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The Traprain Law Environs Project

Fieldwork and Excavations 2000-2004

Colin Haselgrove

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Fieldwork and Excavations 2000–2004

COLIN HASELGROVE

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Contents

This volume is dedicated to my mother Evelyn Haselgrove, who first took me to East Lothian,
and to my father Dennis Haselgrove, who introduced me to archaeology

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The endpapers are a reconstruction of White Castle fort by David Simon, commissioned by East Lothian Archaeology Service for use on an interpretation board at White Castle, Garvald. The East Lothian plain and Traprain Law lie beyond.

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Abstract

From 2000 to 2004, a programme of excavation and fieldwork was carried out by Durham University and Dickinson College on plough-levelled sites around the fortified site of Traprain Law on the East Lothian coastal plain in south-east Scotland. The primary aim of the Traprain Law Environs Project (TLEP) was to investigate the nature and economy of smaller enclosed settlements in an area of 150km^2 centred on the hillfort and to establish the chronological relationship between these sites and the occupation of the hilltop. Subsidiary aims included exploring the extent of Roman influence apparent on these settlements and testing the effectiveness of geomagnetic survey in a region of complex geology. The project was funded by the British Academy, Historic Scotland and the Society of Antiquaries of Scotland, with additional funding and assistance from the universities and from Larry Schoenberg.

The results presented here complement the recently published investigations along the line of the A1 dual carriage-way, which runs close to Traprain Law and was routed to avoid known cropmark sites wherever possible. As part of the TLEP, geomagnetic surveys were conducted at 30 sites, mainly enclosures, but including some probable open settlements. Three enclosures within 5km of the hillfort (at Knowes, Standingstone and Whittingehame Tower) were extensively excavated, whilst smaller-scale work was carried out at another three (at East Bearford, East Linton and Foster Law). To complement the project, cropmark sites in East Lothian have been transcribed and mapped by the Royal Commission of Ancient and Historical Monuments for Scotland, enabling the excavated sites to be placed in a regional context.

All six sites have complex histories of occupation, with a combined chronological span ranging from the late fourth millennium BC to the dawn of the Historic period, although the main focus is on the period from the Late Bronze Age to the early Roman Iron Age. The ravine-edge site at Whittingehame Tower was first occupied in the Neolithic and massively enclosed in the Later Bronze Age. In the Roman Iron Age, a scooped yard was constructed in the interior, and activity continued into the fifth or sixth centuries AD. At Standingstone, a short-lived curvilinear enclosure defined by a ditch and palisade was constructed at the end of the Late Bronze Age over the remains of an earlier boundary and structures, and was reoccupied in the Later Iron Age by a settlement of ring-ditch houses. The hillside also yielded evidence of Later Neolithic occupation and of Early Bronze Age cremation burial. At Knowes, a rectilinear enclosure on a slight terrace overlooking the River Tyne was dated to the Later Iron Age. Within the enclosure was a well-preserved scooped settlement, which was inhabited well into the Roman Iron Age. Late in the occupation, a stone cist was constructed in the now disused ditch terminal beside the entrance; some of the individuals whose cremated remains were found in the cist apparently died well before the enclosure was constructed, suggesting they had been reburied.

The evaluations at the other sites focused on their enclosure circuits. The fort at East Linton was first surrounded by a ditch and palisade in the Later Bronze Age and was refurbished during the Later Iron Age. This was also the case at Foster Law, where a curvilinear enclosure built in the Earlier Iron Age proved to have succeeded an earlier ditched enclosure. At East Bearford, a second rectilinear enclosure, similar to the more extensively excavated example at Knowes, was investigated and appears to have been constructed at the same general period.

Collectively, the results of the work undertaken in the Traprain Law environs since 2000 enable the changing character of the settlement pattern to be reconstructed in some detail. During the Later Bronze Age, many sites were enclosed, but in the earlier first millennium BC, in common with many other areas, the number of occupied sites falls sharply. The Later Iron Age saw a fresh wave of enclosure, including many examples of rectilinear form. Unlike many curvilinear enclosures, these latter sites appear mostly to occupy positions with little previous history of settlement, suggesting that they reflect a process of settlement expansion and infilling. By the end of the first millennium BC, however, surrounding ditches and banks were no longer being maintained and unenclosed settlements dominated the coastal plain instead, some of them evidently extensive. This pattern seems to continue into the earlier Roman Iron Age, when Traprain Law once again became a significant settlement, after a hiatus spanning several centuries. By the later Roman Iron Age, however, these other sites

mostly disappear, just when settlement on the hilltop appears to reach its most intense, implying there may have been an influx of people from the surrounding region. Whittingehame is the only site to display significant signs of activity in the immediate post-Roman period, although this need not have been particularly long-lived.

The excavations yielded evidence of a range of activities and structures, some of them without close parallels on other sites in the region, and provided new insights into the development of crop husbandry and the exploitation of other natural resources such as seaweed. The excavation finds also provide the starting point for a reconsideration of the material culture found on various types of later prehistoric and Roman Iron Age settlements in East Lothian, complementing the detailed new study of the cropmark evidence from the region. Notwithstanding the relatively small assemblages present at most sites, some interesting differences emerge, most notably between Traprain Law itself and the other smaller settlements in region.

Also included in the volume is an assessment of the results obtained by the different survey methods, supported by a detailed comparison of the cropmark and geophysical evidence from the other 24 sites examined as part of the TLEP and a listing of surface finds of Roman Iron Age date made recently at three other sites in the area.

Résumé

De 2000 à 2004, un programme de recherches et de fouilles a été mené par l'Université de Durham et le Dickinson College sur des sites reperés par photographie aérienne dans la plaine côtière de East Lothian aux alentours du site fortifié de Trapain Law (sud-est de l'Ecosse). Le but du Projet « Environs de Trapain Law » (TLEP) était d'étudier le caractère des petits sites enclos dans une aire de 150 km² autour de ce grand site fortifié et d'établir les liens chronologiques entre ces différents sites. Les objectifs secondaires comprenaient l'étude de l'influence romaine dans la région, ainsi que de tester l'efficacité de la prospection géomagnétique dans une région à la géologie complexe. Le projet était subventionné par la British Academy, Historic Scotland et la Society of Antiquaries of Scotland, avec des ressources supplémentaires et l'aide des universités mentionnées et de Larry Schoenberg.

Les résultats complètent les fouilles récentes sur le tracé de la route nationale A1 proche de Trapain Law, qui fut déroutée afin d'éviter autant que possible les sites déjà connus. Dans le cadre du TLEP, des prospections géomagnétiques furent réalisées sur 30 sites, la plupart enclos, certains probablement ouverts. Trois enclos dans un rayon de 5km autour de Traprain Law ont été fouillés de façon extensive (Knowes, Standingstone, Whittingehame Tower), tandis que des tranchées de diagnostic ont été réalisées sur trois autres sites (East Bearford, East Linton, Foster Law). Les photographies aériennes de l'ensemble des sites d'East Lothian ont été rectifiées et cartographiées par la Royal Commission of Ancient and Historical Monuments for Scotland, de sorte que les sites fouillés puissent être replacés dans un contexte régional.

Les six sites fouillés présentent une histoire complexe, s'échelonnant dans leur ensemble de la fin du 4ème millénaire avant notre ère à l'aube de la période historique, bien que concernant principalement la période allant de l'Age du Bronze récent à la période romaine. Le site de Whittingehame Tower fut occupé au Néolithique; lors de l'Age du Bronze récent un grand fossé fut creusé en bordure du ravin. Durant l'époque romaine, une cour fut creusée à l'intérieur, l'activité se poursuivant aux 5ème et 6ème siècles de notre ère. A Standingstone, un enclos curviligne défini par un fossé et une palissade fut aménagé à l'Age du Bronze récent et réoccupé pendant le second Age du Fer par un habitat de maisons circulaires à fossés. Ce site a également fourni des indices datés du Néolithique récent, ainsi que des sépultures à incinération de l'Age du Bronze Ancien. A Knowes, un enclos rectiligne, situé sur une petite terrasse en aplomb de la rivière Tyne, a été construit pendant l'Age du Fer récent. Au sein de cet enclos se trouvait un habitat sur-creusé bien conservé, qui fut occupé lors de la période romaine. Plus tard, une ciste en pierre fut construite dans le fossé alors abandonné, à proximité de l'entrée. Certains individus dont des éléments incinérés furent trouvés dans la ciste sont apparemment décédés plusieurs siècles auparavant, ce qui suggère qu'il s'agit d'un ré-enterrement.

Les diagnostics sur les autres enclos ont principalement porté sur le tracé des enceintes. A East Linton, le site a d'abord été entouré d'un fossé et d'une palissade lors de l'Age du Bronze récent et fut réaménagé au second Age du Fer. A Foster Law un enclos curviligne du premier Age du Fer s'est avéré être précédé par un enclos fossoyé. A East Bearford, un enclos rectiligne, comparable au site de Knowes, s'avère avoir été construit pendant le second Age du Fer.

Les recherches menées depuis 2000 permettent une reconstruction de l'évolution de l'occupation du sol. Durant l'Age du Bronze récent, la plupart des sites étaient enclos. Au début du premier Age du Fer, à l'image de nombreuses autres régions, le nombre de habitats diminue fortement. Le second Age du Fer connait une nouvelle vague de creusement d'enclos, la plupart de forme rectiligne. A la différence des enclos curvilignes, ces sites se localisent souvent dans des endroits sans traces d'occupations précédentes, ce qui suggère un processus d'expansion de l'habitat. Enfin, à la fin du premier millénaire avant notre ère, les fossés d'enclos ne sont plus entretenus et les habitats ouverts, certains assez étendus, dominent au contraire la plaine côtière. Ce modèle semble perdurer lors de la période romaine, lorsque Trapain Law redevient un centre important après un hiatus de plusieurs siècles. Lors du bas empire, alors que le site de hauteur semble être à son apogée, la plupart des habitats voisins sont abandonnés; il y eut peut-être un apport de populations depuis la région environnante vers ce site fortifié. Seul Whittingehame présente des vestiges significatifs d'activité postérieurs à la période romaine, bien que celle-ci ne fût pas de longue durée.

Ces fouilles ont mis en évidence des activités et de structures, certaines d'entre elles sans parallèles proches dans la région. Elles ont fourni de nouvelles données concernant l'agriculture et l'exploitation des ressources naturelles, telles que les algues marines. Les fouilles fournissent également le point de départ d'un réexamen de la culture matérielle découverte au sein des divers habitats protohistoriques et romains en East Lothian, qui complète la nouvelle étude des sites reperés par photographie aérienne. Malgré la taille restreinte des ensembles mis au jour, quelques tendances intéressantes sont à observer, surtout entre Trapain Law et les habitats ruraux.

Ce volume également présente une évaluation des résultats obtenus par différentes méthodes de prospection, soutenue par une comparaison des photographies aériennes et des données géophysiques des 24 autres sites étudiés dans le cadre du TLEP. Est inclus aussi un inventaire du mobilier découvert en surface pendent les prospections effectuées sur trois autres sites dans la région.

Zusammenfassung

In den Jahren 2000 bis 2004 führten die Universität Durham und das Dickinson College Prospektionen im Umfeld des befestigten Platzes von Traprain Law durch. Die durch Pflügen geebneten Fundstellen liegen in der Küstenebene von East Lothian in Südostschottland. Das Hauptaugenmerk des Traprain Law Environs Projects (TLEP) galt dem Wesen und der Wirtschaftsgrundlage kleinerer geschlossener Siedlungen in einem 150 km² messenden Bereich um die Höhenbefestigung sowie der Feststellung des chronologischen Verhältnisses zwischen den Siedlungen und der Besiedlung des Berges. Weitere Ziele waren die Analyse des Ausmaßes des römischen Einflusses in den Siedlungen und die Erprobung der Wirksamkeit geomagnetischer Prospektionen in der komplexen Geologie der Region. Das Projekt wurde finanziert von der British Academy, Historic Scotland und der Society of Antiquaries of Scotland. Weitere Hilfe und finanzielle Unterstützung stellten die Universitäten sowie Larry Schoenberg zur Verfügung.

Die hier vorgestellten Ergebnisse ergänzen die jüngst veröffentlichten Untersuchungen entlang der Trasse der A1 Ausbaustrecke, die bewusst so angelegt worden war, dass bekannte, im Luftbild sichtbare Fundstellen möglichst unbeeinträchtigt blieben. In Verbindung mit TLEP wurden geomagnetische Prospektionen an 30 Fundstellen durchgeführt, hauptsächlich an geschlossenen Siedlungen, wenngleich einige vermutlich offene ebenfalls untersucht wurden. In drei geschlossenen Siedlungen, die nicht weiter als 5 km entfernt von der Höhenbefestigung liegen, fanden ausführliche Grabungen statt (Knowes, Standingstone und Whittingehame Tower), kleinere Sondagen in drei weiteren (East Bearford, East Linton und Foster Law). Darüberhinaus wurden im Luftbild sichtbare Fundstellen in East Lothian von der Royal Commission of Ancient and Historical Monuments for Scotland kartiert, um die ausgegrabenen Fundplätze in ihrem regionalen Kontext darstellen zu können.

Die Siedlungsgeschichte aller sechs Fundstellen ist komplex. Sie reichen insgesamt vom späten vierten Jahrtausend v.Chr. bis zum Anfang der historischen Zeit. Der Schwerpunkt liegt zwischen der späten Bronzezeit und der frühen römischen Eisenzeit. Die Fundstelle von Whittingehame Tower liegt am Rande einer Schlucht und wurde erstmals während des Neolithikums besiedelt, eine massive Einfriedung kam während der späteren Bronzezeit hinzu. Während der römischen Eisenzeit wurde im Innen ein eingetiefter („scooped") Hof gebaut und die Aktivitäten dauerten bis ins 5. oder 6. Jahrhundert n.Chr. In Standingstone bestand die rundovale Einfriedung aus einem Graben und einer Palisade, die am Ende der Bronzezeit über den Resten einer früheren Einfriedung und früheren Strukturen errichtet wurde. Später, in der späteren Eisenzeit entstand hier eine Siedlung mit Häusern, die von runden Gräbern umgeben waren. Spätneolithische Siedlungsspuren sowie eine frühbronzezeitliche Brandbestattung wurden am Hang identifiziert. Eine rechteckige Einfriedung auf einer niedrigen Terrasse oberhalb des Flusses Tyne in Knowes konnte in die spätere Eisenzeit datiert werden. Innerhalb der Umfassung befand sich eine gut erhaltene „scooped" Siedlung, die bis weit in die römische Eisenzeit hinein besiedelt wurde. Neben dem Eingang zur Siedlung war in der letzten Siedlungsphase eine Steinkiste am Ende des aufgelassenen Grabens eingebaut worden. Einige der Individuen, deren verbrannte Reste darin gefunden wurden, waren offenbar deutlich vor dem Bau der Einfriedung gestorben, so dass die Vermutung nahe liegt, dass es sich um sekundäre Bestattungen handelt.

Bei den anderen Fundstellen wurden in erster Linie die Einfriedungen untersucht. Die Befestigung in East Linton umgab in der späteren Bronzezeit zunächst ein Graben und eine Palisade, die in der späteren Eisenzeit erneuert wurden. Die Situation in Foster Law war ähnlich. Hier stellte sich heraus, dass die in der früheren Eisenzeit gebaute rundovale Umfassung auf einen früheren Graben folgte. Eine zweite, rechteckige Einfriedung wurde in East Bearford untersucht, die der ausführlicher ausgegrabenen Anlage in Knowes ähnelte und offenbar etwa in der selben Periode entstanden war.

Insgesamt ermöglichen die Ergebnisse der Untersuchungen im Umfeld von Traprain Law seit dem Jahr 2000 eine recht detaillierte Rekonstruktion des wechselnden Charakters der Besiedlung. Während der späteren Bronzezeit wurden viele Siedlungen eingefriedet, jedoch nahm die Zahl der besiedelten Plätze im frühen ersten Jahrtausend v.Chr. ab, so wie dies auch in vielen anderen Regionen beobachtet werden kann. In der späteren Eisenzeit wurden viele Siedlungen wieder eingefriedet, oft mit rechteckigen Umfassungen. Im Gegensatz zu vielen rundovalen

Einfriedungen wurden zahlreiche dieser Stätten an Plätzen angelegt, die vorher kaum genutzt worden waren, ein Hinweis darauf, dass sie einen Prozess der Expansion und Verdichtung der Besiedlung widerspiegeln. Am Ende des ersten Jahrtausends v.Chr. verfielen die Gräben und Wälle. Das Siedlungsbild in der Küstenebene prägten stattdessen offene Siedlungen, einige von ihnen offenbar recht umfangreich. Dieses Muster setzte sich bis in die frühere römische Eisenzeit fort, als Traprain Law nach einer Unterbrechung von mehreren Jahrhunderten wieder an Bedeutung gewann. In der späteren römischen Eisenzeit erreichte die Siedlung auf Traprain Law ihren Höhepunkt. Zu dieser Zeit wurden die meisten anderen Fundplätze aufgegeben, vermutlich weil sich die Einwohner der Umgebung in der Höhenbefestigung konzentrierten. Whittingehame ist die einzige nahgelegene Fundstelle, für die Spuren signifikanter Aktivität in der unmittelbar nachrömischen Zeit festgestellt werden konnten, auch wenn dies nicht besonders lange angehalten haben muss.

Die Ausgrabungen lieferten Zeugnisse für eine Reihe von Aktivitäten und Strukturen, einige von ihnen ohne enge Parallele in der Region. Auch neue Einblicke in den Ackerbau und die Ausnutzung anderer natürlicher Ressourcen wie Seetang konnten gewonnen werden. Die Funde aus den Ausgrabungen bilden den Ausgangspunkt für eine Neubewertung der materiellen Kultur von unterschiedlichen Siedlungen der späten Vorgeschichte bzw. der römischen Eisenzeit in East Lothian und ergänzen die detaillierte neue Analyse der Luftbildbefunde der Region. Trotz der relativ kleinen Fundinventare von den meisten Fundstellen sind interessante Unterschiede sichtbar, vor allem zwischen Traprain Law selbst und anderen kleineren Siedlungen in der Umgebung.

Ferner enthält der Band eine Auswertung der durch die verschiedenen Prospektionsmethoden gewonnenen Ergebnisse, einen ausführlichen Vergleich der Zeugnisse der Luftbilder und der Geophysik von 24 weiteren Fundstellen, die im Rahmen von TLEP untersucht wurden, sowie eine Liste der jüngst aufgelesenen Oberflächenfunde der römischen Eisenzeit von drei weiteren Fundstellen in der Region.

Abbreviations

ASUD	Archaeological Services University of Durham
CUCAP	Cambridge University Collection of Air Photos
DES	Discovery and Excavation in Scotland
DSR	Data Structure Report
NMRS	National Monuments Record of Scotland
OD	above Ordnance Datum
RCAHMS	Royal Commission on the Ancient and Historical Monuments of Scotland
SUERC	Scottish Universities Environmental Research Centre
TLEP	Traprain Law Environs Project

Chapter 1

Introduction

COLIN HASELGROVE and LEON FITTS

INTRODUCTION

Ever since the 1914–23 excavations on Traprain Law (e.g. Cree 1923) and especially since the discovery in 1919 of the spectacular late Roman silver hoard (Curle 1920; 1923), the archaeology of this volcanic plug overlooking the East Lothian coastal plain (Figure 1.1) has dominated interpretation of political and social developments in southern Scotland from later prehistory to the post-Roman period. It is clear both from the initial discoveries and from several subsequent campaigns, most recently the Traprain Law Summit Project (Armit *et al.* forthcoming), that the hilltop

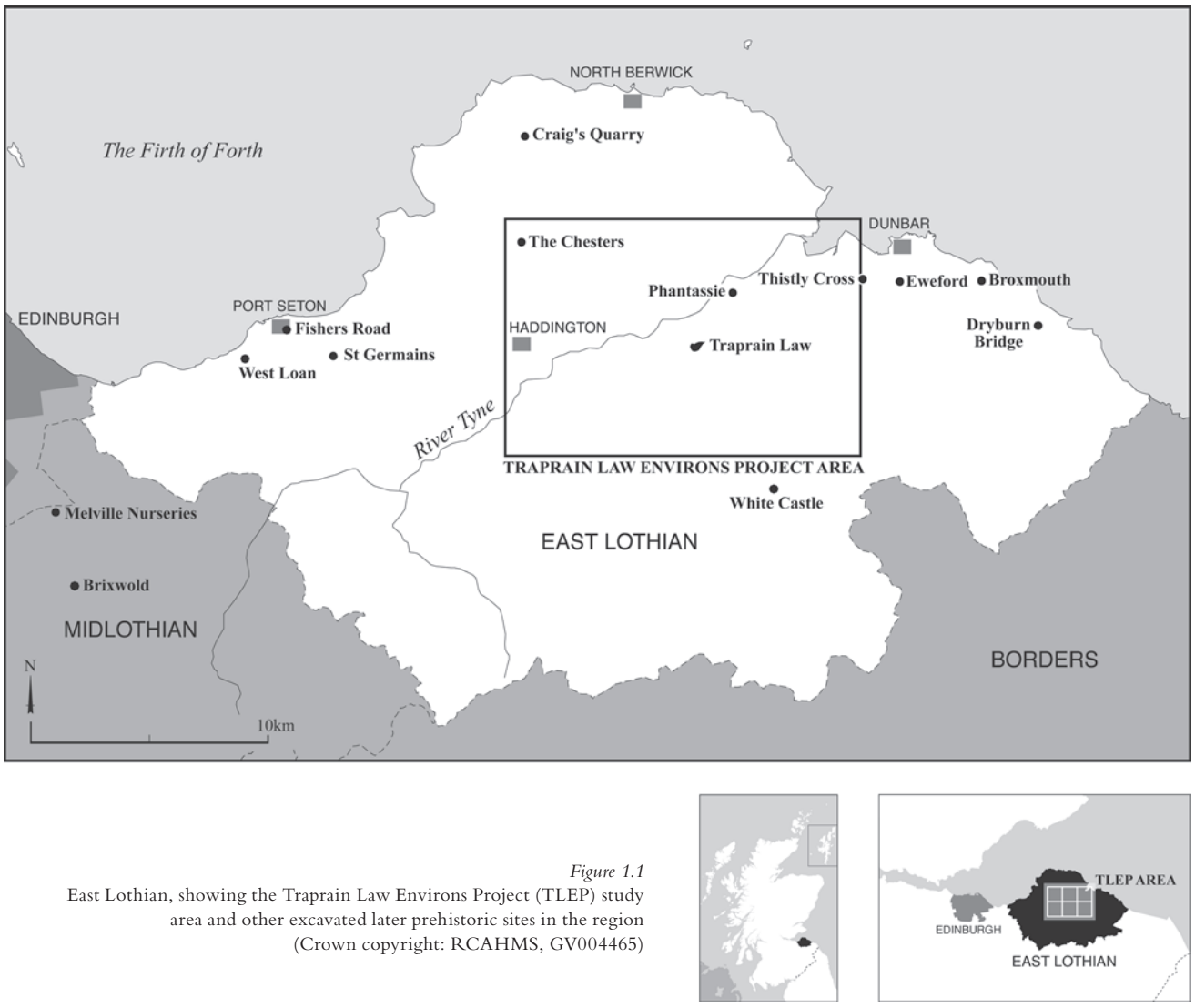

Figure 1.1
East Lothian, showing the Traprain Law Environs Project (TLEP) study area and other excavated later prehistoric sites in the region (Crown copyright: RCAHMS, GV004465)

had a long and complex history of use. Unstratified finds indicate some activity there in the Mesolithic and Neolithic, whilst the presence of rock art implies that the hilltop formed part of the sacred landscape of the late Neolithic and Early Bronze Age. The earliest extensive settlement dates to the Late Bronze Age, but as Jobey (1976) first noted, there was only limited occupation during the Iron Age – although it was probably then that the main ramparts were constructed, creating a hillfort on a scale paralleled in southern Scotland only at Eildon Hill North (Borders; Owen 1992).

Although the Roman army occupied southern Scotland in the Flavian and early Antonine periods, and again briefly in the reign of Severus, for most of the Roman era, East Lothian lay beyond the physical frontier. According to Ptolemy writing in the second century AD, a people known as the Votadini inhabited south-east Scotland and there can be little doubt, given the wealth of Roman finds from the hilltop, that Traprain was one of their major centres, quite possibly their capital. Allied to the lack of Roman military installations in East Lothian – indeed to a large extent throughout the Lothians and eastern Borders region (cf. Hanson 2007) – this has underpinned the further suggestion that the Votadini were Roman clients, on friendly terms with the imperial authorities for most if not all of the period (e.g. Hunter 2006; Mattingly 2006, 150, 424).

The Roman imports from Traprain include a wide range of pottery and glass vessels and coins, but very little military equipment. They are accompanied by a range of other goods of Roman and/or native origins, including a sizeable brooch assemblage, and glass and jet jewellery. The site was also a major manufacturing centre at this time, with evidence of bronze-casting, glass- and enamel-working, and the production of beads and bangles from cannel coal and shale (Hunter 2006). The recent work confirms the intensity of occupation at this period, with settlement spreading over the top of the earlier ramparts, which were evidently no longer maintained (Armit *et al.* 2002; 2006; forthcoming).

It is clear from the nature and date of the Roman imports – of which the great silver hoard is merely the most spectacular element – that unlike most Scottish settlements, the inhabitants of Traprain remained in close contact with the Roman world throughout the third and fourth centuries and into the fifth century AD. However in the decades just before or after AD 400, the site was refortified, after which the occupation seems to have rapidly tailed away. There is no evidence that Traprain Law was ever again a centre either of power or of population, and when such centres re-emerged, they were located elsewhere, notably at Castle Park, Dunbar, to the east (Perry 2000), and on the site of Edinburgh Castle (Driscoll and Yeoman 1997).

THE ARCHAEOLOGICAL SETTING

The rich soil cover and its relatively dry climate has today made the East Lothian coastal plain one of Scotland's finest agricultural areas and there is little doubt that the region has been intensively inhabited and cultivated from prehistory onward. Traprain Law is only one of a handful of upstanding earthwork sites surviving in East Lothian that are likely to date to the later prehistoric period. Probably the best known of these upstanding earthworks is the multivallate enclosure known as The Chesters, near Drem. This has never been excavated, but remains of roundhouses and scooped yards are visible overlying the ramparts, indicating that – as at Traprain and other well-known sites like Hownam Rings (Piggott 1948) – settlement eventually extended over the earthworks after these were no longer required for their primary purpose. There is a noteworthy concentration of multivallate enclosures, or 'forts' as they are often termed, including both earthwork and plough-levelled examples around the Garleton Hills between The Chesters and the former county town of Haddington to the south. The iron ore, haematite, was mined in the Garleton Hills in the nineteenth century, and this may be one reason why there were so many potentially Iron Age enclosures in the area. Another well-preserved earthwork enclosure is White Castle, sited on the edge of the barren Lammermuir Hills, which delimit the region to the south, providing panoramic views over the coastal plain to the Firth of Forth and the Fife coastline beyond (see endpaper).

Unsurprisingly, in the rich agricultural landscape that is the coastal plain today and aided by the presence of a large archaeological community in Edinburgh, aerial survey has had a noteworthy impact in the region. The first discoveries of plough-levelled sites recorded as cropmarks date to very inception of archaeological air photography in the 1920s. Since the middle of the last century, aerial survey has led to the recording of hundreds of cropmarks on the coastal plain to add to the upstanding earthworks. Many of these plough-levelled sites take the form of ditched – or sometimes palisaded – enclosures of broadly circular or curvilinear form, generally assumed on the basis of excavated examples elsewhere to be of later prehistoric

date. The cropmarks include a significant number of rectilinear enclosures, which are widely dispersed across the county, and not, as several authors have noted (e.g. Macinnes 1984; Armit 1997), particularly prevalent close to Traprain Law. Pit alignments are another common monument type, in some cases concentrated around enclosures.

It is not unusual for enclosure cropmarks to occur in close proximity, sometimes forming noticeable clusters. A good example occurs at Fishers Road, Port Seton, where there are three separate enclosures all within a few hundred metres, the last of them only discovered in 2004 (Figure 1.2), along with further pairs at Meadowmill and Seton Mains (Haselgrove and McCullagh 2000). In other areas of the coastal plain, however, sites are rare or non-existent, the area just east of Traprain being a good example. What this signifies has been a matter of some debate. Land use and soil quality are certainly factors in the extent of cropmark formation, but the nature of the distribution may well also reflect some underlying truths. Cropmarked site densities are undoubtedly highest in areas of well-drained soils, while in some pasture areas past land use will have levelled sites that are then unlikely to produce cropmarks. Equally, on the poorer-quality land used for pasture – for example on the fringe of the Lammermuirs – there are apparent gaps in the distributions of what might be comparable earthwork sites. Possible explanations are discussed in later chapters, but it is hard to avoid the conclusion

Figure 1.2
Enclosure at Seton West Mains, Port Seton (NT47NW 214). Discovered in 2004, this enclosure lies within 350m of the sites at Fishers Road West and East excavated in 1994–5 (E12990CN, Crown copyright: RCAHMS)

that enclosures were commoner in some parts of the landscape than in others.

Within the general class of curvilinear enclosures, there is enormous variety, both in their plan and in the scale of the enclosing barrier(s). At one end of the range are numerous small and not always complete circular or oval enclosures with a single ditch, whilst at the other are far fewer larger and more complex sites with multiple boundaries and clear affinities to extant earthwork sites such as 'The Chesters'. Virtually without exception, enclosures of rectilinear or sub-rectangular form in the coastal plain tend to be smaller and simpler, with just a single, albeit frequently fairly substantial, ditch.

Given the large number of sites of later prehistoric character known in East Lothian, to say nothing of the archaeological prominence of Traprain Law, it is surprising how few of them had been excavated by the end of the twentieth century, let alone on any scale. The main exceptions are five curvilinear enclosures along the coast, three excavated ahead of quarrying in the late 1970s and early 1980s at St Germains (Alexander and Watkins 1998), Broxmouth (Hill 1982a) and Dryburn Bridge (Dunwell 2007) – others having been lost without recording, like Riggonhead near Tranent – and two excavated in 1994–5 in advance of new housing at Fishers Road, Port Seton (Haselgrove and McCullagh 2000). All five sites yielded evidence of inhabitation in the first millennium BC continuing to varying degrees into the early first millennium AD, showing that in broad terms the lifetime of curvilinear enclosures overlapped with occupation on Traprain Law. At the same time, the individual sites were all revealed to have more complex sequences than was apparent from the air photographs. None of them, however, is very near to Traprain, as is true of the only other significant previous excavation on an Iron Age settlement in the area (other than on the hill itself) at Craig's Quarry, Dirleton (Piggott 1958), which at a distance of 11km is the closest.

Unsurprisingly given its proximity to the capital, the inception of NPPG5 has led to a sharp increase in archaeological interventions in advance of development in East Lothian (Bradley and Phillips 2004). These have revealed numerous minor traces of later prehistoric activity in the region suggesting the presence of nearby settlement, as at Haddington on the A1 (*DES* 1995, 51), but the relatively few plough-levelled enclosures so far investigated under this regime all lie closer to Edinburgh, as at Brixwold (Crone and O'Sullivan 1997) or Melville Nurseries, Dalkeith (Raisen and Rees 1996). In part, this lack of work on Iron Age sites closer to Traprain Law is due to the extensive programme of scheduling carried out by Historic Scotland in the late 1980s and early 1990s, thanks to which the majority of known cropmark enclosures now enjoy legal protection as Scheduled Ancient Monuments.

One direct consequence of this is that when the dualling of the A1 trunk road between Dunbar and Haddington, which passes close to Traprain Law, was planned, this was routed as far as possible to avoid known cropmark sites. Consequently, whilst numerous prehistoric sites and linear boundaries were identified by the archaeological evaluations carried out in 2001–2 ahead of the building of the dual carriageway, only one previously known enclosure was directly affected, at Eweford C-Road (Lelong and MacGregor 2007).

THE TRAPRAIN LAW ENVIRONS PROJECT

By 1999, the continuing focus on the archaeological remains and finds from Traprain Law had successfully resolved many of the issues thrown up by the 1914–23 excavations relating to the scale and character of activity on the summit. The same could not, however, in all honesty be said of questions pertaining to the possible chronological, social, or economic relationships between Traprain Law, as it underwent various transformations from Late Bronze Age hilltop enclosure to intensively occupied Roman Iron Age settlement and production centre, and the numerous enclosed settlements known in the vicinity, rectilinear or curvilinear, none of which had been excavated. Were these other sites occupied at the same time as Traprain Law in its different guises, and if so, what was their social and economic status in relation to the hillfort community? Or were they largely abandoned at the periods when Traprain itself was intensively occupied? To what extent were these smaller settlements of comparable status to one another or shared similar histories of occupation? More generally, what could be said of the wider regional settlement pattern of which Traprain Law was apparently such a dominant part, and how did this evolve over time?

In the late twentieth century, research elsewhere in Britain, notably around the hillfort of Danebury, has shown the value to be gained from adopting a landscape approach to the study of such monuments, whereby a range of sites are investigated under comparable conditions to construct a picture of the overall settlement

pattern in the area and the changing inter-relationship between its constituent parts (Cunliffe 2000; 2008). With final reports on the St Germains and Port Seton excavations published or in press (Alexander and Watkins 1998; Haselgrove and McCullagh 2000) and a planned new programme on the summit of Traprain Law led by the National Museums of Scotland (for which see Armit *et al.* 2002; forthcoming), it seemed an appropriate moment to initiate a parallel programme of research around Traprain, designed to examine sites in the surrounding area. Although such a programme would affect Scheduled Ancient Monuments, it was felt this could be justified not only with respect to the academic aims and objectives, but also with regard to the future management of the sites, by providing information on the survival of different types of features and deposits and by enhancing our knowledge of the date and character of the sites, none of which had been investigated at the time of scheduling.

