Excavations at Copse Farm, Oving, West Sussex.

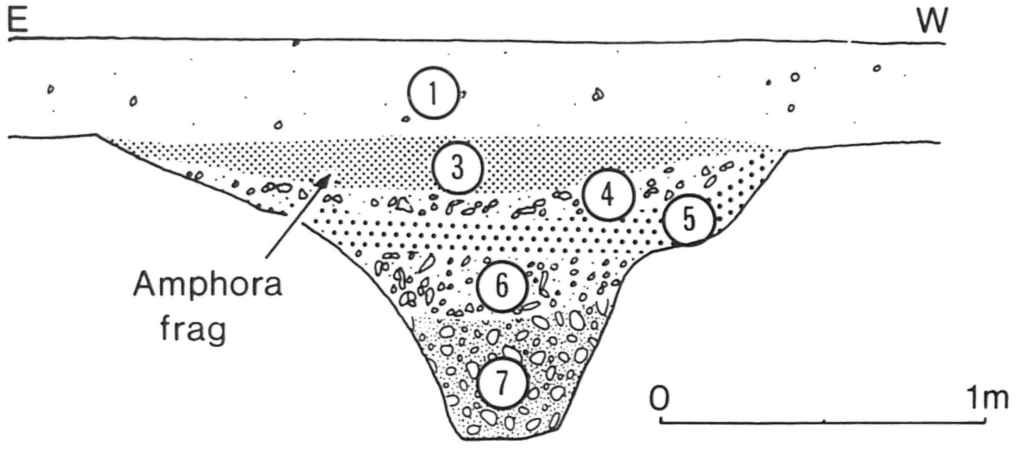
By Owen Bedwin and Robin Holgate.

Microfiche pages 1-72.

Contents

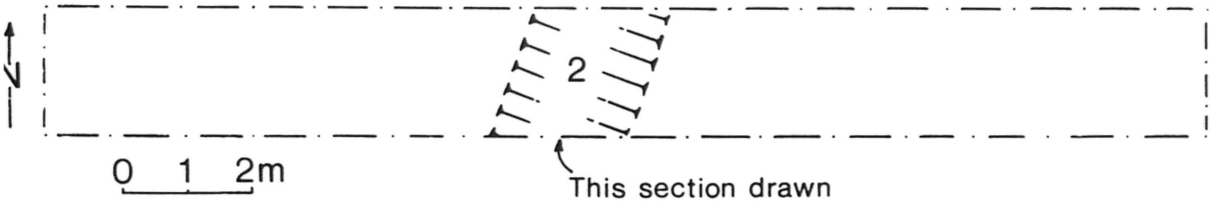
COPSE FARM, OVING 1980

Trench A; Section and plan



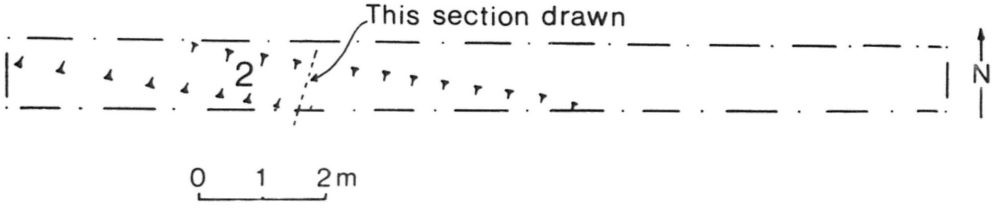
KEY

1 Ploughsoil
3 Fine silty fill
4 Gravelly fill (?tip lines)
5 Soft silty fill
6 Hard stony fill
7 Hard packed gravel fill



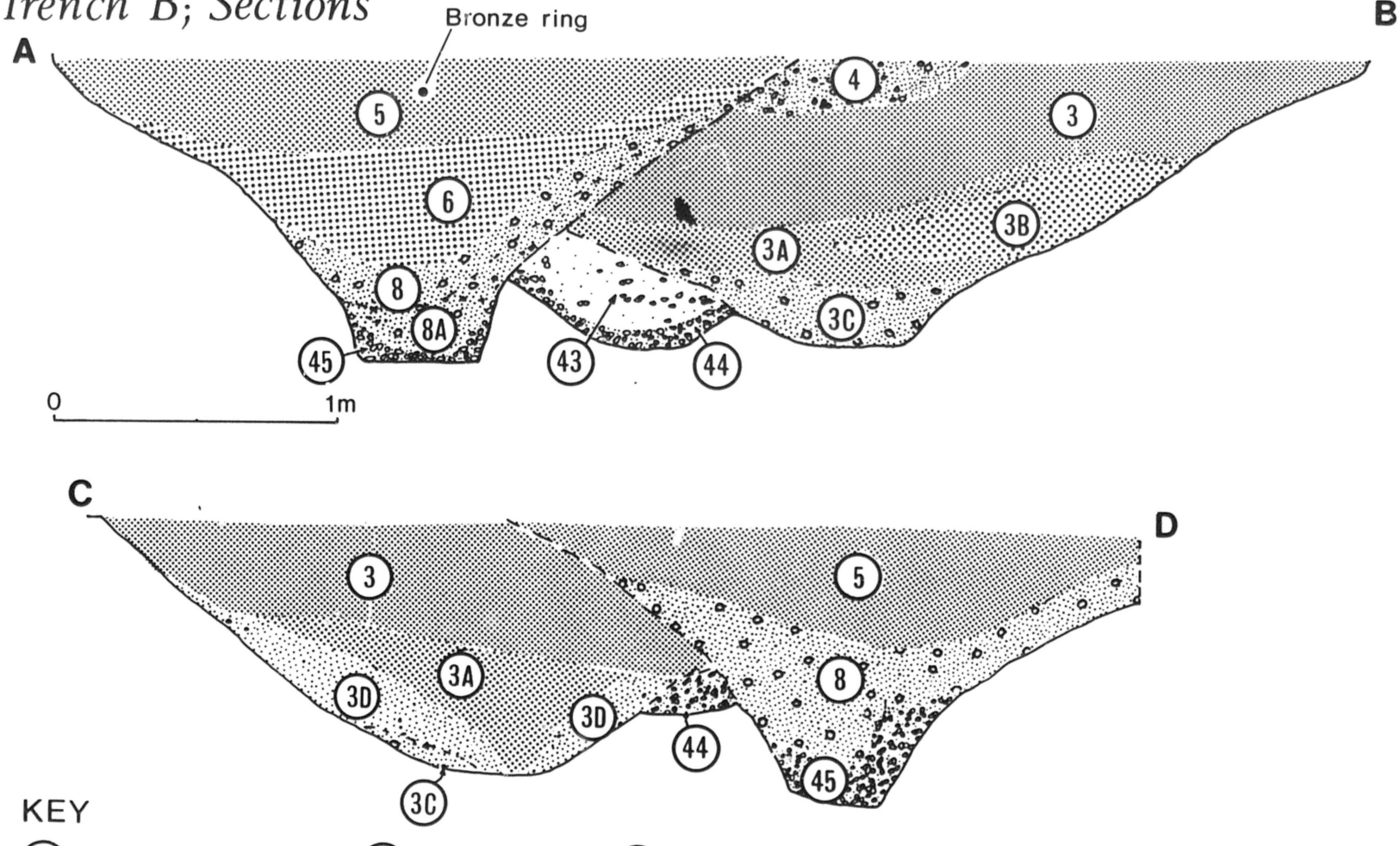
Trench C; Section and plan

3 Chalk and gravel bits in d. grey soil matrix



COPSE FARM, OVING 1980

Trench B; Sections



KEY

(3) Fine mid-brown fill (4) Chalky lens (5) Uniform light brown fill

(3A) As (3) with few chalk flecks (3B) As (3) with a little daub

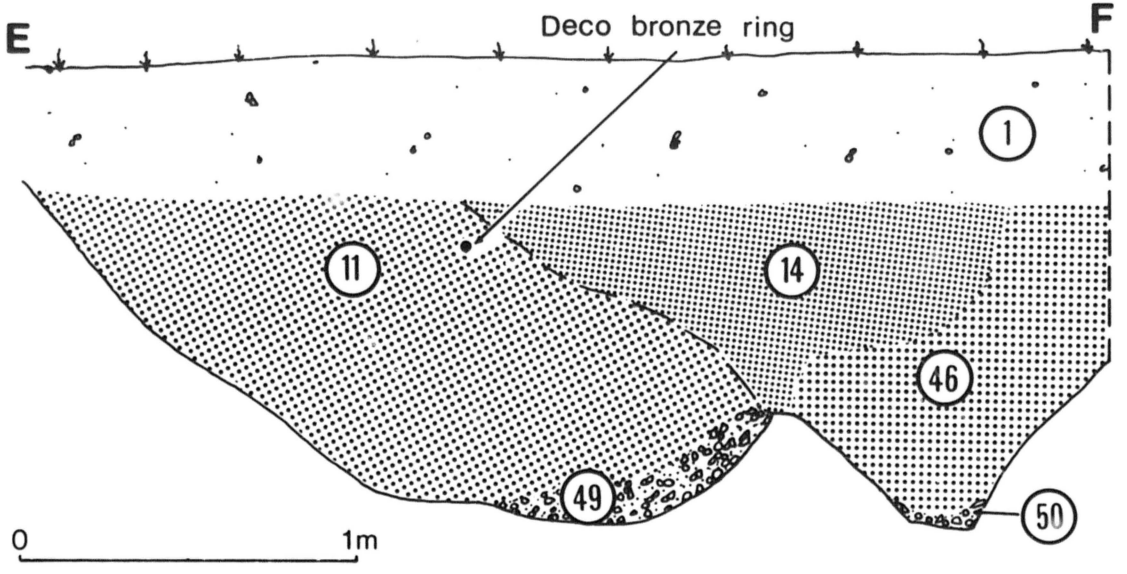
(3C) Chalky bits in (3) (3D) As (3) with chalk flecks

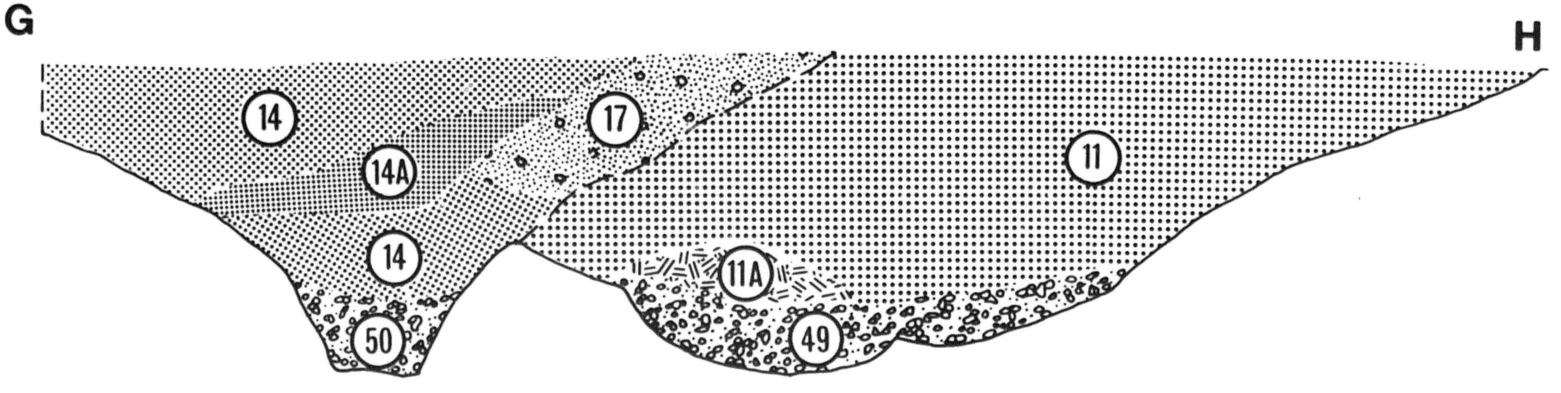
(6) V. daub rich fill (8) (8A) Fine brown fill with chalk flecks

(43) Clean brown fill with a little chalk (44) (45) V. chalky silt

COPSE FARM, OVING 1980

Trench B; Sections





KEY

(1) Ploughsoil

(11) Fine brown fill with chalk and gravel flecks

(11A) As (11) with much yellow clay

(11B) As (11) with more chalk

(14) Fine brown fill similar to (11)

