Proc Soc Antiq Scot, 116 (1986)

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Proc Soc Antiq Scot, 116 (1986), fiche 1: B1-C14

EXCAVATIONS AT CLATCHARD CRAIG, FIFE

JOANNA CLOSE-BROOKS

CLATCHARD CRAIG, FIFE J CLOSE-BROOKS

CONTENTS

4. DETAILS OF TRENCHES AND LEVELS

TRENCH A

1. Turf.
2. Light black: level below turf.
3. Material fallen from rampart 2 on inner side.
4. Red-brown, disturbed natural soil below level 3 behind rampart 2.
5. Disturbed top of rampart 2.
6. Upper stones of rampart 2.
7,8. Layers within rampart 2: stones and brown earth.
9. Very dark earth and large stones, filling a depression in the natural rock.

TRENCH B

1. Turf.
2. Level below turf behind rampart 1.
3. Upper part of rampart 1.
4. Fallen material behind rampart 1.
5. Pockets of reddish soil below level 2.
6,7. Levels within rampart 1, partly burnt.
8. Pit beneath back of rampart 1.
9. Bedding of rampart 1.
11. Disturbed subsoil.
12. Patch of soft dark earth on SE side of trench.

TRENCH B EXTENSION

As Trench B, and also:

5. Brown below level 2 (floor = P3 = PF4)
10. Fragmented natural rock and soil, with and below level 5.

TRENCH C

1. Turf.
2. Fallen material from rampart 2 on inner side.
3. Fallen material from rampart 2 on outer side,.
4. Stones in upper part of rampart 3.
5. Core of rampart 3.
6. Black earth and charred stones below level 5 at base of rampart 3.

TRENCH D

1. Turf.
2. Material fallen from rampart 3.
3. Levels within rampart 3.

TRENCH E

1. Turf.
2. Dark earth behind inner face of rampart 2.
3. Fallen material outside outer face of rampart 2.
4. Upper stones of rampart 2.
5. Timber traces etc, outside rampart 2.
6. Compacted earth against inner and outer faces of rampart 2.
7. Below 6 at base of rampart 2 (= 12).
8,9. Levels within rampart 2.
10. Outer facing stones of rampart 2.
11. Brushwood layer at base of rampart 2.
12. Below 6 at base of rampart 2 (=7).

TRENCH F

1. Turf.
2. Small stones below turf.
3. Floor and make-up which goes with the hearth.
4. Structure of the hearth.
5. Upper part of hearth, crumbled small stones.

TRENCH FF

Trench F re-opened and extended 6" all round in 1960

1. Turf.
2. Small stones below turf.
3. Occupation material above floor.
4. Floor material and below (= F3).
6. Beneath stones of hearth.

BAULK FG

Levels as trench G.

TRENCH G

1. Humus.
2. Dark earth and pebbles.
3. Brown (disturbed subsoil).

TRENCH H

1,2. Turf and topsoil.
3. Fall of rampart 2 to north.
4. Below 3 behind rampart 2.
11. Fall of rampart 2 to south.
13. Fill of rampart 2.
14. Light earth: lower fill of rampart 2 (or below rampart 2 ?)
21. Fall of rampart 3 to south.
22. Upper part of rampart 3.
23,24. Fall of rampart 3 to south.
25. Turf-line and below.
26,27,28 Levels within rampart 3.
29. Turf-line and below, under rampart 3.
31. Fall of rampart 4 to south.
32,33. Fill of rampart 4.

TRENCH H

34=29=25. Various parts of the turf-line, and below it, before the construction of ramparts 3 and 4.

TRENCH J

1. Turf.
2. Pebble layer.

TRENCH K

Small trial pit.

TRENCH L

Small trial pit.

TRENCH M

1. Turf.
2. Brown stony (denuded layer above rock).
3. Earth-pocked and fragmented natural rock. Layer not overall and often not distinct from 2.

TRENCH N

Small trial trench.

TRENCH O

De-turfed to reveal front revetment of rampart 2.

TRENCH P

1. Turf.
2. Brown earth, directly above natural rock or earth.
3. Black earth (deeper pockets in north-east and south-east corners).

TRENCH Q

1. Thick turf.
2. Brown stony (= 2 of M and P).
3. Medium stones (mostly fragmented natural rock, with some earth pockets).
4. Pockets in the rock.

