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THE HUMAN SKELETAL REMAINS FROM AMESBURY G51 BARROW, WITH SPECIAL REFERENCE TO THE CASE OF TREPHINATION AND ITS POSITION IN THE HISTORY OF TREPHINING IN BRITAIN

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The skeletal material received in the laboratory for study can be considered in four separate groups:

1. Broken and mixed bones re-interred by R. Colt Hoare in 1807.
2. Burial A, excavated by Paul Ashbee, and associated with a beaker.
3. Burial B, excavated by Paul Ashbee, found with a beaker.
4. Part of a skull showing clear evidence of trephination.

A. GENERAL REPORT

The Colt Hoare material

From a careful study of the bones and fragments for evidence of differencesin developmental age, sex, and robustness, it seems likely that there is a minimum of four individuals represented. One is possibly an adult female, two may well be adult males, and there are at least parts of one immature skeleton. Separation of the bones into four divisions was not possible in most cases. The bone from all parts of the site was generally strong and well preserved, but in some cases, there is slight to severe surface erosion. Fortunately, in the case of the trephination, the bone surface is in very good condition.

Very few fragments of skull were recovered, and clearly belong to more than one individual. These seem best separately detailed as follows:

a. Parietal fragment approximately 70mm x 55mm in size. Surface erosion.

b. Parietal fragment. About 60mm x 40mm. Some bone erosion.

c. Occipital fragment. 55mm x 40mm. Reasonable condition.

d. Small area of frontal, about 47mm x 34mm in size. The skull is thin and the metopic suture fully open. Immature.

e. Five small fragments; possibly three from parietals, one from a frontal, and one from part of an occipital.

f. A nearly complete upper palate, with the following dentition:

NP 8 | 7 6 5 4 ✗ 2 ✗ | ✗ ✗ ✗ 4 5 6 7 | NP 8

There is no evidence of oral pathology, except for a slight development of an external maxillary torus restricted to one side. In view of the fairly severe degree of M_1 and M_2 molar wear, the individual may have been in the age range 30 - 40 years.

g. Less well preserved palatal fragment. ✗ 3 4 5 6. No pathology was noted. M_1 attrition suggests an age between 25 - 35 years.

h. A mandible fragment with similar preservation to palate g., but with tooth size differences indicating that two individuals are represented. The dentition present is: ✗ 2 3 4 5 6 7 8 NP

There is no evident caries or other pathology, but post-mortem erosion obscures some detail. There is minor development of torus mandibularis. Dental attrition on M_1 and M_2 suggests an age in the range 30-40 years.

i. The anterior portion of a mandibular body, from one mental foramen to the other. There appears to have been tooth loss some time before death in the region $\overline{321/123}$

j. The only other comparable jaw material from Amesbury G51 were marked (G51) /66\ and /69\ (G51). The following details on them were recorded by Mrs C. Keepax in the Ancient Monuments Laboratory.

66. Part of a mandible as follows: $\overline{|4\ 5\ 6\ 7\ 8}$. Possibly abscess cavities below 4 and 5. A medium degree of calculus remains, and there is slight alveolar recession. Dental attrition suggests an age in the range 20–25 years. 69. Most of a mandible, as follows: $\overset{8}{oc}\ \overline{7\ 6\ 5\ 4\ 3\ 2\ 1|1\ 2\ 3\ 4\ 5}$

There is some evidence of occlusal caries and slight alveolar recession (? periodontal disease), but no calculus. Molar attrition suggests that the individual was in the age range 17–25 years.

Of the post-cranial skeleton, the bones were identified in batches as follows:

Post-cranial batch 1.

Complete Bones: Innominates (2 R & L). Sacrum (1) Sternum (1) Calcaneum (3R) (2L) Talus (1R) (2L) Patella (3) Tarsals (3) Metatarsals and Phalanges (15) Carpals (3) Metacarpals and Phalanges (29) Vertebrae (36)

Post-cranial batch 2.

Complete Bones: Femur (2 R & L) Tibia (2 R & L) Humerus (2 R & L) Radius (1 R) Ulna (1 L) Clavicle (1 L)

Post-cranial batch 3.

Fragments of: Femur (3 R) (3 L) (6 U) Tibia (4 R) (3 L) (4 U) Humerus (2 R) (3 L) Radius (3 R) (2 L) (3 U) Ulna (1 R) (3 L) (1 U) Clavicle (2 R) (1 L) Fibula (3 R) (4 L) (4 U).

Post-cranial batch 4.

Immature fragments: Femur (1 R) Tibia (1 R) (1 L) Humerus (1 L) Ulna (1 L) Radius (1) Ilium (1 R) Talus (1 L) Scapula (1). Possibly all belong to the same individual.

Post-cranial batch 5.

Fragments of: Innominates (2 R) (2 L) (2 U) Sacrum (2) Scapula (2 R) (1 L)

(2 U) Ribs (50).

Measurements and special abnormality seen on these bones may be listed as follows:

Right femur (1) Male.

(FeL_1) 480mm.(Stature 5' 9¼". Estimated by use of Trotter and Gleser regression formulae).

(FeL_2) 475 m.m.

(FeL_3) 456 m.m.

(FeD_1) 28.0)
(FeD_2) 34.1) 81.2 Platymeric index.

Marked linea aspera. Signs of bony "lipping" on articular surface of the distal condyles (Osteoarthritis). Slight "ulcerative" femoral neck anomaly.

Left femur (2) Male (? same individual as 1)

(FeL_1) 481m.m.(Stature 5' 9¼")

(FeL_2) 475 "

(FeL_3) -

(FeD_1) 27.3)
(FeD_2) 34.1) 80.1 Platymeric index

Femur fragment. 3. Male

(FeD_1) 26.0)
(FeD_2) 36.2) 71.8 Platymeric index.

Well marked femoral neck anomaly.

Femur fragment 4. Male

(FeD_1) 26.0)
(FeD_2) 31.5) 82.5 Platymeric index.

Fragment 5. Male

Extensive "ulceration" of the femoral neck.

Fragment 6. Male

Slight osteoarthritis at distal condyles.

Fragment 7. Male?

Slight arthritic deformity at distal condyles.

Right tibia (1) Male.

(TiL_1)	396 m.m.		(Stature = 5' $10\frac{1}{4}$")
(TiL_2)	391 m.m.		
(TiL_3)	372 m.m.		
(TiD_1)	40.0	60.0	Platycnemic index.
(TiD_2)	24.0		

Slight osteoarthritis at the condyles.

Left tibia (2) Male. Possibly same person as in (1)

(TiL_1)	384 m.m.		5' 9"
(TiL_2)	376 "		
(TiL_3)	365 "		
(TiD_1)	38.0	63.2	Platycnemic index
(TiD_2)	24.0		

Tibia fragment 3. Male

(TiD_1)	39.5	57.0	Platycnemic index
(TiD_2)	22.5		

Fragment 4. Male?

(TiD_1)	36.0	61.7	Platycnemic index.
(TiD_2)	22.2		

Right humerus (1) Male

(HuL_1)	337 m.m.	(Stature 5' $8\frac{1}{2}$")
(HuD_1)	23.4 m.m.	

(HuD_2) 19.1 m.m.

Left humerus (2). Male. Possibly the same person as in (1)

(HuL_1) 335 m.m. 5' 8½"

(HuD_1) 22.1 "

(HuD_2) 19.5 "

Fragment 3. Male

(HuD_1) 22.2 "

(HuD_2) 15.2 "

Fragment 4.Male?

