9 Faunal and Human Remains from the Iron Age Settlement

9.1 Animal bone *by Jennifer Thoms*

9.1.1 Introduction

A report on the animal bones recovered during the excavation was produced *c* 1980 by Mary Harman. The material has been reassessed in the light of the developments that have occurred in the theory and methodology of zooarchaeology in the years since that time. Harman's original report is included in the project archive, and this account includes consideration of taphonomy (Lyman 1994), in an attempt to learn something about site formation processes, and to examine the pit contents in the light of recent research on 'special animal deposits' (J D Hill 1995).

9.1.2 Methods

The bones were cleaned, bagged and boxed when the current worker first encountered them. Nothing is known of the sampling strategy employed during the excavation, nor whether the bones collated in the boxes represent all the bones collected during excavation, or a percentage of those bones surviving on site.

As the bones had been identified to element and species by Harman, and any unidentifiable fragments classified as such, this normally time consuming process was not repeated. Harman's report made no mention of what criteria had been used to distinguish between sheep and goats. In this report the term caprines describes both sheep and goat identified by Harman since they could not be distinguished using Boessneck's criteria (Boessneck 1969).

Each fragment was examined closely for taphonomic indicators, such as gnaw marks and signs of burning, both of which have implications for the taphonomic history of the bone deposits and, in turn, on the site formation processes (cf Binford 1978; Meadow 1980; Brain 1981; Hesse & Waspnish 1985; Lyman 1994; Reitz & Wing 1999; O'Connor 2000).

All fragments were sorted into size categories of 10mm apart. For example, a bone fragment measuring 24.7mm would be classed in the '<30mm' group.

All fragments were assessed for preservation state and graded on a scale of A to D where 'A' indicates a fresh appearance with no surface degradation, 'B' a duller, slightly degraded surface and 'C' a more highly damaged surface but with at least half of the bone surface remaining intact. A bone with more than half of its surface severely abraded or missing, revealing the internal structure, was categorized as 'D'.

9.1.3 Results

No faunal remains were retrieved from contexts believed to date from Neolithic and Bronze Age activities.

The bone-bearing contexts from the Iron Age settlement are grouped into feature types, to facilitate incorporation of the faunal results into the interpretation of the site as a whole. The features that contained animal bones are discussed in the same order as in the foregoing site description (Section 7). Table 15 displays the results of the animal bone analysis, listing the features that contained animal bones and the species and skeletal parts (elements) they contained. Large quantities of small indeterminate fragments were retrieved from all features and have not been listed on Table 15 unless the feature produced no identifiable bone fragments whatsoever.

The bone fragments were also studied for taphonomic indicators and the state of fragmentation of the bones in each feature was assessed. The information is presented in Table 16.

9.1.4 Outer enclosure palisade trench

Terminal post-hole on the south side of the north-east entrance Twenty samples of animal bone fragments had been retrieved from the fill (Context ACA) of the pit on the south side of the north-east entrance. A fragment of pig ulna, one of only five pieces of pig bone retrieved from the site, was present in one of the samples. The good condition of the bone fragments may suggest rapid infilling of the pit.

Palisade trench AAQ Three maxillary molars were retrieved from the palisade trench north of pit ACB. They were from cattle, caprine and pig. The pig molar was only just in wear, indicating a young animal. No other bone fragments were present in the samples from this context and many factors might contribute to the retrieval of three teeth from the context including the fact that enamel is more durable than most bone material, and, possibly, the higher visibility of teeth in the trench.

9.1.5 Inner enclosure palisade trench

Only teeth fragments were retrieved from the contexts associated with the inner palisade trench. Tooth enamel is more resistant to decay in acidic

