Excavation of a Ringfort at Sluggary, Co. Limerick.

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Report of the excavation of a ringfort near the Regional Hospital, Limerick. The evidence suggests that it had a long period of occupation in the early Christian period. The most interesting individual find was a finely ornamented antler/bone comb while the animal bones provided valuable information about the lifestyle of the occupants.

Introduction

A large trivallate ringfort was partially excavated at Sluggary, Co. Limerick during the months of June and July 1973 and 1974. At that time a number of housing developments were taking place in the area and at the suggestion of the County Manager, the developers of this land (Messrs. Skelly Bros.) agreed to retain the ringfort as an amenity area within the housing estate then known as Raheen Heights. Excavations were financed by a State grant, recommended by the National Committee for Archaeology of the Royal Irish Academy and administered through the National Parks and Monuments Branch of the Office of Public Works.

The ringfort is situated about 5km south of Limerick city centre on the northern edge of Sluggary townland[1] (Fig. 1). Several other enclosures in the area are recorded on the 1902 edition of the Ordnance Survey 6 inches to 1 mile map. The ringforts, including Sluggary, are generally sited just above the 50 foot OD contour.

The area is well-drained boulder clay. The soil belongs to the grey-brown podzolic group (Elton series), which is the dominant soil type in Co. Limerick. According to Finch and Ryan (1966, 49-50), "The soils are derived from dominantly limestone glacial drift with an admixture of sandstone, shale and volcanic materials." The underlying rock is upper carboniferous limestone. The Ordnance Survey Field Books gave the townland name as derived from Slugaire, meaning 'swallow hole' and this derivation is confirmed by Ó Maolfabhail (1990, 248).

Before excavation the site was overgrown with brambles and small hawthorn trees. The central area and the inner banks were cleared for the excavation but the trees on the outermost bank were retained as a screen. Following excavation the cuttings were mechanically backfilled and re-seeded, and the area was left undisturbed.

Survey (by plane-table) following clearance revealed the ringfort as being somewhat polygonal in plan, measuring internally 40m northwest-southeast and 48m northeast-southwest. The external measurements are 70m northwest-southeast and 80m northeast-southwest. Several gaps were worn through the banks but the most substantial opening on the south-west seems likely to have been the entrance. The main defensive/enclosing element consisted of two concentric banks with external ditches. These were further enclosed by a third, lower bank with no external ditch. This was surmounted by a dry-built stone wall which is similar in construction to the field fences in the area and which in places survived to a height of 1m. The Ordnance Survey 25 inch to 1 mile map indicates that an area of 0.985 acre is enclosed by this wall.

[1] Townland: Sluggary . Parish: Mungret. Barony: Pubblebrien. County: Limerick. 6"OS map sheet 13 for Co. Limerick: 460mm from southern margin, 295mm from western margin.

The Excavation (Fig. 2)

In 1973 a 2m wide trench was cut north-south across the ringfort (reduced to 1m wide at each end). Two shorter trenches were cut across the defences in the south-eastern and south-western parts of the ringfort (Plate 2). On the basis of the identification of occupation in the form of pits in the centre part of the fort it was decided to return in 1974 to excavate this area more fully. All the cuttings within the enclosure were excavated during 1974.

1 Banks and Ditches (Fig. 3)

As already noted three banks and two ditches were identified, the outermost bank being surmounted by a recent field boundary wall. Three sectional elevations were recorded in the cuttings through the banks and ditches, in the East (E), West (W) and North (N) cuttings. On the elevations the layers are identified by number and in the text they are prefixed 'S' and shown in square brackets.

Banks

Cutting	Dimension	Inner Bank	Middle Bank	Outer Bank
East	Height	0.50	0.50	0.35
	Width	3.80	2.30	2.20
West	Height	0.80	0.40	n/a
	Width	3.80	2.00	c. 2.00
North	Height	0.65	0.30	n/a
	Width	3.50	1.80	c. 2.50

Table 1: Dimensions of the Banks in Metres

Inner Bank

The bank was composed of reddish [S1], grey-brown [S2], grey [S3] and yellow/red [S4] clay, the tip lines showing that the material was thrown inwards from the ditch to form the banks. In the W cutting, charcoal [S5] was found along the old ground level. In the E cutting the old ground level was marked by a grey-black layer with fine stones [S6]. A layer of fine gravel-like stones [S7] occurred in the upper levels of the inner side of all three banks.

Middle Bank

This bank was lower and narrower than the inner bank and was composed of red [S8] or orange-red clay [S9], with a very shallow turf-line over it [S10]. Traces of charcoal [S5] were noted along the old ground level in the N cutting.

Outer Bank

This was fully examined only in the E cutting due to the presence of trees growing on it in the W and N cuttings. It was composed of grey-brown clay [S11] which was recorded also in the E cutting and on the inner side of the bank in the W cutting. This bank contained more stones than the inner and middle banks. The modern field boundary wall was built on top of it and stones from this had tumbled into the ditch in recent times [S12]. It was not possible to excavate outside this bank to test for an external ditch, but there were no surface indications of such a ditch.

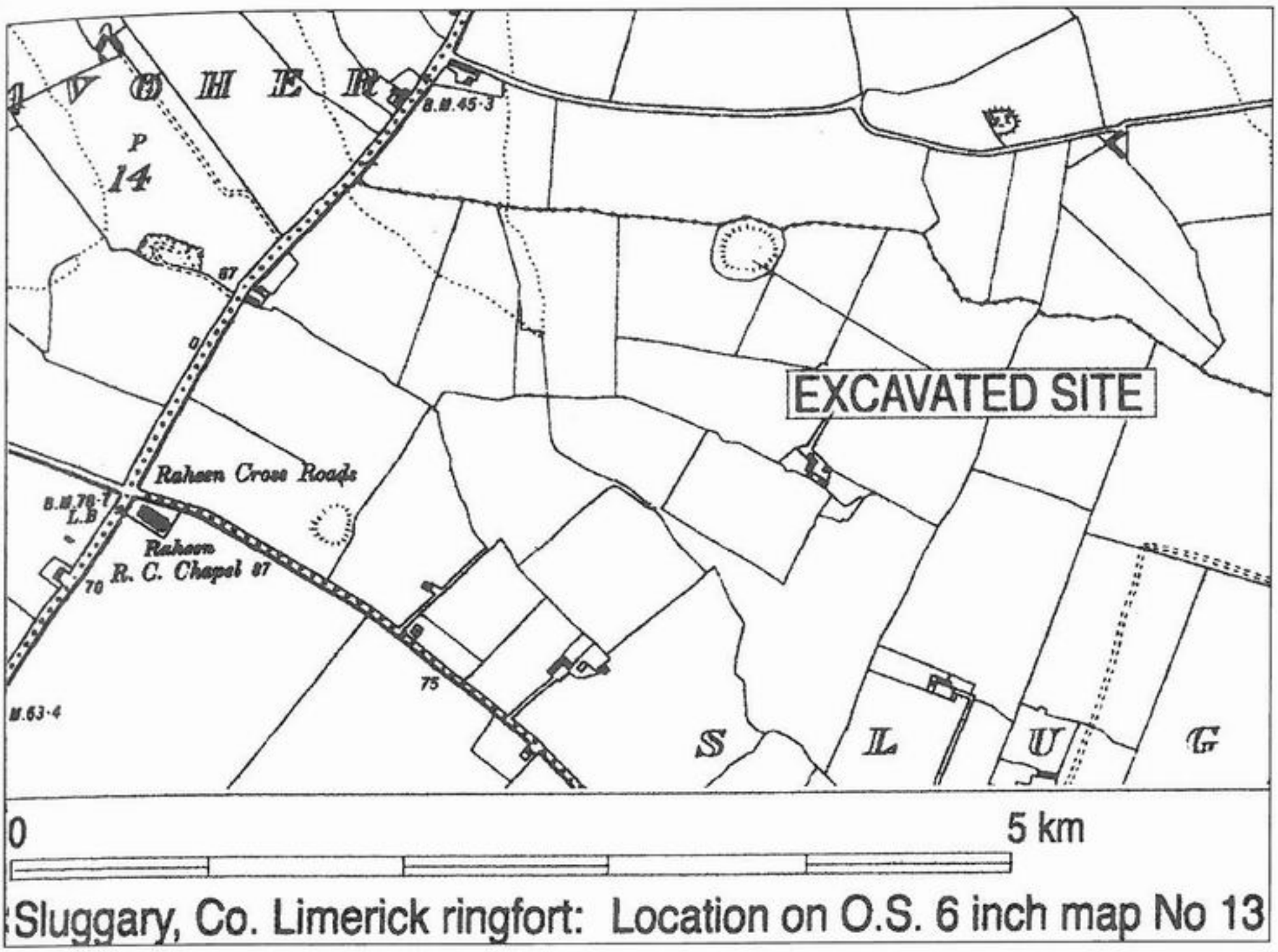

Fig. 1 Extract from Ordnance Survey 6 inch to 1 mile Co. Limerick sheet 13, showing location of site and other earthworks nearby.
(Based on the Ordnance Survey Ireland by permission of the Governmant (Permit No 7129))

Ditches

Cutting	**Dimension**	**Inner Ditch**	**Outer Ditch**
East	Depth	1.25	0.60
	Width	2.30	1.80
West	Depth	1.50	0.70
	Width	2.60	2.30
North	Depth	1.20	0.80
	Width	2.60	2.00

