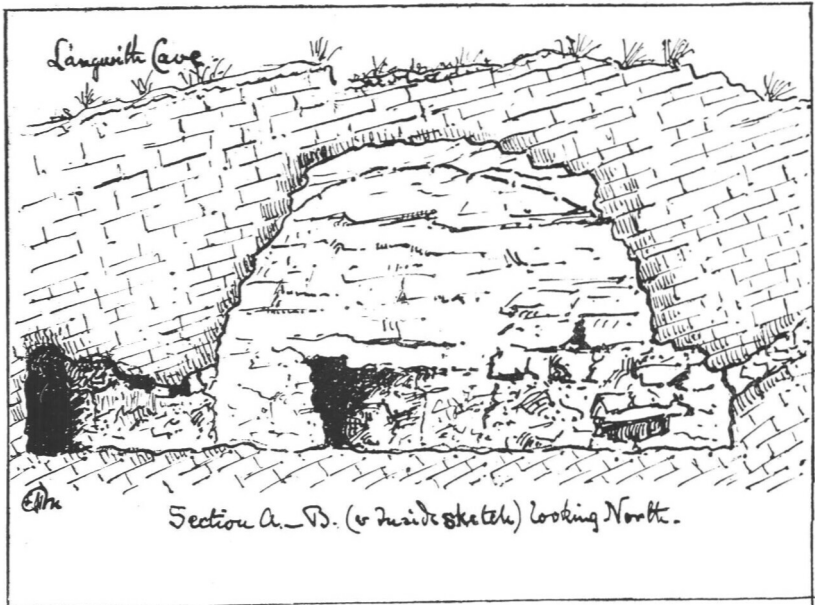
from the time it was filled in. Boys of past generations had made their way into the first chamber, but only to bring out wonderful reports which were quite unfounded as regards facts. The fox and badger had made it their home in more recent times, and, from the evidence of their bones, doubtless ducks, geese, fowl, and other birds, as well as hares and rabbits, had been welcome if unwilling guests, as the bones of all these were numerous in the upper earth, which appeared to have been often turned over by the burrowing creatures, both in the outer and inner chambers.

The first efforts to obtain a working face demonstrated that Langwith Cave was not conformable to any hard and fast cave law. There are, roughly, three horizons, or even more, if local deposits of sand or clay between and in the midst of these may be so called. So far in vain has been the search for a layer of stalagmite or a floor of breccia, as found at Creswell Crags.

The upper horizon was of dry but stiff loam, indistinguishable from that of the neighbouring fields. This is found to have covered the first chamber to a depth of from 3 to 4 ft., and contained the more modern bones, with here and there blocks and bits of limestone.

The middle horizon, on the surface of which was found a humerus of a bear, was composed of blocks of limestone, interspersed amongst angular fragments of the same. In some parts these were quite loose, and in other spots the interstices were filled in with sand, and here and there cemented together by carbonate of lime in such a way as to form a concrete wall or bank, which held back the loose debris, and on cutting this away a considerable amount of loose stone, sand, or earth fell down, completely destroying the working face.

It was observed that after these cemented parts had been left a few weeks exposed to the action of the air, they softened for some distance inward from the exposed surface, and the work of removing the deposit became more easy and was less likely to fracture any embedded bones contained therein.



SECTIONS OF LANGWITH CAVE.

In this horizon were found highly mineralized fragments of large bones, evidently gnawed by hyænas. In depth it was from 5 to 6 ft.

The lower horizon was that which formed the floor—or, rather, the floors—of the cave during the times when man made it his home and had his fires in the cave, and left behind him some of his flint flakes. This horizon was to a great extent like the middle one, being composed of stone blocks, slabs, chips, and sandy clay.

The marks of man's fire in this horizon varied from being placed on what it is believed will prove to be the rock floor, to 3 ft. above that level. This suggests the question, Did man frequent this cave on and off during the time the lower horizon was gradually being deposited in it? In some cases the fires were burnt one above another, with an accumulation of a foot or two feet between them.

On the left-hand side of the mouth of the cave there were a number of large blocks of limestone amongst the earth, and on clearing these away, half-way down the deposit, a natural arch of five or six stones was found resting between the side of the cave and a large stone. It appeared like a fall of roof, but no sign was visible of the spot whence it had fallen. On clearing this away a clear trace of a fire was found beneath where it had been.

