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THE HUMAN REMAINS FROM WEST COTTON, RAUNDS, NORTHAMPTONSHIRE.

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Summary

A Bronze Age round barrow was excavated at West Cotton, Raunds in 1985; a crouched inhumation, a collection of disarticulated bone and 6 cremations were recovered. Plans of several Mediaeval farm houses were also revealed; 3 infant burials were found in these contexts.

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THE HUMAN REMAINS FROM WEST COTTON, RAUNDS, NORTHAMPTONSHIRE EXCAVATED 1985

Introduction to the site

Excavation of a Bronze Age round barrow (Barrow 1) at West Cotton revealed a crouched central inhumation with a beaker, a perforated jet or shale button, a flint dagger and a flint flake. Beneath this burial was a small pit containing some disarticulated human bone.

Barrow 1 was surrounded by three ditches. In the outermost was found an infant femur; two cremation burials, one associated with a small urn, were also inserted into the ditch fill. A further cremation, in a collared urn, was located on the berm between the middle and outer ditches. In addition, two cremations were located in small pits to the south and west of Barrow 1, and one in a small pit adjacent to a long mound which lay to the south-west of Barrow 1.

Some Mediaeval farmhouses were also excavated; a total of 3 infant burials were recovered, 2 from beneath the floors of buildings and 1 from a "backyard".

The human remains

Methods used are noted, with appropriate references, for each individual case below. Note that it is not feasible to determine the sex of infants and children from their skeletal remains. In the sections on ageing the term infant refers to a child of less than 2 years of age.

1. The prehistoric inhumations

Context: F3259, Beaker burial, Barrow 1.

Material: Skeleton about three-quarters complete; bones somewhat fragmentary but moderately well preserved.

Sex: Male (Workshop of European Anthropologists 1980).

Age: Probably 25-35 (see Notes).

Dental formula:

```
. . . . . . . . . . . . . . .
8 7 6 5 4 3 2 1 1 2 3 4 5 6 7 8
8 7 6 5 4 3 2 1 1 2 3 4 5 6 7 8
. . . . . . . * . . . . . . . .
C
     LEFT              RIGHT
```

Key: .=tooth present in socket X=tooth lost post-mortem *=tooth lost ante-mortem T=socket missing or damaged but loose tooth present E=erupting C=caries cavity

Stature: 177.4cm (5'10") - using humerus and radius length in the formula of Trotter & Gleser (1952, 1958, reproduced in Brothwell 1981: Table 5).

Notes. Ageing: the attrition on the molar teeth suggests an age at death of about 25 (using the chart of Brothwell 1981: Fig. 3.9), although the wear on the anterior dentition is rather marked. The pattern of cranial suture closure is rather irregular but seems to suggest a rather older age than the teeth (using Perizonius 1984). The skeleton has the general appearance of a young adult, showing a lack of ossification at the enstheses and very little degenerative joint disease. The pubic symphyses are missing. Hence the age of this individual was estimated at about 25-35.

The molar teeth show dental calculus to Dobney & Brothwell's (1987) grade 2.

An area on the right calcaneus just anterior to the anterior facet for the talus has a rough, porotic appearance, as does the inferior border of the right navicular. The appearance of these 2 bones suggests that they were united in life by a bridge of fibrous or cartilaginous tissue. Coalition of calcaneus and navicular may, in many cases, be symptomless, but it may cause a painful flat foot known as peroneal spastic flat foot (Leonard 1974). This is the most common tarsal coalition (Renton & Stripp 1982), and the most common type of union between the bones is via fibrous tissue (as seems to have been the case here) with complete bony bridges being rather less common (Chambers 1950). Leonard (1974) found that when calcaneo-navicular coalition was present it was generally bilateral; in the present case the condition is unilateral. Peroneal spastic flat foot is a fairly uncommon condition in modern populations - a survey by Harris & Beath (1948) of Canadian army recruits found a prevalence of 2% - although this represents an underestimate of the prevalence of tarsal coalitions as many are symptomless. Several studies (e.g. Wray & Herndon 1963; Leonard 1974) show that calcaneo-navicular coalition is an inherited congenital anomaly.

