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PRELIMINARY REPORT ON MARKED HUMAN BONES FROM THE 1986-1987 EXCAVATIONS AT GOUGH'S CAVE, SOMERSET, ENGLAND

ABSTRACT: *Preliminary research on a new sample of damaged and marked human bones excavated from Gough's Cave, Somerset in 1986-1987, indicates that human corpses were dismembered by the late glacial inhabitants of the site. Macroscopic and microscopic observation of marks made by stone tools indicate that dismemberment took place at or shortly after the time of death and some patterning is evident in the method of defleshing. Interpreting the significance of this activity in terms of human behaviour is difficult at present.*

KEY WORDS: *Gough's Cave — Marked bones — Cut-marks — Defleshing — Dismemberment of corpses — Cannibalism.*

Gough's Cave is part of a phreatic underground system truncated by the Cheddar Gorge which forms part of a dry valley system deeply incised into the limestone on the western edge of the Mendip Hills in Somerset (*Figure 1*).

The cave was discovered in 1890 and from that time until the present, there have been periodical excavations resulting from the need to improve and extend the site as a tourist attraction.

During excavations at the site instigated by Dr. R. M. Jacobi (Nottingham University) and directed by Mr. A. P. Currant and Dr. C. B. Stringer of the British Museum, Natural History in 1986-1987, a new sample of human remains was recovered in association with Late Upper Palaeolithic, Creswellian artefacts and Late Pleistocene fauna. The well-preserved, fresh surfaces of many of the cranial and postcranial bones in this sample show a patterned distribution of distinct, single or discretely grouped, linear incisions.

These marks have provided a basis for further research into the question of post-mortem dismemberment of corpses by the late Devensian occupants of Gough's Cave. The preliminary results of this research are presented below.

SAMPLE AND METHOD OF RESEARCH

During the 1986-1987 excavations about 120 human cranial and postcranial remains were recovered from a small area of deposit near the entrance of the cave (Currant et al, 1989). In addition to the cranial elements summarized in *Table 1*, numerous teeth and cranio-facial fragments were also found. These remains represent at least four adults and one juvenile but this first estimate of the minimum number of individuals represented may have to be revised when the work of refitting all the fragments has been completed. By comparison, postcranial remains are certainly under-represented, as the sample contains only five vertebrae, at least seventeen, possibly thirty seven ribs, small fragments of limb and pelvic bones, a metatarsal and a cuboid bone.

Although all of the bones are damaged and many are merely fragments, their surfaces show little or no alteration resulting from high energy taphonomic processes or diagenetic change (Andrews and Cook 1985; Cook 1986a). Unlike the surfaces of the human bones in the old collection from the site (Cook 1986b), those in the new sample are not obscured by an overlay of modern toolmarks and a coating of preservative. Consequently, it has been possible to examine the marks on their surfaces both macroscopically and micro-

