

Excavation of an Untouched Chamber in the Lanhill Long Barrow

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With a Report on the Barrow and on the Discovery of the New Chamber
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and a Report on the Neolithic Skeletons
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THE BARROW AND THE DISCOVERY OF THE NEW CHAMBER
by A. D. PASSMORE

No. 7 Map of Neolithic Wessex.
Longitude: $2^{\circ} 10' 36''$ W.
Latitude : $51^{\circ} 28' 15''$.

THE Lanhill Barrow stands on the south side of the Chippenham-Marshfield road about $2\frac{1}{2}$ miles west-north-west of the former place. It stands on level ground with a gentle slope to the south down to a small spring a few yards away on that side. The water runs east and at the bottom a dam has been carried across the field thus at one time forming a small lake, this is probably later in date than the barrow itself. The direction of the barrow is slightly south of east and north of west with the larger end to the former point. It is about 185 ft. long by 90 ft. wide at the east end, gradually tapering to a point at the west.

Aubrey's sketch (fig. 1) shows that at its eastern end the mound rose boldly to a height probably of 12 to 15 ft., sinking to about 2 ft. at its western end. Since this time practically the whole of the eastern and southern parts of the barrow have been removed, together with a great part of the centre and the southern side of the western end, in which latter region many loads of stone were taken away as late as the winter of 1935. The only part of the original contour remaining is at the north-west corner where the tail is complete with about 60 ft. of the northern side, beyond this all is ruin and in the words of Thurnam, 'resembles somewhat the site of an old quarry.'

In addition to casual depredations the barrow is known to have been dug into upon three separate occasions :

i. Thurnam's Excavations

In 1856 Thurnam excavated around three stones, exposed 40 ft. from the east end in the centre line of the barrow. Thurnam imagined that these were part of



On the left hand of the road, from Chippingham to Brisew, about half a mile short of Bitezton, near Lanhill in Chippingham parish, is a Barrow, or Tumulus commonly known by the name of Barrow-hill, where they say one Hubba lies buried.

Fig. 1

Aubrey's sketch of Lanhill Long Barrow.
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a chamber but there can be no doubt that they represented the false entrance common to many Long Barrows in this region and well seen in the neighbouring barrow at Lugbury and at Gatcombe Lodge in Gloucestershire. A similar false entrance at Rodmarton appeared to be buried in the mound as in our Lanhill example ; it is however, probable that originally all such false entrances were exposed at the end of a long bay in the larger ends of these mounds.

Thurnam found nothing in this digging except a few scattered bones, human and otherwise. He carried out further investigations at several places without result except at a point on the northern edge, where he found two stones which he took to be part of a ruined chamber, together with the fragmentary remains of two skeletons which he thought to be of men, one of twenty years and the other of forty. These stones are now missing.

2. Diggings in 1909

The false entrance was re-excavated in 1909. In the same year a new chamber was discovered, while a large bank, part of the southern flank of the barrow, was being dug away for stone to repair a farmyard. This contained the remains of 11 skeletons (or parts thereof) which were examined and reported on by Beddoe.

3. Subsequent History

While supervising the renewal of railings on the site the present writer noticed that the north-west corner was untouched and as chambers exist in that region in several long

barrows¹ it was thought that one might remain here. With this in mind the corner of the Lanhill Barrow was subjected to a test which produced a new chamber, complete and untouched. Access was obtained through the roof which was formed of one large stone 6 ft. 4 ins. from east to west and 5 ft. 3 ins. from north to south. This coverstone was only 5-7 ins. thick and had broken into four parts. One of these was raised and the chamber was thereupon revealed. Realising the importance of the find and feeling that no one man ought to excavate an important site, I somewhat reluctantly lowered back the stone into its place and threw tons of earth on top. In due course the help of The Morven Institute of Archaeological Research was enlisted with the results to be described below by Mr Alexander Keiller and Mr Stuart Piggott. After the excavations were completed I lowered the part of the capstone into position and supported it by a strong iron bar which, resting on firm ground either side, held the weight ; the earth was then filled in and the ground restored to its former shape.

THE EXCAVATION

by ALEXANDER KEILLER and STUART PIGGOTT.

The chamber discovered by Mr A. D. Passmore was on the northern side of the barrow and nearer to the west end than that on the southern side previously excavated in 1909 by Capt. Cunnington.² The chamber was approached by a short passage leading from the original outer edge of the barrow. It was impossible to see in the limited excavations whether the barrow had originally been faced with dry stone walling, but from analogy with other similar structures such probably existed.

There was apparently no roofing to the outermost part of the passage, the sides of which were formed of well-constructed dry stone walling remaining to a length of 2.7 ft. on the western and 3.5 ft. on the eastern side. The remainder of the passage was formed by a single slab of stone on each side, that on the west being 3.3 ft. long, and that on the east 3.5 ft. This inner portion of the passage was roofed by a single capstone, 4.4 ft. long and sloping slightly downwards towards the north, thus lying parallel to the floor of the passage which rose at a gentle gradient to the entrance of the chamber at the south end of this capstone. A subsidiary slab 1.2 ft. in width had been inserted across the passage 0.5 ft. below the capstone, and with the intervening space filled with dry stone walling. This gave in effect a higher roof level in the innermost part of the passage which, in fact, must be regarded as constituting a vestigial antechamber. The width of the passage decreased uniformly from 2 ft. at the outer end to 1.35 ft. at the entrance of the chamber.

The floor of the passage consisted of the natural red clay which overlies the corn-brash of the district.

The construction at the junction of the passage with the chamber was noteworthy. Across the floor ran a sill composed of a thin slab of stone 1.5 ft. long and 0.1 ft. thick which

¹ Examples have been found at Poles Wood South and at Eyford, while recently I have discovered in the same position, a large portal stone, lying on the north west flank of the large barrow at Gatcombe Lodge. This seems to have been shaped in the Rodmaston manner but is lying three parts buried in rough bush so that a careful examination is impossible without excavation ; in any case there is little doubt that it is part of a chamber that once existed here. The stone is now 6 ft. long by 3 ft. wide by about 2 ft. thick.

² *Wilts. Arch. Mag.*, xxvi (1909-10), 300-310.

stood 0.3 ft. above the level of the ground and was wedged in position by small slabs of stone set on edge along both its sides. Abutting on this sill at each end and rising to the full height of the roof of the antechamber at this point, two slabs had been set at right-angles to the axis of the passage and chamber. The lower part of the inner edges of these slabs had been broken away in such a manner as to form a rough 'port-hole entrance' as can be seen in the drawing (fig. 1). It is probable, however, that the original opening was more symmetrical, since it appears likely that a piece of rock from the upper part of the west stone had at some time become dislodged and may have been represented by one of the numerous fragments of stone which had fallen on to the floor of the antechamber.

The passage was found to have been loosely blocked at its outer end with flat stone slabs placed horizontally, like very rough dry-walling. The two flanking stones of the antechamber had fallen inwards until their upper edges touched, but the blocking did not appear to have extended beyond the passage proper.

The structure of the chamber itself was exceedingly simple. It was quadrilateral, one side being formed by the port-hole entrance, described above, the remaining three sides each by a single large slab of stone. The length of the chamber was 4.8 ft., and the width 2.6 ft. at the entrance, and 3.8 ft. at the southern end. In the south-western corner dry stone walling had been constructed to fill a triangular space left at the base of the junction between the side and rear stones. A precisely similar feature existed in one corner of the chamber on the southern side of the barrow.

The floor of the chamber was found to have been roughly paved with small irregular slabs of stone. The chamber was roofed by a single large capstone 0.5 ft. thick which rested directly on the side stones, although at the rear dry stone walling, to a thickness of over a foot, had been inserted between it and the upright, in order to bring it to the required level. Dry stone walling was likewise inserted to fill the gaps between the irregular tops of the side uprights and the flat under-surface of the capstone. The floor of the chamber sloped downwards slightly from the entrance and the capstone was at an average height of 2.75 ft. above the floor. At its northern end, which overlapped the capstone of the antechamber and was 0.75 ft. above it, the intervening space was filled with dry walling.

In order to avoid damage to the structural features of the passage-way or antechamber, an entry was gained to the chamber through a small opening in the roof at the northern end, formed by the removal of a broken piece of capstone.

The chamber at first sight appeared to contain a heterogeneous and disordered mass of bones ; careful examination, however, showed this to be by no means the case. No less than seven skulls could be observed, these being placed as follows. Three lay against the eastern side of the chamber ; one of these (No. 7) being considerably nearer the portal than the other two. This skull was lying on its left side and faced to the west ; the second and third skulls (Nos. 1 and 2) lay upside down and actually touched each other. A curious feature of these last was that each was furnished with a lower jaw placed in approximately the correct position, but it was subsequently proved that one of these jaws could not have originally belonged to the skull in association with which it was found. Skull No. 3, badly fractured, was close to the southern wall. The two larger portions of it were upside down, the face and frontal bones downwards, as was the occipital base which lay close to it, while in this case the correct lower jaw was underneath the fragments. Skull No. 4 was lying on its left side in the south-western corner and touching it was No. 5. Only the cranium of the latter remained, the facial bones and both jaws being absent. The cranium rested upside down. Touching this skull again was No. 6, lying on its left side. The forehead

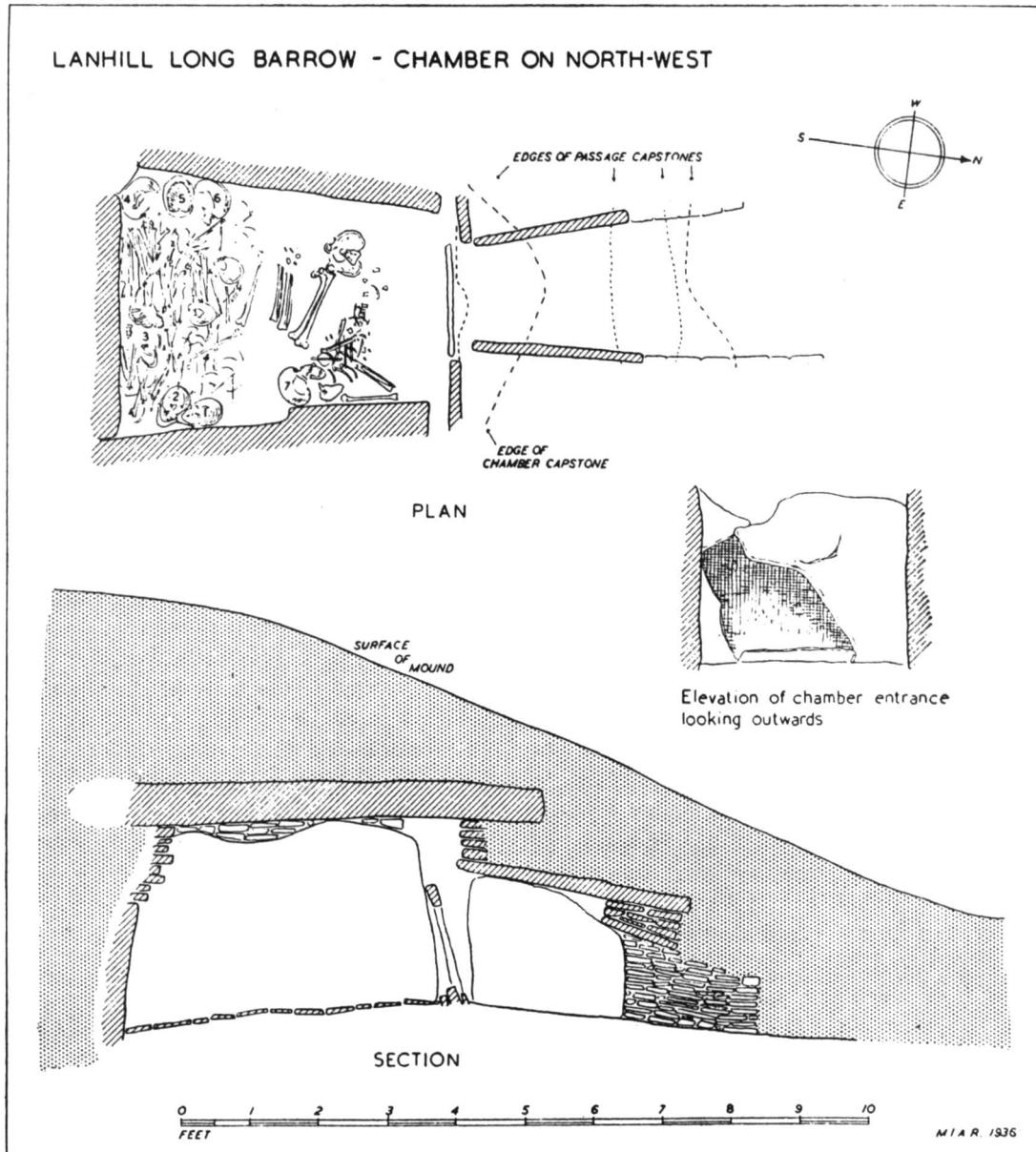


Fig. 2

was in an advanced state of decay and quite soft, and the right facial bones had completely disappeared, while there was a large hole in the right side of the skull and frontal bone where it had rotted away, apparently through a constant dripping of water on it from a crack in the roof above. Between these skulls was a mass of bones clearly not articulated. Several long bones (3 femora ; 2 tibiae ; 2 fibulae ; a humerus and a radius) were lying side by side across the chamber from east to west, the shorter bones being placed between the femora. Around and under them again were pelvic and other bones scattered without any order, and lower still, in a layer of reddish clay flecked with mildew 0.1 ft. in depth which lay on the paving of the chamber, was a mass of smaller bones including metapodials intermingled with sections of vertebrae, ribs, etc. Among these last were four instances of vertebrae definitely articulated ; two of two sections together, and two of three sections, showing that these must have been united by ligaments when placed in their present position. The majority of the exposed bones, as well as the skulls, were thickly encrusted with a calcareous accretion, a condition noted in the excavation of some of the Long Barrows in the Cotswolds. On removal of this accretion remains of gristle were disclosed on one humerus showing that the deposit must have been formed with considerable rapidity. Subsequent examination of these skeletal remains disclosed the fact that bones representing an eighth individual were present. No skull existed which could be allotted to this skeleton. In addition to the above a single incomplete femur of an infant was identified, thus bringing the total of individuals interred to nine.

Although skull No. 7 lay completely exposed, a deposit of earth was seen to cover the floor in the vicinity of the portal. The removal of this earth disclosed the fact that it covered an articulated skeleton, to which this skull belonged, resting in a crouched position upon the paving. The exact position of this body is of some importance. As may be seen from the plan, the skeleton was lying on its back with both the shoulder-blades and the pelvic bones flat upon the floor. The legs were flexed, the femora together, the knee joints within 0.3 ft. of the front of the skull. The tibiae and fibulae of each leg were articulated and lay parallel to each other. The feet were incomplete, a certain number of the digits having disappeared. The vertebral column was slightly curved, and the left arm lay across the chest. As to the right arm, however, the humerus lay parallel to the eastern wall of the chamber, and 0.05 ft. from it, the space between the bone and the wall being filled with reddish earth containing an admixture of a white mildew-like substance. The arm was flexed at the elbow, so that the hand lay upon the chest. Beneath the left scapula was found a small flint flake, the sole artifact discovered in association with the burials.

In clearing out the antechamber and passage, a clavicle and a section of vertebra were found near the sill across the entrance, while a single cervical vertebra was found in the blocking of the passage at the north end.

The conditions described above admit of only one interpretation. It seems clear that the skeletal remains of the eight individuals occupying the rear of the tomb represent successive interments previous to the contracted burial, and that they must have been placed in the position in which they were found immediately prior to, and in order to leave room for, that interment. It is obvious that by this time the previous burials were in a skeletal condition, and it will have been observed that considerable care was taken in the symmetrical rearrangement of the bones, although no attempt at articulation was made save in the case of certain skulls where it has been shown that lower jaws were deliberately supplied, although not always to the correct skull. This goes to prove that more than one,

if not all the skeletons were disturbed at the same time, but this does not render it impossible for the previous interments to have been successive ones, since it would appear that the primary, and indeed the sole, purpose of redistributing the skeletons was to make room for a new-comer in an already crowded chamber. This definite instance of a series of successive burials is of considerable importance, if only in view of the claims frequently put forward to account for the multiple interments in British megalithic tombs, namely that these represented a burial of a quantity of individuals made at one and the same time. The bodies of such individuals are thought of as having been previously stored elsewhere, so that most, if not all, would already be in a skeletal condition at the time of the ceremony. While this practice of 'reserved' burials undoubtedly existed in antiquity, the evidence does not seem to warrant a belief in its normal employment in British megalithic tombs.

The total or partial absence of certain of the bones need not occasion surprise, since it is not uncommon, under conditions similar to those prevailing in this case, for skeletons to be found in an incomplete condition, although the interments had demonstrably taken place when the flesh was still present. A single parallel will suffice : that of the contracted burial in proximity to Stonehole 31 in the megalithic avenue leading from West Kennet to the Circles of Avebury.¹ In this case, the destruction of parts of the skeleton had undoubtedly been due to the seeping of water through part of the filling of the grave. Some of the bones were in a remarkably good state of preservation, though others were partially decomposed, while the ribs and most of the spinal column were represented only by discoloured smears upon the chalk on which they lay. Certain small bones had disappeared completely.