Note: Depth of the ditches was measured below the modern turf line

Table 2: Dimensions of the Ditches in Metres

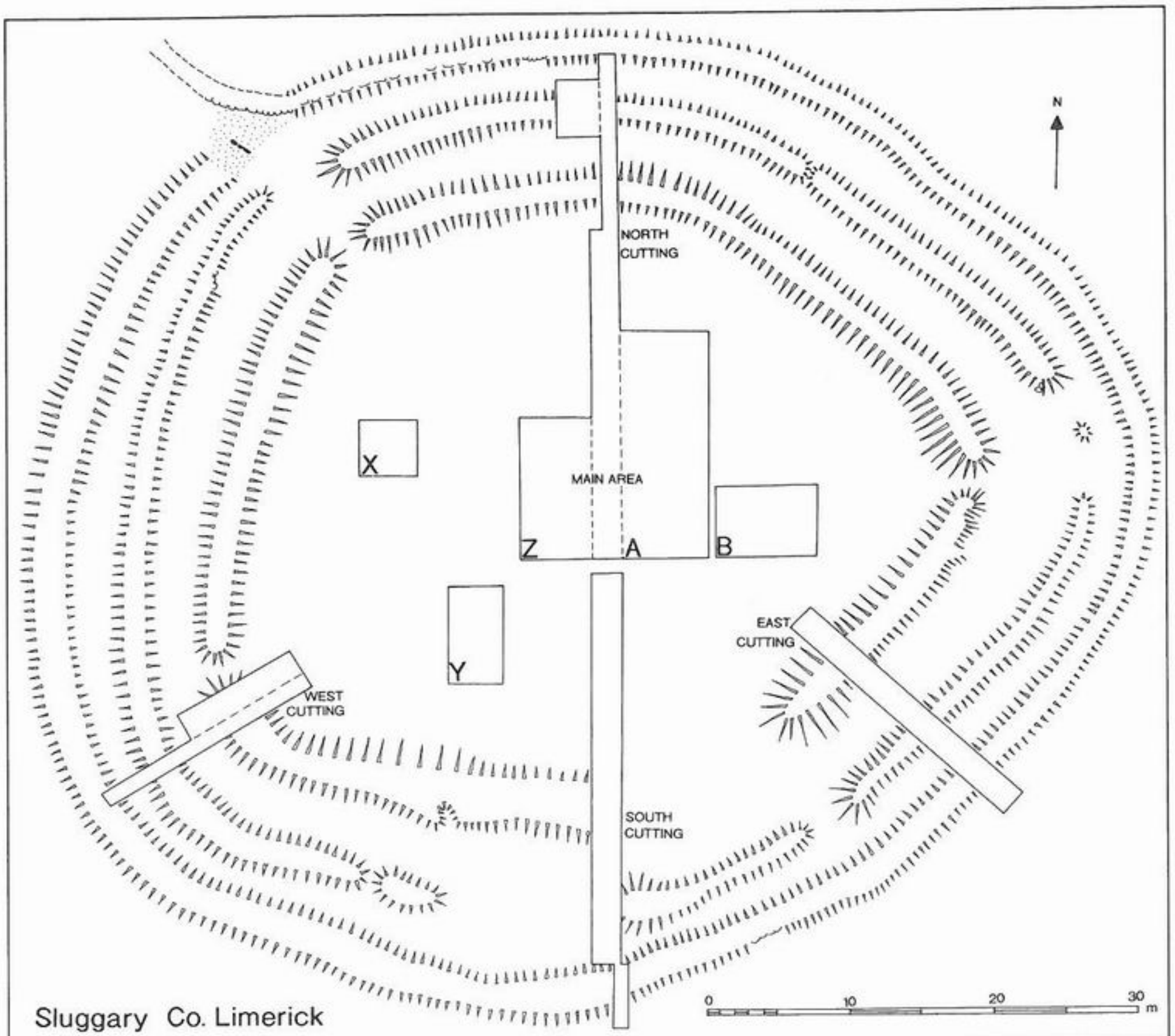

Fig. 2 General plan of site showing areas excavated

Inner Ditch

The inner ditch was noticeably wider and deeper than the outer ditch. The profiles varied from U-shaped in the E and W cutting to a more V-shaped form in the N cutting. The inner face of the ditch in the E cutting showed a break in the slope. The irregular profiles may have been caused by the difficulty of digging 'tidy' ditches in the stony boulder clay. The fill in the inner ditch was brown [S13], with a few stones in the lowest levels. The W cutting showed a darker fill above this, towards the outer side [S14]. The upper fill in the ditch was composed mainly of loose stones, with some dark earth between them [S15]. This must have fallen rapidly off the banks into the ditch and suggests that the banks were faced with stone.

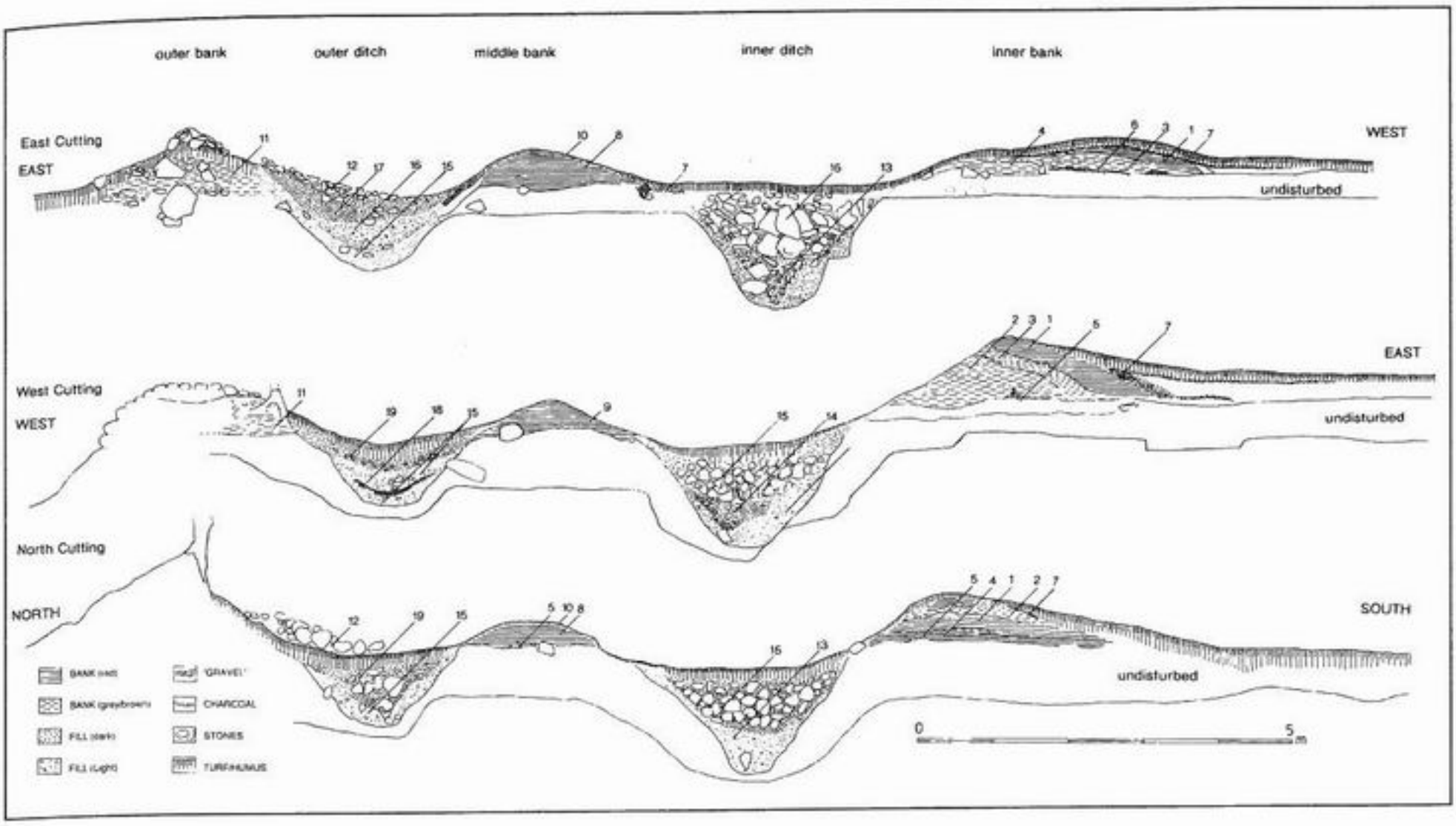

Fig. 3 Sectional Elevations through Banks and ditches

Outer Ditch

This ditch between the middle and outer banks was noticeably shallower and somewhat narrower than the inner ditch (see Table 2). The profiles of the outer ditch were all shallow U-shaped. The primary fill, like that of the inner ditch, was brown with some small stones [S15]. The E cutting had dark brown material with small stones [S16] above the basal fill, with loose dark fill and stones [S17] in the uppermost level. The W cutting had small stones [S18] above the basal fill, then more brown with small stones [S15] and above this was loose stony fill [S19]. The N cutting had loose stones [S19] directly over [S15].

2 Interior (Figs. 4, 5, 6)

Features are numbered on the plan and prefixed 'F' in the text. These numbers were not used at the time of excavation but were set up for ease of reference in the report. Artefact find spots are shown on the plan.

The 2m wide cuttings (North cutting and South cutting) excavated in 1973 showed evidence of occupation in the centre of the interior, and further areas were therefore excavated in 1974. A total of 178 sq. m was excavated in the 'main' area, at the centre of the fort. Three further cuttings were made in the interior, Cutting B (5m x 7m), Cutting X (4m x 4m) and Cutting Y (4m x 7m). A total of 280 sq. m was excavated in the interior.

The nature of the boulder clay made it difficult to differentiate between naturally filled stone holes and real pits and post-pits (Plates 1 and 3). Several of the shallow hollows identified initially as archaeological were later interpreted as stone holes because of their homogeneous fill and smooth profile.

The main features identified included the red clay 'bank' [F1], averaging 0.15m thick and c. 2m wide, which ran east-west across the site. It was recorded first in 1973 and in the following year it was found in all the central area of excavation. The northern edge was difficult to identify, but in Cutting B its southern edge was marked by small stones. Most of the archaeological features recovered cut into the red clay bank. These consisted mainly of pits, usually containing some animal bone and charcoal in their fill, and post-pits some of which still held the base of their post. In one area a number of small stakeholes were found (Plate 4), with patches of burnt earth and a hearth. This area of the fort was obviously occupied, but attempts to identify the ground plans of individual houses have proved unsuccessful. Finds from the site included a range of iron artefacts and some few items in bone and copper alloy. Their find-spots are shown on the plan. They are fully discussed in Section III below.