Following preliminary discussions with Historic Scotland with regard to the likelihood of scheduled monument consents being granted on a case by case basis subject to the submission of a satisfactory research design for each site, we began planning the project as a collaborative venture between the Department of Archaeology, Durham University, where one of us was then based, and the Faculty of Classics, Dickinson College, Carlisle, USA. In academic terms, the project was a natural successor to one we had recently completed at Melsonby, North Yorkshire (Fitts *et al.* 1999), just outside the Late Iron Age royal site at Stanwick, and would address many of the same questions about the relationships between the Roman world and the indigenous inhabitants of central Britain in the early first millennium AD. Like its predecessor, the new project, although research driven, was also designed to provide fieldwork training for undergraduates from both universities, for which opportunities are now far more limited than they were a decade or two earlier.

The study area

After assessment of the East Lothian aerial photographs at the National Monuments Record of Scotland (NMRS) in 1999, a block of landscape measuring 15km east–west by 10km north–south, roughly centred on Traprain Law, was adopted for more detailed study, comprising Ordnance Survey 1:10,000 map tiles NT 57 and NT 67 NW/SW (Figure 1.3). This study area was chosen as encompassing the main concentration of cropmarks in the coastal plain around Traprain Law, along with a secondary cluster of cropmarked sites and earthworks around the Garleton Hills. The area is drained by the River Tyne, which flows broadly west-south-west to east-north-east across the area from Haddington to East Linton and then on to the sea 10km away, just west of Dunbar. Some 190 cropmarked sites of all periods are recorded within the 150km^2 study area, of which more than half are enclosures likely to be of later prehistoric date. As a part of their contribution to the project, these sites have been mapped and analysed by the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS).

The coastal plain has a complex solid geology, which is discussed in Chapter 2. The drift cover is mainly till laid down by the Devensian glaciation, with extensive raised-beach or blown-sand deposits around the coastline. The Holocene saw a gradual recolonisation by flora and fauna, but the coast was affected by continuing sea-level changes, culminating in the main post-glacial transgression through the seventh and sixth millennia BC when the lower-lying ground of the Forth valley was completely covered in water (Coles 1998). More recent alluvial deposits include river gravels, sands, silts, and clays in varying proportions.

RESEARCH DESIGN AND IMPLEMENTATION

At the outset, we decided that the project should focus solely on plough-levelled enclosures of later prehistoric character. There were three main reasons for this, all essentially pragmatic rather than academic. First, with over 100 such enclosures already known in the target area, only a handful of them could be investigated over a five year fieldwork programme – the longest for which we anticipated funding on the scale that would be necessary could be raised. Second, the most likely ways of finding settlements that do not normally generate cropmarks are fieldwalking and geophysical survey, neither of which had systematically been attempted in the area. However, the former seemed better suited to locating lithic scatters, since pottery of Iron Age tradition is too friable and Roman pottery too rare to survive in quantities that might allow later prehistoric sites to be identified. And whilst it might be possible to identify some sites from concentrations of building stone, the chances of obtaining dating evidence is relatively low (but see Chapter 2). The major Iron Age settlement at Phantassie was targeted by

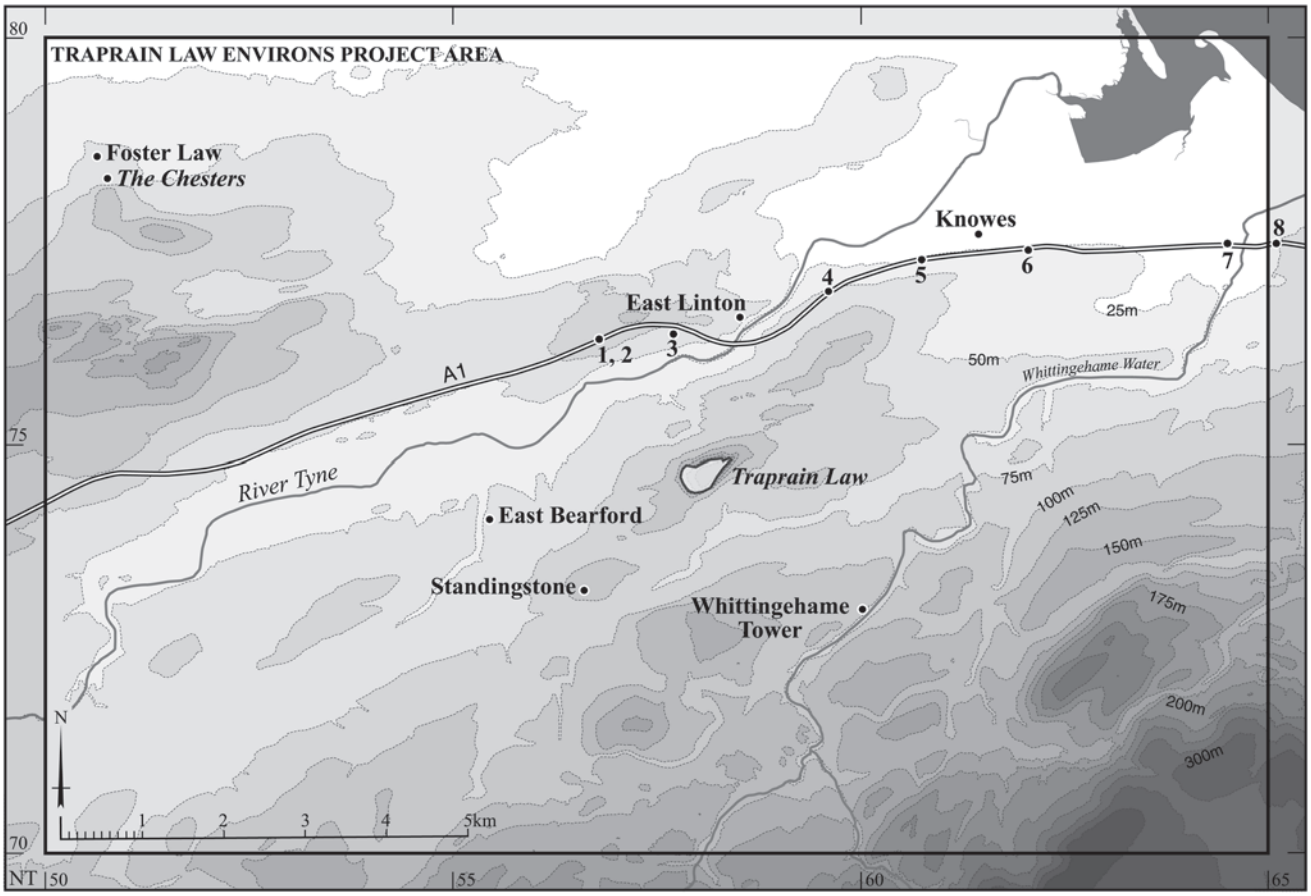

Figure 1.3
The TLEP study area, showing the sites excavated between 2002–4. Also shown are sites excavated by GUARD in 2001–2 in advance of the dualling of the A1 (numbered). 1. Pencraig Hill; 2. Pencraig Wood; 3. Overhailes; 4. Phantassie; 5. Knowes; 6. Howmuir; 7. Biel Water; 8. South Belton (Crown copyright: RCAHMS, GV004466)

GUARD in their evaluations along the line of the A1 because its topographic location, at the break of slope above a river, was shared by several known cropmark sites and the field was covered with stones of varying geological origin (Lelong and MacGregor 2007, 7); yet in the extensive excavations that followed, only one sherd of samian was found.

Thanks to technological advances, geophysical survey is now routinely used to cover large areas of landscape and define sites, as at Melsonby and West Heslerton in North Yorkshire (Fitts *et al.* 1999; Powlesland *et al.* 1997) or in the South Cadbury Environs Project (Tabor and Johnson 2000). However, geomagnetic survey was expected to be problematic in East Lothian owing to the complex geology of the region, although it had worked fairly well on the coast at Port Seton (Haselgrove and McCullagh 2000), so we decided that a more productive strategy was to survey a selection of known sites on different rock types. This would establish for the future on which of the local geologies, geomagnetic survey offered a useful means of characterising sites, whilst any additional details revealed would help inform the choice of sites for excavation. An evaluation of geophysical survey for investigating sites over the different geologies of the coastal plain was therefore built into the project objectives.

The third factor in deciding to focus on plough-levelled enclosures was that the evaluations linked to the construction of the new A1 dual carriageway would in any case provide a systematic transect through the planned study area. Because the new road had been

routed to avoid known cropmarks, the archaeological data generated by the A1 work should be very largely complementary to the research we were planning. After the contract for the A1 work was awarded to GUARD, it was agreed that the two projects would keep each other informed of their results during the fieldwork and post-fieldwork phases. Data structure reports and other data have been exchanged and specialists have maintained contacts, we hope to the mutual benefit of both final publications.

The overarching aim adopted for the Traprain Law Environs Project (TLEP), as we christened the Durham–Dickinson collaboration, was to investigate the nature and changing character of smaller enclosed settlements in the East Lothian coastal plain around Traprain Law during the first millennia BC and AD, thereby contributing to wider research on (1) the development of society and economy in southern Scotland during the later prehistoric period; (2) Roman impact in the northern frontier zone and the nature of indigenous responses; and (3) the extent to which geomagnetic and cropmark evidence are representative of sub-surface remains in an area of complex geology.

Previous excavations of later prehistoric enclosures along the East Lothian coast and elsewhere in central Britain have repeatedly shown that site sequences are more complex than the air photographs indicate. We therefore decided that the first phase of fieldwork would comprise a programme of geomagnetic surveys on a sample of 30 plough-levelled enclosures and other sites with the aim of identifying sites potentially with several occupation phases for further investigation and at the same time evaluate the effectiveness of geomagnetic survey for characterising such sites on different geologies (Phase 1).

The geomagnetic surveys were originally timetabled for the autumn-winter of 2000–01, with excavations scheduled to start in 2001. In the event, work was suspended in February 2001 owing to the outbreak of foot and mouth disease, and the surveys were not completed until 2001–02. The results, if anything, exceeded expectations, fully justifying the decision to invest time and resources in the surveys. In addition, the Edinburgh Archaeological Field Club undertook a trial resistivity survey of the enclosure at Standingstone, but in the event the results did not add significantly to those produced by magnetometry and the experiment was not taken further. No artefacts were picked up during the geophysical surveys, suggesting that a more extensive fieldwalking programme would have been of little value for locating or characterising such sites.

Figure 1.4
The enclosure at Standingstone under excavation in 2003, Traprain Law in the background

Excavation objectives

Phase 2 of the TLEP (2002–04) comprised area excavation in successive seasons of three sites within 5km of Traprain Law to provide detailed archaeological and environmental data on the different enclosure types, together with more limited evaluations of three other sites to validate specific anomalies revealed by the geophysical surveys and provide comparative data (Figure 1.3). For the area excavations, three of the enclosures surveyed in Phase 1 were chosen as representing the principal enclosure types and locational preferences seen in the study area; and having apparently had multiple phases of occupation and thus potentially able to provide information on change over a period of time. The sites selected were a semi-circular ditched enclosure at Whittinghame Tower (NGR: NT 6004 7300), excavated in 2002; an elevated curvilinear enclosure at Standingstone (NGR: NT 5659 7323), examined in 2003 (Figure 1.4; Plate 1); and a rectilinear enclosure at Knowes near East Linton (NGR: NT 6140 7755), investigated in 2004 (Plate 2). At each of the sites, the generic objectives were:

- to establish the sequence and character of the enclosure elements detected by air and ground survey,
- to explore the range and nature of associated structures and validate specific archaeological anomalies revealed by the magnetometer surveys,
- to sample deposits systematically for environmental remains and material culture from which to reconstruct the range and character of economic, social and ritual activities occurring at the site, and
- to investigate the date, duration and continuity of occupation and crop husbandry at the site through a programme of absolute dating.

All three sites revealed complex histories of occupation and re-use. In each case, the main excavation was preceded by an evaluation, which confirmed the presence of carbonised plant remains and during the excavations, intensive bulk soil sampling was undertaken to maximise the recovery of carbonised cereals, a strategy that had proved successful at Port Seton (Haselgrove and McCullagh 2000). Thanks to the subsequent radiocarbon dating programme, we now know that settlement and other activity such as burial and agriculture at all three loci collectively spanned a period of over three millennia, from the later Neolithic to the dawn of the Early Historic period.

The three sites selected for limited evaluations were a second rectilinear enclosure at East Bearford (NGR: NT 5545 7410), a curvilinear enclosure at Foster Law (NGR: NT 5063 7854); and a multivallate 'fort' at East Linton (NGR: NT 5851 7655). They too provided valuable information, complementing and extending that provided by the main sites.

Recording methods

The excavations were conducted in accordance with the individual Scheduled Monument Consents granted by the Scottish Ministers under the Ancient Monuments and Archaeological Areas Act 1979. Sites were excavated by hand following machine stripping and recorded using standard procedures *(ASUD Recording Manual* v.4.3 2004). The surveys and excavations were tied-in to Ordnance Survey points using a Wild T1000 total station survey instrument linked to a SDR33 datalogger. After each excavation, Data Structure Reports were submitted to Historic Scotland. The finds have been deposited at National Museums of Scotland, pending allocation by the Finds Disposal Panel; the individual site archives and overall project archive have been deposited with Historic Scotland for transfer to the NMRS.

THE STRUCTURE OF THE REPORT

The layout of the volume is as follows. Chapter 2 gives an overview of the survey background in the TLEP study area, whilst Chapters 3–5 describe the results from Whittingehame Tower, Standingstone, and Knowes, in the order they were excavated. The results of the smaller evaluations are presented in Chapter 6. The material remains from all six sites are discussed in Chapter 7, with an overview by Fraser Hunter, whilst Chapter 8 examines the subsistence evidence. The radiocarbon dating is presented in Chapter 9, along with Bayesian models for the site chronologies developed by Derek Hamilton. In chapter 10, Dave Cowley places the cropmarked sites around Traprain Law in a wider perspective, whilst Chapter 11 offers a brief overview of the implications of the TLEP and other recent work for our understanding of later prehistoric societies in the region. Appendix 1 compares the results of the geophysical surveys with the aerial record, whilst Appendix 2 catalogues recent

surface finds of Roman material from Athelstaneford and elsewhere in East Lothian

Chronology and terminology

Radiocarbon dates cited in the text were calibrated using OxCal v4.0.5 (Bronk Ramsey 1995; 1998; 2001) and are quoted at 95% confidence. The results and details of the samples are given in full in Chapter 9. Throughout the volume, the term 'Iron Age' on its own designates the pre-Roman part of the period, and is sometimes subdivided into the Earlier Iron Age (*c.* 800–350 BC and the Later Iron Age (*c.* 350 BC–late first century AD). 'Roman Iron Age' is used for the period from the late first to third centuries AD inclusive and 'post-Roman' for the fourth to sixth centuries AD.

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We are particularly grateful to the following for their permission to excavate and assistance in facilitating the work: the late Lord Balfour, the Whittingehame Estate, Patricia Duncan and James Clarke (Whittingehame); Mr Stuart Drysdale (Standingstone); Tyninghame Estate, The Childrens Trust and Mr Peter Cochran (Knowes); Mr Hugh Elder (East Bearford); Mr James Miller (Foster Law); and Mr William Hamilton (East Linton). The fieldwork was undertaken through Archaeological Services University of Durham (ASUD), managed by Duncan Hale, who organised the geophysical programme and the evaluations, and Peter Carne, who oversaw the excavations. The main excavations were supervised by Jane Gosling, assisted variously by Janet Beveridge, Ed Blinkhorn, Amanda Brend, Laura Cripps, Mairi Davies, Tom Moore and Rachel Pope. The DSRs were compiled by Peter Carne and Jane Gosling, with illustrations by Linda Bosveld, David Graham, Janine Fisher, and Martin Railton. Finds recording was undertaken by Pamela Lowther. The evaluations were supervised by Andy Platell (East Bearford), Janet Beveridge (Foster Law), and Matt Claydon (East Linton), who also compiled the DSRs. The geophysical surveys were conducted by Jamie Armstrong, Paul Dungey, David Graham, Duncan Hale, Andy Platell, Alan Rae, Daniel Still, and Barry Taylor. We would like to thank all the additional landowners and farmers who kindly allowed access to their fields.

Particular thanks are due to many colleagues at Historic Scotland and RCAHMS for their advice, support and interest throughout the fieldwork, especially Patrick Ashmore, David Breeze and Olwyn Owen, and Deirdre Cameron at the former and to Marilyn Brown, Dave Cowley, Strat Halliday, Kevin H J Macleod, and Jack Stevenson at the latter. Others whose support is gratefully acknowledged include Biddy Simpson (East Lothian Heritage Officer), Fraser Hunter and Alison Sheridan (National Museums of Scotland). Many other colleagues offered valuable comments on the excavations, notably Ian Ralston and Clare Wilson. John Davies photographed all three main excavations from the air, and we are grateful for him for allowing us to use his photographs. A debt is owed to Gordon Cook (SUERC) for his patience in dealing with a series of less than straightforward radiocarbon dating samples!

Although he would be too modest to admit it, John Minniear made an immense contribution to the day-to-day running of the project in all three seasons. Thanks also to James Whitfield, who catered for the hungry teams in 2003–04, Vivienne Cameron and Sheila Marshall of North Berwick Flats for arranging accommodation, and Michael Brander for local advice. Finally, thanks are due to the students of both universities and everyone else who took part in the excavations and to David Jones and the members of the Edinburgh Archaeological Field Club, who assisted at Whittingehame and carried out the resistivity survey at Standingstone.

Many people have contributed reports and advice to this publication, to all of whom we extend our thanks. Full reports on the human bone by Charlotte Henderson and Anwen Caffell, and on the geology of the stone artefacts by Fiona McGibbon are lodged with the site archives. Conservation was undertaken by Jennifer Jones at the Department of Archaeology, Durham University, with EDXRF analysis by Philip Clogg, who also lifted the Standingstone urn. The archaeo-magnetic date for the Knowes oven was provided by Mark Hounslow and Vassil Karloukovski

of the Centre for Environmental Magnetism and Palaeomagnetism, University of Lancaster. Environmental sample processing was undertaken by Louisa Gidney, Pamela Lowther, Claire Pickin, and Dave Webster.

The final stages of post-excavation analysis and preparation of this report for publication were undertaken by Colin Haselgrove and Pamela Lowther with assistance from John Thomas and Matt Beamish. Particular thanks are extended to Kevin H J Macleod for preparing the illustrations in Chapters 2 and 10 and in Appendix 1, as well as Figures 1.1, 1.3, 3.2, 4.2, 5.2, 6.1, 6.6, 6.12 and the maps in Appendix 2. Dennis Harding kindly gave permission to reproduce Figure 10.19. The excavation illustrations were compiled by Pamela Lowther from the figures prepared for the DSRs. The pottery was drawn by Gavin Lindsay and Christina Unwin; the cremation urns by Marion O'Neil; small finds by Christina Unwin and Alan Braby; and the stone objects by Mark Hoyle and Alan Braby.

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Chapter 2

Survey in the Traprain Law Environs Project area

DAVID C COWLEY, DUNCAN HALE, FRASER HUNTER and KEVIN H J MACLEOD

INTRODUCTION

This chapter contains an overview of the survey work lying behind the excavations undertaken in the TLEP study area. The overview is primarily based on the aerial survey and mapping of plough-levelled sites recorded as cropmarks undertaken by RCAHMS and the geophysical surveys carried out by the TLEP, but consideration is also given to the results of arable fieldwalking. The present study has provided an opportunity to compare the information on sites generated by the methods outlined above in a region where often-complex geology has a direct impact on the character of sites revealed as cropmarks and through geophysics. The subsequent excavation programme has provided further depth to

Figure 2.1
Aerial view looking north-east over the central part of the TLEP study area, with Traprain Law in the foreground
(DP026198, Crown copyright: RCAHMS)

the comparison of results. The chapter begins with general summaries of the character of the area, its geology and land use, as they inform the interpretation of the survey results.

THE TLEP STUDY AREA – LANDSCAPE AND THE CHARACTER OF THE ARCHAEOLOGICAL RECORD

The TLEP study area is an arbitrary block of ground, roughly centred on Traprain Law, and defined by the simple expedient of Ordnance Survey grid lines. The greater part of the study area comprises a gently-undulating coastal plain, rarely above 120m OD, but in places broken by low hills, such as the Garleton Hills and Traprain Law, which rise up to about 200m in height (Figure 2.1). The ground generally rises to the south and, at the south-east corner, includes the Lothian Edge at some 350m OD. The major river draining the area is the River Tyne, which trends from west-south-west to east-north-east, and is predominantly fed by tributaries draining the Lammermuirs to the south, which are typically deeply incised (e.g. Tipping 2007). The other significant catchment is that of the Whittingehame Water in the south-east. Arable land use dominates the area, although there are increasing proportions of pasture as the ground rises to the foothills of the Lammermuirs and unimproved moorland on the hills themselves. There are intermittent blocks of woodland scattered across the plain, mainly taking the form of discrete shelter-belts, but including some more extensive coniferous plantations. Built-up areas are fairly discrete, with Haddington the only significant urban area.

The pattern of land use has had a direct impact on the character of the archaeological record. The vast majority of recorded sites have been levelled by the plough and are only known as cropmarks on aerial photographs. The surviving earthwork sites lie in small patches of unimproved ground, for example, on the rocky outcrops of the Garleton Hills or in shelter-belts and plantations. Artefact recovery through arable fieldwalking has not contributed much material to the record, but some success in this area (see below) suggests that it is an underused technique that would repay further attention. The broader context of the TLEP in East Lothian will be expanded on in Chapter 10 but, for the purposes of the following discussion, it is noteworthy that the study area is broadly representative of this part of south-eastern Scotland, which is roughly coterminous with the administrative area of East Lothian.

THE GEOLOGY AND SOILS OF THE TLEP STUDY AREA

The geology of the TLEP study area is complex and merits description as it bears on the interpretation of the geophysical survey results (below). Two faults cross the south-eastern quarter of the study area, namely the Dunbar-Gifford Fault and the Lammermuir Fault, both aligned broadly north-east to south-west (Lelong and MacGregor 2007, fig 1.4). The rock types all belong to the Carboniferous era with the exception of the Devono-Carboniferous Upper Old Red Sandstone, which occurs exclusively between these two faults. The Garleton Hills Volcanic Rocks lie within the Calciferous Sandstone Measures, which between them occupy most of the study area. Traprain Law itself is a phonolite laccolith, a mass of igneous rock that rose in a molten condition and pushed up the overlying strata to form a dome (McAdam and Tulloch 1985). Erosion has subsequently revealed the original form of the laccolith by stripping away the soft sedimentary cover.

The most recent glaciation, the Devensian, deposited an extensive till (boulder clay) across much of the study area, mantling most of the low-lying areas north of the Lammermuir Fault in a deposit up to 10m in thickness. In the areas of volcanic rock, however, the till is thinner and less widespread. During the late-glacial period raised beaches of sand and gravel were deposited to the north and east of East Linton. Subsequent Flandrian deposits include river-terrace and floodplain alluvium, with limited peat and lake deposits. The alluvial deposits consist of interbedded gravels, sands, silts and clays, in constantly varying proportions (McAdam and Tulloch 1985).

The soils of East Lothian are dominated by Brown Forest and, to a lesser degree, Brown Calcareous Soils. The Brown Forest Soils are generally imperfectly drained, and have a tendency to gleying. Soil depth varies considerably, and there are large areas, especially in soils of the Kilmarnock and Winton Associations, where the bedrock is near the surface. The areas of well-drained soils are relatively discrete and include the Brown Calcareous Soils of the Fraserburgh Association on the coast around Gullane (Ragg and Futty 1967). These latter are some of the better quality

agricultural land in present-day Scotland, which allied to the relatively dry climate that the east coast enjoys, has helped to make East Lothian a prolific county for cropmark formation (Cowley 2007).

AERIAL SURVEY AND MAPPING IN THE TLEP STUDY AREA

Prospective aerial survey has revolutionised the distribution of known sites in the Scottish lowlands (e.g. Maxwell 1983; Cowley and Brophy 2001) – as it has done elsewhere in Britain and beyond. East Lothian is no exception (Cowley 2007; Cowley and Dickson 2007). It has benefited from being close to the main base for aerial survey in Edinburgh, and has been overflown by RCAHMS during almost all summers since 1976, and intermittently by others back to the 1920s. It continues to be flown and, apart from the most dismal of summers, each year brings new discoveries.

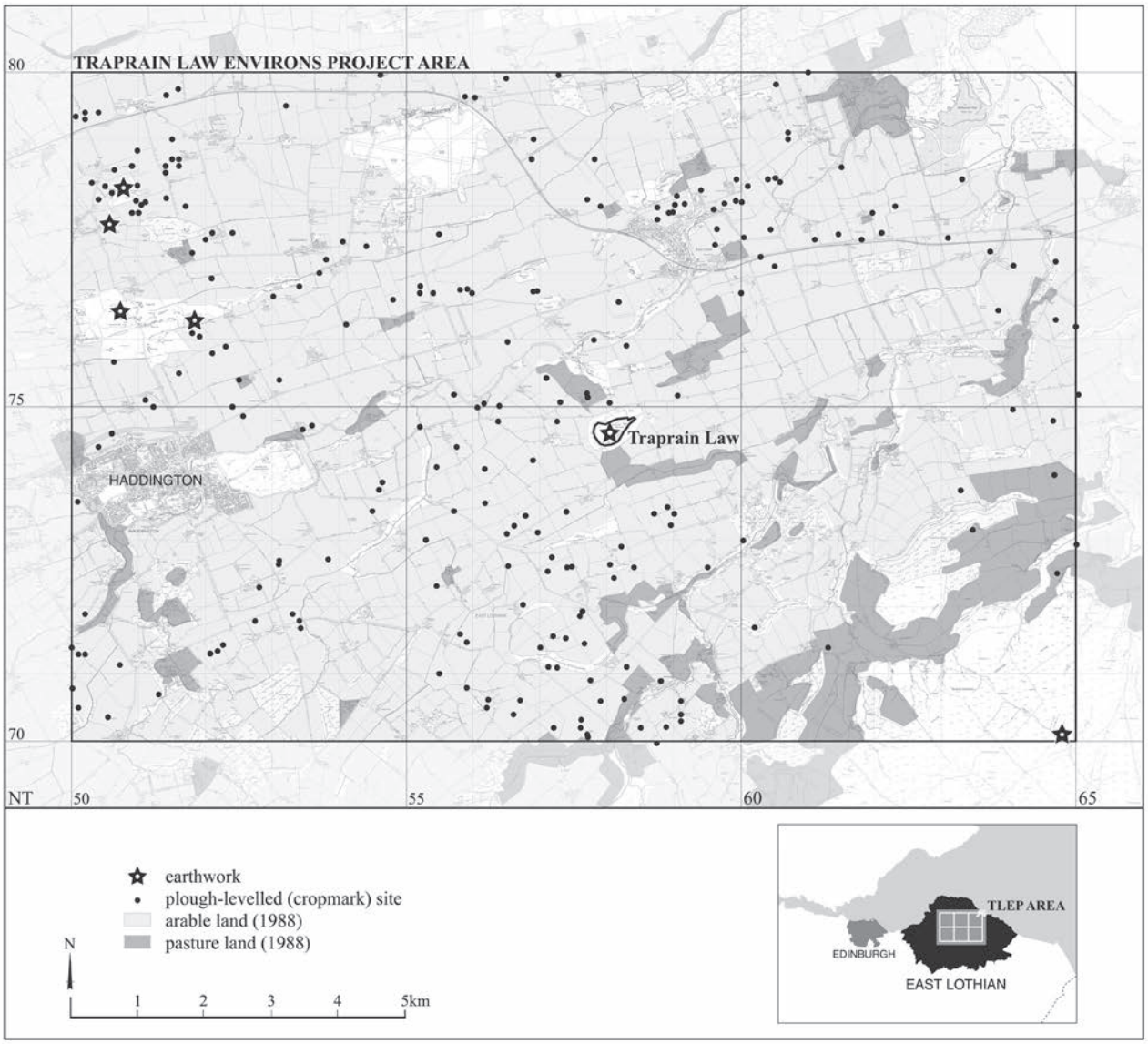


Figure 2.2
Map of the TLEP study area showing the distribution of plough-levelled monuments and earthworks against the extent of arable, pasture and woodland (Crown copyright: RCAHMS, GV004467. Extent of arable, pasture and woodland derived from MLURI mapping, based on 1988 aerial photography)

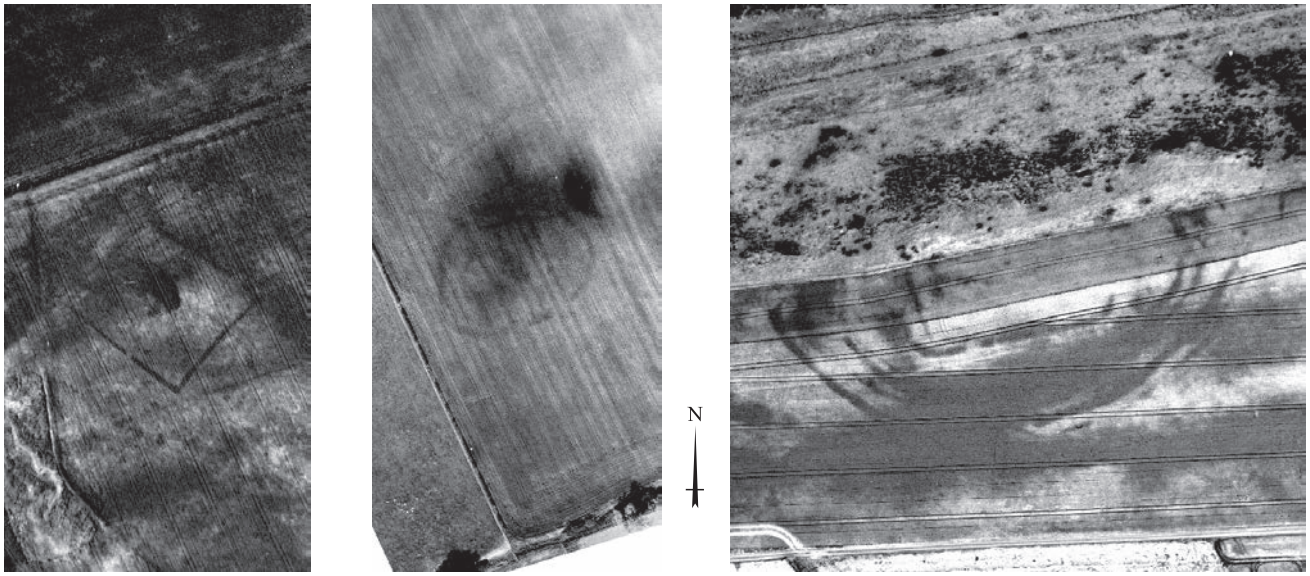


Figure 2.3
Rectified aerial photographs of representative rectilinear and curvilinear settlement enclosures and a fort (rectified versions of EL4136, EL3632 and C52630 respectively, Crown copyright: RCAHMS, GV004468)

The ongoing aerial survey of the TLEP study area has recorded some 190 cropmark sites of all periods. In addition, as part of a contribution to the TLEP and an ongoing programme to map all known plough-levelled sites in Scotland, all the sites have been mapped. The distribution (Figure 2.2) is one of dense clusters of archaeological monuments recorded as cropmarks, interspersed by both thinner scatters of sites and complete blanks in the distribution. The dense clusters of monuments tend to coincide with well-drained soils, or with patches of thinner imperfectly drained soils. More dispersed distributions occur on the thin imperfectly drained soils, while blank areas on the maps tend to be broadly coterminous with deep and imperfectly drained soils, which also have a tendency to be set to pasture (Cowley and Dickson 2007; Ragg and Futty 1967).

An overall consideration of the record of plough-levelled sites in East Lothian is presented in Chapter 10, exploring the basic morphology and distributions of sites, but in general terms the 190 cropmark sites of all periods recorded in the TLEP study area include a figure of about 120 that may be characterised as later prehistoric in date. Settlement enclosures predominate, of which 32 are rectilinear in form, 68 are curvilinear, 10 incorporate a palisade in their circuit (though two of these were revealed by excavation), 10 have been placed with clear defensive intent (including four earthwork sites of which Traprain Law is one), while at least six can be characterised as 'open' or unenclosed settlements (Figure 2.3). The character of this distribution confirms how representative, in general terms, the TLEP is of the wider East Lothian plain (Chapter 10). It also underlines that aerial survey remains the only effective means of discovering plough-levelled sites in the area. Equally, those areas that have remained stubbornly blank, of which the area to the south-east of East Linton is a good example, present a challenge to survey methodologies to explore effectively all parts of the landscape (see below; Cowley and Dickson 2007).

Aerial mapping

The mapping of plough-levelled sites in support of the TLEP has been based predominantly on the collection of oblique aerial photographs held in the archive of RCAHMS. Reference has also been made to vertical coverage, also held in RCAHMS, dating from the period since 1946. In order to locate sites accurately to

the UK National Grid and to rectify the oblique view to a true plan, the *Aerial 5* software programme has been used (Macleod 2006).

The mapping begins with the assessment of a suite of aerial photographs, taken over a number of years, to identify those images with the best representation of the archaeological features. The identification of good quality control-points visible on the aerial photographs and represented on the Ordnance Survey (OS) map is vital. Mapping is undertaken against a digital OS map background, and makes use of the OS Profile Digital terrain Model (5m interval), incorporating the height value at each digitised point. The process produces a geo-referenced rectified version of the oblique aerial photograph, which is then used as a basis for on-screen digitising of the archaeology in 3D. All line work is coded with the reference of the source photography and a simple classification system containing both morphological attributes (e.g. 'rectilinear') and interpretation (e.g. 'roundhouse') that allow efficient searching and retrieval. The rectified and geo-referenced aerial photograph and the line work can then be viewed together in a Geographical Information System, presenting both interpretation and source imagery. In addition, the 3D data can be used to generate visualisations of sites where the topography is otherwise flattened out in the aerial photography (Figure 2.4).