7 CHARCOAL FROM CLATCHARD CRAIG

RRJ McCullagh

Scottish Development Department (Ancient Monuments), 3-11 Melville Street, Edinburgh.

SAMPLES USED FOR RADIOCARBON DATES:

Rampart 1	Trench B	Level 6	Sample 5	Lab No 2859	GU-1794
Rampart 1	Trench B	Level 6	Sample 6	Lab No 2856	GU-1795
Rampart 2	Trench A	Level 7	Sample 3	Lab No 2853	GU-1796
Rampart 3	Trench D	Level 3		Lab No 2855	GU-1797
Rampart 3	Trench H	Level 26	Sample 4	Lab No 2858	GU-1798

TRENCH B, LEVEL 6, SAMPLE 5

Timber from core of rampart 1 (illus 7).

All the charcoal appears to come from a radially split timber of Quercus sp (oak). This seems to have been a thin board, maximum thickness c 30mm, which has preserved a growth sequence (45 rings in 30mm) late in the parent tree's lifespan. Most of the charcoal represents the same c 50 years of that lifespan.

Sample weight: 110g

TRENCH B, LEVEL 6, SAMPLE 6

Transverse timber from the core of rampart 1 (illus 7).

Large fragments of a radially split timber, original radius of unconverted timber in excess of 200mm and sample comes from outer area of that girth. All the charcoal is of Quercus sp (oak).

Sample weight: 85.5g

TRENCH A, LEVEL 7, SAMPLE 1

Timber in core of rampart 2

All the charcoal comes from a single roundwood timber of Quercus sp (oak) c 40mm diameter. The growth pattern is irregular with several periods of retarded increment.

TRENCH A, LEVEL 7, SAMPLE 3

Timber in core of rampart 2

Large fragment of roundwood of Quercus sp (oak), maximum diameter c 100mm; age at felling was 50 years, but outer areas of timber were selected. No bark was present.

Sample weight: 88g

TRENCH A, LEVEL 7, SAMPLE 2

Timber in core of rampart 2

A single fragment of Quercus sp (oak); the contorted pattern of growth suggests a damaged or perhaps a once coppiced timber.

Trench A, Level 7, small find 2

Burnt object in or under rampart 2

Corylus avellana (hazel). This has been carved to form a slightly tapered peg, handle or trenail (Catalogue No 163)

TRENCH C, LEVEL 6

Timber from the core of rampart 3

All the charcoal is Quercus sp (oak) and is derived from a tangential conversion of a large timber. Most species come from the same area of growth and in many, tyloses are absent and insect channels occur indicating that most is sapwood. The longest sequence of growth is only 31 rings.

TRENCH D, LEVEL 3

Timber from the core of rampart 3

One large fragment of Alnus glutinosa (alder) roundwood, 60mm diameter. One equally large fragment piece of Quercus sp (oak) roundwood, 60mm diameter.

Sample weight: 87g

CUTTING I

Transverse timber from the core of rampart 3

All the fragments come from a single radially converted timber of Quercus sp (oak). By matching up sequences of rings of various pieces (a practice that is not exact and in which the 'fit' of each matched overlap was not tested statistically) a large board is suggested, with a cross section of 200 x 50mm. This contained about 100 rings; the original diameter of the parent tree was about 600-800mm and at least 100 years old when felled.

TRENCH H, LEVEL 24

Timber from in front of rampart 3

Six sections of wood of uniform girth, about 60–80mm diameter; perhaps all from one piece of wood. The sections examined are all Salix sp (willow)

The charcoal described above was examined with a view to selecting samples to be used for radiocarbon determinations. A large number of small fragments of timber, mostly from ramparts 1 and 3, remain unexamined. In addition, there are samples of some 10 burnt large diameter timbers from rampart 3, including six timbers with a minimum diameter of 80–100mm from Trench H, level 26. Although the survival of such large diameter charcoal is rare there are insufficient data here for a broad economic or environmental interpretation.

8 MORTAR ANALYSIS

N Davey

Building Research Station, Garston, Watford, Herts

Two samples of mortar, A4 and A5, from the body of Rampart 2 in Trench A level 7 were analysed. The aggregate after the lime had been removed contained approximately the following materials:

	Sample A4	Sample A5
Crushed tile	69%	74%
Sand and gravel	18%	19%
Silt	13%	7%

There seems no reason why the mortar should not be Roman. The crushed tile could quite well be of Roman origin.