The singularly fortunate circumstances of the discovery of this untouched chamber at Lanhill render it possible to reconstruct the stages of the final burial. The passage having been opened, an individual crawled through the porthole into the chamber, and (a task impossible without some form of artificial lighting) rearranged the bones already there in the position in which they were discovered, thus clearing a sufficient area on the floor to take the forthcoming burial. The individual then retired from the chamber and the corpse was inserted upon its back into the passage-way. It was then manoeuvred head first through the porthole, in all probability by pushing its legs. When the shoulders had passed the aperture, whoever was negotiating the burial—and there was only room in the passage for one such—took the right hand of the corpse in his left, and continued to press the body through the porthole. This resulted in a form of swivelling action on the right shoulder-blade, and simplified the body being placed transversely across the chamber. Experiments carried out by the writers with a full sized model of the chamber and porthole entrance, demonstrated that an individual of the same height as that estimated from the skeleton could be inserted through the aperture by tightly flexing his legs against his body, which accounts for the contracted position of the burial. On insertion into the tomb the corpse would still be lying upon its back, while the legs, if they did not naturally fall into the position in which they were found, would take this up as a result of a slight push from without. Finally the right arm of the corpse, bent at the elbow, was forced into the chamber and the upper arm pressed almost at right-angles to the body against the eastern wall. It should be noted that the space of 0.05 ft. between the humerus and the wall of the chamber filled with mildewy soil, may be accounted for by that taken up originally by the skin and flesh prior to decomposition.

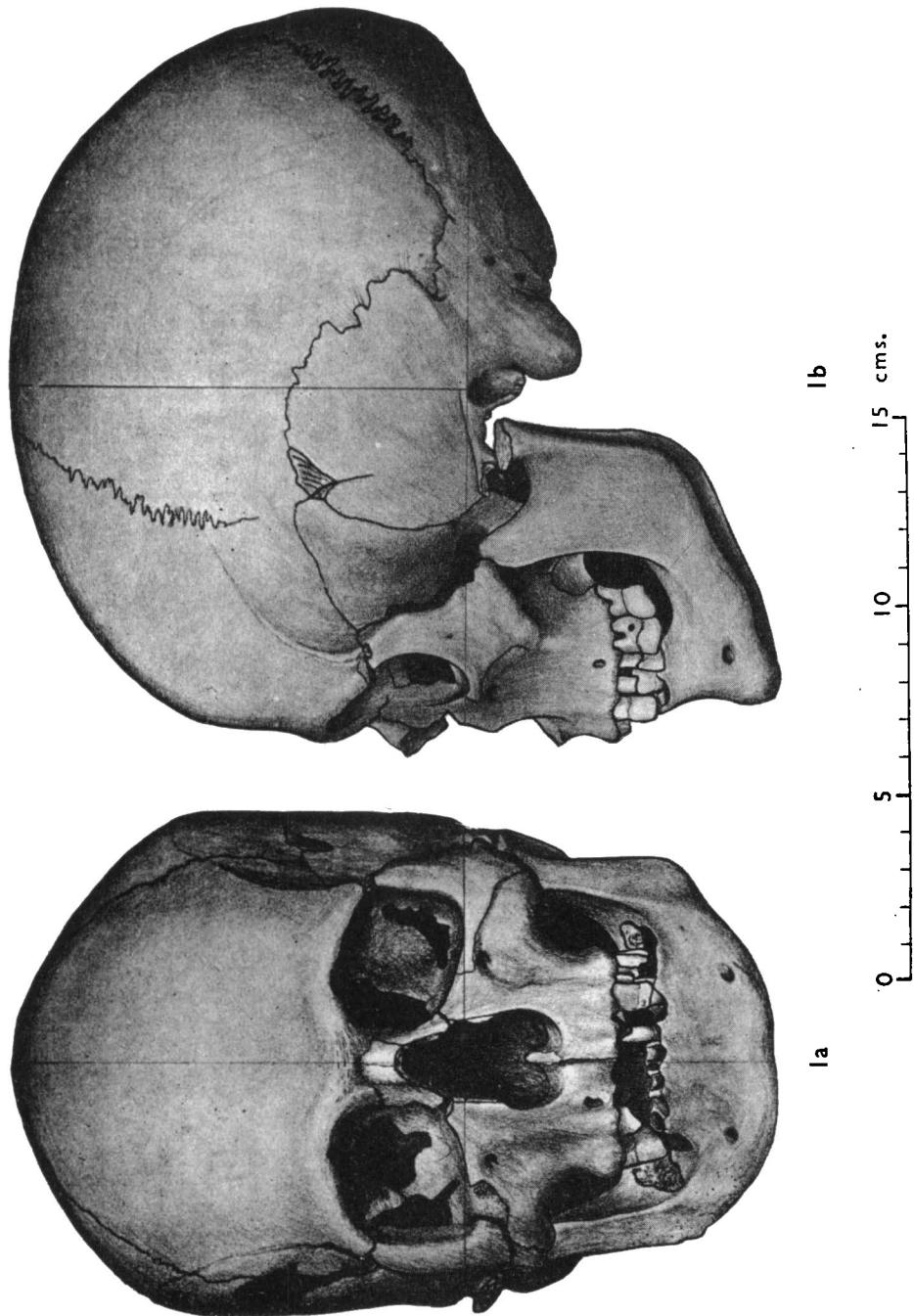
¹ *Antiquity*, x (1936), 417-427.

PLATE XV



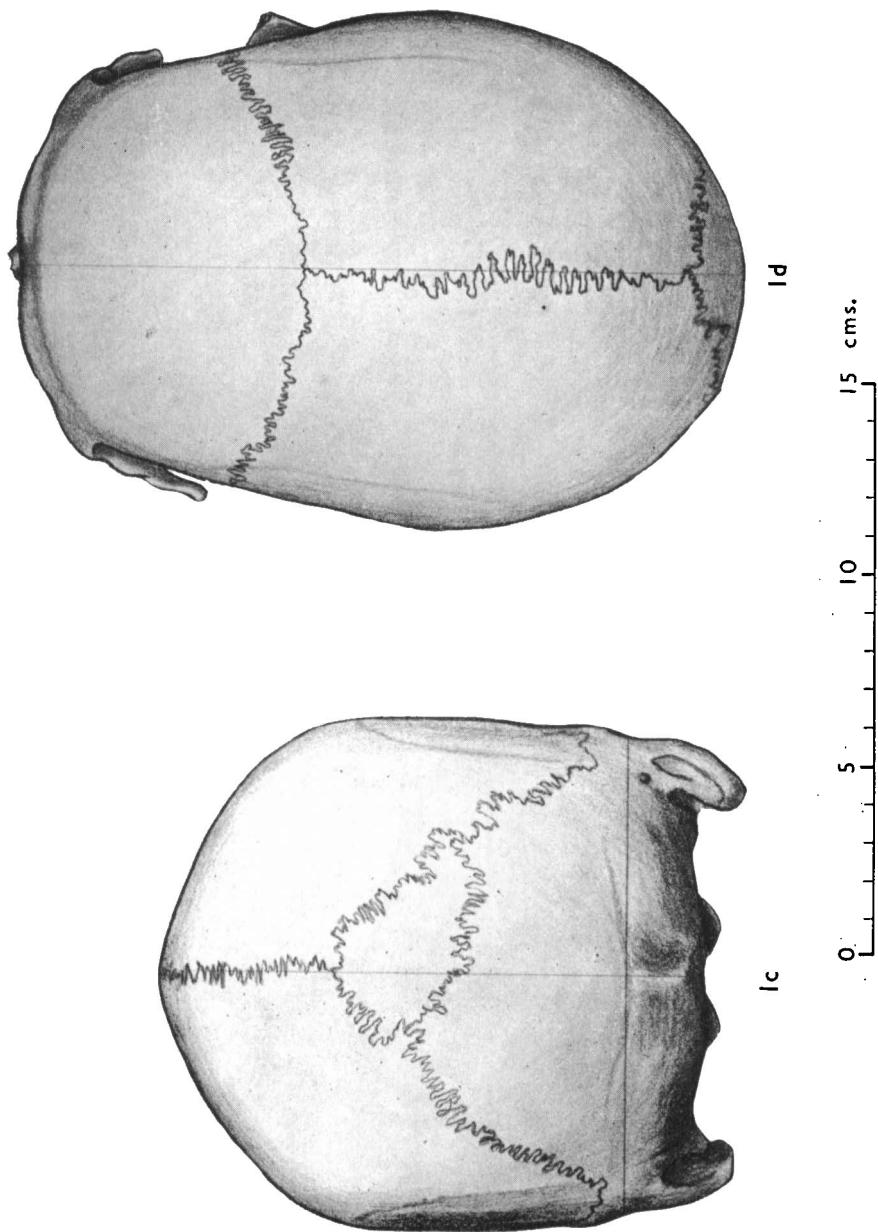
The chamber prior to removal of skeletons. Skull no. 7 on bottom left.

facing p. 128

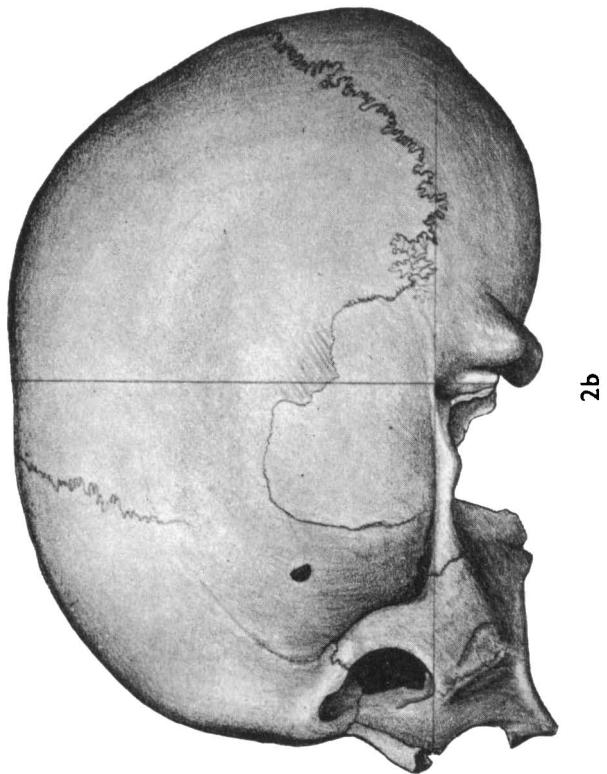


Lanhill. Skull no. 1
1a *Norma facialis*; 1b *Norma lateralis*.

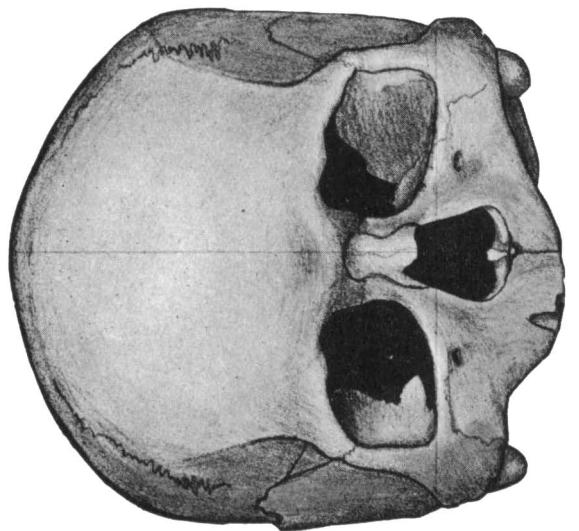
PLATE XVII



Lanhill. Skull no. 1
1c Norma occipitalis; 1d Norma verticalis



2b

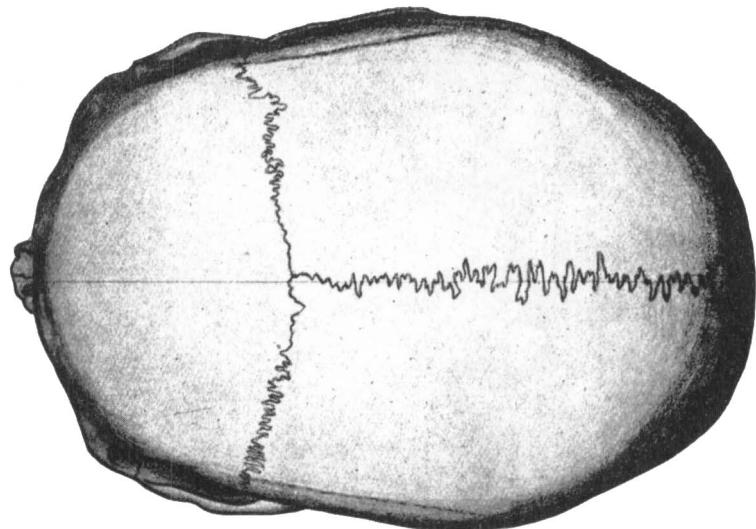


2a

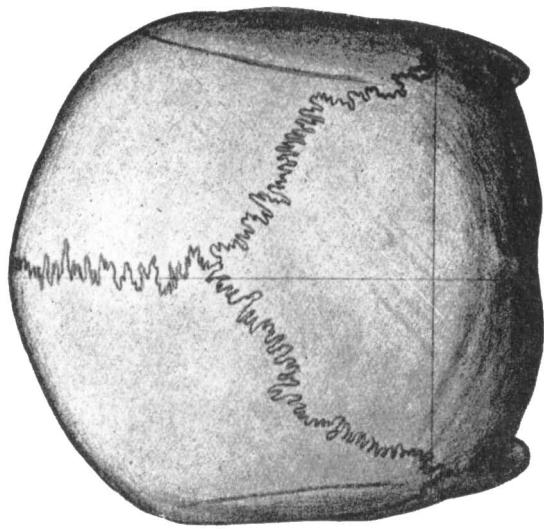
15 cms.
10
5
0

Lanthill. Skull no. 2
2a *Norma facialis*; 2b *Norma lateralis*.

PLATE XIX

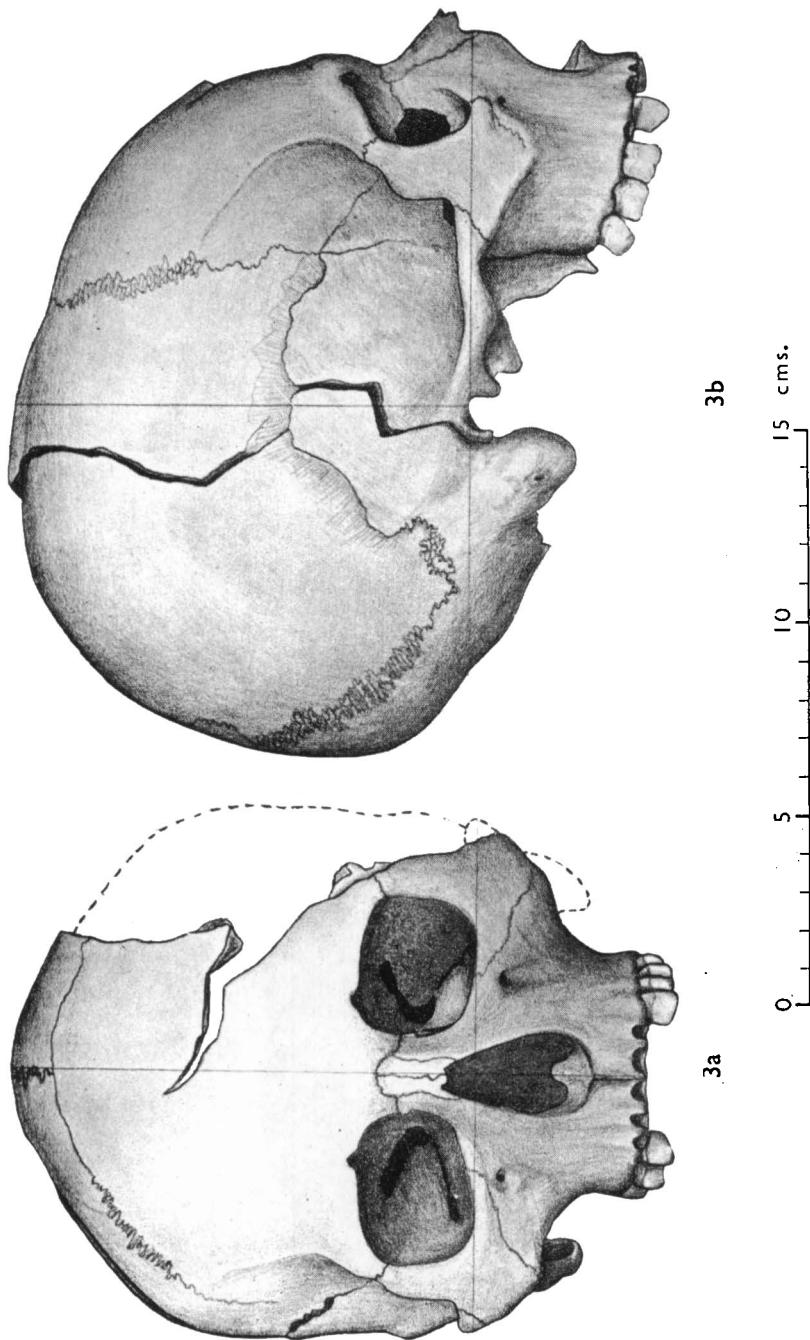


2d



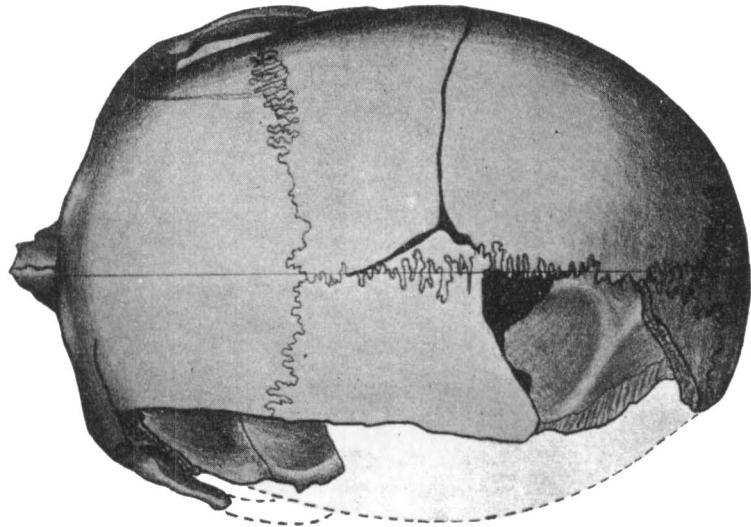
2c

Lanhill. Skull no. 2
2c *Norma occipitalis*; 2d *Norma verticalis*.