So far as it has been explored to the present the west passage has yielded much the same results as the first chamber. In the north-west passage the bones of horse and bos were found, along with reindeer and bear, and in both man had had fires on the rock floor.

It seems probable that much of the space between these two passages will prove to be a swallow hole, and, if so, what was at first thought to be an old fall of roof will prove to be the filling in of the cave.

Except for a very slight example on the west side, nothing of the nature of a stalactite has been found, but the roof has a thin layer of carbonate of lime adhering to it. The present

roof of the cave is a mere shell, it having been, either by denuding or quarry work in the remote past, reduced to 3 or 4 ft. of thickness, and during wet weather a considerable amount of water drips from the roof.

It appears, too, that there are two or three ways in which entrance may have been possible for both man and beast in past ages. Future investigation, it is hoped, will clear up this point, and lead to further interesting finds.

The exploration has been carried on as opportunity and spare time permitted, the chief object being to make it as thorough as possible, so as to avoid anything being lost or overlooked by those doing the work.

DESCRIPTION OF FINDS.

It has been interesting to note that bones so closely placed to one another as to suggest that they belonged to the same animal, have yet differed as to their state of preservation and colour, some being quite white and others black, but both in an equally good state of preservation.

In some cases, too, neighbouring finds have differed from being highly mineralized in the one case to being in a state of great frailty in another. It has appeared as if the presence of water and the nature of the sand or clay surrounding them had had something to do with this state of things.

Mr. E. T. Newton, to whom I have been indebted for kindly determining many species of both mammals and birds, and without whose kind help and advice Langwith Cave would have been at a great loss, has remarked on the great number of modern species found in the collection, but says "that recent cave hunting has shown us how difficult it is to be quite sure of the age of many of the specimens found, for although certain species may be undoubtedly of Pleistocene Age, these are mixed with others such as are living in the neighbourhood at the present time."

"It is quite possible," he says, "that these modern species were already in this country in Pleistocene times, but we want

more positive proof of this than we have yet obtained. The burrowings of badgers, foxes, rabbits, and rats spoil much of the most careful exploration."

"The fauna of the Langwith Cave, in spite of its modern aspect, includes several forms which point to a considerable antiquity."

Mr. Newton says that "the Lemming, Northern Vole, and Siberian Vole, as well as the Arctic Fox, have not been found in Britain in beds known to be newer than Pleistocene, and the same may be said of the *Hyæna*, *Rhinoceros*, and *Bos primigenius*; but these, it is thought, might possibly have been derived from an older deposit."

"The Lemmings and Northern Voles, with the Siberian Vole and Arctic Fox, so far as we know, became extinct in this country about the same time as the Mammoth. We have no record of them in Neolithic deposits. But when did the small vertebrata, which are now living with us, first find their way into this country? Many of them are found with the Pleistocene species, as the Langwith Cave has shown us, and it is highly probable that some of them at least are of Pleistocene age, but which? It is to be hoped that work such as has been done at Langwith will before long enable these questions in some measure to be answered."

Thanks are also due to the numerous friends who have helped and encouraged the explorers in their efforts. Especially is this so in the very great help received from Mr. E. T. Newton, F.R.S., F.G.S., Mr. Martin A. C. Hinton, Doctor Frank Corner, F.G.S., and Professor A. Keith, as well as Professor Sidney H. Reynolds and Messrs. A. S. Kennard, F.G.S., and B. B. Woodward, F.L.S., F.G.S., who have kindly helped to determine the various species.

NOTES ON FLINTS.

Fig. 1.—Is the largest flint as yet found, and measures 103 mm. from A to B. It is curved so as to show both sides, as in Fig. 1a. Its flaking is unabraded, and both

the back and cutting edge show secondary working. This trimmed flake is of an indigo marbled gray tint, and as all the trimming is confined to the back and front face, I refer this flake to the Mousterian epoch. At A on the edge view is the cone of percussion. This flake-knife was found in April, 1910, along with another large flake, at the mouth of the cave, 12 feet from the present surface, in a bed of yellow sand and blocks of stone. The other flake is unworked, unless it be at the point. Colour, dull black.

Fig. 2.—Is the smallest flint as yet found at the Langwith Cave, and came from off the floor of the first chamber. It is of gray smoke colour, and finely trimmed on one face only. The Rev. A. Hunt, M.A., who has examined the Langwith flints, claims this and several others as "Pygmy flints," and says "it places the Pygmy flint period in the Palæolithic Age."