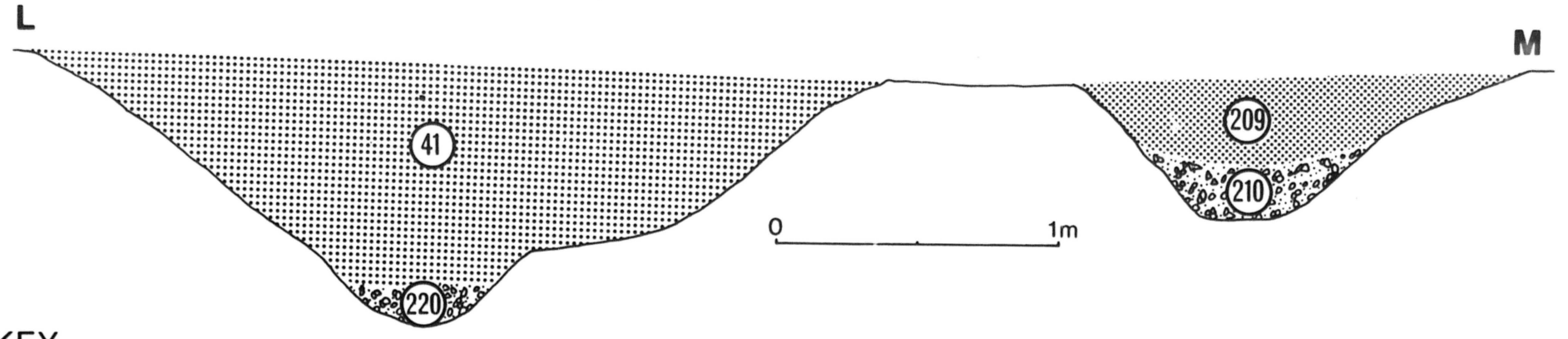
(14A) As (14) with much charcoal

(17) Chalky lens

(46) As (11) but darker

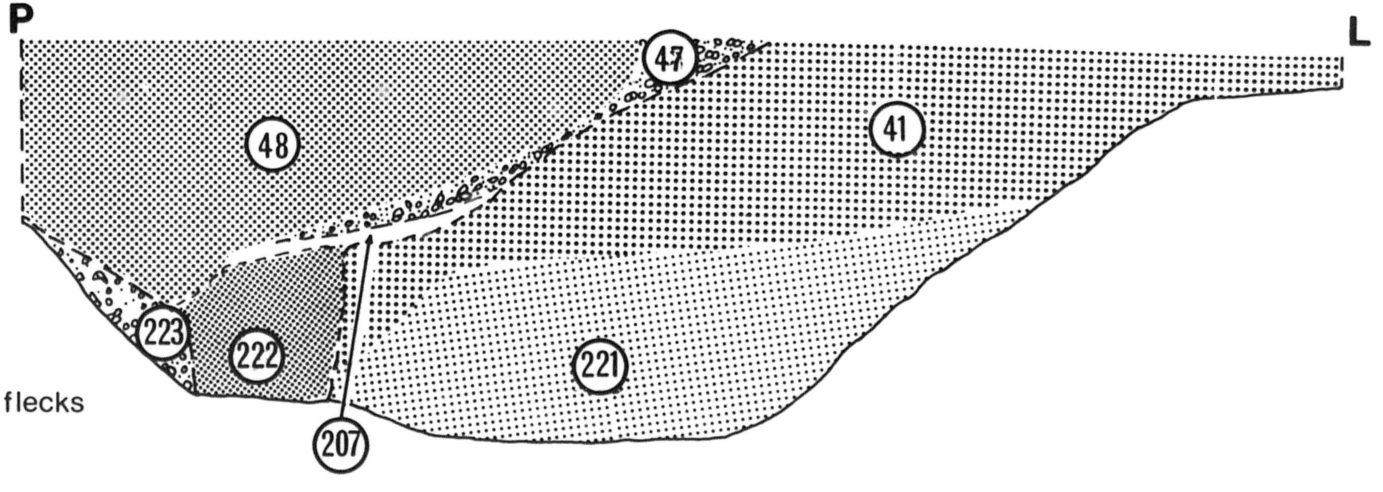
(49), (50) Chalky silt

COPSE FARM, OVING 1980
Trench B; Sections



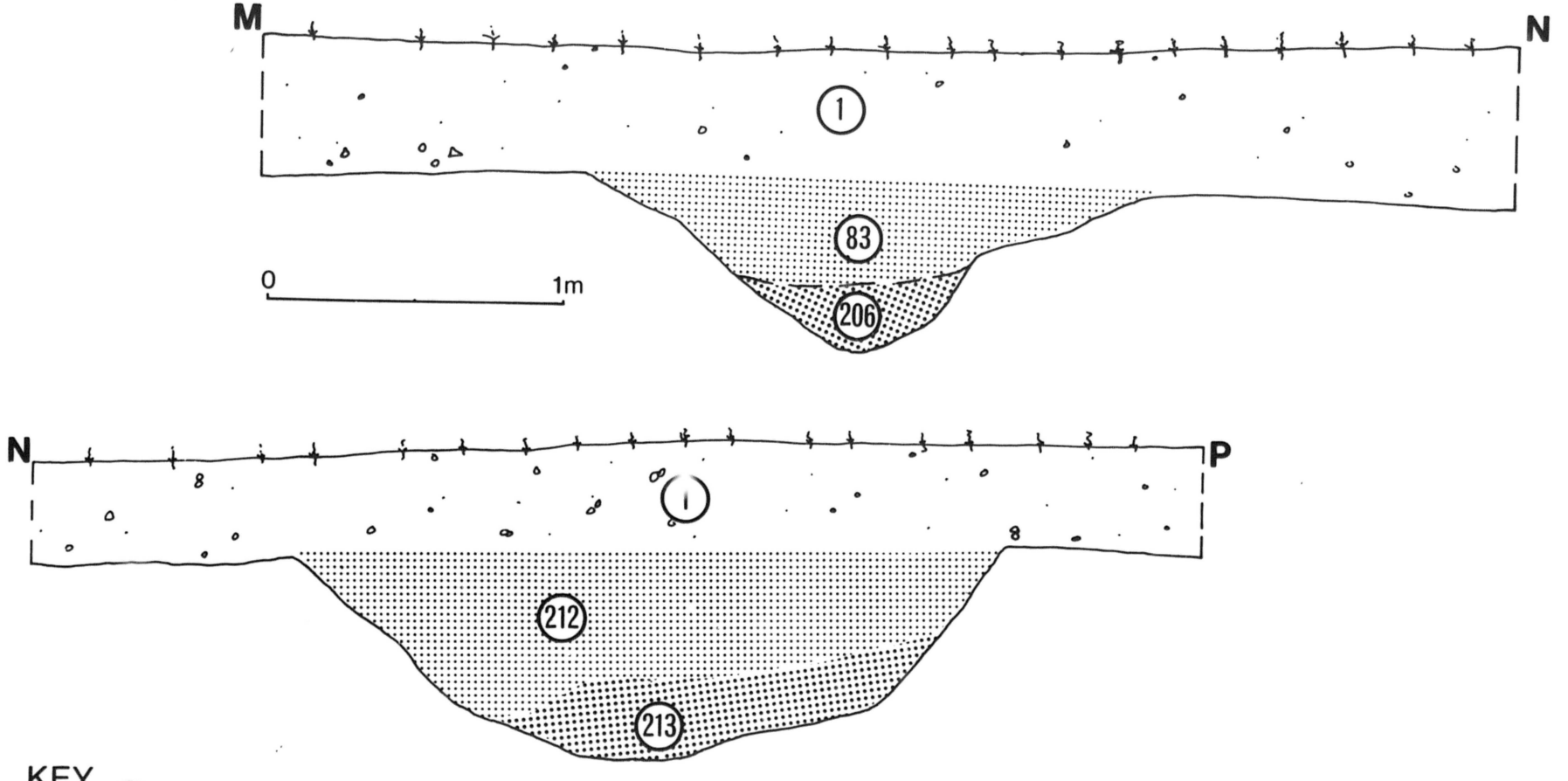
KEY

- (41) Fine brown slightly gravelly fill
- (47) Chalky lens
- (48) Fine brown fill
- (207) Charcoal rich lens
- (209) Uniform slightly gravelly fill
- (210) Brown gravelly fill
- (220) Fine brown silt
- (221) Brown stony fill
- (222), (223) Brown gravelly fill with chalk flecks



COPSE FARM, OVING 1980

Trench B; Sections



KEY

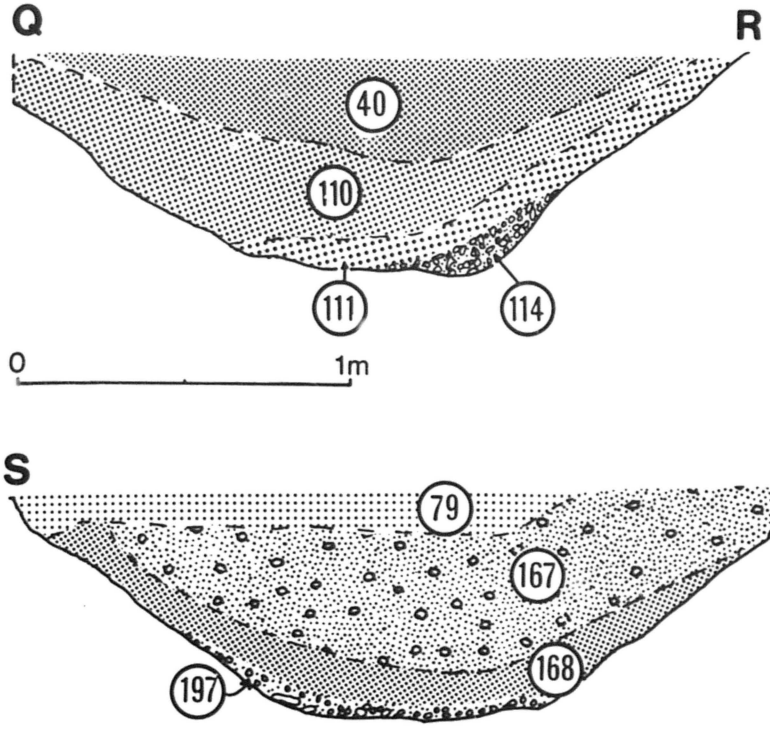
(1) Ploughsoil

(83) Brown slightly chalky fill

(206), (213) Fine brown silt with chalk and gravel

(212) Light brown fill

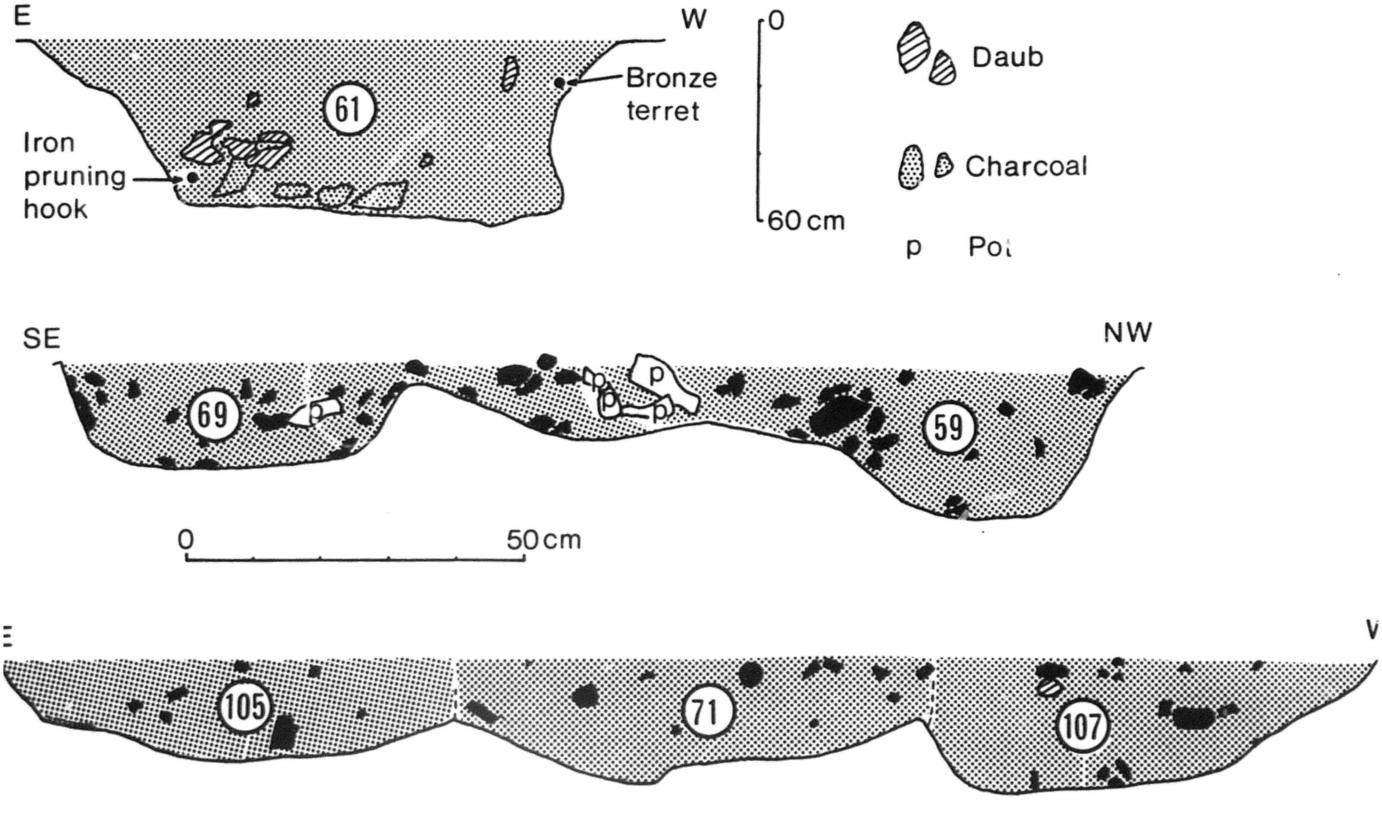
COPSE FARM, OVING 1980
Trench B; Sections



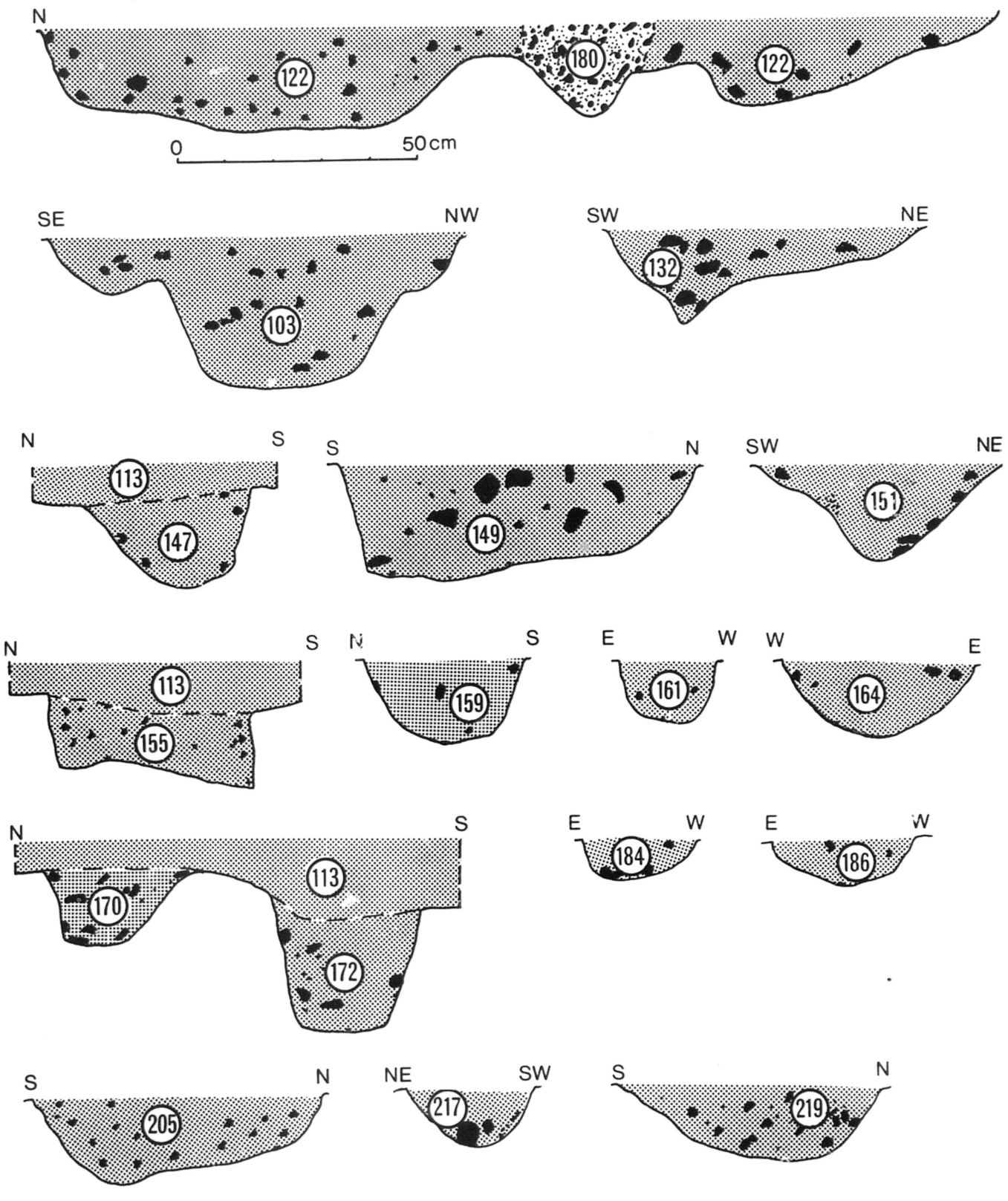
KEY

- (40) Fine d. brown fill
- (110) D. brown fill with some charcoal
- (111) Chalky fill with some charcoal
- (114) Sticky brown fill
- (79) Charcoal rich fill
- (167) Brown fill with chalk bits
- (168) Charcoal rich fill
- (197) Chalky fill