Table 15 The animal bone retrieved from various features at Dryburn Bridge

Feature	Species	Element	Frag	Taph
Outer enclosure palisade	Cattle	Teeth + enamel metapodial	Fragments	
	Caprine	Tooth, tibia, humerus metacarpal	Fragments	
	Pig	Tooth, ulna	Fragments	
	Pig	Milk tooth	Complete	
Inner enclosure palisade	Cattle	Tooth + enamel	Fragments	
	Caprine	Tooth	Fragment	Burnt
Houses 5 and 6	Cattle	Metapodial	Recent break	
	Horse	Skull	Fragment	
House 1	Cattle	Mandible	Fragment	
	Caprine	Astragalus, teeth	Fragment	
House 9	Indet	Indet		
House 3	Cattle	Tooth enamel	Fragments	
House 8	Indet	Indet		
House 7	Indet	Indet		Burnt
House 2	Cattle	Humerus Tooth Pelvis Radius Scapula Tibia	Fragment Fragments Fragment Fragment Fragment Fragment	Butchered Burnt
	Red deer	Antler Antler (cast)	Fragment	Butchered
	Horse	Tooth		
Structure D	Indet	Indet		
Pit grave – B3	Caprine	Third molar	Complete	
	Indet	Indet		Burnt
Pit grave – B2	Indet	Indet		
Pit grave – B 12	Indet	Indet		
Pit E1	Cattle	Teeth	Fragments	
	Caprine	Radius		
Pit M1 (MAC)	Cattle	Third phalanx Teeth Metapodial Pelvis Scapula Tibia Tooth enamel Vertebra	Complete Fragments Fragment Fragment Fragments Fragment Fragments Fragment	
	Pig	Humerus	Fragment	
F2/F3 (FAA)	Indet	Indet	1 fragment	
O36 (OBA)	Indet	Tooth enamel	Fragments	
Pit M69 (MAY)	Cattle	Horn core Skull Tooth enamel Rib		 Gnawed
	Caprine	Third molar (unworn)	Complete	
Pit M43	Dog	Almost complete skeleton		
Pit M5 (MAX)	Cattle	Maxillary molar	Fragment	

Table 15 (contd.) The animal bone retrieved from various features at Dryburn Bridge

Feature	Species	Element	Frag	Taph
Pit O48 (OBH)	Cattle	Axis vertebra	Fragment	
		Teeth + enamel	Fragments	
		Metacarpal	Fragments	
		Tibia	Fragment	
	Red deer	Antler	Large fragment	
	Horse	Metapodial	Fragment	
		Maxillary tooth	Complete	
	Caprine	Metatarsal	Fragment	
	Pig	Third molar	Complete	
Pit LEL	Cattle	Metapodial		
	Indet	Indet	Burnt	
Pit OBL	Indet	Indet		
Pit OCP	Indet	Indet		
Pit LAB	Cattle	Horncore		

Frag, fragmentation state; Taph, taphonomic indicator; Indet, indeterminate fragment.

conditions than is bone, so the finds reflect poor preservation conditions in that area of the site.

9.1.6 Houses 5 and 6

Three contexts from Houses 5 and 6 contained animal bone remains. FBX corresponds to the fill of the outer entrance post-pit L60 (illus 21) and FCT corresponds to the fill of the southernmost middle post-pit in the entrance to House 6 (L61). Context FBC is the fill from one of the post-holes in the post-ring of House 6.

Context FBX contained a very abraded, friable fragment of cattle metapodial that may have deteriorated further since excavation. The fill of L61 contained some small fragments of skull. This was identified by Harman as horse, suggesting it may have fragmented further since her initial analysis, as its present highly fragmented condition would preclude such an identification. Horse is rather rare in the Scottish zooarchaeological record, due to its role as a non-food animal. Hippophagy has been frowned upon by the church since at least medieval times and it seems likely that, even earlier, the animal's usefulness for traction and transportation, together with its slow reproduction rate, would increase its perceived value and so make its consumption less likely. Thus horse tends not to end up on the rubbish heaps or middens commonly excavated by archaeologists, resulting in a scarcity in the archaeological record. The occurrence of horse skull fragments in a pit, particularly a pit that may have had a defining role at the entrance of the house, may therefore be a matter of interest. In this instance, however, the small size of the fragments precludes against drawing any conclusions about their presence in the pit as they may represent re-deposited material.

9.1.7 House 7

Features relating to House 7 Context KAB was the fill of structure K2 (illus 3) and contained more complete, identifiable animal remains than did the internal structures sampled in House 7. The faunal remains included two left horn cores, a fragment of mandible with an almost complete tooth row (third premolar to third molar present) and a fragment of pelvis, all from cattle. One indeterminate fragment was burnt and calcined and was the only burnt bone retrieved from the feature, the pelvis fragment displayed butchery marks and both bones were reasonably well-preserved (B).

9.1.8 House 2

As indicated in Table 15 and Table 16, this more complete house had more bone fragments retrieved from it than the other features on site. Some difficulties exist with correlating the contexts containing bone with the three phases of House 2, so each context will be considered separately.