Fig. 3.—Is a fine specimen of a very thin smoke-gray flint flake, from 2 mm. to 1.2 mm. thick over its greater surface, and only 3.3 at its cone of percussion. The point and edges seem to be worn away.

Fig. 4.—This was the first trace of man found in the Langwith Cave. It was discovered at Christmas, 1904, down on the right-hand side of the first chamber amongst some limestone chips in the middle horizon. The cutting edge has been a good deal chipped, but may have been finely serrated when new. It has also lost its point. Probably it was affixed to a handle as a knife.

Fig. 5.—This spear or javelin head has also lost its point. It is stouter than either Figs. 3 or 4, and has, like them, a suggestive notch, where possibly the lashing securing it to the shaft would find a good hold. Thickest point, 5.4 mm.

Fig. 6.—May be an arrow-head. Again the point is off. It is triangular in section. The highest point of its dorsal

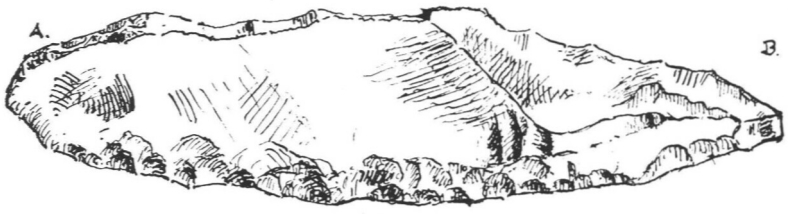


Fig. 1



Fig. 1a.

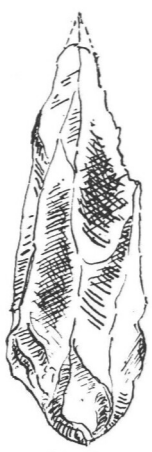


Fig. 3.



Fig. 4



Fig. 2.



Fig. 5.



Fig. 6.

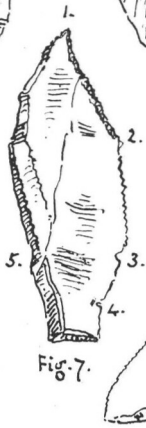


Fig. 7.

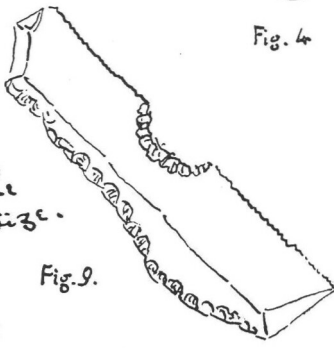


Fig. 9.

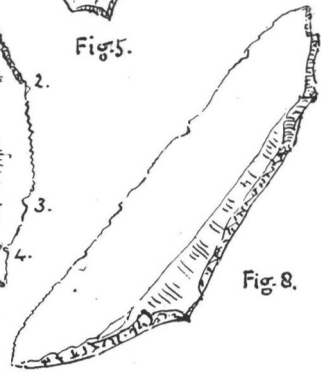


Fig. 8.

Scale Fullsize.

Edm



Fig. 10



Fig. 11.

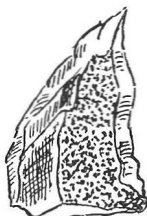


Fig. 12



Fig. 13

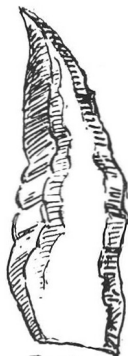


Fig. 14



Fig. 15



Fig. 16.



Fig. 12.a.



Fig. 17.



Fig. 18.



Fig. 19.

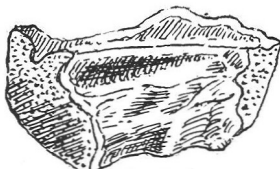


Fig. 12.b.



Fig. 20.

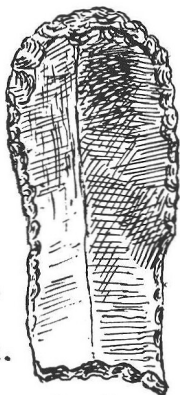


Fig. 24.



Fig. 21.

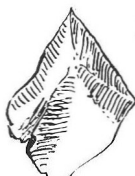


Fig. 22



Fig. 23.