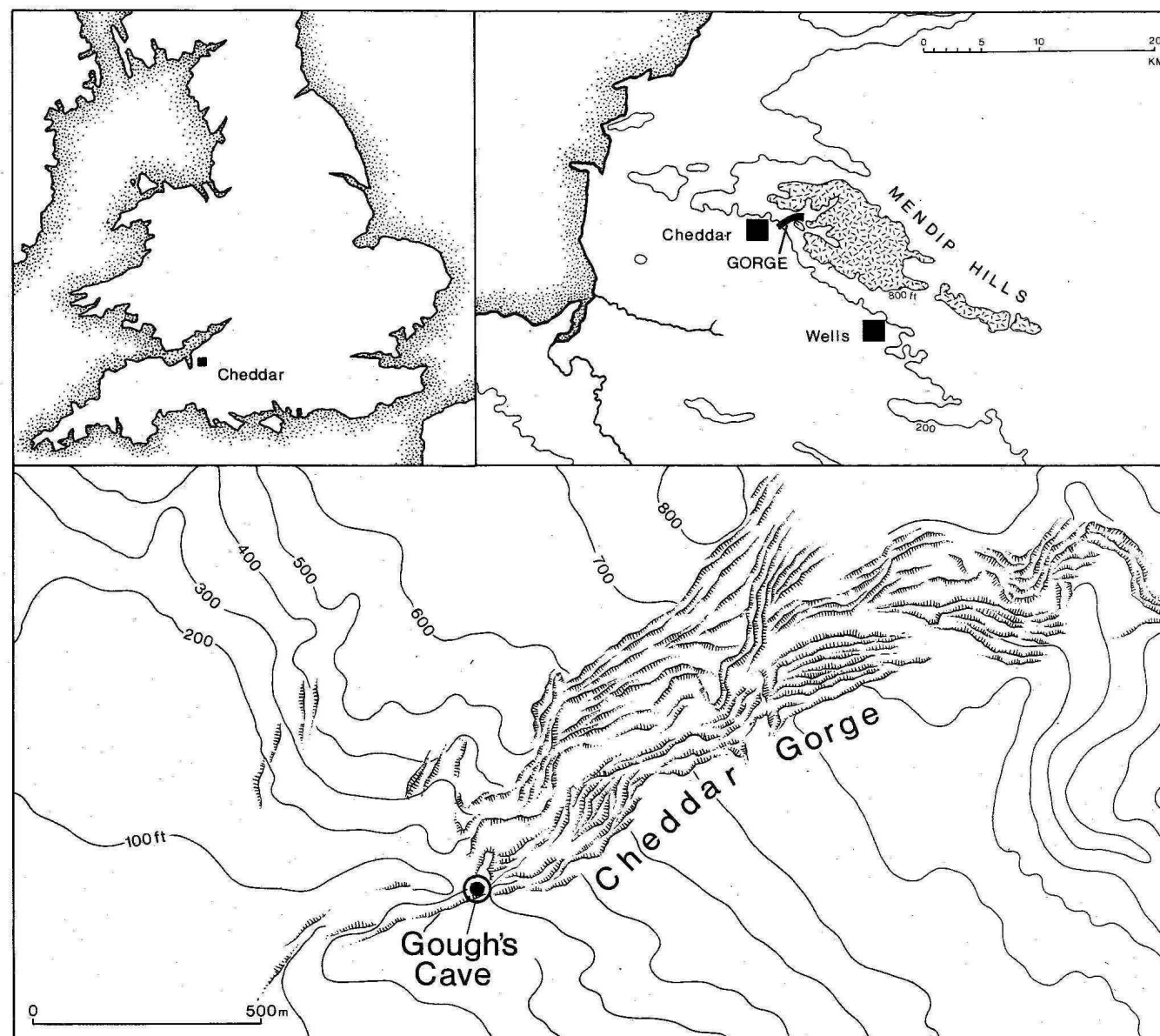


FIGURE 1. Location of Gough's Cave, Somerset.

scopically (Andrews and Cook 1985; Cook 1986a, 1986b) in order to assess their cause.

DESCRIPTION OF THE MARKED CRANIAL REMAINS

Adult calvaria, GC87/190: this specimen lacks both temporal bones and the inferior part of the occipital below the highest nuchal line but the frontal and parietals are complete. Except for some slight pitting in the region of the of the sagittal suture, the bone is in good condition and unmarked except for distinct groups of incisions which occur on the frontal and on the parietals, on and below the superior temporal line sloping slightly upwards from front to back (Figure 2). It is evident that these marks were present on the skull before it was broken because incisions on the parietals have been truncated by damage and the loss of the temporal and sphenoid bones. In addition, a crack caused by

compression of the skull during burial interrupts and clearly post-dates incisions on the right side of the frontal

TABLE 1. Cranial remains from Gough's Cave, 1986-1987

Element	Excavation number	Description
Calvaria	GC87/190	adult
Right frontal fragment	GC87/090	adult male, refits to Gough's Cave 2 (Stringer, 1985)
Maxilla	GC87/139	young adult
Right hemi-mandible	GC87/253	adult
Maxilla	GC87/025	juvenile, c.12 years
Mandible	GC887/049	juvenile, articulates with GC87/025