(HuD_1) 20.5 "

(HuD_2) 18.0 "

Fragment 5. Male

(HuD_1) 23.0 "

(HuD_2) 19.0 "

Right radius. Male

(RaL_1) 262 " (Stature 5' 10")

Radius fragment 2. Male

Left (Fracture some time during life)

Left Ulna. Male

(UlL_1) 238m.m. (Stature 5' 3¾")

The Scapula

Of the two most complete, one left and one right, both display arthritic lipping at the margins of the glenoid cavity.

The Patella

One has minor arthritic change on the lateral margin.

The ribs

Some of the ribs display signs of osteoarthritis at the articular facets.

A hyoid

One hyoid with a fused cornua was identified.

The vertebrae

The vertebrae possibly make up two columns. The complete right and left innominate bones and the complete sacrum, plus the most complete vertebral column probably all belong to the same individual.

"Column I". Complete except for one cervical vertebra. Medium osteoarthritis of the 5th lumbar, with possibly slight involvement of the other four vertebral bodies. (Medium at posterior articular facets). Slight to medium arthritic change on the thoracics; some at the rim of the bodies but also at facets for the ribs.

Slight to medium joint change on the cervicals. Second and third cervicals ankylosed at the articular processes.

"Column 2". All the lumbars are present and all displayed extensive osteoarthritis at the 'rims' of the bodies.

Remains of six thoracics, but unfortunately it was not possible to determine with any certainty the degree of osteoarthritis because of their incompleteness.

There is a slight degree of osteoarthritis at the axis. The left transverse foramen is at least twice the size of the right.

Innominates

Right (1). Male. Signs of osteoarthritis at the acetabulum and at the upper border of the ilium.

Left (2) Male. Signs of osteoarthritis at the acetabulum and at the border

of the ilium. Innominates (1) and (2) may well belong to a single individual of about 35 ± 5 years.

Fragment 3. Male , osteoarthritis may be present at the acetabulum.

Fragment 4. Female? Signs of osteoarthritis at the acetabulum.

The sacrum.

Male (1). Extensive osteoarthritis at the rim of the body at the sacro-lumbar joint.

Male? (2). Slight to medium osteoarthritis at the rim of the body at the sacro-lumbar joint.

Female? (3). Slight to medium osteoarthritis at the rim of the body at the sacro-lumbar joint.

Beaker burial A.

The skeleton is generally in a good state of preservation, with most long bones complete. The skull, however, is a little broken and distorted in parts. This is clearly an adult male individual, possibly within the age range 25–30 years. The dentition is as follows:

$$\frac{8\ 7\ 6\ 5\ 4\ 3\ 2\ 1 \mid 1\ 2\ 3\ 4\ 5\ 6\ 7\ 8}{8\ 7\ 6\ 5\ 4\ 3\ 2\ 1 \mid 1\ 2\ 3\ 4\ 5\ 6\ 7\ 8}$$

There is no caries, tooth loss (ante-mortem) or apical abscessing, but between slight and moderate alveolar recession (? periodontal disease). There is medium calculus and some degree of tooth rotation at $\frac{32 \mid 23}{43 \mid 3}$.

In the case of non-metrical traits, there are no wormian bones, no parietal notch bones, no metopism, no tori, no epipteric bones, and normal spheno-parietal articulations.

Cranial morphology is well within the range seen in British Beaker skulls.

Individual measurements are given in Table 1. The post-cranial skeleton is fairly well developed, but the individual was probably only moderately tall.

Post-cranial pathology is restricted to possibly slight arthritic change at some vertebral rib facets. Also, the neural arch has failed to unite with the vertebral body of the fifth lumbar.

Beaker burial B.

This is a young adult male individual of about 20-25 years of age. The skeleton is in a generally good condition, but the skull is damaged and in parts suffers from post-mortem deformity. The dentition is as follows:

$$\frac{8\ 7\ 6\ 5\ 4\ 3\ 2\ 1 \mid 1\ 2\ 3\ 4\ 5\ 6\ 7\ \overset{c}{8}}{8\ 7\ 6\ 5\ 4\ 3\ 2\ 1 \mid 1\ 2\ 3\ 4\ 5\ 6\ 7\ 8}$$

There is one occlusal caries cavity, but no other certain pathology. Tooth occlusion occurs to some extent at $\frac{1\ 1}{32 \mid 23}$.

There are no wormian bones or metopism. There is no torus auditivus or maxillaris, but a slight degree of torus mandibularis. Neither Beaker skulls show any degree of cribra orbitalia.

The skull is more brachycephalic in morphology, and the individual was probably taller, both characteristics of the Beaker people. Measurements are given in Table 1.

There is no evidence of arthritic deformity. The fourth metatarsal of the right foot shows some degree of shaft swelling which might indicate an old traumatic incident. The only other certain anomaly is the ossification of the right temporo-parietal suture.

B. THE TREPHINATION

Only a part of this important skull remains, but fortunately this is sufficien

to show the position and extent of the trephination. The pieces of skull have been mounted in plasticine and consist mainly of temporal, frontal, parietal and occipital fragments. The positioning of the pieces in relation to the trephine roundel, which is also present, is seen in an 'opened out' placing of the fragments in relation to the circular cut into the skull (Fig 1). It will be seen that in position the 'surgery' was performed at the back of the head and slightly to the left of midline. The roundel cut out about a half of the sagittal suture and about a half of the lambdoid suture - mainly on the left side. There is evidence that parts of the sagittal and lambdoid sutures were in the process of obliteration thus showing the individual to be adult. From the external morphology of the occipital and temporal bones, there is little doubt that this was a fairly robust male.

The trephine roundel is of fairly thick cranial vault (maximum thickness = 12mm), roughly circular in shape, with remarkably well cut margins. Similarly, the cut surfaces seen on the occipital, parietal and frontal regions which form the outer margins of the trephination are also noticeably smooth and well cut. The efficiency of the individual who performed the trephination is indeed confirmed in a close-up examination of the cut margins of the bones and in the fact that remarkably few cut marks extend beyond the immediate margins of the broad circular trephine incision (Plate 1). Not only was the 'surgeon' proficient, but one suspects that the tool or tools used were well sharpened. Whether these were stone or metal can not be deduced from the evidence available. It could well be that specialised tools similar to recent East African examples known to have been used in trephining (Plate 2) may have been used in later prehistoric cultures. However, some forms of metal knife-dagger, at times associated with Beaker burials, may have been used very effectively. However, by Roman times, there is evidence in the form of specialised surgical tools that the operation was definitely not

the result of one or more day-to-day pieces of equipment.

Considering the direction of the cut marks in relation to the circular trephine margins (Fig 1, Plate1), the roundel was separated from the cranial vault by the gradual development of a circular 'V'-shaped groove. The amount of external bone cut away is difficult to be sure of, as the vault is so fragmentary, but some millimetres of bone may have been cut away on the external vault surface. Thus, although the external dimensions of the roundel are approximately 113mm (maximum) by 103mm (minimum), the outer margins of the trephine hole could have been as much as 127mm by 115mm. The position of the trephination is surprisingly low on the posterior aspect of the vault, and the lower part of the external cut surface extends below the superior nuchal line near the external occipital protuberance.