Fig. 25.

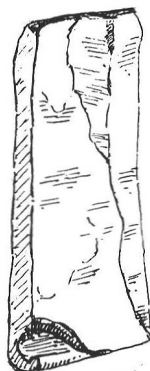


Fig. 26.

Scale
Full
Size.



ridge is 6 mm., and maximum width 11 mm. This specimen has a fine cone of percussion at its base.

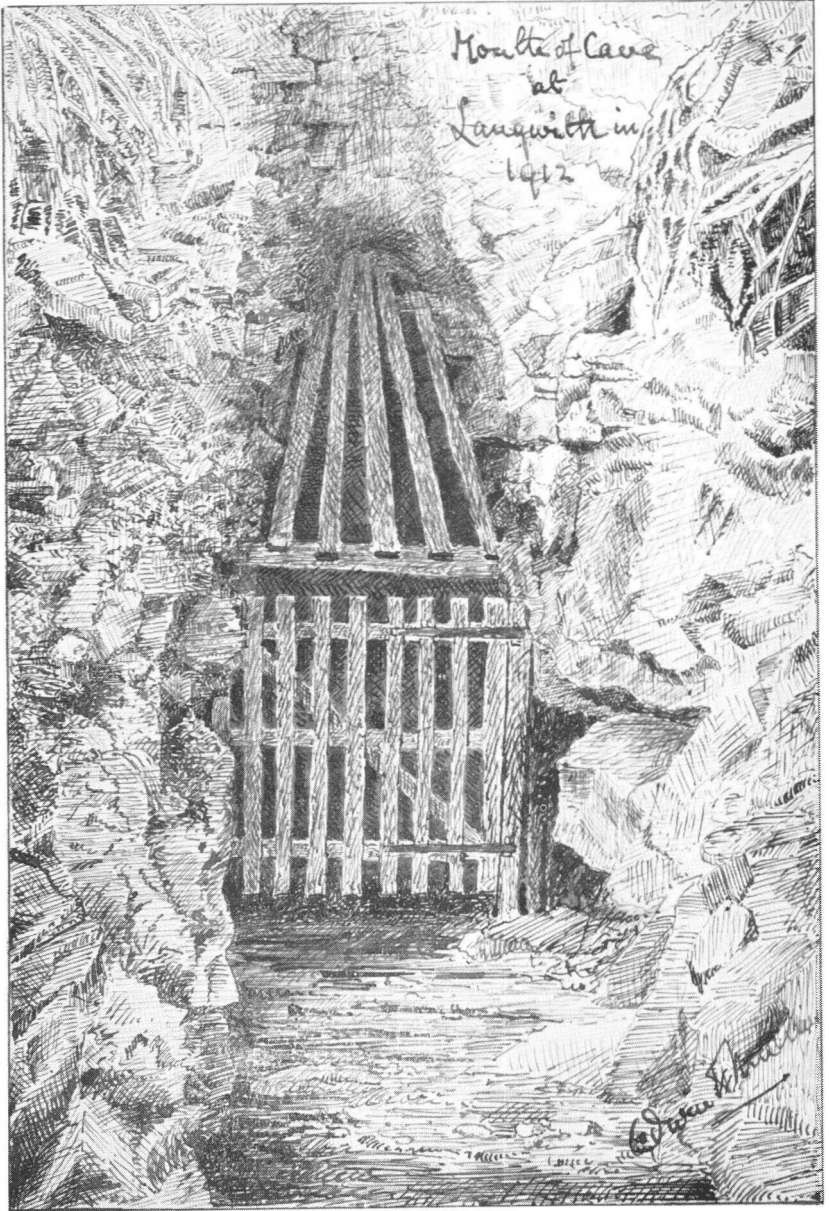
Fig. 7.—This tool is extremely interesting. It has received some sixty-five blows of regulated force to give it its present shape, and yet its greatest thickness is only 3.5 mm. It may be regarded as a borer, but, in fact, it seems to be the prototype of a boy's knife. As all the trimming or secondary work is confined to one face, may we not take it as of the Mousterian period of the Palæolithic Age? If so, it appears to be a veritable "multum in parvo"—knife, dagger, borer, and saw. For the point (1) would make a good "borer," while the edge from (2) to (3) is a respectable "knife." Although very finely serrated as a "saw," the trimming of the base or shaft at (4) suggests it being fixed in some sort of handle, in which case it would be useful as a dagger. The back at (5) is very carefully worked to form a blunt surface on which to place the finger when using the saw. It is one of the smoke-coloured flints.