GOUGH'S CAVE 1987 190

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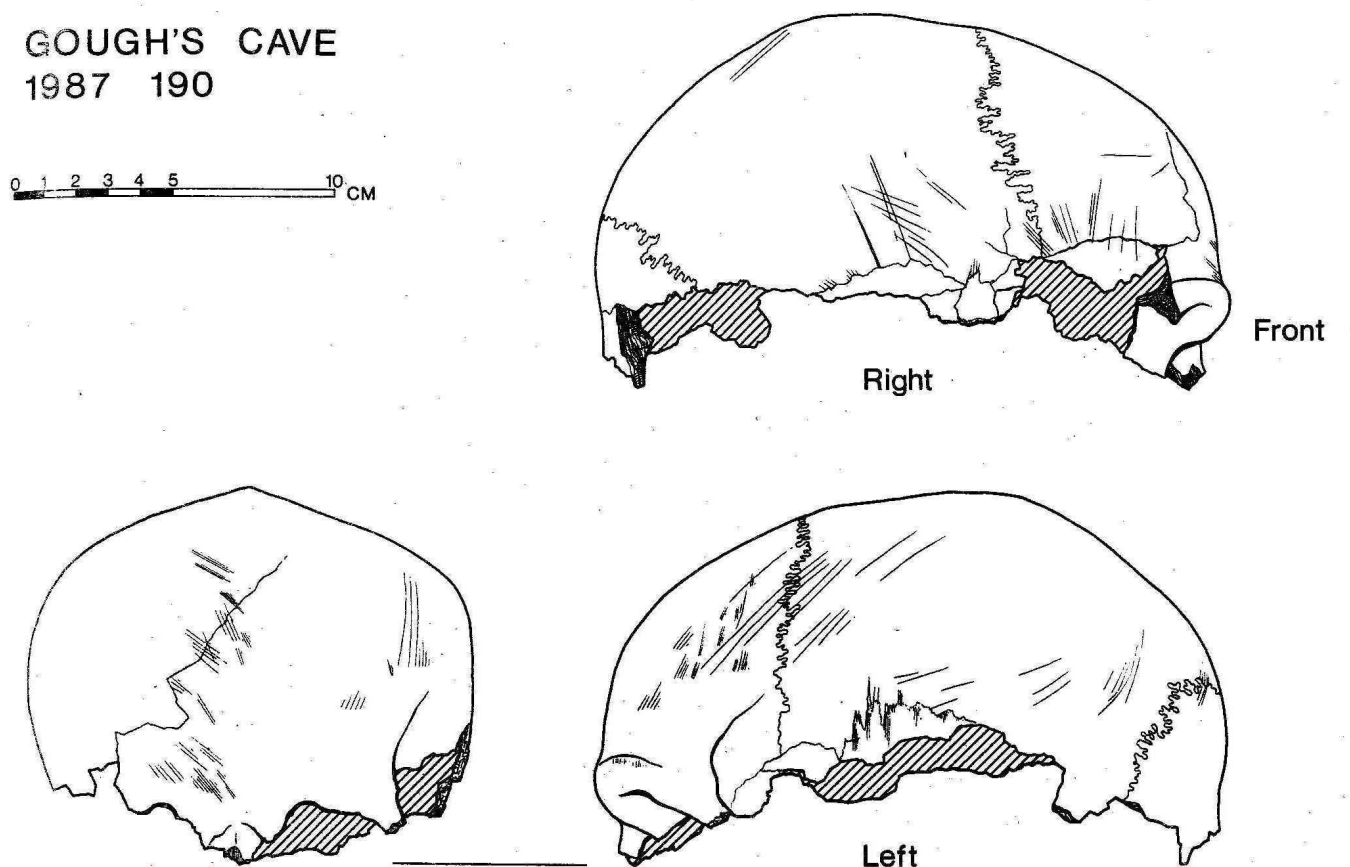


FIGURE 2. Distribution of cut-marks on the adult calvaria (GC87/190).

(Figure 2), indicating that the incisions were present before post-depositional alteration of the specimen took place.

On examination using a hand lens and binocular light microscope, the incisions can be seen to have asymmetrical cross-sections with remnants of displaced bone along the steeper edge, adjacent to the deeper part of the incision. Internally, the incisions show parallel striations, intermittently crossed by tiny "faults". These features are characteristic of incisions made by sharp stone edges on fresh bone (Bromage 1984; Cook 1986a; Shipman 1981). Furthermore, the consistent orientation of the faults indicates that the incisions were made with the skull in a constant position and the stone moving from the front towards the back (Bromage 1984; Bermúdez de Castro et al 1988). Linked with the discretely patterned distribution of the marks which occur particularly in areas of muscle attachment, this evidence suggests that the incisions were made deliberately by a human using a stone tool and are not the result of natural processes effective during and after burial (Andrews and Cook 1985). There are no marks on the endocranium.