Did the individual survive the operation for long? There is no evidence of healing or of surface pitting indicative of post-operative scalp inflammation, as seen for instance in the case of the Jericho G88 trephinations (Brothwell, 1965). It seems more likely, especially as the roundel was never taken away, that this was a poorly performed trephination, and that death followed, as a result of loss of blood from cut internal meningeal vessels. It is interesting to reflect that the Crichel Down Beaker burial with a large unsuccessful trephination was also a thick skulled male, and that the operation was in the very same vault area (Piggott, 1940; Brothwell, 1961). Are these similar trephinations, both fatal, and both with roundels of similar size left in place, purely a coincidence? Or are these failures the result of the same individual? Because some expertise is needed in producing such circles of bone (whether ante-mortem or post-mortem), it is unlikely that many men practised trephination in England during the Beaker phase. It is therefore quite justifiable to look for similarities in 'workmanship' which might suggest that one individual was responsible.

Although in comparison with other British cases of various periods, the Amesbury G51 specimen is the largest trephination yet found, it is by no means the largest example in prehistoric Europe. This would appear to be a Neolithic specimen (Fig 2) from Nordhausen, Germany, where most of the top of the cranial vault was removed (Ullrich, 1964). Although in this case also, it is debatable whether the individual lived very long after the operation, it is known from modern East African examples (Plate 3) that survival can follow removal of very considerable areas of the cranial vault (Margetts, 1967).

Comparison with other British cases.

Since Munro (1897) reviewed trephination, including early British examples, over seventy years ago, there has been a trickle of further discoveries over the decades. These were reviewed to some extent by Parry (1916, 1923, 1931), but far more relevant evidence is now forthcoming.

Although in Europe, and especially in France, there are numerous cases of trephination dated to a Neolithic cultural phase, only one probable and successful case is known in Britain. This is from the Fussell's Lodge long barrow (Brothwell and Blake, 1966). The skull is unfortunately fragmented and incomplete, and thus only a part of the apparent healed trephination remains (Fig 3a). If this is indeed an example, rather than a small well-healed wound, then it was probably of fairly circular shape with perhaps an external maximum diameter of no more than 25 to 30mm. This is far smaller and would have been a much safer operation than the ambitious trephine attempts seen in the Crichel Down and Amesbury G51 cases. In the case of the partially trephined frontal bone from Bisley long barrow, Gloucestershire, it is uncertain why this was not completed, and it may be that we have here one of the earliest examples of so-called "symbolic" trepanning (Fig 3b).

A number of other cases have at some time been considered to be "prehistoric" and might be Neolithic, Bronze Age or Iron Age in date. The "Edinburgh prehistoric" case (Munro, 1897; Parry, 1923) is a well healed rounded but slightly irregular trephine case (Fig 3c). The opening is 36mm x 25mm which is much smaller than the Amesbury case, but is in a similar position. Also of uncertain prehistoric date is the 'River Bed' skull from Thames river deposits near Hammersmith Bridge (Fig 3d). Parry (1916) considered this case, which certainly seems to be a small (45mm x 32mm) healed trephination. It is now preserved in the London Museum and is said to be early Iron Age, although a pollen analysis of the soil matrix adhering to it has been used to argue for an earlier date. In contrast to these cases is the two-holed Ovingdean calotte presumed to be Neolithic but in fact found in the Sea off Ovingdean, Sussex, after a cliff fall. Two of us (DRB and RP) have studied this specimen carefully and have arrived independently at the conclusion that this is a case of psendo-trephination (Fig 4a). The two holes are symettrically placed each side of the sagittal suture and appear to be the result of post-mortem destruction in the region of minor biparietal thinning. This is not the same abnormalit as seen in the Eastry Church skull (Munro, 1897, Parry, 1931). In this case, the two holes are the result of congenitally enlarged parietal foramina.

While on the subject of pseudo-trephination, other cases of possible prehistoric date are now known, but not altogether recognised as such. In a newspaper report (1968) of a Beaker skull from Sewell, Dunstable, claim was made of a trephination in association with a skull tumour. However, on careful study in the B.M.N.H. laboratory, the various changes were found to be post-mortem (Brothwell, unpublished). In another skull (K), possibly of Iron Age date from Gortnacargy, Co. Cavan, Ireland, there is a hole of about 22mm maximum diameter (Fig 4b). It was also extremely far back and low on the skull, being only about 20mm to the right of opisthion on the occipital.

There was no evidence of fracturing (ante-mortem) or of post-operative osteitis, and the most likely explanation for this hole is that it was produced by rodent gnawing (Brothwell,1967). A similar specimen, but of Medieval date, was excavated some years ago at Selbourne Priory, Sussex, and displays an oval hole in a similar position to that of the Gortnacargy specimen (Fig 4c). Again, the hole is in the thin lower part of the occipital bone, and would seem to be the result of rodent gnawing. Yet another form of probably pseudo-trephination is seen in the frontal pathology of the short cist burial from Mountstuart (Bute) discussed by Munro (1897) and Parry (1923). This may have been a female in her late teens who had at her left temporal line a "cup-shaped hollow" with raised margins which have a diameter of about 25mm. There is a small perforation through to the endocranial surface of the skull, with a maximum diameter of about 9mm. This circular abnormality may well be simply the result of a pathological process, although Parry believed that "a necrosis of part of this bone had taken place either as the result of an accident or disease, and the scooped out appearance of the cavity leads one to believe that the necrosed portion, in the form of a sequestrum, was assisted away by the help of a flint-flake".

Of possible early Bronze Age date, and thus roughly contemporary with the G51 skulls, is the post-barrow burial e from Amesbury G71, on Earl's Farm Down, Wilts (Christie, 1967). The skull of a fairly robust male shows a large and somewhat irregular trephine hole at the back of the head (Plate 4a), in the region of lambda. Even allowing for some surface erosion, there is clearly considerable healing at the margins of the opening, and thus he survived some time after the surgery. Allowing for some distortion from post-mortem breakage, the shape of the trephination seems to be more 'squared-off' than in the G51 case, although the basic technique of scraping somewhat curved grooving into the bone seems to have been used. At least there is no

evidence that the roundel was removed following the cutting of four deep grooves (to form a square roundel) or of multiple small drill holes at the margins of theroundel (See Parry, 1916; Lisowski, 1967; Brothwell, 1972 for further details of techniques). In both Amesbury G71 and G51 cases then, we seem to have evidence of the "push-plough" method of trephination, but whereas in the G51 and and Crichel Down specimens the 'surgeon' was noticeably skilled in producing a rounded trephine disc, the initial cuts to the G71 individual were not so rounded and may have produced a somewhat differently shaped roundel.

Of the various early British cultural phases, from Neolithic to early historic, more trephine cases are known for the Saxon period than any other. It would seem useful to look briefly at some of these cases in comparison with the G51 skull. The following may be considered typical of complete Saxon trephination (as opposed to some possible instances of "symbolic" trephining, where a roundel was never actually cut clear and removed).

1. Grave 15. Michell Hill, Icklingham. Male. Hole 47mm x 36mm. Well healed. (Fig 5a). Shape fairly rounded, on left parietal.

2. Grave 12. Sleaford, Lincs. Male. Hole 71mm x 41mm. Well healed. (Fig 5b). Hole long and narrow, on right parietal.

3. Grave 5. Sleaford. Male. Maximum diameter of trephine hole is at least 65mm. Oval in shape, and in the fronto-parietal area near the bregma. Well healed. (Fig 5c).