Context CEQ was the fill of a scoop between the two ring-grooves in House 2 (illus 39). Bone material excavated from context CEQ included worked red deer antler and butchered cattle humeri. The cattle humeri, all from the left side of the body, were derived from at least three animals, and were all heavily butchered. A piece of cattle scapula, also from the left side of the body was also present among the bones from this context, as was half a radius, from cattle and from the right hand side of the body. The slight over-representation of bones from the left side of the body is not particularly surprising; all three humerus fragments are from the distal end of the bone, the most dense part of the humerus and one of the most structurally dense parts of the skeleton. While the deposition

Table 16 Fragmentation and preservation of animal bone

Feature	Burnt frags	No of Frags	Context	% smaller than 20mm	% well-preserved ('A' and 'B')
Outer enclosure palisade	✓	67	ACA	52	59
		96	ACB	56	57
		22	AAR	55	86
Inner enclosure palisade	✓	76		66	72
House 1	✓	126		66	87
House 9	✓			n/a	0
House 3	✓	23		56	40
House 8		19		73	26
House 7	✓	19		95	0
House 2	✓	169		51	60
Burial 12		100+		100 (100+ tiny fragments)	100
Pit E1	✓	254		70	98
Pit M1		61		4	19
Feature M69	✓	216		68	97
Pit O48	✓	279		58	24
Pit LEL	✓	7		100	33
Pit OCP	✓	23	OCP	83	13

of three similar fragments of bone into one context might represent an example of a structured, or special deposit (*sensu* J D Hill 1995) it might equally well represent the activity of one carnivore, such as a dog, hoarding bones, or it may be table or butchery waste.

Context CAQ corresponds to the upper fill of the ditched feature and contained three fragments of bone 20–40mm in length. They were reasonably well-preserved (B) and showed no signs of burning or calcification.

Context CFA was the fill of the largest pit within the floor of the building. Of the 18 fragments of bone retrieved from this feature, 16 were unidentifiable and, of these, one was severely abraded and one was burnt. The identifiable bones comprised one fragment each of cattle tibia and pelvis.

Another context, CFR, the cobble infill of the ring-ditch, produced only tooth enamel fragments, again from cattle. The post-abandonment infill of House 2 (CAB/CBC) produced teeth and indeterminate fragments, predominantly derived from cattle or a similar larger mammal. One fragment of horse molar was retrieved from CBC. Of the 17 fragments retrieved from CAB, two were burnt and the majority (14) were in a reasonable state of preservation (B), while three were poorly-preserved (C). CBC contained around a hundred small (<50mm) fragments of tooth and tooth enamel, the majority from cattle. Some cattle teeth were also retrieved in samples labelled simply as 'House 2'.

9.1.9 Pit graves

Very little animal bone was found associated with any of the burials. One lower third molar from a caprine was retrieved from the fill of Burial 3, along with one indeterminate fragment of burnt bone less than 20mm long. There is no reason to attach any significance to the animal tooth in this context, as it could as easily have been present within the soil matrix used to fill the graves.

The fill of Burial 12, context FDA, contained over a hundred fragments of bone less than 10mm in length. They showed no signs of burning and were poorly preserved (D). It is possible that this is human bone, sampled before the grave was recognized as such, particularly as the human remains in this grave were of a fragmentary nature (Section 9.2). The poor state of survival of this bone sample does not permit further speculation.

9.1.10 Pitted boundaries articulating with House 8 porch (illus 3, b)

Pit E1 contained one caprine radius fragment less than 50mm long and one fragment of long bone from a large mammal such as a cow. Other bone material from this pit consisted of small indeterminate fragments of burnt, calcined bone and tooth enamel, plus some fragments of cattle teeth. The cattle teeth fragments were in very good condition, possibly indicating rapid infilling of the pit.

Pit M1, fill context MAC, contained several relatively complete and identifiable bone fragments. Cattle bones retrieved included two scapula articular ends, a distal end of tibia, a maxillary molar, a pelvis acetabulum articulation, a proximal metapodial fragment and a distal phalanx. All these skeletal areas are composed of structurally dense bone, which probably explains their survival. However, the lack of even such structurally dense bones on other parts of the site indicates that bone survival is better here than elsewhere. A fragment of pig humerus was also present in Pit M1 as well as several indeterminate fragments of bone in fairly poor condition (C). None of the bone in M1 was calcined or showed any other signs of burning. There is nothing about the bone assemblage from these pits to indicate it is anything other than domestic refuse.