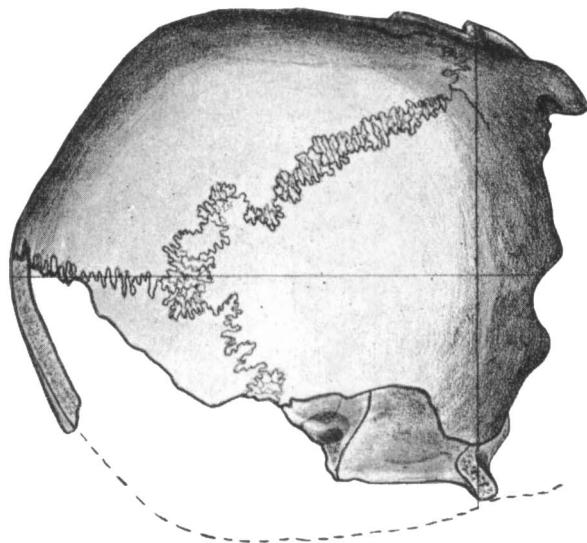
Lanhill. Skull no. 3
3a *Norma facialis*; 3b *Norma lateralis*.

PLATE XXI



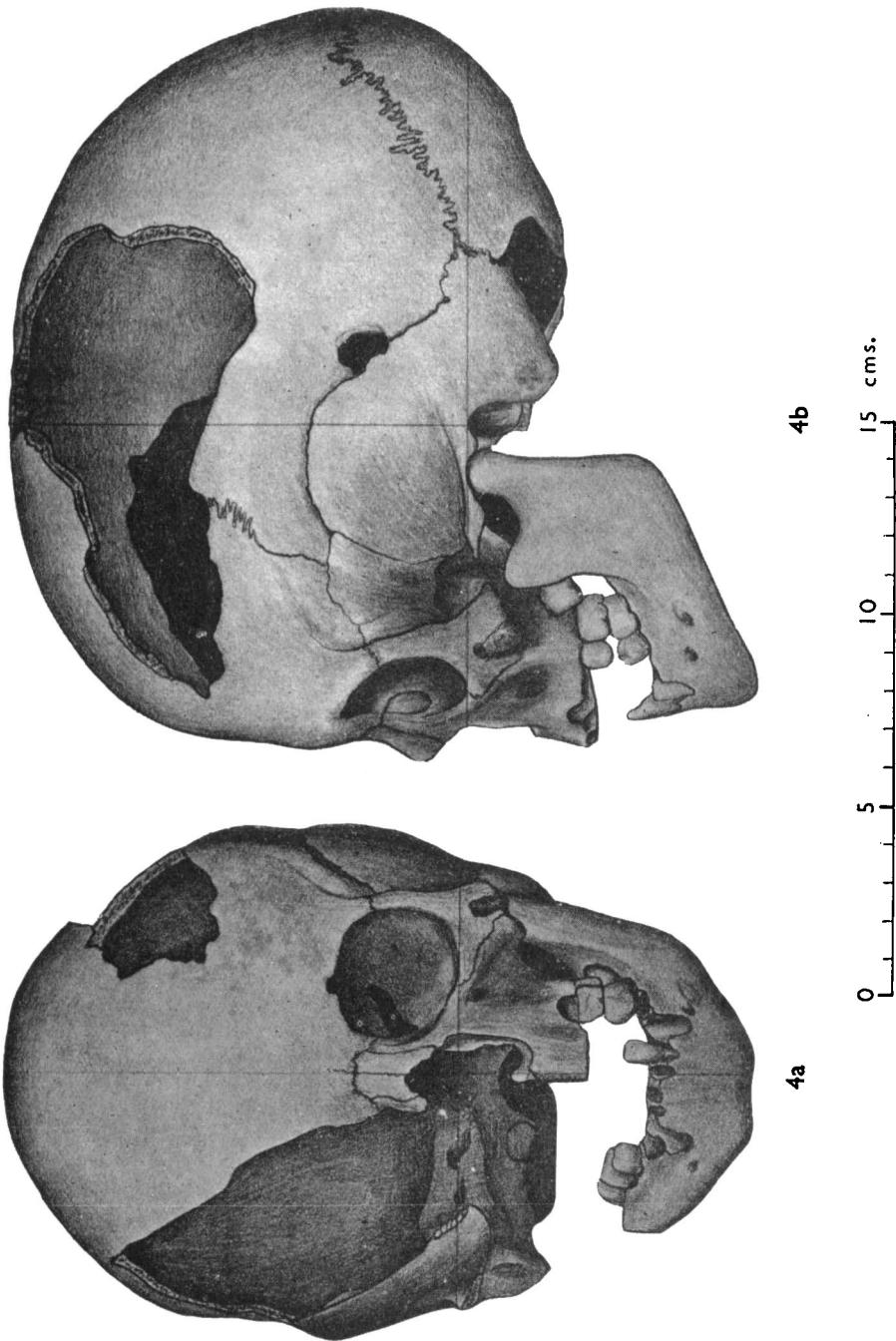
3d

15 cms.
10
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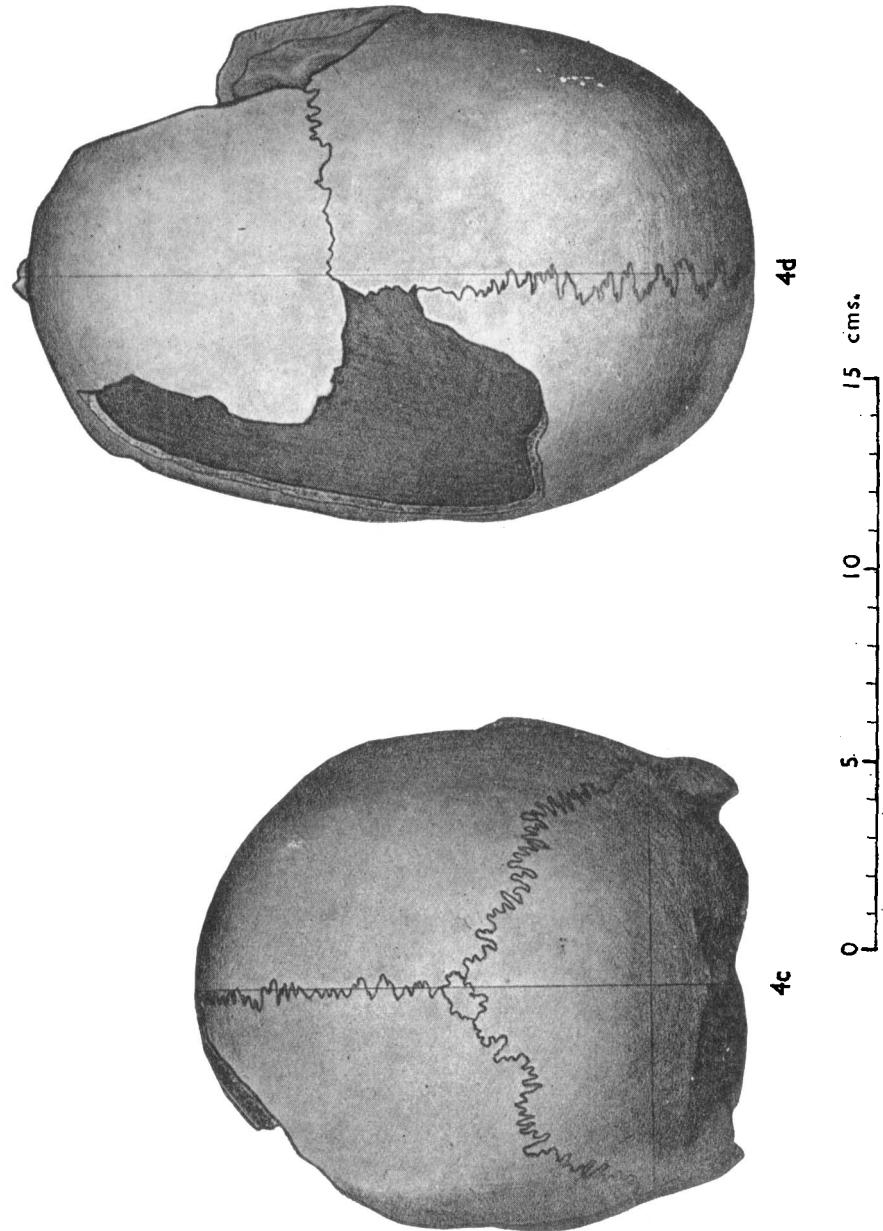
3c

Lanhill. Skull no. 3
3c *Norma occipitalis*; 3d *Norma verticalis*.



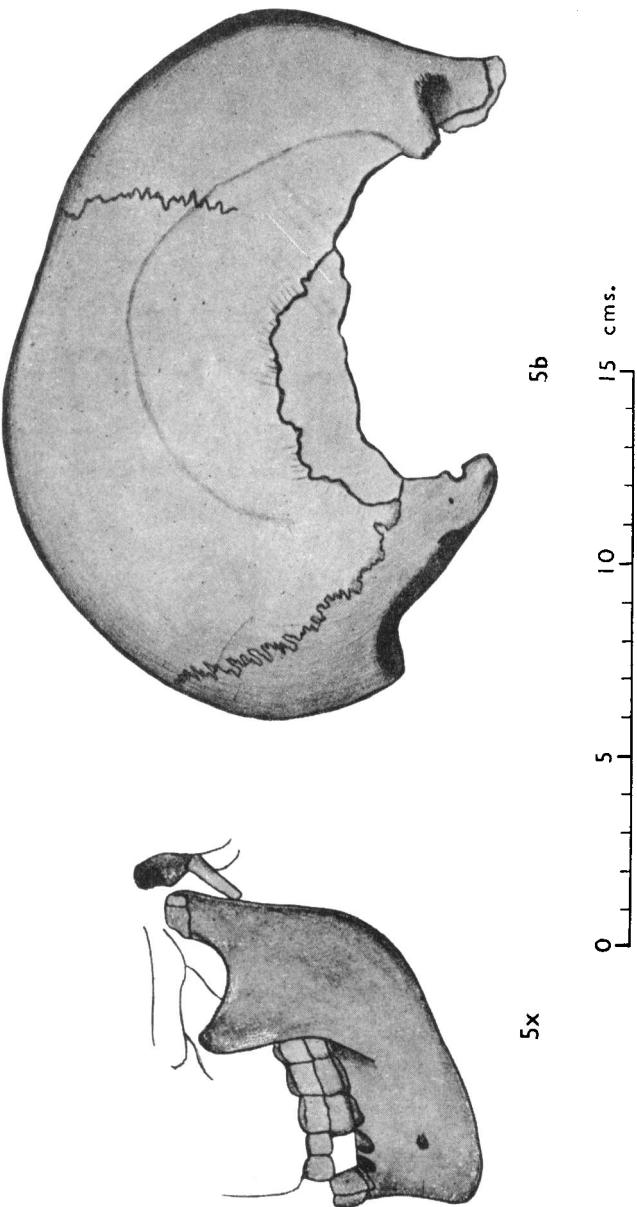
Lanhill. Skull no. 4
4a *Norma facialis*; 4b *Norma lateralis*.

PLATE XXIII



Lanhill. Skull no. 4
4c *Norma occipitalis*; 4d *Norma verticalis*.

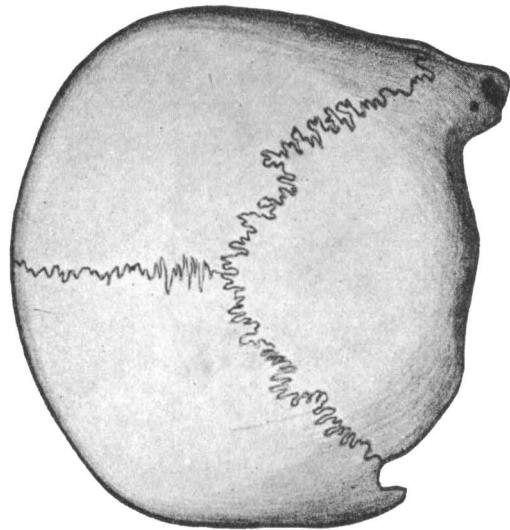
PLATE XXIV



Lanhill. Skull no. 5
5x Mandible; 5b *Norma lateralis*.

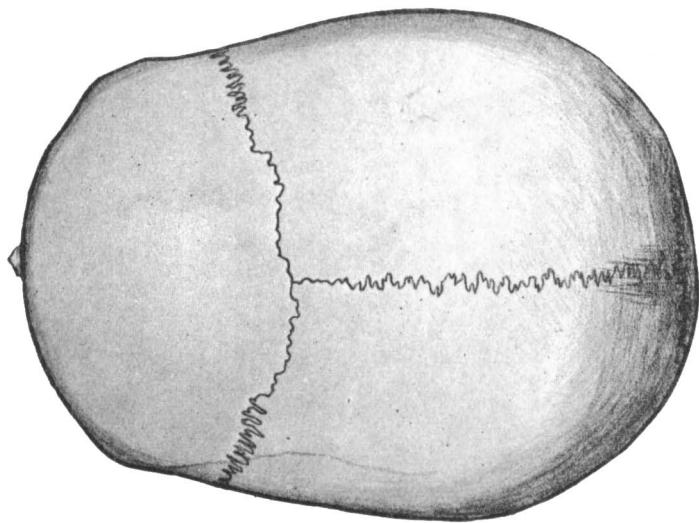
PLATE XXV

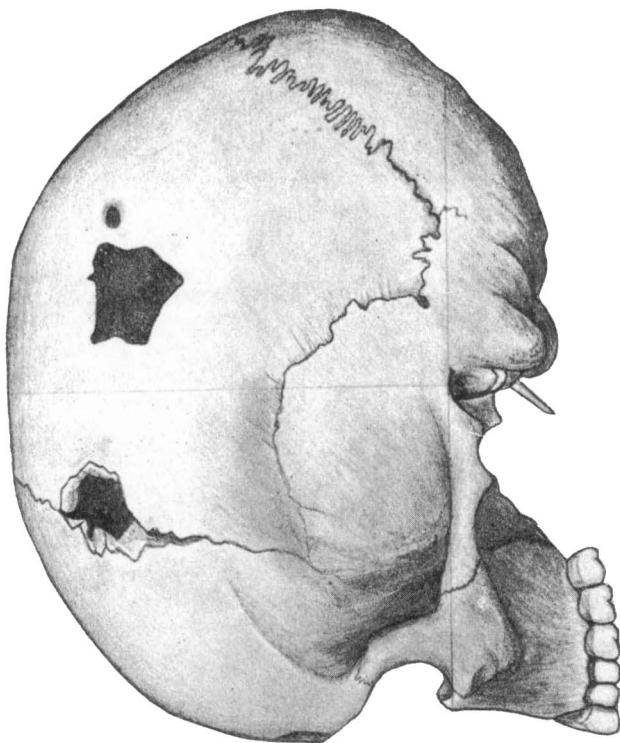
5c



Lanthill. Skull no. 5
5d *Norma verticalis*; 5c *Norma occipitalis*.