Three thoracic vertebrae show irregular depressions on the inferior surfaces of their centra. These probably represent Schmorl's nodes. An intervertebral disc consists of a tough outer layer (the annulus fibrosus) surrounding an inner core (the nucleus pulposus) which, until early adulthood, is composed of semi-gelatinous material. In younger individuals excessive compression of the spine (as might occur on heavy lifting) may result in extrusion of material from the nucleus pulposus, into the adjacent vertebral body. The bony manifestation of this is a pit or cleft: the Schmorl's node. In some individuals congenital weakness of the cartilage plate of the vertebral body may increase the likelihood of the formation of Schmorl's nodes, but there is no doubt that a single trauma may cause extrusion of disc material in a healthy spine (Schmorl & Junghanns 1971: 158-68).

Two of the centra with Schmorl's nodes are adjacent lower thoracic vertebrae. One thoracic vertebra shows osteoarthritis of its facet joints to Sager's (1969 - cited in Brothwell 1981) grade 1, and 4 show osteoarthritis to Sager's grade 3. The remainder of the skeleton is free from osteoarthritic changes.

Mechanical stress plays a major role in the aetiology of osteoarthritis, and it may occur as a consequence of a single traumatic injury (Kellgren & Lawrence 1958; Radin et al. 1980). Three adjacent lower thoracic vertebrae show grade 3 osteoarthritis and 2 of these also show Schmorl's nodes; bearing in mind the general lack of osteoarthritis in this skeleton it seems likely that the osteoarthritis and Schmorl's nodes were caused by traumatic injury to the lower thoracic spine.

The plantar parts of both faces of the articulation between the left 3rd metatarsal and the lateral cuneiform show irregular, porotic bone depressed below the normal joint surface. Lesions of this type have been noted sporadically by the writer in British skeletal material ranging in date from the early Bronze Age to the Mediaeval period. They have also been noted in skeletons from the US (Tenney 1989). The cause is uncertain, but it may well be that they simply represent a skeletal variant rather than being the result of any disease process. It is not possible to ascertain whether the changes are unilateral or bilateral as the relevant parts of the right foot are missing.

The mandibular canines show many ripples of depressed enamel and the crowns of the maxillary premolars show a depressed line about 2mm from the cemento-enamel junction. These lesions are dental enamel hypoplasias - disturbances of enamel formation during childhood associated with a wide variety of stressors, including infectious diseases and nutritional deficiencies. Using the methodology of Goodman et al. (1980) the location of the defects on the premolars suggest that the stress episode giving rise to them occurred when the individual was about 4 years old.

Context: F3390, disarticulated bone from pit beneath F3259.

Material: Skull fragments, axis and atlas vertebral fragments, parts of long-bones and a little other material (much of which consists of unidentified fragments), representing the remains of a minimum of 2 adults (duplication of skull fragments, axis and atlas vertebrae, right femora and left tibiae). Bones poorly preserved (see Notes).

Sex: 1 male (pelvis), 1 ?male (there are 2 sets of male-looking skull fragments).

Age: 1 adult aged about 25 (dental attrition - Brothwell 1981: Fig. 3.9), 1 indeterminate adult.

Dental formula:

```
                                                E
          X . . . X       . . T . . .
8 7 6 5 4 3 2 1 1 2 3 4 5 6 7 8
8 7 6 5 4 3 2 1 1 2 3 4 5 6 7 8
            T
      LEFT                RIGHT
```

Key: .=tooth present in socket X=tooth lost post-mortem *=tooth lost ante-mortem T=socket missing or damaged but loose tooth

present E=erupting C=caries cavity Blank=socket and tooth missing post-mortem

Notes. Many of the bones were moderately well preserved on one side but very eroded on the obverse face - e.g. the medial surface of a right tibia is largely intact but its lateral surface is heavily eroded. Observations in the field indicated that the heavily eroded surfaces are those which faced uppermost in the soil. Initially it was thought possible that this pattern of preservation suggested that the bones were left exposed to the elements or covered only by a very thin layer of soil, having been deposited in the pit in a disarticulated state. However close examination of the remains suggests that this scenario is, perhaps, unlikely. The teeth from this context are in good condition. Teeth, particularly the enamel parts, tend to fragment if exposed to the elements for any length of time. Large pieces of cancellous bone are present in this context; these would be rapidly destroyed if left exposed on the surface.