9.1.11 Feature M69 and dog burial (M43)

The fill of pit M69 (illus 54), context MAY, contained fragments of cattle skull, including a 150mm long piece of horn core, approximately 200 indeterminate skull fragments, some tooth enamel fragments and two pieces of rib from a cattle-sized animal. One rib fragment had gnawing marks on it, and was the only piece of bone retrieved that exhibited evidence of carnivore gnawing. A mandibular third molar from a caprine was also present in this context, and was unworn, suggesting it derived from an animal of between one and two years old (Payne 1973). Burnt, calcined indeterminate bone fragments and fragmented tooth enamel were also present in this context.

The insertion of a dog burial (M43) obscured the relationship between pit M69 and the outer enclosure palisade trench. The dog skeleton is almost complete with parts of both maxillae and mandibles surviving. Other bones present include one cervical vertebra, seven lumbar vertebra, part of the sacrum, three caudal vertebrae, a few rib fragments, most of the pelvis and fragments of both scapulae. The limb bones are even better represented with most of both humeri, both radii and ulnae, six carpals, four metacarpals, seven phalanges, both ends of the right femur, both tibiae, parts of the fibulae, the left calcaneus and astragalus, two tarsals and five metatarsals all present.

The dog skeleton was in reasonable to poor condition (B to C) and the bones were fragile. All epiphyses present were fused to the diaphyses and the teeth were moderately worn, indicating the dog was several years old, certainly mature rather than juvenile.

Unfortunately no complete long bones survived so an estimate of withers height of the living dog could not be made. However, the size and gracility of the bones indicate a small- to medium-sized dog, similar in size to a modern spaniel or small collie.

The dog burial is of particular interest because the upper right forelimb had fractured and healed. This resulted in swelling along most of the length of the ulna and radius and slight bowing of both bones in the anterio-posterior plane, resulting in the right forelimb being around 10mm shorter than the left one. Examples of healed fractures in animal bones are rare in the archaeological record, and may suggest that the dog enjoyed the sort of status today accorded to pets, rather than being a working animal. It can be envisaged that a pet, valued for companionship, would be allowed, or indeed encouraged, to survive a bone fracture, whereas an animal kept primarily for working might not be kept alive if it was unable to run. There is no reason to doubt that animals were valued for companionship in the past, just as they are today, and there is written evidence of this in early Irish legal texts.

Pet dogs were particularly associated with high-ranking women in these sources. A dog's duties include providing company and a function in protecting a woman from fairies when she was giving birth (Kelly 1998, 120). The dog was itself protected by legislation against killing it; anyone doing so faced steep fines and the obligation to provide a priest to read scripture throughout the labour in its stead. Therefore the importance of animals in non-economic roles in the past can be demonstrated, and the idea that the dog buried at Dryburn Bridge might have been of some importance cannot be ruled out. The archaeological evidence that the dog was buried in a carefully stone-floored grave tends to accord with such a possibility.

9.1.12 Pit O48 (illus 3; illus 57)

Pit O48, context OBH, contained a considerable amount of bone and some antler (Section 8.8). An unworn third molar from pig was retrieved, suggesting an older animal than might be expected in an archaeological context. This tooth does not erupt until the animal is between 17 and 22 months (Silver 1969) and as most pigs are slaughtered for meat before that age the tooth may indicate a breeding animal. The tooth is unworn which might indicate that the animal was unsuccessful as breeding stock, dying or being killed later in life than expected if killed for food, but not living to be a productive breeding sow. The death may have been due to disease, infertility or the lack of another animal for the cooking pot.

Context OBH also contained indeterminate bones bearing butchery marks, and both burnt and unburnt bone material. None of this faunal evidence argues against the original suggestion that this feature represents a rubbish pit.

A particularly large antler from a red deer was also present in Pit O48 (Section 8.8). The large size of the antler indicates it came from an animal larger than most found in Scotland today. Red deer size varies considerable according to their nutrition base and the environment in which they live. They are at the edge of their tolerated habitat

range today in Britain and living in a resource-poor environment (Red Deer Commission 1981, 10; Clutton-Brock *et al* 1982, 11). It is known that stags reared on farms or parks can grow up to twice as large as hill animals from the same gene pool (Callandar & MacKenzie 1991, 54). The large size of this antler indicates a more favourable environment for red deer in the Iron Age than they experience in the Highlands today. The antler was cast, so does not indicate the animal had been hunted. It need not represent a local animal either, as antlers may have been a traded item.

9.1.13 Conclusion

The faunal evidence indicates that cattle, sheep or goats and horses or ponies were present on the site. Few gnawing marks were present on the bones, indicating either that dogs were not commonplace or that most bone material was deposited and buried rapidly. Red deer was only represented as shed antler, which may have been collected locally or traded from elsewhere. Larger, compact bone survived better than bone from smaller animals, or more cancellous material. Differential survival of bone precludes any detailed economic reconstruction as large animals such as cattle are over-represented in the faunal remains as a result of taphonomic processes.