Working area

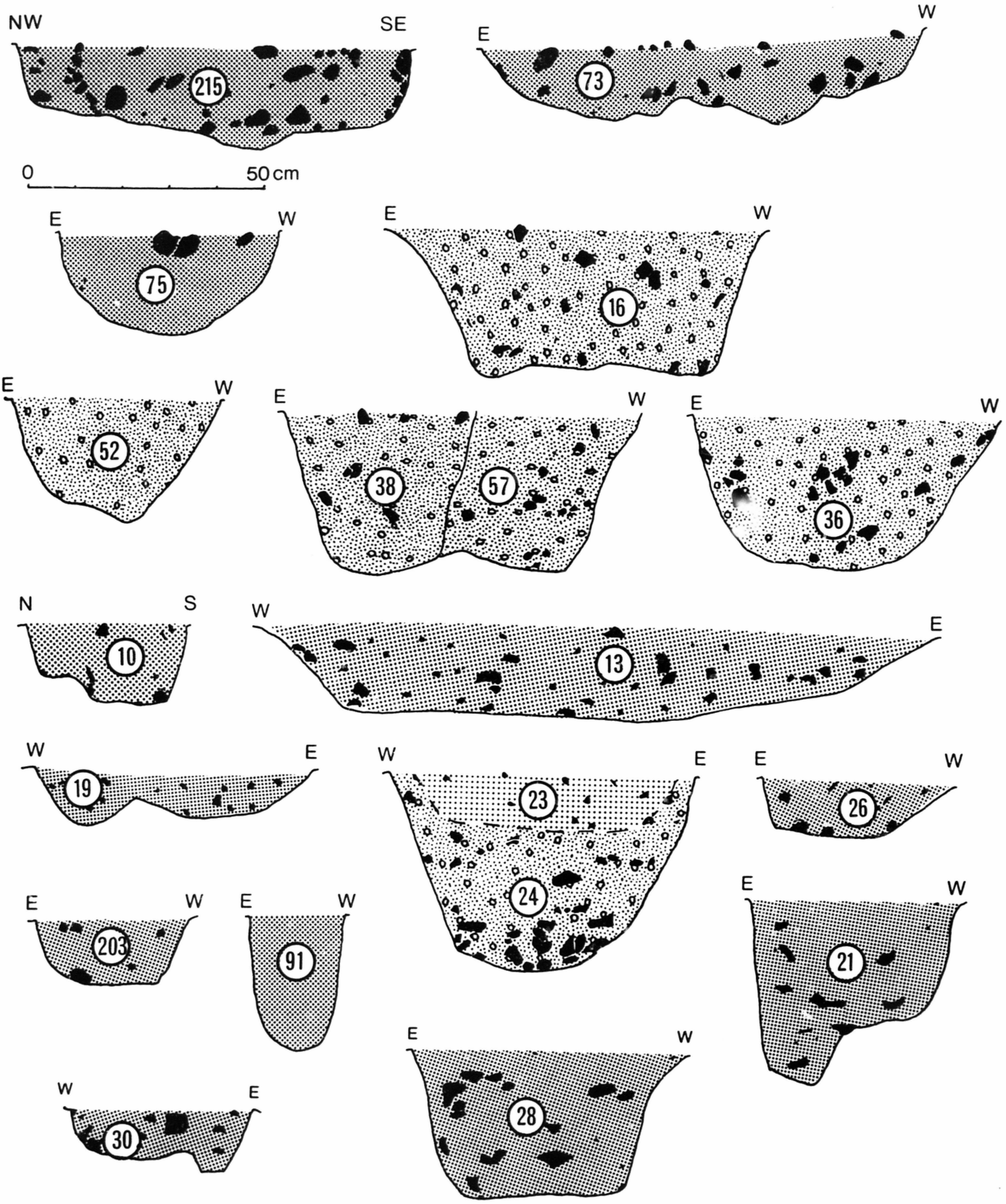


COPSE FARM, OVING 1980
Trench B; Sections; Working area



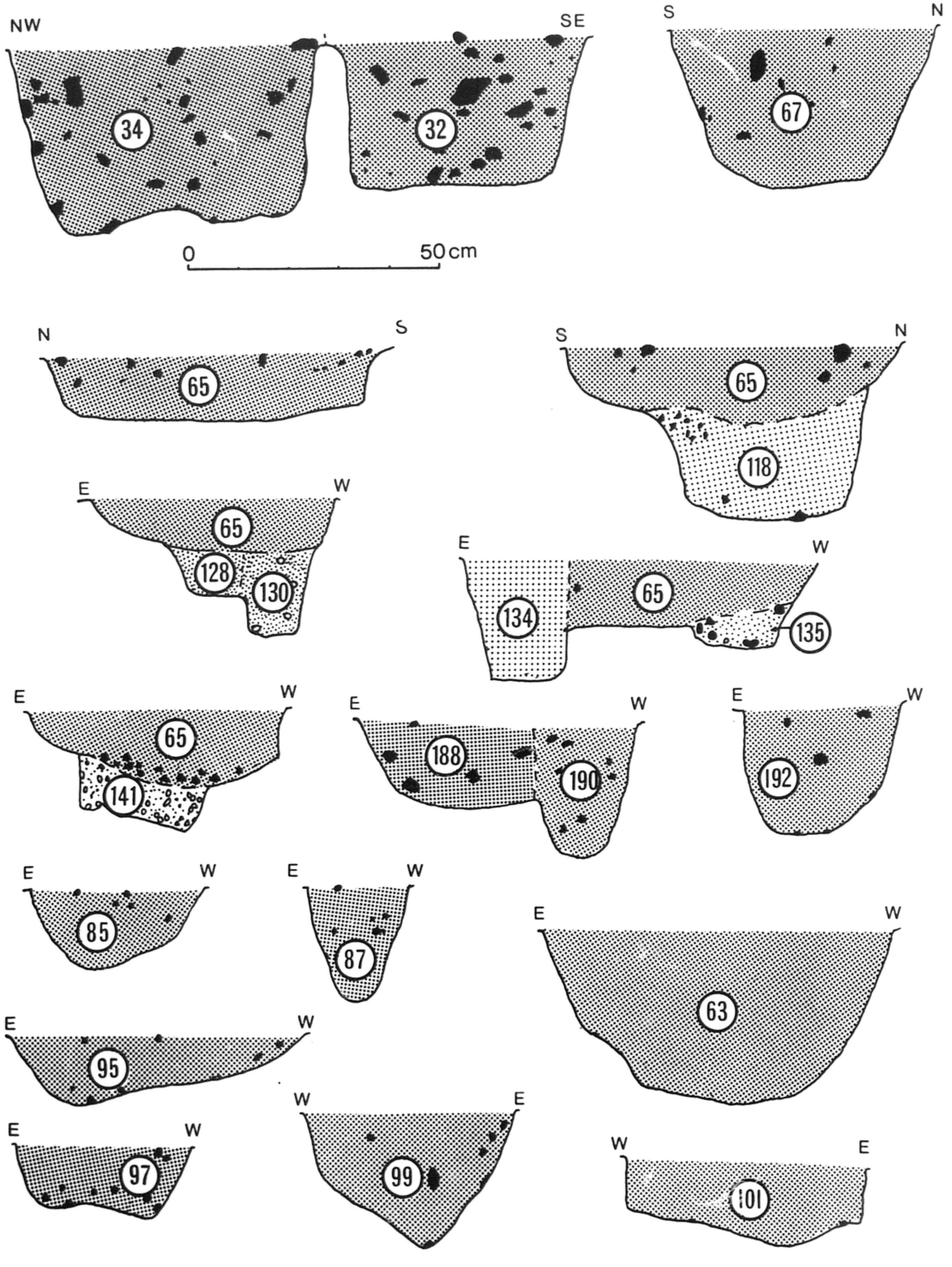
COPSE FARM, OVING 1980

Trench B Sections



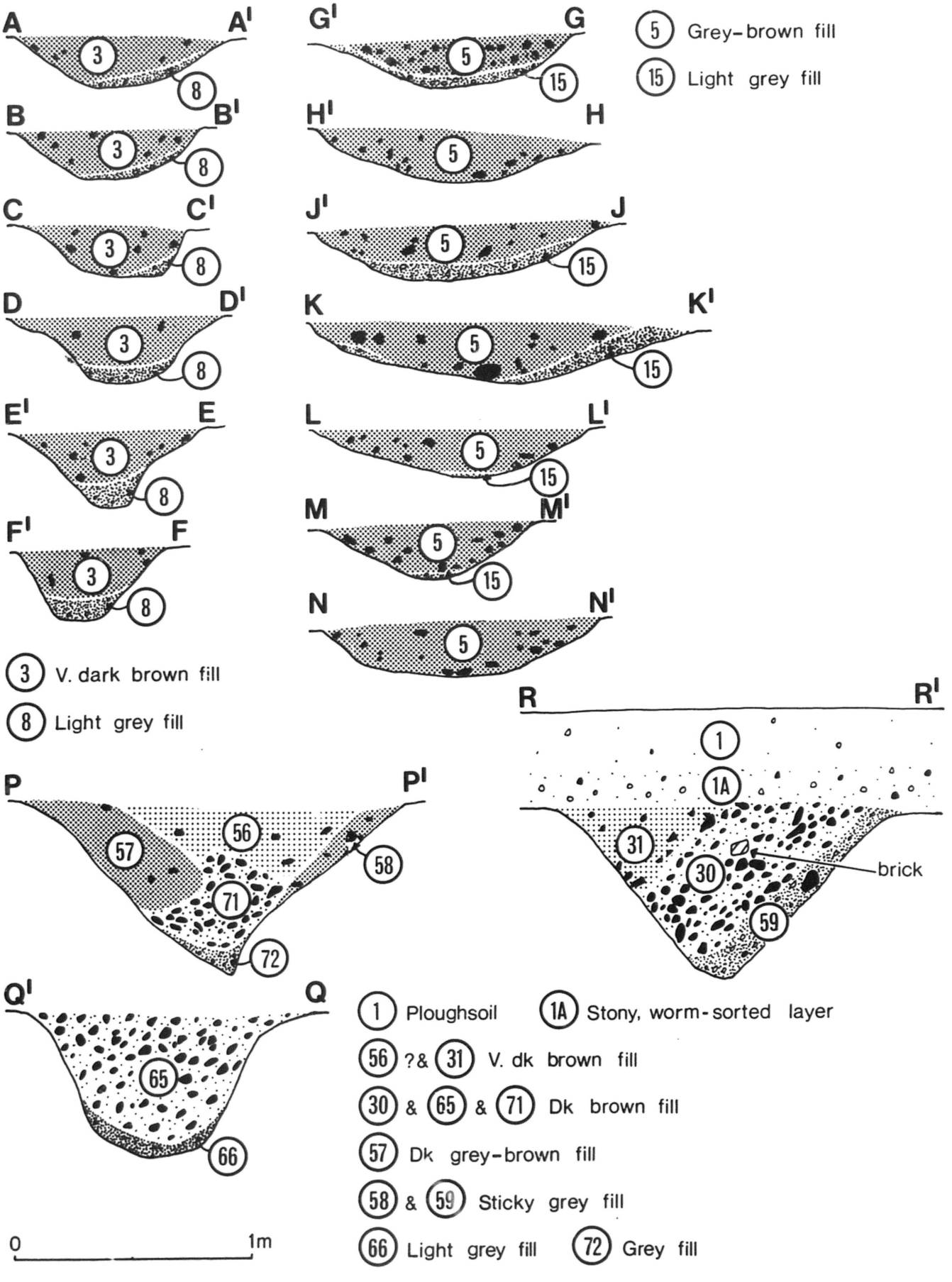
COPSE FARM, OVING 1980

Trench B; Sections



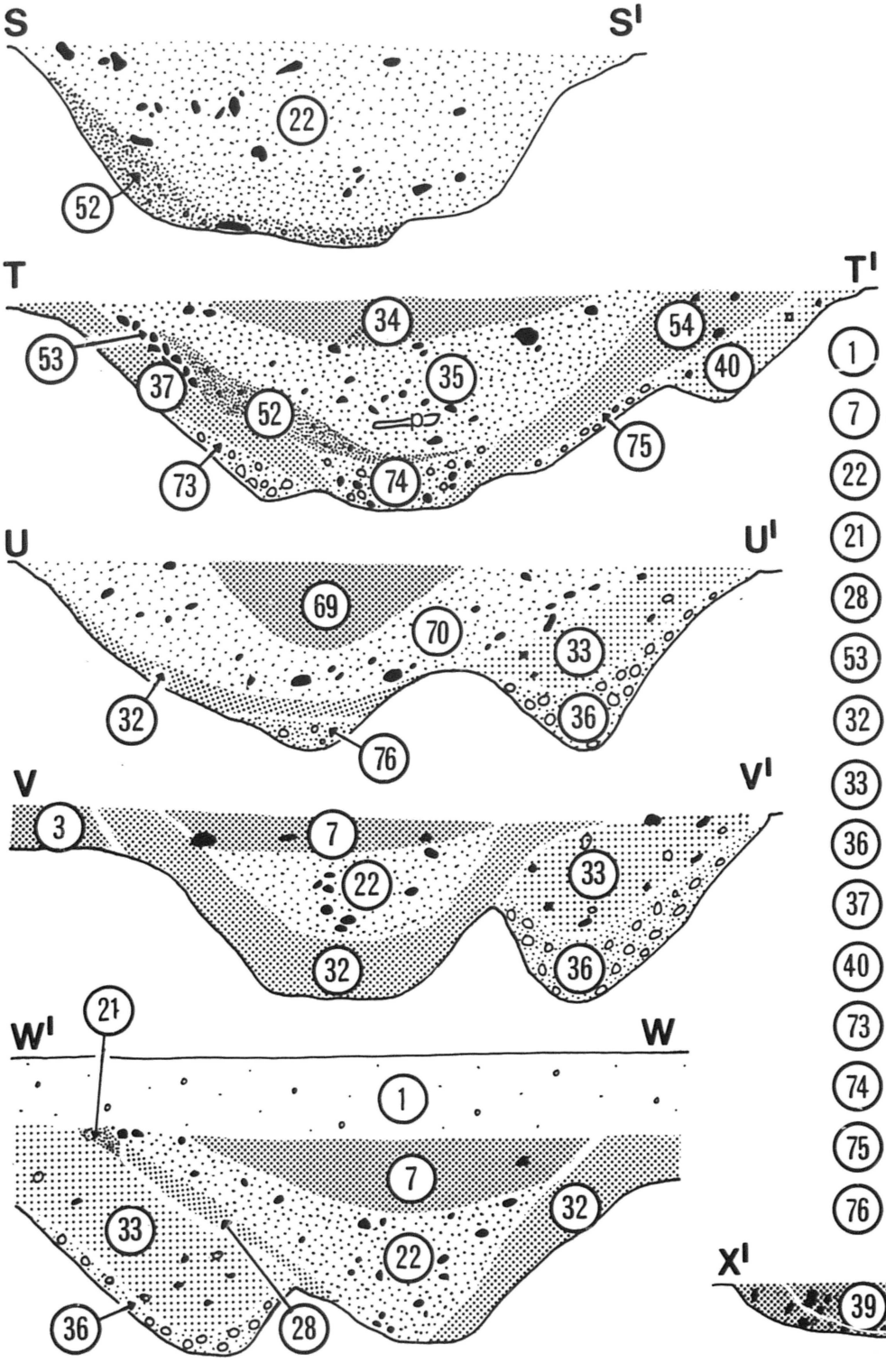
COPSE FARM, OVING 1982

Trench E; Sections



COPSE FARM, OVING 1982

Trench E; Sections



(1) Ploughsoil

(7) & (34) & (69) Dark grey-brown fill

(22) & (35) & (70) Brown-grey fill

(21) Dark grey fill

(28) & (52) Grey-brown fill

(53) Light grey fill

(32) & (54) Grey-brown fill

(33) Light grey-brown clay fill

(36) Light grey fill

(37) Dark grey-brown fill

(40) Light grey fill

(73) Grey fill

(74) Grey-brown clay fill

(75) Grey fill

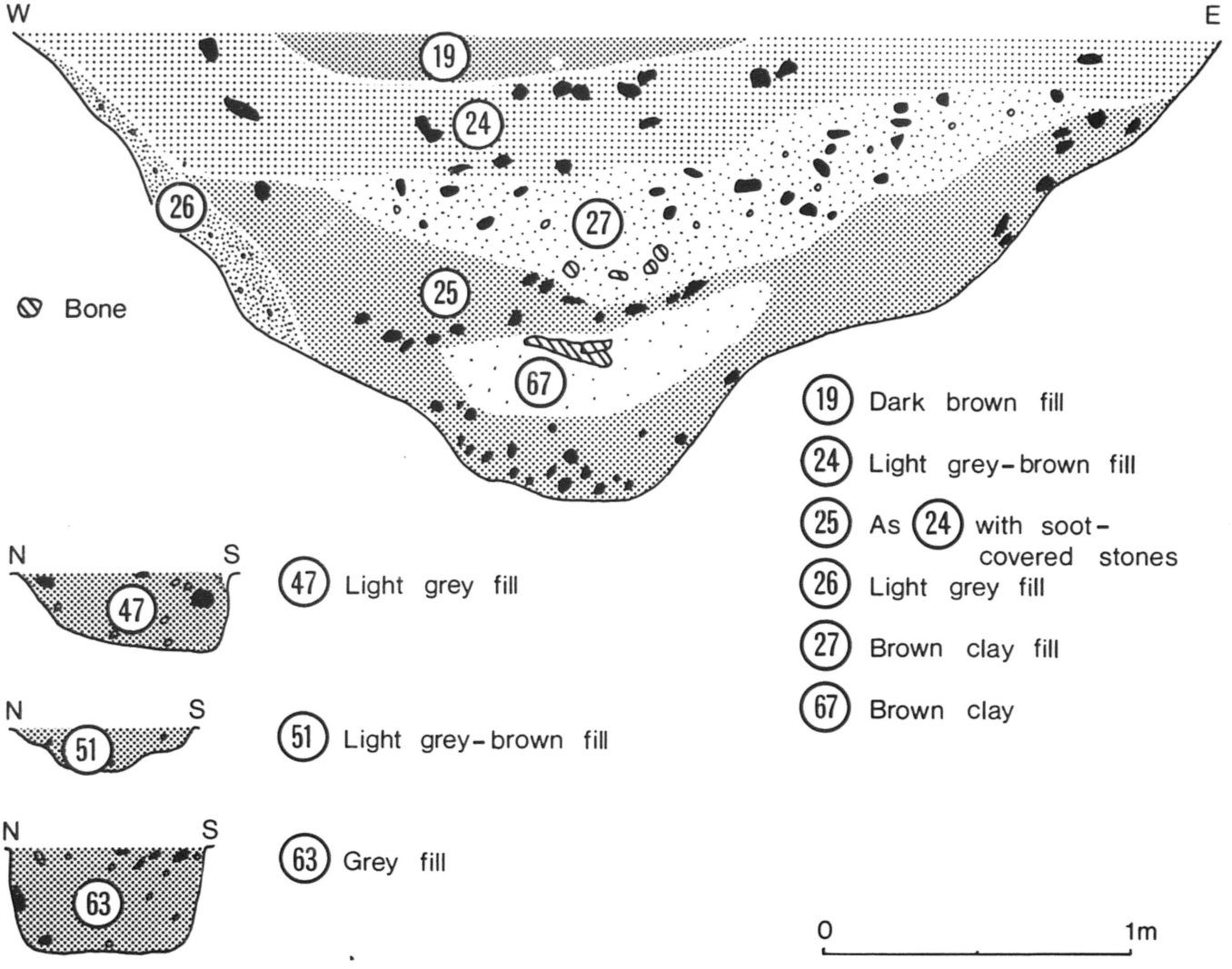
(76) Grey fill

(39) Dark brown fill

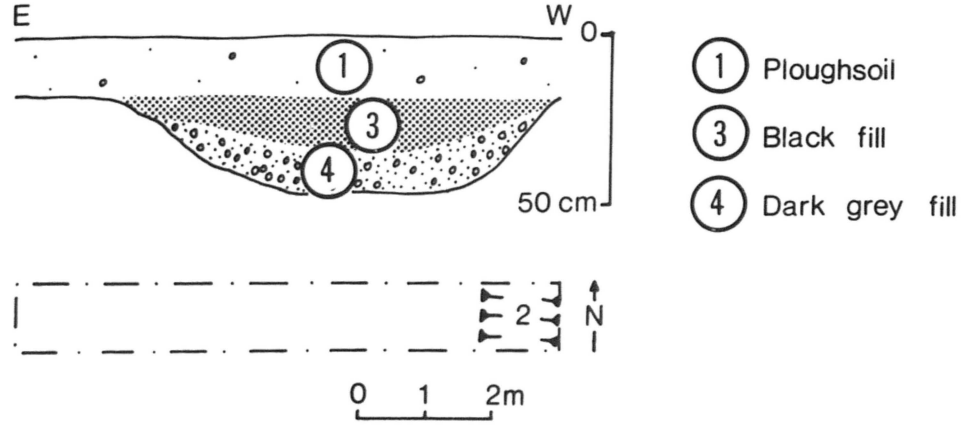
(45) Same as (3)

COPSE FARM, OVING 1982 & 1983

Trench E; Sections



Trench F; Section and plan



IRON AGE POTTERY

by Sue Hamilton

Fabric categories.

Fabric 1: flint tempered (28%)
Inclusions; medium size calcined flint temper of medium abundance (approximately 1000 grains per 1 gm of sherd) with a negligible backing of medium grade sand quartz natural to the clay.
Example of analysed sherd: flint temper (99%0; G - 0.9%, VC - 8.5%, C - 26.8%, M - 39.4%, F - 24.4%
quartz sand (1%); M - 11 grains per gram of sherd
Firing and surface finish; surfaces and core are generally reduced but patches of buff, brown and orange exist. Exterior and some internal surfaces show signs of horizontal burnishing.
Sherd wall thickness; 4 - 8 mm
Technology; handmade with evidence of coil construction and subsequent drawing up (Rye 1981, 67-73).

Fabric 2: flint tempered with some sand (13%)
Inclusions; medium size calcined flint temper of medium abundance (approximately 800 grains per 1 gram of sherd) with some medium grade quartz sand (approximately 200 grains per 1 gram of sherd). The quartz sand appears in sufficient quantity to be a deliberate addition.
Firing and surface finish; sherds may be reduced or oxidised throughout and show less evidence of colour patchiness than fabric 1. Light traces of burnishing remain on exterior surfaces.
Sherd wall thickness; 4 - 7 mm
Technology; the majority of sherds appear to be handmade. A few sherds have possible evidence of wheel finish.

Fabric 3: wheel-thrown quartz sand tempered (55%)
Inclusions; abundant quartz sand temper (approximately 24000 grains per 1 gram of sherd) of predominantly medium and fine sand grade with very occasional brown patinated flint granule and pebble grade inclusions. The quartz grains by visual estimation are rounded (5%), subrounded (40%), subangular (50%) and angular (5%) and are transparent to translucent.

Example of analysed sherd: quartz sand (99.9%); C - 1.1%, M - 53.4%, F - 45.5%
Patinated flint (0.1%); P and G - 2 grains per gram of sherd.

Firing and surface finish; surfaces are generally burnished. The firing procedure has resulted in three variants:

(i) even black surfaces with cores which may be reduced or grey
(ii) even black surfaces with buff or oxidised cores
(iii) oxidised throughout with buff or orange cores and surfaces.

Sherd wall thickness; 5 - 8 mm

Technology; 40% of the sherds show clear signs of wheel throwing (table 7). The even surface colouring would suggest a controlled air supply during firing. The 'sandwich core' is a not uncommon feature of 'belgic' pottery (Thompson 1982,23) and is also characteristic of early Roman wares, for example giving rise to Gillam and Mann's term 'laminated fabric' in reference to Roman black burnished wares (Gillam and Mann 1970, 30).

Fabric 4: quartz sand and shell (0.08%)
This fabric occurs in negligible quantities and only in trench E.
Inclusions; visually estimated as abundant medium grade quartz sand and medium abundant fine grade shell. The shell appears to be fossil and natural to the clay.
Firing and surface finish; reduced surfaces and cores with minimal traces of burnishing.
Sherd wall thickness; 5 - 7 mm
Technology; indeterminate.

Fabric 5: fine flint temper (0.2%)
This fabric occurs in negligible quantities and only in trench B.
Inclusions; visually estimated as abundant fine grade flint temper.
Sherd wall thickness; 4 - 7 mm
Technology; possible signs of wheel throwing/wheel finish.

Fabric 6: grog tempered (2.4%)
Inclusions; medium abundant grog tempering with variable quantities of shell and ironstone. The shell appeared to comprise fragments of tertiary fossils natural to the clay. Similar fabrics have been analysed for other Sussex Iron Age sites.
Firing and surface finish; surfaces and cores may vary in colour from

oxidised to reduced.

Sherd wall thickness; 5 - 8 mm

Technology; the fabric is comparable to the late Iron Age handmade grog wares of East Sussex which have already received analysis (Green 1977, 154; Hamilton 1977, 94). Some sherds, however, show indeterminate evidence of wheel finish or wheel throwing.

Fabric 7: chaff tempered (1.5%)

The occurrence of this fabric is restricted to trench E. The sherds are small and of indeterminate vessel form, handmade, oxidised with reduced cores and with evidence of fired out chaff and grain impressions. The latter have been identified as barley (R. G. Scaife pers. comm.). Similar fabrics have been used for the production of briquetage containers for salt evaporation in other Sussex-Hampshire coastal contexts (Bradley 1975).

Key to tables 6 and 7.

Rims:		Examples:
R1	out-turned (necked bowl/jar)	Figs. 5:4; 6:15; 7:24, 26, 27, 28, 29 and 31.
R2	up-turned (globular bowl/jar)	Figs. 5:8, 10; 6:20; 7:23.
R3	everted (round-bodied jar/bowl)	Figs. 5:6; 6:12, 13 and 18; 7:25.
R4	up-turned (round-bodied jar/ bowl)	Figs. 5:5; 6:21; 7:32.
R5	incipient bead rim	
R6	bead rim	
R7	upright (saucepan jar)	Figs. 5:5; 6:14, 16, 22 and 35.
Bases:		
B1	flat	Figs. 5:9 and 11; 7:30 and 36.
B2	ring-foot	Fig. 6:17 and 19.
B3	quoit	Fig. 5:2.
B4	perforated (cheese strainer?)	Fig. 5:9.
Technology:		
T1	wheel-thrown	Fabric 3.
Decoration:		
D1	finger impressed	Fig. 7:33.
D2	finger-nail impressed	
D3	'dot' impressed	Figs. 5:5; 6:14; 7:32.
D4	rouletted	
D5	combed	Figs. 5:7; 7:34.
D6	incised 'eyebrow' design	Fig. 7:29.
D7	tooled body girth grooves	Fig. 7:23.
D7a	horizontal tooled rim and base grooves	Figs. 5:3; 6:16; 7:35.
D8	shallow tooled curvilinear decoration	Figs. 6:22; 7:32.