4. Saxon burial at Lyminge, Kent. Degree of healing uncertain. Fairly circular trephine hole near an apparent old sword/axe injury on the left parietal. Diameter about 45mm. (Fig 5d). Male adult.

5. Snell's Corner, Portsdown, Hants. 182/57. 522. Small fairly circular trephine hole on the frontal (Plate 4b). Associated with an old healed

injury in the left coronal suture region. Possibly male. 39mm x 33mm.

If these trephinations are indeed typical of Saxon trephining, they show that there was quite considerable size variation, and to a lesser degree some shape variation. In every case, however, the basic technique seems to be the "push-plough" method (Parry 1923), and there is certainly no reason to think that new and quite different methods were being used generally in Saxon times.

Considering the Amesbury G51 trephination, therefore, in relation to these various early British cases from other sites and periods, one can see a continuation of the basic curved scraping technique from probably the Neolithic phase through to historic times. Whatever the general cultural changes during this time in Britain, there is certainly no good reason to believe that the technique of trephination could not have a long unmodified tradition, although the reasons may have changed to some extent. The fact that the G51 and Crichel Down trephinations may have resulted in the death of the individual, is not a good indication of survivorship and in fact most early British cases show signs of healing. As these two trephine cases were especially large, one questions whether the 'surgeon' or 'surgeons' at times became a little over-confident of how much skull could be safely cut away.

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Plates to

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Plate 1 Amesbury G51. Close-up views of the cut edges and bone surfaces near the circular trephine incision, including parts of the roundel.

a) and d); parts of the roundel, showing cut marks.

b) the outer margin of the trephination at the occipital (thickest area cut through). The diploic tissue is exposed and does not show any bone healing.

c) Fragments of left parietal showing surface cut marks.

e) The trephine cutting the sagittal suture. Cut bone at an acute angle to the outer bone surface.

Plate 2 Modern East African examples of trephination tools, and two types of skull trephination resulting from their use. (Photo courtesy of Professor E. Margetts).

Plate 3 Two recent cases of massive but healed upper vault trephination from East Africa (Photographs courtesy of Professor E. Margetts. Discussed by Margetts, 1967).

Plate 4 a) The case of healed trephination from Amesbury G71 barrow.

b) The healed frontal trephination of Saxon date. Snell's Corner, Portsdown.

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Illustrations

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Figure 1 The fragments of bone preserved in the region of the trephination in the Amesbury G51 case. The fragments are positioned in an 'opened-out' view to show general relationships.

Figure 2 The massive unhealed Neolithic trephination from Nordhausen, Germany (from a photograph by Ullrich, 1964).

Figure 3 Cases of possible prehistoric trephining.

a) The Fussel's Lodge long barrow case.

b) The partial trephination from Bisley long barrow. "N" indicates the approximate position of nasion.

c) The "Edinburgh" prehistoric case.

d) The Thames 'River Bed' skull. "L" is the probable position of lambda.

Figure 4 a) The Ovingdean pseudo-trephination. "L" is probable position of lambda.

b) The Gortnacargy pseudo-trephination. Rodent activity.

c) The Selbourne Priory pseudo-trephination. "fm" is the foramen magnum in relation to the occipital opening.

Figure 5 Examples of Saxon trephining -

a) Grave 15 skull. Michell Hill, Icklingham.

b) Grave 12 skull. Sleaford, Lincs.

c) Grave 5 skull. Sleaford.

d) Lyminge burial. Kent. ? healed wound and trephination.

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TABLE I The basic biometric dimensions of Amesbury G51 burials A and B (in millimetres, except indices and stature)

Skull Measurement	Biometric symbol	Burial A	Burial B
Maximum length	L	192?	186
Maximum breadth	B	150?	153?
Minimum frontal breadth	B'	93	108
Frontal arc	S1	145?	142?
Parietal arc	S2	120?	125
Frontal chord	S'1	117?	128?
Parietal chord	S'2	111?	112
Biasterionic breadth	Biast.B	120?	119?
Nasion-alveolare	G'H	61	72
Facial breadth	GB	87	90?
Palate breadth	G2	41.6	43.0
Palate length	G'1	45.0?	47.0?
Nasal breadth	NB	28.0	29.7?
Nasal height	NH'	52.5?	53.5?
Simotic chord	SC	-	7.3
Bicondylar width	W1	123?	124?
Bigonial breadth	GoGo	94	103
Bimental breadth	ZZ	42.0	44.0
Minimum ramus breadth	RB	35.0	35.3
Mandible height	H1	41.2	46.1
Mandible length	ML	106	-
Projective length mandible	RL	62.0	66.0
Condyle length	CYL	24.0	-
Mandibular angle	M<	116°	123°
Long bone dimensions			
Femur length	FeL1	460	482
Femur diameter (min. a.p.)	FeD1	25.0	23.6
Femur diameter (transverse)	FeD2	32.6	35.0
Tibia length	TiL1	379	390
Tibia diameter (max. a.p.)	TiD1	34.0	33.4
Tibia diameter (transverse)	TiD2	24.5	24.0
Humerus length	HuL1	328	337
Humerus diameter (max.)	HuD1	24.5	23.0
Humerus diameter (min.)	HuD2	18.1	17.3
Radius length	RaL1	247	268
Ulna length	UlL1	263	285
Platymeric index (femur)		76.7	67.4
Platycnemic index (tibia)		72.0	71.9
Estimated stature (Trotter and Gleser formulae)		5ft. 7¾ins.	5ft. 9½ins.

FIG. 1.