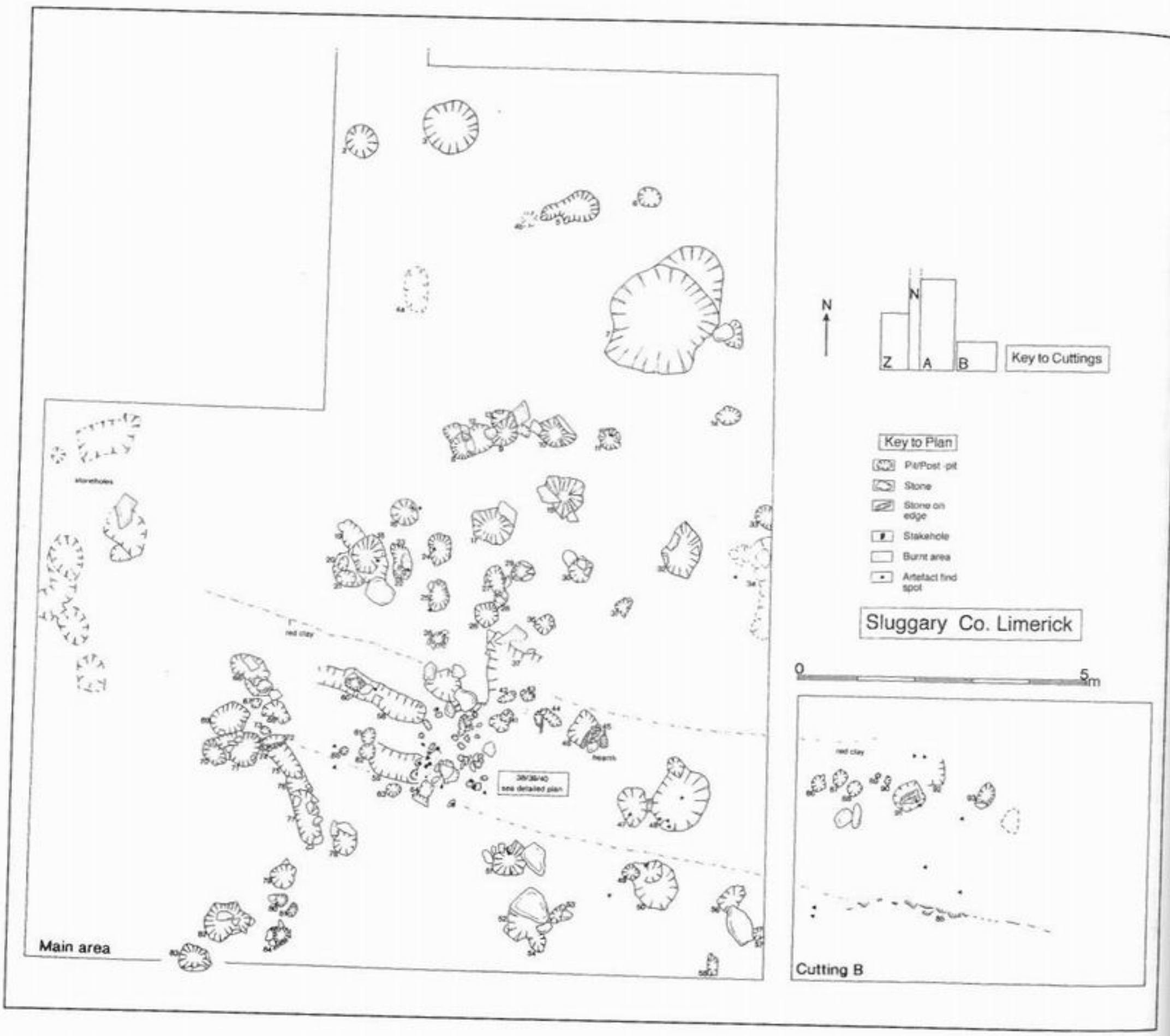

Fig. 4 Plan of excavations in main area

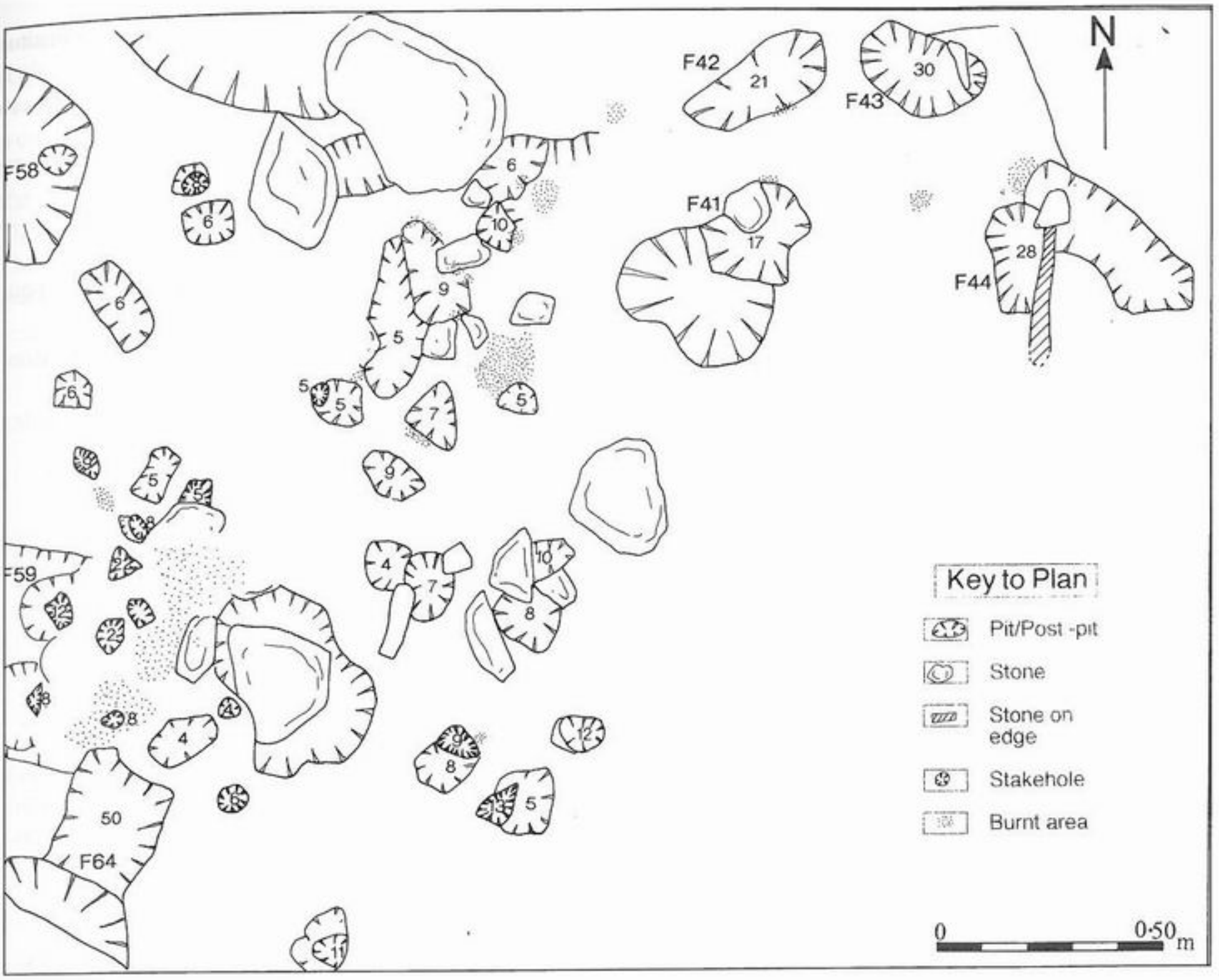

Fig. 5 Detail of stakeholes (F38), burnt soil (F39) and shallow hollows (F40) in main area. Depths of features are shown in centimetres.

Details of features excavated ***(Abbreviation: D = Depth)***

I Main Area (Figs. 4 & 5, Plates 3 & 4)
(Cuttings Z, N and A, described from north to south)

F2 (D:0.25m) pit?
F3 (D:not recorded) pit?
F3 (D:not recorded) possible pit.
F4 & F4b probable stone holes, no archaeological remains.
F5 (D:0.75m) long hollow.
F6 (D: not recorded) well defined, soft fill, some animal bone, little charcoal.
F7 (D: not recorded) large deep pit with brown fill containing 3-4 frags. of animal bone and some flecks of charcoal. Edges very hard. Poss. for water storage?

Four post-pits were found with their centres 0.90m apart: F8 (D:0.37m), F9 (D:0.34m) with packing stones in situ around edges, F10 (D:0.40m), F11 (D:0.29m) with packing stones, contained furnace bottom E131:36.
F12 (D:0.18m) hollow between F8 and F9.
F13 (D:0.16m) post-pit.
F14 (D:0.09m) shallow with some animal bone.
F15 (D:0.40m) post-pit, straight sided, contained loose fill, small stones and animal bone fragments.
F16 (D:0.13m) contained iron knife fragment E131:1 and iron slag E131:34.
F17 (D:0.36m) post-pit, red sticky fill with some charcoal and many stones.
F18 (D:0.42m) post-pit, contained E131:2, an iron fragment. Adjacent to this were F19 (D:0.10m), F20 (D:0.25m), F21 (D:0.23m), F22 (D:0.32m) and F23 (D:0.20m) which contained E131:18, an iron nail.
F24 (D:0.20m) and F25 (D:0.30m) contained charcoal and animal bones. E131:15 and E131:25, both iron fragments, were found with these.
F26 (D:0.20m) and F27 (D:0.20m) were joined by a shallow trench F28 (D:0.10m) with stones along one side, containing a dark loose fill and fragments of animal bone.
F29 (D:0.24m) contained soft fill, some charcoal. Two stones edging it suggest a post-pit.
F30 (D:0.16m) contained mixed fill.
F31 (D:0.14) had well-defined edges.
F32 (D:0.21m) was straight-sided and contained some stones and animal bone fragments.
F33 (D:0.14m) was well made and contained much charcoal.
F34 (D:0.09m-0.17m) was possibly a natural feature with soft sandy filling and no charcoal.
F35 (D: not recorded) post-pit with post and packing stones in situ.
F36 (D: not recorded) had very hard sides, charcoal at bottom.
F37 (D:0.16m) was a shallow hollow area between and south of F35 and F36.
To the south-west of F37 were a number of features cut into F1. These included c. 17 stakeholes [F38] and patches of burnt soil [F39]. They extended over an area of nearly 2m x 2m. The depth of the stakeholes varied between 20mm and 220mm, averaging 80-90mm. There were also c. 16 shallow hollows [F40] which were 100-200mm in maximum dimensions and ranged from 40mm to 120mm in depth. Details of these features and their depths are shown on the enlarged scale plan (Fig. 5).
East of this area were F41 (D:0.17m) and F42 (D:0.21m), both with burning at the sides.
F43 (D:0.30m) and F44 (D:0.28m) were both post-pits. The base of the post was in situ in F44, held in place by a stone. There were patches of burning in the area enclosed by F41/F42/F43/F44.
F45 (D:0.21m) was a hearth defined by three stones set on edge and showing evidence of burning inside. Beside the hearth was a hollow F46 (D:0.12m).
There were several pits and post holes south and east of the hearth: F47 (D:0.20m) was a pit with loose fill on top and burnt wood lying on it. E131:4, an iron blade frag., was found in it. Partly connected to F47 was F48, a large pit (D:0.16m) which contained a number of iron artefacts [E131:5, E131:23, E131:27] and part of a possible clay mould [E131:42]. The fill was loose and stony. These pits were cut into the red clay bank [F1]. F49, a post-pit (D:0.34m) and F50 (D:0.23m) lay immediately to the south. F50 contained dark fill with some bones and E131:7, an iron blade or bar.
To the west was F51, a post-pit (D:0.37m) with loose fill containing charcoal throughout. It had a stone edging the pit, a post in situ (diam.:0.20m) and iron artefacts E131:3 and E131:28.
F52 was to the south, a wide shallow hollow (D:0.17m) with two smaller adjacent hollows F53 (D:0.11m) and F54 (D: not recorded). Other features here were F55 (D:0.22m), F56 (D:0.26m) and F57 (D:0.20m).
The red clay bank [F1] was also found to the west of F38/F39/F40 (where it had been first noted in the 1973 cutting). Here it was cut into by two shallow trenches, F58 and F59. A post-pit, F60 (D:0.51m) was cut into F58 and shallower hollows [F61, F62 and F63, av. D:0.14m] were cut into and beside F59. F64 (D:0.50m) was south of F38/F39/F40. F65 (D:0.10m) was near F61/F62 with E131:19 and E131:30 found nearby.
Further west (in Cutting Z) another series of pits and post-pits had been cut into the red clay bank. These comprised a large pit F66 (D:0.43m) with stone packed into it, F67 (D:0.08m), F68 (D:0.18m) which contained

some bone, F69 (D:0.39m), F70, a post hole (D:0.34m) with bones and charcoal, F71 (D:0.30m) and F72 (D:0.14m) which contained charcoal and bone fragments. A smaller hollow, F73 (D:0.14m), lay beside it. A line of small stones [F74] was set along two sides of F72, separating it from F71 and F75 (D:0.24m). Adjacent to F75 were F76 (D:0.11m) and F77 (D:0.25m), with F78 (D:0.24m) just beyond.
F79 (D:0.16m), F80 (D:0.19m), F81 (D:0.18m) and F82 (D:0.28m) contained stony dark fill. F83 (D:0.26m) was flat bottomed. F84, a post-pit (D:0.38m), had stone packing on the edges.
The western side of Cutting Z revealed a number of hollows whose depths varied between 0.14m and 0.22m. These were probably all natural features (stoneholes) as their fill was homogeneous and did not contain any archaeological material. They are shown in outline on the plan.