D9	shallow tooled geometric decoration	Figs. 5:8 and 10; 6:20; 7:23.
D10	burnished vertical stripes	Figs. 5:11 and 16; 6:13; 7:25.
D11	painted decoration	Fig. 6:12.
Decorative modification of vessel form:		
C	cordon	Figs. 5:40; 6:15; 7:24, 27 and 29.
F	furrowed	Fig. 7:31.

() = the associated vessel form where vessel profiles can be reconstructed.

Table 6: trenches B and E.

Sherd counts of diagnostic rims and bases according to fabric type.

Fabrics		1	2	3	4	6	Total
Rims:	R1	2	1	83	-	5	91
	R2	-	-	8	-	-	8
	R3	21	1	62	-	-	84
	R4	12	-	1	-	-	13
	R5	2	3	11	-	-	16
	R6	-	-	1	-	-	1
	R7	39	14	-	1	-	54
Bases:	B1	21	7	51	-	4	83
	B2	-	-	15	-	-	15
	B3	-	-	1	-	-	1
	B4	1	-	6	-	-	7

Trench 7: trenches B and E.

Sherd counts of diagnostic technological features and decoration according to fabric type.

Fabrics		1	2	3	5	6	Total
Tech	T1	-	12	549	4	3	568
Deco	D1	3	-	-	-	-	3
	D2	2	-	-	-	-	2
	D3	25	1	1	-	-	27
	D4	-	-	2	-	-	2
	D5	3	1	6	-	3	13
	D6	-	-	7	-	-	7
	D7	6	4	3	-	-	13
	D7a	54	22	-	-	-	76
	D8	10	3	5	-	-	18
	D9	2	1	39	-	-	42
	D10	-	-	93	-	-	93
	D11	-	-	10	-	-	10
Deco/	C	4	-	108	4	1	117
Form	F	-	9	-	-	-	9

ROMANO-BRITISH POTTERY

by H. Robert Middleton

Fabric types.

1. Medium to coarse sandy fabric, with a grey/black core and surfaces. Occasionally surfaces oxidised red/brown. Abundant small-medium, angular flint inclusions. ?Iron Age. 50 sherds (4.3%), 645 gm (4.35%).
2. Terra Nigra. Forms present: platter. 1 sherd (0.09%), 10 gm (4.35%).
3. Chichester early fine wares. Produced at the Chapel St. kiln, in Chichester (Down 1978). Bright orange, fine sandy fabric with dark grey core. Frequent small-medium sized ?natural clay inclusions. Claudio-Neronian. 1 sherd (0.09%), 5.0 gm (0.03%).
4. Hardham/Pulborough micaceous wares. Late first-early second century (Green 1977). 2 sherds (0.18%), 5.0 gm (0.035%).
5. Miscellaneous flagons in off-white/light orange, fine sandy fabrics. First-second century. 15 sherds (1.4%), 107 gm (0.72%).
6. Samian Ware (incorporating comments by G. Dannell). Trench D (1), forms present: Dragendorff 31, Antonine, Central Gaul. Trench E (1 and 3), forms present: Dr. ?18; 18 or 18R, first century, South Gaul. 12 sherds (1.1%), 57 gm (0.4%).
7. Miscellaneous Fine Wares. Too small and/or abraded for identification. 5 sherds (1.1%), 18 gm (0.125%).
8. Medium sandy, grey wares. Probably from a variety of sources, including those in South Hampshire identified by Hodder (1974). 434 sherds (39%), 3775 gm (25.7%). Forms present: bowl; jar; lid.
9. Black sandy wares. Medium sandy fabric with black surfaces and red/brown core and/or margins. Exterior often burnished. 192 sherds (20%), 1658 gm (11.25%).
10. Light, self-coloured wares. Medium sandy fabric, similar to nos. 9 and 11, but with oxidised red/brown surfaces. 208 sherds (18%), 1651 gm (11.25%). Forms present: jar; lid.
11. Medium sandy, grey wares with added flint inclusions. 9 sherds (0.85%), 255 gm (1.75%).
12. Light, self-coloured, medium sandy wares with added, angular flint inclusions. 1 sherd (0.09%), 15gm (0.1%).
13. Medium sandy, grey wares with oxidised red/brown iron wash. 71 sherds (6.3%), 1355 gm (16%).

14. Light, self-coloured, medium sandy wares with reduced, grey iron wash. 1 sherd (0.09%), 10 gm (0.07%).
15. Medium sandy fabric with grey or red/brown core, red/brown and brown surfaces. Frequent large, angular flint inclusions. 18 sherds (1.53%), 1270 gm (8.65%). Forms present: jar.
16. Same fabric as no. 15, but with no added flint. 17 sherds (1.55%), 950 gm (6.5%). Forms present: jar.
17. Medium sandy fabric with frequent small to medium grog inclusions. 7 sherds (0.65%), 25 gm (0.17%).
18. Dark grey, grog-tempered fabric. 10 sherds (0.95%), 100 gm (0.67%).
19. Similar to no. 18, but with added, fine quartz inclusions to give it a 'sandier' feel. 13 sherds (1.2%), 128 gm (0.87%). Forms present: jar.
20. Miscellaneous coarse wares. 2 sherds (0.18%), 10 gm (0.07%).

The catalogue.

Trench E (see fig.16 on microfiche).
1. Platter in TH(?). Fine, off-white fabric with frequent, very small, quartz inclusions. Dull, black surfaces. Context 3. (Not illus.).
2. Two sherds of very fine, micaceous fabric with black core and interior surface and brown surfaces. One sherd with rouletted decoration. Sparse, small quartz and grog inclusions. Hardham/Pulborough source. Late first-early second century date(Green 1977). Context 3. (Not illus.).
3. Small sherd of bright orange fabric with light grey core. Frequent small-medium ?natural clay inclusions. Chichester, Chapel St. kiln. Claudio-Neronian (Down 1978). Context 3. (Not illus.).
4. Flagon in fine sandy fabric with numerous small-medium iron oxide inclusions. Interior light grey and light brown exterior. First century? Context 65. (Not illus.).
5. Flagon in buff, micaceous fabric with abundant small, ill-sorted quartz inclusions. First century? Context 65. (Not illus.).
6. Flagon in light brown, hard fabric with frequent ill-sorted, small quartz and grog inclusions. Context 56. (Not illus.).
7. ?Flagon in fine, off-white fabric with buff exterior and light interior surfaces. Occasional medium sized grog, and abundant ill-sorted quartz inclusions. Context 56. (Not illus.).
8. High necked jar with shoulder cordon in medium sandy fabric with abundant ill-sorted small quartz inclusions. Burnished exterior and rim. Context 37.
9. Everted rim jar in medium sandy, grey fabric with sparse medium-sized angular flint inclusions. Context 56.

10. Everted rim jar in medium sandy fabric with sparse iron oxide inclusions. Light grey core with dark grey surfaces. Context 71.

11. Everted rim jar in medium sandy fabric with red/brown core and dark grey/black exterior. Burnt. Context 30.

12. Flaring rim jar with slight shoulder carination in medium sandy fabric with light grey core and margins and dark grey/black exterior. Context 69.

13. Flaring rim jar in medium sandy, grey fabric with numerous, small iron oxide inclusions and medium-sized grog inclusions. Context 30.

14. Flaring rim jar in medium sandy fabric with oxidised red/brown iron wash. Fabric 13. Context 69.

15. Jar with slight neck and flaring rim in medium sandy fabric with red/brown core and black surfaces. Burnished exterior and rim. Fabric 9. Context 30.

16. Necked jar with everted rim in medium sandy fabric with red/brown-grey core and orange surfaces. Occasional medium-sized grog inclusions. Abundant, ill-sorted, quartz inclusions. Fabric 10. Context 56.