The animal bone material is generally in reasonable condition, but highly fragmented, and was present in most contexts in quantities too small to be useful. The bones in the dog burial were soft and friable, indicating that their mineral content had been destroyed, presumably by acidic soil conditions, leaving the organic components more intact. Chemical removal of the inorganic component of the bones would explain why they were generally reasonably well-preserved but very fragmented.

Larger bones and more structurally dense body parts, such as distal humeri, survive this chemical action longer than do smaller, more porous bones. In the case of the human burials, most bones would be large enough to withstand chemical destruction, and the smaller bones from the limb extremities might be expected to survive due to their high structural density. The state of bone preservation seems to mirror the archaeological preservation generally with House 2 and the features in the south-west of the site producing bone that was better preserved than elsewhere. Much of the surviving bone had been burned, as the mineralization that takes place in the burning process aids preservation in certain soil conditions.

9.2 Human remains from the pit graves

by Julie Roberts

9.2.1 Introduction

The ten skeletons excavated from Iron Age pit graves in 1978 and 1979 were originally analysed by Harman (report contained in project archive). Methodologies used in the current analysis are recorded in Appendix I.

The condition of the burials varied greatly, but generally speaking the skeletons in the Iron Age pit burials were in a far worse state of preservation than those from the Bronze Age cists. The Iron Age burials had not been well protected in their pits, and as well as being susceptible to the detrimental effects of physical and chemical agents in the soil, stones had been placed directly on top of them at the time of burial. An assessment of the state of preservation of each articulated skeleton was made, based on the percentage of the skeleton surviving, the amount of fragmentation present and the degree of surface erosion to the bones. All ten individuals were less than 40% complete; seven were considered to be 'very poor' and three were 'poor'.

9.2.2 Age at death and sex

All the Iron Age burials were adults. Using one or more of the methods outlined in Appendix I, it was possible to assign an age range to five. The remaining five could only be termed 'Adult', although one was thought to be older than 25 years, and two were thought to be older than 30 years at death. Table 17 summarizes the age at death and sex data of the Iron Age burials.

Table 17 Summary of ages at death and sex of Iron Age burials

Burial no	Age at death	Sex
1	>30 years	Unknown
2	25–30 years	Female
3	>30 years	Unknown
6	>25 years	Male
7	Probable adult	Unknown
8	18–25 years	Unknown
9	30–40 years	Male
12	28–35 years	? Male
13	25–35 years	? Female
14	Adult	? Female

The sex of six of the adult individuals could be determined. The remainder were too poorly preserved and lacked sexually dimorphic elements. Two were female, one was a probable female, two were male and one was a probable male. This makes a male to female ratio of 1:1 if the probable and definite males and females are added together, respectively. If it had been possible to determine the sex of the remaining four adults, this ratio may obviously have been different.

In previous studies of 'normal' prehistoric and medieval populations (those that are not besieged

by famine or warfare), there has been a tendency for larger numbers of females to appear in the young adult age range, and this has been attributed to deaths during childbirth (Roberts & Manchester 1997). In this instance, there were no clear patterns.

9.2.3 Metric data

Very few cranial or post-cranial measurements were possible given the fragmentary state of the skeletal material. Details are included in the full osteoarchaeological report contained within the project archive.

9.2.4 Health and disease

Although the state of preservation of the remains was poor, it was still possible to undertake a reasonably comprehensive assessment of any pathological conditions present due to the relatively high survival rate of joint surfaces, fragments of shafts of long bone and rib, and dentition. This meant that conditions such as dental disease, degenerative joint disease and infectious disease could potentially be identified.

Dental disease The preservation of the dentition of even the more poorly preserved burials was generally good. Even in cases where the roots and pulp of the crown had degraded leaving only the outer enamel shell, it was still possible to examine the teeth for oral pathologies such as caries and dental enamel hypoplasia. A total number of 102 teeth were recovered from the Iron Age individuals. The frequencies and types of dental diseases observed will be discussed below in terms of overall frequency rates within and between the groups and also with reference to individual burials.

Three carious lesions were identified, giving an overall prevalence rate of 1.5%. Two of the Iron Age individuals were affected, a probable male who had two small lesions (Burial 12) and a female who had one lesion (Burial 2). The affected teeth were mandibular molars of Burial 12 and the right maxillary second molar of Burial 2. The lesions were small and slight in severity. None of the individuals had suffered from ante-mortem tooth loss.