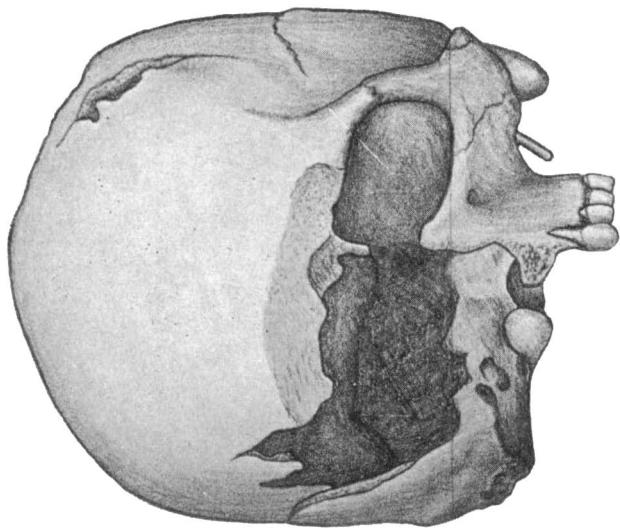
5d





6b

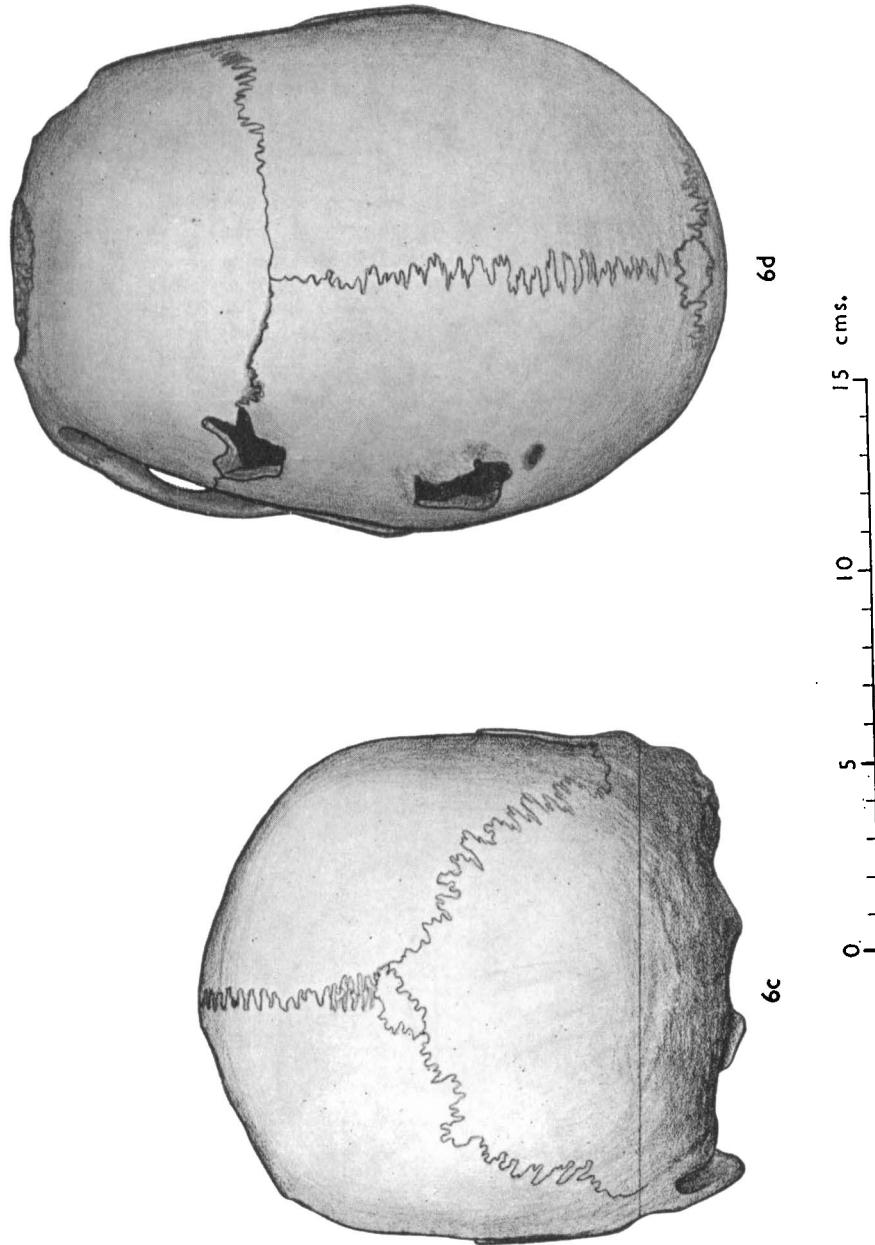
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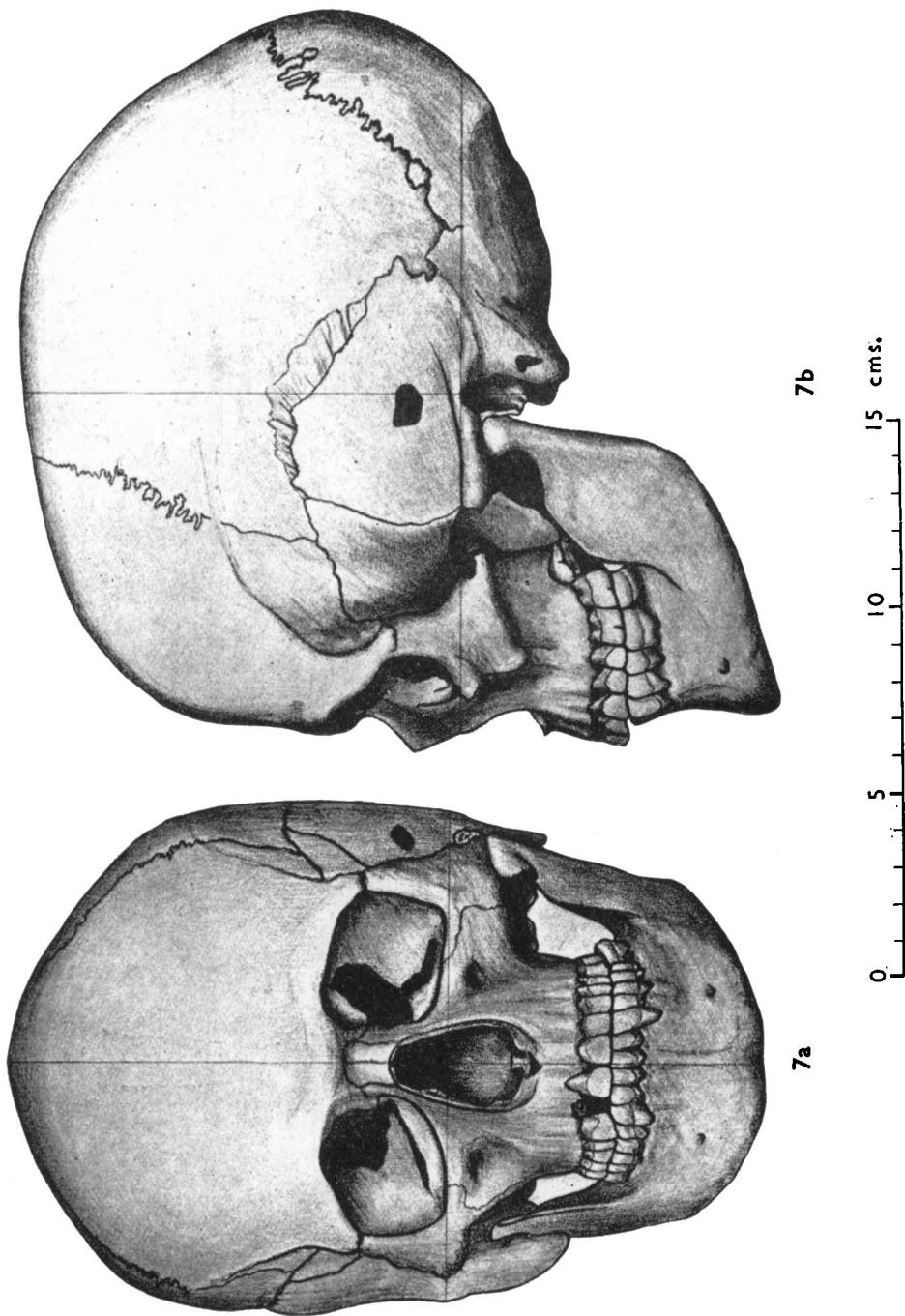
6a

Lanhill. Skull no. 6
6a *Norma facialis*; 6b *Norma lateralis*.

PLATE XXVII

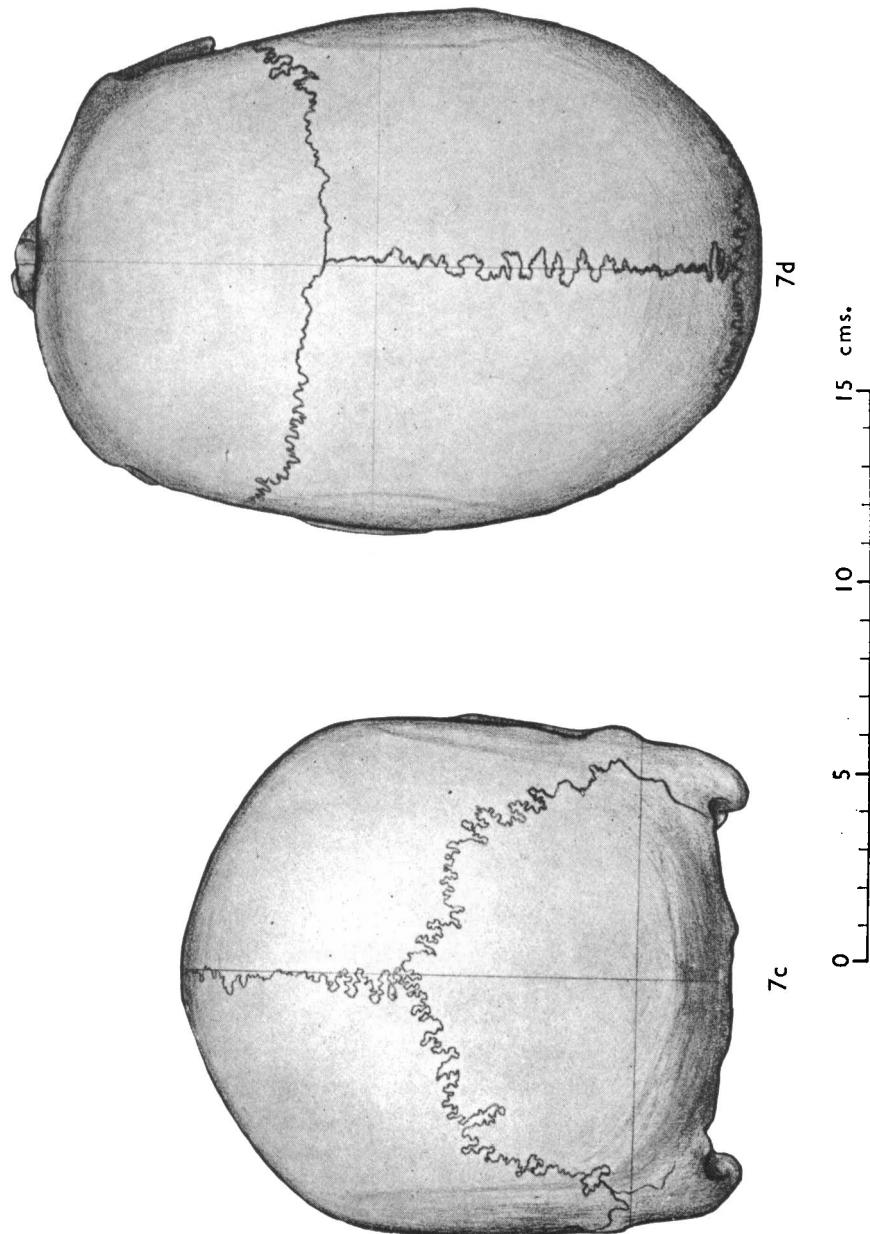


Lanhill. Skull no. 6
6c *Norma occipitalis*; 6d *Norma verticalis*.

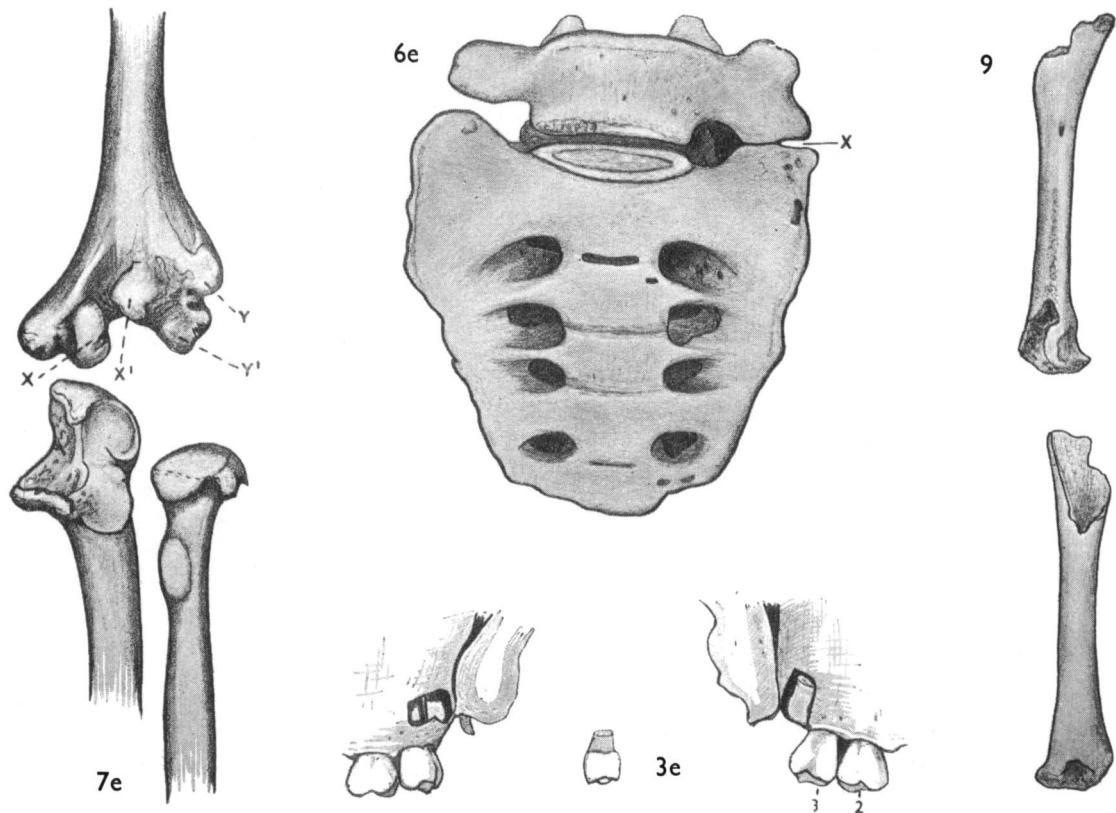


Lanhill. Skull no. 7
7a *Norma facialis*; 7b *Norma lateralis*.

PLATE XXIX



Lanhill. Skull no. 7
7c *Norma occipitalis*; 7d *Norma verticalis*.



Lanhill

- 7e. Left elbow joint of skeleton no. 7, showing old injury of humerus and disorganisation of joint (x, x^1 =ulnar articulation; y, y^1 =radial articulation).
- 6e. Unilateral sacralization of 5th lumbar vertebra of skeleton no. 6.
9. Sole remains of skeleton no. 9 (damaged right femoral shaft).
- 3e. (From skeleton no. 3), two extra molars with septum between and a supernumerary molar; all right side.

(Scale one-half).

PLATE XXXI



Lanhill



Reconstruction of facial appearance from skulls of no. 1 (left) and no. 4 (right) by Miss D. E. Chapman.

No. 5

PLATE XXXII



Lanhill



Reconstruction of facial appearance from skulls of no. 2 (left) and no. 7 (right) by Miss D. E. Chapman.

As regards the period of time after death during which such a burial took place, two alternatives are possible, but for various reasons only one probable. The interment might have taken place prior to the setting in of rigor mortis, but this presupposes that the transport of the body to the barrow and its insertion, to say nothing of the careful rearrangement of the bones already within the chamber, must have taken place within an almost incredibly short time after death. It would seem to be very much more likely that the burial was undertaken after rigidity had worn off—a matter, generally speaking, of forty-eight hours, but varying with climatic and individual conditions,—while it should be understood that, actually, a dead body would be easier to manipulate, in the manner described subsequent to the cessation of rigor mortis than prior to the onset of that condition. After the body had been disposed in the manner described, it must have been covered by a thin layer of earth, the head, however, being left exposed. The next stage of which we have evidence consists of the final blocking of the outer portion of the passage by means of the rough stonework described. In this regard it may be suggested that the bones, which, it should be recollect were of small size, found in the antechamber and passage-way, were inadvertently dragged out from the chamber during the withdrawal either of whoever was responsible for the rearrangement of the other bones of the previous burials or, less probably, of the individual who had carried out the actual insertion of the corpse.

The above reconstruction of the final burial inevitably recalls the practices described by Dr A. J. B. Wace in the Late Helladic Chambered Tombs of Mycenae,¹ where the favourable circumstances of careful excavation and record, no less than the relatively high material culture represented, enabled a more detailed restoration of the burial rites to be made than has elsewhere been possible. Although the Mycenaean tombs in question are chronologically later than the British chambered cairns, the burial rites, and indeed the details of the interior structure, are so similar as obviously to represent only slightly divergent specialisations from a common stock.

Wace is of the opinion that the tombs of Mycenae were 'family sepulchres used by the same families over a considerable period of years' and there seems little reason to doubt that most, if not all, British chambered tombs are susceptible of a like explanation. As at Lanhill, when the Mycenaean tombs were reopened for a fresh burial the remains of the preceding burials were, when necessary, removed or more often 'simply swept up in a heap to the sides and corners of the chamber' to make room for the later occupant. It should be noted, however, that no instance was recorded at Mycenae of the careful arrangement of the bones such as has been described above.

The similarities to Mycenaean practices presented by the final interment at Lanhill (No. 7) are almost startling. There 'the dead when laid in the tomb seem to have been placed on their backs or slightly on one side. The knees were bent upwards and the head seems to have been slightly raised, for in one case a stone was found beneath the skull and in others the lower jaw was found among the ribs. The position of the hands varied. Sometimes the arms were bent upwards as in the contracted attitude of burial, sometimes they lay by the sides, but in many cases it was noted that one hand lay in the lap.' The slightly raised skull is noteworthy, since at Lanhill the fact that the body was covered with earth, whereas the skull was left exposed, points to a similar practice. Wace observed that in some cases a layer of earth had been laid over a body. 'This may have been done,' he suggests, 'just before the closing of a tomb after a burial, but it is more probable that it

¹ *Archaeologia*, LXXXII (1932), especially pp. 138–146.

was done on re-opening the tomb as a purification to prepare for a new burial.' The Lanhill evidence, however, implies that his first suggestion may be the more probable.