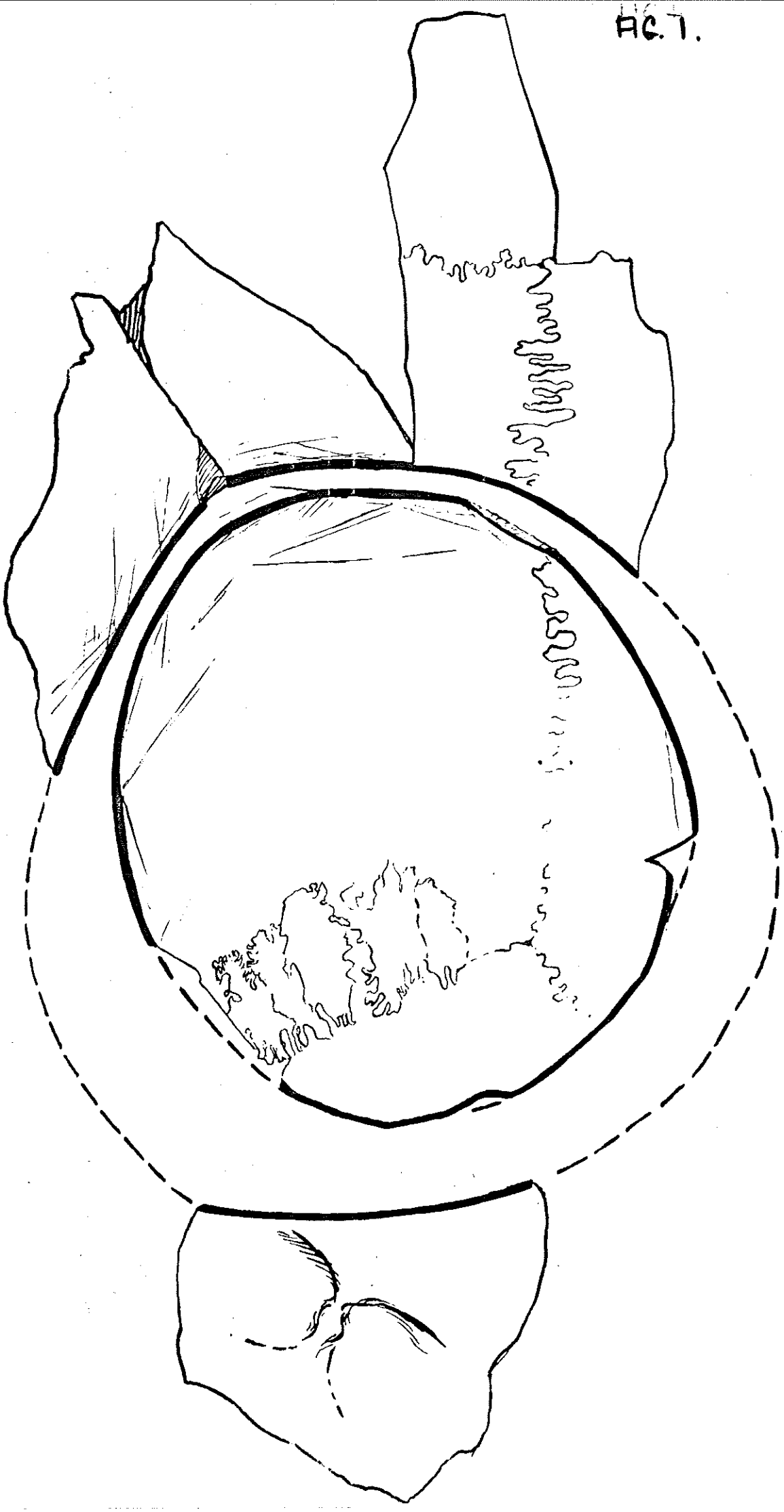
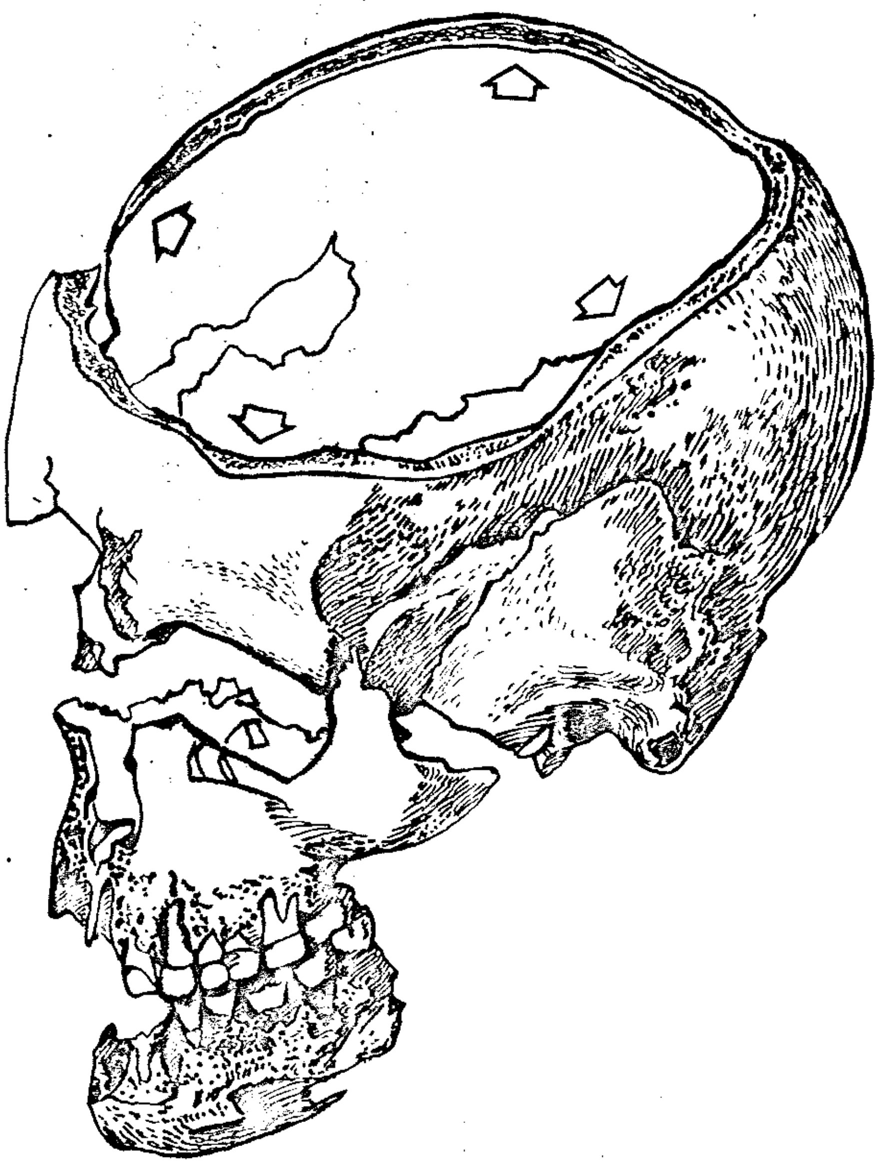
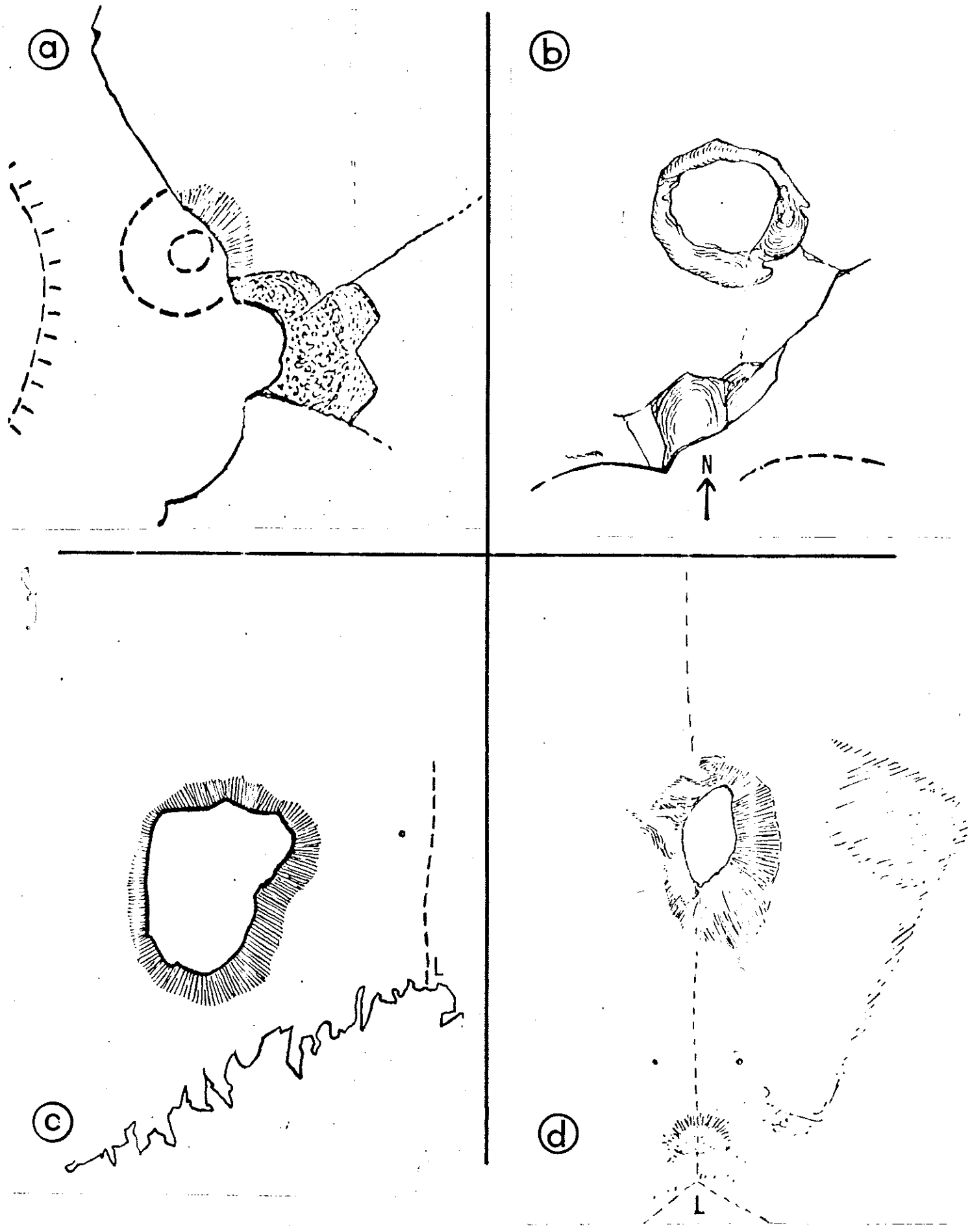