Adult right frontal fragment, GC87/90: this piece of bone has been refitted from five small fragments. In the supraorbital region, the bone surface has been affected by diagenetic change and no marks are apparent. The small, superficial scratches in the postorbital region are lighter in colour than the surrounding bone and are clearly the result of modern handling. This fragment

refits to the Gough's Cave 2 calvaria (Stringer 1985) from which ancient marks are also absent (Cook 1986b).

Adult maxilla, GC87/139: this well-preserved specimen exhibits no marks and little damage. The dentition is complete and the only break occurs in the region of the erupting right third molar which was found in 1986 and refitted to the maxilla found in 1987. The break appears to be the result of natural processes which affected the bone following its deposition.

Adult right hemi-mandible, GC87/253: this specimen is in good condition although it is broken across the ascending ramus from the gonial angle to the top of the coronoid process and retains only a worn second and third molar (Figure 3). The break across the ascending ramus interrupts a group of consistently orientated incisions on the coronoid process. These occur above a line of short, parallel incisions slightly inclined towards the anterior edge of the ascending ramus and continuing along the oblique line onto the horizontal ramus (Figure 4a). At least one incision runs along the base of the horizontal ramus and on the lingual surface, distinct groups of short, parallel, diagonally oriented marks occur on the inferior border the back of the horizontal ramus and along the mylohyoid line.

On examination in an ISI 60A scanning electron microscope (SEM), the incisions could be seen to pre-date both the breakage of the bone and its burial. The SEM also revealed the diagnostic characteristics of cut-marks made by a sharp stone edge on fresh bone. As

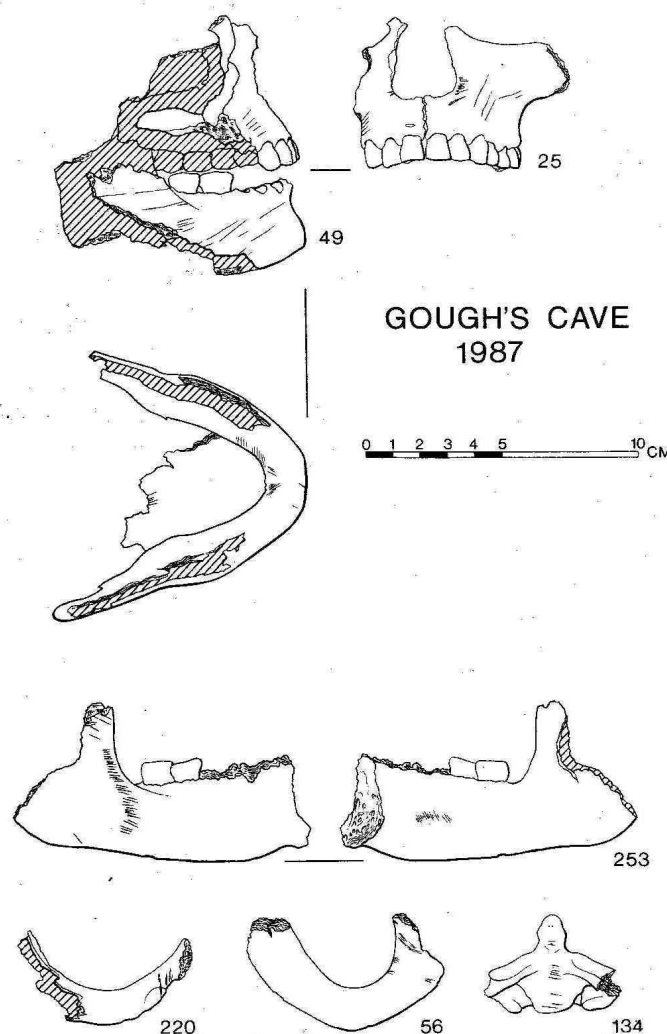


FIGURE 3. Distribution of cut-marks on a juvenile maxilla, (GC87/025) and mandible (GC87/049), adult right hemi-mandible (GC87/253), ribs (GC87/220, GC87/056) and axis vertebra (GC87/134).