GEOPHYSICAL SURVEY

A sample of 30 sites was chosen for detailed geophysical survey from roughly 120 plough-levelled later prehistoric sites recorded and mapped in the TLEP study area. The sample aimed to reflect both the broad proportions in which the main types of enclosure appear in the record and the overall distribution of plough-levelled sites across the study area. The focus on plough-levelled sites has inevitably informed the distribution of the geophysical surveys (Figure 2.5),

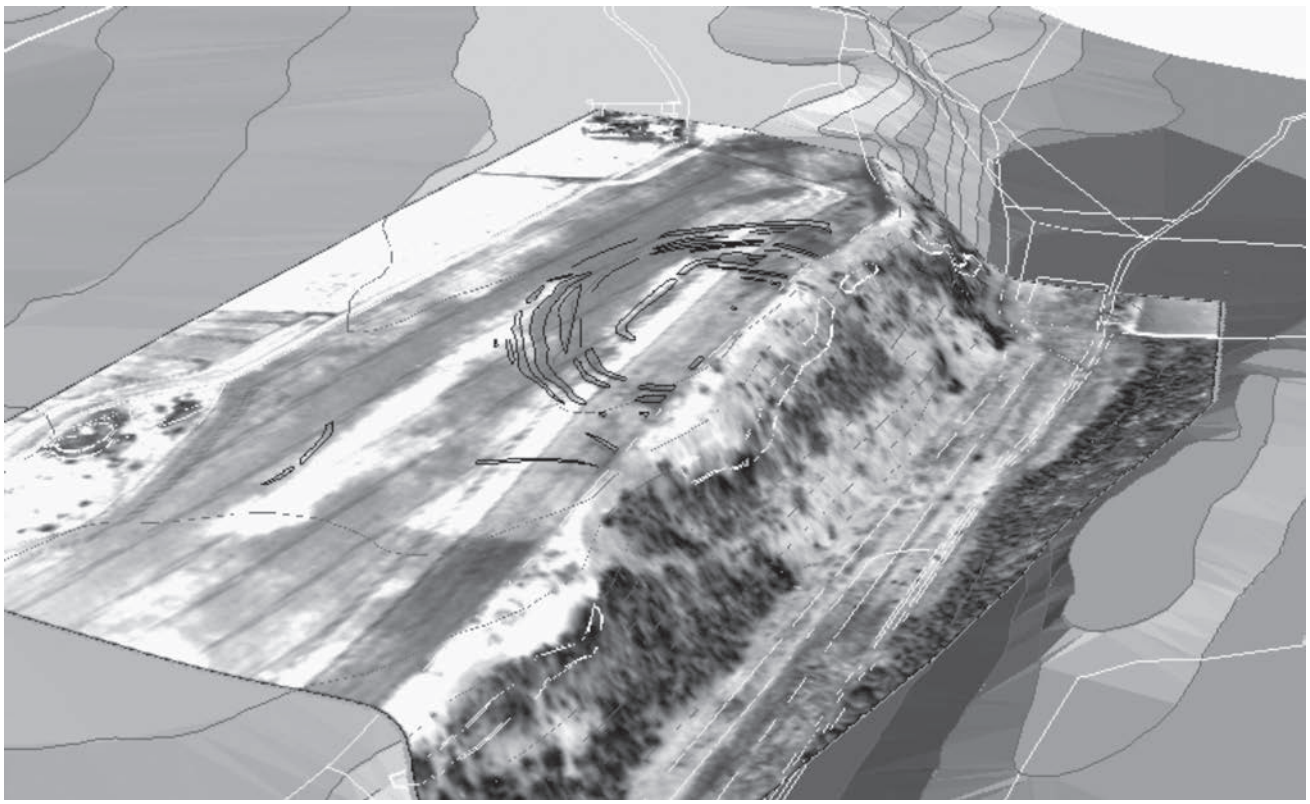


Figure 2.4
3D visualisation of the plough-levelled fort at Hanging Craig (NT57NW 89) constructed digitally in ArcScene over the OS profile model surface (Crown copyright: RCAHMS, GV004469)

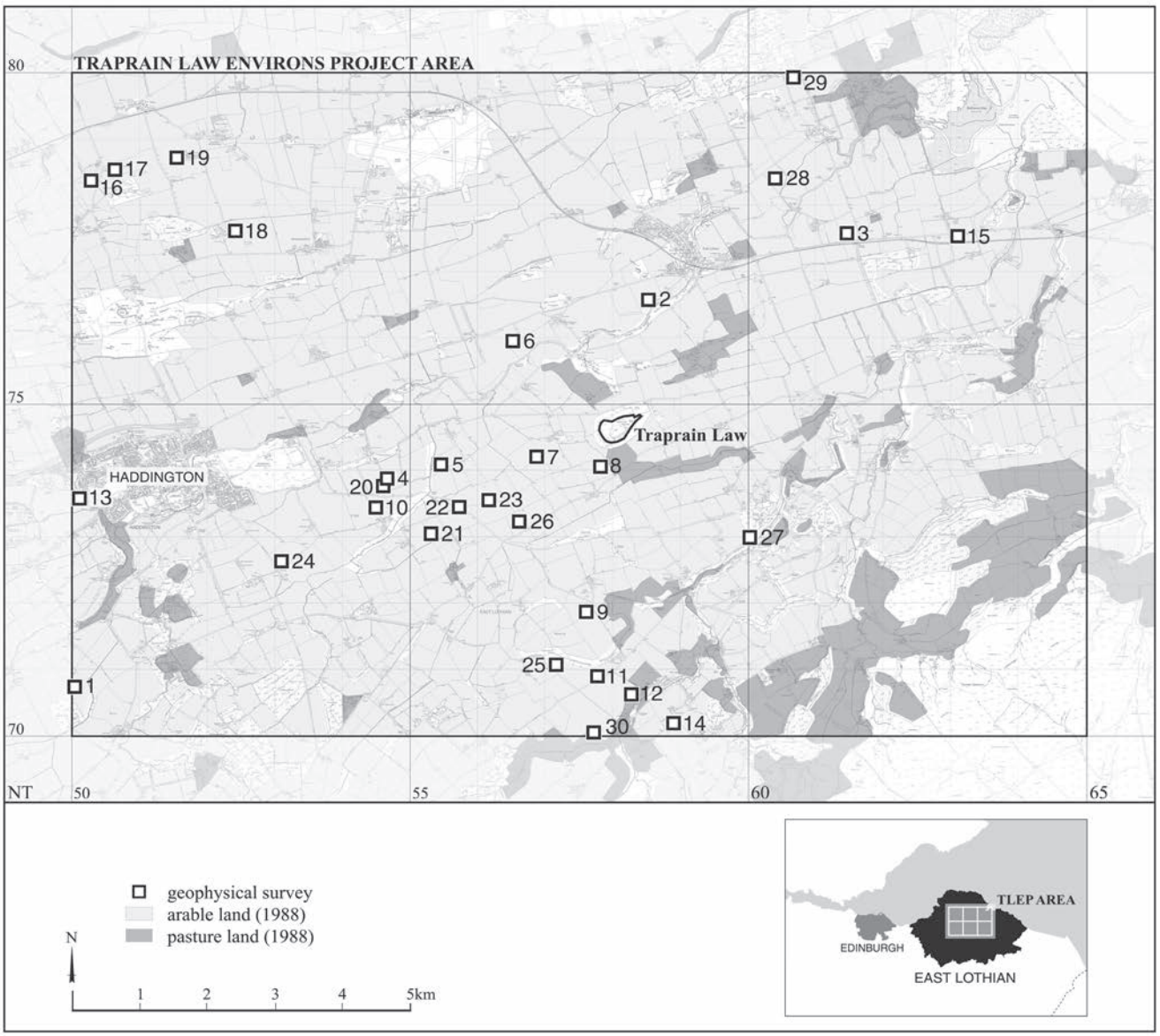


Figure 2.5
Map of the TLEP study area showing the distribution of sites chosen for geophysical survey, against the general distribution of arable, pasture and woodland (Crown copyright: RCAHMS, GV004470. Extent of arable, pasture and woodland derived from MLURI mapping based on 1988 aerial photography)

concentrating as they do into the predominantly arable and cropmark-rich parts of the study area.

The specific aims of the geophysical survey programme were to assess the nature, extent and potential degree of preservation of the 30 sites, comparing cropmark information with the geophysics and using both data sources to inform further phases of work, such as the excavation of selected sites. A further question was to investigate whether geophysical survey could identify small features, such as ring-ditches, which did not appear as cropmarks. A subsidiary objective was to establish whether the effectiveness of the geophysical surveys differed significantly over different rock types.

The sites selected for geophysical survey comprised two multivallate 'forts', 12 rectilinear and 13 curvilinear

Table 2.1

Geophysical site surveys (Geological information from Davies *et al.* 1986; McAdam & Clarkson 1986; McAdam & Tulloch 1985). Site types: M = multivallate, R = rectilinear, C = curvilinear, U = unenclosed, B = building. Numbers refer to Figure 2.5

	NMRS	*Site name*	*Site type*	*Survey area (ha)*	*NGR*	*Geology (GHVR: Garleton Hills Volcanic Rocks)*	*Igneous*	*Geophysics results*	*Geophysics unique features?*
1	NT57SW 31	Begbie	M	3.08	NT 5001 7079	Calciferous Sandstone Measures		Good	Yes
2	NT57NE 17	East Linton	M	2.40	NT 5851 7655	Extrusive basalts and tuffs GHVR	✓	Good	Yes
3	NT67NW 19	Knowes	R	2.56	NT 6140 7755	Calciferous Sandstone Measures		Good	Yes
4	NT57SW 46	Stevenson Mains	R	0.36	NT 5465 7385	Calciferous Sandstone Measures		Poor	No
5	NT57SE 16	East Bearford	R	1.16	NT 5545 7410	Extrusive trachyte GHVR	✓	Good	Yes
6	NT57NE 16	Overhailes	R	1.68	NT 5651 7597	Extrusive basalts and tuffs GHVR	✓	Mixed	No
7	NT57SE 37	Cairndinnis	R	0.96	NT 5689 7420	Extrusive trachyte GHVR	✓	Poor	No
8	NT57SE 79	Standingstone	R	1.40	NT 5788 7402	Extrusive basalts and tuffs GHVR	✓	Poor	Possibly
9	NT57SE 36	West Mains	R	1.00	NT 5763 7194	Extrusive trachyte GHVR	✓	Good	Possibly
10	NT57SW 95	West Bearford	R	0.72	NT 5449 7344	Calciferous Sandstone Measures		Mixed	No
11	NT57SE 41	Tanderlane	R	2.76	NT 5775 7091	Upper Old Red Sandstone		Mixed	No
12	NT57SE 39	Garvald	R	1.56	NT 5825 7063	Intrusive dolerite and basanite	✓	Poor	No
13	NT57SW 77	Haddington	R	0.80	NT 5009 7358	Calciferous Sandstone Measures		Good	Yes
14	NT57SE 104	Nunraw Barns	R	0.48	NT 5888 7021	Upper Old Red Sandstone		Good	No
15	NT67NW 20	Hedderwick	C	1.36	NT 6309 7752	Calciferous Sandstone Measures		Good	Yes
16	NT57 NW 30	Sixpence Strip	C	1.44	NT 5030 7835	Extrusive trachyte GHVR	✓	Good	No
17	NT57NW 41	Foster Law	C	2.40	NT 5063 7854	Extrusive trachyte GHVR	✓	Good	No
18	NT57NW 35	Kilduff	C	1.20	NT 5236 7760	Extrusive trachyte GHVR	✓	Very poor	No
19	NT57NW 38	Newmains	C	1.00	NT 5157 7870	Extrusive trachyte GHVR	✓	Poor	Possibly
20	NT57SW 47	Stevenson Mains	C	0.48	NT 5459 7376	Calciferous Sandstone Measures		Good	Yes
21	NT57SE 50	Northrig	C	0.96	NT 5526 7301	Calciferous Sandstone Measures		Good	No
22	NT57SE 91	Coldale	C	0.88	NT 5571 7344	Extrusive trachyte GHVR	✓	Poor	Possibly
23	NT57SE 56	Coldale	C	0.76	NT 5617 7356	Extrusive trachyte GHVR	✓	Good	Possibly
24	NT57SW 50	Mitchell Hall	C	0.48	NT 5309 7264	Calciferous Sandstone Measures		Very poor	No
25	NT57SE 27	Chesters Quarry	C	0.80	NT 5712 7111	Intrusive dolerite and basanite	✓	Good	No
26	NT57SE 45	Standingstone	C	0.60	NT 5661 7322	Extrusive trachyte GHVR	✓	Good	No
27	NT67SW 15	Whittingehame Tower	C	0.84	NT 6003 7300	Upper Old Red Sandstone		Poor	Yes
28	NT67NW 18	Preston Mains	U	0.60	NT 6040 7840	Extrusive basalts and tuffs	✓	Mixed	Yes
29	NT67NW 16	Tyninghame	U	0.80	NT 6058 7991	Extrusive basalts and tuffs	✓	Mixed	Possibly
30	NT57SE 103	Sled Hill	B	0.36	NT 5771 7006	Upper Old Red Sandstone		Mixed	No

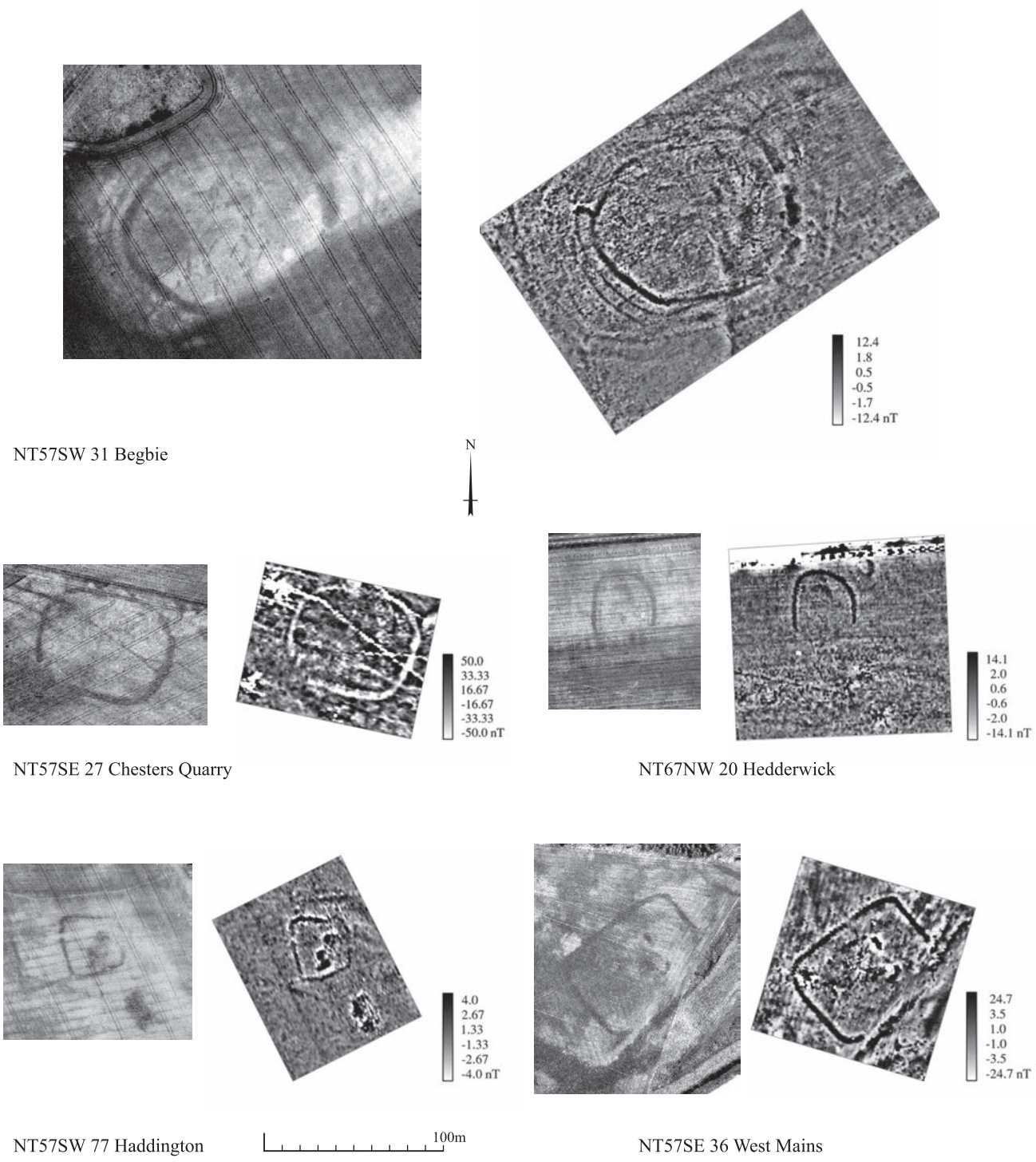


Figure 2.6
Selected sites with rectified aerial photographs of the cropmarks set beside the TLEP geomagnetic survey plots
(rectified versions of A29865, EL3032, A22255, B05135 and B24406 respectively, Crown copyright: RCAHMS, GV004471)

enclosures, as well as parts of two unenclosed settlements and a possible rectangular building (Table 2.1). The proportion of rectilinear enclosures selected was slightly higher than numbers alone merited, on the grounds that hardly any have been excavated in southern Scotland. With the exception of Sled Hill, each of the surveys was undertaken with Scheduled Monument Consent granted by the Scottish Ministers under Section 42 of the Ancient Monuments and Archaeological Areas Act 1979. The geophysical surveys were undertaken by ASUD between August and November 2000 and then, following the 2001 outbreak of Foot and Mouth Disease, between October 2001 and January 2002.

Geophysical survey: fieldwork and data processing

In order to assess the suitability of a geomagnetic survey technique in this complex and part-igneous geological environment, small trial areas were initially surveyed by fluxgate gradiometry. This demonstrated that significant magnetic susceptibility contrasts could be recorded over both the igneous and sedimentary strata, and that some of the geomagnetic anomalies almost certainly reflected archaeological features. This technique was therefore employed at all of the 30 selected sites.

Each survey was undertaken on a 20m grid, which was tied-in to known Ordnance Survey points using a total station survey instrument and datalogger. Measurements of geomagnetic field gradient were determined using Geoscan FM36 fluxgate gradiometers with automatic datalogging. A zig-zag traverse scheme was employed. The instrument sensitivity was set to 0.1nT and measurements were logged at 0.5m intervals along traverses spaced 1m apart, thus providing 800 sample measurements per 20m grid unit. Data were downloaded into laptop computers on-site for initial processing and interpretation.

The geophysical data presented as greyscale images have basic data processing functions applied. Geoplot and InSite software was used where necessary to correct for spikes, striping, shear and instrument drift. Data have been interpolated to 0.25m intervals. In each greyscale image, positive magnetic anomalies are shown as dark grey and negative magnetic anomalies as light grey; palette bars relate the greyscale shades to values in nanoTesla. A number of interim reports have been published (Hale *et al.* 2001; 2003; 2006) and Data Structure Reports are lodged with Historic Scotland (ASUD 2001; 2002).

Geophysical survey: results

Despite the complex and often igneous geology – situations where a geomagnetic technique might not traditionally have been used – good overall results have been obtained adding value to existing knowledge derived from cropmarks (Figure 2.6). Indeed, several of the surveys indicated the presence of previously unrecorded features, both internal and external to enclosures, such as probable roundhouses, palisades and annexes, and in some cases it has been possible to distinguish more than one phase of occupation. In only seven of the 30 cases were the features recorded as cropmarks not readily identified in the geophysics. This appears to be due to a range of factors, with the underlying igneous geology apparently to blame in only a single case. The current plough regime is typically apparent on the geophysical surveys as a uni-axial 'texture'.

The basic results of the geophysical survey are presented (Table 2.1) with a subjective assessment of the quality or significance of the results, mainly in terms of a value judgement of the information return. A similar subjective assessment of the information return from the aerial photography is also presented, alongside the background geology.

In the majority of cases (23 out of 30), the geophysical surveys replicated the expression of the features recorded as cropmarks on aerial photography, often with very clear results. This alone is a valuable outcome in providing a group of sites where the differing forms of registration – cropmarking and geophysics – can be compared. A second encouraging result is that at a number of locations, the geophysics produced evidence of probable internal and/or external features, which were not immediately visible on the aerial photography. These included the three sites subsequently selected for large-scale excavation at Whittingehame, Standingstone and Knowes (Chapters 3–5) and two selected for smaller scale evaluations (Chapter 6). At all these sites, the excavations subsequently confirmed the presence of many of these additional features. Finally, it is notable that many of the useful geophysical surveys were carried out over igneous bedrock, giving good results in less than auspicious conditions, a factor that should encourage the more widespread application of such surveys in Scotland.

In the seven surveys where the cropmarked features were not readily identified, a number of factors appear to be responsible. In only one instance (Kilduff) does the underlying igneous geology appear to be the main factor in the lack of resolution of features.

Further commentary of the geophysical results on the unexcavated sites is found in Appendix 1.

Geophysical survey: questions and issues

A number of questions have inevitably arisen from the geophysical survey results, largely concerning the effect of the underlying geology. Marked variations are evident where surveys have been conducted over the same general rock type. Over igneous trachyte, the East Bearford and Foster Law surveys provided much more archaeological information than the Kilduff survey, although the explanation for this is not clear. Similarly, while the surveys at Standingstone and Overhailes provided useful plans of the enclosures, the nature of some of the anomalies is not fully understood. There are of course a number of other factors besides solid geology that will determine the effectiveness of one technique over another at any given location. These include the depth to rock head, the nature of overlying soft sedimentary cover, the composition of boulder clay, the nature and depth of likely targets, ground conditions and the proximity of buildings, fences or services.

MAKING SURVEY COUNT – INTEGRATING METHODOLOGIES

Few archaeological distributions can be taken to reflect past activity in any meaningful manner, more often being the product of variation in land use, bias in survey methodology, variation in survival and the influence of soil types, amongst many other factors. The broad pattern of sites in the TLEP study area illustrates how effective a prospective survey methodology aerial survey is, but even here there are stubbornly blank areas, generally on poorly drained soils, that are unresponsive. Indeed, the large number of previously unknown sites discovered during the works in advance of the A1 road upgrade (Lelong and MacGregor 2007) are another indication of the limitations of traditional aerial survey, relying as it does on the formation of cropmarks over buried features. These are a clear challenge to develop approaches to explore the wider landscape more effectively, drawing on other forms of remote sensing.

Such problems in defining the wider landscape are emphasised by other East Lothian discoveries. There is, for instance, a series of cave sites with Iron Age activity (Chapter 7), which need to be incorporated into the settlement pattern. While these could at least be prospected for, other components are more problematic. East Lothian is a high-spot of Iron Age burials, but this is entirely due to accidental discoveries and the character of the known distribution is difficult to assess. There is more hope in prospecting for other types of site via an often-undervalued avenue – the finds. A number of East Lothian excavations have been stimulated by casual finds, such as the midden at Muirfield (Younger 1936) and the settlement at New Mains (Stevenson 1966; Clarke 1969; 1970), while antiquarian casual finds from a midden at Pincod, Dunbar can also be identified as Iron Age (*PSAS* 1910, 102). These examples are unlikely to have been discovered from the air, and may represent further facets of the unenclosed settlement pattern of the Iron Age, complementing that emerging from the analysis of the aerial photographic record (Chapter 10).

Developing an approach from a response to serendipitous discoveries into a prospecting tool is rather more problematic. Yet fieldwalking should not be dismissed as futile for later prehistory. Recent experience on Traprain, where a wealth of material was gathered after a fire, is perhaps exceptional, but the unpublished New Mains collection includes a significant quantity of Iron Age finds (mostly pottery and stone tools) recovered by fieldwalking. Stray finds of querns in particular are likely to be revealing, as these are unlikely to have moved far from their original settlement, yet they are rarely if ever incorporated in considerations of Iron Age settlement distributions north of the border, despite the rich insights that comparable exercises have produced in north-east England (Hayes *et al.* 1980; Heslop 2008).

Recent work at Gilmerton House, Athelstaneford (Appendix 2), while less finds-rich than New Mains, has shown that fieldwalking can produce useful results – especially in combination with metal-detecting. This latter method is the great under-used tool for later prehistoric sites, especially those with a Late Iron Age phase when non-ferrous ornamental material becomes more common. At Gilmerton House, the metal-detected discovery of four Roman brooches on a known cropmark site marks it as unusual. At Aberlady the thin scatter of Roman Iron Age material in an Early Historic and medieval metal-detected assemblage shows that there is an earlier phase to this important 'productive site'.

Fieldwalking can undoubtedly be soul-destroying; several days of walking and trial-trenching in the field immediately south of Traprain produced only a single, early prehistoric find (M Cook, pers. comm.),

and no finds were made in the course of the TLEP geophysical surveys. However, when tied in with metal detecting it becomes a valuable prospecting strategy for unknown sites and for investigation of known ones (as Gilmerton House suggests). Yet for this, detecting and fieldwalking must be sustained and intensive, not a once-over scan; it is clear that persistence over a period of time is necessary to extract the best results. So, while perhaps less widely-recognised than other survey techniques in Scotland, this brief review does suggest that strategies targeted to artefacts have more to offer studies of later prehistory than current practice allows. In developing future practice, however, the emphasis on the recovery of artefacts from the ploughsoil must be maintained, a process that does not further disturb stratified contexts.

The same is true of geophysical survey. At present geophysical survey in Scotland has not been trialled as a tool to prospect the landscape at a regional level, but the good results obtained from the TLEP study area should encourage its use and highlight its potential value in exploring areas where cropmark formation is rare. The widespread application of geophysical survey in Scotland still suffers from a perception that it is not effective (Jones and Sharpe 2006), but these results weaken that position. The interpretation of both cropmark evidence and geophysical surveys has benefited from a symbiosis between the results, each feeding off the other, and in the cases of the excavated sites benefiting from corroboration through excavation. Overall, the approach of the TLEP in drawing on the coarse grain, but extensive, relatively inexpensive and non-destructive survey data in tandem with the detailed, but expensive and destructive, view from selected excavations provides a solid model for exploring relatively unknown landscapes.

Chapter 3

Excavations at Whittingehame Tower

COLIN HASELGROVE, PETER CARNE and LEON FITTS

The site at Whittingehame Tower lies 2.5km south-east of Traprain Law (Figure 3.1), on the northern edge of the steep-sided ravine of the Whittingehame Water, 250m south-west of the tower-house which gives the site its name. It occupies a slight promontory at 110m OD, bounded on the north-east by a shallow gully cutting back from the ravine, and is bisected by a field boundary. The enclosure was discovered from the air in 1983 and recorded again in 1998; in both cases, the visible cropmarks were recorded in the field south-west of the field boundary, which was under a cereal crop (apart from a strip of set-aside along the ravine edge in 1998, where the clay is particularly intractable).

The cropmarks describe the arcs of two ditches, a broad inner one, measuring between 5m and 6m across, and a narrower outer one about 2m across (Figure 3.2). Projecting these arcs into the field to the north-east of the field boundary (a former seed orchard, now pasture) produces a C-shaped arc of ditches set against the side of the ravine. The projected line of the inner ditch suggests a maximum internal length of the enclosure along the ravine edge of about 75m, with a maximum transverse measurement of about 50m; an internal area of about 0.26ha is thus likely.

The geophysical survey undertaken in 2000 added to this information by confirming that the main ditch,

Figure 3.1
View of Whittingehame Tower excavation looking towards Traprain Law

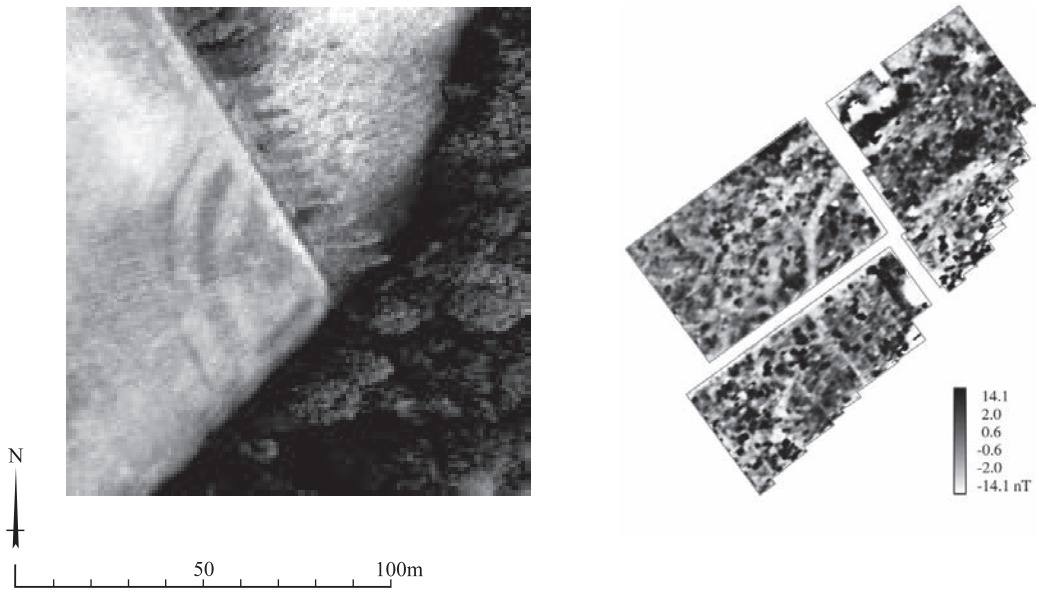


Figure 3.2
Whittingehame Tower (NT67SW 15): rectified aerial photograph (EL6682) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004472)

at least, continued to the north-east of the field boundary. Beyond that, the data are unexpectedly noisy, perhaps due to the igneous rock content of the boulder clay overlying the Sedimentary Upper Old Red Sandstone and/or near-surface ferrous litter. A positive magnetic anomaly in the eastern part of the enclosure could be a substantial soil-filled pit, but an arcuate, positive magnetic anomaly detected just to the west of the enclosure is difficult to interpret, as no sign of its projected continuation was found in the excavation.

On basis of the cropmarks and geophysical survey evidence, Whittingehame provides a fairly typical example of the many curvilinear enclosures recorded in the TLEP study area, as well as being one of a significant minority situated on the edge of a ravine. The site was therefore selected for area excavation following an evaluation in April 2002, which located the main enclosure ditch and confirmed the presence of charred plant remains. Although its ravine-edge location might suggest the site was selected with defence in mind, the enclosure does not occupy a dominating position locally. The ground rises up again north-east of the gully leading down to Whittingehame Water (Figure 3.3), and, when approaching the site from

Figure 3.3
The enclosure at Whittingehame, showing the principal subsurface anomalies and the location of the 2002 excavations. Contours at 0.5m intervals

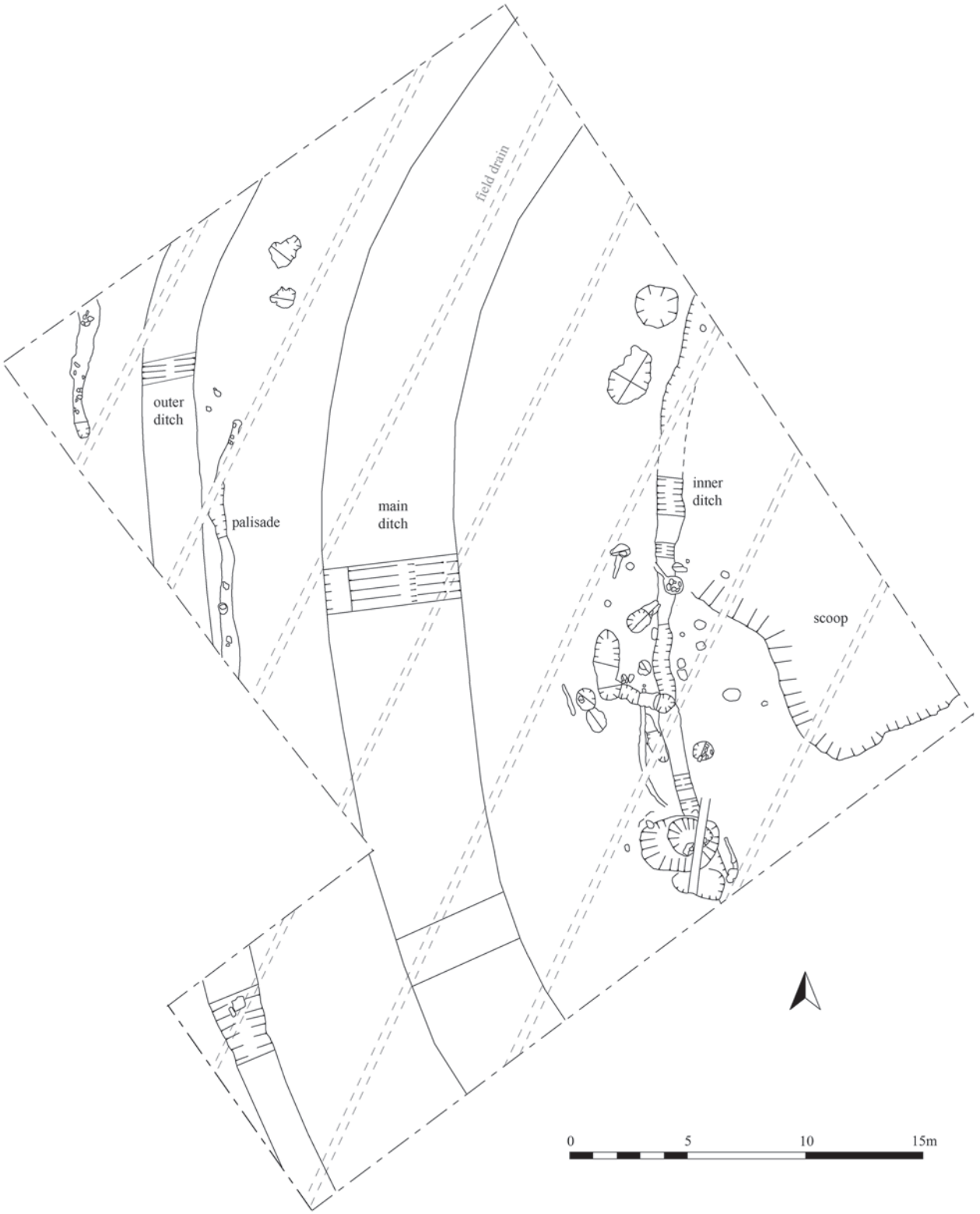


Figure 3.4
Whittingehame: plan of principal features excavated

the north-west along the modern field boundary, the excavation spoil-heaps were hidden from view until only 150m away, suggesting that even as an earthwork, the enclosure would have been relatively inconspicuous in its immediate setting. The site is however visible from further afield and indeed can clearly be seen from the top of Traprain Law.