17. Flaring rim jar with slight neck in medium sandy fabric with numerous medium-large angular flint inclusions. Light brown core, red/brown margins and bark brown surfaces. Fabric 15. Context 39.

18. Everted rim jar in medium sandy fabric with abundant small-medium, ill-sorted quartz and grog inclusions. Red/black core and surfaces. Burnt. Fabric 20. Context 58.

19. Lid with down-turned rim in medium sandy fabric with frequent small quartz and flint inclusions. Red/brown core with black surfaces. Perforated by drilling - re-use as a weight? Fabric 9. Context 54.

20. Sherd of medium sandy fabric with red/brown core and black surfaces. Drilled in two places - re-use. Fabric 9. Context 7.

Table 8.

Summary of Romano-British pottery by sherd count per context.

Context	Fabric numbers																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Trench A																				
1	2																			
6	1								1											
Trench C																				
1	3							11	13	6									5	
3	7							19	11	1	1					1			1	
Trench D																				
1						3			1											
Trench E																				
1	4				2	7	1	33	29	46						5	2			
3		1	1	2	1		2	43	15	59	2	1						6	1	
5	6							24	11	5	1								2	
7	3							10	10	24						4				
19	3						1	14	7	2									3	
21	1							1	9	1										
22								11	4	8				1	7	4	15			1
24	11							1	9											
27	3							2												
28							1	7	9	5						1				
30	1							24	12	7										
31								4	5	3	1							1		
34	2							5	1	6										
35	7							15	4	5	2		1			5				
37								1	15											1
39	1							6	1	10					7			1		
40								3	1	2										
43	2																			
52									1	1										
53								1												
54									4											
55								2			1									
56	2					11	1	19	5	9	4									
57	1							2	5	1								2		

Table 8(cont)

Context	Fabric numbers																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Trench E																				
58								1												1
65					1				1	1										
69								33		7			70							
70	1																		1	
71								140		1									1	
Trench F																				
1																	1			
4						1		2	3	5										

Figure 16

Romano-British pottery

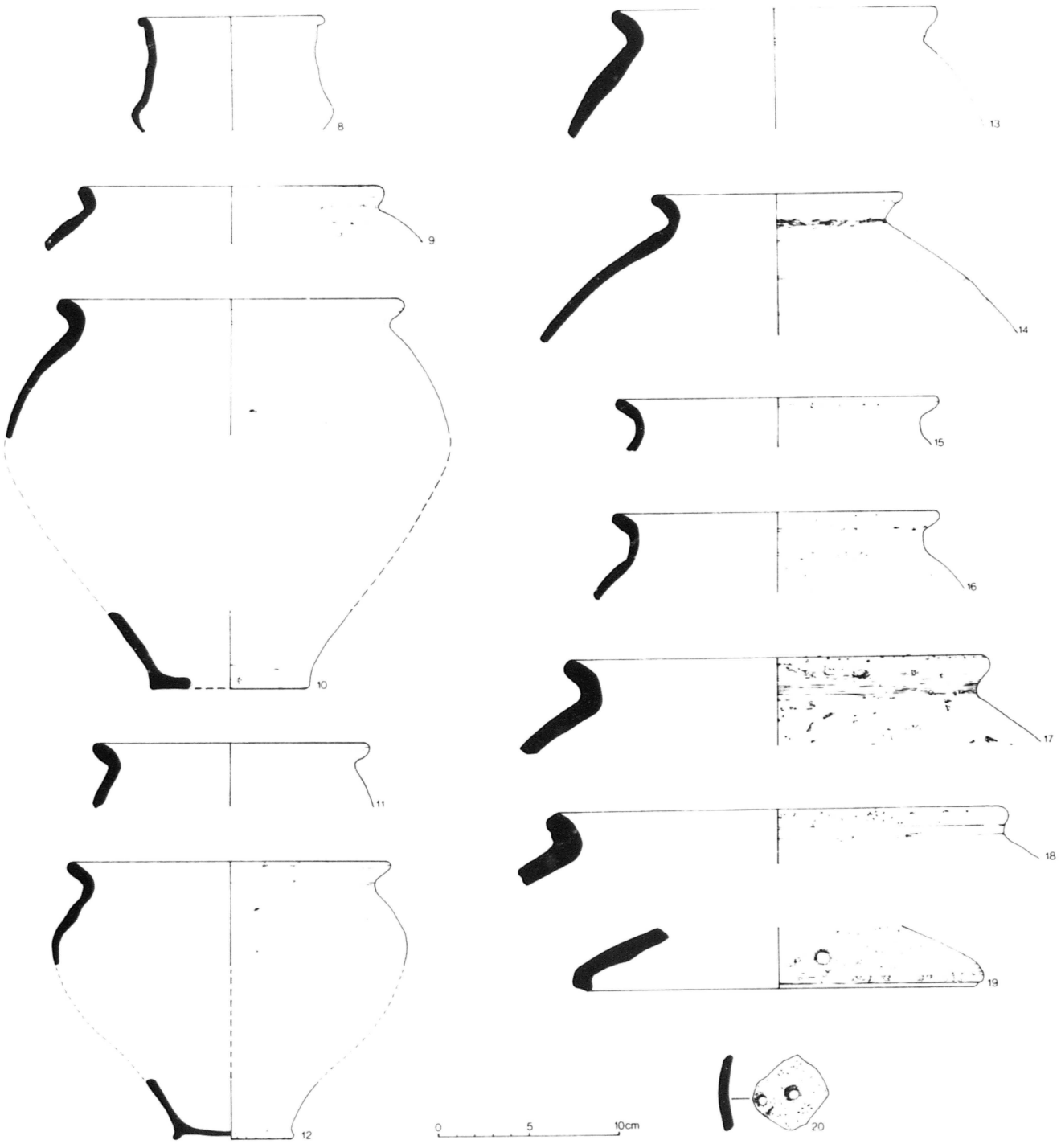


Figure 16

AMPHORAE

by D.F. Williams

Table 9: summary of amphorae by context.

	Trench A	Trench B	Trench C	Trench E
Handle from a Dressel 1, probably the 1B form		113		24
Bodysherd from a Dressel 1 or Dressel 2-4, in a 'black sand' fabric		11(2 sherds)		1, 24
Bodysherd from a Dressel 1 or Dressel 2-4	3	1, 3(4 sherds), 41, 113		35
Bodysherd from a Dressel 20				1
Bodysherd from a ?Camulodunum 185A			1	40
Bodysherd from a Southern Spanish amphora				3, 30

ROMAN TILE

by D. Rudling

Four small fragments of Roman tile were recovered from trench E. All of these are flat fragments, their approximate thicknesses being: 25 mm (context 1); 28 mm (context 35); 37 mm (context 1); and 40 mm (context 56). The two thinest fragments fall within the range of values known for tegulae, but could also possibly be from thin 'Flat' tiles. The two thicker fragments are from 'Flat' tiles/bricks.

POST-MEDIEVAL POTTERY (16th/17th-18th century)

by D. Rudling

Five sherds were submitted for study: three from trench A, context 1; and two from trench E, context 1. Those from trench A include: 1 sherd of orange ware with internal mottled green glaze; 1 sherd of orange ware with internal orange-brown glaze; and 1 sherd of Staffordshire combed ware. Of the sherds from trench E, 1 is of pale orange/buff ware with internal mottled green glaze; and the other is of orange ware with partial external light green glaze and internal green glaze above applied, raised decoration in the form of pellets and lines.

THE METALWORK

by Brian Oldham

The excavation produced a total of 23 metal artefacts; five of copper alloy and eighteen of iron. This material was recovered from two trenches only (B and E). The relationship of types to trenches is given in table 2.

Copper alloy (fig. 9).

1. Terret ring. Oval in form and of circular cross-section, with a low ridge-moulding around the outer edge of the loop. The loop tapers gradually from 7.2 mm diameter at the terminals to 6.2 mm opposite them. The terminals are circular (12.8 mm diameter) and have a shallow groove incised around them close to their inner faces. The attachment bar is parallel-sided and of rectangular section (6.6 mm x 4.5 mm). External dimensions: 54 mm x 47.2 mm; weight 41.6 gm.

The terret is pitted with corrosion but shows the characteristic wear marks on the top of the terminals. The loop also shows signs of wear and this is particularly pronounced on one side, a usual feature on terret rings. There seems little doubt that this type of ring was a harness loop for the reins of a pair of chariot ponies to pass through. The Garton Slack burial suggests that five terrets were mounted along the yoke (Stead 1984, 35). Since they were individually cast (Spratling 1979) it is unlikely that exact parallels will be found. This example is a plain one of Foster's (1980) group I, but it is not of similar form to any of the Gussage moulds. The ridge around the outside of the loop is unusual. (B/61; pit 60).

2. Decorated ring. An irregular penannular ring of thickness c.3 mm and maximum width 5.8 mm. Internally it is convex in section, whilst the outside comprises a deep channel set between two ridges. In the base of this groove around the outer edge is a crimped rib made by alternate punching on either side of a narrow ridge of metal. The punch marks are clearly visible. The effect of this work is the production of a wavy line decoration within the channel. The open ends of the ring have been reduced in width and notched across to produce terminals. These have been irregularly produced, being 7.5 mm and 5 mm in length respectively. The gap between the terminals appears to have been produced by filing through a complete ring. External dimensions: 30.3 mm x 29.6 mm; weight 8.9 gm.

The function of this ring is uncertain. It is too large to be a finger ring. The terminals are faintly reminiscent of the "pinched"

effect of the type D penannular brooches (Fowler 1960) but there is no evidence that this ring ever had a pin. A ring found at Meare (Gray and Bulleid 1953, pl. 49, E 69) is remarkably similar in size, form and decoration. This was catalogued as "a drop handle for a small bowl", but this is not convincing. The decoration on the Copse Farm ring is unusual. Fox (1947, 80), commenting on similar decoration on a terret and a bridal-bit from Llyn Cerrig Bach, suggests that it is a decorative survival of an old technique for joining two pieces of bronze. This decoration also occurs on a terret from Hod Hill (Richmond et al. 1968, fig. 31), and brooches from Maiden Castle (Wheeler 1943, fig. 83, no. 15) and Gussage All Saints (Wainwright 1979, fig. 86, no. 3046). (B/11; ditch 2).

3. Spiral ring. Part of a larger ring, one spiral only remaining. One end appears to be original whereas the other is clearly broken. Originally square in section it has marked wear on the outer face and inside the spiral. It is unornamented. Dimensions: internally 14.6 mm x 15.2 mm; externally 19.6 mm diameter; width 2.7 mm; thickness 2.4 mm; weight 2.1 gm.

Spiral rings are known from contexts dating from the Middle Bronze Age to the Anglo-Saxon period. A number have been published from Iron Age sites (e.g. Maiden Castle, Glastonbury and Hod Hill). However, most are larger than this example (18-22 mm) or are much smaller (c.12 mm). This latter group are generally referred to as "childrens' rings". If the Copse Farm example was a finger-ring, as the wear might suggest, it was not for a large hand - a female perhaps. (B/5; ditch 2).

4. Brooch. A broken, bent and corroded example of the La Tène III type with a boss on the bow. It comprises the bow, two coils of the spring and part of the internal chord. The lower part of the bow has been bent at right angles to the rest. The bow was originally decorated with grooves along its sides; this, together with the boss, being vestigal traces of the returned foot and collar of the earlier La Tène III types. The boss is flanked by a rib moulding running around the brooch. Below the bow are two horizontal ribs. There is no catch-plate present, but its junction with the bow is visible as a small knob. Examination of the knob shows that the remains of the catch-plate were carefully removed by filing. Further modification is shown at the foot of the bow where there is evidence of sharpening using a file, as if to produce a pin. Dimensions: length 89 mm; weight 6.6 gm. (E/1; topsoil).

5. Brooch. Two pieces representing most of the bow of another La Tène III type with boss on the bow. There is no trace of the spring or the pin. The catch-plate is not present, but part of the join to the bow has been folded back around the bow. The boss is decorated with cross-hatching and

has a partly formed rib moulding below it. The bow has been stepped down just below the boss. Dimensions: length 61 mm; weight 2 gm.

This piece is clearly unfinished and appears to have broken in manufacture and been scrapped. The bow above the boss is triangular in section and has not been curved to shape. The link to the spring has only been partly shaped and is broken off - perhaps the reason for discard. (B/113; working area 112).

The La Tène III brooch with a boss on the bow has been the subject of a study by Stead (1976), who cites 23 from graves of his Welwyn phase of the Aylesford culture. They occur elsewhere including examples in the Le Catillon hoard, Maiden Castle, Meare and at Arundel Park in Sussex.

Iron (fig.10).

6. Socketed hook. A badly corroded, small, hooked cutting tool in two pieces and missing much of the back of the blade. The blade is tightly incurved and tapers from c.16 mm at the socket to 4 mm at the tip. The socket is an open one formed by two 1.5 mm thick flanges. It is 35.5 mm long and tapers from 23.8 mm to 19.4 mm in diameter. Traces of the wooden shaft are visible in the oxidation products in the socket. The hook was fixed to the shaft of the tool by a rivet c.12 mm long, which is still retained in the rivet hole and bent down into the socket. The rivet hole is 4 mm in diameter. Overall dimensins: height 71 mm; width 51 mm; weight 18.6 gm.

The size and tightly incurving nature of the blade of this hook suggest it was a pruning hook (Rees 1979). This type frequently occurs on Iron Age sites, and examples are known in Sussex from Cissbury, Highdown, South Harting and the Trundle. (B/61; pit 60).

7. Socketed object. Much of the object is missing, precluding attribution of function. What remains is the socket and a small part (28 mm) of the head. The latter is curved on one side but broken away on the other. The open socket is formed from two flanges c.2 mm thick, and tapers from 22.2 mm to 20.5 mm in diameter. It is c.55 mm long and is filled with a mixture of soil, corrosion products and the charred remains of the wooden shaft. The shaft was retained in the socket by a rivet still intact in the filling and visible on X-ray. The rivet hole is c.3 mm in diameter. Overall dimensions: height 102.4 mm; width 36.6 mm; weight 47.3 gm (including the filling in the socket).

The type of socket on this object suggests that it was some form of hooked agricultural tool. (B/61; pit 60).

8. Knife. Part of a small, tanged example. The blade is broken across

and the tip is missing, but the point of maximum width (20.9 mm) is probably a real one. The tang appears to be entire and measures 34 mm long by 5.5 mm thick and tapers from 10.8 mm to c.6 mm in width. It is offset from the blade at an angle of 150 degrees. The knife is badly corroded. Overall dimensions: length 76.1 mm; weight 17.7 gm.

Iron knives are common on sites of the late pre-Roman Iron Age and Roman periods. No comprehensive study has been published but it is likely that they performed a variety of functions. The small size of this example might suggest a razor, but these are usually broader across the blade (Jacobi 1974, 91-4; taf. 21, 349-359). Knives with an arched back are known from Meare (Gray and Bulleid 1953, pl. 51, 126) and Hod Hill (Richmond et al. 1968, fig. 58, B2a; Brailsford 1962, pl. 8, G58). The shape of this knife suggests that it may have been used in a whittling or scraping mode, and this might indicate that it was a craft tool rather than a household item. (B/40A; ditch 39).

9. Pin. A straight pin 66 mm long and tapering from 3.6 mm to 2.5 mm in diameter. It is corroded and is broken across at the thicker end. Weight 1.6 gm. It is possibly the pin from a brooch. (B/110; ditch 39).

10. Sheet metal. A fragmentary piece of sheet iron measuring 48.5 mm x 36.6 mm x c.2 mm thick. Three edges appear to be in their original form, but the fourth is clearly folded over to form a slight lip. There is a small hole (2.2 mm diameter) offset to one side of the piece. Weight 13.5 gm. (E/24; pit 18).

11. Sheet metal. A corroded, roughly trapezoidal piece of sheet iron measuring 52.6 mm x 38 mm (maximum) x 3.5 mm thick. Weight 36.4 gm. (B/3; ditch 2).

12. Sheet metal. Two corroded pieces which do not join and which are c.3 mm thick. The larger piece has a 5 mm diameter rivet going obliquely through its centre. Maximum dimensions: 46.6 mm x 33.7 mm; 22.5 mm x 17.9 mm; total weight 24.7 gm. This was presumably some sort of fitting riveted to another object. (E/39; ditch 38).