It has been the writer's experience that when a grave is cut by a later feature (be it another grave or not) the bones lying nearest the later cut are frequently rather more poorly preserved than those lying further away. The reasons for this are obscure, but it may be related to differences in permeability between natural, unidisturbed soil and the more loosely packed soil of a man-made feature. The bones in F3390 lay only a few centimetres beneath grave cut F3259; the erosion on the upward facing parts of the bones from F3390 is probably due to these surfaces' proximity to the later feature.

There is no evidence for mixing of bones between contexts F3390 and F3259.

The bones in F3390 were clearly interred when the soft tissues had decayed. No signs of animal gnawing were found on the bones. No cut marks were found as might be expected if the flesh had been cut from the bones as part of funerary ritual. It thus seems that the corpses must have been left to decay naturally, in a place where animals could not gnaw the bones, most probably by earth burial. The skeletons were then exhumed and some bones taken and buried in F3390.

A maxilla from this context shows an impacted third molar. The tooth has erupted so that the top of the crown is level with the base of the crown of the fully erupted M2 and impacted against its distal surface. The orientation of the M3 is not abnormal, there is simply insufficient space for it to erupt fully. There is resorbtion of the alveolar bone on the lateral side of the tooth so that the whole of the crown is visible.

Context: F3196, a single human infant femur found within the final fill of the outer ditch of Barrow 1.

Sex: Unknown.

Age: The diaphysial length is 73mm, suggesting neonatal age, perhaps slightly premature - the formula of Scheuer et al. (1980) gives an age of about 37-38 weeks in-utero - a full term foetus is about 40-42 weeks.

2. The prehistoric cremations

Recovery of cremations: for some cremations bone was recovered by hand-picking on site - such cases are denoted by the entry 'unsieved' in the recovery section. For some contexts bone was recovered by wet sieving down to 2mm mesh - these cases are denoted by the entry 'sieved' in the recovery section.

Context: F3206/3226, cremation in fill of outer ditch of Barrow 1. These 2 contexts were thought in the field probably to be parts of the same burial; study of the bone supported this conclusion.

Recovery: F3206 - sieved; F3226 - unsieved.

Material:

	Weight (g)	Fragment count	Mean fragment size (mm)
Skull	0.14	9	4
Post-cranial & unidentified	4.80	200	5
Total	4.94	209	

Colours: Neutral white.

Identified elements include fragments of: skull and long-bones.

Sex: Unknown.

Age: The small size of the long bone and the paper-thin skull fragments indicate infant.

Context: F3219, cremation beneath inverted urn in fill of outer ditch of Barrow 1.

Recovery: part sieved, part unsieved.

Material:

Weight (g)	Fragment count	Mean fragment size (mm)
5.51	150	4

Colours: Neutral white.

Identified elements include fragments of: skull vault.

Sex: Unknown.

Age: Paper-thin skull fragments and size of bones indicate infant.

Note: Fragments of burnt animal tooth/teeth found with the remains.

Context: F3178, inurned cremation on berm between middle and outer ditches of Barrow 1.

Recovery: Part sieved, part unsieved.

Material:

	Weight (g)	Fragment count	Mean fragment size (mm)
Skull	58.29	65	16
Post-cranial & unidentified	464.92	4800	5
Total	523.21	4865	

Colours: Mainly neutral white, a few grey or bluish fragments.

Identified elements include fragments of: root of maxillary permanent tooth, root of permanent molar, thoracic vertebral facet joints, ribs, proximal joint surface of radius, shaft of left 5th metacarpal, intermediate and proximal hand phalanges, vertebral bodies, left and right radial tuberosities, cranial vault (with un-united sutures), sacral vertebral bodies (not fused to one another), cervical vertebral body (with unfused epiphyses), first metacarpal, metatarsal fragments, distal joint surface of tibia, vertebral neural arches, a distal hand phalanx (epiphysis just fused), scapula, lumbar vertebral body, metacarpal shaft, fibula and unidentifiable long-bone fragments.

Sex: Unknown, but where enough of individual bones are present to give an impression of their size (mainly the hand and foot bones) they seem to be rather small, even in cases where the epiphyses have fused; perhaps this might be suggestive of female sex.