THE EXCAVATIONS

The principal objectives of the excavation were to sample the different enclosure elements; to investigate the interior for structural remains; and to sample deposits for material from which to reconstruct the chronology and character of activity. Area 1 (*c.* 1030m^2) in the cultivated field uncovered a substantial length of the ditch circuits and a portion of the interior. A small trench (Area 2) was opened in the pasture to confirm the continuation of the inner ditch and to investigate the state of survival of deposits. The excavation was conducted in two stages: four weeks in late June–early July 2002, and a further period in October–November, necessitated by the adverse weather conditions of the early summer! A Data Structure Report was submitted to Historic Scotland in March 2003 (ASUD 2003a). The site code is TWT02.

The results are described in two main sections: the first describes the enclosure features, the second deals with the interior, where several phases of activity were revealed. The topsoil was a brown clay loam *c.* 0.35m deep, whilst the subsoil consisted of slightly sandy orange-brown boulder clay. This was fairly consistent across the area investigated, although there was some variation, particularly in the south-eastern part of Area 1, where there was more colour variation and a greater concentration of rounded stone inclusions. Some limited disturbance (< 0.1m) caused by modern ploughing was evident to the subsoil and the upper horizon of archaeological deposits, and a parallel series of clay field drains cut through the site following the lie of the land, which falls gently from south-west to north-east within the enclosure. Their position is shown on the site plan (Figure 3.4); they were particularly clear where they cut through an area of stone spreads in the eastern corner of the site.

Figure 3.5
View from the west, showing the palisade, main ditch and field drains

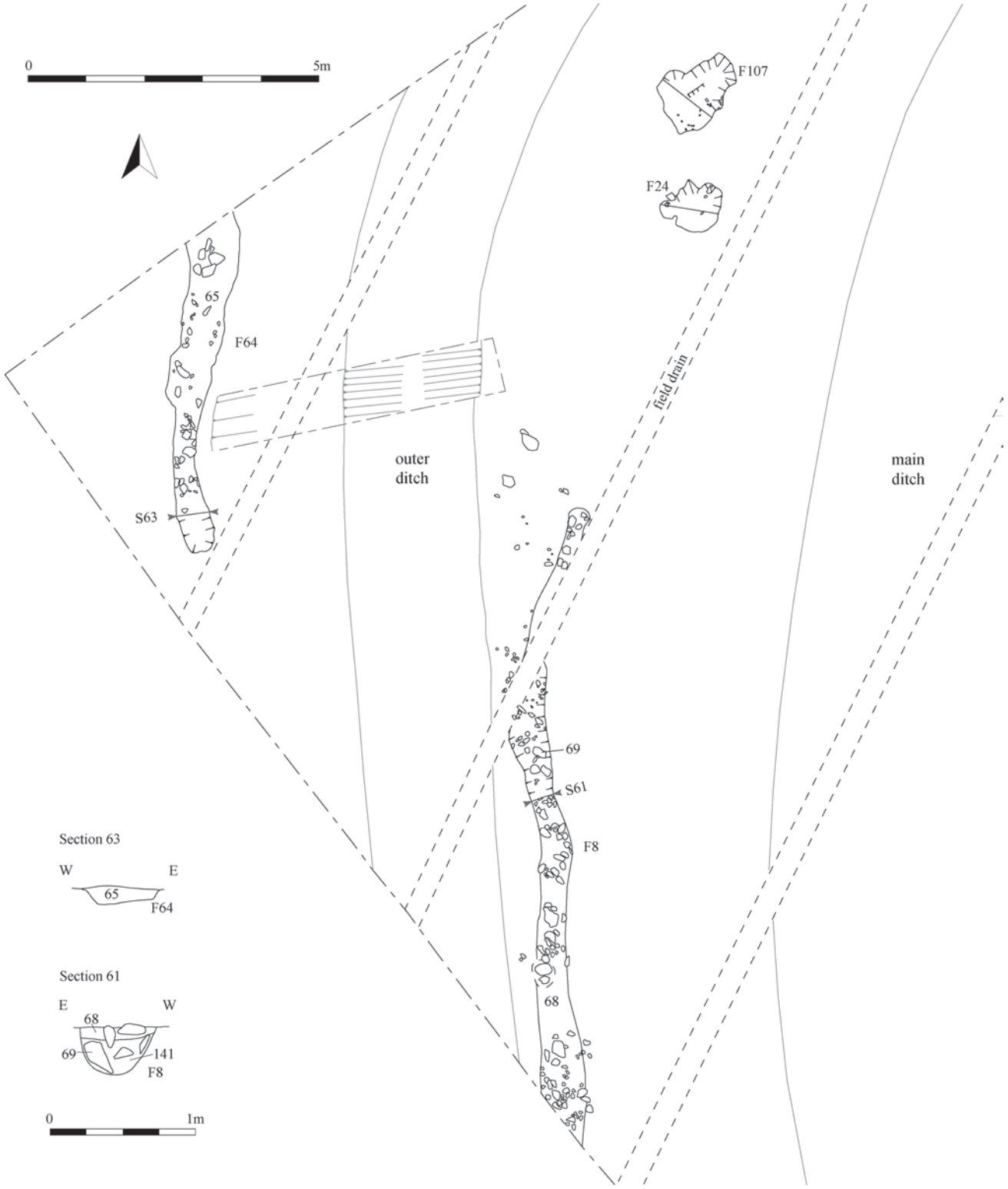


Figure 3.6
Plan and sections of the palisade

THE ENCLOSURE

Four separate enclosure elements were investigated: the two major ditches which generated cropmarks, together with a smaller ditch and a palisade (Figure 3.5). All are broadly concentric, suggesting that they are in some way inter-related, but there were no direct stratigraphic links between them. Nor was there a simple relationship between them and the features in the interior.

The palisade

In the north-western corner, the remains of two lengths of palisade concentric to the outer ditch were uncovered, one lying a short distance outside the ditch, the other just inside its inner edge (Figure 3.6). The inner slot (F8) was traced over a length of *c.* 11m, following a somewhat sinuous path, but running generally parallel to the inner edge of the ditch. At its northern end the slot turned slightly inwards, away from the ditch, before butt-ending. A more recent field drain cut through it at the point where it changed direction, so that it now appears discontinuous in plan. The palisade had a U-shaped profile with a depth of 0.33m and a width between 0.52–0.70m. Embedded in the lower silty clay fill [141], were numerous large stones and boulders up to *c.* 0.3m in size [69], some set along the edges and base of the slot and evidently the remains of packing for upright timbers. A single sherd of undiagnostic hand-made pottery (sf 4) was found in the upper fill [7 = 68].

The outer slot F64 continued the general alignment of F8, but offset 6m to the west, following the outer edge of the ditch. This slot was revealed over a length of *c.* 6m and was of similar width. Its southern terminal curved inwards slightly before butt-ending. The butt-end was only 0.13m deep, having been truncated by another field drain. This slot too contained numerous packing stones [66] set in silty clay [27 = 65], from which a few flecks of burnt bone were recovered.

The layout and similarity of the two palisade segments suggests an offset entrance. There is no stratigraphic relationship with the outer ditch, but given their occurrence at a point where the ditch is continuous, they are unlikely to be contemporary (although the similarity in alignment suggests that they may not be far removed in date). On balance, the palisade seems likely to be earlier, since a later entrance here would have had to contend with the residual hollow of the ditch. In addition, the better preservation of the inner palisade would be consistent with its having been protected by an internal bank accompanying the ditch. Assuming it continued on the same alignment (as opposed to stopping or veering away to the west), the palisade should have re-emerged in the top part of the site, but could well have been ploughed out, since the ditch also appears to have been truncated here (below).

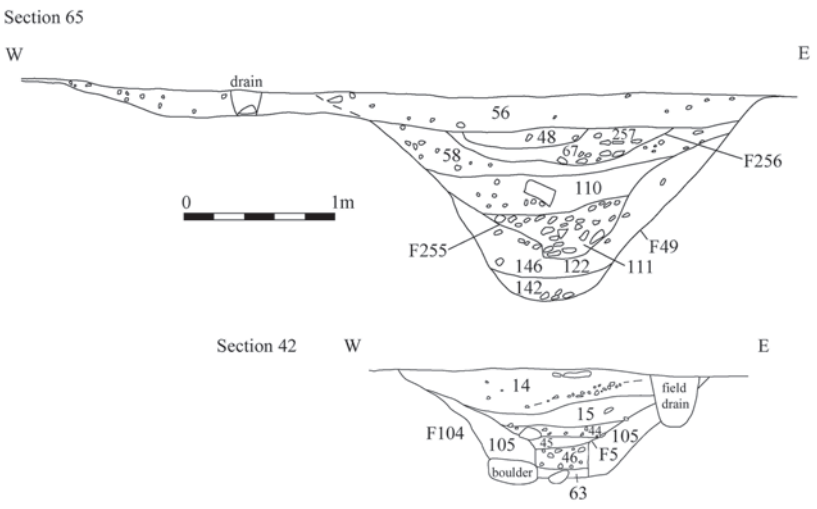


Figure 3.7
Sections through the outer ditch and photograph of cobble-filled slot in base of recut F5

The outer ditch

The outer ditch was examined in two places, a 3m length in the highest part of the site in the south-west corner of Area 1 (Cutting 1), and a 1m section in the north-west corner (Cutting 2). No evidence for a break in the ditch was identified within the areas examined and the cropmarks seem to indicate that it was continuous between these points. Excavation revealed two main phases of ditch (Figure 3.7).

The primary ditch

The original outer ditch had sloping sides, with slightly different profiles in the two sections, becoming more substantial as it descended the hill. The fall in levels between the bases of the primary cuts in the two sections is *c.* 1.7m. In Cutting 1 (F104), it was 2m wide and 0.65m deep, with a flattish bottom interrupted by several natural boulders not removed by the ditch diggers. In Cutting 2 (F49) the ditch was substantially wider (2.5m) and deeper (1.2m), but maintained the same overall profile. In F49, a layer of silty clay [142] had formed in the base of the ditch, above which was a substantial deposit of clay with silt which almost filled the ditch [146 = 122]; the equivalent deposit in Cutting 1 was a tan coloured silty clay [105], which again extended most of the way up the ditch.

Second ditch phase

A second phase of boundary ditch was dug through the infilled earlier ditch, creating a feature of similar depth, but with a markedly different profile and character from its predecessor – and to a certain extent between the two cuttings.

In Cutting 1 (F5), the recut ditch had shallower sloping sides than its predecessor, but with a pronounced, vertically sided slot, of the kind often termed an 'ankle-breaker', 0.35m wide and 0.2m deep in the base. Apart from a thin basal silt [63], the slot was filled with cobbles and small stones [46], perhaps as an aid to drainage (Figure 3.7, photo). Above this were alternating layers of silty clay [45; 15] and stones [44; 37]. The first of these stony layers [44] covered the bottom of the ditch, whereas the upper layer incorporated some more substantial stones.

In Cutting 2, the recut had a broadly similar profile, but the basal slot was less pronounced (F255). It was filled with stones in yellowish brown clay [111], broadly analogous to the basal deposit in Cutting 1, although not so obviously laid. A piece of birch charcoal from [111] yielded a date of 3350–3030 cal BC (SUERC-10617). Covering it was a layer of dark silt [110] with some stones, which might conceivably relate to the middle stony episode in Cutting 1. Within the overlying sandy loam [58], another possible shallow cut 1.5m wide (F256) was observed, perhaps indicating a partial redefinition of the boundary, but containing quite a lot of stone [257], which may well be equivalent to the upper stones in Cutting 1. The remainder of the ditch in both cuttings was filled with more silty deposits [14; 67], but in Cutting 2, this incorporated

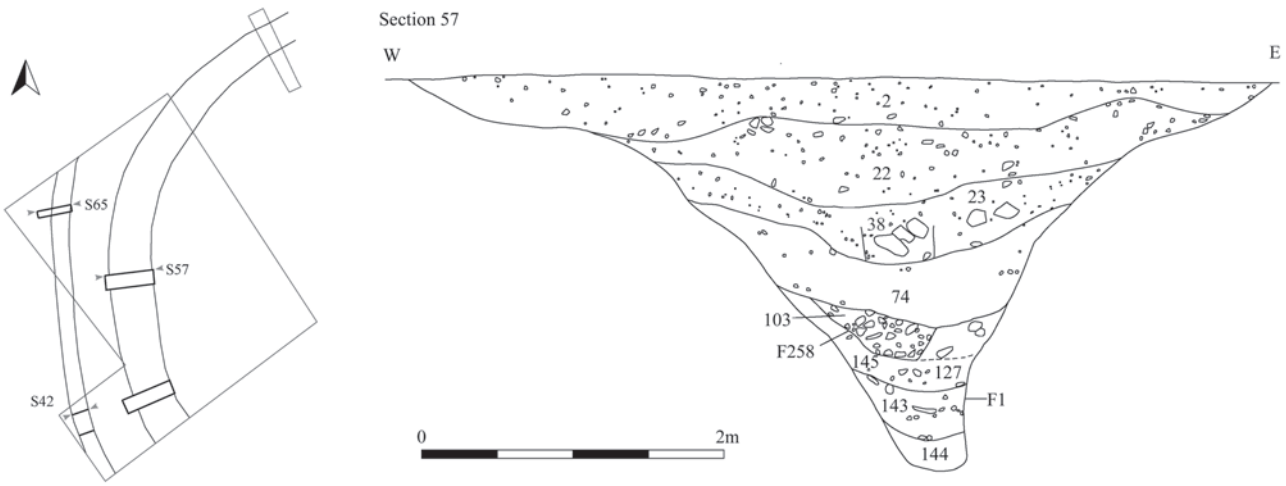


Figure 3.8
Section of main ditch

a deposit of charcoal, fuel ash and burnt stones [48], perhaps the remains of a fire or hearth, and the top of the ditch was covered by a thick deposit of loam [56], most likely agricultural in origin. The absence of an equivalent deposit in Cutting 1 and the smaller overall dimensions of the ditch there is consistent with its truncation by modern ploughing.

The main ditch

A continuous length of the main ditch was revealed running across the excavated area. This was substantially larger than the outer ditch, with which it is concentric. A 2m-wide section was excavated near the centre of the excavation (Cutting 1); a second partial section was positioned in the south-west corner of the site, where patches of cobbles were visible on either side of the ditch (Cutting 2), just to the south of the point at which the ditch was first located in the evaluation.

The ditch was 5.65m wide and proved to have two main phases (Figure 3.8). In its first incarnation (F1), it had a steeply sided V-shaped profile, the lower edges becoming even sharper below a depth of *c.* 1.75m, defining a narrow, near vertically sided cut with a slightly rounded base, giving a total depth of 2.6m. The upper part of the ditch was fairly wide, with a shallow lip on each side, probably the result of erosion.

After a period of neglect, during which the lower part infilled with a series of silt and silty clay layers [144, 143, 127, 145], the ditch was recut or cleaned out (F258). This new cut was 1.85m deep, so the ditch remained very substantial. In time, the recut filled up with clay and cobbles [103], above which a thick layer of sandy clay [74] formed, presumably due to erosion from the sides. Above lay another thick deposit of silty sandy clay [23] incorporating a substantial deposit of large boulders in blue clay [38] which had collected along the inner edge and centre of the partly infilled ditch; the most likely interpretation is that this deposit derives from an internal bank and its revetment, which had partly collapsed or been pushed back into the ditch. The ditch then filled up with clayey loam [22], eventually stabilising as a slight hollow.

No finds were recovered from the ditch fills proper, apart from fragments of a cattle tooth from [38] and a triangular stone slab decorated with incised lines (sf 15), found in the uppermost fill [2]. Two radiocarbon dates were obtained: a fragment of birch charcoal from the basal fill of the recut [103] yielded a date of 1200–940 cal BC (SUERC-10615); a second fragment from the stony deposit higher up the fill [38] gave a date of 340–540 cal AD (SUERC-10609).

Cutting 2 (2m wide) examined the ditch at a point where a cobbled path was visible on its outer and inner edges, in order to verify the stratigraphic relationship between the ditch and the cobbles. Only the uppermost deposits were investigated. The sides of the ditch (F60) began to drop away sharply at a depth of *c.* 0.4m, at which point it was 3.1m wide (comparable to the profile in Cutting 1). The cobbled surface [3; 4] proved to have been laid right across the surface of the ditch, resting on a deposit of silty clay [121], which closely resembled the penultimate fill in Cutting 1.

This laid surface was aligned with the south-western end of a linear feature, which appears to have been a path or track running across the interior of the site (F77 below). An elongated shallow lip on the outer edge of the ditch implies that this had been in use for some time before the cobbles were laid down, presumably to improve the surface where it ran across the ditch.

In both sections, the top of the ditch ultimately filled up with loam [2; 61], which resembled the surface fill of the outer ditch, and appears to be ploughwash.

The course of the main ditch was also confirmed further down the slope in a 2m wide trench in the orchard area east of the main site (Area 2; Figure 3.3 above). At this point the top of the ditch (F269) was only 4.7m wide; it was not further investigated. Here too, the ditch was covered with ploughwash [273], indicating that the orchard area had previously also been under cultivation, so that survival is unlikely to be any better in this part of the interior. The only other feature identified in Area 2 was a field drain.

The inner ditch

A third, much smaller ditch was identified just over 8m from the inside edge of the main ditch and concentric with both the other ditches. This feature is not apparent on the air photographs or geophysical survey, being obscured and truncated over most its length by later features. It could nevertheless be traced for 25m running from south to north right across the site (Figure 3.9), although the southern part had been very largely removed by a later pit complex (F85).

The ditch was investigated in five separate locations. Even where best preserved, it was no more than 0.85m across and 0.4m deep, with an essentially V-shaped

profile and a rounded base (F9). For the most part, it was filled with silty clay [10; 114; 139; 187; 210; 211; 216]; small patches of cobbling were noted in the base in several places, perhaps as an aid to drainage. There was no evidence for settings for upright timbers, implying the feature was not structural. A possible recut was observed at one point (F186), but only in one place was the ditch was observed to cut through another feature (F259), suggesting that the ditch was one of the earliest features in the interior.

The role of this ditch and its relationship with the other circuits is uncertain, but it does not seem substantial enough to have demarcated an enclosure on its own, whilst its concentricity with the other ditches argues that it referenced, or was referenced by, one or both of them, implying that it is not far removed in time. Since the distance to the outer ditch is too great (20m) for them to have functioned together in a meaningful way, any relationship is likely to be with the main ditch. However, the inner ditch does not seem close enough to the main ditch to mark the back of an accompanying bank (although the bank might have spread over time), but it would have been well-positioned to prevent water running off the bank from draining across the sloping interior. Whether or not this was its purpose, it clearly went out of use well before the overlying cobbled surface was laid, since there are various intervening features, evidently representing more than one phase of activity.

Banks

No *in situ* remains of banks were recovered next to any of the enclosure ditches, nor was there conclusive evidence from their fills, apart from the tumbled stone mid way up the fill of the recut main ditch. This appears to have derived from the eastern, inner edge, and could well be the remains of a bank revetment. Equally it is noticeable that a band of the same width as the main ditch, and immediately inside it, is devoid of features, as essentially is the area between the two larger ditches, apart from the palisades and a couple of shallow scoops. This suggests that banks probably did accompany the two larger ditches. Indeed, a bank inside the outer ditch may have contributed to the apparently better preservation of the inner arm of the palisade (assuming that it is earlier). At the same time, there are a number of features in the space between the rear limit of the putative main bank and the small inner ditch.

The enclosure entrance

No break for an entrance though the ditches was apparent within the excavated area or on the air photographs of the south-western part of the enclosure. The geophysical survey does, however, hint at a possible gap in the inner and outer ditches close to the northernmost point of the circuit (Figure 3.3), which might mark the position of an entrance giving onto the gully leading to Whittingehame Water. As we have seen, the cuttings through the outer ditch imply that the earthworks became more substantial as they descended the slope, which would be appropriate on the entrance side, although this effect could also be a function of more severe plough truncation at the top of the site and/or in deference to the topography.

THE INTERIOR

The main feature of the interior is a large scooped area with a cobbled surface. As we shall see, this was created at a time when the main ditch – although by then largely silted up – still formed a significant physical boundary, whereas the inner ditch had gone out of use and in fact is sealed by the cobbling associated with the scoop.

In the area close to the inner ditch, the excavation revealed a cluster of different types of cut feature, evidently representing several phases of activity. The task of phasing these features is far from straightforward; as they form no coherent structural plan and such relationships as exist do not always help! Various features, including some that cut the ditch are sealed by one or both phases of cobbled surface; they seem to represent at least two phases of activity and possibly as many as four. Others cut though the ditch, but cannot be related to the surfaces. A further group are either contemporary with the scoop or even later, but this leaves a residue, especially west of the ditch, which could be of any phase.

The features most likely to represent occupation contemporary with the main enclosure ditches are described first. Digging the scoop will have removed any insubstantial traces of earlier occupation in the area further away from the inner ditch.

Features pre-dating the scooped settlement (Figure 3.9)

As noted above, only a single feature, a small pit (F259, 0.5m deep) filled with fire-cracked stones and burnt silty clay [260], can be shown to be certainly earlier

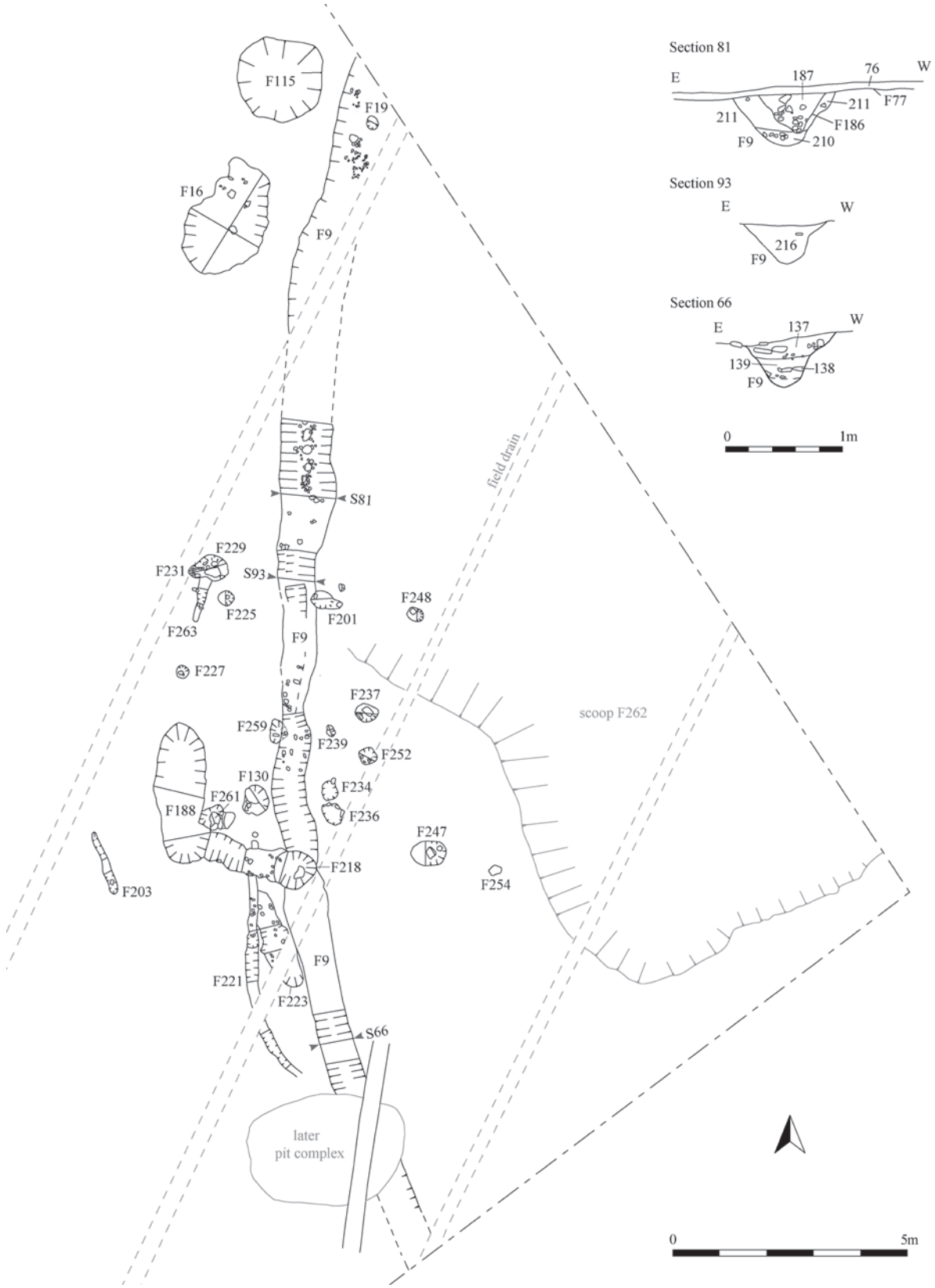


Figure 3.9
Plan and sections of inner ditch, early cut features and scoop

than the inner ditch. A fire-cracked sandstone boulder (F261) and another, shallower pit (F130, 0.15m deep) with fire-cracked stones and charcoal in its lower fill [181] lay just over 1m away and might be connected. The upper fill [168] of this second pit (which was sealed beneath the first cobbled surface) contained two large flat stones that might have been post supports.

Prominent among other features sealed below the early cobbled surface were two post-pits just under 3m apart and perhaps a pair (F247; F218). Both were of similar depth (0.35–0.38m) and contained a number of large packing stones in clayey fills. One of them (F218) cut the inner ditch as well as a gully beyond it (F152), one of a series of intercutting gullies west of the inner ditch. The earliest of these (F223) – an elongated feature some 2m long and 0.4m deep – may also have cut the inner ditch, but the relationship was obscured by a field drain. F223 was cut by a narrow, curvilinear gully F221, which was traced for a distance of *c.* 6m; its southern end was cut away by a later pit complex, whilst its northern end appears to tail out. Apart from one possible stake-hole at its northern end, there was no conclusive evidence for uprights and the gully seems too irregular to be the wall of a building, although it could perhaps mark a fence line or less regular structure. F221 was in its turn cut by gully F152. At its western end, F152 intersects at a near right-angle with another broad shallow gully (F188, 3m in length); the two together might form the remains of some kind of structure. Precisely how many phases of activity are represented is uncertain, since some of the inter-cutting gullies may nevertheless be essentially contemporary, but there are at least two and possibly up to four. Completing this group of features were three post-holes (F234, F236, F252), which are more rectangular in plan than the others in the area.

The remaining features sealed by the earlier cobbled surface consisted of a broken saddle quern (sf 6) set into the ground surface, which might have been re-used as a post-pad (F254) and a handful of post-holes of different sizes containing packing stones, none deeper than 0.15–0.25m (F201, F225, F237, F239, F248). F201 (which cuts the ditch) and F248 may have formed a pair, whilst F225 might form a pair with the similar F227, which lies beyond the cobbled surface, 1.8m to the south-west.

Unphased features

A number of unphased features are most usefully mentioned at this point, as some of them may well pre-date the scooped settlement. The best candidates are two pairs of irregular, shallow pits or scoops (0.1–0.2m deep;), given their general resemblance to other features mentioned above. The first pair (F24; F107) lay between the main and outer enclosure ditches, north of the inner palisade, in a position where they would have been sealed by any bank associated with either ditch (Figure 3.6 above); they might therefore belong to the same phase as the palisade. The second pair (F16; F115) were located a little the north of the main concentration of cut features, beyond the area of the scoop but within the likely line of any bank for the main enclosure. These are slightly larger and more regular than the first, with silty clay fills.

Among the other unphased features are an intercutting pair of post-holes (F229; F231), connected to a short stretch of gully (F263). Finally, post-hole F19 cut into the north end of the inner ditch appeared comparable to other features and included two cobble tools in its stone packing (sf 13; sf 17), but charred barley in the fill yielded a post-medieval date (SUERC-10606), casting some doubt on its age.

The digging of the scoop and the first cobbled surface

In the eastern corner of the excavation, a broad and shallow scoop (F262) had been cut into the natural slope, creating a level, sub-rectangular platform roughly 5×7m in extent within the excavation, but extending beyond it to the east. The scoop had a sharp lip at its southern end, but the western edge was gentler. This terracing would have removed any smaller structural features associated with the earlier occupation described above.

The scoop had been surfaced with a layer of small rounded cobbles [31 = 32 = 75], bedded in a gritty layer [123, 124] (Figure 3.10A, B). There is no evidence for any accumulation of material in the scoop, or of features pre-dating the cobbles within it, which suggests that the surface is primary. Although the cobbles closely followed the southern edge of the terraced area, they extended beyond it to the west and north – covering the infilled inner ditch and many of the features described above – so that the total area covered is some 12×10m. The western edge of the surface was truncated by a later track through the site, but it appears to peter out at around the projected location of the bank for the main enclosure ditch, suggesting that the bank remains were still evident when the surface was laid. One sherd of hand-made pottery (sf 8) and scattered fragments of burnt clay

Figure 3.10 (A)
Plan of earlier cobbled surface

Figure 3.10 (B)
View of earlier cobbled surface, showing later field drains

were found among the cobbles [31], whilst a second sherd (sf 2) was found on top of them [87].

Other signs of contemporary activity were restricted to a small scoop with a charcoal-rich fill cut into the cobbling (F96) and a post-hole (F99), which occupies a void in the cobbling, and so *could* alternatively belong with the previous occupation. A stone spread along the southern edge of the scoop [118] may represent an episode of resurfacing or levelling before the new surface about to be described. A charred barley seed from within [118] produced a date of cal AD 60–240 (SUERC-10618).

The later cobbled surface and paving

A second surface was established over the western two-thirds of the first one, largely outside the scoop. This new surface covered an overall area of *c.* 9m × 8m and comprised areas of larger paving [47] as well as rough cobbles [21], the latter generally larger than in the earlier surface and including a fair amount of fire-cracked and burnt stone (Figure 3.11). Within the scoop, the existing cobbling appears to have continued in use, unless [118] is in fact part of the new surface.

On the eastern edge of the new surface, beside the scoop was a sub-circular paved area of large flag stones around 4m across, its north-west corner cut through by one of the field drains (Stone Structure 1; Figure 3.12). On analogy with other sites in the region such as St Germains (Alexander and Watkins 1998), this is likely to be the remains of a stone structure or building of circular or sub-rectangular plan. No traces of a wall-line were observed, however, whether stone settings or post-holes, or wall foundations. A little to the south lay a discrete smaller patch of paving. This may be the remains of another structure, since to its south-east was a spread of larger stones [109] extending down the slope into the scoop over [118], too uneven to be an *in situ* surface, but which could be later tumble or collapse.

On the south-west side of Stone Structure 1 was an L-shaped arrangement of stones set on edge in a manner resembling hearths found at other sites. There was, however, no obvious evidence of *in situ* burning, although its silty clay [39] fill did yield two of the site's more diagnostic finds – a copper alloy and blue enamel stud (sf 1) and part of the base of a second century AD Drag 31 samian bowl worn almost beyond recognition

Figure 3.11
Plan of later paved surface, with later cut features, showing location of later pathway

Figure 3.12
Stone Structure 1 under excavation, from the east

(sf 9)! Also apparently integral with this later surface were two substantial steep sided circular post-pits, 7m apart (F128; F199). Both were of similar dimensions (0.8–0.9m across; *c.* 0.55m deep) and were densely packed with large stones set in clay (Figure 3.13). F128 was clearly visible in plan at this level; F199 lay beneath the later track so its relationship it less secure, but the similarity in construction makes it likely that it too belongs to this phase. F199 was connected with a short segment of narrow gully F242, running north-west out of the top of the pit. The gully contained a row of slabs laid on edge, and its charcoal rich fill [241] perhaps indicates the *in situ* burning of wooden structural remains.

To the east of the paved areas, a series of silty loam deposits formed in the area of the original scoop [98, 52, 11], eventually infilling the hollow and covering rubble spread [109]. Two cobbles utilised as hones (sf 3; sf 12) were found in [98]. This lower deposit seems to have accumulated gradually, whereas the two upper deposits [52, 11], which contained large quantities of carbonised barley and seaweed, presumably accumulated as a result of activities undertaken nearby; a few chips of burnt bone also survived. Radiocarbon dates of cal AD 330–540 and 350–550 (SUERC-10599; 10600) were obtained from burnt barley and hazelnut in the upper deposit [11].

Other late features

Around the edge of the cobbled area were a number of other features that cannot be related stratigraphically to either surface, but appear from associated radiocarbon dates to be broadly contemporary with the later deposits in the scoop.