Figure 2.



Brothwell Powers Denston.

FIG: 3



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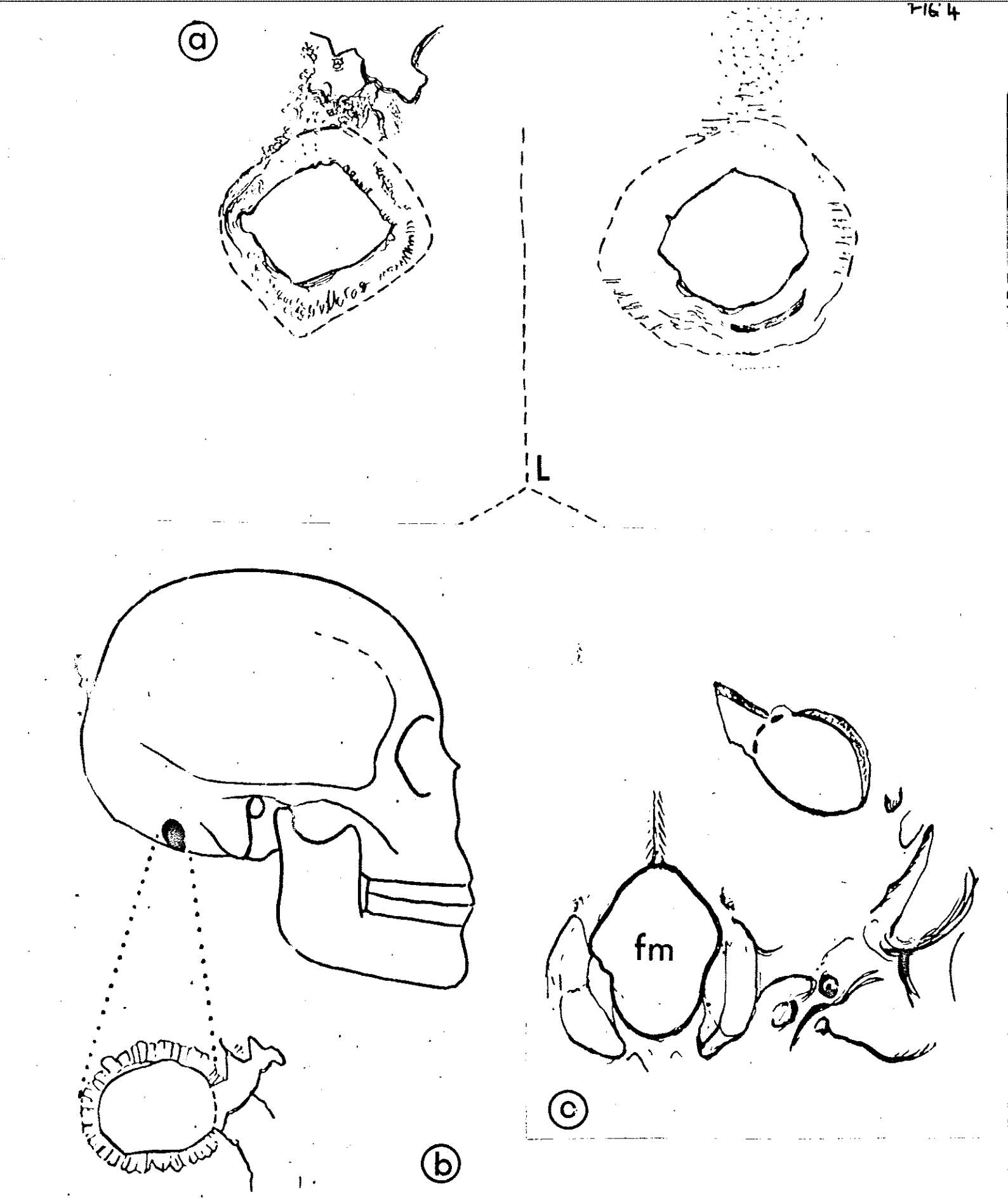
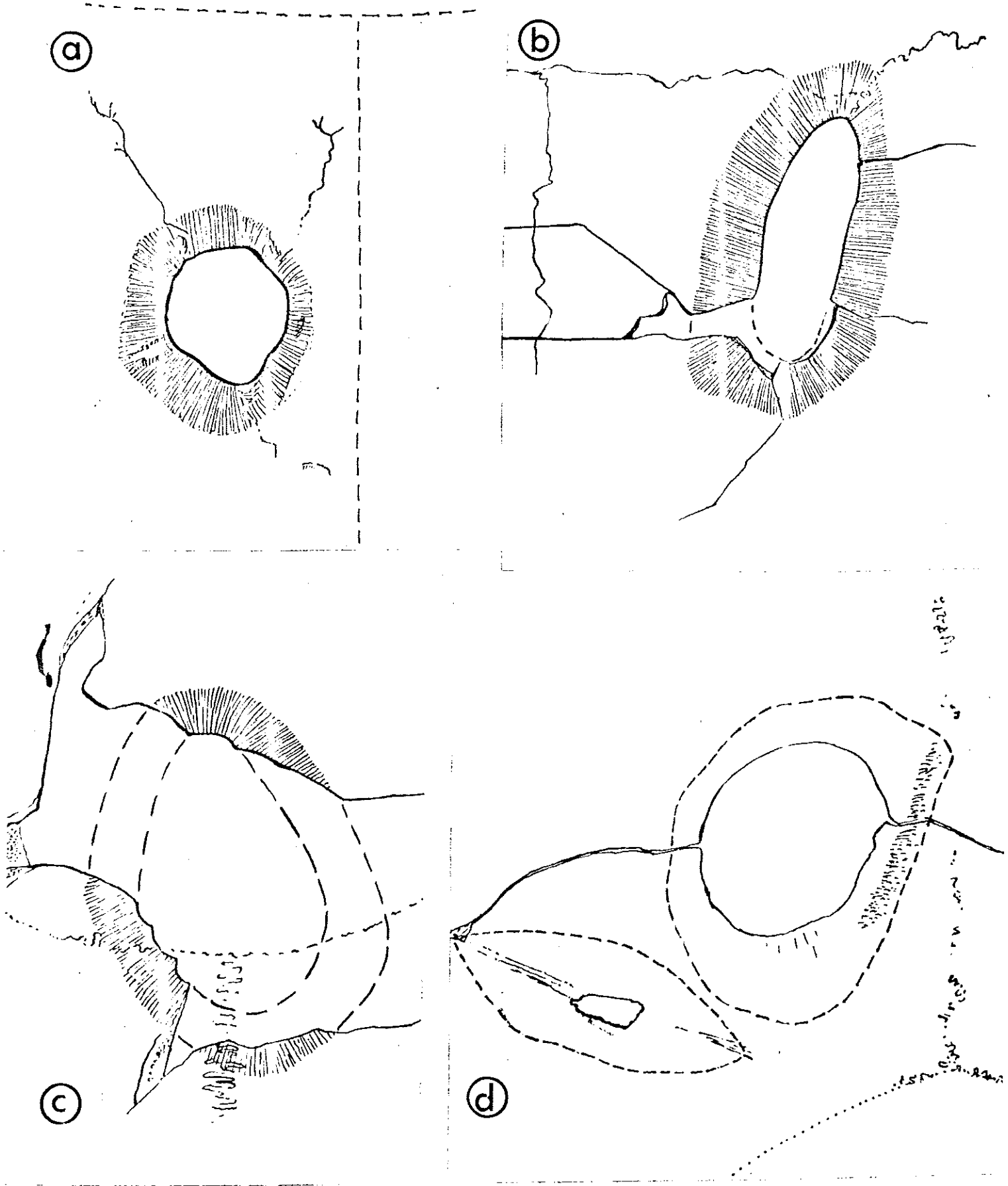