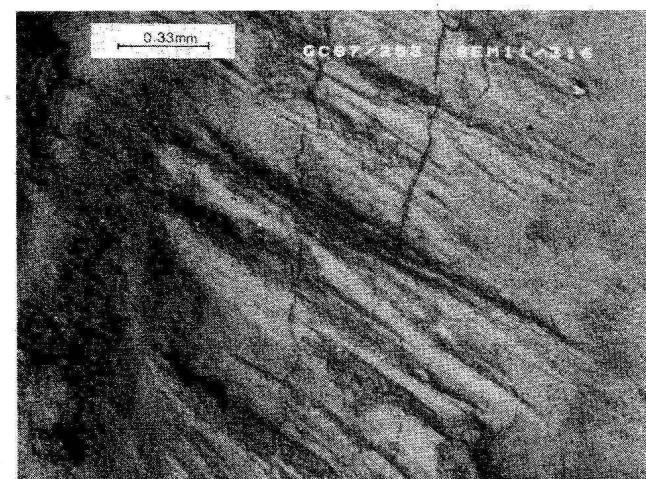


FIGURE 4a. Cut-marks on the ascending ramus of adult hemi-mandible (GC87/253).

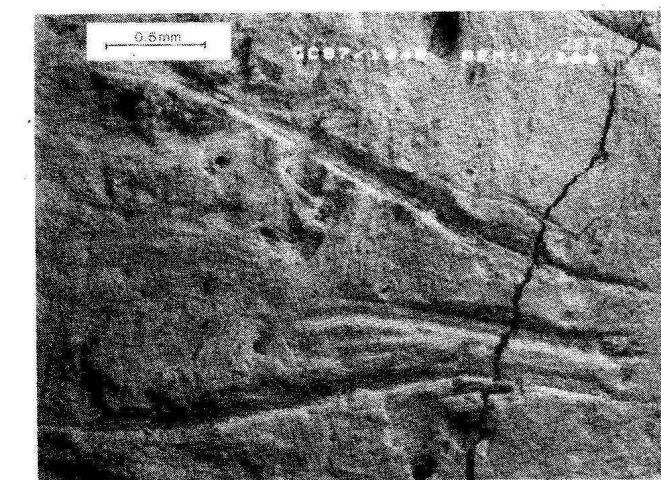


FIGURE 4b. Cut-marks on the body of axis vertebra (GC87/134).

the marks have a non-random distribution on specific areas of the bone, it is clear that the incisions must have been made deliberately by a human using a stone tool to cut through the temporalis, masseter and buccinator muscles where they attach to the ascending ramus, as well as the mylohyoid and medial pterygoid muscles where they attach to the lingual surface. Such dissection would permit the detachment of the mandible from the skull and the removal of the tongue.

Juvenile maxilla, GC87/25: this specimen is in good condition although much of the right side has been broken away and both sides lack the frontal process. Incisions are clearly visible on both sides of the maxilla on the margin of the nasal notch and on the anterior surfaces (Figure 3). Examined under a binocular light microscope, these incisions can be seen to possess the characteristics of cut-marks made by stone tools and their positions are related to the areas of attachment of the levator and nasalis muscles.

Juvenile mandible, GC87/49: this mandible of a boy estimated to be about twelve years old, matches the maxilla GC87/49 and undoubtedly comes from the same individual. It is in good condition but lacks the ascending rami on each side. Damage related to the loss of the ascending rami also extends along the base of the mandibular body on both sides. On the buccal surface, this damage interrupts long, parallel incisions sloping downwards towards the back of the mandible on the mandibular body and from the oblique line towards the ascending ramus. On the lingual surface, short, vertically oriented groups of parallel incisions occur in the area of the diagastric fossa and along the mylohyoid line. The antiquity of these marks is evident from their condition and relationship to the areas of damage on the bone. In addition, the microscopic characteristics of the incisions are consistent with their having been made by a sharp stone edge on fresh bone. This evidence and the discrete positioning of the marks in areas of muscle attachment suggest that they were inflicted by a human using a stone knife.

Other cranio-facial fragments: incisions like those present on the calvaria, mandibles and maxilla have been recorded on five out of about twelve skull fragments identified so far.