(Report submitted 23 June 1959.)

9 SLAG FROM CLATCHARD CRAIG

J G McDonnell

Department of Mechanical and Production Engineering, The University of Aston in Birmingham

The early manufacture of iron artefacts required two processes. The first was the smelting of the iron ore to produce metallic iron, the bloom. Secondly the smithing process, which includes the consolidation of the bloom, the manufacture of artefacts, and the subsequent alteration, repair and recyclying of artefacts.

Residues are by-products of both processes. They can be divided into two broad groups, the diagnostic residues, principally the silicate slags, and the non-diagnostic residues, furnace lining and fuel-ash slag. The non diagnostic residues may also be by products of other pyrotechnological processes, eg kilns, non-ferrous working as well as domestic hearths and fires. The silicate slags areby-products of both the smelting and smithing processes. It is therefore of importance to distinguish between the slags from each process to identify the technologies practised on the site in the past. The slags derived from the smelting and smithing are similar in chemical and mineralogical composition, but may be distinguished because of the different conditions under which they formed and cooled. The nature of the smelting slags is dependent on the furnace technology, which has changed and developed since the first introduction of iron into Britain. The characteristic form of smelting slag is tap slag, which has a lava-like morphology, which was a product of the more advanced shaft furnaces, and medieval bloomeries. Other furnace technologies produced a variety of different forms of smelting slag, which in many cases is different forms to distinguish for smithing slags. The development of iron-smelting technology in Britain is not understood; in England there were a variety of furnace technologies used in the Iron-Age, Roman and Anglo-Saxon/Medieval Periods. In Scotland few iron-working sites have been scientifically studies, although many excavation reports note the presence of slag, sometimes in large quantities, but no evidence is presented as to whether the slag derived from the smelting or smithing process.

The examination of ironworking slags from a number of recent excavations, eg Birsay, Orkney (Hunter 1986, 196-203, Fiche 1:B9-D11), and Howe, Orkney (B Smith, pers comm) indicate that the slags are morphologically similar to those from early Iron-Age and Anglo-Saxon/Scandinavian Periods in England, and that the smelting slags are difficult to distinguish from the smithing slags.

The classification of mixed assemblage of slags into smelting and smithing slags relies on visual inspection of the individual specimens. Examples from each type and/or different phases may then be subjected to microscopical and chemical an annalysis. The detailed examination of all specimens is impossible, owing to the quantity involved.

The assemblage from Clatchard Craig contained 14.94 kg of residue (over 250 individual specimens) and the visual classification is shown in Table 1. This includes 0.86 kg of furnace/hearth lining and fired clay; 0.75 kg of fuel-ash slag (FAS); and 1.49 kg of 'earthy' fuel-ash slag. The furnace/hearth lining was typical, having a vitrified surface degrading (in cross-section) to heavily fired clay. It derives from the tuyère zone (air inlet), of the furnace/hearth where the temperature is greatest,and oxidising conditions prevail, causing vitrification of the clay surface. The tuyère mouth (a hole 1.2 cm in diameter) is often preserved, although at Clatchard Craig only fragments of the mouths occured. The quantity of furnace/hearth lining was normally less than 100g from individual layers. The exceptions were Trench G (180g), and Trench E Layers 9 and 11 (575 g) the latter was associated with concentration of slag. Fuel-ash slag is a high temperature product between silacous material and fuel ash. Morphologically it is grey/cream in colour, often vitrified, low density and occurs as fused globules fused together. The 'earthy' fuel ash slag in Ramparts from Trench C Layers 3 and 4 (570 g) and Cutting 3 (925 g) occurs in large lumps and includes other foreign material eg charcoal, pebbles etc. and probably dervies from a lower temperature reaction of siliceous material in the soil or rampart with fuel ash, resulting from the burning of the timber-laced rampart.