In Scandinavia the use of megalithic tombs for successive burials has been clearly established. More particularly to our point is the fact observed by Nordman in two chambered cairns in Zealand¹ where, although the earlier burials had been moved out of the way, yet, as at Lanhill 'a certain amount of consideration was shown : the crania were collected in heaps by the wall of the chamber and the long tubular bones were deposited in a protected spot.'²

Coming nearer home, lamentably incomplete though the detailed records of earlier excavations are, the same sequence of burials as existed at Lanhill can be recognised as occurring in at least three other Cotswold Long Barrows. At Hetty Pegler's Tump, Uley, although there seems to have been some Roman or later spoliation, it was observed that 'in the interior, were the remains of thirteen human skeletons, six of which were in the central gallery. Most of them had been much disturbed, but one, about three feet within the entrance, retained very much its original posture—the sitting or rather squatting—the head having fallen forward in decay.'³

At Belas Knap in the eastern chamber (C) the confused remains of twelve skeletons were found and nearer the entrance to the chamber one skeleton apparently articulated was discovered by the excavator, Mr Winterbotham, who was (to use his own words) 'fortunate enough to be present just as the work was finishing.'⁴

In the chamber discovered towards the west end of the Pole's Wood South Long Barrow⁵ remains of nine or ten skeletons in a fragmentary condition were found within its small space of 7 ft. by 4 ft. In the short passage leading to this chamber was one skeleton in an 'almost perfect state' and remains of two others. This strongly suggests that the chamber had become so overcrowded that burials had perforce to be placed in the passage. Crawford's comment upon this is that 'the perfect skeleton in the entrance passage suggests the immolation of a victim.' In view of the evidence adduced above such an explanation would appear unnecessary.

From the account of the 18th century exploration of the chambered Long Barrow known as Fairy's Toot, Nempnett Thrubwell, Somerset (116 of the O.S. Map of Neolithic Wessex) it seems that an articulated skeleton lay immediately inside the porthole entrance, while disordered bones were contained in the inner chambers.⁶

A Scottish example may be quoted in this connection in the Horned Chambered Cairn at Lower Dounreay, Caithness.⁷ Disarticulated skeletons were found in the rear part of the chamber, but nearer the entrance lay a complete contracted burial.

Since, as has been explained above, the purpose of the redistribution of previous burials was carried out solely in order to make room for a subsequent interment, the situation in the southern chamber at Rodmarton⁸ of the thirteen skeletons 'which appeared to

¹ *Nordiske Fortidsminder*, II, 71–80 (Troldhøj); 80–87 (Raevenhøj). Cf. Fig. 57 with the arrangement of skulls at Lanhill (pl. xv).

² *The Megalithic Culture of Northern Europe* (SMYA–FFT, XXXIX–3), 28.

³ Davis, J. B., and Thurnam, J. *Crania Britannica* (1865), vol. II.

⁴ *Proc. Soc. Ant.* Second Series III (1866), 278; quoted by Crawford in *Long Barrows of the Cotswolds* (1925), 74.

⁵ *Long Barrows of the Cotswolds*, 125–128.

⁶ *Gents. Mag.*, LIX (1789), 392–393.

⁷ *Proc. Soc. Ant. Scot.*, LXIII, 140–149.

⁸ *Crania Britannica*, vol. II.

have been deposited in a crouching posture' may be explained on the score of adequacy of space in this instance.

The presence at West Tump Long Barrow¹ of a single intact crouched burial of a young female with a child on a semi-circle of flat stones at the furthest point of the chamber, which contained the remains of nineteen other individuals in a dismembered condition, can be interpreted by supposing that this, the first burial, had remained intact owing to its remote and prepared position.

The use of the British megalithic tombs for successive burials over a considerable period of time has been urged by various writers—notably Mr Lindsay Scott, his arguments being based mainly on the pottery stratifications observed during his excavations of chambered cairns in Western Scotland and in North Wales.² The Lanhill evidence detailed above supplies important confirmation of this view.

As regards the structural features of the passage and chamber at Lanhill, since these present no unorthodox details it will be sufficient to draw attention to a few relevant parallels.

The raising of the level of the passage roof to form an antechamber has been noted by Mr Hemp as an important characteristic of chambered tombs and he has also drawn attention to the fact that, both in his own excavations at Bryn Celli Ddu³ and in those of la Hougue Bie in Jersey,⁴ the ceremonial blocking filled the passage only, stopping short of the antechamber. It will be remembered that this feature was observed at Lanhill.

The sill which formed a dividing line between the antechamber and chamber is a relatively uncommon feature; one such seems to have existed in the Pole's Wood chamber referred to above, while the original illustration of the southern chamber at Rodmarton shows a sill occupying precisely the same position in relation to a porthole entrance as that at Lanhill.⁵ Such portholes occur likewise in the Cotswold Long Barrows at Norn's Tump, Avening, and at Belas Knap Chamber C.⁶

The portholes enumerated above are in each case formed of two opposed slabs of stone hollowed into a roughly semi-circular form on their inner edges. So far as can be judged from the curious engraving illustrating the account of Fairy's Toot, however, it would appear that the porthole entrance in this case was formed of a single perforated slab of stone.

REPORT ON THE NEOLITHIC SKELETONS

by A. J. E. CAVE, M.D.

The human remains from the sepulchral chamber of the Lanhill Long Barrow were carefully removed and forwarded to the Royal College of Surgeons' Museum for examination and report. They arrived in three separate osteological collections, as follows:—

- (1) The skull and skeleton of the last interment (No. 7).
- (2) A series of six skulls or crania individually labelled 'Lanhill 1-6,' representing the previous burials in the chamber.

¹ *Long Barrows of the Cotswolds*, 137-138.

² e.g., Rudh' an Dunain, Skye (*Proc. Soc. Ant. Scot.*, LXVI, 183-213); Clettraval, N. Uist (*ibid.*, LXIX, 480-536); Unival, N. Uist (unpub.); Pant-y-saer, Anglesey (*Arch. Camb.*, LXXXVIII, 185-228).

³ *Archaeologia*, LXXX (1930), 190.

⁴ *Bulletin Annuel, Soc. Jersiaise*, 1925, 209.

⁵ *Crania Britannica*, vol. II, Fig. 2 of Rodmarton article.

⁶ *Long Barrows of the Cotswolds*, 73 and refs. there given.

- (3) A vast collection of non-cranial bones comprising the mixed remains of at least half a dozen previous burials, whose skeletons had been crowded to the back of the tomb to accommodate the entrance of the last burial (skeleton 7).

An essential preliminary to report, therefore, was the sorting and identification of this mixed osteological collection, to determine the number, age, and sex of the individuals therein represented, and the relationship of such skeletons to the skulls 1-6. This lengthy business was satisfactorily accomplished—though no attempt could be made to allocate to individual skeletons the bulk of the ribs, the metatarsals, metacarpals, a pair of patellae, certain damaged vertebrae, and various comminuted fragments of long and flat bones.

The following persons are represented in the Lanhill material :—

- No. 1. A male of at least 50 years—lacking upper limbs.
- No. 2. A female, aged.
- No. 3. A male 30-40 years—lacking spinal column, pelvis, etc.
- No. 4. A child, 12-13 years.
- No. 5. A female, 30-40 years.
- No. 6. A male, about 30 years—extremely long-limbed.
- No. 7. A male, about 50 years—with old standing trauma of left elbow joint.
- No. 8. A male, adolescent, about 20 years—lacking skull and lower limb bones.

A detailed account of each individual skeleton is herein presented, followed by certain general conclusions concerning racial type, familial relationship, pathology, and the dental conditions encountered. Lists of available osteometrical data are also appended in each case.

DESCRIPTION OF SKELETONS

SKELETON No. 1.

A male, aged at least 50-60 years at death, and of an estimated stature of 5 ft. 4½ ins. or so.

Parts present : skull, mandible, 7 cervical, 10 thoracic, 3 (damaged) sacral vertebrae, a piece of the sacrum, both innominate bones, a fragment of the manubrium sterni, certain ribs (including the first pair), the right radius and ulna, both femora, both tibiae and fibulae, the left calcaneum, astragalus and scaphoid, and the right calcaneum and astragalus. All bones light and porous.

(a) *The skull* is typically male, with pronounced, though not excessive, mesially confluent supraorbital ridges, and with large, pneumatic mastoid processes. Lower parts of the coronal, and the hinder end of the sagittal, suture obliterated : a single, fairly large Wormian bone at the lambda. Post-mortem damage to both zygomatic arches, right orbit and nasal bridge. The cranium is long (dolicocephalic) and evenly contoured : from the moderately full and vertical brow region it widens progressively to a maximum bi-parietal breadth, and thence tapers more rapidly to the occipital region, the supra-inital portion whereof forms a gently prominent bulge. This bulge is slightly more marked on the left than the right side, an asymmetry suggestive of right-handedness during life. Frontal bosses are faintly developed, and there is incipient median keeling of the fronto-parietal portion of the vault (see pls. XVI and XVII, b, c, and d).

The facial skeleton is long (leptoprosope), with prominent nasal bridge, quadrilateral-shaped, medium-sized orbits, long and moderately wide nasal aperture, and a prominent anterior nasal spine. The otherwise sharp edge of the apertura pyriformis is deficient inferiorly. The zygomata are flattened laterally, the palate well arched and moderately large, and both the incisive and the canine fossae well developed. Subnasal prognathism is present in slight degree ; otherwise the skull is orthognathous.

'Rheumatic' change (osteo-arthritis) has affected both temporo-mandibular joints. The right mandibular condyle has undergone much atrophy, being flattened and distorted, and a corresponding change has affected the right eminentia articularis. The left condyle has suffered an even more severe atrophy, being worn down almost to the mandibular neck, whilst the left

glenoid fossa has suffered to a correspondingly extreme distortion, involving complete destruction of its eminentia articularis.

Of the maxillary teeth, the right central incisor has been lost (not ritually extracted) some time before death. Though its socket has healed the healing is imperfect, owing to the septic condition of the mouth generally. Parodontal disease has been severe and has caused the loss of both 3rd molars, besides exposing the roots of the remaining molars, R. 1st and 2nd and L. 1st. The sockets of all the maxillary teeth reveal evidence of rarefaction due to chronic sepsis ; an apical abscess has eroded externally above the right canine, whilst another has burst through above the 2nd L. premolar.

The 1st and 2nd left molars are obliquely worn from the difficulties of 'bite' consequent upon the arthritis involving the temporo-mandibular joints.

Of the mandibular teeth the 1st and 2nd L. molars, and the R. premolar, 2nd molars 1st and 2nd, have all been shed from parodontal disease at varying dates before death. The teeth of the left side were lost first, and there is still evidence of residual infection in the greatly absorbed alveolar bone of the jaw. The loss on the right side is more recent ; the 1st molar was shed first, followed at a later date by the 2nd premolar and 2nd molar. The sockets of these last two teeth have never completely healed, their present pathological state testifying eloquently to the severity of the dental disease from which this subject suffered so chronically in later life ; for years before death his whole mouth must have been in an intensely septic condition.

(b) *The axial skeleton.* All the vertebrae present manifest some pathological change—mainly that spinal form of osteo-arthritis loosely, if conveniently, termed 'rheumatism.' The vertebral bodies reveal destruction of their cranial and caudal surfaces, whilst the lower thoracic and lumbar members bear excavations due to herniation of the nucleus pulposus of the intervertebral discs—the whole condition suggesting great loss of elasticity in the backbone with considerable limitation of movement. There is incipient osteophytic 'lipping' of the lower thoracic vertebrae, and a similar but much more intensive, deformation of all the cervical vertebral bodies. The neural arches have also suffered greatly : many of their superior and inferior articular processes are pitted, eburnated and 'mushroomed'—whilst the majority of the costo-vertebral diarthrodial joints are similarly affected.

The fragment of manubrium present indicates that the sterno-clavicular joints were healthy.

The first ribs manifest an arthritic condition of their heads : they were co-ossified with the sternum. Each has a prominent Lisfranc's tubercle, a well-marked sulcus subclaviae, and, inferiorly, a distinct sulcus diagonalis for the first intercostal nerve. Of the remaining ribs attributable with certainty to this skeleton, all show destructive pathological changes involving their heads and tubercles (*i.e.*, 'rheumatism' of the costo-vertebral and costo-transverse articulations) ; otherwise they display the features anatomically characteristic of a muscular adult male subject.

(c) *Upper limbs.* Only the right forearm bones remain—the radius minus its head, and the ulna lacking its distal end. The bicipital tuberosity of the former is unduly roughened and prominent (age-change) : both bones are of slight and graceful build ; both elbow and wrist joints appear healthy.

(d) *Lower limbs.* Both innominate bones (incomplete) exhibit frankly male characters, as well as that exaggeration of muscular and ligamentous markings indicative of advancing age.

The femora are both damaged at proximal and distal ends. Each is of graceful build, with well developed linea aspera, gluteal ridge and trochanters : each is markedly platymeric. The upper cervical tubercle (for part of the ilio-femoral ligament) is exuberant in each bone : age changes are apparent in the region of the trochanters. Both hip and knee joints show clean, healthy articular surfaces ; the distal end of each femur is well-modelled, and suggestive of a wide free range of movement during an active life.

The tibiae are decayed at their superior extremities : each bone manifests marked platycnemia, well defined secondary markings, and a 'squatting facet' inferiorly from contact with the astragalar neck.

The calcanei are of moderate size, with extraordinary development of their peroneal tubercles. The astragali are medium-sized, clean cut and healthy, and their necks reveal a forward extension of the trochlear articular surface. The osteology of the ankle region suggests a previous considerable functional activity.

OSTEOMETRICAL DATA. SKELETON No. 1.

<i>Skull :</i>	mm.	<i>Femur (L) :</i>	
Max. length ..	187·5	Max. length 424
Biparietal breadth ..	136		
Min. front. diam. ..	92		
Auricular ht. ..	124	<i>Indices :</i>	
Bizygomatic width ..	120 approx.	Cephalic .. = 72·5	Dolichocephalic
Bimaxillary width ..	102·5	Facial .. = 58	Leptoproscopic
Basion-prosthion ..	95	Nasal .. = 50	Mesorhine
Basion-nasion ..	102	Orbital .. = 88	Mesosome
Nasion-prosthion ..	70	Gnathic .. = 93·1	Orthognathous
Nasal aperture, ht. ..	54	Mean platymeric = 84·5	
Nasal aperture, width ..	27	Mean platycnemic = 54·5	
Orbital ht. ..	33		
Orbital width ..	37·5		

SKELETON No. 2.

An elderly (senile) female of about 70 years, of an estimated stature of 5 ft. 3½ ins.

Parts present : skull, mandible, 3 cervical and 5 lumbar vertebrae, two sacral fragments, the entire sternum, right clavicle, both scapulae (incomplete), portions of both innominate bones, the right and left humerus, radius and ulna, the right and left femur, tibia and fibula, both calcanei, both first metatarsals, and some fragmented ribs.

(a) *The skull.* Much of the base (the whole cranial floor anterior to the foramen magnum) has been lost, and the vault has suffered in consequence a certain degree of post-mortem lateral compression : the right temporal bone has undergone some dislocation medially, so that the mandible cannot now be articulated properly. Evidence of this post-mortem trauma is seen in the depressed condition of the right zygomatic arch.

Senile changes are present in both the sutures and maxillae. The coronal suture is largely obliterated, though its right moiety is still faintly discernible, whilst obliteration is taking place in the sagittal and lambdoid sutures. There is marked absorption of both maxillary and mandibular alveolar borders, this absorption being more extreme in the upper jaw, more particularly on the left side : the bony absorption due to age has been augmented by long-standing dental sepsis (*vide infra*). Female sexual characters obtain in the vertically disposed brow region, in the faint supra-orbital ridges, in the small infantile mastoid processes, and in the general absence of pronounced secondary markings on vault and base (see pls. XVIII and XIX).

The vault is long and of essentially the same configuration as skull No. 1. The brow region continues without much interruption into the line of the nasal bridge (an approximation towards the 'Grecian profile') : there is a slight post-coronal depression, and slight flattening of the vault in the pre-lambdoid region : supra-ainial occipital bossing is characteristically pronounced. Tentative evidence of right-handedness is seen in the slightly greater projection of that part of the occipital covering the left occipital pole of the brain.

The facial skeleton is wide, with well marked canine fossae, small horizontally-disposed, rectangular orbits, and a relatively broad nose. The maxillary alveolar processes are absorbed almost to the level of the palate. Both nasal bridge and anterior nasal spine are prominent. At death, the maxillary right canine, and the right premolars alone remained *in situ*. The molar region on each side has been the site of chronic inflammatory mischief, due to primary dental (or paradental) sepsis. The mandibular condyles are roughened and slightly arthritic; the lower left canine and left 2nd premolar alone remain in place. Not long before death the 3rd molar had been shed, its infected socket never healing completely. The alveolar margins of the mental and right mandibular regions are the seat of long-standing infection : there is marked necrosis around the right canine socket, where the inferior dental canal has been opened into. The inference is that this individual suffered severely from an intense neuritis of the mandibular nerve.

(b) *Axial skeleton.* The three cervical vertebrae (4th, 5th and 6th) present manifest senile changes : the intervertebral discs between the 5th and 6th, and the 6th and 7th, vertebrae must

have completely disappeared : the surfaces of the relevant vertebral bodies are much pitted and eroded, though the diarthrodial joints of their neural arches remain normally healthy. The five lumbar vertebrae are the seat of extensive pathological change. All exhibit marked osteophytic lipping of their bodies, the first three of which have undergone some anterior atrophy. In addition the dorsal articular facets of the last two lumbars and of the sacrum reveal great architectural destruction : the articular areas are pitted, eburnated and abnormally exaggerated, whilst their enclosing capsular ligaments have undergone extensive ossification. Actual ankylosis, however, has been avoided, though lumbar, and lumbo-sacral, mobility must have been impaired.