As was the case for the Bronze Age skeletons (Section 4.4.7), it was difficult to assess the amount of dental calculus (mineralized plaque) present on the teeth. Where calculus was observed, it was generally slight. The only exceptions were female Burial 2, who had moderate to heavy calculus on her left mandibular molars and moderate on her right maxillary molars, and male Burial 9, who also had heavy calculus on the left mandibular molars (categorization after Brothwell 1981).

No dental enamel hypoplasia was observed on any of the teeth.

Degenerative joint disease Burial 2 was the only Iron Age individual to show signs of spinal joint disease and these were only slight, present in the first and second cervical vertebrae (although those were the only two vertebrae preserved in that skeleton).

9.2.5 Catalogue

Skeleton number: 1
Preservation: Very poor. Just a few degraded fragments of bone and tooth enamel. <5% complete. Moderate surface erosion.
Elements present: Cranial: Left temporal.
Dentition: Loose fragmented crowns, mostly unidentifiable except for right maxillary canine, and left maxillary canine and lateral incisor.
Post-cranial: Small fragments of upper limb and unidentified long bone, articular facets from three vertebrae, rib fragments × five.
Age at death: Amount of wear on surviving tooth crowns suggests age of 30+ years (judging from attrition patterns in others).
Sex: Unknown.
Stature: Unknown.
Pathology: None observed.
Non-metric traits: Not observable.
Additional info: Considerably less bone survived than originally catalogued. Various fragments previously sent for dating (GU-1149).

Skeleton number: 2
Preservation: Poor. 20% complete, very fragmentary with moderate surface erosion.
Elements present: Cranial: Left and right mandible (right menton only), left frontal and parietal, left and right occipital, temporal, sphenoid, maxilla and nasal bones, left zygoma, fragments of ethmoid and vomer.
Dentition: All maxillary and mandibular dentition except right mandibular third molar.
Age at death: 25 to 30 years.
Sex: Female.
Stature: Unknown.
Pathology: Dental disease, slight spinal joint disease.
Non-metric traits: Right mastoid foramen extra-sutural, left accessory supra-orbital foramen, posterior atlas bridging.
Additional info: 'Tibiae' (right and left?) previously sent for C14 dating (GU-1404).

Skeleton number: 3
Preservation: Very poor. <10% complete. Fragments only. Moderate surface erosion.
Elements present: Post-cranial: Left humerus and ulna, fragments of unsided humerus, ulna, femur, tibia and rib. One fragment of rib could be identified as right. One unidentified tarsal bone, one hand phalanx, ten fragments of vertebra, including lumbar and thoracic.
Age at death: Adult (30+ years based on vertebrae).
Sex: Unknown.
Stature: Unknown.
Pathology: None observed.
Non-metric traits: None observable.
Additional info: 'Assorted' fragments previously sent for C14 dating (GU-1405).

Skeleton number: 6
Preservation: Poor. 20% complete, very fragmentary. Moderate surface erosion.
Elements present: Post-cranial: Fragments of sternal

body, right clavicle, left humerus, ilium, ischium, right femur, fragments of right and left tibia, left ribs × three, left 1st metacarpal and 3rd metatarsal, three fragments of vertebra.
Age at death: Adult (25+ years).
Sex: Male.
Stature: Unknown.
Pathology: None observed.
Non-metric traits: Right plaque.
Additional info: Left femur previously sent for C14 dating (GU-1410).

Skeleton number: 7
Preservation: Very poor. <5% complete. Several fragments only. Moderate surface erosion.
Elements present: Cranial: right and left temporal bones. Post-cranial: Fragments of unsided femur, tibia, unidentified long bone and calcaneus.
Age at death: Probable adult.
Sex: Unknown.
Stature: Unknown.
Pathology: None observed.
Non-metric traits: None observable.
Additional info: None.

Skeleton number: 8
Preservation: Very poor. <5% complete. Several fragments only. Moderate surface erosion.
Elements present: Cranial: Left mandible, left and right occipital, left temporal.
Dentition: All left and right maxillary and mandibular premolars and molars. The teeth were all loose and with the exception of the right mandibular second molar, crowns/enamel only.
Post-cranial: One cervical vertebra, and one fragment of unidentified vertebra.
Age at death: 18 to 25 years.
Sex: Unknown.
Stature: Unknown.
Pathology: None observed.
Non-metric traits: Left double anterior condylar canal.
Additional info: A label on the box stated 'fragments except for skull removed for C14'. No C14 dates are known to have been obtained previously.