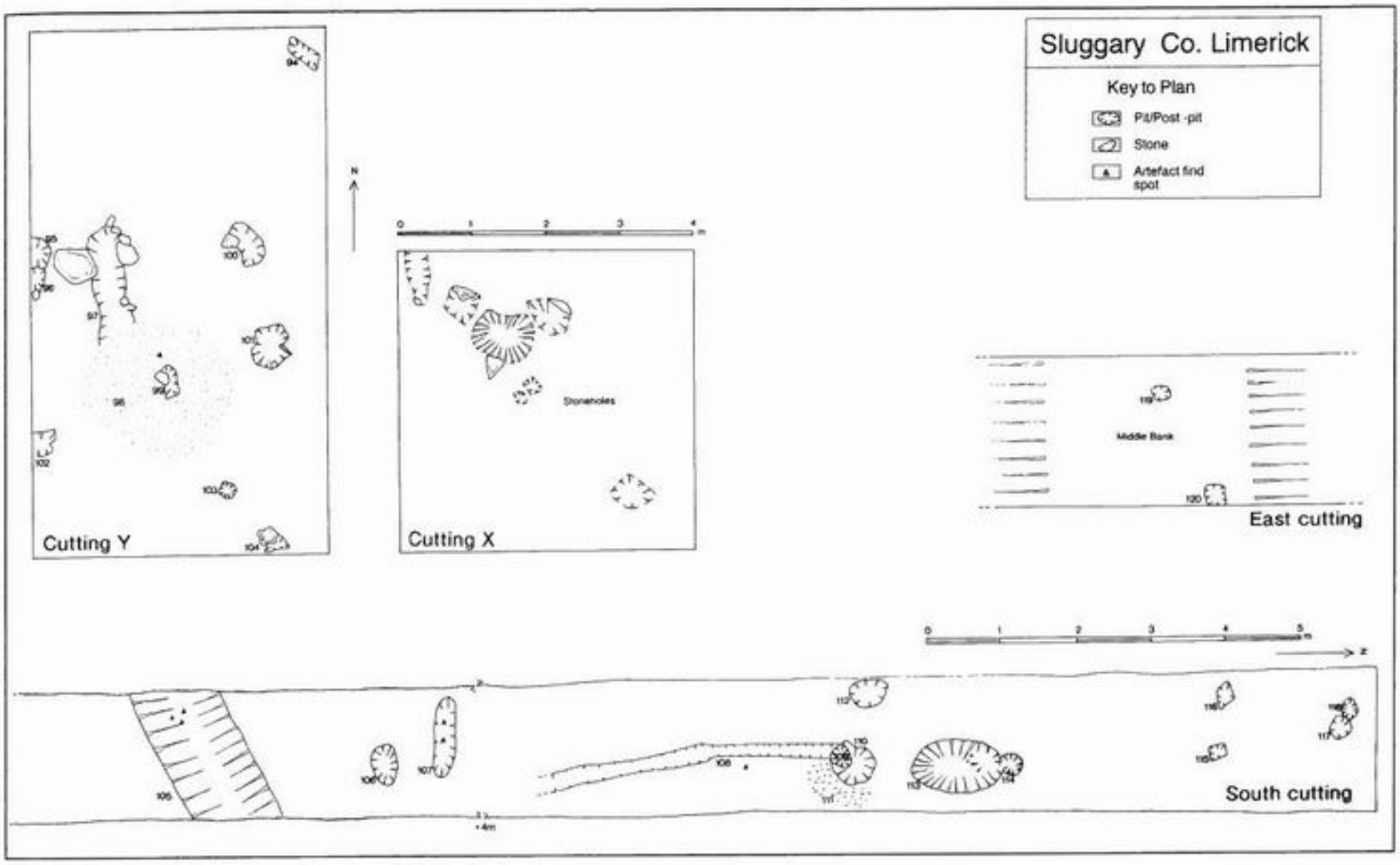

Fig. 6 a. Cutting Y b. Cutting X c. South Cutting

II Cutting B (Fig. 4)
This cutting was immediately east of the Main Area described above and it was opened in order to investigate further the red clay bank [F1]. The southern side of the bank was edged with stone [F85] and iron pieces E131:11, E131:14, E131:21 and E131:22 were found here. A number of features were cut into the bank. These included three hollows, each of which contained some animal bone: F86 (D:0.07m), F87 (D:0.10m) and F88 (D:0.05m).
F89 was a deep narrow post hole with charcoal and some bones.
F90 (D:0.11m).
F91 (D:0.15m) contained dark fill with animal bones and broken stone at the bottom. Iron pieces E131:3 and E131:12 were found in this.
F92 was shallow (D:0.14m) with dark fill. A furnace bottom [E131:33] and an iron bar [E131:24] were found nearby.

F93 was deeper than the other features in Cutting B. It was 0.36m deep overall, the upper 0.20m cut through the red clay bank. The lower part was stone lined.

III Cutting Y (4m x 7m) (Fig. 6)

F94 (D:0.20m) in the north-east corner contained very soft dark fill and two fragments of animal bone.
F95 (D:0.25m) and F96 (D:0.29m) were conjoined and contained animal bones in dark fill, above sticky red fill with specks of charcoal.
F97 (D:0.16m) had very dark fill with animal bones. South of this was a dark sandy area, F98, in which was a shallow pit F99 (D:0.08m). E131:37, a copper alloy button/stud was found in F98.
F100 (D:0.16m) contained very soft dark fill.
F101 (D:0.34m) contained very soft dark fill, snail shells, bone fragments and burnt stone.
F102 (D:0.07m), F103 (D:0.09m) and F104 (D:0.09m) were shallow hollows which contained charcoal in their fill.

IV Cutting X (4m x 4m) (Fig. 6)

This was in the western part of the fort's interior. A number of hollows were revealed here. All had hard smooth sides and contained red sticky fill. They appear to be stone holes. No archaeological material was found in this cutting.

V South cutting (Fig. 6)

This 2m wide cutting was made in the first season of excavation, 1973, and extended from 1.35m south of the central peg across the interior to the banks and ditches at the southern side of the fort. The southern end of this cutting was not recorded on the plan.
The inner ditch of the fort, F105, was 1.25m wide and 0.90-0.95m deep. It contained a considerable amount of animal bone waste. Both artefacts made from skeletal material were found here: E131:41, the comb, and E131:40/49 which was found in two parts.
F106 (D:0.28m), fill not recorded, had a nearby hollow [F107] which contained the bronze strip E131:39 at 0.28m deep and iron fragments E131:29.
F108, a long shallow trench (D:0.03m) had F109 at its northern end (D:0.33m), connected to F110 (D:0.20m), with reddened earth [F111] around them. E131:26 was found near F108. F112 (D:0.20m) contained soft red fill. A large pit, F113 (D:0.44m) had a post-pit F114 (D:0.33m) at the northern end. Nail frag. E131:17 was found here. At the northern end of the cutting were shallow pits F115 and F116 (both D:0.09m), F117 (D:0.12m) and F118 (D:0.21m).

VI East cutting (Fig. 6)

In this cutting two shallow holes were found on the old ground level in the middle bank: F119 (D:0.09m) and F120 (D:0.10m).

The Finds

A total of 43 artefacts which can be identified as belonging to the period of ringfort use were recovered, while 5 others are of post-medieval/recent date.

The finds' numbers are prefixed by the National Museum's excavation identification number, E131. Selected artefacts are illustrated in Figs. 7 and 8 herein. Figs. 9-12 are in the archive.
Catalogue abbreviations are as follows:
L.= Length. W.=Width. D.=Diameter. Th.=Thickness.

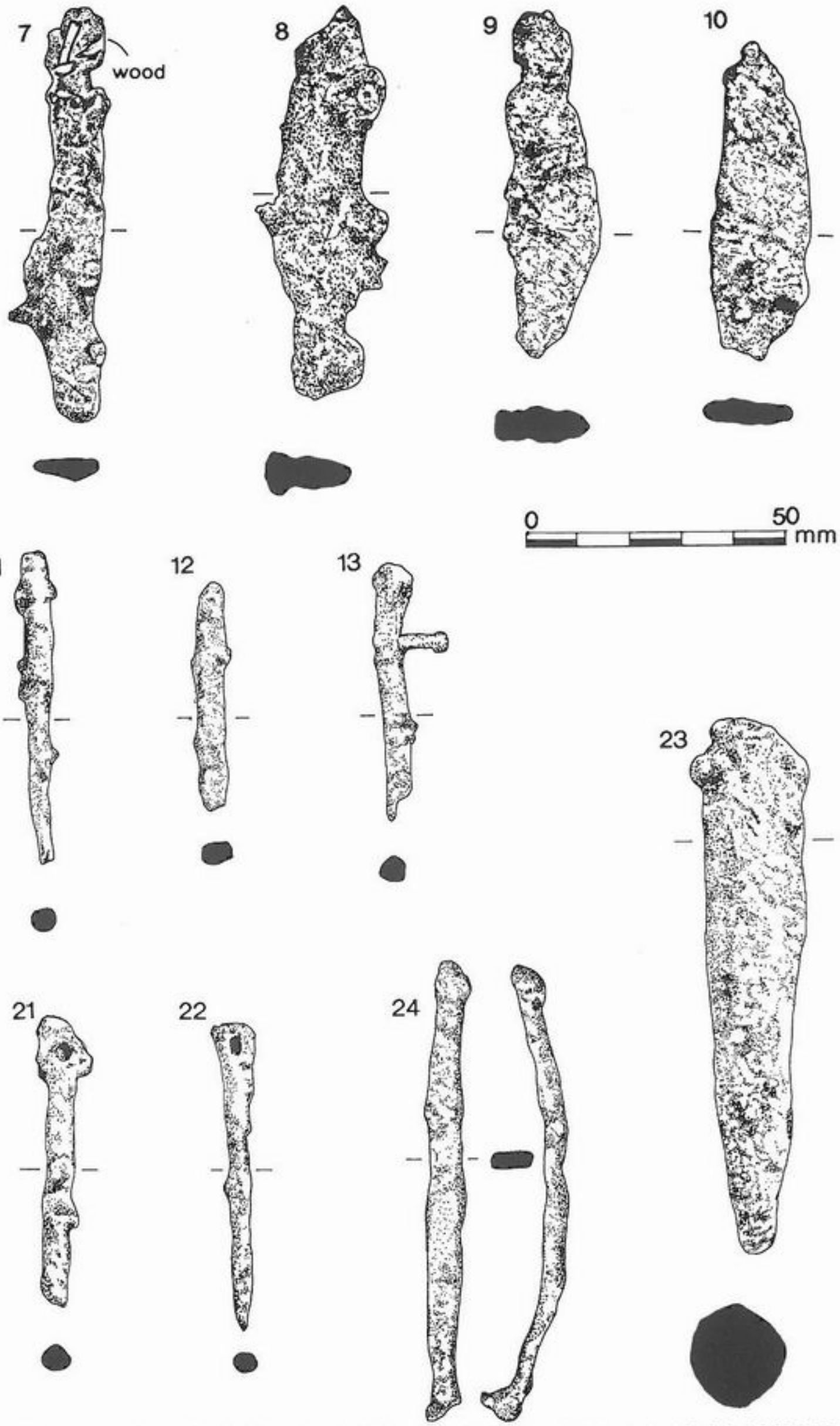

Fig. 7 Iron artefacts. Blade/bar E 131:7, 8, 9, 10. Bar/rod E131:11, 12, 24. Nail E131:13. Needle E131:21, 22. Cone E 131:23.