The fragmentary sacrum shows the osteophytic distortion of age ; its characters are those of the female.

The sternum is complete : manubrium and gladiolus remain distinct, though the xiphisternum has coalesced with the latter. Sterno-costal articulation was normal.

(c) *Upper limbs.* The scapulae are fairly large, with vigorous muscular markings upon their axillary borders. Both bones are of the sharp 'triangular' type ; both lack the spine and acromion, and each has its coracoid process but moderately roughened by ligamentous attachments.

The single (right) clavicle present demands no special notice.

Of the humeri, the left has suffered detachment of its head. Proximal and distal articular surfaces of both bones are well formed and free from all pathological change. The tubercles are well developed as are the lips of the bicipital groove, the deltoid tuberosity, and the supracondylar ridges. About its middle third, each shaft is bowed slightly outwards.

The forearm bones, like the foregoing, are gracefully built. Elbow and wrist joints are healthy. Age changes are seen in the ossification involving the tripiceps insertion on each ulna, and to a much less degree, the bicipital tuberosity on each radius.

(d) *Lower Limbs.* Each innominate bone is incomplete. The right bone is frankly female in character, with an extremely deep pre-auricular sulcus : acetabulum and auricular articular areas are healthy : there is ossification into the posterior sacro-iliac ligament, and into the aponeuroses attached to the iliac crest.

The femora are small-headed, platymeric and of long and graceful configuration. Articular surfaces remain healthy. There is generalized senile exaggeration of the linea aspera, gluteal ridge, spiral and intertrochanteric lines, and some ossification of the ilio-psoas tendons as well as of those attached to the great trochanter. Muscular and ligamentous markings at the distal end bespeak a great range of functional activity during life.

The tibiae are remarkably platycnemic. Each is strongly yet delicately built, with clean cut, healthy upper and lower articular extremities. 'Squatting facets' are present inferiorly.

The fibulae are most vigorously moulded by their contiguous and attached muscles : senile osteophytic outgrowth marks the upper end of each bone.

OSTEOMETRICAL DATA. SKELETON No. 2.

<i>Skull :</i>	<i>mm.</i>	<i>Long Bones :</i>	<i>L.</i>	<i>R.</i>
Max. length ..	188	Femur max. length ..	440	?
Biparietal breadth ..	135	Tibia " "	348	347
Min. front. diam. ..	90	Fibula " "	341	?
Auricular ht. ..	113	Humerus " "	?	314
Bizygomatic width ..	128	Radius " "	247	247
Bimaxillary width ..	96	Ulna " "	264	264
Basion-prosthion ..	?			
Basion-nasion ..	?			
Nasion-prosthion ..	58	<i>Indices :</i>		
Nasal aperture ht. ..	44	Cephalic = 72 approx.	Dolichocephalic	
Nasal aperture width ..	25	Facial = 46.4	Chamaeprosopic	
Orbital ht. ..	28	Nasal = 57	Platyrhine	
Orbital width ..	38	Orbital = 73	Microseme	
		Gnathic = ?	(Orthognathous)	
		Mean platymeric = 83		
		Mean platycnemic = 51		

SKELETON No. 3.

The incomplete skeleton of an adult male, aged 30–40 years, of an estimated stature of about 5 ft. 8 ins.

Parts present : skull (incomplete), mandible, 6 very damaged vertebrae, left clavicle and scapula, right ditto, left humerus and ulna, right humerus, the right and left femur, tibia, fibula, calcaneum and astragalus.

(a) *The skull* is depicted by pls. xx and xxi. Much of the left side of the vault is missing and the remainder has suffered considerable post-mortem damage. Male characters are seen in the confluent supraorbital ridges and the relatively large (right) mastoid process. The vault is perhaps more evenly globular in norma verticalis than that of Nos. 1 and 2, and is rather flatter than either of those in its lambdoid region. There is bossing of the supraindian portion of the occipital, some suggestion of median keeling, and a minimal development of secondary muscular markings. The sutures remain open save for the inferior portions of the coronal suture : there is asymmetry of sutural pattern at the lambdoid, due to the local occurrence of Wormian ossicles. The (right) mastoid foramen is extremely small. Intracranially, the vascular meningeal pattern is well marked : as are the Pacchionian depressions and the imprints of the temporal convolution of the brain. The right lateral sinus groove is surprisingly small.

The facial skeleton is long, with narrow, prominent nasal bridge and very narrow anterior nares : the edges of the apertura pyriformis are everywhere sharp and the anterior nasal spine is pronounced. Subnasal prognathism is present in slight degree in an otherwise orthognathous face. The orbits are small, rectangular, and sharp-edged ; the canine fossae are pronounced.

The palate is of good size, and well arched. At death a full complement of both maxillary and mandibular teeth was present. The remaining maxillary teeth (premolars and molars) show crown attrition in moderate degree, but no trace of dental or paradontal disease, both teeth and alveoli being remarkably sound and healthy. The 'bite' was of the edge-to-edge variety. Bilaterally molars 1st and 2nd have undergone some degree of oblique rotation. Supernumerary teeth are present. An unerupted fourth molar lies immediately behind and above the right 3rd molar, in the maxillary tuberosity. On the left side, in the corresponding position, two extra teeth are enclosed in distinctly separate alveoli, constituting a 4th and 5th molar respectively. These supernumerary teeth are small and stunted and are figured separately (pl. xxix, fig. 3 e) : they would probably never have erupted.

The mandible has the characters of its age and sex : the ascending ramus joins the body at right angles, and condyle and coronoid lie on the same level.

(b) *Axial skeleton.* Of the vertebrae but 4 thoracics and 2 lumbars occur—all considerably damaged. Of these the 12th thoracic manifests some ossification of its costo-vertebral joint, whilst the 2nd lumbar vertebral body is compressed ventrally, and deformed by extensive osteophytic outgrowth from both cranial and caudal surface.

(c) *Upper limbs.* The scapulae are of good size, with curvilinear vertebral borders : their acromia and coracoids bear vigorous secondary markings. The deltoid and subscapularis muscles appear to have been extremely active functionally.

The clavicles are slender and graceful—almost 'effeminate'—but their secondary (muscular and ligamentous) markings are quite pronounced. The sterno-clavicular, acromio-clavicular and shoulder joints are all healthy.

The humeri are gracefully fashioned bones, of which the right lacks its head. In both bones the ridges for the insertions of the pectoralis major and deltoid muscles are extremely well developed : the markings on the right bone surpass those of the left, and thus argue for right-handedness in an active and vigorous arm.

The musculo-spiral groove is pronounced in both bones, as is the lateral supracondylar ridge : each distal articular end is well formed and the elbow joints are healthy.

The single (left) ulna present is long and gracile, with clean-cut articular surfaces and a minimal display of secondary markings.

(d) *Lower limbs.* The femora are strong, well curved bones, with moderate-sized heads, well-developed trochanters, and well-formed distal ends ; the linea aspera is not unduly pilastered. The upper third of each shaft is remarkably flattened antero-posteriorly (platymeric),

so that this region of the bone bears a well-marked rounded medial border and a sharper convex lateral border. Dorsally, between this curved lateral border and the linea aspera is an inch-long shallow fossa, which extends upwards to just below the small trochanter. At this latter level, the gluteal ridge expands into a definite third trochanter. Hip and knee joint articular surfaces are well formed and healthy. Despite its gracile nature, the femur gives every impression of having been extremely strong and active.

The tibia lack their proximal, and are decayed at their lower ends. Each is platycnemic and of gracile build. The distal extremities bear witness to the habitual adoption of the 'squatting posture' during life.

The fibulae are complete, with normal articular surfaces. Each bone is strong and well (though not excessively) marked by its attached muscles.

The astragali and calcanei are of moderate size. All their articular surfaces are of good shape and condition, suggesting good functional mobility of the living foot and ankle joint.

OSTEOMETRIC DATA. SKELETON No. 3.

<i>Skull :</i>	mm.	<i>Long bones :</i>	<i>R.</i>	<i>L.</i>
Max. length ..	181	Clavicle	143	141
Biparietal breadth ..	135 (estimated)	Humerus	—	287
Min. front. diam. ..	92	Radius	—	—
Auricular ht. ..	122 (prob. less)	Ulna	—	248
Bizygomatic width ..	135	Femur	428	431
Bimaxillary width ..	108	Tibia	—	—
Basion-prosthion ..	—	Fibula	335	336
Basion-nasion ..	—			
Nasion-prosthion ..	72	<i>Indices :</i>		
Nasal aperture, ht. ..	55	Cephalic .. .: = 74.5	Dolichocephalic	
Nasal aperture, width ..	21	Facial .. .: = 53	Leptoprosopic	
Orbital ht. ..	30	Nasal .. .: = 38	Markedly leptorrhine.	
Orbital width ..	38	Orbital .. .: = 79	Microseme	
		Gnathic .. .: =		
		Mean platymeric .. = 87		
		Mean platycnemic .. = 69		

SKELETON No. 4

The skeleton of a child (? sex) aged about 12-13 years.

Parts present : skull (incomplete), mandible, axis and 7th cervical vertebrae, 7 thoracic vertebrae, the 2nd, 3rd, 4th and 5th lumbar vertebrae, 1st and 2nd sacral vertebrae, right clavicle and scapula, the humeri, radii and ulnae, the right 1st and 3rd metacarpals, a thumb proximal phalanx, both innominate bones, the femora, tibiae and fibulae, both calcanei and astragali, and the left scaphoid, internal cuneiform and cuboid.

(a) *The skull* (pls. XXII and XXIII) lacks the right half of the face and palate, much of the right frontal and parietal bones, a little of the occipital and the right ramus of the mandible. In addition, a large frontal-parietal fragment of the left side of the vault is missing. The isolated right malar bone persists.

The skull is thin-walled, very long, high and narrow, with a smooth vertical forehead bearing incipient supraorbital processes and a symmetrical, evenly-rounded supra-aural occipital region. Its sutures are all open : a tiny Wormian ossicle occupies the lambda. The small mastoid processes are well enough developed for a child of this age. The spheno-occipital synchondrosis remains widely patent ; the sphenoidal and maxillary air-sinuses are spacious ; the pituitary fossa is long and shallow and the foramen magnum is relatively large.

The face is small (infantile) with a narrow, sharp-edged apertura pyriformis and a relatively large (left) orbit, whose rim is everywhere thin and sharp. The malar is flattened laterally ; incisive and canine fossae are pronounced. The lower part of the forehead continues uninterruptedly into that of the moderately prominent nasal bridge (an approximation to the 'Grecian' profile).

The persistent (left) moiety of the palate is well arched. At death the permanent maxillary incisors, canine, premolars and 1st and 2nd molars had all erupted, the last-named but very recently. The 3rd permanent molar occupies its sac in the posterior surface of the maxilla. In the mandible all the teeth back to and including the 1st molar are long erupted : the right 2nd molar has completed about half of its extra-alveolar growth, but the corresponding left tooth is still in process of cutting the gum. All the upper and lower teeth are well formed and healthy, as are the alveolar borders which bear them.

(b) *Axial skeleton.* The axis vertebra still retains a space for the first intervertebral disc between its body proper and the odontoid ; its transverse and spinous epiphyses are ununited. The 8 thoracic vertebrae manifest traces of the neuro-central suture ; they lack the epiphyses for spinous and transverse process, and also for cranial and caudal body-surfaces. The 4 lumbar vertebrae present likewise lack spinous, transverse and body-epiphyses. The 1st and 2nd sacral vertebrae are still discrete, with intervening intervertebral disc ; they want transverse and body epiphyses : the neural arch of the 1st is still unclosed.

(c) *Upper limbs.* The single (right) clavicle lacks sternal and acromial epiphyses : it displays an emphatic pectoral muscle attachment and a faint trapezoid ridge. The corresponding scapula has a curvilinear vertebral border, without epiphysis : the acromion is missing and the immature coracoid is independent of the glenoid region.

The humeri are represented by their shafts only. Their pectoral and deltoid muscle insertions are pronounced, more especially on the right bone, whose shaft is thicker and distinctly convex laterally in the region of the deltoid tuberosity—an argument in favour of right-handedness.

Both radii and ulnae are similarly represented by their shafts alone. They are delicate, well-shaped bones, typical of their age. The thumb metacarpal lacks its basal epiphysis, and the 3rd metacarpal that for its head.

(d) *Lower limbs.* Each innominate bone consists of two pieces—(i) the detached ilium (lacking epiphyses for crest and anterior inferior spine) and (ii) a pubo-ischial element, comprising pubis and ischium confluent by their conjoint rami, but discrete at their bodies (=acetabular ends). A space remains for the triradiate cartilage of the hip joint. The epiphyses for ischial tuberosity and pubo-ischial rami are wanting. The auricular surface of the ilium is well formed : in front is a distinct pre-auricular sulcus.

The platymeric femora are well arched sagittally : each bone lacks capitular and trochanteric epiphyses : the left lower epiphysis is alone present. Secondary markings on the shaft are well marked for a femur of this age (12–13 years). An incipient third trochanter is present on both bones. The lateral border of each femoral shaft is, in its upper fifth or so, sharp-edged and convex laterally : on its dorsum, between this sharp lateral edge and the linea aspera, lies a long shallow fossa.

Each tibia comprises three elements—shaft, proximal and distal epiphyses. Each shaft has a slight medial curvature : each is platycnemic, and bears, dorsally, immediately above the oblique line, a coextensive broad furrow, presumably for the insertion of the strong fleshy fibres of an active and extremely well-developed popliteus muscle. The articular surfaces for knee and ankle joints are, like all the remaining diarthoses in this skeleton, well formed and free from all traces of disease.

The fibulae, represented by their incomplete shafts, lack their upper epiphyses : they bear vigorous muscular impressions.

Ankle- and tarsal-joints are well formed. Faint 'squatting facets' occur reciprocally on astragalar neck and antero-inferior aspect of inferior tibial epiphysis.

The calcaneum lacks its posterior epiphysis. There is nothing noteworthy about the remaining tarsalia.

OSTEOMETRIC DATA. SKELETON No. 4.

<i>Skull :</i>	<i>mm.</i>	<i>Indices :</i>	
Max. length ..	190	Cephalic .. = 69.5 approx.	Markedly dolichocephalic
Biparietal breadth ..	132 approx.	Facial .. = 61 approx.	Markedly leptoproscopic
Min. front. diam. ..	—	Nasal .. = 45 approx.	Leptorhine
Auricular ht. ..	121	Orbital .. = 91	Megaseme
Nasion-prosthion ..	61	Gnathic .. = 95.8	Orthognathous
Basion-prosthion ..	88	Mean platymeric = 80 approx.	
Basion-nasion ..	92	Mean platycnemic = 68.5	
Apertura pyriformis ht. ..	47		
Apertura pyriformis width ..	21 (estimated)		
L. orbital ht. ..	32		
L. orbital width ..	35		
Bizygomatic width ..	100 (estimated)		
Bimaxillary width ..	82 (estimated)		

SKELETON No. 5.

An adult female, aged 30-40 years, of an estimated stature of 4 ft. 11 ins.

Parts present: calvarium, lower mandible, complete vertebral column, manubrium sterni, many ribs (including first pair), both clavicles and scapulae, the humeri, radii and ulnae, the femora, tibiae, fibulae, patellae, astragali and calcanei, the left innominate bone and the greater part of its fellow.

(a) *The skull:* Represented by the lower mandible and the calvarium only, *i.e.*, the upper ends of the nasals, practically the entire frontal, both parietals, most of the supra-inial occipital, and the upper part of the right squamous temporal. The coronal suture is obliterated where covered by the temporales muscles, and is completely closed elsewhere: the sagittal suture is similarly closed and in process of obliteration in its penultimate inch or so: the lambdoid suture is well closed.

The brow is low, vertical and typically female: its profile continues uninterruptedly into that of the root of the nasal bridge. The remaining upper rim of the (right) orbit is sharp-edged. The frontal bone is slightly asymmetrical (? result of grave pressure), but a normal (anatomical) asymmetry affects the smooth, rounded bulge of the supra-inial portion of the occiput, an asymmetry due to a relatively greater backward projection of the left occipital cerebral pole, and not infrequently correlated with right-handedness. The vault is distinctly depressed along the sagittal suture at the obelion, where a broad shallow groove separates the parietal eminences. This cranium is broader generally than the preceding specimens, its cephalic index falling within the limits of mesaticephaly. The (right) mastoid process is well developed: its digastric fossa is relatively large and its mastoid foramen absolutely so. The lineae temporales are faint and the superior curved line of the occipital is moderately pronounced (see pl. xxiv).

The mandible is well formed and complete (pl. xxiv). Its body (horizontal ramus) is long and graceful with a prominent triangular mental (chin) region. The ascending ramus is disposed at right angles to the body: its condyle and coronoid process lie on the same level, separated by a shallow sigmoid notch; its marking for the attachment of the M. temporalis is extremely well developed; those for the masseter and internal pterygoid muscles are prominent though not unduly so: the mandibular angle itself is rounded. The mental foramen is situate nearer the lower than the upper (alveolar) border of the bone: the genial tubercles, mylo-hyoid ridges, digastric and submaxillary fossae are all well marked.