Skeleton number: 9
Preservation: Poor. 25% complete. Fragmentary with moderate surface erosion.
Elements present: Cranial: Mandible, occipital, temporal, zygoma, maxilla, palatine.
Dentition: All left mandibular premolars and molars. Loose right maxillary second and third molars, left maxillary lateral incisor and right mandibular second premolar and second molar. All loose teeth were crowns/enamel only.
Post-cranial: Right clavicle and humerus, left ulna, right and left ilium and ischium, left femur and tibia, right scaphoid, capitate and 1st and 2nd metacarpals, hand phalanges × 6, six cervical and five sacral vertebrae.
Age at death: 30 to 40 years.
Sex: Male.
Stature: Unknown.
Pathology: None observed.
Non-metric traits: Left foramen of Huschke, mastoid foramen extrasutural, posterior condylar canal open and absent zygomatico-facial foramen, precondylar tubercle, double atlas facets.
Additional info: Femoral head previously removed for C14 dating (GU-1412).

Skeleton number: 12
Preservation: Very poor, fragments of cranium and dentition only. 5% complete. Moderate surface erosion.
Elements present: Cranial: Left mandible, frontal, temporal, sphenoid and maxilla.
Dentition: All right maxillary teeth, left maxillary premolars and first and second molars, all left mandibular teeth except lateral incisor (lost pm), right mandibular central incisor, canine, both premolars and first and second molars. Only right mandibular teeth *in situ*.
Age at death: 28 to 35 years.
Sex: Possible male.
Stature: Unknown.
Pathology: Dental disease.
Non-metric traits: None observable.
Additional info: None.

Skeleton number: 13
Preservation: Very poor. <10% complete. Very fragmentary with severe surface erosion.
Elements present: Cranial: Left and right occipital, right petrous temporal.
Dentition: All dentition loose. Right maxillary lateral incisor, both premolars, second and third molars, left maxillary canine, both premolars and second and third molars, right mandibular premolars and 2nd molar, left mandibular premolars and second molar.
Post-cranial: Unsided scapula, humerus and fibula, right tibia, unsided fibula, minimum number of seven left ribs and two right, seven thoracic vertebrae, plus fragments of neural arch, three further fragments of unidentified vertebra.
Age at death: 25 to 35 years.
Sex: Probable female.
Stature: Unknown.
Pathology: None observed.
Non-metric traits: None recordable.
Additional info: 'Leg fragments' previously removed for C14 dating (GU-1414).

Skeleton number: 14
Preservation: Very poor. <5% complete. Only four fragments with moderate-severe surface erosion.
Elements present: Post-cranial: Right radius, ulna and femur.
Age at death: Adult.
Sex: Possible female.
Stature: Unknown.
Pathology: None observed.
Non-metric traits: None observable.
Additional info: None.

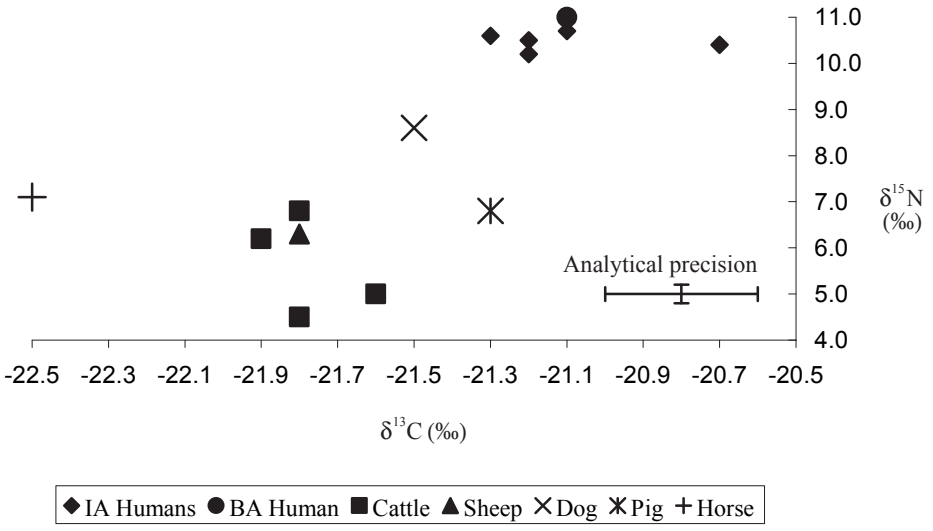
9.3 Stable isotopes from the human and faunal remains *by Mandy Jay*