The pit complex

The most prominent of these was a large sub-rectangular pit approximately 2.5m × 3.5m across (F85), lying just beyond the south-west corner of the cobbled area; this seems to have been recut once (F86) and also cut through the old inner ditch [114] (Figure 3.14). A series of thin deposits of loamy clay around the western and southern sides [88; 89; 94; 106] were all that remained of the original pit fill. The recut increased the depth of the pit slightly in the centre

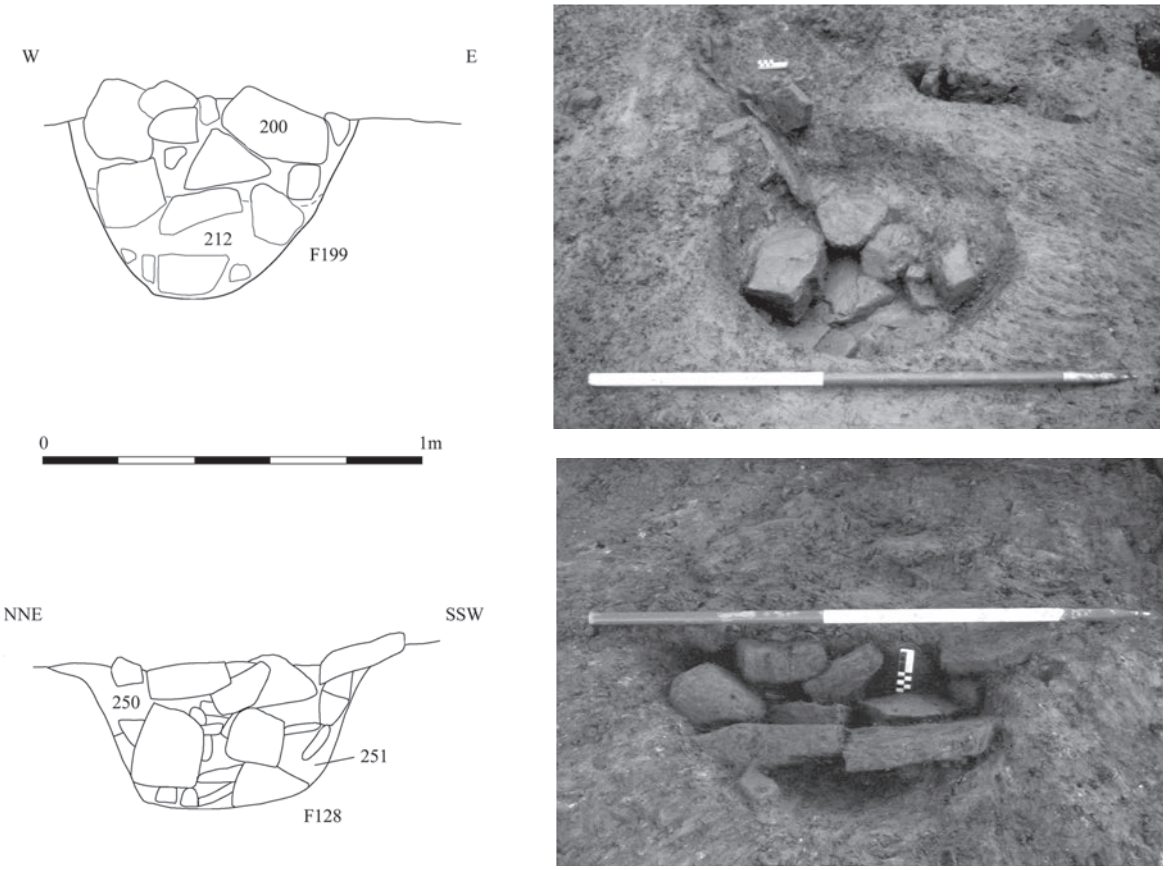


Figure 3.13
Stone packed post-holes F128 & F199

to 0.65m, although a deposit of bluish clay [93] at the centre, beside a large flat boulder in the natural subsoil, was strictly speaking perhaps the result of gleying rather than anthropogenic. Covering both of these was a layer of reddish-grey silty clay [87], whilst a deposit of clay with small stones [43] around the shallower southern edge, from which a rubber or polisher (sf 18) was recovered, may reflect erosion whilst the pit was open. Lining part of the northern side of the pit was a blackish deposit [113], perhaps a natural staining or concretion as there was no clear evidence of burning.

Around the pit were a number of features, which may represent a screen around it, since, as with the pit itself, there appeared to be two phases. The first is on the east side of the pit, and comprises a 2.5m long curvilinear gully (F12) filled with charcoal-rich sandy clay [13]. Cut into this were the remains of a post-setting (F33) perhaps replacing an earlier post-hole (F101), whilst further around the pit's circumference were two more post-holes, one of which (F72) cut the fill at the edge of the first pit phase, the other just outside (F91); a small scoop on the edge of the pit might mark the position of a third. Together the post-holes and gully form an arc of diameter 4.75m, enclosing the northern side of the pit, but leaving the southern side open for access, which suggests they were contemporary. It remains possible, however, that the gully and post-holes instead relate to a shallow scoop F90, which was later dug into the southern edge of the infilled pit and was itself filled with stones [18].

Following its use, the upper part of the pit was backfilled with loam and large stones, perhaps deriving from an adjacent structure [42; 71] and was capped by a thin layer of reddish, slightly stony clay [40], from which a piece of fired clay was recovered. This final infill clearly post-dates the later cobbled surface, although the relationship of the pit itself to

the cobbles is less certainly proved. A charred cereal grain from the lowest surviving fill of the first pit [106] produced a date of cal AD 420–590 (SUERC-10616), whilst emmer and barley grains from one of the adjacent post-holes (F33) yielded determinations of cal AD 400–560 and cal AD 410–570 (SUERC-10608; 10607). These very consistent dates tend to confirm the view that the pit and the post-holes were contemporary and also that the pit itself was dug after the second surface was laid.

Other features

Some 6m to the north of the pit, in the same area as the earlier pits and gullies, but underlying the later track across the interior, were two pairs of intercutting pits of similar dimensions. In each case, a fairly substantial steep-sided post-pit (F182; F193) containing packing stones had been cut through an earlier shallow scoop (F205; F213). The base of both post-pits had a thin layer of grey clay, above which was a fill of clayey loam and stones. Samples of charred grain from the basal clay [195] in F193 yielded dates of cal AD 400–560 and cal AD 330–540 (SUERC-10621; 10625), whilst a charred oat grain from the lower fill [184] of pit F182 produced a date of cal AD 410–570 (SUERC-10619). A pea from the same deposit, however, proved to be post-medieval (SUERC-10620) and is presumably intrusive.

Also belonging to this general period is a shallow scoop F54 to the north-west of the cobbles, from which hazel charcoal yielded a date of cal AD 250–530 (SUERC-10610).

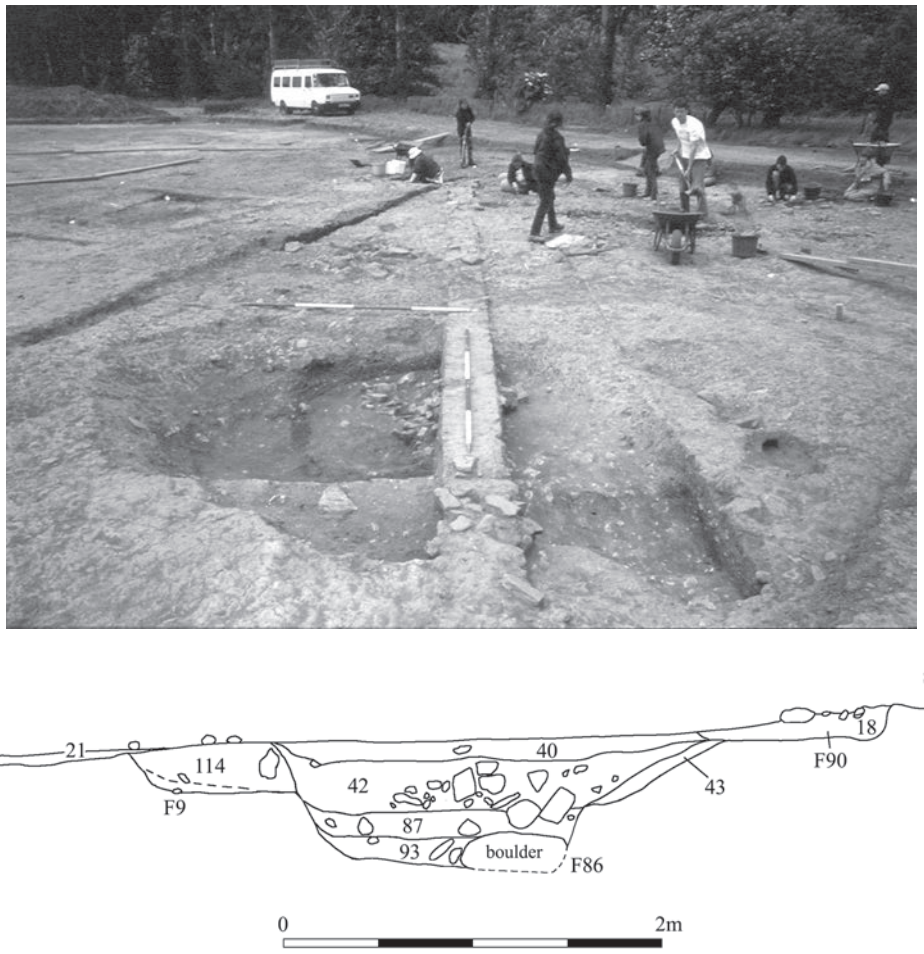


Figure 3.14
View of pit area during excavation and section

The trackway and later agricultural features

Some time after the abandonment of the settlement, a path or track (F77) was worn across the enclosure, discernible as a shallow hollow around 2.5m wide, skirting the north-western side of the former scoop (Figure 3.11 above) and running over a slight hollow marking the site of the main ditch, where a spread of small cobbles [3, 4] had been laid to stabilise the surface over the largely backfilled main ditch, after which it tailed off. To judge from the degree of erosion, this path was in use for some time, but the only archaeological dating evidence was a single abraded sherd of hand-made pottery (sf 11), which is clearly residual.

A period of agricultural use then followed, of sufficient duration for ploughsoil to fill the tops of the ditches, but pre-dating the insertion of a series of ceramic field drains, spaced at *c.* 5m intervals, presumably in the course of nineteenth century agricultural improvement. Like the trackway, these traverse the site on a north-east to south-west alignment, cutting the underlying archaeology to a depth of 0.3m.

DISCUSSION

The radiocarbon dating is presented in Chapter 9. As we saw, the excavated evidence only enables the site to be partially phased, since the enclosure ditches cannot be related to one another, or apart from the inner ditch, to the sequence in the interior. With the help of the radiocarbon dates, a fairly detailed picture of the later stages of occupation can be proposed, but the same unfortunately cannot be said for the enclosures ditches and the early features beneath the cobbles, which were largely barren of suitable samples, a problem compounded by the absence of diagnostic artefacts.

Before presenting a model for the site, we therefore need to review the evidence for the three enclosure circuits. Their concentricity suggests that at the very least they referenced each other, whilst the tops of both larger ditches were evidently still visible hollows when the last occupants abandoned the site. There is also reason to believe that (1) the palisade slots were replaced by the outer ditch; and (2) the inner ditch was an adjunct of the main ditch rather than an independent circuit. Both larger ditches displayed evidence of recuts.

Investigations at Bannockburn and Broxmouth have shown just how complicated sequences of enclosure can be (Hill 1982; Rideout 1996). Discussion here will therefore be restricted to the merits of the two simplest models for Whittingehame. These are that the two main circuits represent discrete remodellings, or that essentially they belong together. Taking the first model to begin with, there are in fact arguments both for and against. In potential support is the Neolithic radiocarbon date from the outer ditch recut, whereas charcoal in the main ditch recut yielded a Late Bronze Age date. Neither sample is taphonomically secure, however, and pottery of later prehistoric character was found in the palisade. Unless other regional examples emerge, a Neolithic date for the outer ditch is probably to be discounted. The other argument against the outer circuit being an earlier settlement boundary is the lack of features beneath the bank of the main ditch (two pits between the circuits would have lain beneath the bank of the outer ditch). The outer ditch also seems unlikely to post-date the main ditch, since it would have been easier to recut the existing ditch – unless more living space was required, in which case we might expect the top of the existing ditch to be infilled, which it was not.

The absence of clear evidence that the two circuits represent individual remodelling episodes leaves us with the possibility that they belong together. If so, the simplest scenario is to see the main ditch and bank as originally fronted by a palisade, which was superseded by a ditch. The gap through the palisades might have served to channel people and animals entering the site into the area in front of the ditch and towards an entrance lying further round the main ditch circuit to the north, screened from direct access by the palisade. When the ditch replaced the palisade, either the entrance was now approached directly, or a new palisade was erected outside the area investigated.

A Late Bronze Age date for the enclosure is plausible in the light of broadly similar dates from Standingstone and East Linton (Chapters 4, 6) and on Traprain Law itself, whilst the steep-sided form of the main ditch recalls some of the Standingstone cuts. Against this, earthworks on the scale of the Whittingehame main ditch are generally of Later Iron Age date in southern Scotland, as at Bannockburn (Rideout 1996), Brixwold (Crone and O'Sullivan 1997), Fishers Road West (Haselgrove and McCullagh 2000) or St Germains (Alexander and Watkins 1998); Broxmouth is the only excavated site in East Lothian with even larger ditches.

The pottery in the palisade apart, the only other pointers to the date of the enclosure are (1) the reused saddle quern from below the first cobbled surface; and (2) the late/post-Roman Iron Age radiocarbon date from among the bank remains higher up the main ditch fill. The former would accord better with occupation before the final centuries BC (but does not demand it), whilst the latter shows that by the mid-first millennium AD, the main earthwork was no longer being maintained, notwithstanding intensive activity in the interior at this time.

Pottery and rotary querns are both reasonably common on settlements occupied at the turn of the first millennia BC and AD in East Lothian, including Broxmouth, Foster Law, Knowes, Phantassie, and St Germains (Chapter 7), perhaps providing a further argument against occupation at Whittingehame at this time. There is no hard and fast rule, however – the extensively excavated site at Fishers Road East (Haselgrove and McCullagh 2000) only yielded 12 sherds of pottery and one saddle quern – and the limited quantity of the former and lack of rotary querns at Whittingehame might just be down to the particular part of the site explored.

In view of the limited signs of pre-enclosure activity, the simplest option is probably therefore to take the Late Bronze Age radiocarbon date and the other late prehistoric finds at face value and to suggest that the Whittingehame enclosure was constructed and occupied at this period. The recutting of the ditches could however have taken place at a later date. As we will see in subsequent chapters, there is evidence of renewed episodes of ditch digging in the Later Iron Age on a number of other enclosures in East Lothian that were originally founded in the Late Bronze Age and/or Earlier Iron Age.

In the light of this discussion, the preferred chronological model for the site will now be presented, bearing in mind that various alternatives are also possible.

1. Neolithic?

Judging from the radiocarbon dated charcoal in the outer ditch, there was some kind of activity on the site in the middle Neolithic. No definite context was apparent, but it may be relevant that one of two adjacent early pits containing fire-cracked stones was cut by the inner ditch, whilst a nearby post-hole yielded bread wheat (F234), a species which does sometimes occur in the Neolithic (Chapter 8). It is possible that these and some of the other unphased features in the cluster behind the main rampart represent a phase of pre-enclosure occupation.

2. Late Bronze Age/Earlier Iron Age enclosed settlement

There was apparently no further activity until the Late Bronze Age. Either then or in the Earlier Iron Age, a semi-circular enclosure was constructed on the ravine edge. Initially, the main ditch and bank were screened by a palisade, with a break on the north-west side of the circuit. This may have served to channel people and animals towards an entrance further along the circuit to the north, well-placed to give access to Whittingehame Water below.

The palisade was later replaced by an outer bank and ditch, while a smaller ditch behind the main bank and ditch silted up. Less is known about the contemporary occupation in the interior of the enclosure, but several phases of activity are represented in the area immediately behind the main bank, implying that it was of some duration. The various gullies and post-holes form no coherent structural plan, however, and the only finds from this period were a broken saddle quern reused as a post-pad and a single potsherd from the palisade. Both earthwork circuits were remodelled at least once during the lifetime of the enclosure, although precisely how much later is unclear.

3. The Roman Iron Age scooped settlement

Probably after a significant period of abandonment, the enclosure was reoccupied. The new occupants dug a large shallow scoop into the slope – in the process probably removing some of the evidence left by the earlier stages of occupation – and a cobbled surface was then laid over the scoop and much of the adjacent area inside the main ditch and bank – at this stage still a substantial earthwork. Again dating evidence is limited, but a single radiocarbon date from a secondary cobbling episode and a residual sherd of worn later second century AD samian imply that this reoccupation dates to the Roman Iron Age.

The first cobbled surface was later replaced by another laid directly over its predecessor. This second surface, however, included areas of more substantial paving, which are likely to be the remains of one or more stone buildings similar to those known on other Roman Iron Age sites in East Lothian. A small number of other features appeared to be contemporary with

the use of this second surface, including the remains of a possible hearth and some post-holes.

4. Post-Roman occupation

It then seems that the focus of habitation shifted out of range of the excavated area or the settlement may even have been abandoned again, as shown by the collapse of at least one of the stone structures and soil accumulation over the floor of the scoop.

After some time had elapsed, the western end of the enclosure once again became a focus of activity. This resulted in the upper part of the scoop being filled with soil containing a significant amount of burnt material including both cereal and seaweed, the latter perhaps having been brought to Whittingehame for use as a fertiliser. A large pit with two distinct phases and protected by a screen was dug next to the surface, along with a number of other scoops and post-holes. Many of these other features also yielded fairly rich carbonized assemblages, again attesting to the agricultural nature of much of this activity.

In contrast to the paucity of radiocarbon determinations for the earlier periods, several dates were obtained, placing this phase of activity firmly in the early post-Roman period; according to the modelling undertaken in Chapter 9, this phase probably ended in the sixth, if not the seventh, century cal AD. Although this post-Roman activity seems fairly intensive, it need not follow, however, that the settlement was permanently occupied at this time. The remains of the enclosure might simply have provided a convenient place for processing crops close to where they were grown. The tight dispersion of the radiocarbon dates would allow the relevant activity to have been of relatively short duration – although long enough for some structures to be replaced – whilst it was around this time that the bank revetment finally collapsed or was pushed down, showing that by now the occupants no longer had any interest in keeping the ditch even partly open.

5. Post-Medieval and modern

Probably long after the settlement had been abandoned, a spread of cobbles was laid at the point where a relatively long-lived path or track crossed the hollow left by the main ditch. A period of agricultural use followed, during which the tops of the ditches filled up with ploughsoil, and finally, in the nineteenth century, a series of regularly-spaced field drains were inserted to aid drainage on the heavy clay soil.

Chapter 4

Excavations at Standingstone

COLIN HASELGROVE, PETER CARNE and LEON FITTS
(with contributions by Alison Sheridan and Charlotte Henderson)

The enclosure at Standingstone is situated on the western flank of a low rise some 2km to the south-west of Traprain Law at 110m AOD (Plate 1). It was first recorded in 1976 by RCAHMS, when two aerial photographs were taken. On one image a roughly C-shaped arc of ditch can be seen, while on the other image, taken from a different direction, it requires the eye of faith (and the other image) to see the feature. Fortunately 1977 produced a clearer cropmark (Figure 4.1), recording the line of an arcing ditch which describes about two-thirds of a circle, broken by a wide gap on the north-west and, apparently, a narrower gap on the south-west (which was not evident on excavation). The site was not photographed again until 1994, when the definition of features was once more indistinct; further photographs were taken during the excavation in 2003. However, the mapping of the visible cropmarked ditch indicates a projected diameter of about 47m within a ditch averaging 2.5m across. Allowing between 2.5m and 3m for a bank on the inner lip of the ditch, an internal area of about 0.15ha is indicated.

The geophysical survey produced particularly noisy data, with consequent problems of interpretation, but the ditch is clearly evident, as is the break to the north-west. Some very weak, curvilinear, positive magnetic anomalies detected inside the enclosure proved to coincide with features revealed by excavation, as did a narrow ditch at the southern edge of the enclosure. Other relatively intense, but diffuse, geomagnetic anomalies detected outside the enclosure are almost certainly geological in origin. The site lies on Carboniferous extrusive trachyte, overlain by Boulder Clay.

The location provides extensive views to the west over towards Edinburgh and the Pentland Hills (Figure 4.2), but the site itself is not visible from the ground immediately below it to the west, although the hill itself is a prominent feature within the area. Traprain Law dominates the view to the east. Other apparently incomplete curvilinear enclosures are known in the TLEP study area, for example at Hedderwick, near East Linton (although here an internal palisade is visible all the way round, and the ditch disappears into a band of darker cropmark which might be colluvium), suggesting that the form might represent a particular class of monument, rather than a case of incomplete construction. An evaluation trench was therefore

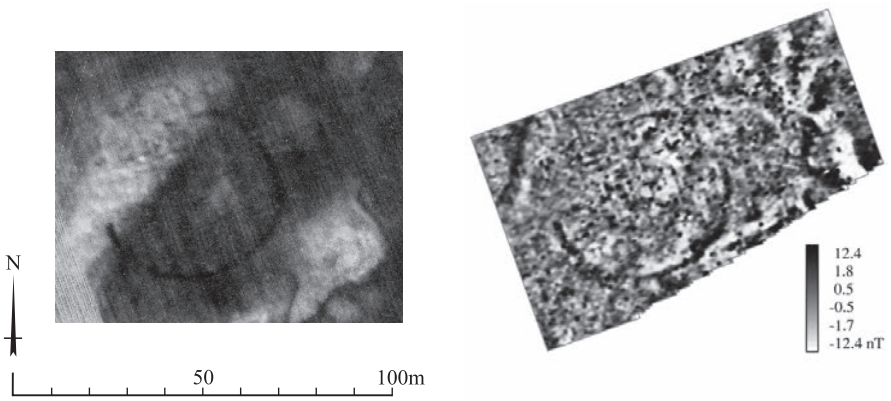


Figure 4.1
Standingstone (NT57SE 45): rectified aerial photograph (EL3490) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004473)

Figure 4.2
The Standingstone enclosure immediately after stripping: view towards the Pentland Hills (centre) and Edinburgh

excavated in April 2002 over the Standingstone ditch to investigate the state of preservation and to sample for carbonised plant remains (ASUD 2003b), following which the site was selected for more detailed investigation in 2003. The evaluation indicated that the site was suffering badly from ploughing and it was agreed with Historic Scotland that in this case the excavation would cover the entire enclosure.

Standingstone takes its name from the presence of a monolith at the farm 1.5km east of the site; another standing stone lies nearby.

THE EXCAVATIONS

In order to encompass the whole enclosure, an area *c.* 46 × 49m was opened, with a 20m long extension to the east to examine possible features there (Figure 4.3). The total area examined by the excavation, which took place over four weeks in June–July 2003, was *c.* 2565m^2. A Data Structure Report was submitted to Historic Scotland in March 2004 (ASUD 2004a); the site code is TST03.

The results are described in three main sections: first those features which certainly or probably pre-date the enclosure (Phase 1); second, the enclosure ditch, an accompanying palisade revealed in the excavation, and other associated features (Phase 2); and thirdly, later features established in the interior long after the enclosure was created, but when there was still a vestigial earthwork (Phase 3).

The site lies on gently sloping shelf, with a fall of *c.* 2m across the interior from north-east to south-west. For the most part, the subsoil comprised yellow brown clay with laminations of sand, visible as linear gullies where they reached the surface; topsoil was a dark brown clay loam some 0.25m deep. In the north-west part of the excavation, bedrock outcropped to form an uneven surface in which pockets of subsoil were present to a depth of up to 0.4m. Both ditch terminals cut into the outcropping bedrock at opposite ends of the circuit. Modern ploughing was visible across the site, primarily in a north–south direction, and a number of field drains on the same general axis were identified. Plough damage was greatest in the southern and eastern parts of the site, effectively following the topography, and on the surface of the bedrock. A zone of enhanced preservation about 10m in width was evident adjacent to the outcrop; here earth-bound

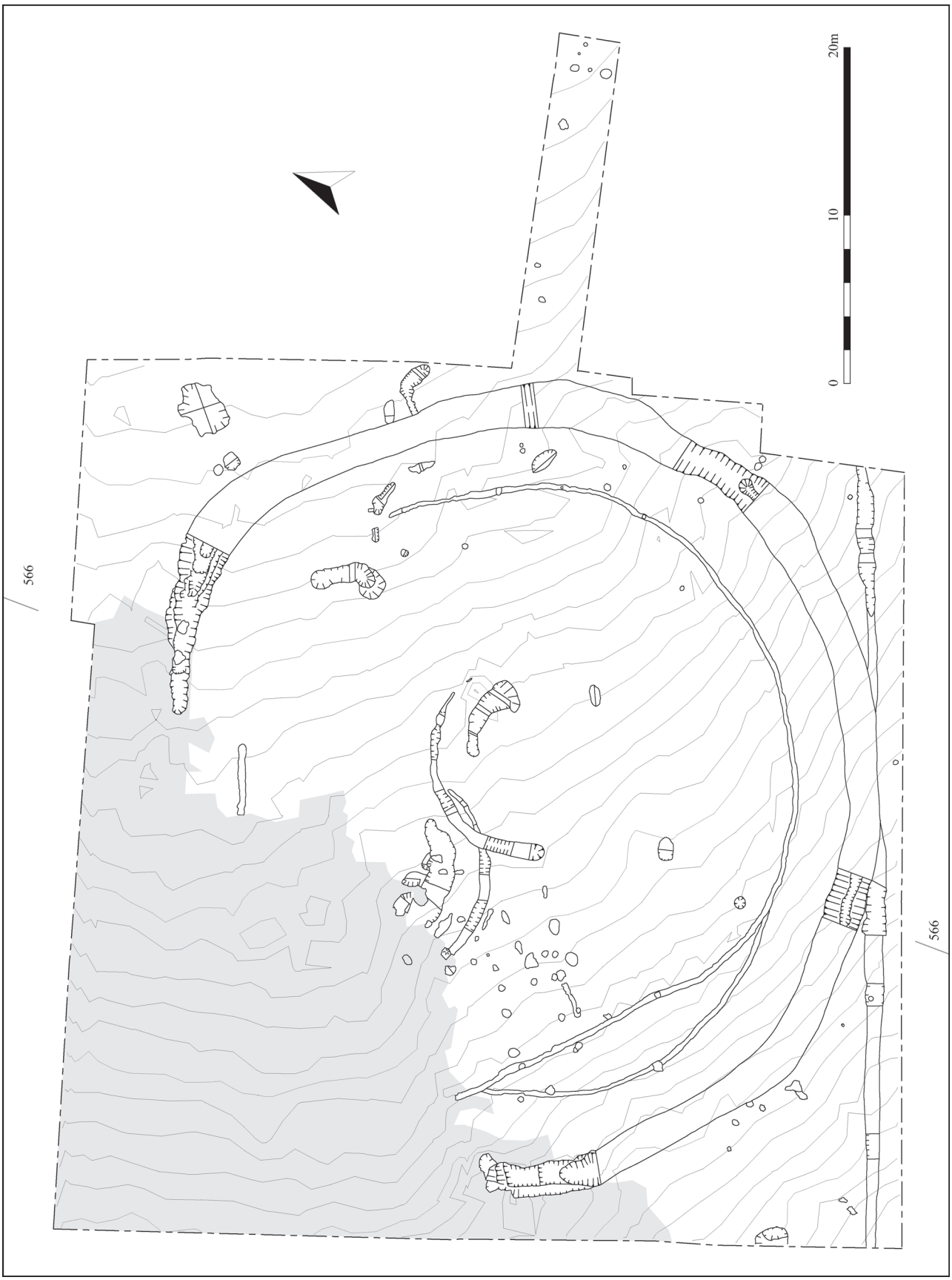


Figure 4.3
Standingstone: plan of principal features excavated, showing extent of outcropping bedrock and contours at 01.m interval

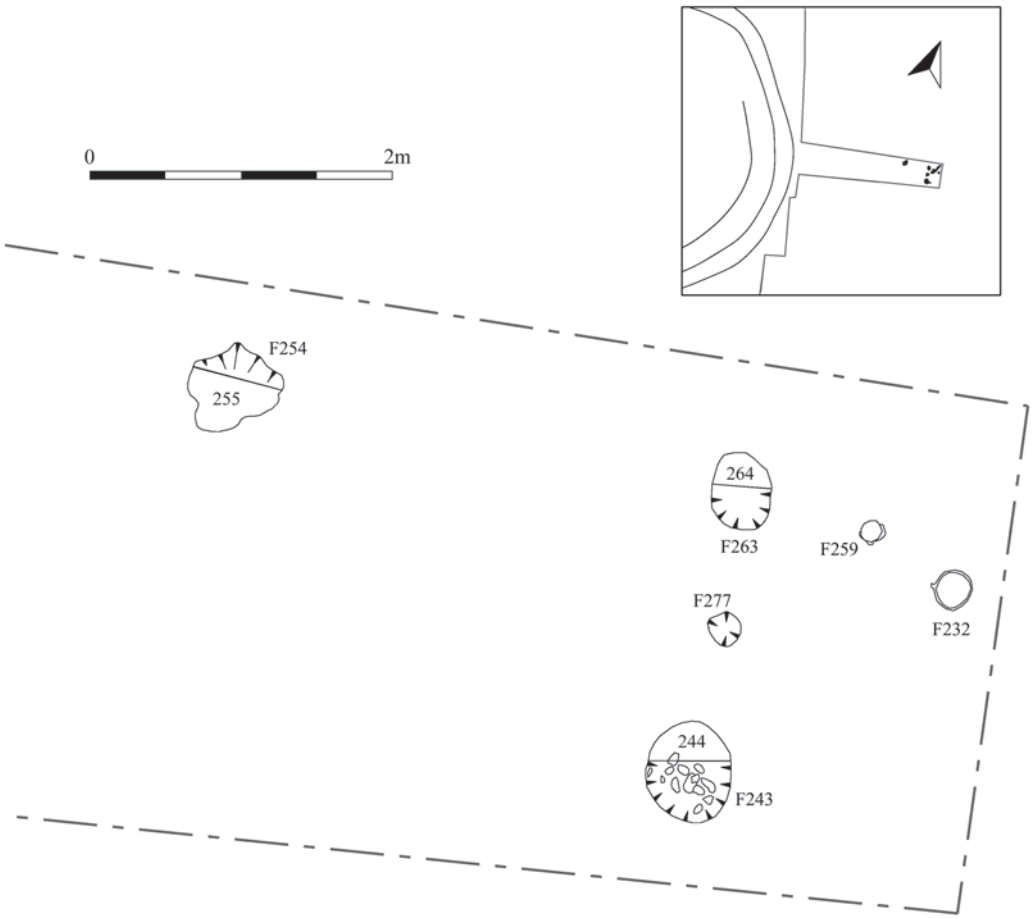


Figure 4.4
Plan of the cremations (F232, F259) and nearby features

features were less damaged, presumably because the rock had forced the plough to be raised, thus reducing truncation.

PRE-ENCLOSURE ACTIVITY

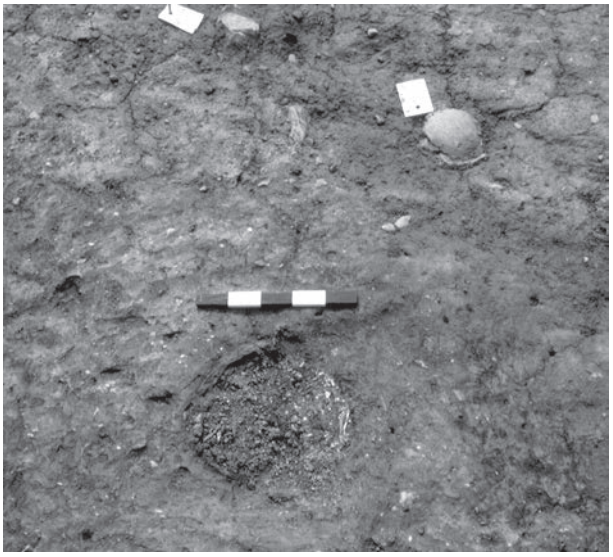
A number of features clearly pre-date the enclosure, based on their location, character, or stratigraphic position. These include a linear ditch, burials, some fire pits and possible buildings.

Later Neolithic pit

A small circular pit with sloping sides (F56, 0.65m in diameter) lay within the southern part of the enclosure, but is clearly of earlier date. The contents included seven potsherds that could conceivably be attributed to the Grooved Ware tradition (Chapter 7), a broken flint blade (sf 11) and three flakes, and tiny fragments of calcined bone. Radiocarbon dates of 2880–2570 cal BC and 2870–2490 cal BC (SUERC-10535; 10536) were obtained from barley grains in the fill [21], which also included pockets of charcoal towards the top, as well as rounded stones lying on the base.

Early Bronze Age graves containing cinerary urns

The remains of two pottery vessels were identified some 20m outside the enclosure ditch at the end of the eastern extension (Figure 4.4). The first (Pot 1) comprised the rim of an inverted urn, with cremated bone clearly visible within the fill (F232). A minute



(A)

(B)

Figure 4.5
(A) The cinerary urns *in situ*; (B) Lifting Pot 1

flint flake was found on the surface (sf 63). No trace of any pit remained. The remains of the urn were frozen with liquid nitrogen and lifted in a block for laboratory excavation (Figure 4.5). From the surviving part of the pot, an estimated 0.3–0.4m of subsoil has been lost to ploughing, assuming the urn was buried intact and below ground level. The remains of a second vessel lay 0.5m to the west, this time the base of an upright urn (Pot 2). Chips of calcined bone were recovered from the surrounding soil, suggesting this is the truncated remains of a second cremation (F259), buried at a slightly shallower depth.

A number of other small pits and post-holes were found in the vicinity: F243 (0.65m in diameter) yielded two spalls of coarse pottery (sf 43, 44), whilst F254 yielded a cobble tool (sf 64). An irregular gully F270 cutting the second cremation appeared to be a burrow, but contained charred cereal, which may derive from a disturbed feature. A sherd of flat-rimmed ware (sf 61) came from the spoil-heap nearby.