The diagnostic silicate slags (12.51 kg) were classified into three groups; possible smelting (?) slag (2.070 kg), smithing slag (9.770 kg)and

cindery fuel-ash slag (0.670 kg). The overall distribution of the slag in ramparts 2 and 3, inside the ramparts, and in Cutting 3 are shown in table 2. Over 50% of the slag was found in Trenches L, M, P, and Q and therefore cannot be satisfactorily phased. The slag from rampart 3 (Trench H Layer 22, S.F.19) was a single larger hearth-bottom (a plano-convex accumulation of slag in the base of the smithing hearth). The smithing slag from rampart 2 and from Trenches L, M, P,Q, comprised hearth-bottoms and randomly shaped lumps. The smelting (?) slag was distinguished on the basis of greater apparent density, a uniform fine crystalline fracture, and fewer vessicles. Several pieces of smelting slag occured as slag-cakes (plano-convex lumps of tapped slag cooled in small pits in front of the furnace.) The remainder was morphologically the same but occured as randomly shaped lumps.

Two samples were selected for detailed analyses to identify any differences between the smelting (?) and smithing slags. The smelting (?) specimen was a slag cake from Rampart 2, Layer 9 (CCE.9), and the smithing sample a hearth-bottom from the Interior Trench P, Layer 2 (CCP.2). Silicate slags comprise three mineral phases, iron silicate (normally fayalite $2FeO.SiO_2$), free iron oxide (normally Wustite FeO), and a glassy phase which contains silica, iron oxide and alkali oxides, (K_2O, CaO, etc). The texture of the minerals is primarily dependant on cooling conditions. The Clatchard Craig smithing slag, 9(CCP.2) contained varying amounts of free iron oxide (20-40%) in dendritic from, rhombohedral iron silicate (30-40%), and an unusually high glass content of about 40%. The smelting(?) slag was similar, but had a more homogeneous texture, and a lower free iron oxide content (20%), a high silicate content (50%), and 30% glass. Chemical analyses were obtained using a scanning electron microscope with an Energy Dispersive Analyser attachment; bulk analyses were obtained using a raster scan (at 200 or 500 times magnification), and spot analysis was used to analsyse individual phases. The results are shown in table 3 and are in accordance with other slag analyses. They confirm the iron silicate as fayalite. Two relevant points emerge from the analyses. Firstly the iron oxide analysis of the smithing slag shows the presence of magnetite (Fe_3O_4), containing 72% Fe) rather than wustite (FeO, 77% Fe). This is indicative of greater oxidizing conditions, commonly found in smithing hearths. Secondly the smelting (?) slag contained a high manganese oxide content, which replaces FeO in the iron

silicate. The presence derives from the smelting of 'bog ores', in which manganese oxide occurs naturally, and the level of smelting technology which could not reduce the oxide to the metallic state. The analyses confirm that CCE.9 is a smelting slag and distinguishes it from the smithing slag CCP.2. It is reasonable to assume that all smelting (?) slag derives from the smelting process, and it is also possible that some of the smithing slag has been mis-identified and derives from the smelting process, although the quantity is probably small. The texture of the Clatchard Craig smelting slag suggests a furnace technology in which the slag did not achieve the totally fluid state, remaining in a pasty condition, and was removed by raking-out rather than tapping, i.e. free flowing.

The nature of the excavations does not allow any assessment of the extent of the iron smelting and smithing activity at Clatchard Craig. The lack of evidence from other trenches indicates that the ironworking activity was concentrated in the vicinity of Trenches L, M and P and the slags were later incorporated in Rampart 2. Had the slags been dumped some distance from the hearths and furnaces, a wider distribution would have been expected. The quantity of slag (12.5kg) from a limited area does suggest quite intensive ironworking activity.

CONCLUSIONS

The Clatchard Craig residues include quantities of furnace/hearth lining, fuel ash slag, (including a distinctive 'earthy' form) and ironworking silicate slags. The chemical analysis confirmed the presence of smithing and smelting slag concentrated in the area of trenches L, M and P and Rampart 2. The analysis also indicates the use of 'bog ores' as a possible ore source. No conclusions can be drawn as to the extent of the ironworking activity due to the limited area of excavation. The morphology of the smelting slags indicates a low level of technology similar to that observed in Iron-Age and Anglo-Saxon England. Archaeological evidence suggests that the slag from Clatchard Craig dates to the fifth, sixth or seventh century AD.