DESCRIPTION OF THE MARKED POSTCRANIA

Although some human postcranial material undoubtedly still remains to be identified from amongst all the bone excavated in 1986-1987, it is clear that the postcrania are under-represented. Moreover, many of the elements present are damaged or fragmentary, two pieces may be burnt and about 26 out of just over 100 currently recognized specimens show discrete incisions on otherwise unmodified surfaces. In every instance examined to date, these incisions can be confidently ascribed to human activity rather than natural causes. The positions of these marks are described below.

Vertebrae: only three vertebra fragments and one complete axis vertebra have been recovered. Incisions occur on one of the fragments which comes from a cervical vertebra and on the dens and body of the axis vertebra (Figures 3 and 4b). The latter are clearly the result of cutting through the muscles at the back of the neck.

Ribs: the majority of specimens in the sample of 37 ribs are shaft fragments, some of which show the type of damage which results from movement and pressure during and after burial. At least eight of these fragments exhibit discrete groups of incisions oriented vertically or slightly diagonally on the external surfaces of the bone (Figure 5a). Three of the more complete ribs (GC87/56, GC87/207 and GC87/220) are marked on the necks and tubercles (Figure 3). Examination in the SEM showed that these marks did not possess the characteristic features of cut-marks made by a slicing action as on the shaft fragments (Figure 5a) but deeper, more symmetrical marks (Figure 5b) of the kind which result from using a blade with a chopping action. In each of these examples, the head of the rib is damaged.

Limbs and pelvis: identification and refitting of fragments which may belong to upper and lower limbs and the pelvis have only just begun and although some pieces do show incisions, it has not yet been possible to determine any patterned distribution.

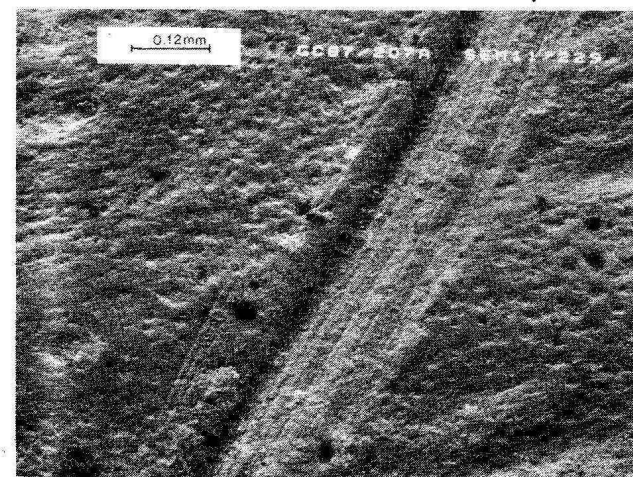


FIGURE 5a. Cut-mark showing the characteristic features produced by a sharp stone edge used with a slicing action on the external surface of a rib shaft fragment (GC87/207a).

INTERPRETATION

In his description of the human bones discovered in Gough's Cave between 1905 and 1970, Tratman (1975)

referred to cut-marks and bone breakage which he attributed to anthropophagic practices (ibid., p.21). In the absence of proper justification for this conclusion, the bones were subjected to more rigorous investigation by the present author in 1984. The results achieved did not permit unequivocal interpretation. Many of the putative cut-marks recognized by Tratman proved, on examination, to be either natural or recent in origin, whilst others were so thickly covered with preservative that their characteristics could not be discerned (Cook 1986b). The only indisputable evidence for postmortem human interference with a corpse was found on the mandible of an adult male (Stringer 1985), Gough's Cave 6. In addition to natural marks on the ascending ramus and buccal surface of the mandibular body, discrete groups of parallel incisions were recorded on the lingual surface of this specimen in the region of the diagastric fossa and along the mylohyoid line. The positioning and microscopic characteristics of these marks allowed the conclusion that they had been inflicted by a stone artefact. However, it would have been imprudent to use this limited evidence as a basis for interpreting any particular human behaviour at the site, especially as the finds had not come from controlled excavations and data relating to their depositional context and associations were entirely lacking. Fortunately, the new collection does not present these problems, although the research work has not yet gone far enough to allow any but the most tentative conclusions.