Fig. 8.—Is a flake of smoke-coloured flint, intended as a saw, the long edge being serrated (except where chipped), while the back and ends are trimmed flat.

Fig. 9.—This flint is white marbled with dark indigo. Its shape and purpose seems to be very like Fig. 8, except that the centre of its saw-edge has been trimmed in such a way as to suggest a tool for trimming round shafts for daggers or arrows.

Fig. 10.—Is a white flint, which, along with many others found in the cave and cutting, has a part of the old surface of the crust, which is ochreous. When I made the sketch I thought the splintering of the present point was probably due to having hit a hard substance in use as an arrow tip. I have since noted a very distinct bulb of percussion on the under side. This effect may therefore not justify the suggestion of a sharp point such as I indicated.

- Fig. 11.—Gray flint, marbled with white; trimmed on the back; probably a point.
- Figs. 12, 12a, 12b.—Three sketches of the same tool. It is a blue flint, with ochreous crust on two sides, with sharp chisel edge in the centre; flat at back, as shown in end view 12 and bird's-eye view 12b.
- Fig. 13.—Blue gray-mottled flint, trimmed at the back, and the fractures of the knife-edge are of great age, as shown by whitened patination. It may be only an arrow point, but has some slight resemblance to Fig. 7, especially in the shank-like base.
- Fig. 14.—Is of dove-coloured flint (?), as also is Fig. 22. They are the only flakes found of this material. It is trimmed on the back, which it hardly would be if it were a point for an arrow.
- Fig. 15.—Pygmy flake of white flint. The hollow seems to be a natural, not worked, one.
- Fig. 16.—Is a worked blue flint, worked along the back. It might be a borer or Pygmy knife.
- Fig. 17.—Has lost its point. Is of gray flint, and carefully trimmed on the narrow side or back. A borer?
- Fig. 18.—This is trimmed all round, and is of dull white marbled with blue.
- Fig. 19.—Looks like the trimmed end of a long scraper, of smoke-coloured flint.
- Fig. 20.—Arrow point of white flint, mottled with blue.
- Fig. 21.—This remarkable bit of buff transparent flint is only 1.5 mm. thick on its dorsal ridge, and yet shows fine serrated working on the left edge. It seems to have been broken, but when?
- Figs. 22 and 23.—May have been used as arrow points.
- Fig. 24.—Is a fine specimen of a long-shaped scraper, of indigo marbled gray flint, of the same kind as Fig. 1, and possibly of the same age.
- Fig. 25.—A very fine pointed borer, suitable to drill a needle's eye. Is of blue-gray flint.



MOUTH OF LANGWITH CAVE.

Fig. 26.—A mottled smoke-coloured flake, with edge for trimming wood shafts.

Besides these that are figured there are forty-four similar flakes, of which there are four that show some secondary working; the rest are points, scrapers, knives of various sizes, many so small that they would be claimed as true Pygmys if they are not waste chips.

Four, however, are perhaps worthy of special mention. There is one which Mr. Hunt kindly drew my attention to as being an undoubted "drill." It is trimmed on both left and right edges, has an ordinary drill-head point so worked that on

A DRILL.



Fig. 27a.

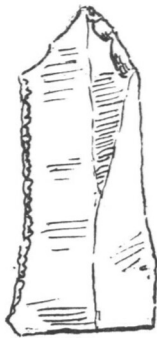


Fig. 27b.

being turned from right to left each cutting edge would come into action.

This tool is much worn, and seems to have been used as a scraper from the state of the edges. It is of mottled blue-gray colour.

There is another implement of a drill-like point, but only the right edge has been trimmed.

The next to note is a good example of the tip of a flake, with sharp edges, being trimmed into a round point.

The following flint for a long time was only regarded as a waste fraction, but after reading Mr. W. G. Smith's work

on "Primeval Man," it seems possible that it may be a rude fabricator, as it is splintered at both ends, and at the thicker end in two places, and may have been used as a punch.

The sketches of all the flints here given are "full size," except that the tracing of the outline of some has given the thickness of a line in excess.

A PUNCH.



Fig. 28.