A full complement of excellent healthy teeth was present at death—since when the left premolars alone have been lost. The teeth are of good shape and size, and manifest neither overcrowding nor any sign of caries, abscess or paradental disease. All (save the 3rd molars) are crown-worn to some degree: this attrition is maximal on the 1st molars, whose cusps are worn flat as are the occlusal surfaces of the incisor teeth, indicating an 'edge-to-edge bite.' The

3rd molars are fully erupted : they attain the same height as the 2nd molars, though a trifle smaller in general size. Each third molar bears an extra cusp—a tiny adventitious elevation on the postero-mesial aspect of its crown.

(b) *Axial skeleton.* The vertebral column is complete, and of normal numerical constitution (=C. 7, Th. 12, L. 5, S. 5) : the 1st coccygeal vertebra is fused with the sacrum. The cervical, lower dorsal and lumbar regions are much affected by osteoarthritic change. In the neck this affects vertebral bodies 2–6 inclusive, and almost all the diarthrodial articulations of the successive neural arches down to and including Th. 1. The articular processes involved are roughened, pitted or eburnated, and much splayed and distorted : their enclosing capsular ligaments have in many cases suffered a partial ossification.

The left diarthrosis between C.V. 2nd and 3rd is much distorted and its mobility lost through intensive capsular ossification : the corresponding joints on the right side between C.V. 3rd, 4th, 5th and 6th are similarly grossly disorganised ; the left diarthrosis is below C.V. 7th and Th. V. 1st is mildly diseased.

Thoracic vertebrae 8th–12th, and lumbar vertebrae 1st, 4th and 5th, manifest a moderate degree of osteophytic lipping of their bodies, though their neural arch joints, like their costovertebral, remain healthy enough.

The sacrum, typically female in character, is slightly roughened and pitted on its upper aspect. Its auricular surface is well formed and healthy ; below this is a deep sulcus, and behind it an enormous fossa, for the attachment respectively of powerful inferior and posterior sacro-iliac ligaments.

The ribs attributable to this individual are delicately fashioned, with a minimal manifestation of secondary markings : in the first rib the sulcus subclaviae is very faint and the scalene tubercle ill-defined.

The sternum is represented by the manubrium only, which displays female characters and shallow clavicular facets.

(c) *Upper Limbs.* The clavicles are almost perfect : each has marked impressions for the rhomboid, conoid and trapezoid ligaments, suggesting considerable functional activity during life.

The scapulae have straight vertebral borders : their secondary markings are not unduly pronounced.

Each humerus is perfect and vigorously fashioned. The bicipital groove is unusually wide inferiorly, with exaggerated inner and outer lips for the respective attachments of the teres major and pectoralis major muscles. Each deltoid tuberosity is extremely developed and bipartite, comprising two ridges—(i) a rough elevation below the lateral lip of the bicipital groove ; (ii) a convergent oblique rough prominence on the lateral aspect of the shaft, whose contour is thereby bowed markedly outwards in this region. The lower halves of the humeri are gracile and normal. Obviously the Mm. pectoralis major, latissimus dorsi, teres major, and deltoideus were all well-developed and subject to a full range of physiological employment, particularly in the right arm. This individual was certainly right-handed.

Of forearm bones, the right ulna alone is complete : the left lacks its distal end, as do both radii. All four bones are of slender, refined build ; their markings and the large (radial) bicipital tuberosities suggest great past functional activity.

(d) *Lower limbs.* Each innominate bone is typically female in all its characters. The auricular articular area is bounded below by a remarkably deep pre-auricular sulcus, and behind by a mountainous bony district providing security of attachment to powerful sacro-iliac ligaments. Secondary markings are minimal.

In conformity with their sex the femora are relatively short, shorter than those of the elderly female No. 2, than those of all the adult male skeletons, and indeed but little longer than the femora of the 13 year-old child, No. 4. Each femur is strongly curved sagittally, is moderately pilastered and is platymeric : each is small-headed (sex character) and presents vigorous linea aspera, trochanters and secondary markings.

The superior cervical tubercle on the anterior inter-trochanteric line is pronounced, as is the gluteal ridge : no third trochanter occurs but the flattening of the infra-trochanteric portion of the shaft gives its upper fifth or so a sharpish border, convex laterally.

Articular surfaces are smallish, healthy and indicative of a good and constant range of movement at hip- and knee-joints.

The complete and extremely platycnemic tibiae have well retroverted heads ; they are of graceful proportion and substantial build : their articular surfaces are well fashioned and healthy. The fibulae are complete and both are very well ridged and fluted by their active attached muscles. The two patellae are very small. The astragali and calcanei are small-made : the former bear 'squatting facets' upon their necks, and the latter are devoid of any recognisable peroneal tubercle.

OSTEOMETRICAL DATA. SKELETON No. 5.

<i>Skull :</i>	mm.	<i>Long bones :</i>	<i>R.</i>	<i>L.</i>
Max. length ..	175	Clavicular length	—	133
Biparietal breadth ..	134	Humeral	280	276
<i>Indices :</i>		Ulnar	236	—
Cephalic = 76.5 (mesaticephalic)		Femoral	382	381
Mean platymeric = 70.5		Tibial	328	328
Mean platycnemic = 61.5		Fibular	314	316

SKELETON No. 6.

A long-limbed adult male, aged 30 or thereabouts, of an estimated stature of about 5 ft. 8 ins.

Parts present : the mutilated cranium, left mandibular condyle, the incomplete vertebral column, some ribs, the clavicles and scapulae, both humeri, the right radius and ulna, the two innominate bones, and the femora, tibiae, fibulae and astragali. Some metacarpals and metatarsals may belong also, but are not considered.

(a) *The skull* lacks the right half of the facial skeleton and much of the right side of the frontal and sphenoid ; its vault bears two areas of post-mortem erosion, one involving the left half of the coronal suture, the other the left parietal eminence. The remaining supraorbital region is much eroded, preventing accurate estimation of maximum cranial length. The sutures are closed but unobiterated. The vault conforms in general characters to the previously described male crania, being long, narrow and pentagonal in configuration (pls. XXVI and XXVII). The brow region is full and vertical : there is distinct median keeling along the sagittal suture : the parietal eminences are prominent : the bulging supra-occipital is full and smoothly rounded, with the slight asymmetry suggestive of right-handed activity.

The missing supraorbital ridges were evidently fairly well developed : the (left) mastoid and styloid processes are substantial, the mastoids being of the pneumatic variety. The nuchal portion of the occipital is not very much marked by muscular attachments, nor are the lineae temporales and other secondary markings at all conspicuous. The mastoid foramina are tiny, and the parietal foramina absent. The sphenoidal sinus is capacious, involving the entire basi-sphenoid. Despite an extremely deep canine fossa the (left) maxillary air-sinus is likewise commodious : it excavates the entire body and alveolar process of the maxilla, and extends laterally to invade the malar bone.

The much mutilated face presents a small rectangular (left) orbit, the remnant of a fairly high and well-arched palate and a most pronounced canine fossa. The nose was presumably long and narrow.

The remaining teeth are the left upper canine, premolars and molars. All are healthy and normal, showing nothing beyond a slight attrition of their crowns. There is no trace of para-dental disease, and the (left) temporo-mandibular joint is perfectly healthy.

(b) *Axial skeleton.* The following vertebrae occur : the atlas, axis, 5th and 7th cervicals, 8 thoracics (including the 1st, 11th and 12th) all 5 lumbar and a 5-pieced sacrum showing incomplete fusion of its 1st and 2nd vertebral bodies. Many of the vertebral bodies are damaged or decayed, but none show the least sign of rheumatic, or other, disease : all are well-formed, with excellent articular surfaces suggesting a free range of vertebral and costo-vertebral mobility. The 5th lumbar vertebra is unilaterally sacralized : its left transverse process articulates diarthrodially with the 1st sacral vertebra (see pl. XXX, 6 e), over an oval area 20 mm. x 13 mm. The sacrum presents male characters.

The ribs exhibit no unusual features : all are strong and typical : the first rib lacks a definite sulcus subclaviae and a genuine scalene tubercle.

(c) *Upper limb.* The left clavicle is complete, the right deficient medially. Both are strong and powerful bones with enlarged sternal articular extremities, deep depression for the rhomboid ligaments, and a most vigorous development of conoid tubercles : secondary markings yield evidence of powerful deltoid, pectoral and subclavius muscles.

The scapulae, of good size, present curvilinear vertebral borders, which still retain traces of an epiphyseal line.

An anatomical variation—an adventitious epiphysis—occurs on that part of each scapular spine (so-called 'deltoid' tubercle) which receives the insertion of the trapezius muscle. Thus, a small, oval, half-inch long, scale-like epiphysis lies *in situ* here on the right bone, whilst the left bears, in the corresponding position, a tuberculated epiphyseal area. Secondary markings on both scapulae are very faint indeed.

The humeri are long, slender, but very powerful bones : the right has the greater length (by 6 mm.) and a greater width superiorly (by 2 mm.), and each presents very vigorous secondary markings. Articular surfaces are all healthy and suggestive of considerable functional activity.

The (right) radius and ulna are very long and gracile, with somewhat eroded proximal portions. The customary lateral curvature of the radius is exaggerated, but neither bone is unduly marked by muscles or ligaments.

(d) *Lower limbs.* The innominate bones are massive, vigorously marked and of male character. There remains in each a faint trace of the line of union of the epiphysis for ischial tuberosity and conjoint ramus, and still fainter traces of that for the iliac crest epiphysis. The sacro-iliac and hip joints are perfectly healthy.

The femora are extremely long and platymeric ; they are relatively straight with excellent articular surfaces and most vigorously-emphatic secondary markings. In each bone the neck is of good length, the greater and lesser trochanters pronounced (the former remarkably moulded by its attached muscles and tendons) and the upper cervical tubercle enormous. The linea aspera is not pilastered, but the strong gluteal ridge is raised above into a definite third trochanter. Between the gluteal ridge and the sharp convex lateral border of the superior fifth of the shaft is a narrow, rough-floored depression. A longer and smooth depression occurs on the anterior surface of the shaft in its upper third, between the prominent medial border of the bone and its middle. The lower third of the shaft is considerably flattened front and back ; the condyles are not unduly large. The various markings made by muscles, tendons and ligaments in the hip and knee regions bespeak lower limb musculature subjected habitually to active employment.

The tibiae are long, strong, well-marked and extremely platycnemic : their articular ends are well-formed, healthy and indicative of a free range of movement. 'Squatting facets' occur inferiorly.

The fibulae are complete : each is long, strongly-built and vigorously ridged and fluted by its attached musculature.

The well-built astragali bear 'squatting facets' on their necks : their configuration and ligamentous markings suggest great functional activity of ankle and mid-tarsal joints.

OSTEOMETRICAL DATA. SKELETON No. 6.

	mm.	<i>Long bones :</i>	R.	L.
Max. length ..	191 approx. (prob. more)	Clavicle, max. length	—	143
Biparietal breadth ..	135	Humerus max. length	331	325
Min. front. diam. ?		Humerus, upper end—width ..	48	46
Auricular ht. ..	116	Radius max. length	257	—
L. orbital ht. ..	29	Ulna " "	274	—
L. orbital width ..	38 approx.	Femur " "	474	477
<i>Indices :</i>		Tibia " "	388	397
Cephalic =70·6	Dolichocephalic	Fibula " "	374	371
Orbital =76·3	Markedly microsome			
Mean platymeric =73·5				
Mean platycnemic =61·7				

SKELETON No. 7.

A short-limbed male, about 50 years of age, and about 5 ft. 4 ins. in stature.

Parts present : skull, vertebral column, most of the ribs, the clavicles (incomplete) and scapulae, the humeri, radii and ulnae, some finger phalanges, both innominate bones, the femora, tibiae, fibulae, astragali, calcanei and tarsal scaphoids, some metatarsals and various toe phalanges.

(a) *The skull* is characteristically male and agrees remarkably closely in size, shape, sutural condition and general features with that of No. 1 (*supra*) (cf. pls. XXVIII and XXIX and pls. XVI and XVII). Both malar regions have suffered post-mortem damage, as have the walls of the nasal fossae.

The vault is long and narrow, with full, vertical forehead, distinct median keeling from brow to obelion, some slight prelambdoid flattening and a typically protuberant 'bossed' supra-occipital, manifesting that natural asymmetry associated with habitual right-handedness. (The median keeling is more pronounced than pl. XXIX c would suggest). The temporal lines and occipital secondary markings are very faint : the pneumatic mastoid processes are large and rough : the digastric fossae are moderate, the mastoid foramina large, and the glenoid fossae well-formed and healthy.

The facial skeleton presents confluent, fairly vigorous supraorbital ridges, a narrow high-bridged nose, small and rather rectangular orbits, moderate-sized incisive and deeply excavated canine fossae. There is slight subnasal prognathism. The malars are flattened laterally : sphenoidal and maxillary sinuses are capacious, and the medium-sized, well-formed palate is high and well arched.

A full dentition was present at death in both jaws : the right upper lateral incisor has been lost since. The 'bite' is mainly edge-to-edge, though there is slight protrusion of the upper over the lower central teeth when the mandible (which lacks the right condyle) is articulated. The teeth show considerable—but not excessive—crown attrition : the enamel has been eroded in the 1st and 2nd mandibular molars of both sides : the cusps of these teeth, like those of the upper premolars and 1st and 2nd molars, have been worn away.

The maxillary 3rd molars, though erupted, are malplaced and functionless. They lie in the bone at the level of the roots of their anterior fellows, facing backwards, instead of downwards (see pl. XXVIII b). All the remaining teeth in both upper and lower jaws are perfectly healthy, nor is there the slightest trace of paradontal disease.

The mandible lacks its left coronoid and its right condylar processes. It is a lightly-built bone with a long body, feeble muscle-markings, and a prominent chin region : it retains a normal complement of shapely, healthy teeth.

(b) *Axial skeleton.* All the vertebrae are present, *viz.*, 7 cervical, 12 thoracic, 5 lumbar, and a 5-pieced sacrum : the bodies of the lower cervical, and upper 6 thoracic, vertebrae are lacking. All the vertebrae present are smallish, of typical character and graceful build, without the least suspicion of osteoarthritic or other pathological change. The clean intervertebral and costovertebral joint surfaces indicate a free and ample habitual movement of the spine and ribs.

The ribs (many fragmented or incomplete) are very 'effeminate,' gracile structures: nevertheless their articular surfaces, tubercles and secondary markings are all emphatically developed ; the head of the 12th right rib (and the corresponding facet for it on Th. V. 12) shows some slight commencing ossification of the capsular ligament.

The sacrum presents male characters.

(c) *Upper limbs.* The clavicles are incomplete and somewhat eroded. Each is surprisingly slender and 'effeminate,' lacking that degree of secondary marking to be expected in an adult male bone.

The right scapula is complete, the left mutilated : both bones are of 'triangular' type, *i.e.*, present straight vertebral borders and taper rapidly to their inferior angles. The right bone is normal : it exceeds the left in length, breadth and in general robustness of its parts. The sub-normal development of the left scapula, and indeed of the corresponding humerus, radius and ulna, is a disuse-atrophy, the inevitable pathological consequence of the old-standing injury present in the left elbow joint and illustrated in pl. xxx, 7 e. The fixation and immobility of this joint, following traumatisation of the distal articular end of the growing humerus, rendered the left arm and forearm relatively useless, and its long bones still reveal the great wasting which affected this limb. Unfortunately, the damaged condition of the bones concerned precludes a precise mensural estimation of the differences in size of corresponding bones of the two sides, but these differences are strikingly apparent upon mere inspection.

The right (normal) humerus is stout and vigorous ; its tubercles, muscular prominences, and bicipital groove are all emphatically developed—the deltoid and pectoral ridges in particular : the corresponding elbow-joint is sound. The right ulna is present (as three fragments) and is broken away proximally : it is, however, well formed and moderately marked.

By comparison, the injured left humerus is half an inch or more shorter than the right : its head is distinctly smaller and its shaft everywhere smaller in all dimensions. Its distal end has suffered a crippling injury in childhood—the resultant permanent distortion of parts being depicted in pl. xxx, 7 e.

Analysis of the disorganised elbow region shows that the epiphysis for the medial epicondyle has developed normally, but that for the lateral epicondyle has been dislocated forwards and upwards. The epiphysis for the medial part of the trochlea has developed fairly normally with a minimal disturbance : but the epiphysis for the lateral part of the trochlea and the capitellum has been violently displaced upwards and forwards to lie in the coronoid fossa, where it has persisted as a stunted irregular mass of bone confluent with the distal end of the humeral diaphysis. The cause of this disaster was direct violence of some kind—probably a penetrating wound—and the consequent crippling must have been extreme. Though the ulnar sigmoid notch has opened out in an endeavour to provide some sort of passable joint, the attempt is a failure. The forearm must have been permanently flexed at an angle of 45° upon the upper arm, and though, in the skeleton, the ulna can be extended to an angle of about 90° it is not certain that such a range of extension was feasible during life, though extension was possible in some degree. The radial head has accommodated itself to the distorted contiguous surfaces of humerus and ulna and is grossly deformed ('mushroomed') in consequence. It would appear that the radial movements (supination and pronation) were fairly well preserved, a matter of no small importance to a patient handicapped by a fixed elbow joint.

(d) *Lower limbs.* The femora are shortish, powerful bones, well-curved and platymeric : each presents a third trochanter, a vigorously moulded great trochanter and an enormous cervical tubercle for the ilio-femoral ligament. The flattening of the upper shaft produces a convexity of its rather sharp lateral border : the linea aspera and other muscular markings are pronounced, though not excessively so : the condyles and adjacent regions are strongly yet delicately fashioned, and the knee surfaces are healthy.