13. Sheet metal. A fragmentary piece of sheet iron broken into two pieces. It is roughly triangular in form, with rounded corners. Maximum dimensions: 63.7 mm x 33 mm x 8 mm; weight 23.8 gm. (B/16; post hole 15).

14. Hook. A corroded looped attachment in the shape of a triangle, with the two ends of metal forged together to form an arm. The arm is 15.8 mm long and 7 mm in diameter. The hook is rectangular in section and 5.9 mm thick. Overall dimensions: height 39.5 mm; width 29.2 mm; weight 10.9 gm. A similar hook was recovered from Danebury (Sellwood 1984, 370 and fig. 7.24, no. 2.189). (E/7; ditch 6).

15. Hook. A straight bar with two opposed hook ends. It is corroded and has one end broken away, but present. Dimensions: 59 mm x 12.2 mm (maximum) x c.6.5 mm thick; internal hook diameter 5.7 mm; weight 13.8 gm. Sellwood (1984,367) interpreted a similar hook (2.169) from Danebury as a bucket fitting. (E/27; pit 18).

16. Hook. A C-shaped hook broken at one end and roughly rectangular in section. Dimensions: 39.8 mm x 11.2 mm x 8.4 mm (maximum); weight 10.8 gm. (B/40B; ditch 39).

17. Nail. Badly corroded and with the tip and half of the head missing. The shank is square in section and tapers from 9 mm to 5 mm. The flat head is now 21 mm x 17.5 mm. Overall length 53.5 mm; weight 11.7 gm. (B/215; pit 214).

18. Nail. Apparently complete except for part of the head. The shank is square in section and tapers from 5.4 mm to 3.1 mm. The head is elliptical and now measures 15 mm x 13.8 mm. Length 43.6 mm; weight 3.4 gm. (E/35; ditch 6).

19. Nail. Part of the shank only, and broken in two. Square in section and tapering from 4.5 mm to 3.2 mm. Length 33.5 mm; weight 2.3 gm. (E/35; ditch 6).

20. Nail. The shank only. Badly corroded, but probably round in section. Length 24.7 mm; weight 0.9 gm. (E/24; pit 18).

21. Pointed rectangular bar. Very badly corroded and in a number of pieces. A straight object 83.5 mm long and tapering from 7 mm to 6.2 mm. Weight 13.5 gm. This object is too badly damaged to suggest any function. (B/132; pit 131).

22. Rectangular bar. A small piece of broken hollow bar slightly bent at the centre. Length 32 mm; weight 5 gm. (E/28; ditch 6).

23. Small piece of corroded iron. Roughly circular in section (c.7 mm diameter) and 28.5 mm long. Weight 3.1 gm. (E/56; ditch 29).

SLAG ANALYSIS

by K. Brown

Excavation of trenches B and E produced a small quantity of metalworking residues which was subjected to a simple visual examination in order to determine the nature of the metalworking activity. Four basic types of ironworking slag were identified in addition to a small quantity of fired clay, ammounting to 1.44 kg of debris. Further metallographic analysis would be required to continue the following divisions.

Type 1: small fragments of roughly circular plano-convex slag "buns", probably no greater than 15 cm diameter and 1.5-3 cm thick. The majority have a reddish-brown weathered exterior, whilst 1-2 pieces have a smooth, shiny, grey-black upper surface. All fragments possess a grey and brown core, often showing a crystalline structure in reflected light with occasional areas of multi-coloured fayalite. The pieces are dense with the larger vesicules concentrated at the base and finer vesicules to the centre. The upper surface is often slightly concave, displaying signs of having been semi- or completely molten. Some pieces have fired, light blue-grey clay with flint inclusions adhering to the base.

Type 2: small, irregularly shaped lumps of slag, some showing an agglomerated appearance. One fragment is part of a small bun, no greater than 10 cm diameter and 25 cm deep. The outer surface is weathered reddish-brown; the interior is light grey and brown. The pieces are vesicular, especially around the outside, and there are occasional, small charcoal and flint inclusions. The uppermost surface suggests relatively high temperatures, with an irregular surface of rounded peaks.

Type 3: black, vitrified and slagged clay.

Type 4: small, irregularly shaped fragments of a light reddish-brown "ocherous" material. The pieces are 5 x 3 x 3 cm. The core is of light grey vesicular slag.

Type 5: light grey to black fired clay, some pieces being vitrified.

The following table indicates the occurence of these different types of material in trenches B and E.

Context	Type 1	Type 2	Type 3	Type 4	Type 5
Trench B 40	10frags 700gm	5frags 250gm	-	-	-
46	-	1frag 25gm	1frag 25gm	-	-
Trench E 19	-	-	-	1frag 50gm	1frag 10gm
22	-	-	-	-	1frag 10gm
24	1frag 25gm	1frag 20gm	-	-	2frags 10gm
25	-	-	-	1frag 125gm	-
27	-	1frag 50gm	-	-	-
30	3frags 75gm	-	-	-	2frags 25gm
35	-	-	-	-	1frag 10gm
37	-	-	-	-	2frags 10gm
56	-	-	-	-	1frag 10gm
68	-	-	-	-	2frags 10gm

Types 1-2 are clearly debris from the working of iron. Type 2 has the characteristics of smithing slag - slag that has accumulated in a small hearth during the course of successive forgings. This would explain the agglomerated appearance. It is probable that type 1 also derives from smithing, despite its denser matrix. The upper surface concavity and semi-molten aspect suggest higher working temperatures induced by the use of bellows. However, similar types can be formed from semi-molten slag that is raked out of a smelting furnace and allowed to cool in the small hollows which abound in the trampled area around a furnace.

Type 3 represents the clay lining from a furnace or hearth structure. It is possible that some of the vitrified pieces of clay assigned to type 5 may also represent such material, but many are not associated with iron-working slags and in the absence of adhering slag it is best to assume a different source.

Type 4 derives its reddish colour and friable texture from its subjection to heat. The vesicular slag that coats some pieces is fuel ash slag and indicates that they have been in a hearth. But there is no suggestion that the material is a potential ore, nor that it has been roasted.

It is clear from the above table that the largest collection of slag

comes from trench B. Here, approximately 1 kg of iron was recovered from two ditch sections, 39 and 2, with 950 gm coming from a single layer (40) in ditch 39. Not only is this the largest collection of material discovered, but it is also the one most representative of metalworking, comprising slags of types 1 and 2. Given the size of the collection it is likely that the material represents smithing rather than smelting, despite the doubts about the true nature of type 1 slags. Figures given by Salter (in Cunliffe and Miles 1984, 147: fig. 10.1) suggest that smelting produces 10 times more slag than iron iron whilst smithing slag represents between a half and a tenth of the iron worked. The largest piece of slag from Copse Farm weighs less than 333 gm making it unlikely that the material was produced by smelting.

Trench E produced only scattered fragments of debris, most of which could not be related directly to iron-working. Only pit 18 contained a range of residues, including slags of types 1 and 2, and fired clay of type 5, in a number of layers (19, 24, 25 and 27).

Apart from the presence of slags at both sites there is little other evidence to suggest that iron-working took place, especially at trench E; no definite metalworking structures were identified, for example furnaces, hearths and pits. The extant material comes from secondary fills of the enclosure ditches and could derive from any source in the surrounding area.

FIRED CLAY

by Robin Holgate

Table 10: trenches B and E.

		Number	Weight(kg)	Pieces with smoothed surfaces or wattle impressions
Trench B				
Topsoil:	1	32	0.23	'structure'
Ditch fills:	3	29	0.38	loom weight and 'structure'
	5	23	0.08	
	11	17	0.28	
	40	14	0.37	'structure'
Pit fill:	61	190	1.5	'structure'
Post holes:	38	4	0.04	
	75	7	0.42	'structure'
Working area:	113	9	0.16	'structure'
Trench E				
Topsoil:	1	1	0.01	
Ditch fills:	3	12	0.55	
	7	1	0.01	
	21	2	0.02	
	22	4	0.01	
	28	8	0.07	
	30	9	0.03	
	31	1	0.01	
	32	1	0.01	
	34	2	0.01	'structure'
	37	1	0.01	
	45	1	0.01	
	56	5	0.05	'structure'
Pit fill:	19	3	0.02	

THE FLINT

by M.B. Roberts

A total of 71 struck flints were recovered: 8 from trench A, 59 from trench B and 4 from trench E. Details of context and typology are shown in table 11.

The assemblage mainly consists of pieces made on gravel flint, with only a few on flakes of chalk flint. This is consistent with the ready availability of gravel flint in this area. There is little evidence for the preparation of flakes to make tools; all the notched flakes and the hollow scrapers were produced on natural nodules. The high number of flakes with cortex (81.25%) also implies that no attempt was made to produce more elaborate pieces. However, it is possible that the more carefully manufactured tools were made elsewhere and kept as objects of greater value, whilst the rough material produced in situ was left behind.

A striking feature about the assemblage is that all the recognisable tool-types comprise scrapers or notched pieces (19.7% of the total assemblage). The miscellaneous retouched pieces also have semi-abrupt retouch. The flintwork could represent, as suggested by Drewett (1980) for the Chidham assemblage, the result of a specialised activity or range of activities exploiting a specific environment. The number of notched pieces may imply the preparation of wood for specialised tasks, for example making arrowshafts or fishtraps. Dating the flintwork is extremely difficult, particularly as the chances of contamination are high. The two bladelet segments, for instance, are probably Mesolithic, while the rest of the assemblage could date to any period from the Neolithic onwards.

Table 11.

The flint assemblage.

Context		Flake without cortex	Flake with cortex	Bladelet segment	Core	Rough waste	End scraper	Side scraper	Hollow scraper on natural nodule	Notched thermal nodule	Miscellaneous retouched flake	TOTAL
A	1	3	1		1					3		8
B	1	1	13	1	2	2			2*	4	3	28
	3	2										2
	5		2			2	1*				2	7
	11		2									2
	13									1		1
	14	1	3	1							1	6
	28									1*		1
	40		1									1
	46		1									1
	48		1								1	2
	61							1*				1
	83							1				1
	110		1									1
	113		1		1						2	4
	167		1									1
E	3		1									1
	5		1									1
	23	1										1
	24		1									1
TOTAL		6	32	2	4	4	1	2	2	9	9	71

* denotes pieces illustrated in fig. 11

STONE OTHER THAN FLINT

by Caroline Cartwright

Table 12: trench B.

CONTEXT	greensand	Mayen lava	mica-schist	pebble	'Purbeck marble'	sandstone	siltstone	shale	TOTAL
Topsoil				2					2
Ditch									
3			1	7		21*	2	1**	32
5				3		9		1	13
11	4			9		17*	3		33
14	1					3			4
40				1		1			2
41						1			1
46						2	3		5
110				1				1	2
167				1		1			2
Posthole									
10				1			1		2
16	2								2
36				1					1
38						1			1
52						1			1
62		1							1
75				1		2			3
Pit/Scoop									
34					1*				1
Working area									
61						1	1		2
113	7			1		11*			19
Ring gully									
65						1			1
	14	1	1	28	1*	72*	10	3	130
	10.77%	0.77%	0.77%	21.54%	0.77%	55.38%	7.69%	2.31%	

numbers = fragments

* includes quern fragments

** Kimmeridge shale bracelet fragment

Table 13: trench E.

CONTEXT	pebble	sandstone
Ditch		
5		3*
7	1	1
22		1*
37		3
71		1*
Pit		
24		2*
27		1+
	1	12

numbers = fragments

* includes quern fragments

+ part of whetstone

CHARCOAL

by Caroline Cartwright

Table 14: trench B.

numbers = weight in grams

CONTEXT	*Corylus* sp. (hazel)	*Crataegus* sp. (hawthorn)	*Quercus* sp. (oak)	*Ulex* sp. (gorse)	
Ditch					
3	7	3	3	2	15
6	5		5		10
7	3	2			5
11			1	1	2
40			10		10
42	3			1	4
167	1		1		2
Posthole					
36			2		2
38	2				2
55				2	2
151	2	2			4
Pit/Scoop					
61		1	100*	3	104
122	4		8		12
215	1	9			10
219				1	1
	28	17	130	10	185
	15.1%	9.2%	70.3%	5.4%	

* CARBON-14 DATE (HAR - 4252) : 2180. $\pm$ 70 ; 230.bc

Table 15: trench E.

numbers = weight in grams

CONTEXT	*Corylus* sp. (hazel)	*Fraxinus* sp. (ash)	*Quercus* sp. (oak)	
Ditch				
21	12	27	65	
	12	27	65	104
	11.54%	25.96%	62.50%	

CARBONISED SEEDS

by Pat Hinton

Table 16: trench B.

	Ditch context 11	Ditch context 42	Posthole context 55
Hordeum vulgare (hulled barley)	1		
cf " "	2		1
Triticum sp.			
cf T. spelta (spelt)		6	12
cf T. aestivum (bread wheat)		3	
Cereal fragments (wheat or barley)	3	11	8
Avena sp. (oats)		1	2
cf Umbelliferae		1	1

MARINE MOLLUSCS

by Caroline Cartwright

Table 17: trench A.

Minimum numbers

CONTEXT	Ostrea edulis (oyster)
sub-topsoil	
3	1
primary silts	
7	3
	4

Table 18: trench B.

Minimum numbers

CONTEXT	Ostrea edulis (oyster)	Mytilus edulis (mussel)
Posthole		
16	1	
38	1	
Ditch		
46		4
	2	4 TOTALS

Table 19: trench E.

Minimum numbers

CONTEXT	Ostrea edulis	Mytilus edulis	
Ditch	(oyster)	(mussel)	
3	3		
7	4	1	
37	2		
	9	1	TOTALS

THE BONE

by Sue Browne

TRENCH B

In all, 1065 fragments of bone were recovered from trench B. The bulk of the bone (868 fragments: 81%) came from the ditch; 121 fragments came from pits and scoops, 74 fragments from post holes and 1 fragment from a layer in the 'working area'. Four of the pits and three of the post holes are in the 'working area' and they contained a total of 104 fragments of bone; the five post holes interpreted as a four-post structure contained 40 fragments of bone. With the exception of post holes 96 and 117, which contained one and two fragments of bone respectively, no bone was recovered from contexts east of the ditch running north-south at the eastern side of the site (39 and 78), nor from those contexts lying between its terminals. Two fragments of worked bone were recovered, one from context 5 in the ditch and one from post hole 75, which also contained one of the bird bones; the other bird bone came from context 41 in the ditch. The human remains and the dog bones were recovered exclusively from the ditch. The distribution of the bones of the larger domesticates and pig indicates consistency and continuity in disposal practices: 95.6% of the identified horse bones, 92.5% of the identified cattle bones and 80.5% of the identified pig bones were recovered from the ditch. Only the caprovid bones were spread more evenly over the site: 66.7% came from the ditch, 26.1% from the pits and scoops and 7.2% from post holes. Fragments of burnt bone were recovered from contexts 3 (ditch), 16 (post hole) and 107 (pit). Butchered and gnawed bones were distributed without any particular pattern in all three types of bone-bearing context.

The material

Of the 1065 fragments recovered, 866 (81%) were identified to species level or, in the case of undiagnostic skull, vertibra and rib fragments and a few long-bone shaft fragments, placed in a group of Bos/horse-sized, caprovid-sized or pig-sized fragments. The relatively high percentage of identified bones reflects the predominance in the assemblage of large fragments of bone with at least one articular end. Recent damage was seen on many of the long-bone shaft fragments of all the species present,

especially those recovered from the ditch, and although bones showing recent damage were reconstructed where possible (and then counted as one fragment), inevitably the fragment count is inflated by this factor. Preservation of the bone is good to fair and in general the bones of caprovids are the least well preserved. Some variation in the degree of preservation of the bones of cattle, horse and caprovids was noted within contexts: a total of 22 bones from these species are very eroded, perhaps reflecting differences in the method of disposal of these particular bones compared to the rest of the assemblage. Another possibility is that they are residual, but in fact no residual pottery or flintwork was recovered from contexts containing eroded bones and, on these grounds, it was felt that it was justifiable to include them in the analyses which follow.