LIST OF FAUNA FROM LANGWITH CAVE UP TO
OCTOBER, 1912.

- Man (*Homo sapiens*, Linn.).
- Lynx (*Felis lynx*, Linn.).
- Cat (*F. catus*).
- „ small (*Felis*, sp.).
- Hyæna (*Hyæna crocuta*, Erxl.).
- Wolf (*Canis lupus*, Linn.).
- Fox (*Canis vulpes*, Linn.).
- Arctic Fox (*Canis lagopus*, Linn.).
- Cave Bear (*Ursus spelæus*, Ros.).

- Small Bear (*Ursus*, sp.).
- Dog, large (*Canis*, sp.).
- „ small (*Canis*, sp.).
- Badger (*Meles taxus*, Bodd.).
- Otter (*Lutra vulgaris*, Erxl.).
- Martin (*Mustela martes*, Linn.).
- Polecat (*Mustela putorius*, Linn.).
- Weasel (*Mustela vulgaris*, Briss.).
- Stoat (*Mustela erminea*, Linn.).
- Horse, large (*Equus caballus*, Linn.).
- „ small (*Equus*, sp.).
- Woolly Rhinoceros (*Rhinoceros antiquitatis*, Blum.).
- Pig or Wild Boar (*Sus scrofa*, Linn.).
- Stag or Red Deer (*Cervus elaphus*, Linn.).
- Reindeer (*Rangifer tarandus*, Linn.).
- Roe Deer (*Capreolus capræa*, Gray).
- Siaga Antelope (*Siaga tatarica*, Linn.).
- Sheep or Goat? (*Ovis aries*, Linn.).
- Aurochs or Urus (*Bos primigenius*, Boj.).
- Long-faced Ox (*Bos longifrons*, Owen).
- Bison (*Bison bonasus* var *priscus*, Boj.).
- Common Hare (*Lepus europæus*, Linn.).
- Snow Hare (*Lepus variabilis anglicus*, Hint.).
- Common Rabbit (*Oryctolagus cuniculus*, Linn.).
- Souslik of ? sp. (*Spermophilus*, sp.). Extinct in Britain.
- Squirrel (*Sciurus vulgaris*, Linn.).
- Rat (*Mus (Epimys) rattus*, Hint.).
- William's Banded Lemming (*Dicrostonyx gulielmi*, Sanford.). Extinct.
- Hensel's Banded Lemming (*Dicrostonyx henseli*, Hint.). Extinct.
- Common Lemming (*Lemmus Lemmus*, Pallas.). Extinct in Britain.
- Red Vole, sp.? (*Evotomys*, sp.). Extinct.
- Abbott's Vole (*Arvicola abbotti*, Hint.). Extinct.
- Field-Vole, sub. sp.? (*Microtus agrestis*, Linn.). Extinct.

- Continental Field-Vole (*Microtus arvalis*, Pallas.) Extinct.
 Corner's Field-Vole (*Microtus corneri*, Hint.) Extinct.
 Extinct Field-Vole (*Microtus anglicus*, Hint.) Extinct.
 Northern Field-Vole (*Microtus ratticeps*, Key and Blasius).
 Extinct in Britain.
- British Red Vole (*Evotomys glareolus britannicus*, Miller).
 Water-Vole (*Arvicola amphibius*, Linn.).
 Wood-Mouse (*Mus (Apodemus) sylvaticus*, Linn.).
 Small Horseshoe Bat (*Rhinolophus hipposideros*, Bech.).
 Mole (*Talpa europæa*, Linn.).
 Common Shrew (*Sorex araneus*).
 Hedgehog (*Erinaceus europæus*, Linn.).
 Redwing (*Turdus iliacus*, Linn.).
 Thrush (*Turdus musicus*, Linn.).
 Blackbird (*Turdus merula*, Linn.).
 Wheatear? (*Saxicola æanthe*, Linn.).
 Robin (*Erithacus rubecula*, Linn.).
 Nightingale? (*Daulias luscinia*, Linn.).
 Chaffinch (*Fringilla coelebs*, Linn.).
 Common Sparrow? (*Passer domesticus*, Linn.).
 Skylark (*Alauda arvensis*, Linn.).
 Nuthatch (*Sitta cæsia*, Wolf.).
 Hedge Sparrow (*Accentor modularis*, Linn.).
 Tit Lark (*Anthus pratensis*, Linn.).
 Wagtail? (*Motacilla* ?).
 Rock Pipit (*Anthus obscurus*, Lath.).
 Swallow (*Hirundo rustica*, Linn.).
 Jackdaw (*Corvus monedula*, Linn.).
 Crow or Rook (*Corvus*, sp.).
 Raven (*Corvus corax*, Linn.).
 Greater Spotted Woodpecker (*Deudrocopus major*, Linn.).
 Tawny Owl (*Syrnium aluco*, Linn.).
 Eagle Owl (*Bubo ignavus*, Forst.).
 Eagle?
 Gray Goose (*Anser cinercus*, Meyer.).
 White-fronted Goose (*Anser albifrons*, Scop.).