The platycnemic tibiae have grace and strength of build : their secondary markings are emphatic and their articular surfaces well-formed and healthy. Each proximal tibial extremity suggests strong and active femoro-crural ligaments, whilst the distal extremity bears a 'squatting facet.'

The fibulae are remarkably ridged and fluted, with normal superior and inferior articular surfaces : their characters suggest a former habitual activity of the leg.

The tarsalia are of good size : each astragalar neck causes a 'squatting facet,' the calcaneal peroneal tubercle is minimal : the sulcus for the flexor longus hallucis muscle is pronounced, and the tendo Achillis appears to have been both active and powerful. All tarsal and metatarsal joints are of normal and healthy pattern.

OSTEOMETRICAL DATA. SKELETON No. 7.

<i>Skull :</i>	mm.	<i>Long bones :</i>	<i>R.</i>	<i>L.</i>
Max. length ..	191	Femoral length	401	401
Biparietal breadth ..	135	Tibial length	345	347·5
Min. front. diam. ..	96	Fibular length	327	331
Auricular ht. ..	120			
Bizygomatic width ..	120	<i>Indices :</i>		
Bimaxillary width ..	82	Cephalic .. =70·6	Markedly dolichocephalic	
Basion-prosthion ..	97	Upper facial .. =56·6	Leptoprosopic	
Basion-nasion ..	99	Nasal =50	Mesorhine	
Nasion-prosthion ..	68	Orbital .. =79·5	Microseme	
Nasal aperture, ht. ..	48	Gnathic .. =98 approx.	Orthognathous	
Nasal aperture, width ..	24	Mean platymeric =75·7		
Orbital ht. ..	31	Mean platycnemic =66·6		
Orbital width ..	39			

SKELETON No. 8.

An immature male, aged about 20 years, of an estimated stature of approximately 4 ft. 6 or 7 ins.

Parts present : the (incomplete) vertebral column, numerous ribs (including the first pair), the sternal gladiolus, the broken left clavicle and scapulae, the humeri, radii and ulnae, and both innominate bones. Of the skull no trace persists, unless some odd teeth accompanying the general osteological collection belong here, which is very doubtful. Possibly certain otherwise unplaced hand- and foot-bones may be attributed to this individual, but in the absence of any certain criterion of allocation they are omitted from consideration.

(a) *Axial skeleton.* The vertebrae present include 3 cervicals (the dorsal atlantal arch, the 6th and 7th vertebrae), 12 thoracic (the 5th and 6th wanting most of their bodies), the first 3 lumbar, a 5-pieced sacrum, and the independent 1st coccygeal vertebra. All vertebrae are typical in shape and characters, and free from all traces of disease. In the pre-sacrals, epiphyses for vertebral bodies and spinous processes are not yet fully coalesced. The sacral bodies are still discrete ; the laminae of the first three sacrals are confluent, but the last two neural arches retain their independence : the characters of the bone are definitely male.

The ribs belonging here are slender 'effeminate' bones with capitular epiphyses still incompletely united. On the first ribs the sulcus subclaviae is moderately pronounced, but here, as elsewhere, secondary markings are faint.

The sternal gladiolus reveals normal sterno-costal articulations. The first mesosternal segment shows traces anteriorly of its recent coalescence with the remainder of the bone.

(b) *Upper limbs.* The left clavicle is deficient medially. Its ligamentous markings (conoid tubercle and trapezoid ridge) are vigorously developed, as are the imprints of origin of the greater pectoral and deltoid muscles.

The scapulae have curvilinear vertebral borders and strongly moulded spines : they lack their acromion processes.

The humeri are stout, well-made bones : in each the distal end is completely ossified, but the composite epiphysis for the proximal end is still incompletely joined with the shaft. The tubercles and bicipital grooves are vigorously developed : the inner and outer lips of the latter are partly replaced by rough depressions for the fibres of the powerful teres major and pectoralis major muscles. The deltoid tuberosity is likewise very prominent. Distally each bone bears a normal articular area and shows vigorous secondary markings (lateral supracondylar ridge, impressions on epicondyles, etc.). The right bone is the more powerfully built ; it is 8 mm. longer than its opposite fellow ($R=230$ mm., $L=292$ mm.) and its upper end is some 4 mm. wider transversely ($R=47$ mm., $L=43$ mm.) whilst its secondary markings are more emphatically pronounced—all evidence indicating right-handedness.

Of the right forearm bones, the radius lacks its distal end and the distal ulnar epiphysis is incompletely united to its shaft. Both are slender but powerful bones, the ulna showing

considerable muscular moulding. The left radius and ulna are complete, with imperfectly united distal epiphyses : in build and markings they resemble their opposite fellows. Articular surfaces at elbow and wrist are well-formed and healthy.

The osteology of the upper limbs suggests a considerable functional activity with good amplitude of movement at the several diarthrodial joints.

(c) *Lower limbs.* These are represented by the innominate bones only. Each of these is complete, and unequivocally of male type. Acetabular and auricular (sacro-iliac) articular surfaces are perfectly healthy. The epiphysis for ischial tuberosity and conjoint ischio-pubic rami is in process of fusion, but the epiphyses for iliac crest and anterior inferior iliac spine are completely united—an order of union the reverse of that usually obtaining in modern pelvises.

OSTEOMETRICAL DATA. SKELETON No. 8.

	<i>R.</i>	<i>L.</i>
Humerus, length	230	292
Humerus, width upper end ..	47	43
Radius, length	—	224
Ulna, length	250	248

SKELETON No. 9.

A baby about 12 months old.

The material from the Lanhill Long Barrow contains, besides the bones of skeletons 1-8 a single, imperfect bone not referable to any of these. This bone, depicted in pl. xxx, 9, has been carefully compared with human and comparative osteological material in this Museum, and subsequently identified as the incomplete shaft of the right femur of a human infant. Though much shorter, it agrees in outline, configuration and proportions with the right femur of a 15-month baby in the Human Osteological Series here.

The most careful scrutiny of the various odd bony fragments and chips from the Barrow fails to reveal any further part of this baby's skeleton.

GENERAL CONCLUSIONS

RACIAL TYPE. The individuals interred in the Lanhill Long Barrow are all excellent examples of Sergi's 'Mediterranean' (Elliot Smith's 'Brown') race : they display a homogeneity of anatomical characters devoid of any discernible admixture of alien traits.

(a) *Stature.*—They were people of small stature, distinctly smaller than the average modern Briton (who is about 5 ft. 10 ins.). Of the adult males, two (Nos. 3 and 6), the tallest individuals in the group, have an estimated height of 5 ft. 8 ins., but two others (Nos. 1 and 7) attain no more than 5 ft. 4 ins. or so. This last figure is the approximate stature of the elderly woman (No. 2); the younger mature woman (No. 5) is even shorter—not more than 4 ft. 11 ins.

(b) *Colour.*—Whilst there exists no direct evidence as to skin-, hair-, and eye-colour in the Lanhill people, by analogy they were brunettes with swarthy skins, dark brown or black hair (either straight or wavy) and dark-coloured irides. It is probable, too, that their bodies were glabrous, and that the beards of their menfolk were thin and scant, best developed in their prominent chin region.

(c) *Crania.*—The skulls are of characteristic configuration. They are thin-walled, long and pentagonal or ovoid when viewed from above or behind : their supra-inial region protrudes as a rounded emphatic 'boss'; the brow is rounded, smooth and vertical;

supra-orbital eminences are but moderately developed, even in the men. The smallish, sharp-rimmed orbits are roughly rectangular in outline, with parallel upper and lower margins, and the malar regions are flattened laterally. The face is small, straight and narrow, with slight subnasal prognathism : the root of the bony nose is depressed and the nasal bridge moderately prominent : the nasal cavities are narrow and the anterior nasal spine particularly prominent. The canine fossae are emphatically pronounced ; the teeth are medium-sized and the bite is of the 'edge-to-edge' variety. The mastoid processes are pneumatic ; the accessory nasal sinuses (maxillary, sphenoidal, etc.), are extremely capacious. In female and adolescent skulls there is an approximation to the so-called 'Grecian profile,' *i.e.*, the profile of the brow continues uninterruptedly into that of the nasal bridge.

(d) *Habit*.—Presumptive evidence of right-handedness is seen in the particular form of natural asymmetry of the occiput—(the left moiety of the occipital 'boss' being displaced further posteriorly than its fellow) and in the general greater manifestation of muscular and other secondary markings upon the bones of the right arm and shoulder girdle. Where comparison is feasible (Nos. 5 and 6) there is, as anticipated, an absolute preponderance in length of the right humerus.

(e) *Skeleton*.—The symmetry of cranial form and the almost 'effeminate' gracefulness of the general skeleton is striking. The various bones are of smallish size : they reveal an excellent firm grain and texture, and a characteristic gracile architecture. Secondary markings, though readily discernible, are generally of minimal exuberance, and even where pronounced, do not mar the uniform harmony of skeletal structure and proportion. The articular ends of the long bones are characteristically neat and well-formed, suggesting, with their adjacent ligamentous markings, a constant and considerable employment and a full amplitude of movement during life.

Platymeria and platycnemia are pronounced throughout the series, and there is a concomitant (though less easily assessed) generalised flattening of the upper limb bones.

Hands and feet appear to have been small and delicately fashioned. The vertebrae and ribs are small-sized, of excellent osseous texture, and (save where diseased) of a characteristic neatness of build.

NOTE.—Detailed cranial analyses and comparative studies of individual skeletal elements have been purposely omitted for several reasons. First, the series is small and the condition of many of the bones present precludes all accuracy of measurement; secondly, the inclusion of long statistical tables, with their limited appeal to the specialist, would but unduly lengthen this Report without enhancing its intelligibility: thirdly, there is no question as to the racial type of the Lanhill material.

FAMILIAL RELATIONSHIPS. That the Lanhill Long Barrow skeletons (1-9) belong all to one distinct racial type (the Mediterranean) is sufficiently obvious from the foregoing. That, further, they represent the several members of one particular family group is equally obvious on various grounds. In one common grave are successively entombed four adult men, a youth of 20, an aged woman, another in the prime of life, a child of 12 and a year-old baby. This mixture of sexes and ages is significant : there is no question here of the ceremonial burial of a chieftain, or of slain warriors, or of attendants sacrificed at the entombment of a local king. The archaeological evidence shows that successive burials took place in the barrow, and there is nowhere any hint of sacrificial, cannibalistic, or other similar practices having been performed.

Moreover, a distinct family resemblance is anatomically apparent between certain members of this group, as a study of the cranial drawings will reveal. It is very possible, although no certainty can be reached on the point, that skulls Nos 1, 3 and 7 are those of brothers. The younger woman (No. 5) may well be the daughter of the aged female (No. 2), and further—though, again, no certain opinion is possible—it is quite likely that the youth of 20, the child of 12 and the year-old baby are her children. These suggestions are purely tentative : they are unsupported by any direct evidence, but are not contradicted by the general anatomical evidence.

Another curious piece of evidence indicating familial relationship is the frequency of Wormian ossicles at the lambdoid in these Lanhill crania. Thus No. 1 has a large (florin-sized) lambdoid Wormian representing morphologically an interparietal ; No. 3 shows a curious irregularity of lambdoid sutural pattern with a tiny Wormian in the hind end of the sagittal suture ; No. 4 has a tiny Wormian exactly at the lambda ; No. 5 is devoid of sutural ossicles, but manifests the attempted formation of two such in the left parieto-occipital suture ; No. 6 shows a tiny Wormian situated precisely at the lambda ; Nos. 2 and 7 reveal a normal lambdoid suture pattern.

ANATOMICAL.—Skeleton No. 6 shows the interesting and not infrequent anatomical variation of unilateral sacralization of the 5th lumbar vertebra. The condition is congenital and in this instance the sacralization is by diarthrosis and not by synostosis : it appears to have been wholly symptomless.

This same individual presents an unusual skeletal variation—adventitious epiphyses on the roots of the scapular spines.

Skeleton No. 3 manifests supernumerary maxillary molar teeth—a right 4th molar and left 4th and 5th molars. The 1st, 2nd and 3rd molars in this specimen show some oblique rotation, whilst the 3rd molars bear each a small supernumerary cusp.

Skeleton No. 1 has the mental foramen double bilaterally. Skeleton No. 8 (the 20-year adolescent male) reveals early fusion of the epiphysis for the iliac crest. In each innominate bone this epiphysis (usually the last to fuse) has already joined the rest of the bone, only the faintest traces of its epiphyseal line remaining : by contrast the epiphysis for ischial tuberosity and conjoint rami is still ununited, the epiphyseal line being here quite distinct. In modern pelvis, the ischial epiphysis precedes that for the iliac crest in order of union. The evidence of the pelvis of Nos. 5 and 6 appears to indicate a similar ossificatory pattern to that described for No. 8, the inference being that Neolithic and modern pelvis present certain minor differences in their mode of post-natal development.

ODONTOLOGICAL.—The Lanhill skeletons, so obviously representing members of one and the same family, are of extreme odontological interest. They dispose of prevalent fallacious notions which attribute a perfectly healthy dentition to earlier or ‘ primitive ’ peoples, for of five crania examined two (Nos. 1 and 2) present evidence of severe paradental disease, another (No. 3) manifests certain dental anomalies, whilst yet another (No. 7), though free from infective dental disease, shows malposition of the maxillary 3rd molars. Thus one skull only (No. 6) out of the five is free both from disease and dental irregularity.

No. 1 has suffered from marked paradental disease and apical abscesses : an (unassociated) severe osteo-arthritis of both his temporo-mandibular joints has drastically

modified the 'bite' and the form and size of the left upper premolars, which, themselves the site of rarifying paradental mischief, are reduced to abbreviated stumps, with an extreme linguo-labial obliquity of their occlusal surfaces. In other teeth crown-wear has been severe, the enamel being, in places, completely denuded.

The old woman (No. 2), has been the victim of an extensive pyorrhoea and has suffered greatly from a severe neuritis of the right mandibular nerve.

In No. 3, the supernumerary molars are but an interesting (and rare) odontological variation, indicating instability of the primitive tooth-band : the functional teeth are well formed and healthy (as are their sockets), presenting but a moderate degree of crown attrition. The remaining teeth in No. 6 are healthy, moderately worn, and set in perfectly clean, well-formed sockets. Crown attrition is again moderate in No. 7, wherein all alveolar bone is conspicuously healthy, but wherein the maxillary 3rd molars are mal-placed and functionless through lack of accommodation on the part of the alveolar process.

In all the above cases, the 'bite' is of the 'edge-to-edge' variety : there seems to be slight protrusion of the upper central over the lower central teeth in No. 7, but this point cannot be certainly determined since the mandible is damaged.

PATHOLOGY.—The pathological lesions present in the Lanhill material come under three headings—(1) dental ; (2) osteo-arthritis ; (3) trauma.

(1) *Dental disease* : (*vide supra*).

(2) *Osteo-arthritis*.—'Rheumatic' change, chiefly spinal and costo-vertebral, is present in three of the skeletons (Nos. 1, 2 and 5). In the male No. 1, there is generalised severe osteo-arthritis of the vertebral column involving both the bodies and the neural arches, and a correspondingly severe affection of the costo-vertebral joints. Spinal and costal mobility was seriously diminished and possibly considerable pain was suffered. A very destructive arthritis of both temporo-mandibular joints has profoundly distorted the glenoid fossae and the mandibular condyles, and has had a marked effect upon mastication and upon the form and wear of the teeth.

The old woman (No. 2) manifests senile osteoporotic changes in her backbone, with superadded atrophy and 'rheumatic' lipping of the lumbar vertebrae. The lumbo-sacral spine is severely crippled, the pathological change stopping just short of actual vertebral ankylosis. Pain was doubtless a symptom in this case also.

Specimen No. 5 (middle-aged woman) also suffered somewhat from generalised spinal 'rheumatism.' The pathological changes are more pronounced in the cervical spine and in the thoraco-lumbar region : the lowest four costo-vertebral articulations are also involved in an arthritis, though the remainder are healthy and functional. The neural arches have escaped destructive change, save in the neck, where their extreme distortion has involved certain of the posterior rami of the spinal nerves, presumably giving rise to chronic deep-seated pain.

(3) *Traumatic*.—As described above individual No. 7 suffered, in childhood, a crippling injury (? penetrating wound) of his left elbow-joint : the disorganisation of the elbow region, consequent upon epiphyseal injury, is depicted in pl. xxx, 7 e (q.v.) The left arm remained permanently acutely flexed at the elbow-joint throughout life ; flexion and extension were possible through a few degrees only, though pronation and supination were probably preserved in fair degree. The skeletal atrophy consequent upon such a

stabilisation of the arm is strikingly apparent in the subnormal development of the left clavicle, scapula, humerus, radius and ulna when compared with the corresponding bones of the opposite, sound limb.

Apart from the foregoing instances the Lanhill skeletons yield no evidence whatsoever of either ante- or post-mortem trauma. There is not the least suggestion of ritual tooth-extraction, of trephining, of cremation, or of the dismemberment of the corpse. Individual bones are nowhere marked by either human or animal agency : a few indeed have been recently broken during excavation or transport, but all other damage present is the natural deterioration due to time and the physical conditions obtaining in the grave.

The Lanhill family, obviously people of importance in their day, were buried, as they died, in their family sepulchre, their remains being thereafter undisturbed, save to accommodate later burials. The method of interment was uniform, and whatever funerary ceremonial was practised, it was accorded to both men and women and to young and old alike.