Early Medieval
Identified as belonging to the period of use of the ringfort, these comprise 35 iron objects, 4 of copper alloy, 2 of skeletal material and 2 of fired clay. The artefacts include iron implements, some items relating to crafts (iron working and possibly metal casting) and a few interesting ornamental or toilet pieces. All can be paralleled on other sites of the period, though none can be closely dated.

Iron (Fig. 7 for E131:7-13, 21-24; Figs. 9, 10, 11 for the remainder)
These were generally quite corroded when recovered and only a small number can be positively identified. The range is typical of the finds from other ringforts, and includes knives, bars/awls/nails, needles and some miscellaneous items.

Knives:
Four items are probably tanged knife blades or parts thereof [E131:6, 8, 9, 10] and there are 6 further possible examples [E131:1, 3, 4, 5, 7, 29]. E131:6 and E131:8 are noticeably thicker in section on one side of the blade than the other, and the back (thicker side) of the blade is curved. E131:7 is a very corroded blade or bar with traces of a possible wooden handle visible at one end. Two possible bone handles (E131:40 and E131:49) were also found.

Saw:
One possible example is E131:2, which is very corroded, but has serrations along one edge. It is like those from Garryduff discussed by O'Kelly. (1962, 45-7, fig. 5).

Bars/Awls/Nails:
Five long pieces [E131:11, 12, 13, 14, 26] could be awls, or alternatively some form of bar, rod or nail. E131:15, 16, 17, 18, 19 and 20 are nails or parts of nails.

Needles:
One needle [E131:22] and one possible needle [E131:21] are relatively well preserved, at 58mm and 55mm long respectively.

Key:
E131:24, a bar with the end turned at right angles, resembles the keys for barrel padlocks from Garryduff discussed by O'Kelly. (1962, 54). In this example corrosion has obscured details which might allow definite identification, but at 87mm long the piece would fit well into the size range of the Garryduff keys.

Furnace bottoms:
Four furnace bottoms [E131:32, 33, 35, 36] or parts thereof show that smithing or iron smelting was being carried out on site. No traces of actual hearths or furnaces were identified. One piece of slag was found [E131:34].

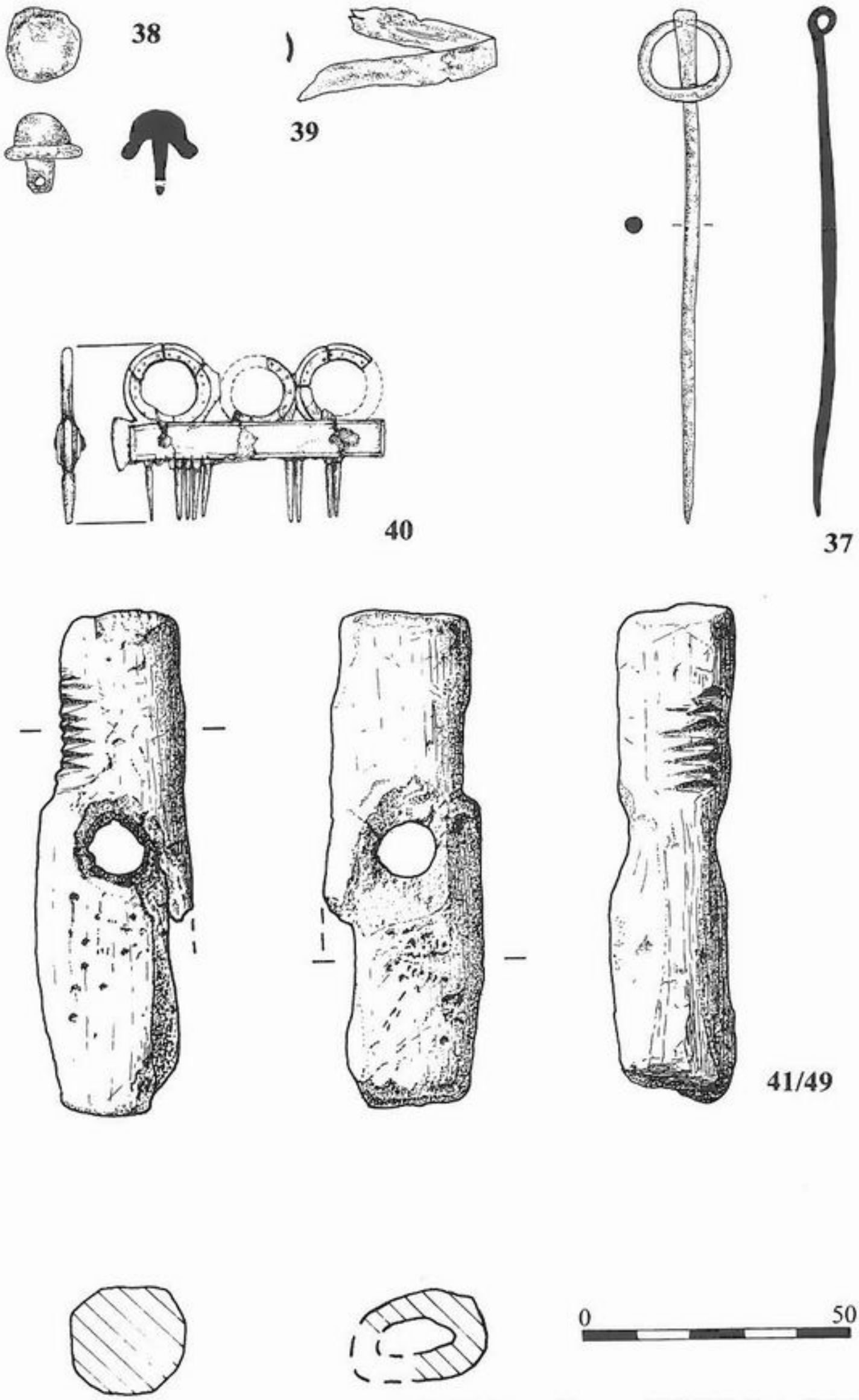

Fig. 8 Artefacts of copper alloy. Ringed pin E131:37. Tanged button E132:38. Strip E131:39. Artefacts of skeletal material. Comb E131:40. ?Handle E131:41/49.

CATALOGUE: IRON (Fig.7; Figs. 9, 10, 11 in the archive)

E131:1. Fig. 11. Blade fragment? Asymmetrical thickness of cross section suggests a knife blade. L. 30mm, W. 17.8mm, max. Th. 65mm. Main area, 8.15m N, 0.25m W, 0.31m deep.
E131:2. Fig. 9. Blade or saw fragment? Thick, rectangular section. Serrated along one edge, thus possibly a saw. L. 26.5mm, W. 21mm,
Th. 5.5mm. Main area, 7.28m N, 0.92m W, 0.31m deep.
E131:3. Fig. 11. Blade fragment? Triangular section. Pointed at one end, broken at the other. L. 36.5mm, max. W. 16.5mm, max. Th. 5.5mm. Main area, 1.8m N, 1.5m E, 0.28m deep.
E131:4. Fig. 11. Blade fragment? Thin, with possible rivet. L. 26mm, W. 14mm, Th. 2.5mm. Main area, 2.85m N, 3.6m E, 0.38m deep.
E131:5. Fig. 11. Blade fragment? Two possible rivets. Max. dim. 22.5mm, Th. 2.5mm. Main area, 2.74m N, 4.34m E, 0.49m deep.
E131:6. Fig. 11. Blade fragment, well preserved, thicker in section along curved edge. L. 34.5mm, W. 13.2mm, max. Th. 4.5mm. Main area, 1.48m N, 4.32m E, 0.24-0.28m deep.
E131:7. Fig. 7. Blade or bar. Very corroded. Parallel sided. Traces of wood (handle?) near one end. L. 79mm, W. 11mm, Th. 5mm. Main area, 2.10m N, 3.9m E, in pit fill.
E131:8. Fig. 7. Blade. Very corroded, slightly curved back. L. 74mm, av. W. 15mm, Th. 9mm. Main area, 1.54m N, 3.25m E, 0.3m deep.
E131:9. Fig. 7. Knife blade. Rectangular section. Very corroded, straight edge, curved back. Possible tang. Possible rivet on one side. L. 65mm, max. W. 19mm, av. Th. 6.5mm. Main area, 3.20m N, 1.02m E, 0.29m deep.
E131:10. Fig. 7. Knife blade, straight edge, curved back, tang broken, point broken. Corroded rivet visible. L. 60.5mm, max. W. 18.6mm, Th. 2.5-4mm. Main area, 0.05m N, 1m E, 0.165m deep.
E131:11. Fig. 7. Bar or rod. Round section. Heavy corrosion.
D. increases from one end to the other. L. 59.6mm, D. 5.5-3.7mm. Main area, 1.20m N, 6.82m E, 0.23m deep.
E131:12. Fig. 7. Bar or rod, corroded, rectangular cross section. L. 44.3mm, W. 5.2mm, Th. 3mm. Main area, pit E, 3.20m N, 8.25m E.
E131:13. Fig. 7. Nail. Round section. Shank corroded. Short projection from near one end. L. 48.4mm, D. 9.5mm. Main area, 2.99m N, 9.48m E, on top of red clay bank.
E131:14. Fig. 11. Nail/bar. Bent fragment. Rectangular section. Corroded. L. 34.5mm, W. 4.7mm, Th. 3.4mm. Main area, 1.57m N, 9.54m E, on top of red clay bank.
E131:15. Fig. 11. Nail/pin fragment. Round section. L. 21mm, max. D. 3.7mm. Main area, 7.50m N, 0m E/W, in pit.
E131:16. Fig. 9. Nail fragment. Round section. Corroded. L. 29.5mm, av. D. 7.5mm. East trench, 18.6m from base. Found in cleaning section face, unstratified.
E131:17. Fig. 9. Nail fragment. Round section. Narrows towards one end. Corroded. L. 27.5mm, max. D. 8mm. South trench, 6.40m S, 0.73m W, 0.45m deep. In side of pit.
E131:18. Fig. 11. Nail. Section probably round. Head distinguishable. Very corroded. L. 54.4mm, max. D. 15mm. Main area, 7m N, c. 0.5m W, 0.25m deep in pit.
E131:19. Fig. 11. Nail. Round section. Widens to head, pointed at opposite end. L. 31.4mm, D. at middle, 4mm. Main area, 4.08m N, 1.63m W, 0.20m deep.
E131:20. Fig. 9. Nail? Round section. Corroded. L. 34mm, av. D. 4.5mm. Main area, 13.3m N, 0-0.5m W, 0.34m deep.
E131:21. Fig. 7. Needle? Bar of round section. Expanded head with perforation. L. 55mm, D. of bar 5mm, W. of head 9mm. Main area, 1.12m N, 6.72m E, 0.42m deep.
E131:22. Fig. 7. Needle. Round section. Perforated/ looped head, pointed at opposite end. The hole was made by turning the top of the bar over to form a loop. L. 58mm, av. D. 3mm, D. of hole 1.5mm. Main area, 2.04m N, 9.01m E, on top of red clay bank.
E131:23. Fig. 7. Cone. Round section. L. 101mm, max. D. 2.2mm. Main area, 2.83m N, 4.13m E, 0.26m deep.