- Common Duck (*Anas boscas*, Linn.).
 Wood Pigeon (*Columba palumbus*, Linn.).
 Pigeon Domestic (*Columba*, sp.).
 Red Grouse (*Lagopus scoticus*, Lath.).
 Ptarmigan (*Lagopus mutus*, Montin.).
 Pheasant (*Phasianus colchicus*, Linn.).
 Fowl, large.
 „ small.
 Partridge (*Perdix cinerea*, Lath.).
 Egg Shells.
 Snake (*Tropidonatus natrix*, Linn.).
 Frog (*Rana temporaria*, Linn.).
 Toad (*Bufo vulgaris*, Laurent.).

To the above list of the fauna found in the Langwith Cave may be added two plants, *Acorns* and *Grass*, both of which are in a black coal-like condition. Man's work is represented by flints, a few cut bones, and traces of many fires.

REPORT ON THE MOLLUSCA OF LANGWITH CAVE.

By A. S. KENNARD, F.G.S., and B. B. WOODWARD, F.L.S.

- Limax maximus* (Linn.).
Vitrea crystallina (Müll.).
 „ *cellaria* (Müll.).
 „ *scharffi* (Ken.).
 „ *nitidula* (Drap.).
 „ *pura* (Ald.).
 „ *alliaris* (Mill.).
 „ *rogersi* (B. B. Woodw.).
Euconulus fulvus (Müll.).
Arion, sp.
Vitrina pellucida (Müll.).

- Pyramidula rotundata* (Müll.).
 „ *runderata* (Stud.).
Hygromia hispida (Linn.).
Acanthinula aculeata (Müll.).
Helicigona lapicida (Linn.).
 „ *arbustorum* (Linn.).
Helix aspersa (Müll.).
 „ *nemoralis* (Linn.).
 „ *hortensis* (Müll.).
Ena obscura (Müll.).
Cochlicopa lubrica (Müll.).
Caciliaides acicula (Fer.).
Jaminia cylindracea (Da Cost.).
Clausilia laminata (Mont.).
 „ *bidentata* (Ström.).
Carychium minimum (Müll.).
Acicula lineata (Drap.).
Ova of a large Helicoid, probably *Helix nemoralis*, also occurred.

It was obvious on examining the shells that they were of various ages. A comparison of the species found with those obtained at Dog Holes, Warton (Lancashire), Ightham (Kent), and from a recently-discovered fissure deposit near Chudleigh (S. Devon), shows a remarkable similarity.

That many of the shells must be of the Pleistocene Age is shown by the occurrence of *Pyramidula ruderata* (Stud.), a species which is only known in this country from the Pleistocene.

There is only one species that there is any reason for doubting its Pleistocene Age, and that is *Helix aspersa* (Müll.). It is quite true that it occurs in all the three cave deposits just mentioned, but at Ightham it was obviously a modern introduction, and at Dog Holes it only occurred in the upper layer with the human relics, and was absent from the lower bed, which was undoubtedly Pleistocene. At Chudleigh it certainly occurred with the remains of pica and lemming, and,

so far as one could tell, undisturbed. It is probably an ancient species in the West of England and Ireland, but in the rest of England it was probably introduced in late Celtic times, and is particularly abundant in deposits of Roman age.

The large series found in the Langwith Cave is additional proof of the abundance of Molluscan remains in cave deposits, and that the lack of records of shells from so many caves arises not from their absence, but from the fact that they were considered of no importance.

REPORT ON A CRANIUM FOUND AT LANGWITH CAVE.

By PROFESSOR A. KEITH, M.D., F.R.C.S., ESQ.,
Conservator of Museum and Hunterian Professor, Royal College
of Surgeons, England.