TABLE 1

Classification of residues (weight in grammes)

Trench	Layer	Smithing	Smelting(?)	Cinder/FAS	FAS	F/H Lining
A	7	180	-	-	-	95
C	3&4	-	-	-	570*	-
E	4	-	285	-	-	-
	9	-	1340	180	-	-
	11	500	-	-	-	355
F	2	-	-	-	-	55
FF	-	-	-	-	-	45
G	2	-	-	-	-	180
H	11	275	-	-	-	-
	13	120	-	35	-	-
	14	-	-	35	-	-
	22	900	-	30	-	-
	23	-	-	60	-	-
	27	-	-	30	-	-
J	2	180	-	-	10	-
M	2	595	430	80	-	5
	3	195	-	-	50	20
P	2	2215	-	-	-	65
	3	2765	-	-	10	5
Q	2	-	-	15	5	-
	3	835	15	220	-	-
	4	160	-	-	-	35
Cutting	3	850	-	-	925*	-
	TOTAL	9770	2070	670	75+1495	860

(*= earthy fuel-ash slag from a burnt rampart)

TABLE 2

Distribution of silicate slags and non-silicate residues (in grammes)

Feature	Smithing Slag	Smelting(?) Slag	Cinder/FAS	FAS + f/hl
Rampart 2	1075	1625	235	450
Rampart 3	900	-	90	570
Internal Area	6945	445	345	485
Cutting 3	850	-	-	925

TABLE 3

S E M analyses of smithing slag, CCP.2, and smelting slage, CCG.9 (% Oxide)

	Na	Mg	Al	Si	P	K	Ca	Mn	Fe	Total
Bulk (area) Analyses										
CCP.2	01.3	00.0	07.8	20.1	00.8	02.1	02.5	00.8	63.7	99.1
CCE.9	01.2	00.2	07.5	23.4	01.6	02.6	03.6	01.5	60.6	102.2
Silicate Phase Analyses										
CCP.2	00.4	00.9	00.1	27.5	00.3	00.1	00.6	00.9	70.0	100.8
CCE.9	00.0	02.3	00.0	25.3	00.3	00.0	01.0	03.1	64.4	100.4
Iron Oxide Phase Analyses										
CCP.2	00.0	00.0	00.9	00.6	00.0	00.0	00.0	00.0	93.2 (72.5% Fe)	94.7
CCE.9	00.0	00.0	01.0	00.6	00.0	00.0	00.1	01.1	95.5 (74.2% Fe)	98.3
Glass Phase Analyses										
CCP.2	01.8	00.0	12.0	33.6	01.8	04.8	06.0	00.4	29.5	89.9
CCE.9	02.0	00.0	13.8	35.8	03.3	06.1	09.5	01.5	28.3	100.3

10. ANIMAL BONES FROM CLATCHARD CRAIG

Lin Barnetson

PREFATORY NOTE

Joanna Close-Brooks

An animal bone report for the 1959-60 excavation was prepared by R Hope-Simpson based on the work of Mrs W J Hope-Simpson on the 1959 material and Messrs G H Bunting and D W Verity with Dr I W Cornwall on the 1960 material. By 1982 this report needed updating. Unfortunately some of the bones including those from Trench H cannot now be traced so that Miss Barnetson could not re-examine all the bones. The present report therefore gives the commentaries from the original report in quotation marks when these refer to material now wholly or partially missing. The numbers of bones indentified in the original report are given in brackets. It will be seen there are a few changes in identification: rather more pig bones than were noted before, and a few equid bones.

The bones have been listed under the groups defined in the original report. The animal bones from 1954 Cutting I, rampart 3 equate with the 1959-60 Group I.

The animal bones are now housed in the Royal Museum of Scotland, Edinburgh.

Note: b = bone fragment, t = tooth fragment. * = bones not available for re-examination.

1953-4 EXCAVATION

Cutting I, Rampart 3

Cattle - 18b, 1t
Sheep - 2b
Pig - 6b, 1t
Equid - 1t

One cattle distal tibia has the epiphysis unfused, immature. Among the pig remains was a burnt distal humerus of an immature animal. The equid tooth is a lower molar in two pieces.