The cinerary urns – Alison Sheridan

Pot 1, which consisted mostly or exclusively of sherds from the uppermost part of the vessel, had been buried inverted; Pot 2, represented by its base and a few fragments from the lower body, had been buried upright. Cremated bone was associated with both vessels.

POT 1

This vessel (sf 35) is represented by its rim and the top 71mm of its body, the constituent sherds having been refitted and gap-filled to form an unbroken, slightly oval and uneven circuit some 210–220mm in diameter (Figure 4.6). A further eleven small sherds and 16 fragments are also present. The original height of the vessel can be estimated at 270–320mm.

The rim is gently pointed and has a steeply-sloping, concave internal bevel 16.5–20mm deep. The exterior below the rim slopes out gently and is slightly convex; it is decorated with a design of broad (up to 2.5mm) but shallow impressions of loosely-twisted cord, arranged as upwardly-sloping diagonal lines framed top and bottom by horizontal lines. The wall probably tapered in below this point, and although this top section of the vessel is collar-like, it would not be correct to describe the vessel as a Collared Urn, for reasons given below. Wall thickness varies from 10mm at the bottom of the surviving 'collar' to 16.5mm at the bottom of the rim bevel.

The surfaces of the pot are a reddish and orange-brown colour, now darkened by the application of consolidant; the core matches the surface colour over parts of the circumference, and elsewhere has a blackish band of variable width, indicating where the organic material in the clay had been incompletely burnt out during the rapid firing. The fabric is slightly gritty and these stone inclusions protrude through the surfaces, despite attempts to achieve a smooth finish (which probably involved wet-smoothing of the surfaces). The inclusions comprise small fragments, mostly under 5mm

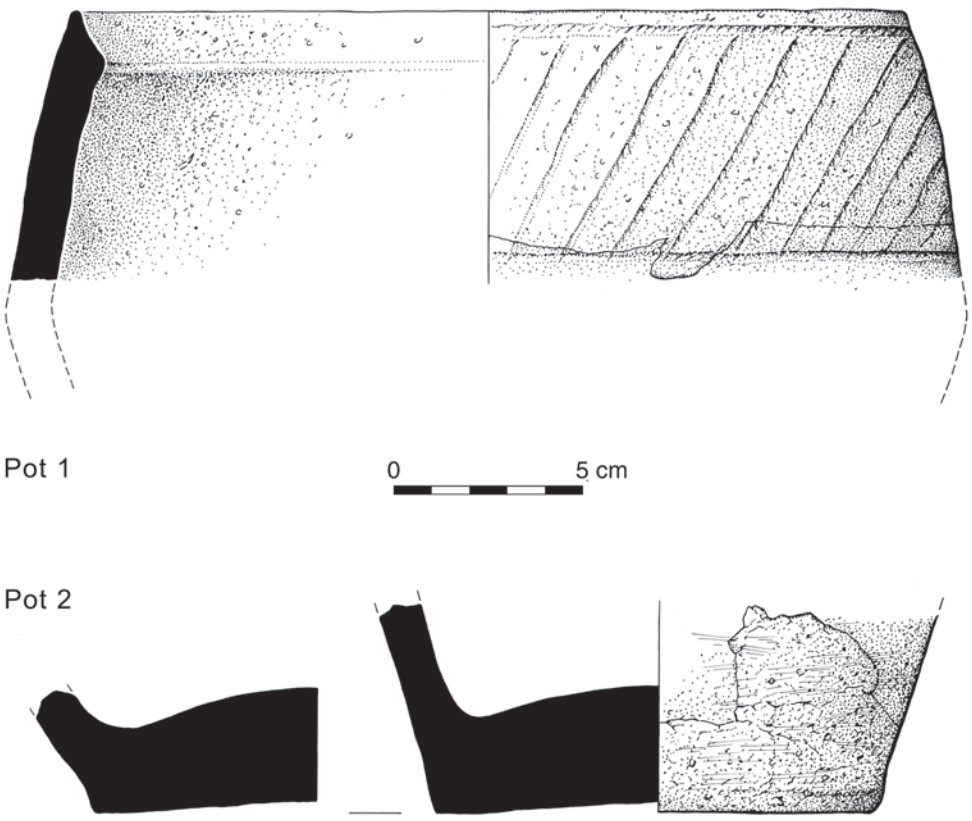


Figure 4.6
The cinerary urn (Pot 1) and base (Pot 2). Scale 1:2 (Marion O'Neil)

in their maximum dimension, and mostly angular and sub-angular in shape; their overall density is 10–15%. They mostly consist of a hard black stone, which may contain a black shiny mineral; there are also fragments of a speckled crystalline stone, reddish, white and black, and discrete fragments of the constituent black shiny mineral. Occasional fragments of a very fine-grained speckled stone, and occasional quartz grains are present. It is likely that some of these inclusions were present naturally in the clay, while others represent deliberately crushed filler. The stone types have not been identified to their probable source.

POT 2

This comprises a complete base and part of the lower body (sf 37, found *in situ*; sf 1 from topsoil), together with one sizeable detached lower body sherd (sf 60) and two further, smaller body sherds (sf 2, 38) all found in topsoil nearby, with a few additional small sherds, fragments and crumbs. The base, 112–120mm in diameter, is pedestalled and has a slightly concave outer surface and markedly convex interior (Figure 4.6). The wall splays at a variable angle and variable degree of curvature, giving the vessel a markedly lopsided profile. Wall thickness, at the lower belly, is *c.* 12mm; the maximum basal thickness is 31mm. The exterior surface at the base is fairly soft: brush marks from the pot cleaning process are visible.

The exterior is a mottled buff and pale pink colour; the core, blackish-grey; and the interior varies from pale grey to grey-brown and dark grey. An attempt had been made to achieve a smooth surface and, to judge from the detached belly sherd, the pot had probably been coated with a thin slip; but numerous lithic inclusions protrude nevertheless. Again, these inclusions comprise a variety of types, shapes, and sizes and represent a mixture of naturally-present and deliberately-added material. Fragments are angular to rounded, up to 6.5 × 4mm in size, and at a density of 10–15%; some of the same rock types as seen in Pot 1

are present (notably the shiny black mineral, speckled red-white-black stone, occasional quartz grains, and hard black stone). Brown sandstone and speckled sandstone are also present, and since sandstone is abundantly available locally, it is likely that this pot was made locally.

DISCUSSION

Despite the fact that only a small part of each vessel is present, enough survives to provide pointers to the type of pottery represented. A radiocarbon date of 1680–1490 cal BC (SUERC-11893; Table 9.2) on cremated human long bone from Pot 1 and the fact that Pot 2 was buried upright provide further clues. It will be assumed that the proximity of the two vessels to each other indicates that they are broadly contemporary and broadly of the same type of pottery.

Pot 1's internally-bevelled rim, slightly convex and inclined collar-like neck and simple, cord-impressed decorative scheme are all features of the Cordoned Urn tradition (for a discussion of the tradition, see Waddell 1995; Sheridan 2003; 2007). If one assumes that Pot 1's lower body was of the same basic shape as that of Pot 2, then both urns may well have been simple bipartite vessels (with or without a cordon at the bottom of the 'collar'). Such vessels can be regarded as an intermediate form between the more globular and sometimes multi-ribbed Cordoned Urns that reflect this tradition's origins in the Collared Urn tradition (as shown, for example, at Stobshiel, East Lothian: Waddell 1995, fig. 11.1.10) and simple Bucket Urns. Other, similarly 'transitional' urns are known from elsewhere in Scotland, as at Ardeer (Stevenston) Sands, South Ayrshire (Mann 1906; Morrison 1968) and Limefield, South Lanarkshire (Maclaren 1984). Such urns are found in both inverted and upright positions, like the Standingstone examples. Cremated bone from one such vessel from Ardeer Sands (Mann's urn 15) has produced a radiocarbon date of 1740–1520 cal BC (GrA-34770, 3350 ± 35 BP: Sheridan and Bradley 2007, 220), very similar to the date for Standingstone Pot 1. Closer to Standingstone, both geographically and in terms of shape and decoration, is a bipartite urn from a Bronze Age cemetery at Eweford, East Lothian (MacGregor 2007, fig. 5.11, urn 5). Found empty and on its side, this vessel may well represent a cenotaph or special offering; its decoration is identical to that of Standingstone Pot 1. Although the Eweford vessel was not directly dated, it is likely to have been buried within the time range 1750–1675 BC (Sheridan unpublished) – slightly earlier than the Standingstone urns.

The simple shapes and decorative schemes of these 'intermediate Cordoned-to-Bucket Urns' and their Bucket Urn successors are paralleled among contemporary domestic pottery from southern Scotland and northern Britain, as found for example in unenclosed platform settlements such as Green Knowe, Borders (Jobey 1980) and Lintshie Gutter, South Lanarkshire (Terry 1995). This kind of pottery has been defined and discussed by Colin Burgess (1995). An East Lothian example of a bucket-shaped vessel with a similar decorative scheme to that of Standingstone Pot 1 was recently found at the Howmuir Farm settlement (Innes 2007, fig. 6.3). Five radiocarbon dates for Howmuir range from 1910–1690 cal BC (GU-13318, 3490 ± 35 BP) to 1610–1410 cal BC (GU-13319, 3210 ± 35 BP), overlapping with the date obtained for Standingstone Pot 1.

These two graves at Standingstone are likely to represent the last surviving remnants of a Bronze Age cemetery. Their location on a local rise is wholly typical for Bronze Age graves. There is abundant evidence in East Lothian for funerary activity from most parts of the Bronze Age: the A1 excavations at Eweford produced an entire cemetery with urned and un-urned cremated remains spanning the second millennium BC (MacGregor 2007).

The cremated remains – Charlotte Henderson

Pot 1 was excavated in the Conservation Laboratory at Durham University, by Grant Lock. The fill was removed in separate quadrants in four spits of *c.* 20mm each, the remains being photographed and drawn at each stage; the soil was then washed through a 500μm sieve and the residue sorted. A total of 236g of cremated bone was recovered from within the urn; 2.8g came from outside it and 0.2g beneath it. The bone was extremely fragmented and very little was identifiable; only 53% of fragments were larger than 10mm, the largest measuring 46 × 22 × 4mm (max).

The only identifiable remains came from within the urn. Several pieces of skull were found (12.9g), together with long bone fragments (21.9g), including a piece possibly from the neck of a femur and a piece of humerus or tibia (which was radiocarbon dated). An articular surface and two possible rib fragments (5.7g) were also recovered. The only more accurately identified remains (2.7g) were several probable molar roots; an incisor root and a possible pre-molar were also present. The tooth roots resembled stage H development (El-Nofely and Iscan 1989, 248–9), which indicated that the individual(s) was at least 9

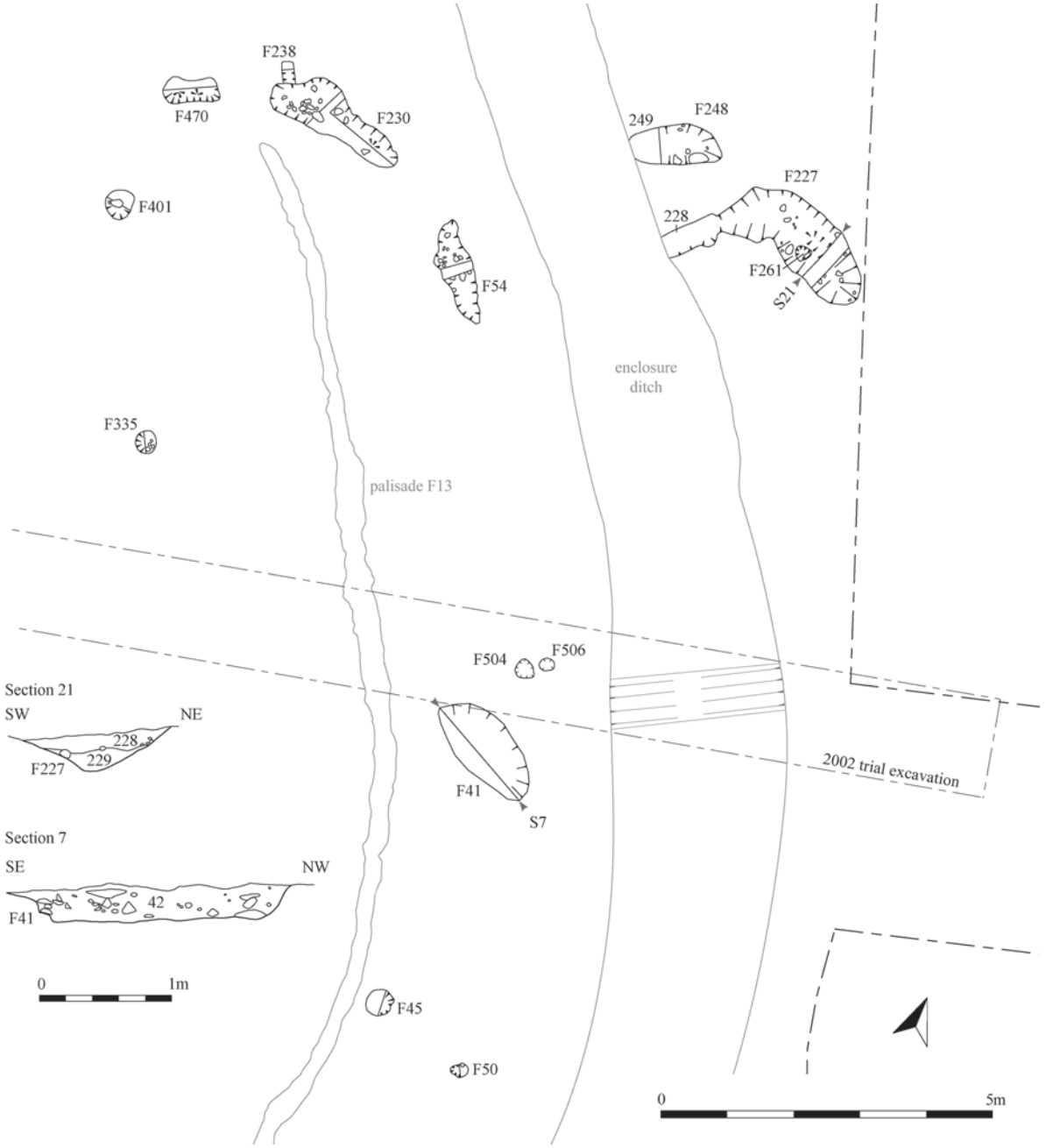


Figure 4.7
Early features on the eastern side of the enclosure

years old. Most of the identifiable pieces of bone came from the lowest spit, but skull and long bone fragments were present in most contexts; tooth roots occurred only on the surface of the urn (as excavated) and in the lowest spit.

No minimum number of individuals could be ascertained, and sex was impossible to determine. The only identifiable individual was more than nine years old (with no upper limit), based on tooth root development. No evidence of pathology could be

recovered from the fragmentary remains. All the bone was fully oxidized and white in colour, indicating a temperature of over 600 degrees centigrade acting on the bone (McKinley 2004). The cremated bone had regular transverse and longitudinal cracking, indicating that the body had not been defleshed prior to cremation (Buikstra and Ubelaker 1994, 96).

The soil from the urn also contained tiny fragments of charcoal and of a soft reddish stone, which may be a natural feature of the soil rather than a deliberate inclusion. Further fragments of burnt bone from the adjacent spoilheap and elsewhere on the excavation were examined, but none could be identified as human. A full report is in the site archive.

Linear ditch

A shallow linear ditch F31 running south-west to north-east along the southern edge of the site was cut by the later enclosure ditch (Figure 4.13 below). This evidently reflects an earlier phase of land division or enclosure, but no direct dating evidence was forthcoming. Towards its eastern end, eight stake-holes were observed in the base of the ditch; their exact relationship to the ditch is uncertain. Further to the west, a post-hole (F77) cut the fill. Two more post-holes and a stake-hole (F331; F155; F188) lay close by, but need not be associated. It is, however, possible that more than one phase of the boundary is represented, or that it was long enough lived to require repair.

Other pre-enclosure features

A number of other features can be attributed to this general phase, either through their relationship to the enclosure ditch or from radiocarbon dating. They include a variety of feature types and possible structures, which from radiocarbon dates seem likely to represent a phase of activity or occupation post-dating the cremation cemetery. It is possible that the linear ditch formed a boundary to this activity. Some unphased features which cannot obviously be related to later occupation are also conveniently described here.

Outside on the eastern side

Just to the north of the extension, a curving elongated pit (F227, 3m long), deepest at its eastern end, was clearly cut by the enclosure ditch (F348) on its west side, where it took the form of a much narrower gully (Figure 4.7). A grey primary fill contained much charcoal indicative of burning [279]. A small post-hole

Figure 4.8
Plan of scoop F240 and nearby features

F261 cut the basal fill [297]; both were covered by the upper fill of brown sandy clay [228], which yielded a small fragment of coarse pottery (sf 53) and more charcoal. The form of the pit suggests it might be the remains of an oven or hearth, although the base was not evidently scorched. Birch charcoal from the upper fill [228] gave a date of 1380–1090 cal BC (SUERC-10555), suggesting that the burning was not associated with the cremations. Just to the north-west of F227 was a shallow oval scoop (F248, 1m long) also cut by the enclosure ditch.

Some 10m further around the circuit to the north-west was a rectangular shallow scoop (F240, 3.2m long) with a roughly cobbled base [242], which could be the remains of a working area or structure, possibly accessed from its north-western side (Figure 4.8). Between F240 and the ditch was a post-hole (F292) and a square, flat-based pit (F294, 1m across). The only other features of note in the eastern part of the site were a possible pair of post-settings 1.75m apart in the eastern extension (F257; F265), and two adjacent post-holes (F355; F357) close to the line of the enclosure ditch.

Between the ditch and the palisade

A scatter of truncated features lay between the ditch and the palisade on the eastern side of the enclosure. These would have been sealed beneath any internal bank, unless they were created after it had virtually disappeared (Figure 4.7). They included an oval pit with a flat base (F41, 1.75m long), which was probably a hearth or fire-pit, since the fill [42] contained a large amount of charcoal, burnt clay and flecks of burnt bone, and the sides were scorched, suggesting burning *in situ*. Two post-holes lay nearby (F504, F506).

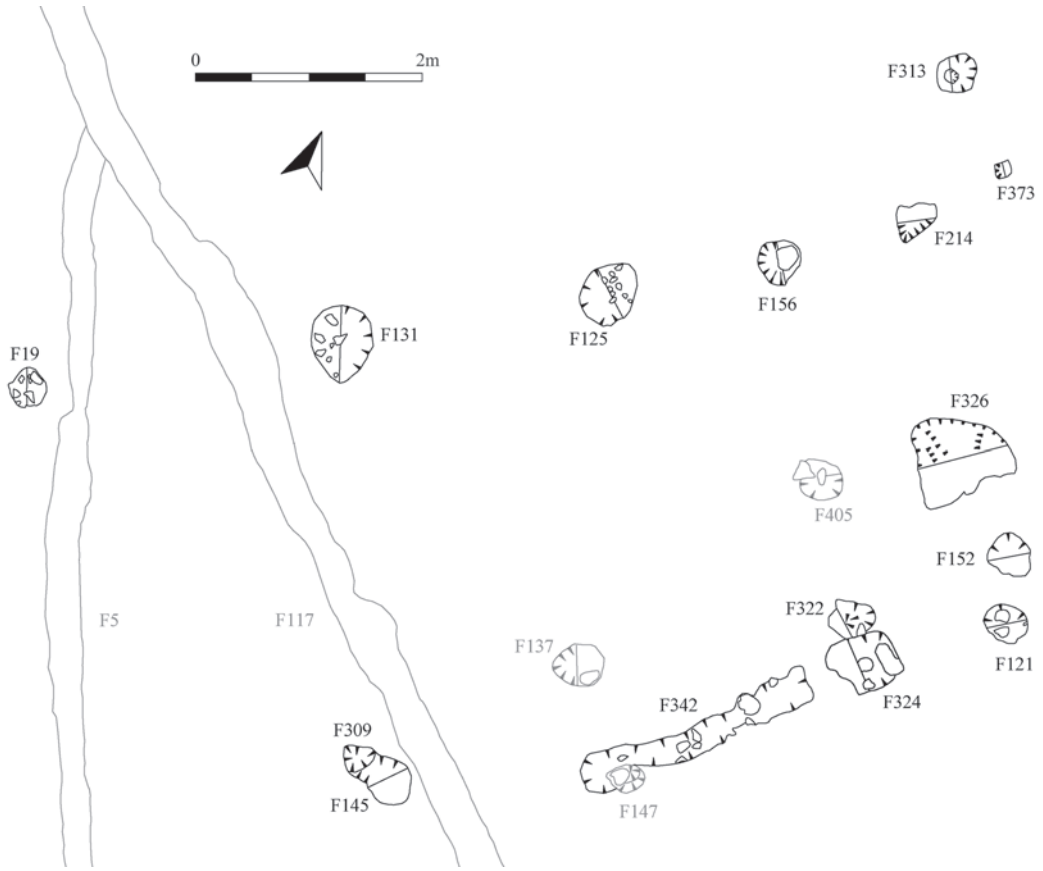


Figure 4.9
Plan of probable early features at the western end of the palisade

The most interesting feature in the area was a small, shallow pit F45 (0.4m in diameter), which lay close to the palisade. This yielded a cache of fully processed grain, predominantly of emmer-type wheat (84%), but also hulled barley (16%). An emmer grain provided a date of 1010–830 cal BC (SUERC-10537), similar to the dates for the palisade. The cache might conceivably be some kind of foundation deposit.

Close to the end of the palisade was an arc of three features, two of which would lie below a bank. F54 was an irregular elongated scoop 1.5m long, parallel to the ditch, with patchy cobbles [225] across its base and containing a stake-hole (F226). F230 was a slightly larger elongated pit, *c.* 2m long, with a fairly flat base; its main fill [231] contained burnt and fire-cracked stones and hazel charcoal, which produced a date of 1010–830 cal BC (SUERC-10556). At its western end was a short segment of narrow gully (F238) cutting the upper fill of F230. The third feature in the arc, an irregular hollow (F470) just inside the line of the palisade, again had a charcoal-rich fill [471]. Although different from each other in character, these slots form an arc of 6.5m diameter and may be the remains of a badly eroded structure, to which two nearby post-holes might also belong (F335; F401), as they lie on a circle of *c.* 5m diameter concentric with the gullies. However, F230 resembles the oven-like feature F227 just across the ditch at this point, so the positioning may be coincidental.

Near the western end of the palisade

At the opposite, western end of the palisade, a cluster of post-holes was recorded in the zone of enhanced preservation beside the exposed bedrock (Figure 4.9). More than one structural phase is represented. Some of these features are probably contemporary with the palisade (and discussed below), but others seem more likely to pre-date it. Among the latter is a pair of larger post-settings (F125; F131) just over 2m apart, which may form part a longer alignment with F19, a similar distance to the west and, less certainly, F214 a similar distance to the east. Three other posts form a second, equally spaced alignment at a right angle (F156; F405; F324). Birch charcoal from F131 gave a date of 1110-840 cal BC (SUERC-10548).

Other features seem to form a curvilinear arrangement, perhaps a screen or part of a larger structure of *c.* 8m diameter, belonging to a separate phase of activity to the first group. The core of the arc is a 2m long gully F342, extended to the west by a conjoining post-hole and scoop (F145, F309), and to the north by post-holes F322, F326, and perhaps F214. These different elements are spaced roughly 2m apart. F147 on the edge of the gully may also belong to this structure, unless it is a pair with F137. F137 might form a concentric inner arc with F156 and F405 if these latter are not part of the linear alignments described above. F313 on the edge of the bedrock had a clear post-pipe, but could not be related to any nearby features apart from possibly F373.

A solitary sub-rectangular scoop F63 to the south-east of these structures may also belong this phase; it has patchy cobbling in the base [64], reminiscent of some of the pre-enclosure features in the north-east part of the site, although this characteristic does recur in the sunken features belonging to the Iron Age circular structures (below).

Outside to the south-west

Another cluster of features lay outside the enclosure, in the angle between it and the earlier linear ditch, among them three pairs of post-holes. The first pair was 0.5m apart: F183 preserved a post-pipe [184] as well as packing stones, and was cut by the enclosure ditch; F186 also contained large packing stones and its fill [187] yielded two sherds of coarse pottery (sf 45, 47). A metre to the north-west, a pair of smaller, shallower post-holes lay 1.3m apart (F200; F196); a hazel twig from fill [197] in F196 gave a date of 1130–910 cal BC (SUERC-10551). Finally, 7m to the south,

Figure 4.10
Standingstone from the air during excavation (Photo John Davies)

Figure 4.11
The enclosure ditch and palisade seen from the south

close to the early ditch, were two more irregular post-holes 0.5m apart (F161; F163). A clear post-pipe F211 within F161 was set at an angle (towards the north-west); the fill of the post-hole [162] contained burnt stones and charcoal. F163 also contained a post-pipe (F198) and was cut by a stake-hole (F165).

Also in this area was an oval scoop F1, which extended beyond the excavation. Nine stake-holes in the exposed part were possibly associated with a structure over the scoop. The fill contained charcoal and a few fragments of burnt bone, the whole feature somewhat recalling F227. Nearby was a small oval pit (F212) cut by a post-hole (F208) containing large packing stones.

THE ENCLOSURE

The enclosure is represented by a near-concentric penannular ditch and palisade *c.* 3–3.5m apart, broken only by a gap of *c.* 38m on the north-west, where the bedrock outcrops (Figure 4.10). Whether the circuit was originally continuous or not is considered below. In the south-west part of the site, two lines of palisade are apparent, one replacing the other. The evident conformity of the ditch and palisade implies that they are contemporary (Figure 4.11).

The enclosure ditch

Both ditch 'terminals' and three segments of the southern and eastern sides of the circuit were investigated. The ditch rather peters out at the northern end, but from its deepest point here was cut essentially level across the slope as far as the south-eastern cutting, where it then stepped steeply down by 0.75m. From the rather better defined western terminal, the base of the ditch was similarly dug level at least as far as the south cutting. Between there and the south-eastern cutting, where the ditch climbs the steepest part of the slope, the base rises by 1m, either by a further step(s) between the two cuttings or simply by following the slope.

The western terminal

At its western end, the ditch (F3) had a maximum depth of 0.75m and width of 2.25m, becoming slightly narrower and shallower towards the terminal. It was cut entirely into the bedrock, which shatters in straight planes, giving the ditch a rectilinear plan, with near-vertical sides and a flattish base at the end, although it becomes more rounded towards the east (Figure 4.12). Given the depth of soil lost to ploughing, we should perhaps consider the possibility that this was not the original end of the ditch, but that it instead stepped up at this point, to continue its course across the bedrock as a much shallower feature, rather as occurs at the northern terminal.

The primary fill [101, 0.25m deep] contained much shattered bedrock, no doubt resulting from collapse of the rock on the outer side of the ditch. This was covered with deposits of sandy clay, the first largely stone free [49, 0.3m deep], the second containing much angular stone [48, 0.3m deep]. Both deposits lay principally on the inner side of the ditch, suggesting that they originated from erosion and collapse of an associated internal bank. The hollow left at the top

Figure 4.12
View and section of the western ditch terminal (F3)

of the ditch was again filled with sandy clay [4, 0.2m deep]. Five of the six cobble tools from the site came from this terminal, one from the basal fill (sf 42); three from the upper stony layer (sfs 20, 23, 25) and one from the top fill (sf 4). A single flint flake came from [49] (sf 39). Fragments of burnt bone were found in the two lower fills, including a cattle tooth from [49], which was dated to 1370–900 cal BC (SUERC-10538).

The northern terminal

The northern terminal (F29) was cut into the bedrock outcrop, although at the eastern end of the excavated section, the ditch reached the boulder clay subsoil. In contrast to the western terminal, this end began quite narrow and fairly shallow (0.9m wide, *c.* 0.5m deep), with a relatively flat base, increasing gradually in width to 2.8m and stepping down some 1.75m before the section to reach a depth of 1.25m, by which time the profile was roughly V-shaped (Figure 4.13).

A thin primary silt [415] was overlain by deposits of silty clay [306, 0.2m deep] and [304, 0.2m deep], the latter containing many stones; these deposits were confined to the deepest part of the ditch. Above them, extending along to the terminal, the upper part of the ditch was filled with dark brown sandy clay [296, 0.45m deep], towards the top of which were many large rounded stones [30; 291], suggesting that this fill may again have originated from a collapsed bank or revetment, although here there is less evidence for the direction from which these deposits accumulated. The uppermost fill consisted of more sandy clay [281, 0.2m deep].

The gap

There was no indication of any continuation of the circuit on the north-west side between the two terminals, although, as noted above, the ditch could have stepped up on the western side and continued as a shallower feature. Alternatively, it may never have been completed, or its place been taken by a fence or hedge, or a bank on its own. Two shallow features in the base of the northern terminal might be pits or post-settings (F282; F284), or just accidental undulations in the bedrock. The entrance to the enclosure was presumably in this sector, possibly nearer the northern terminal where the ground is flatter, but no direct evidence was recovered.

The eastern and southern ditch segments

Three further ditch segments were investigated on the southern and eastern sides of the enclosure, one of them in the 2002 evaluation. In the southern segment, the lower part of the ditch penetrated bedrock (F70), whereas on the eastern side, it was dug entirely though clay (F273). The ditch was essentially V-shaped in all sections, but a steep step down in the base occurred on the south-eastern part of the circuit, whilst the southern segment was the only place to reveal clear evidence of a recut (Figure 4.14).

The ditch was up to 2.3m wide and 1.25m deep, except above the step where it was only 0.5–0.7m deep. Above the primary fill [72; 445, up to 0.25m deep], was a thick horizon of silty clay with few stones up to 0.4m thick, which extended high up the sides in both sections, suggesting a gradual silting up [444; 71]. In the southern section, the ditch was subsequently recut close to its original depth, but this time in the form of a narrow basal slot (0.25m wide) with nearly vertical edges (F57). There was no conclusive evidence for a recut in the eastern section, or indeed at either of the terminals, so this may have been an operation restricted to this particular part of the ditch, necessitated either by greater depth of silting resulting from its position at the bottom of the slope, or a localised collapse, which an irregularity in the profile of the inner edge might suggest. The recut slot was filled almost to the top with sandy silt containing large stones [69, 0.32m deep], but although this resembles a palisade, there was no evidence that the stones represented packing.

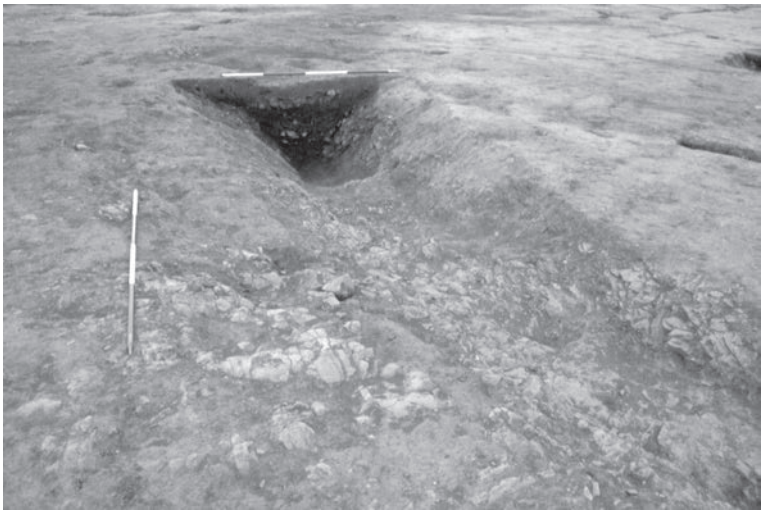


Figure 4.13
View and section of the northern ditch terminal (F29)

The upper part of the ditch contained deposits of silty and sandy clay up to 0.35m deep with frequent small and occasional larger stones [65, 272, 253], presumably largely erosion from the bank. A hazelnut shell from the upper part of this horizon [253] gave a date of 810–540 cal BC (SUERC-10557). The top was infilled with silty clay [58; 256], from which a hone (sf 24) was recovered.

The palisade

The palisade ran concentric to the inner edge of the ditch for most of its length, set back by a distance of 3–3.5m. Assuming they were contemporary, the palisade might well have formed a revetment at the back of a bank. For the most part, the palisade trench was around 0.3–0.4m wide and 0.15–0.2m deep. At the northern end of the circuit, the palisade stops short of the ditch terminal by some 16–17m, but had by then become very shallow, suggesting it was truncated (see also CS3 below). On its western side, the palisade ran as far as the bedrock beside the ditch terminal, and had two phases, having been realigned here (Figure 4.15).