The analyses

For the fragment count, every fragment was counted. No adjustment was made for anatomical differences between species (e.g. the fact that cattle and caprovids have horns while pigs and horses do not) because it was felt that on the whole, and bearing in mind the recovery rate for the elements concerned from this site, these equalled out. Unfused epiphyses were counted separately because there was insufficient time to check through all the bones from each context for conjoining epiphyses and diaphyses. The number of fragments identified to species level is shown in table 20 and the number of undiagnostic fragments of Bos/horse-, caprovid- or pig-sized bones is shown in brackets. On the basis of the relative numbers of cattle and horse bones positively identified to species level, probably more of the largest undiagnostic fragments are from cattle than horse; and probably most of the caprovid-sized fragments are indeed from caprovids, since there is no evidence of the presence of roe deer at the site and 46% of the bones in this group are very small fragments of adult long-bones or immature long bone shafts which are definitely not from pig, although possibly a few of the rib and vertibra fragments are from small pigs. Nevertheless, as these bones have not been identified certainly to species, they are excluded from subsequent calculations.

Table 21 shows the percentage of fragments identified for each species and the minimum number of individuals represented by these bones is shown

in table 22. The complex stratigraphy of both trenches has made it necessary to analyse the bone in terms of the total assemblage recovered from each trench: as the deposits probably represent a period of two hundred years or more, it is likely that this will have had the effect of depressing the figure for the minimum number of individuals. The minimum number of individuals has been calculated by counting the bone which occurs most frequently and by checking the results against the other data, particularly with regard to the possibility of age groups being present which are not re-examined for the presence of non-matching bones (which had been 'paired' in the calculations because they come from opposite sides of the body) as this undertaking is very time-consuming and it was thought that, in this relatively small assemblage, it was unlikely to produce such markedly different figures as to justify the exercise. The cattle, although outnumbered by caprovids in the count of the minimum number of individuals, would have supplied a greater quantity of meat and other products than the caprovids because of their larger body size. Horse remains, too, are numerous and clearly this animal was of economic importance at this site. The skeletal representation in the major domesticates (table 23) demonstrates that the remains of the entire animals were discarded at the site. The high figures for bones from the skull are partly due to the large number of loose teeth which could not be replaced in their sockets: they do not indicate the deposition of crania from more animals than can be accounted for by the post-cranial remains. In the case of cattle and caprovids, the long-bone data agree well with the figures for the minimum number of individuals calculated from the mandibles; and in the case of horse and pig, the mandibles represent fewer animals than do the long-bones. The major meat-bearing bones are well represented in the postcranial remains and the scapula, radio/ulna and tibia comprise 22.1% of the cattle bones, 28.9% of the horse bones, 27.2% of the caprovid bones and 29.9% of the pig bones.

Age estimation

Estimation of the age of the domestic animals is based on data published by Grant (1975; 1982) and Silver (1969). It is realised that there may be a discrepency between the age of an animal indicated by the dentition and that determined from the epiphyseal union data, but the low number of complete tooth rows recovered made it necessary to draw on both sets of data. Where a chronological age is given for an animal, it is based on

Silver's (1969) data for recent animals and is intended as a guideline only since the rate at which dental attrition progressed and the age at which epiphyseal union occurred may well have been different in the Iron Age and Romano-British animals. In order to simplify the results, epiphyseal union data were amalgamated into three groups of early-, middle- and late-fusing epiphyses. The early-fusing group contains epiphyses fused by the age of (in modern terms) 1½ years (cattle and horse), 10 months (caprovid) and 1 year (pig); and the late-fusing group contains epiphyses which fuse between the ages of 3½ and 4 years (cattle) and 3 and 3½ years (horse, caprovid and pig).

Metrical data

Measurements were taken following the method advocated by von den Driesch (1976) and are listed in table 29.

Cattle

Eight cattle are represented by mandibles and by the right proximal radius. Six mandibles have worn permanent dentition and two have deciduous dentition. Epiphyseal union data indicate two animals with unfused epiphyses in the early-fusing group and at least two fully mature animals with late-fusing epiphyses fused. Probably two animals were (in modern terms) under 1½ years old at death, four were at least 3 years old and two were over 4 years old. Evidence of the sex of the animals is lacking but no particularly large bones, which might be from bulls, were noted in the sample. The long-bone measurements are within the range for Iron Age cattle from Ashville and other Iron Age sites (Wilson et al., 1978: table XIX), Gussage All Saints (Harcourt 1979: table XXI) and Danebury (Grant 1984: table 70).

Horse

Five horses are represented by the left scapula. All the dental remains are worn permanent teeth and, with the exception of one proximal tibia, all the long-bone epiphyses (in all three groups) are fused. These data indicate four animals over the age of 5 years - one with very worn teeth was probably a considerable age - and one animal between 1 and 3 years old. No upper canine teeth (this tooth is present only in males) were

recovered. It would seem, from the few published measurements of Iron Age horse bones, that the horses from Copse Farm were within the size range for horses from sites of this date: one incomplete metacarpal with a larger proximal width than any from Danebury (Grant 1984: table 77) probably indicates a more heavily-built animal but not necessarily a taller one.

Caprovids

Although some of the caprovid bones are large enough, compared to the majority of the caprovid remains from trench B, to arouse suspicions that they are from goat, there is no certain evidence of this animal's presence. The single fragment of horn core is from sheep; two measurable metacarpals have $\frac{\text{diam. trochlea} \times 100}{\text{diam. verticillus}}$ indices of 69.5 and 72.3, well inside the range (over 63) for sheep (Boessneck 1969, 355); and, on the basis of the lengths of the goat metapodials from Gussege All Saints (Harcourt 1979: table XXXI), the Copse Farm metapodials are too long to be from goat (it is sad that measurements of the goat bones from Danebury were not published).

Nine animals are represented by mandibles, five with deciduous dentition and four with fully-erupted and worn permanent dentition. All the early-fusing epiphyses and most of the epiphyses in the middle-fusing group are fused; and there are no epiphyseal union data for the late-fusing group. The dental remains indicate that two of the immature animals were aged only about 3 months at death, one was about 1 year old and two were between 1 and 2 years old. The remaining four animals were well over 2 years old. There are no obvious indications as to the sex of any of the animals but the size variation observed in the post-cranial bones, if it is not due to the presence of goat, may well be reflecting sexual dimorphism.

Pig

Probably all the pig remains from trench B are from domestic animals. The measurements of the permanent third molar are well below the range for wild pig and the only two measurable long-bones are within the size range for Iron Age domestic pig from other sites. Four pigs are represented by the right ulna and bones from a very young, probably newborn, piglet are present also. Dental data indicate that one pig was only a few months old at death (the deciduous third molar is in an early stage of wear) and two

were over 1½ years old. Only one long-bone epiphysis (out of a total of 14 recovered) in the late-fusing group is fused and the implications are that only one of the pigs from Copse Farm was fully mature at death. All the canine teeth recovered are mandibular and are from males. Only one is *in situ* in a mandible fragment but at least one loose tooth comes from a second male animal and several more fragments of loose male canine teeth were recovered from different contexts. Because of the possibility that the loose teeth were picked up elsewhere and carried to the site, it is uncertain whether they represent animals which were killed at Copse Farm. If they do, males appear to predominate in the assemblage. The sample may be biased due to its small size or because of differential recovery of the large, curved canine teeth of the male which are more easily seen in the soil than the smaller female canines. Alternatively, the recovered remains may indeed reflect the selective slaughtering of males for consumption.

Dog

The dog remains represent two puppies under a year old and two adult dogs. Cut marks on two of the bones suggest that these animals may have been eaten.

Bird

Both the bird bones from trench B are from carrion crow (*Corvus corone*). A right tibia was recovered from the ditch, context 41, and a left humerus from a post hole, context 75. The humerus is large and the bones are probably from two different birds, both adult. Corvid remains are relatively common on Iron Age sites and the birds may have been attracted to the site as scavengers. It is uncertain whether they would have been eaten, but there are no cut marks on the bones.

The domestic/wild ratio

Only two bones from a wild species were identified and 99.9% of the bones from trench B are from domestic animals.

Pathology

The only disease seen in the bones from trench B was a few instances of

oral pathology. Two loose bovine teeth (a mandibular third molar and a maxillary molar) are worn very unevenly; crowding and misalignment of the teeth was noted in a bovine mandible and three caprovid mandibles (from three different ani,als); and in two bovine mandibles (from two different animals) the second premolar is congenitally absent.

Butchery

Evidence of butchery is slight and was sometimes difficult to evaluate owing to erosion of the surface of the bone. Only 1.5% of the bone bears chop or cut marks, mainly the bones of cattle and horse. Cut marks on two dog bones may indicate that the animals were eaten.

Gnawed bones

Signs of gnawing, probably by carnivores, and sometimes scratch marks as well were seen on 1.4% of the bone. The condition of the bone made assessment difficult in some cases and the incidence may have been higher. The bones of all four major domesticates have been chewed, but none of the dog bones.

Summary

The interpretation of the bone from trench B is tentative because of the small sample size and the limited extent of the excavations. Nevertheless, there are some similarities between this assemblage and the bone from another Iron Age site on the Coastal Plain, North Bersted (Bedwin and Pitts 1978), which are of interest. At both sites, the remains of cattle are predominant and there is a virtual absence of the remains of wild species. It would seem, however, that horse had a more important role in the economy at Copse Farm than at North Bersted.

TRENCHES A, C AND E

A total of 2209 fragments was submitted for examination from trenches A, C and E: 17 fragments from trench A, 19 fragments from trench C and 2173 fragments from trench E. The bone from trenches A (trackway ditch) and C (gully) has been included in tables 24 and 25, but it is excluded from

further analyses because its relationship to the bone from trench E is uncertain; and 168 fragments from trench E which came from the topsoil are also omitted from further analyses because of the risk of contamination by earlier or later deposits.

The spatial distribution of the bone in trench E is as follows: 1184 fragments (59%) came from the ditches and 821 fragments from pit 18. The red deer bone, the bird bone and the human tooth came from ditch 6, which contained 61.4% (727 fragments) of the bone recovered from the ditches. The remains of the domesticated animals were distributed throughout the fills of the ditches and pit 18. One piece of worked bone came from ditch 4 and two pieces from pit 18. Burnt fragments of bone were recovered only from the ditches; butchered and gnawed bones were distributed in the ditches and pit 18.

The material

Preservation of the bone is good to fair, with some variation between contexts. Chewing and scratching by carnivores - probably dogs, since their bones have been recovered, but no doubt the contents of the ditches and pit would have attracted wild carnivores as well - have destroyed the ends of the bones in many cases. The bones from several contexts in the ditches are very pale in colour (the bones from context 23, in particular, are almost white and the surface of the cortex has a 'chalky' texture) and are stained to a greater or lesser degree by an iron deposit (Cartwright pers. comm.). The bones from two layers in pit 18 (24 and 67) are slightly stained also but the bones themselves are darker in colour than those from the ditch contexts. Recent damage was seen on many of the bones but there is also considerably more ancient fragmentation than was observed in the bones from trench B.

The analyses

Of the total of 2209 fragments from trenches A, C and E, 1483 fragments (67.1%) were identified to species level or placed in a Bos/horse-sized, caprovid-sized or pig-sized group (tables 24 and 25). The analyses which follow are concentrated on the bone recovered from the ditches and pit 18 in trench E. The number of fragments identified to species level and the minimum number of individuals they represent are shown in tables 26 and 27.

Cattle predominate in both analyses and horse, although less frequent than caprovid in the count of the minimum number of individuals, would have provided the second largest meat yield because its body size is considerably larger than that of caprovid. The relative proportions of the different anatomical elements recovered for cattle, horse, caprovid and pig are shown in table 28. The abundance of cattle metatarsals is notable and this is illustrated in fig. 17, in which the cattle remains (excluding the skull, vertebrae and ribs) from both trenches are compared with the caprovid remains.

Cattle

The minimum number of cattle, calculated from the metatarsals, is twenty-eight. In four animals, distal epiphyseal union has not yet occurred in this bone and in the remainder it is completed. Nine left mandibles were recovered with the permanent third molar in wear and in two more mandibles this tooth has not yet erupted through the alveolar bone. All the early-fusing epiphyses were fused (in one proximal radius the fusion line is still visible) and in the late-fusing group of epiphyses, four left radii are fused distally and two are unfused. These data indicate that most of the cattle were over 3 years old and at least four were over 4 years old.

Measurements of the four complete metacarpals (the indices of the $\frac{\text{maximum distal width} \times 100}{\text{maximum length}}$ are 26.7 - 28.8) are within the range for the bones from Roman Exeter which Maltby (1979,33) suggests are from cows, but there are some large bones in the assemblage which are probably from bulls - two measurable examples are a metatarsal with a distal breadth (Bd) of 55.0 mm and an astragalus with a lateral length (GLl) of 65.5 mm and a distal breadth (Bd) of 43.1 mm. None of the bones is large enough to be from Bos primigenius.

It has been suggested (Bedwin 1983, 92) that the site may have been supplying dressed carcases to the inhabitants of Chichester, which would account for the large number of bones from the extremities compared to the number of meat-bearing bones. Unfortunately there are no published data from the Chichester excavations to support or disprove this theory. Another possibility, which it is hoped to investigate further, is that the uneven skeletal representation in the cattle bones is due to an activity which is not directly related to the consumption of the animals and it

should be pointed out that the figure given for the minimum number of individuals represented by the cattle bones does not necessarily reflect the consumption of beef at this site in relation to the consumption of the flesh of the other species.

Horse

Five horses are represented by the right mandible with the third permanent molar in wear and by the left proximal metacarpal. All the dental remains which were recovered are permanent teeth, in wear, and with two possible exceptions all the long-bone epiphyses (from all three groups) are fused. The possible exceptions are an olecranon process which was recovered as a separate entity and a calcaneum. In both bones the fusion data are uncertain because of erosion of the surface of the bone but neither shows obvious signs of having been gnawed by carnivores. The dentition indicates that all five animals were at least 5 years old; if the two epiphyses referred to above were unfused, they must be from an animal (or animals) under $3\frac{1}{2}$ years old.

There is no evidence of the sex of the animals. Many of the measurable horse bones from trench E are slightly smaller than those from trench B, but there is one large tibia with a distal breadth (Bd) of 77.2 mm which is probably from a horse (i.e. over 14.2 hands high) rather than a pony.

Caprovids

The presence of goat among the caprovid remains is indicated by two horn cores attached to skull fragments. No other bones were identified as being certainly from goat but a distal humerus in which epiphyseal union had been completed shortly before death (unfortunately it is damaged and unmeasurable) and a radius shaft, both of which are considerably larger than any others from trench E, may well be from goat too. If they are not goat, their size suggests that they must be from a large ram. All the other horn core remains are from sheep (fragmentation makes it uncertain how many animals they represent), some long bones in which the diagnostic features are undamaged are certainly from sheep and the gracile nature of many of the other bones is suggestive of sheep rather than goat. The index of the $\frac{\text{diam. trochlea x 100}}{\text{diam. verticillus}}$ for the only measurable metacarpal is 68.0,

well within the range for sheep (over 63.0) given by Boessneck (1969, 355) and it is thought likely that most of the caprovid remains are from sheep.

Six animals are represented by mandibles. Four still have deciduous dentition (in one animal the permanent second molar is in the process of erupting) and in the remaining two the full permanent dentition is in wear. These data indicate that one animal was aged about one year, three were under 2 years old and two were over 2 years old. With one exception, a proximal phalanx (middle-fusing group), all the long-bone epiphyses are fused. The line of epiphyseal union is still visible in the distal humerus referred to above which is possibly from goat and in the distal tibia. A fused proximal tibia indicates that at least one animal was fully mature at death. Many of the caprovid long bones have survived only as shaft fragments and there is only one bone providing fusion data for the late-fusing group. Whether the older animals are greatly under-represented by the bones which have been recovered because of taphonomic factors (certainly some of the ends of the shafts have been chewed by carnivores, which would have destroyed fused articulations) or whether most of the bones are indeed from subadult animals is uncertain. If the latter alternative is the case, the immature state of the ends of the long bones would probably have made them particularly susceptible to destructive post-depositional processes and would account for the large number of bones lacking their articular ends.

Pig

There is no certain evidence that any of the pigs from trench E are wild. The length range of the third molar is 28.3 mm to 34.9 mm and the breadth range is 14.0 mm to 18.7 mm, well below the range for wild pig (Luhman 1965, 21) but three fragments of mandibular canine teeth from at least two males, an ulna fragment and a fourth metatarsal from an immature animal which is 69.9 mm long (maximum length measured to the unfused distal end of the diaphysis) must be from very large domestic pigs if they are not from wild animals. In modern pigs the canine teeth have erupted by the time the animal is a year old while the distal epiphysis of the metatarsal does not unite with the shaft until the animal is aged about 2¼ years, so it is possible that the metatarsal is from one of the animals represented by the large canine teeth. However, because the method used for calculating the minimum number of individuals does not take account of loose teeth,

these animals are not included in the total given in table 27.