1959-60 EXCAVATION

Group I Bones in Ramparts 1 and 3 or in levels prior to their construction

Deposits	Species	No of Identified Pieces	Original Report
Trench B	Cattle	18b, 9t = 27	(25)
Levels 3, 6, 7	Sheep	2b, 5t = 7	(12)
(in Rampart 1)	Pig	10b, 2t = 12	(1)
	Red Deer	1b, = 1	
*			
Trench	Ox		(79)
Levels 25, 29, 34	Sheep		(2)
(prior to Rampart 3)	Pig		(1)
Levels 22, 26, 27, 28			
(in Rampart 3)			
Trench C	Cattle	4b = 4	(No totals
Level 6	Sheep	1b = 1	given)
(in Rampart 3)			
Trench D	Cattle	2b, 2t = 4	(5)
Level 3	Sheep	4t = 4	(2)
(in Rampart 3)	Equid	1t = 1	

'Commentary on Group I:

The only significant numbers occurred in Trench H, where the majority of remains are of ox and at lease five beasts are represented. The humeri present show one large animal, the others being somewhat smaller, and it is possible that this represents a sex difference. Two sheep fragments (radius and horn-core) are of small proportions. Pig is represented by an M3 germ only, i.e. a young animal.'

Notes

Two species not recorded in the original are red deer (a distal humerus of a mature specimen) and equid, probably pony, (a fragment of premolar) in Trench B, level 6, and Trench D, level 3, respectively.

The cattle bones in Trench B all belonged to a mature individual/s. One pig tibia had both epiphyses unfused indicative of an immature individual, probably less than two years old, and one pig metacarpal had an unfused distal epiphysis.

There were fragments of burnt bone in Trench B, level 6 and Trench C, level 6. Both deposits contained fragments of burnt cattle horn-core.

Measurements (all in mm)

Cattle:	Humerus, breadth of distal	62.0
	Metacarpal, breadth of distal	33.5
	Astragalus, length of lateral	44.5
	Astragalus, length of medial	40.5
	Astragalus, breadth of distal	23.0
Pig:	Calcaneum, greatest length	77.0
Red Deer:	Humerus, breadth of distal	52.0

Group II Bones in Rampart 2

Deposit	Species	No of Identified Pieces	Original Report
Trench A	Cattle	98b, 32t = 130	(113)
Levels, 5, 6, 7, 9	Sheep	27b, 1t = 28	(26)
and extension to	Pig	12b, 8t = 20	(6)
south	Equid	1b, = 1	
	Red Deer	1b, 4t = 5	
Trench E	Mostly tooth enamel scraps - cattle and pig,		
Levels 8, 9, 11	unburnt. (Original report 'A few calcined bones only, including parts of two ox molars').		
*			
Trench H	'A few bones mainly of Ox'		
Levels 12, 13			

Notes

The first phalanx in Trench A, level 7 is definitely that of an equid (pony). One cattle radius had ancient deep cuts on the diaphysis as did one rib. Level A 7 contained several bones of a very young calf, probably a neo-nate. Trench A also contained a red deer distal humerus and four teeth.

Measurements

Cattle:	Scapula, greatest length of distal end	44.0
	Scapula, greatest length of glenoid cavity	35.0
	Scapula, greatest breadth of glenoid cavity	24.5
	Radius, breadth of proximal	57.5
	Tibia, breadth of distal	50.0
	Calcaneum, greatest length	105.0
	Astragalus, length of lateral	51.0, 42.5, 43.5
	Astragalus, length of mesial	45.0, 39.5, 39.5
	Astragalus, breadth of distal	30.5, 22.0, 25.0
	Metatarsal, breadth of proximal	38.5
Pig:	Metacarpal III, greatest length	66.5
	Metacarpal III, breadth of proximal	14.0
Equus:	First phalanx, greatest length	c.68.5
	First phalanx, breadth of proximal	51.0
Sheep:	Humerus, breadth of distal	15.5
Red Deer:	Humerus, breadth of distal	47.0

Group III Bones from the interior: Trenches B, F/FF and G

Group IIIA Bones in and below the Floor (levels F3-FF4-B5) associated with the hearth in Trench F.