Brothwell, Powers, Denston.

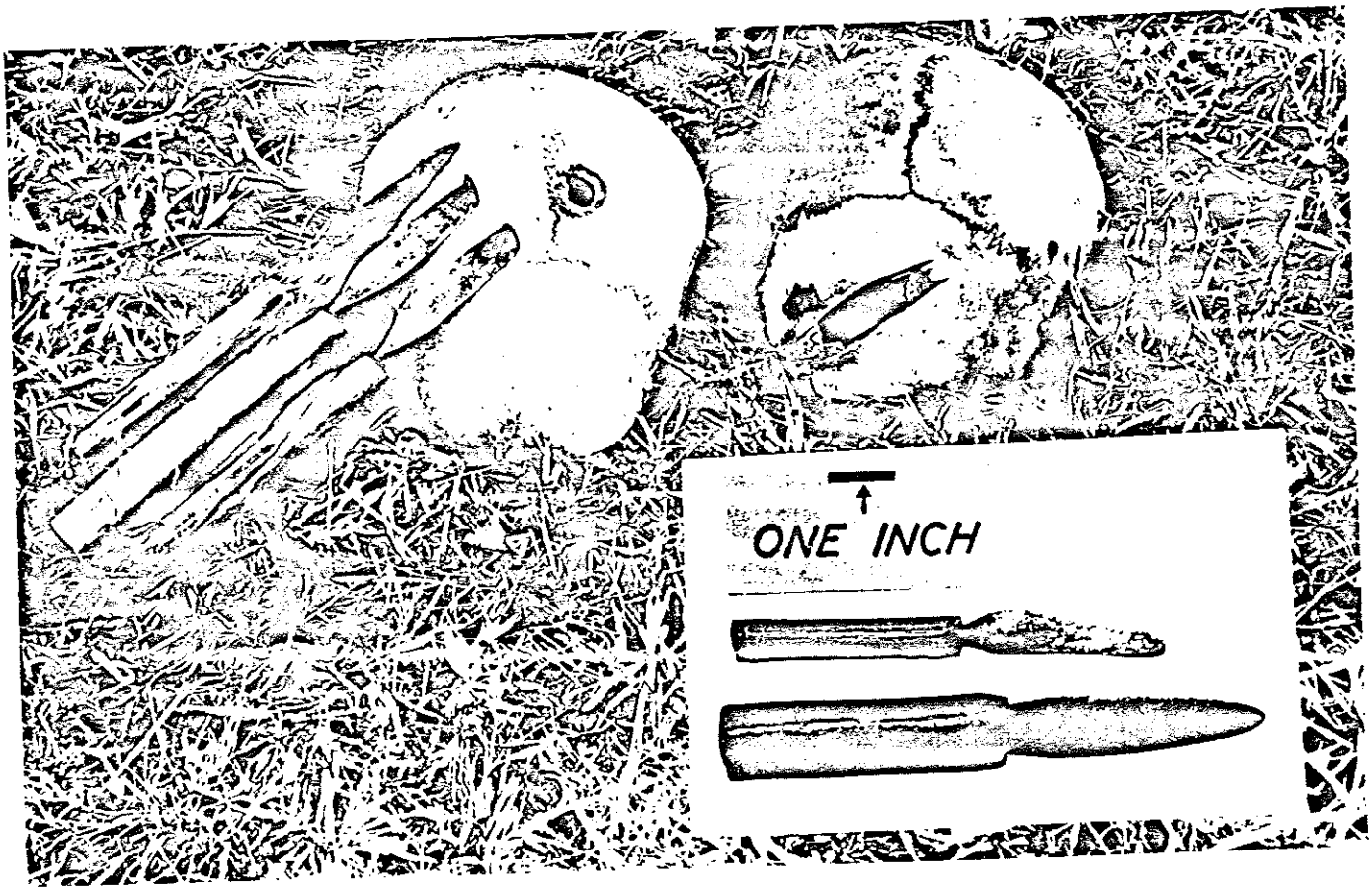
FIG: 5



Brothwell, Powers, Denston.