Four pigs are represented by mandibles, three with the permanent third molar in an early stage of wear and one with deciduous dentition. Only ten of the long bones provide epiphyseal union data: eight epiphyses in the early-fusing group are united with the shaft and the remaining two, in the middle-fusing group, are unfused. There is, therefore, no evidence from the pig remains that any of the animals were fully mature at death. The data show that one pig was about 1 year old and the other three were over 22 months old.

Evidence of the sex distribution of the animals is similar to that encountered in the pig bones from trench B. All the canine teeth which were recovered from the ditches and pit 18 in trench E are mandibular and from males. (Indeed, the only canine tooth from a sow recovered from any of the trenches came the topsoil in trench E; a mandibular canine tooth from trench A and one from trench C are both from males.) One of the canine teeth from trench E is *in situ* in a mandible fragment and the presence of a second male animal is indicated by the morphology of the canine socket (the tooth has been lost after death) in another mandible. Loose canine teeth were recovered from three more males, including the two possible wild boars referred to above.

Dog

The dog bones represent five animals, all of which were probably adult; in the bones which were recovered the permanent teeth have erupted and all the long-bone epiphyses are fused. A range of sizes is present and the measurements obtained are given in table 29.

Red deer (*Cervus elaphus* L.)

The red deer metacarpal came from ditch context 34. The distal end has been chewed and destroyed by carnivores but the general appearance of the bone suggests that it is from an adult animal.

Bird

A right ulna from an adult raven (*Corvus corax*) is the only bird bone

recovered from trench E. It came from ditch context 7. There are no cut marks on the bone and it is uncertain whether this species of corvid would have been considered edible. The bone may simply be from a bird which died in the vicinity of the site to which it had been attracted as a scavenger.

The domestic/wild ratio

The bones from trench E are predominantly from domestic animals, only 0.1% being certainly from wild species (assuming the raven was a wild bird). Even including the possible wild pig remains, the bones of domestic animals comprise 99.5% of the identified bones.

Pathology

Few instances of pathology were seen in the bones from trench E and on the whole the animals seem to have been in good health at the time of their death. There are two minor dental anomalies: uneven wear in a bovine lower third polar and misalignment of the fourth premolar in a caprovid mandible. A dog mandible shows ante-mortem loss of the fourth premolar and the traces of associated periodontal disease are still visible in the region of the socket, which is almost healed. In one bovine mandible the second premolar is agenic and the presence of assymmetrical foramina in two vertebrae may be genetically determined also (Bourdillon and Coy 1980, 92). A possible healed fracture was noted in the distal diaphysis of a dog tibia. The shaft shows a slight swelling on the antero-medial aspect but there is no sign of an inflammatory reaction in the bone and no distortion of the shaft. If it is the site of a former injury, it clearly occurred some time before death and healed well. The only instances of disease which might have affected the mobility (and hence, perhaps, the usefulness) of the animal are two cattle bones showing arthropathic changes, a lumber vertebra with small osteophytes on the centrum and a metatarsal in which the tarsals are fused to the proximal articulation.

Butchery and other activities

In all, 82 bones bear marks resulting from human activities and most of them (90%) come from pit 18. The marks are predominantly on the bones of the larger species - approximately 67% are cattle bones and 21.0% from

horse - and while some of them are cut and chop marks clearly made during dissection of the carcass some, mainly on the metapodials, cannot be explained in this way and it is hoped to make these the subject of further study.

Gnawed bones

Signs of gnawing by other animals were seen on 2.5% of the bone from the ditches and 5.2% of the bone from pit 18. Only bones from the four major domesticates and the red deer have been gnawed: none of the dog bone is chewed, nor is the bird bone. With one exception, a bone from pit 18 which has probably been gnawed by a rodent, the marks on the bones have scratch marks as well, probably made by the claws of the animals which were chewing them.

Burnt bones

Seven small fragments of burnt bone from indeterminate species were recovered from ditch contexts 3, 5, 22, 33 and 36.

Summary

The assemblage from ditches and a pit in trench E is dominated by cattle bones. Interpretation of the assemblage is not attemted because, without further excavation and analysis, its significance is uncertain.

Human remains

One upper left medial incisor was recovered from ditch context 37. It is a permanent tooth, showing light wear, and (in modern terms) is from an individual over 8 years old (Brothwell 1981: fig. 3.3A). Moderate enamel hypoplasia indicates that the individual experienced a phase or phases of malnutrition or infection during early childhood.

Table 20.

Trench B.

Number of fragments identified to species level (and number of undiagnostic fragments of Bos/horse, caprovid and pig size, shown in brackets).

Type of context	Cattle	Horse	Caprovid	Pig	Dog	Bird	Human
Ditch	223(117)	109	130(24)	62(1)	19	1	22
Pit/scoop	8(7)	2	51(23)	2			
Post-hole	9(13)	3	14(10)	11		1	
Layer, 'working area'	1						
Total	241(138)	114	195(57)	77(1)	19	2	22

Table 21.

Trench B.

Number of identified fragments for each species expressed as a percentage of the total number of fragments identified to species level, excluding human bone (n=648).

Cattle	Horse	Caprovid	Pig	Dog	Bird
37.2	17.6	30.1	11.9	2.9	0.3

Table 22.

Trench B.

Minimum number of individuals.

Cattle	%	Horse	%	Caprovids	%	Pig	%	Dog	%	Bird	%
8	24.2	5	15.1	9	27.3	5	15.1	4	12.1	2	6.1

Table 23.

Trench B.

Skeletal representation in the major domesticates.

	Cattle		Horse		Caprovid		Pig	
	no. of frs	%	no. of frs	%	no. of frs	%	no. of frs	%
skull	121	50.2	54	47.4	72	36.9	37	48.0
vertebrae	7	2.9	4	3.5	5	2.6	2	2.6
scapula	11	4.6	16	14.0	8	4.1	7	9.1
humerus	11	4.6	5	4.4	11	5.6	4	5.2
radio/ulna	33	13.7	6	5.3	23	11.8	13	16.9
metacarpal	11	4.6	6	5.3	14	7.2	2	2.6
phalanges	6	2.5	3	2.6	7	3.6		
pelvis	8	3.3	5	4.4	3	1.5	2	2.6
femur	2	0.8	1	0.9	5	2.6	6	7.8
tibia	10	4.1	11	9.6	22	11.3	3	3.9
tarsals	5	2.1			4	2.0		
metatarsal	16	6.6	3	2.6	21	10.8	1	1.3
Total	241		114		195		77	

Table 24.

Trenches A, C and E.

Number of identified and unidentified fragments.

		Identified	Unidentified
Trench A		14	3
Trench C		11	8
Trench E	Ditches	711	473
	Pit 18	662	159
	Topsoil	85	83
Total		1483	726

Table 25.

Trenches A, C and E.

Number of fragments identified to species level (and number of undiagnostic fragments of Bos/horse, caprovid and pig size, shown in brackets).

	Cattle	Horse	Caprovid	Pig	Dog	Red deer	Bird	Human
Trench A	2(1)	1	3	7				
Trench C	1(5)	1	1(1)	1				
Trench E								
Ditches	194(105)	201	128(25)	32(4)	19	1	1	1
Pit 18	341(121)	56	73(9)	39(3)	20			
Topsoil	25(17)	6	19(9)	9				
Total	563(249)	265	224(44)	89(7)	39	1	1	1

Table 26.

Trench E.

Number of identified fragments for each species expressed as a percentage of the total number of fragments identified to species level, excluding human bone (n=1182).

Cattle	Horse	Caprovid	Pig	Dog	Red deer	Bird
47.6	22.4	18.9	7.5	3.3	0.1	0.1

Table 27.

Trench E.

Minimum number of individuals.

Cattle	%	Horse	%	Caprovids	%	Pig	%	Dog	%	Red deer	%	Bird	%
28	56.0	5	10.0	6	12.0	4	8.0	5	10.0	1	2.0	1	2.0

Table 28.

Trench E.

Skeletal representation in the major domesticates.

	Cattle		Horse		Caprovid		Pig	
	no. of frs*	%	no. of frs	%	no. of frs	%	no. of frs	%
skull	267	50.0	163	63.4	101	50.2	33	46.5
vertebrae	8	1.5	25	9.7	2	1.0	3	4.2
scapula	10	1.9	2	0.8	8	4.0	8	11.3
humerus	9	1.7	3	1.2	12	6.0	8	11.3
radio/ulna	27	5.1	11	4.3	14	7.0	4	5.6
metacarpal	47	8.8	13	5.1	13	6.5	2	2.8
phalanges	33	6.2			1	0.5	1	1.4
pelvis	4	0.7	9	3.5	5	2.5	4	5.6
femur	5	0.9	6	2.3	3	1.5	4	5.6
tibia	11	2.1	13	5.1	28	13.9	1	1.4
tarsals	24	4.5	7	2.7	1	0.5	2	2.8
metatarsals	89	16.7	5	1.9	13	6.5	1	1.4
Total	534		257		201		71	

*excluding one bovine carpal

Table 29.

Bone measurements. The method used is that advocated by Von den Driesch(1976)

Key

W.d. art. = width of distal articulation

Th = (humerus) thickness of distal articulation; (radius and metacarpal) thickness of proximal articulation

? = accuracy questionable due to erosion of the surface of the bone

e = estimated because of slight damage

R and L = right and left

(i) Cattle

Humerus		W.d. art.	Th
Trench B,	L	70.6?	39.8
	R	70.5	42.6
Trench E,	L	64.2	38.6
	L	65.1	37.8

Radius		GL	Bp	Th
Tr B,	L	247.0	61.5	33.5
	R		66.1	36.3
	R		69.1	37.1
	R		67.5	36.4
	R		72.9	39.3
	R		65.3	35.7
	R		63.4	35.9
Tr E,	R		66.5	36.1
	L		63.5	32.5e
	L	257.0		
	L		59.9	33.1
	R		65.4	37.0

Metacarpal		GL	Bp	Th	SD	DD	Bd
Tr B,	L		49.0	31.3			
	L		58.4	33.6			
	R		52.4	33.0			
	R		44.6	29.1			
	L	156.5?	50.3	32.7			
	R		57.0	37.5			
	R		55.0	31.7			

Cattle(cont)

Metacarpal(cont)		GL	Bp	Th	SD	DD	Bd
Tr E,	R	172.0	56.3	34.5	26.4	16.7	45.9
	L		50.5	31.4			
	L		49.8	31.7			
	R		52.0	31.3?			
	L	175.0	50.1	32.0	28.1	17.2	
	L	181.0?	50.1	30.6	28.0	18.8	
	R		49.5	29.6			
	L						51.2
	L						45.9
	R						50.6
	R	174.0	49.7	28.7?	27.5	20.0	50.1
	R	169.5	45.0	28.5	25.2	17.3	48.8
	R		50.5	32.7			
	R						53.9
	L	176.0	49.6	31.2	26.4	18.6	49.6
	R		48.7	32.2			
	R						52.3

Tibia		Bd
Tr B,	L	50.9
	R	54.1
	R	56.6
	L	55.8e
	L	49.7?
	L	54.1
Tr E,	R	52.6
	R	59.1
	L	47.0
	R	56.0
	R	49.8

Metatarsal		GL	Bp	SD	DD	Bd
Tr B,	L					48.1
	R	206.0	42.0			48.9
	R					47.7
	L		45.4			

Cattle(cont)

Metatarsal(cont)		GL	Bp	SD	DD	Bd
Tr E,	R					45.5
	R	207.0?	41.2	24.5	22.1	
	R	208.5	43.9	23.6	22.5	48.8
	R	195.5	40.0	23.3	20.2	42.5
	R	202.0	41.7	23.4	22.2	47.2
	L	199.0	40.9	21.7	20.8	45.0e
	R	204.5	39.7	23.0	22.9	47.2
	R	200.0?	41.2	22.6	21.4	
	L	201.5	43.9	22.9	19.8	46.0e
	L					45.4
	L					55.0
	R	198.5		21.0	21.0	44.0
	L	208.0	36.2	23.8	22.1	47.3
	L	204.5	42.4	21.6	22.4	48.1
	R	198.0	42.1	21.2	21.2	45.5
	R	190.5	37.3	23.1	18.6	43.9
	L		41.4	22.6	20.8	
	L					43.8
	R		43.8			
	L		49.6			
	R	193.0	43.0	24.0	21.6	47.0
	R					47.4?
	R					45.9
	R					50.0
	R					50.2
	L		40.6			
	L		42.9			
	L		47.5			
	R		46.2			
	L					43.6
	L		39.9			
	L	205.0	47.2	25.3	23.3	50.7
	R		46.5			
	R		46.5			
	L	204.5	42.1	23.1	20.6	46.3
	L					43.2

Cattle(cont)

Metatarsal(cont)	GL	Bp	SD	DD	Bd
Tr E, L		40.9			
L					44.9
R	198.0	41.7	21.7	20.2	45.2
L	197.5		23.3	20.1	45.9
L					44.8
R		41.9			
R		50.6			

Horn core	basal circumference
Tr B	140.0
Tr E	125.0
	110.0
	120.0
	120.0
	90.0
	89.0
	89.0

(ii) Horse

Humerus	GLl	Bp	W.d. art.	Th
Tr B, R	268.0	78.9	67.5	41.8
R			68.0	40.7
Tr E, L			61.5	39.0
L			58.3	40.3
R			64.3	40.0

Radius	Bp	Th
Tr B, L	72.8	38.4
Tr E, R	68.1	36.2
R		35.3

Metacarpal	GL	Bp	Dp	Bd
Tr B, L		43.7	27.9	
R				53.5?
R				41.1
R		55.7	35.7	

Horse(cont)

Metacarpal(cont)		GL	Bp	Dp	Bd
Tr E,	L		43.2	37.5	
	L	205.0	44.9	30.0	44.1
	L		44.5	29.9	
	L				43.7
	L	197.5	43.2	27.5	40.7
	R		50.2	32.3	
	L		40.1	26.4	

Tibia		Bd
Tr B,	L	59.2
	L	63.7
	L	57.7
Tr E,	R	62.4
	R	63.5
	R	62.0
	R	77.2
	L	58.3

Metatarsal		GL	Bd
Tr B,	R	218.5	
	L		46.6
	L		41.5
Tr E,	R	246.0	39.5?
	R		42.5
	L		44.2

(iii) Caprovid

Humerus		W.d. art.	Th
Tr B,	R	24.1	16.9
	R	23.3	15.0
	L	24.0e	14.6
	R	24.5	15.4
	L	23.1	13.1
	L	26.6	16.0
Tr E,	R	23.5	15.0
	L	21.6	14.4

Caprovid(cont)

Radius		Bp	Th
Tr B,	R	22.1	12.6
	R	21.0	13.7
	R	23.3	12.2
T	R	26.0	14.3

Metacarpal		GL	Bp	Th	SD	DD	Bd
Tr B,	L		18.6	14.0			
	L	114.5	17.9	13.6	9.0	7.2	20.0
	L	112.0	19.2	14.6	11.0	7.7	21.1
	L		19.7	15.0			
	L		19.5	15.0			
Tr E,	R		20.1	14.6			
	R						22.2

Metatarsal		GL	Bp	SD	DD	Bd
Tr B,	L					21.0
	R		18.4			
	R	125.0	16.5	9.4	7.7	19.2
	L	125.0	16.5	8.8		
Tr E,	R		16.8			

Horn core: sheep		basal circumference
Tr E		95.0

Horn core: goat		basal circumference
Tr E,	R	140.0
	L	145.0

(iv) Pig

Humerus		GLC	W.d. art.	Th
Tr B,	L	167.5	31.7	25.9

Radius		Bp	Th
Tr A,	R	25.3	17.1
Tr E,	L	27.9	19.1
	R	26.9	20.1
	L	26.8	18.5

Pig(cont)

Tibia	Bd
Tr B, R	25.9
Tr C, R	25.1

(v) Dog

M_1	length
Tr E, L	19.7
R	22.1
L	22.3

Radius	GL
Tr E, L	170.0

Tibia	GL
Tr E, L	172.0
L	187.5

Figure 17. Trenches B and E: skeletal representation (postcranial bones excluding vertebrae and ribs) in caprovids and cattle.