E131:24. Fig. 7. Bar. Rectangular section. Curved. Turned at right angles at one end. Max. L. 87mm, av. W. 6mm, av. Th. 32mm. Main area, 3.91m N, 8.25m E, on top of red clay bank.
E131:25. Fig. 11. Fragment. Approx. triangular section. Pointed at one end. L. 49mm, Th. 19.5mm. Main area, 6m N, 0m E/W, in old ground level.
E131:26. Fig. 9. Bar fragment. Rectangular section. Corroded. L. 35mm, av. W. 10mm, Th. 6mm. South trench, 9-10m S, 0-1m W, 0.25m deep.
E131:27. Fig. 11. Fragment. Round section. Curved. Max. dim. 17.5mm, D. 4mm. Main area, 2.80m N, 4.10m E, in pit fill.
E131:28. Fig. 11. Fragment. Very corroded. L. 24.5mm, W. 15.5mm, Th. 10mm. Main area, 2.10m N, 1.5m E, in posthole.
E131:29. Fig. 9. Three small fragments found together, possibly part of a blade. Corroded rivet(?) on one piece. Max. dims. 18.7mm, 16.3mm and 12.5mm. Th. 3.5mm. South trench, 16m S, 0.30m deep.
E131:30. Fig. 9. Fragment. Broken. Max. dim. 10mm. Main area, 3.45m N, 0.45m W, 0.30m deep.
E131:32. Fig. 10. Furnace bottom. Approx. one quarter of a plano-convex furnace bottom. Max. dim. 74.7mm, max. Th. 23mm. Main area, 3.25m N, 8.60m E, in pit on top of 'bank'.
E131:33. Fig. 10. Furnace bottom. Part of a plano-convex furnace bottom. Contains many impurities including possible charcoal. Max. dim. 63.5mm, approx. Th. 25mm. Main area, 3.90m N, 8.85m E, in pit on top of 'bank'.
E131:34. Fig. 11. Fragment of slag. Max. dim. 37.3mm. Main area, 8.15m N, 0.25m W, 0.31m deep.
E131:35. Furnace bottom, high amount of iron. D. 124mm, max. Th. 66.2mm. Main area, 0m N, 7.0m W, 0.20m deep, at bottom of humus layer.
E131:36. Furnace bottom. Plano-convex, broken. D. 87.6mm, max. Th. 50mm. Main area, 9.40m N, 3.10m E, in pit fill.

Copper alloy (Fig. 8)

Four items of copper alloy were recovered, of which one (E131:31) is quite fragmentary.

A thin strip (E131:39) probably formed part of a composite object and might have been some form of binding. Alternatively, it could have been a bracelet, like those identified by Hencken at Lagore (1950, fig. 20).

The pin (E131:37) is of interest, being a very plain example of Fanning's plain-ringed loop-headed class, which have a long period of use, from the 6th to the 12th century (Fanning 1969 and 1994, 16). The ring can slide around in the pin-head, rather than merely swivelling on a bridge or pivot. This particular feature is found more commonly in iron than in copper alloy examples. In letters in 1974 and 1984 Tom Fanning informed me that this form was frequently found in Viking graves in Scotland, as discussed in his 1983 paper , but that "the only other good parallel...appears to be the lost specimen from the Viking grave at Donnybrook" which was re-published by Hall. (1978).

The button/stud (E131:38) is of a type found on early medieval period sites, though not in large numbers. Parallels include two examples from Cahercommaun (Hencken 1938, fig. 18 nos 65 and 252) which, like the Sluggary example, have a perforation through the shank. No. 42 at Cahercommaun is described as being silver plated, while an example from Garranes (Ó Riordáin 1940, fig. 3 no 322) is described as 'tinned'. A date range from 5th/6th centuries at Garranes, Co. Cork, to 7th/9th centuries at Cahercommaun, Co. Clare, has been proposed by the excavators of these sites. In discussing some more ornamental examples from Lagore, Co. Meath, Hencken suggested parallels from Roman Germany (1950, 83).

CATALOGUE: COPPER ALLOY (Figs. 8, 11)

E131:37. Fig. 8. Ringed pin. Loop at top of pin into which a ring is inserted. Oval/rectangular section near top, becoming rounded in section towards the point. Top of pin is flattened and turned to make loop. A shallow groove runs from the top to midway down the back of the pin. The ring is round in section, narrowing towards

the ends, which are set tightly against each other. Pin: L. 96.8mm, max. D. 4mm. Outer D. of ring 17.7mm. Main area, 9.5m N, 5.35m W, 0.30m deep.
E131:38. Fig. 8. Button/stud. Semi-spherical hollow button with slightly expanded rim. A flat tang or shank projects from inside the button and is perforated at its outer end. D. of button 14.6mm, L. of shank 94mm. Cutting Y (south-west quadrant of fort), 2.65m N, 1.75m E, 0.30m deep.
E131:39. Fig. 8. Strip. Very thin. Slightly curved in section, and bent over its length. L. 85mm, W. 58mm. South trench, 14m S, 1.5m W, 0.28m deep.
E131:31. Fig. 11. Fragment of copper alloy, very thin. L. 12.5mm, max. W. 8mm, Th. c. 0.5mm. Main area, 22.65m N, 0.80m W, 0.25-0.30m deep.

Skeletal Material (Fig. 8)

Two artefacts made from skeletal material were found, of which one, E131:41, is a very finely worked piece. It is a single edged comb, with finely worked crest and incised decoration. Dunlevy places it in her Class C1, which group includes some of the most ornate combs known in these islands. In particular, she cites two examples from Lagore, Co. Meath which provide close parallels: her E14:549-500, (Hencken 1950, fig. 97, no. 1616) from the excavator's Period II, and an old find (Hencken 1950, fig. 102 C). Dunlevy suggests that this type evolved about the 4th/5th century and that it was popular particularly in the 6th and 7th centuries, with the Lagore examples extending the date range of the type (Dunlevy 1988, 357).

A bone handle or possible anvil was found in two parts (E131:40 and E131:49) which fit together. The piece is carved from a cattle metatarsus and is polished from use. It has an oval boring or perforation, the inside of which shows very clear striations and polishing from something having revolved inside it. A flake of bone has broken away from around the perforation on one face, possibly as a result of pressure from whatever was rotating in the piece, therefore the piece may not have been perforated right through originally. To one side of the perforation the bone has been cut back, and a series of six notches has been cut sharply across this surfaces, as on a tally stick. The surface of E131:49 retains less evidence of polishing than the other part, and has pitting (from use as a hammer/anvil?) on two of its opposing faces. A somewhat similar, but cruder, piece was recorded amongst the old finds from Lagore (Hencken 1950, 198, fig. 108 A), where the boring does not go through the piece, and the illustration shows pitting near the edges.

CATALOGUE: SKELETAL MATERIAL (Fig. 8)

E131:40 and E131:49. Fig. 8. Cattle metatarsus. Round section. Found in two parts. Total length 92m. Bored or perforated
(max. diam. 14.3mm) Max T. 20.5mm. Cut back along one side, with sharply cut notches along the cut back section. Most of the object is smoothed from polishing and/or handling. E131:40 from south trench, 21-21.5m S, 1-2m W, in fill of inner ditch. E131:49 (found with animal bone refuse) from south trench, 21-22m S. of central peg, 0-1m from W. side. 0.25-0.50m deep, in fill of inner ditch.
E131:41. Fig. 8, Plate 5. Comb. Antler? Single sided, composed of three tooth plates with thin flat sideplates. Three iron rivets hold parts together. Fifteen teeth were recovered (see Plate 5), although only nine are shown on the drawing made at the National Museum. Teeth medium size (five or six per 10mm). The crest of each toothplate is high and is carved into a perforated ring, decorated with dots and lines. The central ring is smaller than the two outer rings. L. 50.5mm, D. 34mm, Th. 6.4 mm. South trench, 21-21.5m S, 1-2m W, in fill of inner ditch.

Plate 1 General view of site in 1974, looking south

Plate 2 West cutting, excavation through inner bank.

CATALOGUE: MISCELLANEOUS FINDS (Archive Figs. 11, 12)

E131:42. Fig. 11. Fragment of clay mould? Piece of fine cream/yellow fired clay, no grits, possibly fragment of mould. Max. dim. 22mm, max. Th. 7mm. Main area, north-east of centre peg, in pit fill, exact location not recorded.

E131:43. Fig. 11. Fired clay. Lump of fired clay, fine paste, oxidised about three-quarters through. Max. dim. 26.8mm. Main area, 5m N in trench with burnt material, c. 0.30m deep.

E131:44. Fig. 12. Glass fragment. Short piece of glass, section triangular with chamfered corners. L. 22.3mm, max. W. 55mm. South trench, inner ditch, loose fill. 21.40m S of central peg, 0.55m from E side of trench.

E131:45. Fig. 12. Gun flint. Grey. Square. Struck on all sides. Particularly worn along one side. L. 2.94mm, W. 26mm, Th.10.7mm. South trench, 32.7m S, just below turf.

E131:46. Fig. 12. Clay pipe bowl, spurred. Hyphenated line decoration below bowl rim. Above stem is a stamped circle with IRELAND FOR EVER running inside the circle, central shamrock. Height of bowl, 42mm, stem Th. 10mm, inner D. of bowl 18mm, outer D. 27.8mm, bore D. 17mm. East trench, outermost bank, in stones at the top of the bank.

E131:47. Fig. 12. Iron horse bit. Half jointed pelham-type horse bit. Long cheek piece, ring for reins. Max. dim. 102mm. West cutting, 3.25m from end of trench, 0.37m deep in humus at edge of inner bank, in north section face.

E131:48. Heel iron? Curved bar, flat rectangular section, two raised bosses along bar are probably corroded nails. Max. dim. 55mm, Th. 7.5mm. East trench, 9.70m from ref. 0.06m deep on shoulder of inner ditch/middle bank.