Age: About 16-21 (epiphysial fusion - Workshop of European Anthropologists 1980). This is also consistent with the state of fusion of the skull sutures and with dental development.

Note: Fragments of a cow/horse tooth and oyster shell found with the remains.

Context: F1738, cremation in pit to south of Barrow 1.

Recovery: Part sieved, part unsieved.

Material:

	Weight (g)	Fragment count	Mean fragment size (mm)
Total	149.9	600	9

Colours: mainly neutral white, a few blue fragments.

Identified elements include fragments of: distal joint surface of R femur.

Sex: Unknown.

Age: Size of femur fragment suggests older adolescent or adult.

Context: F4948, cremation in pit to west of Barrow 1.

Recovery: Sieved.

Material:

	Weight (g)	Fragment count	Mean fragment size (mm)
Skull	27.83	31	19
Post-cranial & unidentified	95.20	125	17
Total	123.03	156	

Colours: mainly neutral white, some blue.

Identified elements include fragments of: skull (including right temporal bone in region of external auditory meatus), ulna and vertebrae.

Sex: Unknown.

Age: Adult. Skull sutures are un-united but have lost the serrated appearance characteristic of children and young adults, having rather rounded edges.

Context: F5548/5550, cremation from small pit adjacent to long mound.

Recovery: Sieved.

Material:

	Weight (g)	Fragment count	Mean fragment size (mm)
Total	1.51	100	4

Colours: white/bluish-white.

Identified elements include fragments of: paper-thin skull vault.

Sex: Unknown.

Age: Infant (indicated by size of bones).

Discussion

Six cremations were studied, of which 3 were probably adults and 3 were infants. The quantity of material ranged up to 523g for the adult remains and up to about 5g for the infants. In no case did a burial contain the remains of more than one individual. Studies (discussed by Wahl 1982) show that complete cremation of an adult corpse yields about 2kg of bone; thus the adult cremations from West Cotton each represent less than about one quarter of the remains expected from a human body. The infant cremations, too, must be substantially incomplete. Since burning in all cases was not in-situ, but must have occurred on a pyre with subsequent collection of remains for burial, it is probable that much loss of material occurred during funerary ritual, although inevitable losses in recovery, and destruction of bone during its sojourn in the soil, must not be forgotten.

The bone fragments from all 6 burials are quite uniform in colour, mainly neutral white, with some light blue or grey fragments. Colour may be used as a very approximate guide to firing temperature (Shipman et al. 1984). The appearance of the West Cotton remains suggests thorough, even firing; most fragments have probably been exposed to temperatures in excess of about 940C.

3. The Mediaeval inhumations

Context: F1648, Mediaeval burial in external spread ("back-yard").

Material: Skeleton about one third complete - parts of trunk, arms and upper legs present. Bones well preserved.

Sex: Unknown.

Age: Long-bone lengths suggest an age of about 30-31 weeks in utero (Scheuer et al. 1980).

Context: F3065, Mediaeval burial under the floor of a barn.

Material: Skeleton virtually complete, bones very well preserved.

Sex: Unknown.

Age: Neonatal (dental development - Ubelaker 1978: Fig. 62), long-bone length (Scheuer et al. 1980) suggests perhaps slightly premature - about 37 weeks in-utero.

Dental formula:

			U		U	U				
X	X	X	.	X	.	.	X	X	X	
e	d	c	b	a	a	b	c	d	e	
e	d	c	b	a	a	b	c	d	e	
X	.	X	X	X	X	X	X	.	X	
		U						U		
		LEFT				RIGHT				

Key: .=tooth present in socket X=tooth lost post-mortem *=tooth lost ante-mortem T=socket missing or damaged but loose tooth present E=erupting U=unerupted C=caries cavity Blank=socket and tooth missing post-mortem

Context: F4329, early Mediaeval burial inserted within long range.

Material: Skeleton about two-thirds complete, bones well preserved.

Sex: Unknown.

Age: Neonatal (dental development - Ubelaker 1978: Fig. 62); longbone length (Scheuer et al. 1980) suggests 40-44 weeks in-utero - full term.