Deposits	Species	No of Identified Pieces	Original Report
Trench F/FF	Cattle	32b, 9t = 41	(118)
Levels F3 and FF4	Sheep	4b = 4	(6)
	Pig	8b, 4t = 12	(23)

Trench B	Cattle	1b, 11t = 12	(13)
level 5	Sheep	2t = 2	(0)
	Pig	7t = 7	(7)

'Commentary on Group IIIA:

Ox fragments are again in the majority, and several animals are represented. Four scapulae are present, all from mature beasts, although one is slightly larger than the others. This size difference is repeated in horn-cores and fragments of femora. The remains of at least two younger beasts are also present as two metapodials have separated epiphyses. Several pieces, including a metacarpal and fragments of femur are well burnt. Although over 20 fragments of pig are present, there is no direct evidence of more than one individual. Similarly, the six fragments of sheep appear to be from the same beast.'

Notes

Many of the bones from F3 and FF4 are obviously missing. Much of the bone is burnt and survives as splinters and small unidentifiable fragments. One cattle mandible has the permanent third premolar erupting indicating an animal probably c 30 months old. One other cattle mandible retains both third and fourth deciduous premolars.

One pig mandible shows the permanent third molar begining to erupt.

Measurements

Cattle:	Scapular, greatest length of distal end	48.0
	Scapular, greatest length of glenoid cavity	37.0
	Scapular, greatest breadth of glenoid cavity	31.0
	Metacarpal, breadth of distal	38.0
	Metatarsal, breadth of proximal	32.0

Group IIIB Trench F/FF, beneath the Hearth

Deposits	Species	No of Identified Pieces	Original Report
*Level FF5	Ox		(61)
	Sheep		(24)
	Pig		(1)

'Commentary on Group IIIB:

Again, the majority of remains are of ox. At least two beasts of less than four years at death are indicated. The sheep remains include at least one young animal, indicated by the absence of a third molar in a fragment of mandible. Pig is represented by one molar only.'

Group IIIC Trench F/FF, in upper part of Hearth

Deposits	Species	No of Identified Pieces	Original Report
Level F5	Cattle	8b, 4t = 12	(No totals given)
	Sheep	4b = 4	
	Pig	4b = 4	

'Commentary on Group IIIC:

Miscellaneous fragments of calcined bones.'

Notes

The left mandible of a pig shows the third permanent molar erupting. Only tow sheep rib fragments and one vertebral fragment are burnt.

Group IIID Occupation material in levels above Floor F3-FF4, or around it

Deposits	Species	No of Identified Pieces	Original Report
Trench F/FF	Cattle	9b, 45t = 54	(53)
Level F2	Sheep	- - = 00	(0)
	Pig	1b, 3t = 4	(5)
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Trench F/FF	Ox		(109)
Level FF3	Sheep		(16)
	Pig		(1)

Deposits	Species	No of Identified Pieces	Original Report
Trench G	Cattle	9b, 24t = 33	(54)
Level 2	Sheep	1b, 3t = 4	(1)
	Pig	3b, 2t = 5	(6)

'Commentary on Group IIID.

The collection is mainly of ox and several beasts are represented, with a high proportion of young animals, including (in FF level 3) most of the skeleton of an ox which appears to have been about 2½ years at death. The

sheep remains are few in number and may be from one young animal only. The remains of pig are of jaw or teeth only.'

Notes

All the bones from FF3 are missing and some of the bones from G2 must also be missing.

One cattle mandible in F2 retains its deciduous premolars though the first molar is erupted and in wear - probably less than 18 months old at death or kill.

The pig bones include a maxilla fragment with M2M3 in situ, a piece of calcined rib, a calcined second phalanx and a distal metapodial.

The sheep scapula fragment and three teeth are all from a mature animal.

GENERAL NOTES

Bones from all parets of the sketeton are present in most of the deposits available for examination, indicative, presumably, of midden bedris rather than food residue alone. As the burnt and calcined bones included hornocre and tooth fragments besides ribs and limbs, this is probably not the result of cooking (roasting) processes only. The cuts on the cattle bones appear to be butchering marks but there are also some fragments which bear marks comparable to dog-gnawing marks, for example, the pig distal humerus epiphysis in Trench D. The pigs generally seem to be immature whereas both mature and immature specimens of cattle and sheep are present. The neo-nate calf from Trench A, level 5, was surely not food debris.

Preservation of the whole is reasonably good, for example, the comparatively fragile bulla tympanica of an ox is present in Trench A. Unfortunately many of the bones are missing but at least most of the material is identifiable to species and some pieces were sufficiently intact to permit measurements to be taken.