Skeletal material from Dryburn Bridge has been included in a wider project employing carbon and nitrogen stable isotope analysis of bone collagen to investigate Iron Age diet in Britain. The data from the project as a whole will be published elsewhere. The site was chosen as one of four which are geographically close and from which a number of humans and also faunal material were available. The latter is important in providing a 'baseline' for the human values, since local environmental conditions will affect interpretation of the data. The other East Lothian sites from which material has been analysed are Broxmouth (Hill 1982a), Winton

House and Port Seton (Dalland 1991; Haselgrove & McCullagh 2000). These four sites were considered of particular importance in respect of their coastal location, as one of the research questions for the study was the consideration of the level of marine foodstuffs in the diet.

Samples were originally taken from ten humans, two of which were Bronze Age. Collagen preservation for this site was poor and only six of the ten yielded acceptable results. These are presented in Table 18 and illus 64, the latter also including the faunal data. Burials 5 (Bronze Age), 7 and 13 produced collagen with C:N ratios outside the range considered acceptable for uncontaminated material (2.9 to 3.6), while Burial 12 was not well enough preserved to produce enough collagen for analysis. For the four cattle and the sheep (representative of the herbivores from the site) the average $\delta^{13}C$ and $\delta^{15}N$ values were –21.8±0.1‰ and 5.8±1.0‰, respectively. The horse has not been included in these averages, since this animal regularly produces depleted carbon values when compared to cattle and sheep and this is likely to indicate physiological disparity.

The $\delta^{13}C$ values from this study compare well with those produced by the radiocarbon dating process (Table 7; Table 11), except in the case of Burial 8. Analytical error for the data presented here is considered to be ±0.2‰ (1-sigma) for both carbon and nitrogen and all data are based on the average of two replicates. The collagen extraction procedure underlying these data includes the use of ultrafilters (Brown *et al* 1988; Ramsey *et al* 2004), while the radiocarbon procedure did not (Gordon Cook, pers comm). This filtering may remove additional contaminants, which may be particularly relevant where consolidants have been applied, as in this case. Burial 8 has been included in this analysis as an Iron Age individual, as it was originally classified based on the archaeology, but the radiocarbon date suggests that it is younger than the others presented here (although there are questions over the reliability of the date, Section 7.6).



Illus 64 Stable isotope values plotted for individual humans and fauna

Table 18 Isotopic results for human samples

Burial (skeletal element sampled)	$\delta^{13}C$ (‰)	$\delta^{15}N$ (‰)	C:N (atomic)	%C (wt)	%N (wt)
10 (Bronze Age) (rib)	–21.1	11.0	3.3	45	16
2 (long bone cortex)	–21.2	10.2	3.4	44	15
6 (long bone cortex)	–21.3	10.6	3.5	42	14
8 (skull)	–21.1	10.7	3.3	44	15
9 (long bone cortex)	–20.7	10.4	3.4	29	10
14 (long bone cortex)	–21.2	10.5	3.6	42	14
Average Iron Age	–21.1	10.5			
Standard deviation	± 0.2	± 0.2			

Sample numbers here are low, but the conclusions reached take into account results from the other sites which have been included in the overall study. Despite the coastal location of the East Lothian sites, no significant levels of marine foodstuffs were present in the diet at any of them. This suggests deliberate avoidance of this resource. At Dryburn Bridge, the spacing between the average Iron Age human $\delta^{15}N$ value and that of the herbivores is 4.7‰, indicating a diet high in animal protein (meat and/or dairy produce). A spacing of 3 to 4‰ is often given as that expected between diet and consumer (eg Sealy 2001), so that a value over 4‰ is noticeably elevated. This elevation is not considered to be due to marine resources, as the average of the $\delta^{13}C$ values is only 0.8‰ less negative than that of the herbivores, such a shift being indicative of one trophic level in the terrestrial system. Human diet is consistent, both across the small number of individuals from this site and from the other sites investigated. The values for the dog and the pig, while being only single individuals here, conform to an overall pattern seen in which adult pigs are largely herbivorous, apparently not being fed significant amounts of animal waste protein, and dogs are omnivorous, probably consuming less animal protein than the human populations. The single Bronze Age human from this site has a slightly enriched nitrogen value over those for the Iron Age, although the numbers of individuals involved here does not allow for this to be considered significant.

next section