Dental formula:

			U	U						
X	X	.	.	X						
e	d	c	b	a	a	b	c	d	e	
e	d	c	b	a	a	b	c	d	e	
.	.	X	.	X	X	X	X	X	X	
		U						U		
		LEFT					RIGHT			

Key: .=tooth present in socket X=tooth lost post-mortem *=tooth lost ante-mortem T=socket missing or damaged but loose tooth present E=erupting U=unerupted C=caries cavity Blank=socket and tooth missing post-mortem

Discussion

Three burials of infants whose ages range from about 30-44 weeks in-utero were studied. The normal gestation period for a human foetus is 40-42 weeks, but after 28 weeks it is potentially viable and, given care, may survive (discussion in Molleson 1989). Hence all three inhumations studied were potentially viable. The locations of these burials is suggestive of still births or unbaptised infants dying shortly after birth. The skeletal evidence is consistent with this, however it is not possible to determine in each individual case whether the infant was still born or died in the immediate post-natal period.

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Appendix: Non-metric and metric variation for the prehistoric & Mediaeval inhumations

Metric variation. Cranial and post-cranial measurements were taken according to the definitions of Howells (1973) (skull measurements), & Brothwell (1981) (mandibular and post-cranial measurements). Long-bone measurements for the infant burials are for diaphyses only. All measurements in millimetres.

Metric data: F3259.

Bregma-lambda chord	110
Mastoid height (right)	31.8
Simotic chord	8.3
Foramen mentalia breadth	46.0
Minimum ramus breadth (right)	37.8
Coronoid height (right)	61.8
Humerus length right	335
Radius length right	266
Humerus epicondylar width right	65.0
Femoral head diameter left	45.8
Meric index right	75.1
Cnemic index left	71.8
Cnemic index right	67.7

Metric data: Mediaeval infant burials.

	F1648	F3065	F4329
Femur length left	57	72	80
right		72	
Tibia length left		61	
right		61	74
Fibula length left		58	
right		58	70
Humerus length left		62	73
right		62	
Radius length left		49	59
right	40	49	
Ulna length left		58	67
right	46	58	
Clavicle length left		42	49
right		42	48

Non-metric traits. Non-metric traits are minor skeletal variants which are scored here mainly on a presence absence basis. Definitions of cranial traits are those of Berry & Berry (1967); post-cranial traits are defined after Finnegan (1978).

Non-metric traits: F3259

Trait	
Metopic suture	0
Ossicle at lambda	0
Lambdoid ossicle	1
Inca bone	0
Ossicle at bregma	0
Coronal ossicle	0
Squamo-parietal ossicle	-/0
Parietal notch bone	-/0
Auditory torus	0/0
Foramen of Hushke	0/0
Ossicle at asterion	-/0
Palatine torus	0
Maxillary torus	0
Mastoid foramen extra-sutural	0/1
Mastoid foramen absent	0/0
Double condylar facet on occipital	-/0
Parietal foramen	0/0
Zygomatic-facial foramen	-/0
Divided hypoglossal canal	1/-
Posterior condylar canal patent	0/-
Precondylar tubercle	0/-
Foramen ovale incomplete	1/-
Supra-orbital foramen complete	0/0
Maxillary M3 agenesis	0/0
Mandibular M3 agenesis	0/0
Mandibular torus	0
Mylohyoid bridging	1/1
Fossa of Allen	-/0
Plaque formation	-/0
Exostosis in trochanteric fossa	0/0
Supra-condyloid process	0/0
Septal aperture	1/0
Acetabular crease	0/0
Accessory sacral facets on ilium	0/-
Spina bifida occulta	Partial - S1 & 2 arches incomplete
Acromial articular facet	0/-
Os acromiale	0/-
Supra-scapular foramen	0/-
Vastus notch	1/-
Vastus fossa	1/-
Emarginate patella	0/-
Anterior calcaneal facet double	1/0
Anterior calcaneal facet absent	0/1

Non-metric traits: F3390

Mastoid foramen extra-sutural	1/-	
Mastoid foramen absent	0/-	
Divided hypoglossal canal	1/0	(probably not a pair)
Posterior condylar canal patent	0/-	
Precondylar tubercle	0/0	
Supra-condyloid process	-/0	
Septal aperture	-/0	
Acetabular crease	1/1	
Atlas facet double	0/-	
Atlas facet double	0/-	(other individual)

1=trait present 0=trait absent -=no observation possible. Scores for bilateral traits are presented as score for left side/score for right side.