The human bones found in 1986-1987 were excavated from narrow fissure just inside the entrance. The bones had not been deliberately or carefully buried but were randomly distributed with animal bones and flint, bone, antler and ivory artefacts in a variably cemented deposit of angular limestone clasts in a matrix of red silt grading upwards into a fine gravel (Currant et al. 1989). Close groupings of articulating animal bones suggest a low energy depositional environment but there is still some uncertainty as to whether the archaeological material is in a primary context or has been derived from another part of the cave system. However, even in the absence of evidence for burial or *in situ* accumulation of a charnel deposit, it is evident that the human bones had a common origin and can be regarded as a sample.

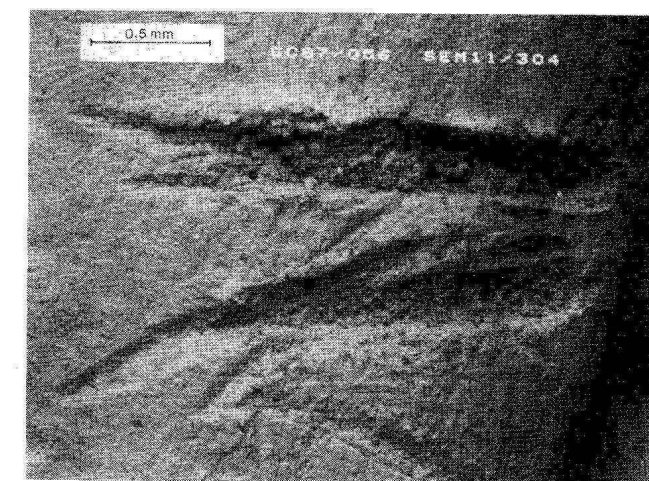


FIGURE 5b. Deep, symmetrical marks produced by a sharp stone edge used with a chopping action on the neck of a rib (GC87/056).

Further refitting work will undoubtedly confirm this and may even tie in specimens from the old collection.

Within the new sample, the incisions referred to in this report are sufficient to indicate that human corpses were dismembered at or shortly after the time of death. This is determined by the absence of any signs of sub-aerial weathering, root or moss growth and rodent or carnivore gnawing on the bones, as well as the microscopic characteristics of the marks. On the calvaria, GC87/190, the marks which occur outside areas of muscle attachment, such as the group which extends from the frontal across the coronal suture onto the left parietal (Figure 2), may be related to the removal of the scalp. However, the concentration of incisions on the parietals in the area of attachment of the temporalis muscle suggests that the head was completely defleshed and the mandible detached. The incisions on the juvenile maxilla, GC87/025, and other cranio-facial fragments indicate that such defleshing of the head may have been practiced on more than one individual. This is also reflected in the evidence from the mandibles. Like the Gough's Cave 6 mandible from the old collection, both the hemi-mandible, GC87/253 and the juvenile mandible, GC87/049, from the new collection are marked with incisions which relate to the severing of the temporalis and masseter muscles to detach the jaw from the head, as well as the cutting of the mylohyoid, geniohyoid and genioglossus to remove the tongue.

Much of this dismemberment seems to have taken place with the face of the corpse uppermost, whereas the incisions on the axis vertebra and complete ribs (figure 3) suggest that at least one body was decapitated and cut into from the back. However, further evidence for the dismemberment of bodies is limited. It is possible that damage to the rib heads might be the result of snapping them from the vertebral column after stripping away the flesh, rather than cutting through the musculature of the back but this speculation cannot be supported with any certainty at present. It is equally difficult to interpret the absence and fragmentation of limb bones. Indeed, if any evidence is forthcoming, it will undoubtedly be derived from research on the damage and breakage pattern as yet to be ascertained from an attempt at systematic refitting, rather than from the cut-marks.