All the facial part of the skull was broken away and missing, so that the racial character of the individual to which it belonged must be inferred from a consideration of the brain-containing part. The roof, the sides, and the base are complete. The state of the bone is remarkably fresh in texture and appearance. In this it resembles many of the mammalian bones found in the cave—the bones of *Bos primigenius* and the bear. The bone shows no appearance of being mineralized. The condition of the skull gives no clue to the age at which the individual lived.

The cranial features are distinctly male in type. The condition of the sutures—they have commenced to close on the roof—shows that the man had passed middle life—was probably between forty-five and fifty-five. The cranial capacity is

1250 cc., showing a brain considerably below the English average in size—indeed, a distinctly small but well-formed brain. The cranial bones are slightly above the average of modern skulls in thickness and strength.

A minute examination of the cranium reveals none of the characters which are associated with the Neanderthal race (the oldest European), nor does it resemble the very ancient skull found at Galley Hill, but has numerous points in common with that found at Tilbury, and described by Sir Richard Owen in 1883. The antiquity of the Langwith cranium must be judged from the nature of the things found with the specimen. It is the antiquarian, not the anatomist, who can fix the approximate antiquity of the Langwith man.

The Langwith cranium is a very typical specimen of what Professor Huxley described as the "River-bed" skulls. I have compared it with the two specimens—the Muskham (Trent) and the Towyn-y-capel (Anglesea) skulls—both in the Museum of the Royal College of Surgeons, which Professor Huxley selected as types of the group. One of these skulls (the Muskham) was found in the alluvial deposit of the Trent, with the bones of the wolf, dog, red-deer, goat, *Bos longifrons*; the Towyn-y-capel in a long barrow or tumulus. Huxley regarded these as belonging to the period immediately preceding the historic.

There can be no doubt that the Langwith man is of the same race as Professor Huxley's river-bed people. They were lightly-made individuals, of short stature (from 5 ft. 2 in. to 5 ft. 6 in.), with projecting hinder heads (occiputs), and moderately long-headed (cephalic indices of 72-76); eyebrow ridges rather prominent. One finds such a type common in England and Wales to-day.

On the evidence at present at our disposal, it seems very probable that the "river-bed" type of skull will prove to be characteristic of the late Palæolithic and early Neolithic inhabitants of Britain.

The antiquity of the Ancient British (river-bed) type is probably infinitely greater than we think at present. Professor Huxley regarded the river-bed race as nearly related to the people (if not the same people) who built the long barrows.

The maximum length of the Langwith cranium is 192 mm. ; its width, 135 ; its height (meatus to highest point), 113. The cephalic (length) index is thus 70 ; the length height index, 58.8.

During the present year I propose to publish accurate figures and a full description of this skull, comparing it with other ancient skulls found in England.¹

REPORT OF THE LAGOMORPHA OF THE LANGWITH CAVE.

By MARTIN C. A. HINTON.

I have examined the bones of the lagomorpha from the Langwith Cave, collected by the Rev. E. H. Mullins, and have made the following determination :—

1.—*Lepus variabilis anglicus*: Skull and Mandible, Humeri, Radii, Pelvis, Femora, Tibia.

2.—*Lepus europæus*: Skull, Mandible, Humerus, Radius.

All the above specimens referred to *L. europæus* are, in

¹ See Professor Keith's *Ancient Types of Man*: Harper & Brothers, London, 1911, p. 12. "It is impossible to frame in years any accurate estimate of the period that has elapsed since the Tilbury man was alive, but at least a period of 30,000 years seems necessary, &c. . . .," and again, p. 20, "Indeed, this specimen of the river-bed type from Langwith Cave deserves fuller mention, for that able scientist, Mr. Martin A. C. Hinton, regards the fauna found with this skull as of the Pleistocene Period, and therefore much older than the Tilbury specimen." On page 25 (Fig. 6) is a profile of the Dartford cranium compared with the "river-bed" type found in Langwith Cave.

my opinion, recent, and cannot be regarded as of the same antiquity as the remains of the extinct voles. But there is, in addition, one very important specimen, a mere fragment of a right ramus, which, on account of the form of the inferior border and symphysis, is clearly to be referred to *L. europæus*, which is dark in colour, and which I shall accept as of the Pleistocene Age.

Oryctolagus cuniculus : rabbit bones seen : recent.