As elsewhere, the first palisade on the west side (F5) followed a curving course, but came rather closer to the ditch here. Except at one point near the northern end, the fill contained few packing stones, in contrast to the rest of the circuit, suggesting that they were mostly removed when it was replaced. At one point the trench was interrupted by a large natural boulder, which had not been removed. The westernmost 22m of the palisade was subsequently replaced by a nearly straight slot (F117), which cut across the original arc parallel to the ditch, which is itself fairly straight here, reducing the area thus delimited. The new slot lay further away from the ditch (6.25m), but in other respects appeared to join seamlessly with the rest of the circuit. Apart from the intersections, there was no evidence for wholesale replacement elsewhere, suggesting that rebuilding was restricted to the western

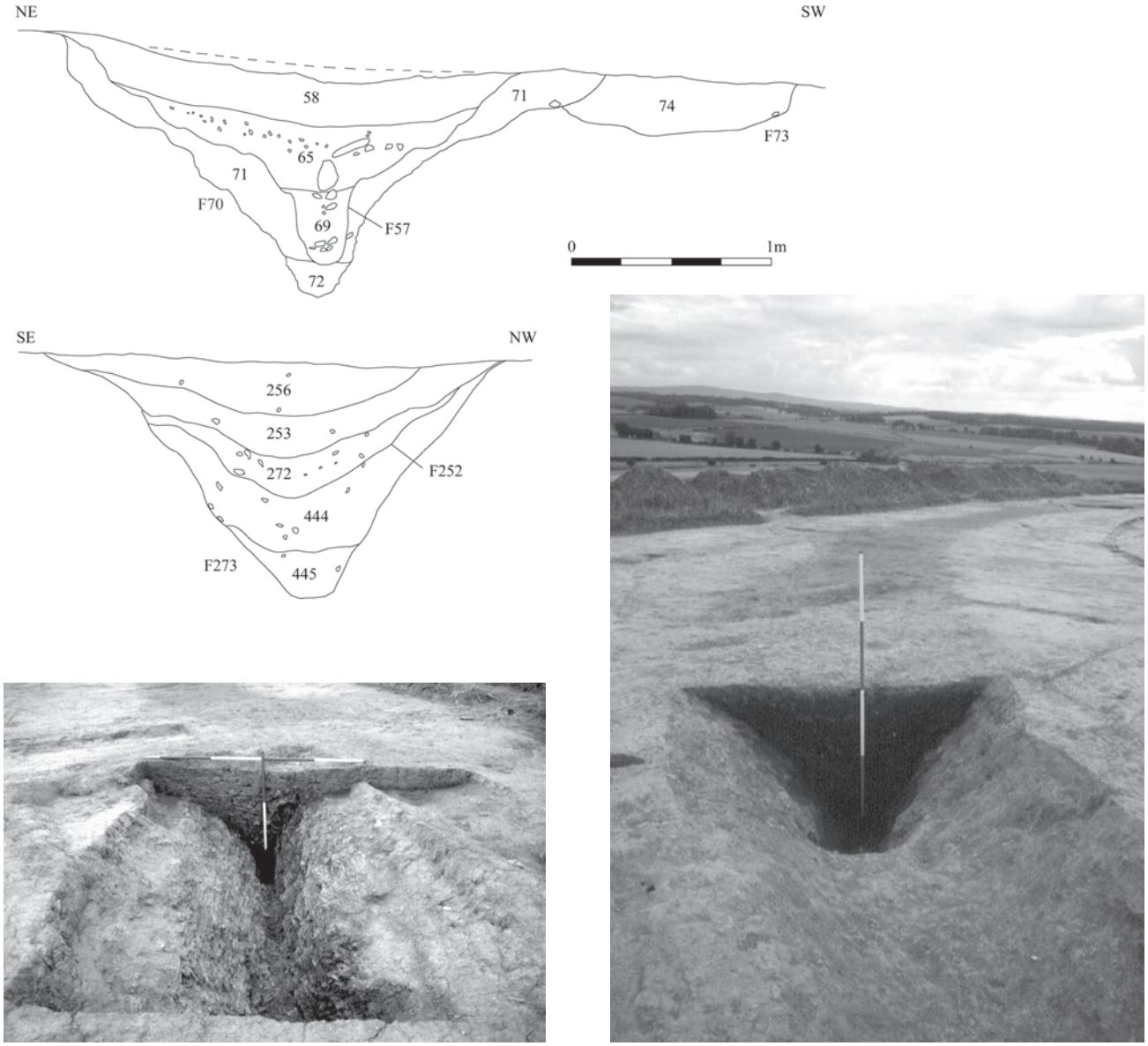


Figure 4.14
Views and sections of the eastern (F273) and southern (F70) segments of the enclosure ditch, the latter cutting early linear ditch (F73)

side of the circuit and probably occurred quite soon after the palisade was first erected.

The second-phase palisade (F117) and the original slot round the rest of the circuit (F13) contained many large rounded packing stones throughout their length, overlying a thin silty basal fill. Some of these stones were positioned vertically along the sides, others had slumped inwards, presumably following the removal or decay of the posts. A number of post-holes, all containing packing stones, were identified within the trench in various places around the circuit (e.g. F11, F267) (Figure 4.16), although it is unclear whether they are primary or additions. Further post-settings can be inferred from gaps in or arrangements of packing stones, whilst a number of irregularities or 'bulges' in the plan of the palisade may denote more settings, or mark the limit of different constructional sections; indeed it is possible that the palisade was

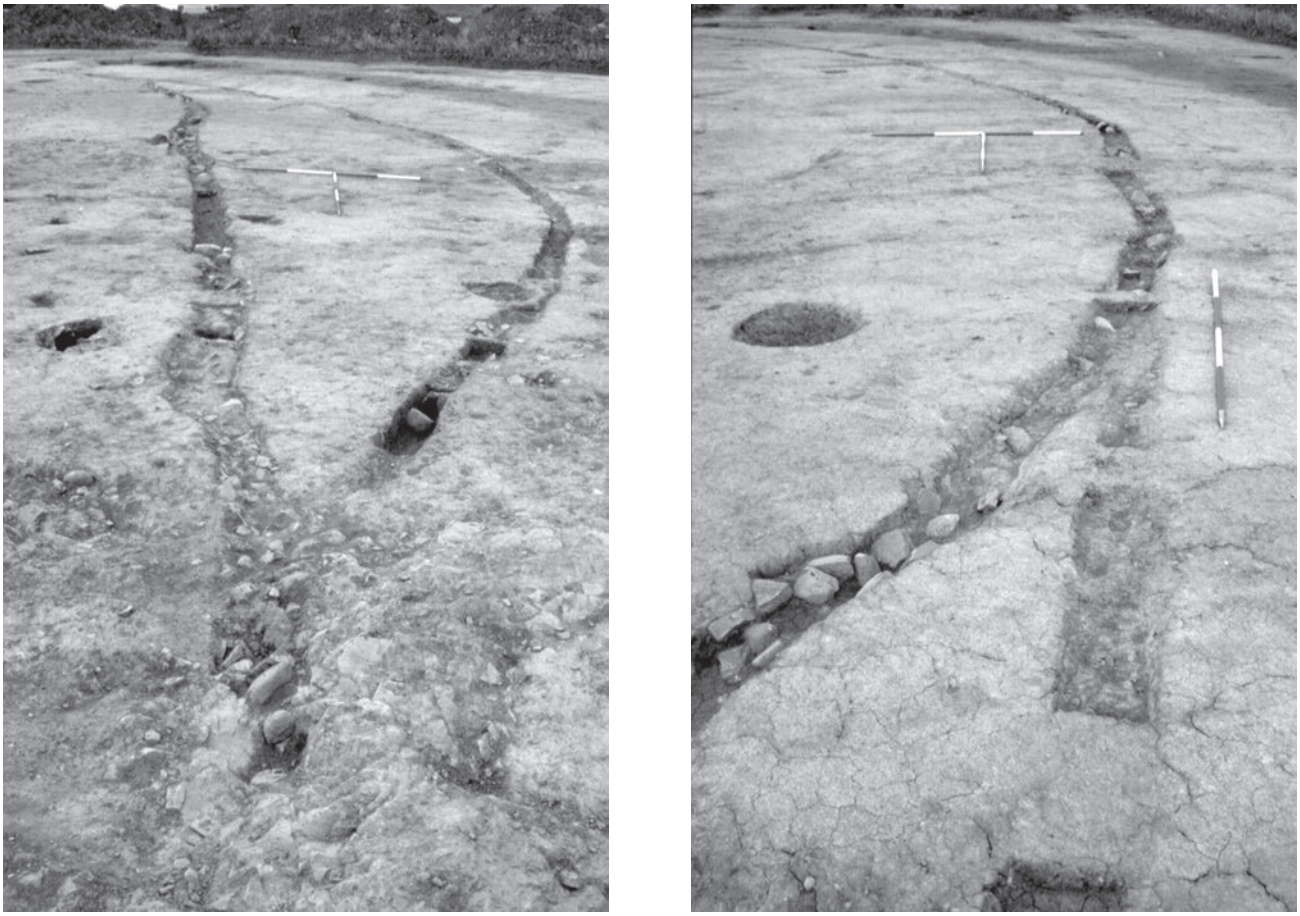


Figure 4.15
The junctions of the inner (F113) and outer (F5) palisades, viewed from the north; packing stones are clearly visible in the fill of F113 and its continuation F13

stepped along its length on account of the slope, rather like the ditch.

Over a 10m length on the north-eastern side of the circuit, a steep-sided, narrow slot 0.15m wide (F371) was identified within the palisade trench; in it several stake-holes were distinguished and some small, regularly spaced packing stones hint at further stake positions. Either this slot marks the position of upright timbers in the palisade trench, and was only observed in this part of the circuit, or it was a localised repair.

Four radiocarbon dates were obtained for the palisade. Charcoal from the upper fill [14] and a *Triticum* grain from post-hole F11 (which also contained a flint flake, sf 65) both gave dates of 1010–830 cal BC

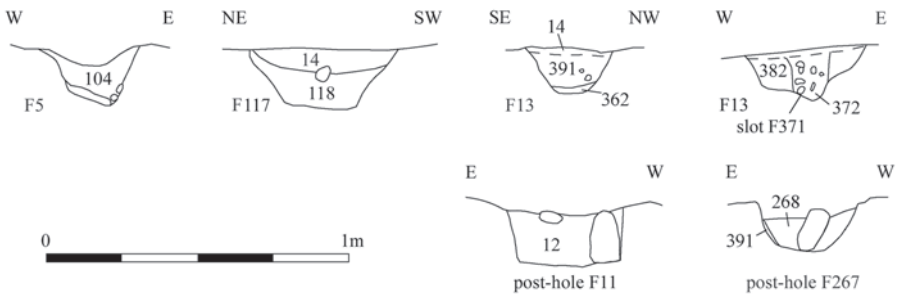


Figure 4.16
Sections through the palisade and integral post-holes

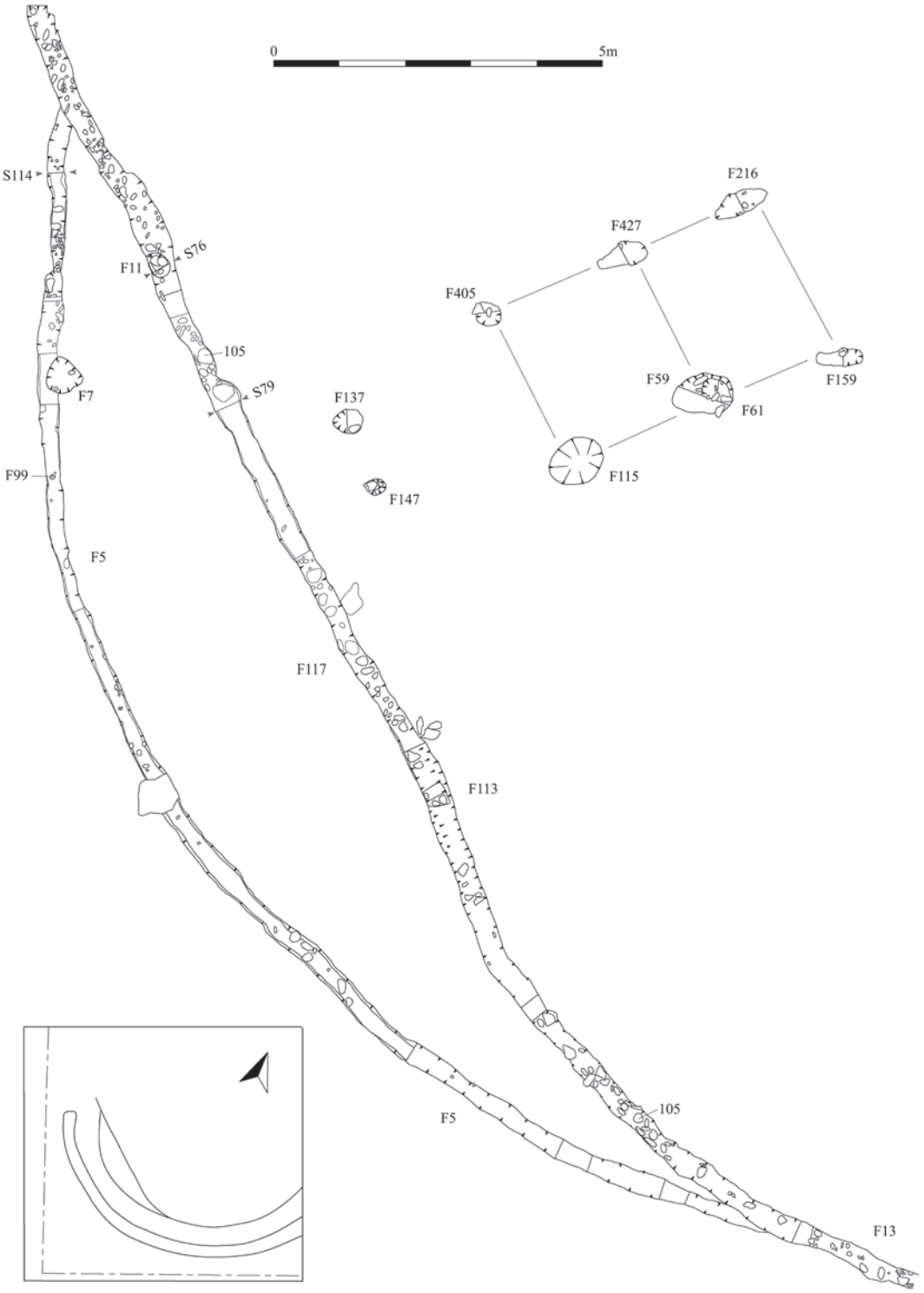


Figure 4.17
The west end of the palisade circuit and adjacent features

(SUERC-10530; 10531), whilst charred barley from a much truncated post-hole F7 cut into the palisade on its western side, yielded one of 980–810 cal BC (SUERC-10528), suggesting that this is a near-contemporary repair. However, a hazel nutshell from the northern end of the primary branch [104] gave a date of 390–200 cal BC (SUERC-10545), which on the basis of the other three dates is likely to be intrusive.

Continuation of the palisade?

As already noted, the north-eastern end of the palisade is heavily truncated and fades out well short of the northern ditch terminal. One reason for this may have been the need to create a level platform for a later curvilinear structure (CS3 below). However, in the north-western part of the site, a 4m length of straight gully F446 was identified, set back from the inner edge of the ditch by a similar distance to the palisade, but extending beyond the surviving terminal. This feature was somewhat square in profile, and had a darker, looser fill than most features on the site, but could nevertheless be related to the palisade or perhaps connected to the enclosure entrance, presumed to lie somewhere in the gap between the ditch terminals.

Bank and other contemporary internal features

As indicated above, the infill of the enclosure ditch at a number of points suggests that there was originally an internal bank. Given the extent of soil erosion, the original ditch could have been nearer 3m wide at the top, so the palisade is well-positioned to mark the rear limit of an internal bank of similar width. From its position between the palisade and ditch lip, the grain cache from pit F45 might well be a foundation deposit.

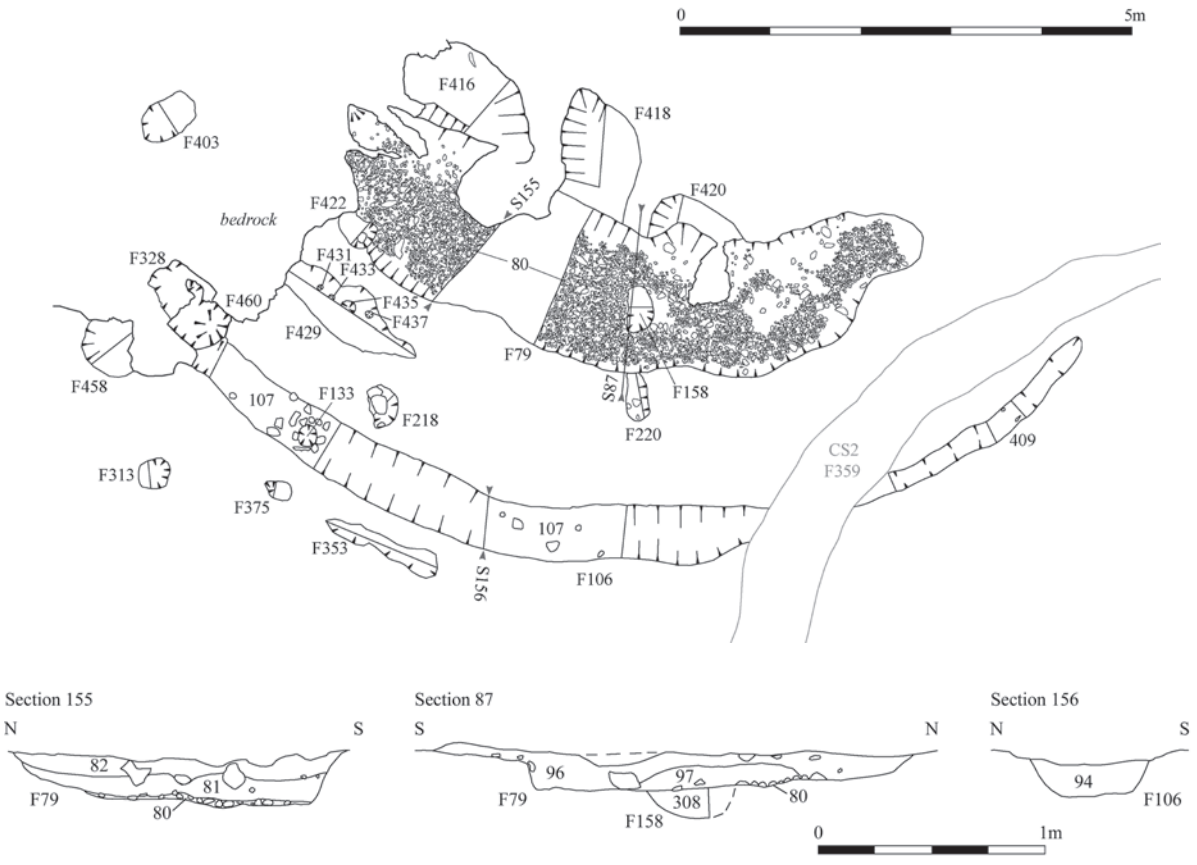


Figure 4.18
Plan and sections of Curvilinear Structure 1

The only internal features that could be related to the enclosure lie in the zone of enhanced preservation at the western end of the palisade (Figure 4.17). The most obvious were a pair of post-settings with packing stones, over 0.2m deep (F61; F115), which stand 2.5m apart at a right angle to the reshaped palisade. Charred hazel nutshell from F61 gave a date of 1020–830 cal BC (SUERC-10539). F216 and F427 form a second pair. Along with two much slighter, more irregular post-holes (F159, F405) – if the latter is not part of the curvilinear structure mentioned above – these post-holes form a rectangular arrangement, perhaps a 6-post structure, measuring 4.4×2.5m. Also potentially contemporary with the palisade are a pair of smaller posts south-west of the first group (F137; F147), the latter cutting the curvilinear gully F342 described above.

IRON AGE OCCUPATION

Two groups of features on the edge of the bedrock in the centre of the interior, plus a third to the north, appear to represent the remains of circular structures belonging to the ring-ditch house tradition (Hill 1982b). Associated radiocarbon dates suggest they are part of a later re-occupation of the site, when the bank and ditch probably still formed a vestigial earthwork.

The main elements of curvilinear structures (CS) 1 and 2 are very similar in form and plan: they each comprise a curving, sunken-floored feature with a cobbled base, shallow at one end and becoming deeper and wider at the other, and an associated outer gully. CS2 was stratigraphically later than and replaced CS1. A third sunken feature seems to be the truncated remains of another similar structure.

Curvilinear Structure 1

The focus of CS1 was a curving shallow hollow F79 running approximately east–west, with its terminals curving northwards, cut into the outcropping bedrock. A short distance to the south was a clearly concentric curvilinear gully F106. No traces of the building could be found on the exposed surface of the bedrock to the north. Presumably, like the adjacent cluster of post-holes, the surviving elements of this building had been protected by the outcropping bedrock forcing the plough to be lifted at this point.

The curving outer gully F106 was 11.5m in length and described an arc of *c.* 12.5m in diameter (Figure 4.18). It increased in width (from 0.25m to 0.5m) and depth (from 0.05m to 0.12m) towards the west, where it abutted the bedrock. The poor preservation of its eastern end is probably due to the fact that it had been

(A)

(B)

Figure 4.19
(A) CS1 outer gully F106, showing post-setting F133; (B) view of CS1 sunken feature F79

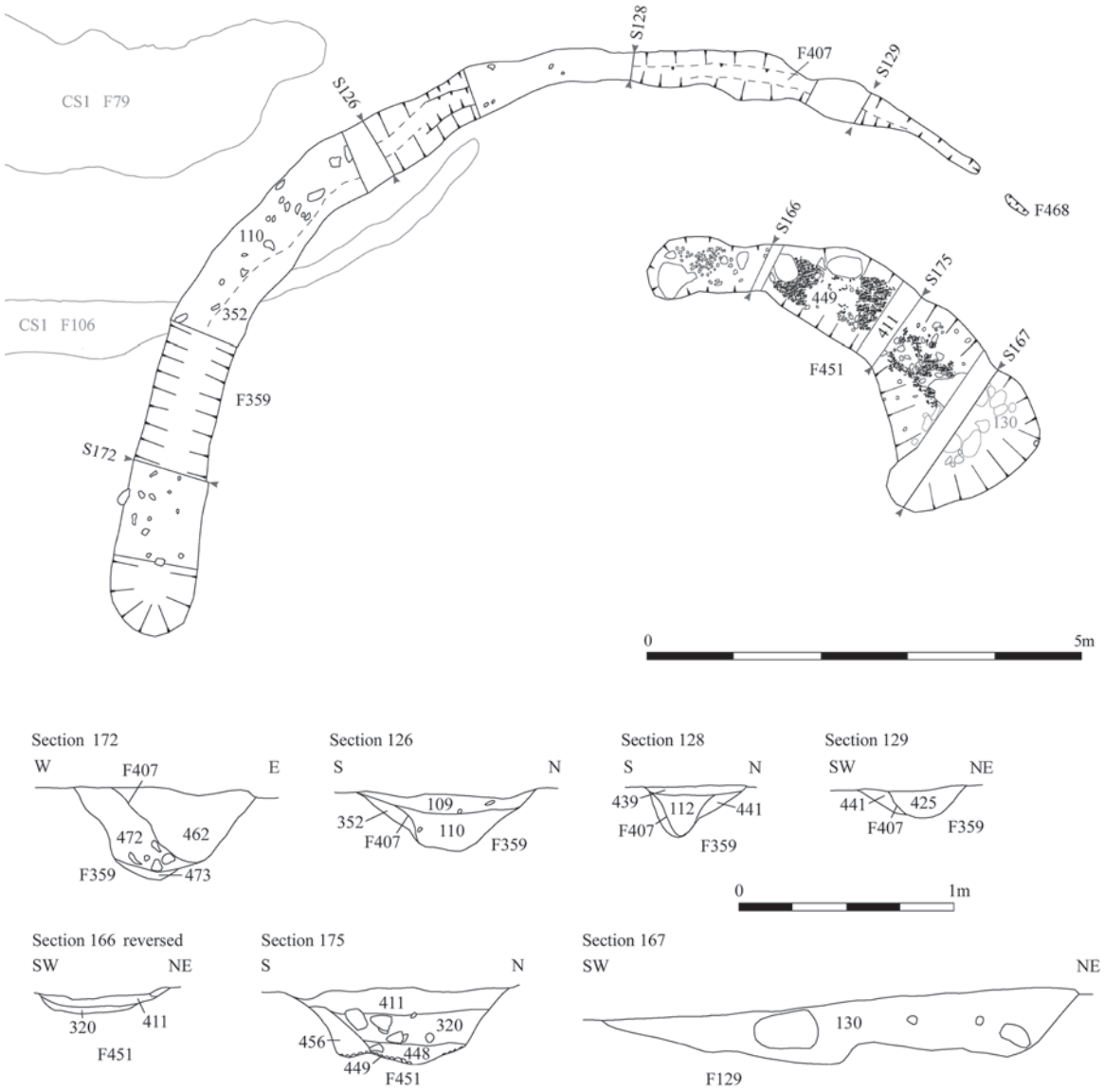


Figure 4.20
Plan and sections of Curvilinear Structure 2

truncated by CS2, which succeeded it. Gully F106 had a flattish base and was filled with clayey silt [94]. Incontrovertible evidence for uprights was restricted to a single post-hole F133, its packing stones clearly visible in the fill (Figure 4.19), but there were further groups of stones elsewhere in the gully, and there were two smaller post-holes (F328; F460) at the edge of the bedrock. Hazel charcoal from the gully fill [94] and birch charcoal from F328 both yielded dates in the third to second centuries cal BC (SUERC-10541; 10559).

Whilst gully F106 might be thought to be structural and to represent the wall line of a large circular building, the base actually falls slightly more than the slope does, a phenomenon repeated in CS2. It might therefore have been designed to collect water. If so, the wall of the building probably lay just inside, and was perhaps constructed of turf or stone and post-hole

F133 may be secondary. On the other hand, possible remains of an eavesdrip (F353) were observed 0.4m outside gully F106.

Some 2m inside gully F106, closely following its alignment and curvature, was a large sunken feature F79, the largest of three such features at Standingstone. It comprised a curving hollow (6.5m long × 1.5m wide × 0.2m deep) with a flattish base, becoming deeper towards the western end. The base was covered with a metalled surface [80] using smaller, more compacted pebbles than in the other comparable structures, and in places incorporating the bedrock. The northern edge of F79 was formed by the bedrock, the surface of which was worn smooth in one area, perhaps suggesting its use for access. Three irregularities in the bedrock filled with natural clay along the northern edge (F416; F418; F420) are probably places where the rock surface had disintegrated and required levelling.

A single post-hole (F158, 0.15m deep) cut through the centre of the pebble surface is evidently contemporary with the building. It was sealed by a patch of dark grey-brown silty loam [97], rich in charcoal and presumably associated with the use of the sunken feature or the demise of the post. Along the inner edge of F79 were small slumps of redeposited clay, presumably eroded out of the adjacent surface whilst the sunken feature was in use. The character of the main fill – deposits of sandy loam with large stones and charcoal [81 = 96; 82] – implies that the feature may have been deliberately infilled when CS2 was built. Birch charcoal from [82] gave a third date in the same range as before (SUERC-10540).

A few other features between F79 and the outer gully may belong to CS1. They included an elongated scoop F429 containing a small post-hole (F435) and three stake-holes (F431, F433, F437), perhaps the remains of a screen or even the inner face of the wall. Another post-hole (F220) with a charcoal-rich fill [123, 124] 3.5m away from the first, occupies a similar position 1.5m within the outer gully, suggesting they may be the vestiges of an inner post-ring. The scoop pre-dated a small patch of cobbled surface [354], which may be contemporary with CS2. Three other post-holes might belong with either CS1 or with its successor: F422 appeared to cut the southern edge of F79 and is a potential pair for F133 if this is secondary to the gully; F218 lay just inside the outer gully; whilst F458 cut into the edge of the bedrock just outside F106.

Curvilinear Structure 2

CS1 was replaced by a similar structure (CS2), the outer gully of which clearly cut that of CS1 towards its eastern end (Figure 4.20). This time, only the northern part of the structure survived, its preservation again assisted by proximity to the bedrock outcrop, leaving the downslope part to be ploughed away over time. From the evident truncation of the CS1 gully within CS2, it is likely that the ground was levelled when the later structure was built.

The outer gully of CS2 (F359) was similar to the outer gully of CS1 and defined an almost identical area (*c.* 12.75m in diameter), although a greater length (14m) survived and it was slightly more substantial.

(A)

(B)

Figure 4.21
(A) View of CS2 from the west, showing outer gully F359 cutting through CS1; (B) view of sunken feature F451

Like CS1, the downslope (southern) end was the deeper and wider (Figure 4.21), whilst the other end petered out; a slight feature (F468) disturbed by a burrow is probably its continuation.

The base of F359 fell even more than the outer gully of CS1, 0.25m more than the natural slope, and 0.7m in all. The gully had sloping sides and was filled with silty clays with few stones; unlike CS1, it had at some stage been recut as a narrower feature with steeper (but still sloping) sides (F407), lying towards the outer side of the original gully. The recut too contained silty clays and small stones, except at the southern end, where there was a concentration of larger stones, though nothing to suggest a structural arrangement. It thus seems unlikely that this gully functioned as a wall slot, whilst the silting, the need for a recut and the lack of any continuation beyond the terminal suggest that the feature was open and that any building stood inside it. Charcoal from the recut near the middle of the gully [110] gave a date of 370–110 cal BC (SUERC-10546), but dates on two nutshells from the southern terminal were earlier and inconsistent (SUERC-10560; 10561) implying either that residual material had become incorporated or that earlier features were disturbed by the gully.

Two metres inside the northern end of the gully, echoing its curvature, was another sunken-floored feature F451, similar in form to F79 in CS1, but slightly smaller (5m long) and with the deeper, wider end to the east. Except at this end, where the bedrock was exposed, its base was surfaced with tightly packed cobbles [449], although an oval gap filled with compacted soil in the middle section might mark the position of a post-setting like F158 in CS1. A slump of natural clay [456] had spilled over the cobbles along the inner edge of the feature, over which silty clay deposits formed [448, 452]. The main fill was stonier [320] and at the east end – where the feature cut into bedrock – there were numerous large rounded stones [130]. The upper fill was silty [411]. Charred grain from [130] gave a date of 360–50 cal BC (SUERC-10547) consistent with the latest date from the outer gully.

No other features survived within the projected area of CS2, apart from an isolated post-setting F139 4m south-east of F451, itself replaced by a slightly larger post-pit F141, both with packing stones. This setting lies on the same arc as the sunken feature and might form part of a post ring of 8.5m diameter.

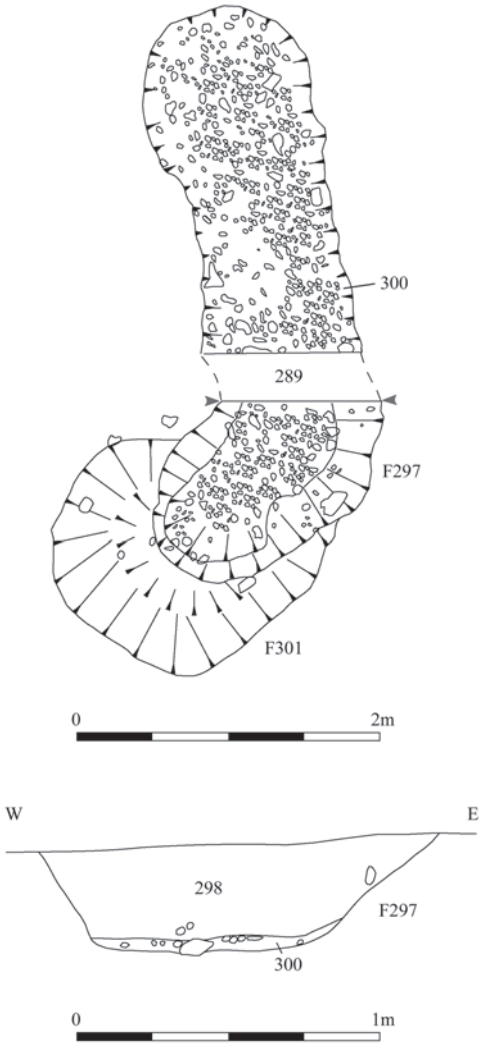


Figure 4.22
Plan and sections of Curvilinear Structure 3

Curvilinear structure 3

A third sunken-floored feature was located in the northern part of the enclosure. Although no associated outer gully was found, the overall resemblance to the features within CS1 and CS2 suggest that this was part of a third circular structure. F297 took the form of an elongated hollow aligned north-west to south-east, with the deeper, southern end turning quite sharply towards the south, where it broadens out considerably (F301) (Figure 4.22). A compact cobbled surface covered the whole base [300], apart from a patch mid-way along the inner edge reminiscent of

the break in F451. The feature was filled with dark brown silty clay with charcoal flecks. The southern end was comparatively rich in carbonised cereals [298; 302], one of which produced a date of 370–100 cal BC (SUERC-10558), consistent with the dates from the other curvilinear structures.

If F297 was like the other sunken-floored features, it could be the inner element of a building of comparable size to CS1 and CS2, but the only surviving features which might conceivably be associated are post-hole F401 and a slighter feature F470 near the north-east end of the palisade. CS3 would have been located over any continuation of the palisade and/or bank through this area; indeed, as suggested for CS2, it is quite possible that a platform cut for CS3 removed further traces of the palisade. CS3 would seem too close to CS2 to have stood at the same time, although it could have been contemporary with CS1.

DISCUSSION

The excavation at Standingstone revealed a long history of habitation, including several pre-enclosure phases, the construction of the ditch and palisade, and finally an 'open' settlement. A minimum of five periods of occupation may be defined, although some isolated features cannot be related to the sequence. A detailed chronological model is developed in Chapter 9.

1. Neolithic

Pit F56 produced the earliest evidence of occupation, with radiocarbon dates indicating a later Neolithic time span for its infilling (2880–2490 cal BC). Sherds of pottery, a few flints, naked and hulled barley, and emmer, as well as the remains of an apple core, were recovered, suggestive of nearby settlement. No other features can be attributed to this phase of activity, but a radiocarbon date of 2560–2140 cal BC from a later deposit may suggest at least sporadic further occupation in the Neolithic.

2. Early Bronze Age

In the Early Bronze Age the hillside became a focus for burial, represented by two graves containing cinerary urns at the eastern side of the site. The more complete urn contained the fragmentary remains of an individual over nine years old, buried between 1680–1490 cal BC. Whether a tiny flint flake and chips of reddish stone found with the bones were accidentally gathered up along with the pyre material or deliberately included is unclear. A concentration of small features on the eastern side of the site may reflect associated activity. It might be tempting to relate a pit (F41) with *in situ* burning, 25m away, with the cremated remains, but other pits containing burnt material have later radiocarbon dates. The truncation of the inverted urn provides a useful measure of the amount of overburden potentially lost to ploughing.