Overall, the evidence from the preliminary research on the bones from Gough's Cave indicates that the late glacial inhabitants of the site dismembered their dead. What this activity means in terms of human behaviour is a much more difficult question to answer. Although one interpretation may be preferred on grounds of circumstantial evidence, none can be proved beyond reasonable doubt. Dismemberment of corpses may take place as a means of disposing of the body, as in the case of the so-called "sky burials" still practised in Tibet, or may occur in instances of secondary reburial as in the example from the Grover Hand Site, South Dakota, described by Bass and Phenice (1975). However, at Gough's Cave the human remains appear to have been casually discarded in the same manner as the animal bones and this has caused some speculation about cannibalism. This is difficult to confirm or refute from the evidence available. The apparently casual disposal of dismembered remains, fragmentation of the postcrania and possible indications of burning on two of the rib fragments might be taken to support the cannibalism theory as put forward for the Neolithic site of Fontbrégoua Cave (Villa et al. 1986). However, at present such evidence must be regarded as inconclusive

as much remains to be learned about the taphonomy and mode of deposition at Gough's Cave and no attempt has yet been made to compare the butchery and disposal of the animal bones with the methods applied to humans. In general, the animal remains seem less fragmented than the human bones but there may be a similar scarcity of limb bones amongst the former as among the latter (Currant 1986; Parkin et al 1986). The significance of this bias is uncertain and taphonomic explanations cannot be ruled out at this stage; but if cannibalism is implied, its practice could not have been a dietary necessity because plenty of food was available at the site throughout the period of occupation.

CONCLUSION

Preliminary research on the assemblage of late Pleistocene human remains from Gough's Cave has produced indisputable evidence for the dismemberment of corpses. Further work, currently in progress, will provide more information about this activity but these data are unlikely to reveal the motivation behind the activity. Consequently, any explanation of the remains in terms of human behaviour will be a matter of supposition and interpretation incapable of proof.

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REFERENCES

- ANDREWS P., COOK J., 1985: Natural modifications to bones in a temperate setting. *Man*, 20: 675-691.
- BASS W. M., PHENICE T. W., 1975: Prehistoric human skeletal material from three sites in North and South Dakota. In: *The Sonota Complex and associated sites on the Northern Great Plains*, Ed. Neumann, R. W. pp. 106-140. Lincoln: Nebraska State Historical Society, *Publications in Anthropology*, 6.
- BEERMÚDEZ DE CASTRO J. M., BROMAGE T. G., FERNANDEZ-YALVO Y., 1988: Buccal striations of fossil human anterior teeth: evidence of handedness in the middle and early Upper Pleistocene. *Journal of Human Evolution*, 17(4): 403-412.
- BROMAGE T. G., 1984: Microscopic criteria for the determination of directionality of cutmarks on bones. *Am. J. Phys. Anthropol.* 65: 359-366.
- COOK J., 1986a: The application of scanning electron microscopy to taphonomic and archaeological problems. In: *Studies in the Upper Palaeolithic of Britain and northwest Europe*, Ed. Roe, D. A. pp. 143-163. Oxford: British Archaeological Reports.
- COOK J., 1986b: Marked human bones from Gough's Cave, Somerset. *Proc. Univ. Bristol Spelaeol. Soc.* 17(3): 275-285.
- CURRENT A. P., 1986: The lateglacial mammal fauna of Gough's Cave, Cheddar, Somerset. *Proc. Univ. Bristol Spelaeol. Soc.* 17(3): 286-304.
- CURRENT A. P., JACOBI R. M., STRINGER C. B.,

in press: Excavations at Gough's Cave, Somerset, 1986-1987. *Antiquity*, 63: 131 - 136.

- PARKIN R. A., ROWLEY-CONWY P., SARJEANTSON D., 1986: Late Palaeolithic exploitation of horse and red deer at Gough's Cave, Somerset. *Proc. Univ. Bristol Spelaeol. Soc.* 17(3): 311-330.
- SHIPMAN P., 1981: Applications of scanning electron microscopy to taphonomic problems. *Ann. N. Y. Acad. Sci.* 376: 357-386.
- STRINGER C. B., 1985: The hominid remains from Gough's Cave. *Proc. Univ. Bristol Spelaeol. Soc.* 17(2): 145-152.
- TRATMAN E. K., 1975: Problems of the Cheddar Man. *Proc. Univ. Bristol Spelaeol. Soc.* 14(1): 7-23.
- VILLA P., COURTIN J., HELMER D., SHIPMAN P., BOUVILLE C., MAHIEU E., 1986: Un cas de

cannibalisme au Néolithique. Boucherie et rejet de restes humains et animaux dans la grotte de Fontbrégoua à Salernes (Var). *Gallia Préhistoire*, 29: 143-171.

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