b
d
e

Plate 2



flare 3@

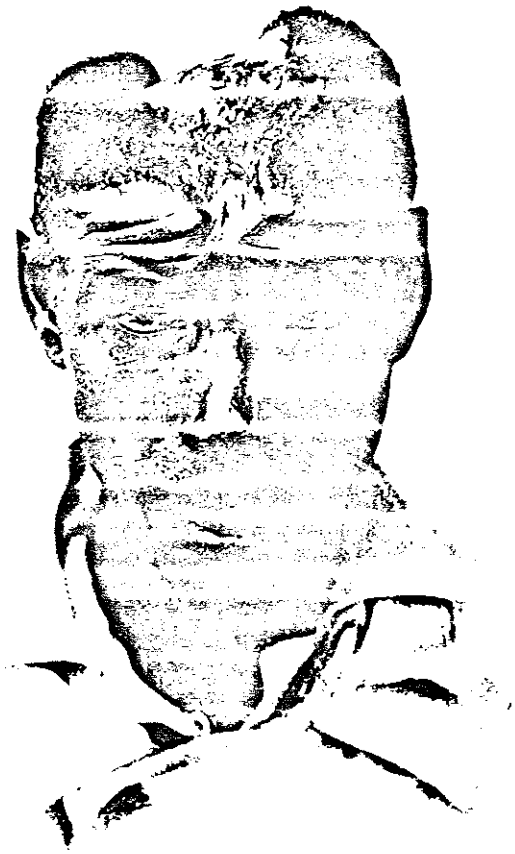


Plate 56

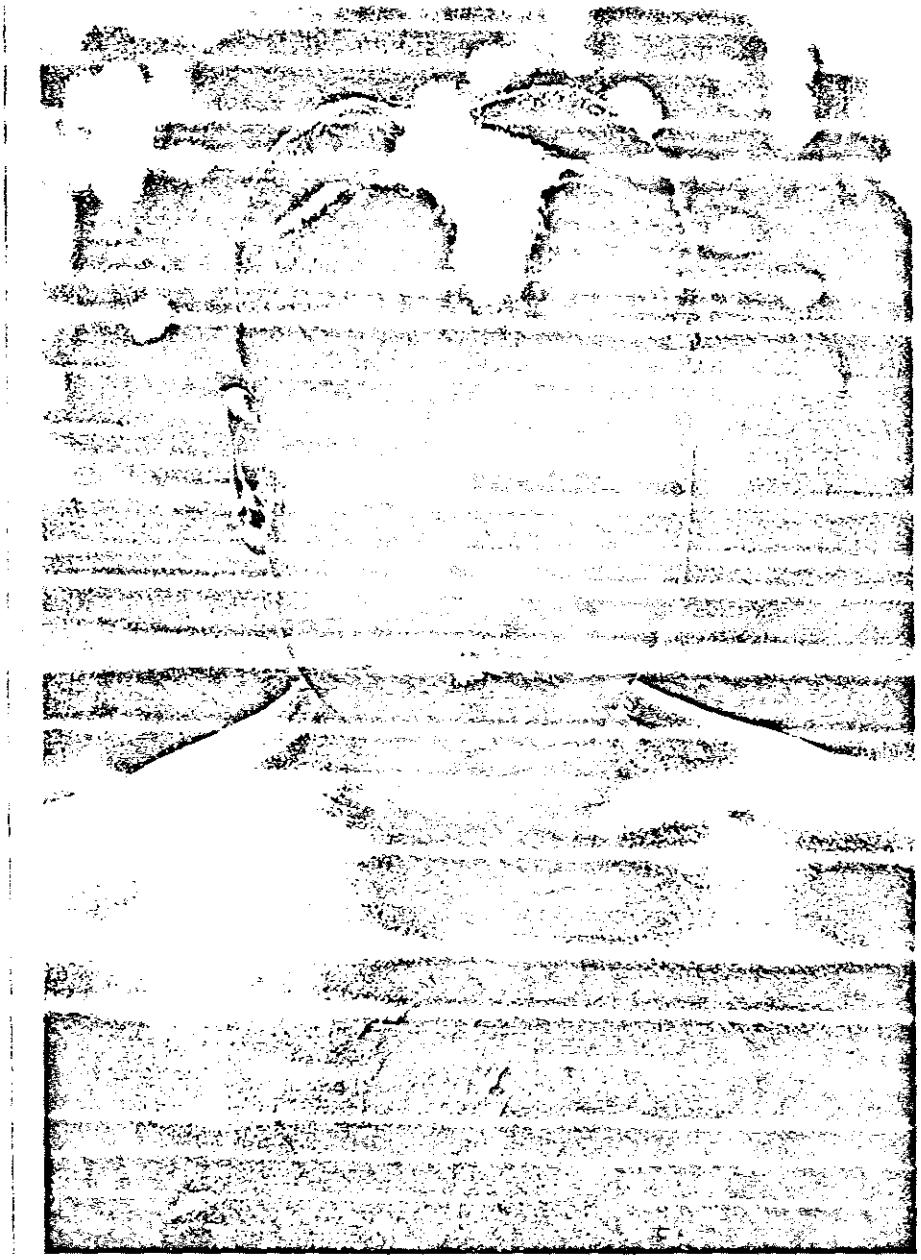


Plate 4@

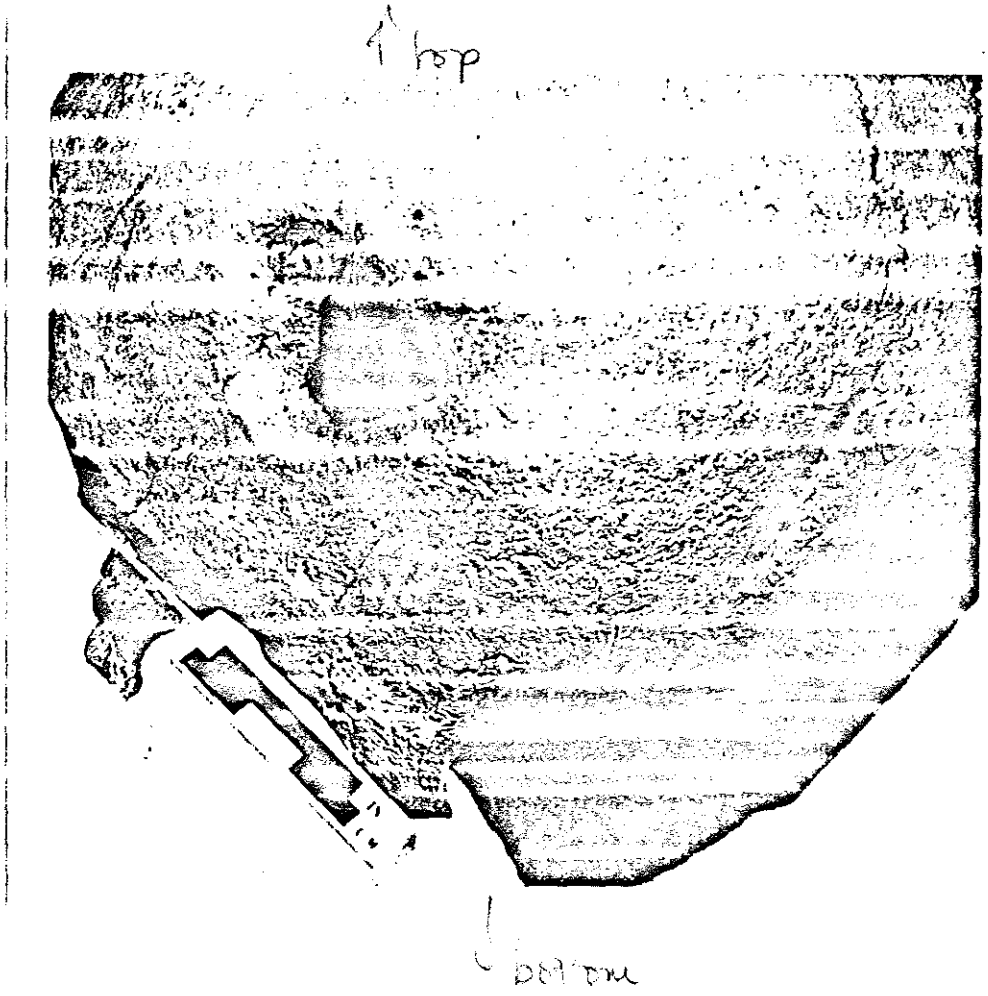


Plate 40