Animal Bone Report

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Introduction

A small sample of animal bones collected during excavations of a ringfort at Sluggary, Co Limerick were held in storage in University College Cork until September 1994 when they were submitted to the Archaeological Services Unit for analysis. Faunal material came from a variety of contexts associated with the occupation of the ringfort. The bones originated mainly from ditch deposits and pit fills with lesser quantities occurring in the bank layers and general occupation spreads. Although the faunal samples were small, it was hoped that they might provide some insight into the meat diet of the site's inhabitants.

Retrieval and Methods

Retrieval was by conventional means only as the site was excavated at a time when there was no general policy of soil sampling and wet sieving in order to achieve a fully representative sample of bones. The bone material was identified with the aid of the collections of modern skeletal material housed in the Department of Archaeology, University College Cork. Many bones were broken during removal and these were refitted and treated as single fragments. The samples were identified to element and species as far as possible though frequently, due to the fragmentary nature of the assemblage, only identification to a size category was possible. The latter fragments were classified

as large and medium mammal remains. The age of the domestic stock, where it could be determined, was based on the presence of mature and immature bones only as there were no sufficiently intact jaws to enable a detailed dental analysis. Measurements were few as much of the bone was highly fragmented. All were taken with a vernier callipers and are listed in Table 4. The bone material was returned to the excavation director on completion of the analysis.

Condition of the material

The poor preservation of the material indicated that soil conditions prevailing at the site were not conducive to bone survival. The scarcity of bones in the occupation spreads indicated that domestic refuse was deliberately discarded into the ditches and pits in order to keep the living area clean. There was a handful of calcined bone from the ditches and two fragments from the pit fills bore patches blackened by fire. Dogs also seemed to have played their part in the degeneration of the material with many of the bones showing traces of carnivore gnawing.

	Ditch	**Pit**	**Bank**	**Surface**
	Contexts	Contexts	Contexts	Finds
Horse	2	-	1	-
Cow	186	43	11	24
S/G*	60	8	3	3
Pig	78	14	2	19
Deer	1	-	-	-
Dog	6	-	-	-
LM*	223	69	12	28
MM*	153	59	-	18
INDET*	229	77	-	28

*S/G** Sheep/Goat *LM** Large mammal *MM** Medium mammal *INDET** Indeterminable

Table 1: Species representation by context grouping

Analysis

In all 1357 bones were presented for analysis of which 461 (34%) were taken to species level. Most of the food waste generated by the occupants seems to have been discarded into the ditches (938 specimens) surrounding the settlement. The next largest concentration of bone material (270 specimens) occurred in four pits; three in the Main Area and the other in the South cutting. Species identifications and total numbers for the ditch deposits and the pits are provided in Tables 2 and 3 respectively. The samples recovered from the inner bank and from general surface spreads were too small to merit representation in tabular form. The material is described below using the context groupings recognised by the site director.

Ditch Material

The ditch fills provided the largest and most varied sample of bones. In all 938 bones were examined of which just 35% were diagnostic to species. This high degree of ancient fragmentation may be an indicator of maximum carcase utilisation but linked with the large amount of surface erosion could mean that some were crushed while exposed on the surface.

	Horse	Cattle	S/G*	Pig	Deer	Dog	LM*	MM*
Horn Core	-	-	4/	-	-	-	-	-
Cranial	-	30	22	27	1	-	39	35
Maxilla	-	2	2	3	-	-	-	-
Mandible	-	24	1	4	-	2	-	-
Teeth	-	44	10	16	-	1	-	-
Axis	-	1	1	1	-	-	-	-
Vertebrae	-	8	2	2	-	-	-	-
Scapula	-	8	3	2	-	-	6	13
Humerus	-	1	1	4	-	-	12	22
Radius	-	9	4	-	-	-	-	-
Ulna	-	6	-	4	-	-	-	-
Pelvis	1	9	2	2	-	-	7	-
Femur	-	9	3	6	-	-	12	17
Tibia	-	14	1	2	-	-	21	-
Astragalus	-		1	-	-	1	-	-
Calcaneum	-		-	-	-	1	-	-
Metatarsus	-	9	-	1	-	-	-	-
Metacarpus	-	5	3	1	-	1	-	-
Phalanx	-	4	-	3	-	-	-	-
Ribs	-		-	-	-	-	49	27
Other	1	2	-	-	-	-	-	-
LBF*	-		-	-	-	-	77	39
Total	2	186	60	78	1	6	223	153

*S/G** Sheep/Goat *LM** Large mammal *MM** Medium mammal *LBF** Long Bone Fragments

Table 2: Species representation - Ditch fills

Identification of the bones showed that domestic animals formed the major part of the assemblage (Table 2). Cattle accounted for 56% of the total identifiable sample while pig (23%) and sheep (18%) were almost equally represented. There were no diagnostic goat bones and many definite sheep identifications, therefore it is assumed that goat was present in minimal quantities, if at all, among the ovicaprid remains. Horse was represented by a splinter bone from the hindlimb and by an extremely eroded pelvic fragment.

Six dog bones, probably all from the same individual, represented a mature animal a little smaller than a modern day spaniel. The dog may have been used for herding and protecting the settlement.

The presence of the right portion of a red deer skull from which the beam had been removed suggests that antler working may have taken place in the enclosure. Although a careful check was made, there were no post cranial deer bones amongst the large mammal sample.

Pit Material

Four pits produced 270 animal bones, the largest sample coming from a pit in the south trench. The poor condition of the bones indicated that they did not represent a primary deposit but were redeposited from elsewhere on the site.

	Cattle	S/G*	Pig	LM*	MM*
Cranial	3	1	-	6	5
Mandible	6	2	-	-	-
Teeth	12	2	7	-	-
Vertebrae	5	-	2	-	-
Scapula 2	-	-	2	7	
Humerus	4	-	-	4	-
Radius	1	2	-	-	-
Pe;vis	-	1	-	-	-
Femur	3	-	1	-	-
Tibia	3	-	2	-	-
Astragalus	-	-	1	-	-
Phalanx 4	-	1	-	-	
Ribs	-	-	-	11	8
LBF*	-	-	-	46	39
Total	43	8	14	69	59

*S/G** Sheep/Goat *LM** Large mammal *MM** Medium mammal

Table 3: Species representation - Pit fills

Examination of the material indicated the presence of the three main domesticates. Cattle bones (66%) dominated the identifiable sample representing at least two individuals. There were lesser quantities of sheep (12%) and pig (22%) remains. Elemental analysis indicated that this is not a specialised deposit as most parts of the skeleton are present.

Inner Bank Material

29 animal bones became incorporated into the layers of the inner bank. The sample was made up entirely of domestic species with cattle (4 specimens), pig (2 specimens) and horse (1 specimen) being identified. The horse astragalus compared well with the skeletal remains of a large and sturdy pony in the departmental collections in Cork.

Surface Material

The faunal sample from the surface spreads was poor, consisting of just 170 fragments. The low density of bones from these features suggests that there was a genuine effort to keep the living surface relatively free of food waste by disposing of domestic debris in the ditches and pits. These bones were the least well preserved from the site and the proportion of unidentifiable material was large. Over 70% of the assemblage was eroded and loose teeth were the most commonly represented elements, all clear indicators that the material was trampled for some time prior to becoming incorporated into the layers.

Among the mammal remains, all of which belonged to domesticated species, those of cattle (24 specimens) were the most numerous followed by pig (19 specimens) and sheep (3 specimens). The sample is a typical domestic assemblage consisting entirely of the remains of meals.

Age, size and sex of the animals

The analysis of the age structure of the animals was severely hampered by the small number of bones recovered and by the poor condition of the material. There is evidence from the state of fusion of the long bones that many cattle were not slaughtered until they were at least 4 years old. The very worn state of the third molar indicated that some animals were even older. These probably represent cows that were killed once they had outlived their usefulness as milk producers and breeding stock. There is some evidence for animals under one year of age although there were no calf remains. Many of the sheep bones also belonged to relatively old animals (at least 3 years). According to Ó Corráin, the Early Irish considered sheep's milk to be of an inferior quality to that of cows so it is unlikely that sheep were kept specifically for their milk. A certain percentage of the flock must have been overwintered for a number of years as suppliers of wool and lambs. Pigs were slaughtered for their meat at a younger age than cattle and sheep. Most bones belonged to animals between 1 and 2 years of age and there was also evidence that suckling pigs were eaten. The few older specimens probably represent sows that were kept for breeding.

As complete bones were absent no conclusions could be made concerning the size and sex of the animals, although in accordance with other early medieval sites, the bones were on the whole more slender and smaller than those of present day animals. The measurements taken are listed below in Table 4.

A sheep horn core showed depressions and weakenings of the core thought to indicate castration.

Species	**Element**	**Measurement**	**N**	**Range**
COW	Scapula	GLP	1	58.2
		GLG	1	48.9
		BG	1	42.1
	Phalanx 1	Bp	2	28.9 28.1
		GL	2	59.1 58.1
	Metatarsus	Bp	1	52.3
		Dp	1	47.7
	Radius	Bp	1	70.1
		BFp	1	64.7
		Dp	1	36.1
PIG	Astragalus	GLl	1	38.6
		GLm	1	36.1
SHEEP	Radius	Bd	1	27.6
		BFd	1	23.6
		Dd	1	17.1
	Metacarpus	Bp	1	19.8
		Dp	1	14.4

Table 4: Summary of measurements

Butchery

An analysis of the body parts for the three main domesticates showed that most skeletal elements were present indicating that the animals were slaughtered within the ringfort. Most butchery was seen in the

form of cut marks which suggested that sharp knives and heavy chopping tools were used. Knife marks on the shafts of bones and on the scapulae, vertebrae and ribs were caused by filleting meat from these parts while cuts on and around the joints were due to dismembering the carcass. A very high proportion of the limb bones, in particular the cattle metapodia, were split axially suggesting that the processing of marrow was important. The fragmentary nature of the sample, while partly due to the preservation conditions prevailing at the site, may also be the result of butchering methods.

Conclusions

The animal bone samples collected during excavations at Sluggary consist of the remains of meals and carcass preparation. The bones, if representative of the food requirements of the occupants, have indicated that beef was the preferred meat which was occasionally supplemented by mutton and pork. The available ageing data showed that most cattle and sheep were kept well into maturity, being valued for their milk, wool and hides as much as their meat. The sheep would appear to have been horned and, as with cattle, were generally of short stature. The single red deer skull fragment points to small scale hunting in the vicinity of the settlement although venison was clearly not a significant item in the food supply of the ringfort. Other potential foods from the wild such as hares and birds were absent but this may be a factor of recovery. The presence of a red deer skull with the antler chopped off together with the finished bone artefacts indicates the working of skeletal material. Although the samples in themselves are small and the results probably affected by recovery, the material has provided a general picture of the range and composition of the fauna exploited by the early medieval inhabitants of this ringfort.

DISCUSSION

This triple banked ringfort is situated in an area richly endowed with ringforts, a factor almost certainly related to the good soil on which they are located. Most of the sites in the immediate area marked on the early editions of the Ordnance Survey 6 inch maps were extant at the time of the Sluggary excavation, and this was the only multivallate site amongst them. The barony has a density of 1.21 ringforts per km2 according to Stout (1997, 55, fig.11, 84, fig.23) and this high density extends to the neighbouring baronies on the west and south. As noted by Monk (1998, 41-2), however, these numbers are based the records of the Ordnance Survey 6 inch maps, and do not include the results of recent surveys for the county inventories where many new sites have been identified in certain areas through fieldwork and aerial photography.

The plan of the ringfort is irregular, with an inner diameter of 40-48m and the external diameter at 70-80m. The circularity index (calculated by dividing the minimum diameter by the maximum diameter) is 0.83 - a true circle would have a circularity index of 1. Stout (1997, 14) has argued that ringforts were generally laid out to a circular plan and he suggests that significant deviation from this might indicate some pre-existing features on the site which made it difficult to lay out a circle by the basic central peg and rope procedure. The Sluggary excavations gave little indication of pre-ringfort use, except that some animal bones were incorporated into the bank and some postholes were found under the middle bank in the east cutting. The red clay 'bank' might also be an earlier feature.

Plate 3 Main area 1974, north east corner of excavated area.

Plate 4 Details of area with stakeholes and shallow hollows, looking west.

The status of this site at the upper end of a putative scale of ringforts is evident from both its size and the fact that it is multivallate. The minimum internal diameter here is noticeably greater than that of the 'average' ringfort, which is generally regarded as being c. 30m (e.g. Edwards 1990, 14). This figure is confirmed by the more detailed analyses carried out by Stout (1997, 15) though he shows that there are regional differences. At Sluggary the interior area is c. 1450 sq. m, and the overall area is c. 4500 sq. m, thus the living space is only c. 35% of the overall size. Originally the enclosing elements/defences at Sluggary would have been substantial, with stone revetments to the banks, and overall bottom of ditch to top of bank measurements of c. 3m for the inner bank and ditch and 1.5-2m for the middle bank and outer ditch.

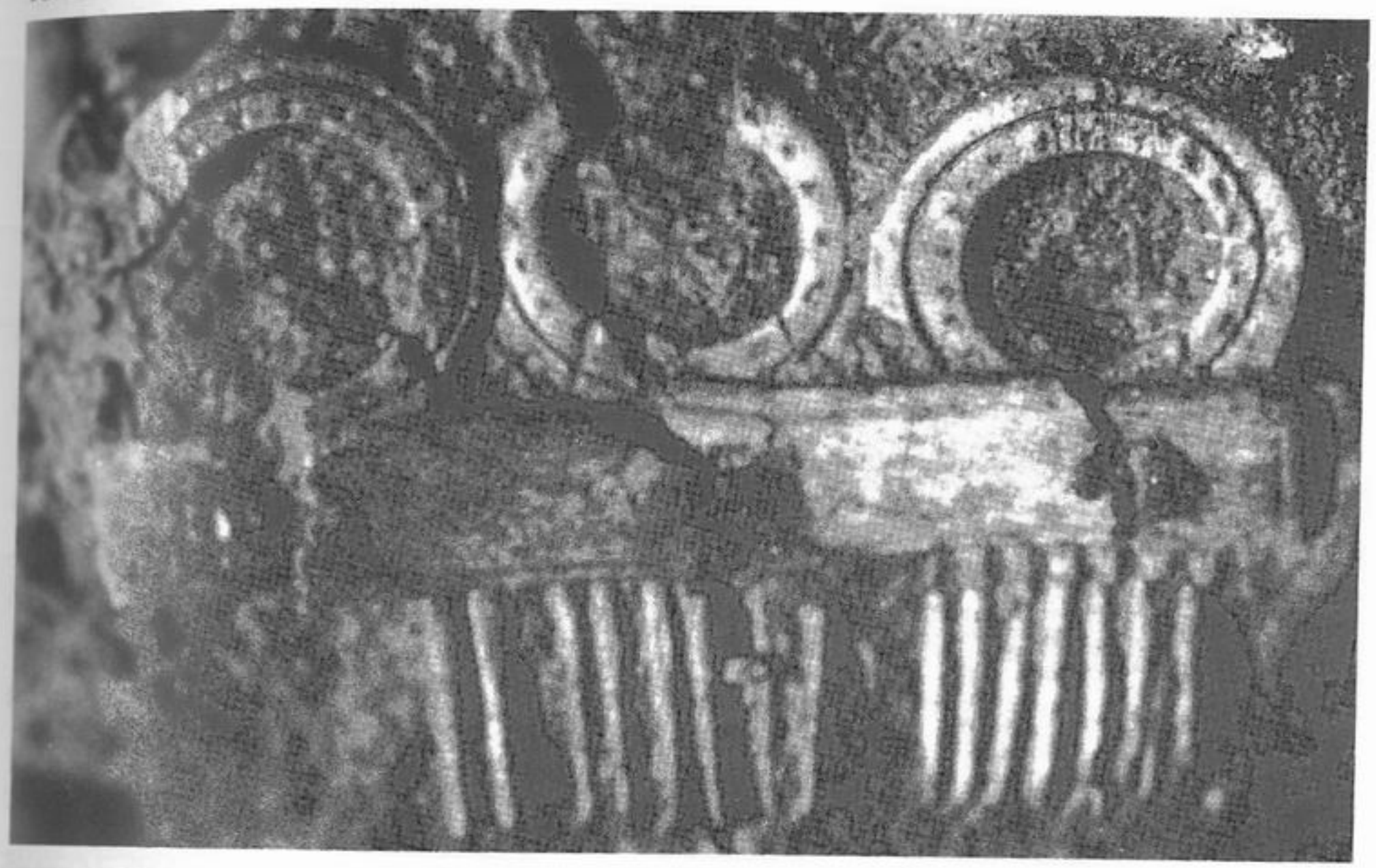

Plate 5 Comb (E131:41) as excavated.

The proportion of trivallate sites to univallate examples does not appear to have been quantified. Stout (200, 96-7) has noted that "multivallate sites... constitute c. 18% of the ringfort population". However this statement refers mainly to bivallate sites. Interestingly, Stout draws attention to the fact that bivallate forts tend not to have an outer ditch , which seems to be the case also at this trivallate site (*Stout* 1997, 18).

It is clear from the number of features recorded and from the finds that this ringfort was occupied, particularly in the central area. Unfortunately it has not proved possible to identify individual house plans from the many features recorded. The hearth [F45] is perhaps the most distinctive feature, together with the stake holes and burnt areas to the west of it, which presumably relate to cooking activities. The houses would have been constructed of post and wattle and a small piece of possible daub found would be appropriate to this type of structure. Many of the features were built into the red

clay 'bank' [F1], which therefore must be an early feature on the site, perhaps to level the area for settlement. If that is the case, then it might have been a factor preventing the accurate laying out of the interior as a circle as mentioned above.

Some of the activities of the inhabitants of the ring fort can be deduced from the artefacts and the animal bones recovered. Tools included iron knives, rods and bars, while woodworking is suggested by the possible saw. Traces of a wooden handle on one of the knives serve as a reminder of the loss of organic materials. Several needles indicate that sewing (of leather or textiles) was done. Furnace bottoms indicate iron working - either smelting or smithing/forging. A small piece of a possible clay mould may indicate the casting of copper alloy pieces. The recovery of a few items made from copper alloy show that the occupants had access to more valuable metals than just locally smelted iron. Amongst these were a tanged button or stud of the kind found on prestigious sites such as Lagore crannóg, Co. Meath, and a ringed pin of unusual form. The 'best' piece is probably the finely ornamented comb of antler/bone which also finds parallels at Lagore, as does the unusual bored bone piece. The animal bone remains suggest that both bone and antler was being worked on the site.

Margaret McCarthy's study of the animal bones shows that cattle provided most of the meat eaten by the inhabitants of the fort, followed by pig and sheep. They were butchered on site. Many cattle were not slaughtered until at least 4 years old, being kept for milking and as breeding stock. Sheep were retained until at least three years but it is suggested that they were used for breeding purposes and as a source of wool rather than for their milk. The main living area seems to have been kept clear of animal bone refuse as most of the animal bone was found in the ringfort ditches and in a few of the larger pits. There were also some horse bones and the remains of one dog, while the fragments of a single red deer skull show signs of having the antler removed as a raw material for artefact manufacture.

The site clearly belongs to the second half of the first millennium AD, but cannot be closely dated: those artefacts which are in any way distinctive still appear to have a long period of possible use. These include the button/stud, which is variously dated from the 5th/6th centuries to the 9th/10th centuries, the ringed pin from 6th - 12th centuries and the comb from 4th/5th to 9th/10th centuries. Nevertheless it is clear that the site belongs to the general period of ringfort construction, the period variously labelled, 'early medieval', 'early historic' or 'early Christian'.

Bibliography

Dunlevy, M. 1988 — A Classification of Early Irish Combs, *Proc. Royal Irish Academy* 88C, pp 341-422

Edwards, N. 1990 — *The Archaeology of Early Medieval Ireland*, Batsford, London

Fanning, T. 1969 — The Bronze Ringed Pins in the Limerick City Museum, North *Munster Antiquarian Journal* 12, pp 6-11

Fanning, T. 1983 — Some aspects of the bronze ringed pin in Scotland, in A. O'Connor and D.V. Clarke (eds), *From the Stone Age to the 'Forty-five. Studies presented to R.B.K. Stevenson*, pp 324-42, John Donald, Edinburgh

Fanning, T. 1994 — *Viking Age Ringed Pins from Dublin*, Royal Irish Academy, Dublin

Finch, T.F. and Ryan, P. c.1966 — *Soils of Co. Limerick*, Foras Talúntais, Dublin

Hall, R.A. 1978 — A Viking-age grave at Donnybrook, Co. Dublin, *Medieval Archaeology* 22, pp 64-83

Hencken, H. O' Neill 1938 — *Cahercommaun: A Stone fort in County Clare*, Royal Society of Antiquaries of Ireland, Dublin

Hencken, H. O'Neill 1950 — Lagore Crannog: An Irish Royal Residence of the 7th to 10th Centuries A.D., *Proc. Royal Irish Academy* 53C, pp 1-247

Monk, M. 1999 — Early Medieval Secular and Ecclesiastical Settlement in Munster, in M.A. Monk and J. Sheehan (eds), *Early Medieval Munster: Archaeology, History and Society*, pp 33-52, Cork University Press, Cork.

Ó Corráin, D. 1972 — *Ireland before the Normans*, Gill & Macmillan, Dublin

O'Kelly, M.J. 1962 — Two Ring-Forts at Garryduff, Co. Cork, *Proc. Royal Irish Academy* 63C, pp 17-125

Ó Maolfabhail, A. 1990 — *Logainmneacha na hÉireann: Imleathar: 1 Contae Luimnigh*, Baile Átha Cliath.

Ó Ríordáin, S.P. 1940 — The Excavation of a large earthen Ring Fort at Garranes, Co. Cork, *Proc. Royal Irish Academy* 47C, pp 77-150

Rynne, E. 1964 — Some destroyed sites at Shannon Airport, *Proc. Royal Irish Academy* 63C, pp 245-77

Stout, M. 1997 — The Irish Ringfort, Four Courts Press, Dublin

Stout, M. 2000 — Early Christian Ireland: settlement and environment in T. Barry (ed.) *A History of Settlement in Ireland*, pp 81-109, Routledge, London & New York.

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