3. Later Bronze Age open settlement?

At some point, a linear boundary, possibly of more than one phase, was constructed across the southern part of the site; this remains undated, other than preceding the enclosure. This may have been a field boundary but is perhaps more likely to be linked to a scatter of other pre-enclosure features to the north, dividing them from open ground to the south. These other early features include pits containing burnt material, hints of circular structures, and a number of post pairs, especially in the zone of better preservation in the lee of the bedrock, which taken together suggest the existence of an open or semi-open settlement. Radiocarbon dates place this occupation in the later part of the Bronze Age. The coincidence of the linear boundary and later enclosure circuit might imply that the earlier feature was a point of geographical or historical reference.

4. Late Bronze Age enclosure

In the tenth or earlier ninth century cal BC, a ditched enclosure was constructed, accompanied by a palisade, which probably marked the back of a bank. From the radiocarbon dates, the use of this enclosure was short-lived, possibly as little as a generation (Chapter 9), although long enough for the palisade to be realigned on the south-west side and for the ditch to be recut at the lowest point on the circuit where most silting would have occurred. The ditch itself was stepped down the hillside rather than following the slope. The reshaping of the palisade appears to have taken place rapidly, since most of the circuit was retained; there is some evidence for segmentary construction, different sections being marked by larger posts.

Whether the enclosure circuit was originally continuous is unclear. No evidence for the boundary was found in the wide gap between the surviving ditch terminals where the bedrock outcrops. A similar gap in the ditch circuit may exist at Hedderwick, but, given the stepping of the Standingstone ditch and

degree of plough erosion, it is possible that a shallow segment of ditch has been lost. On the other hand, the surviving western terminal did yield five of the six cobble tools from the site and it is reasonable in any case to assume that the entrance was located within the bedrock area.

Erosion and/or the short lifespan of the enclosure may help explain the paucity of internal features, which were restricted to a few post structures in the south-western part of the site, whilst part of the palisade appears to have been lost to a later phase of occupation.

5. Later Iron Age 'open' settlement

After a gap of some centuries, the vestiges of the earthwork were re-utilised for a settlement, represented by three large circular structures. At least two building phases are attested in the later centuries BC. Detailed evidence for the construction of these buildings does not survive, but there is some indication that the stances were levelled beforehand, obliterating earlier features such as the palisade. Two of the structures preserved partial outer gullies, but these were not dug level, and whilst one contains some evidence for uprights, the other appears to have stood open. In addition, if the outer gully of CS2 originally surrounded the whole structure, it is difficult to explain why more of the circuit does not survive, given the depth of the surviving terminal on the downslope side, and the gullies may always have been partial. Assuming the gullies defined circular buildings, rather than just being shelters, the wall line must have stood just inside.

All three structures are characterised by curving sunken-floored features with cobbled surfaces. The hollows were apparently accessed from the inner side and their use may have been over quite a long timespan, to judge from an area of worn bedrock in CS1. Two of them appear to contain evidence for uprights, perhaps even the remains of an inner post ring. No evidence of function was obtained, but the sunken features are somewhat reminiscent of the stone paving seen inside ring-ditch houses known elsewhere in south-east Scotland (e.g. Hill 1982b) and the structures overall are of comparable size. Excluding the grain cache beneath the bank of the Late Bronze Age enclosure, the environmental samples from the three circular structures were amongst the richest from the excavation, implying that cereal processing took place in or near these structures.

Like the previous phases, the Later Iron Age occupation was relatively sterile in terms of artefacts. There is no evidence for later use of the site apart from recent cultivation.

Chapter 5

Excavations at Knowes

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(with a contribution by Anwen Caffell)

The rectilinear enclosure at Knowes is situated at just under 20m OD on a broad terrace sloping down northwards towards the River Tyne, 2km from East Linton and 4km north-east of Traprain Law, beside the A1 trunk road (Figure 5.1). It was discovered from the air by CUCAP in 1970 and has been photographed repeatedly since. The cropmarks reveal a sub-rectangular ditched enclosure measuring internally about 48m from north-north-west to south-south-east and 44m transversely at its southern end, tapering to about 33m at the north (Figure 5.2). The ditch varies from about 3.5–6.5m across and is widest on the west. After making an allowance for an internal bank, the internal area is about 0.14ha. There is an entrance on the eastern side and a large macular cropmark in the interior indicating a scooped or dished area of locally deeper deposits. Some 30–35m north-north-west of the enclosure is a similar macular cropmark measuring about 15–20m across.

In the geomagnetic survey, much of the ditch and the internal and external scooped areas were evident as intense positive magnetic anomalies, although south of the entrance causeway the ditch is apparent only as a much weaker anomaly. Within the interior, an area of enhanced magnetic susceptibility and concentrations of small, intense anomalies, possibly reflecting hearths and other subsequently excavated features, are also evident. Outside the enclosure, several linear anomalies, almost certainly ditches, were recorded, including one running right up to the entrance, but some of the more diffuse and irregular anomalies are probably geological in origin. The north–south

Figure 5.1
Knowes, looking towards Traprain Law. The excavation is visible in the middle foreground beyond the farm buildings; the line of the newly dualled A1 is clearly visible (Photo John Davies)

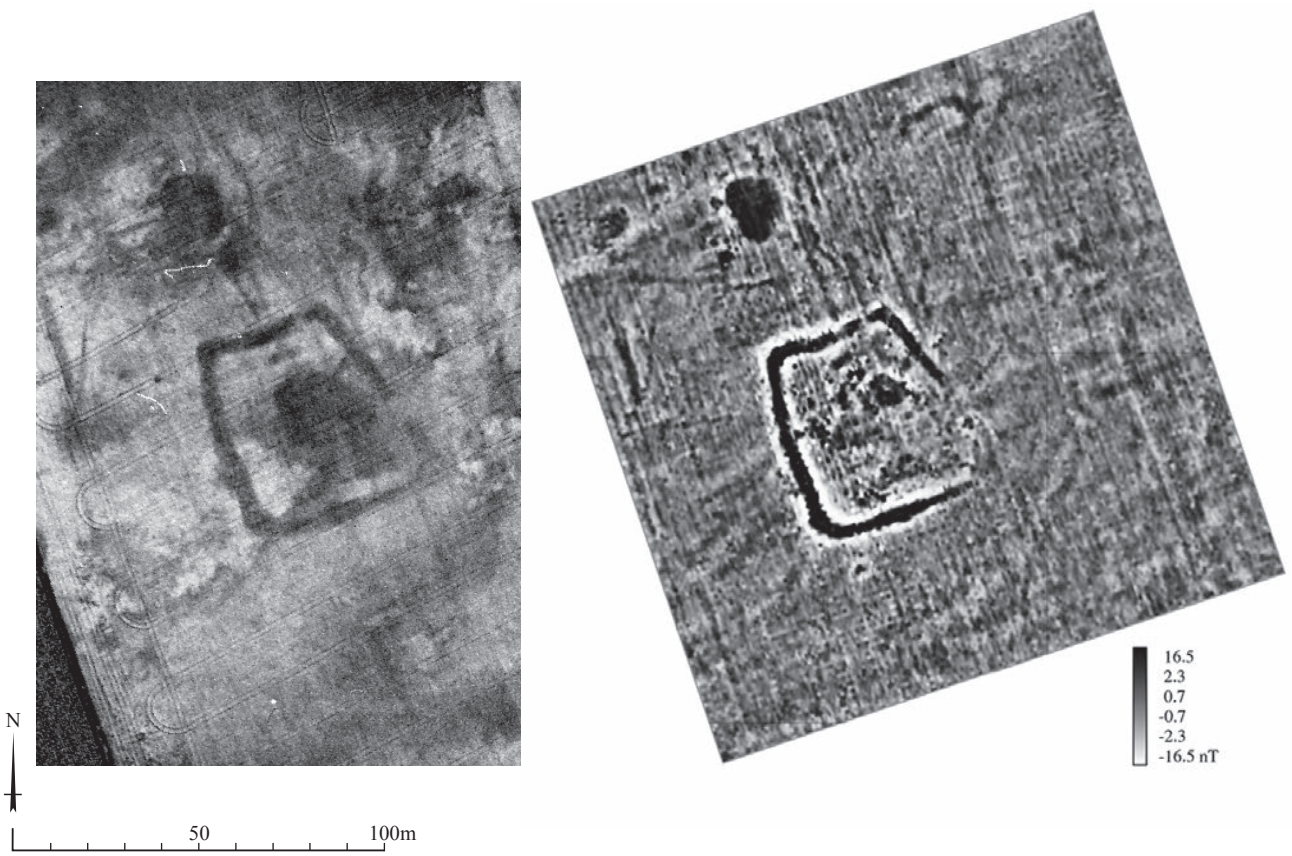


Figure 5.2
Knowes (NT67NW 19): rectified aerial photograph (EL4557) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004474)

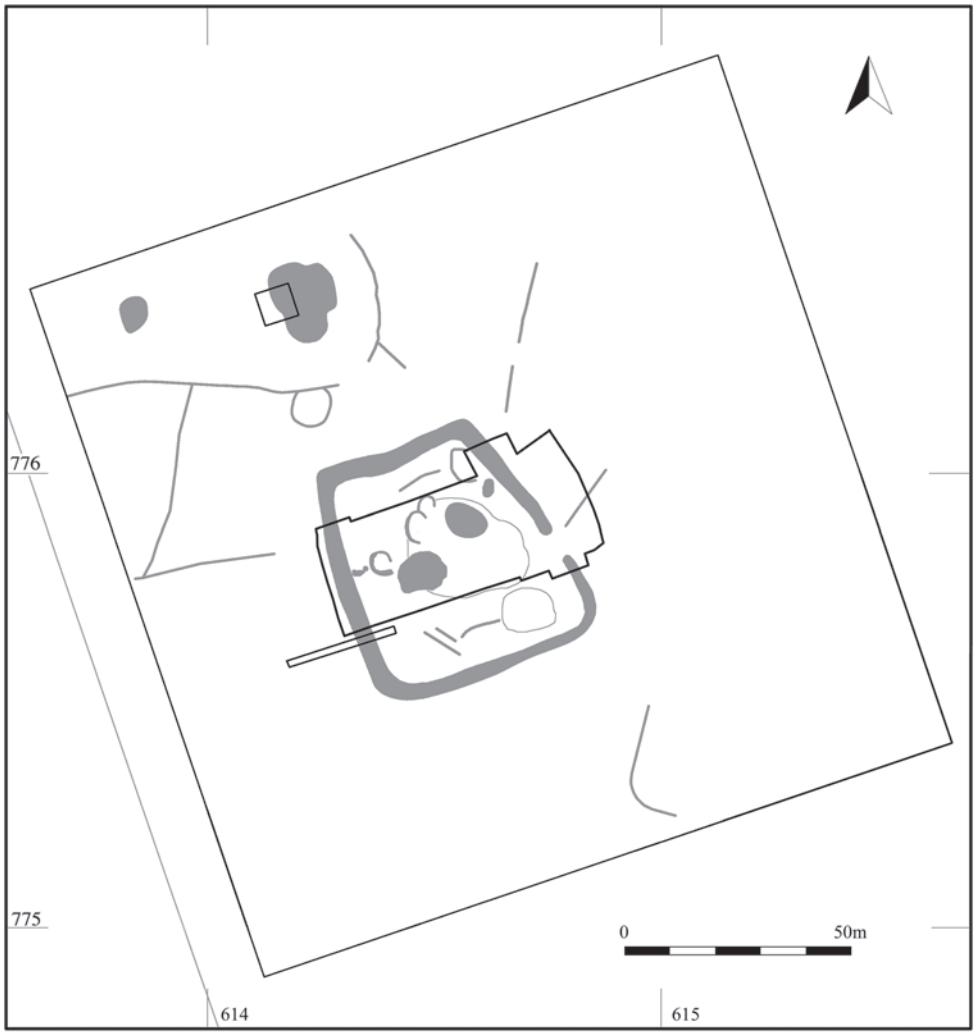
aligned texture in the geophysical data reflects the modern plough regime. The geology is Calciferous Sandstone Measures, overlain by late glacial sand and gravel deposits.

From the cropmark and geophysical evidence, Knowes represents a good example of the many rectilinear enclosures recorded in the TLEP study area. Following an evaluation trench over the western enclosure ditch in October 2002, which recovered carbonised cereals (ASUD 2003c), the site was chosen for large-scale excavation. A second evaluation in September 2003 examined the macular feature north of the enclosure (ASUD 2004b).

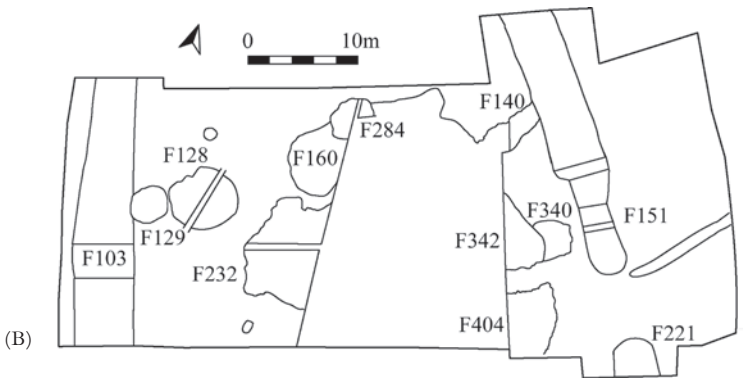
THE EXCAVATIONS

An east–west transect of *c.* 1540m^2 was opened across the site in order to investigate the enclosure ditches and entrance area, and to characterise the internal occupation (Figure 5.3; Plate 2). The work took place over seven weeks in June–July 2004. Following machine stripping and cleaning, test pits confirmed that the central cropmark was indeed generated by a large scoop, which had subsequently been buried by a thick deposit of silty sand to a depth of at least 0.7m. Since complete excavation was beyond the scope of the project and the overburden deep enough to protect the underlying archaeology from plough damage for the foreseeable future, it was decided to focus on the western and eastern sides of the scoop. At the end of the excavation, the exposed stone structures were covered with a protective layer of stones before backfilling. The Data Structure Report was submitted to Historic Scotland in March 2005 (ASUD 2005a). The site codes are TKN02 and TKN03 for the evaluations, and TKN04 for the main excavation.

The natural subsoil was sand, sometimes with gravelly laminations, and was both free draining and



(A)



(B)

Figure 5.3
(A) The enclosure at Knowes, showing the principal subsurface anomalies and the location of the 2002–4 excavations.
(B) Key plan showing the main excavated features

extremely loose, particularly in the western half of the site, where it resembled beach sand. This proved very susceptible to rapid redeposition by the prevailing westerly wind, as the students learned to their cost! The modern ploughsoil averaged 0.3m in depth and north–south plough marks were visible cutting into the underlying deposits over much of the site. A single field drain cut through the trench from north-east to south-west (F398).

THE ENCLOSURE CIRCUIT

Sections were excavated through the western and eastern sides of the enclosure ditch, as well at both

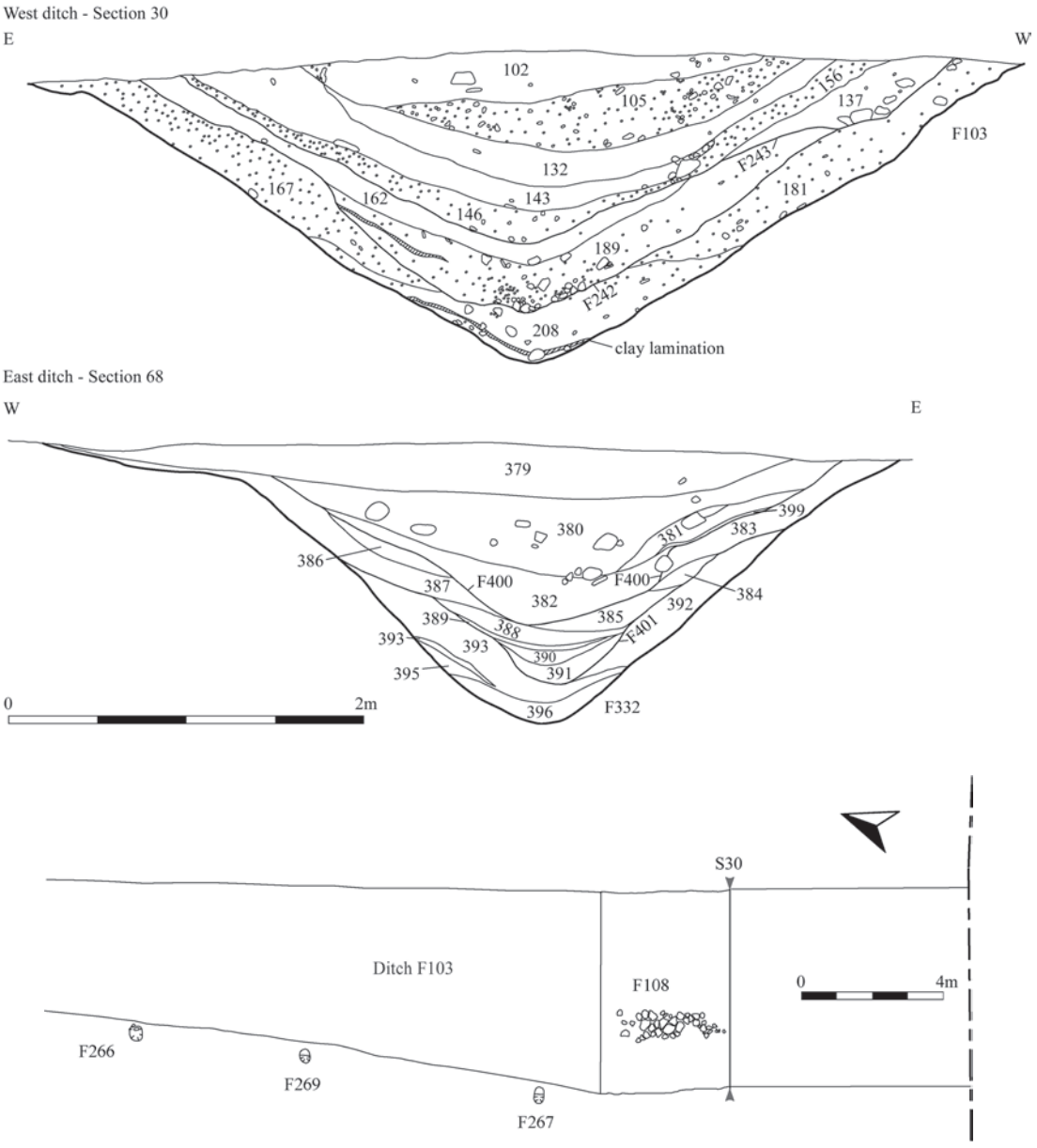


Figure 5.4
Sections through western (F103) and eastern (F332) ditches; inset of late paving (F108) and post-holes on the western side of the enclosure

entrance terminals. The apparent variations in ditch width around the circuit proved to be real, reflecting a combination of intentionality on the part of the original builders – such as a shallow lip along the east side – and differential erosion and truncation in the sandy subsoil.

The western side of the ditch

A 3m section was excavated across the western side of the ditch (F103) at the point where it slightly changes direction and becomes narrower as it descends the hill. This was positioned just to the north of the 2002 excavation, which had sampled the upper fills to a depth of 0.9m.

The ditch possessed a broad, V-shaped profile, with a maximum depth of 1.75m and width of 5.75m (Figure 5.4) and had been recut at least twice. The primary fill comprised 0.3m of light brown sand with a few small stones [208], presumably from erosion of the ditch sides, containing thin lenses of clay and loam [e.g. 207]. Above were further deposits of gritty sandy loam, reflecting the gradual infilling of the ditch as both edges eroded [167; 181]; that on the outer side contained part of the base of a coarse pottery vessel (sf 124).

The ditch was later recut to the same V-shaped profile, albeit a little more irregular and only to a depth of 1.5m (F242). This recut was filled with sandy loam with small stones in the middle [189, 0.3m deep], then black silty loam [162, 0.2m deep]. Three carbonised grains in these fills were radiocarbon dated to between the second century cal BC and the early first century cal AD (SUERC-10576; 10575; 10580). The profile was then redefined for a second time, again creating a shallower version of the same overall profile (F243, 1.15m deep). A build-up of a gravelly sandy loam [146, 0.35m deep] suggests that this recut initially suffered erosion from the outer side. Above this were sandy loams with gravel [107; 137; 156], and laminated fine dark silts [143; 132], variably distributed along the length of the ditch. They were covered by more gravelly deposits [136; 105], by which time the ditch was largely infilled, leaving only a shallow hollow 0.2–0.3m deep. Several of the fills of both recuts were comparatively rich in charred cereals, as were equivalent layers from the 2002 evaluation [7–11]. Two more radiocarbon dates were obtained from the second recut, one from [146] similar to those from the earlier recut (SUERC-10569), the other from [143] slightly later (SUERC-10567). [132] yielded pottery (sf 66), whilst part of an amber bead (sf 248) was recovered from an equivalent deposit [10] in 2002.

A band of flat slabs F108, *c.* 4m long, was placed over [105] towards the western side of the ditch (Figure 5.4 plan), apparently the remains of a surface. Its original extent is unclear, but it might indicate a later access route across the former ditch from the west. Other stones were observed in the unexcavated upper fill on both sides of the ditch to the north, which might be remnants of further stabilization at about the same stage as F108. In time, the slab surface and remaining hollow in the top of the ditch were covered by black silty loam resembling midden [102; 179], which was evidently deliberately deposited. This deposit was rich in finds, including fragments of white glass bangle (sf 121) and decorated copper alloy sheet (sf 242), as well as a concentration of mussel and winkle shells, and small fragments of animal bone. An intact quern upper stone (sf 104) was also found, placed upright within the ditch (Figure 5.5).

Three widely spaced post-holes, each about 0.3m in diameter (F267; F269; F266), found alongside the outer edge of the ditch may be the remains of an earlier or later fence; no relationship to the ditch was recovered, although the presence of cereal remains in the fills of F267 and F269 might suggest that they cut the ditch deposits.

Figure 5.5
Quern upper stone (sf 104) placed upright within western ditch (F103)

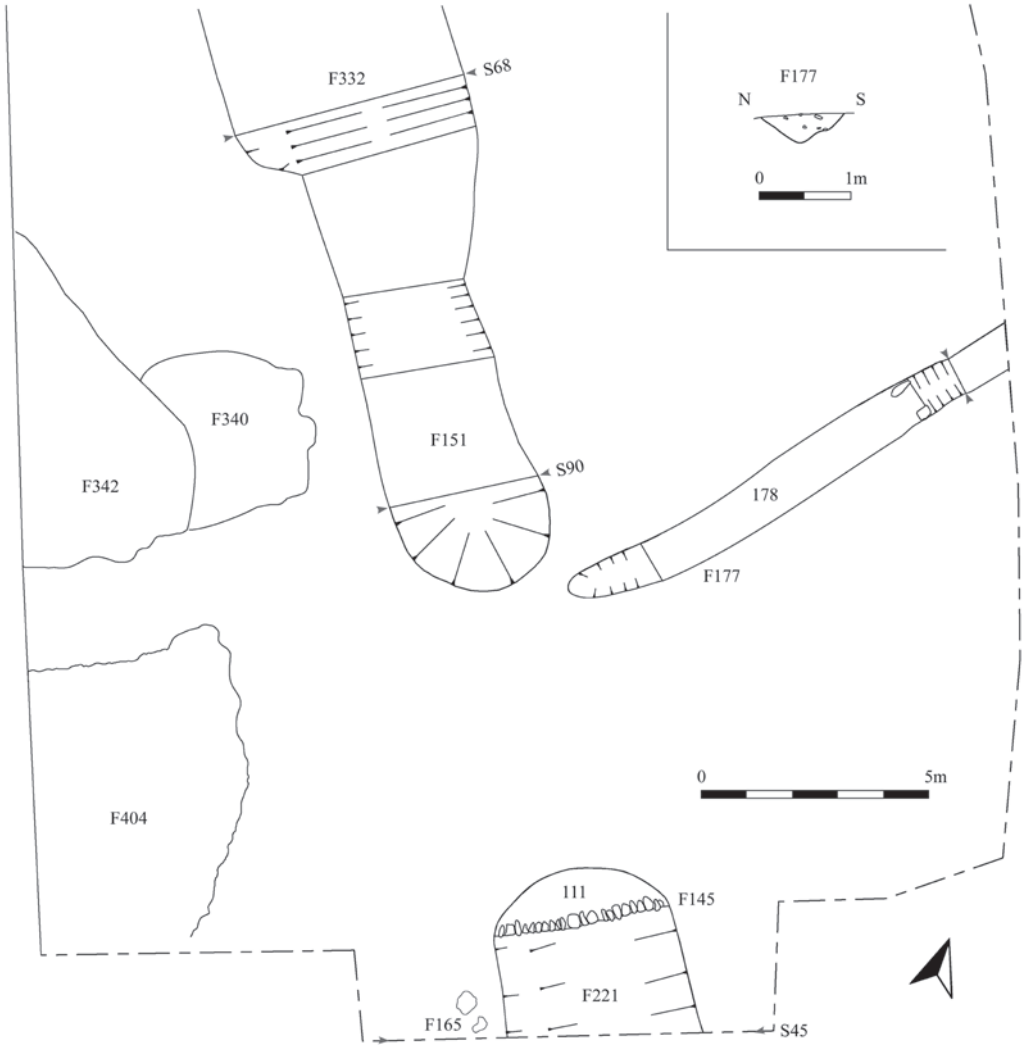


Figure 5.6
Plan of eastern entrance; inset section of gully F177

The eastern ditch

A second section was excavated across the ditch on the opposite side of the site, some 8m north of the entrance, at a point where the ditch apparently widened significantly. Here too there was evidence of two phases of recutting. The initial ditch was again a broad V-shape in profile and 1.6m deep (F332), but proved to be only 3.8m wide, much narrower than in the western section (Figure 5.4). The impression of greater width was due to a shallow lip 1m broad on the inner edge, which began at this point. The base of the ditch was filled with coarse gravel [396], followed by lenses of gravelly soil and dark loam [395; 394], then more substantial deposits of silty loam on the inner side [393], and a thick gravelly deposit [392] on the outer slope, all presumably the result of erosion.

The first recut retained the original profile but was shallower (F401). Its base was filled with successive deposits of sand and stones [391] and clayey loam [390] – very much as on the western side – but was then covered by a skim of clean reddish-brown sandy clay [389], perhaps laid to retain water or formed as a result of standing water. Over this, successive bands of silt [388] accumulated and then gravelly slumps [385; 386; 387; 383], with some clay loam [384].

These deposits greatly reduced the size of the ditch, which was recut to a shallower, more U-shaped profile, with a steeper slope to the outside (F400). At the base was a thick layer of dark loamy sand [382, 0.3m deep], covered on the outer edge by lenses of fine gravel and gritty sand [399; 381]. The body of the ditch then infilled with dark sandy loam and some large stones [380], leaving only a slight hollow 0.3m deep, at the level corresponding to a stone structure over the northern terminal (described below). In due course, the hollow filled up with brown clayey silt [123], from which the lower stone of a quern (sf 65) was recovered.

Banks

No *in situ* remains of banks were recovered on either side of the site, nor was there conclusive evidence from the ditch fills. Indeed, the loose, sandy subsoil would have made it difficult to construct any lasting bank. However, a band around the inner edge of the ditch is devoid of features apart from a few late structures dating to a period when the ditch had very nearly filled up, which implies that there was originally an internal bank. There is also circumstantial evidence for an internal stone revetment beside the entrance. From the ditch fills, there could easily have been an external bank as well.

THE ENTRANCE AREA

The enclosure entrance was formed by a break in the ditch circuit approximately 6m wide on the eastern side of the site, although the excavation only exposed the tip of the southern terminal (Figure 5.6). Both terminals were initially rounded and showed evidence of recutting, although less than in the other ditch sections. After the terminals silted up, stone structures were constructed over them. The subsoil in the entrance area was more gravelly and firmer than on the western side of the site.

The ditch terminals

A 7m segment of the ditch north of the entrance was investigated, but owing to the overlying stone structures, only the 3m nearest the causeway was excavated to natural. The original ditch (F151) had a broadly similar profile to the section to the north, but was apparently slightly shallower (1.4m) – although since the base was waterlogged (during excavation standing water was present to a depth of 0.4m), it was difficult to be certain of the exact profile of the lower reaches. In the base was a distinct deposit of brown-grey clay [333], which had almost petered out by the time the section was reached (Figure 5.7). Above was a thick deposit of green-grey sand with gravel [275],

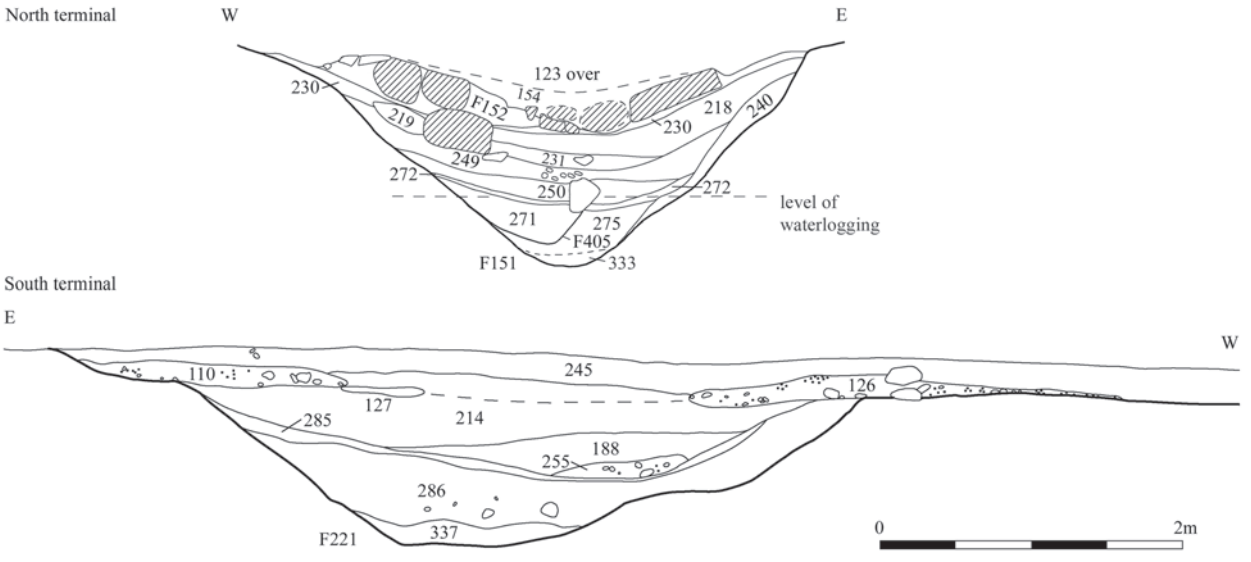


Figure 5.7
Sections through northern (F151) and southern (F221) ditch terminals

and on the outer side, silty sand [240] representing erosion.

A V-shaped recut (F405) through [275] appears to equate to the recut observed further north. This was filled with dark grey silty clay [271], which – unlike the basal fill of the primary ditch – contained waterlogged plant remains as well as part of a hazel stake (sf 205) driven at an angle into the clay. The stake and a charred barley grain from the same layer gave radiocarbon dates between the fourth and first centuries cal BC (SUERC-10587; 10588). Above [271] was a skim of clean sandy clay [272] which extended right across the ditch, reminiscent of [389] in the same recut to the north, but this time greenish-grey, perhaps due to the waterlogging. Two more radiocarbon dates were obtained from barley in this deposit (SUERC-10590; SUERC-10589). Above [272] were a series of fairly horizontal sandy clay layers with varying amounts of silt and gravel, some 0.6m deep [250; 220; 249; 231]. There was no sign of the second recut seen in the section to the north in these deposits, but a slump of compact clayey sand with large rounded boulders on the inner edge [219] may be the remains of a collapsed bank revetment, of which more evidence was found at the south terminal. Overlying this were further deposits of sandy silt [230; 217; 218].

The southern ditch terminal (F221) had a more U-shaped profile than elsewhere on the circuit, shallower (1.3m) but also slightly wider (4.2m) than its northern counterpart. The basal fill [337] was blue-grey silty sand with pebbles, but unlike on the north side, this terminal showed no evidence of waterlogging, nor of an early recutting phase – which may be explained by its different structural history. Although it was initially rounded, at a relatively early stage a dry-stone revetment wall (F145) was built straight across the butt end, squaring it off. Between the wall and original ditch edge was a layer of sandy silt [111], but whether this was packing or earlier ditch fill is uncertain, since only 0.1m was excavated (in order not to disturb the wall). Sitting in the top of [111] was the rim of a large bucket-shaped pottery vessel [sf 10], which may have been a deliberate deposit.

The lower part of wall F145 rested directly on [337] and was formed of boulders, whereas the upper part was made of smaller cobbles laid in irregular courses (Figure 5.8). It is unclear whether two phases of construction are represented or whether expedient use was made of available stone, perhaps from an adjacent revetment, of which two large boulders (F165) set in the ground beside the inner edge of the ditch were perhaps the last remnants. Following the building of wall F145, a thick deposit of silty sand with stones [286] – quite possibly bank material – formed against it, across the body of the ditch. Over this a thin compact layer of brown silty sand and stones [285; 262] formed, its profile suggesting a stabilization of the ditch, perhaps equivalent to the second recut elsewhere. The upper part of the ditch was infilled mainly with soft clay [188] and a thicker deposit of clayey silt with stones and gravel [214], perhaps deliberate levelling, which left the terminal virtually full.

Figure 5.8
Revetment wall F145 in southern ditch terminal

The external gully

A shallow gully with sloping sides, up to 0.3m deep and 0.9m wide (F177), ran from close to the northern ditch terminal towards the north-east, evidently the external feature apparent on the geophysical survey. The fill contained a few large stones, but there was no evidence for stakes or posts. Whilst there is no direct relationship, the position of the gully suggests that it is contemporary with the entrance at some point, and was intended to control or guide movement in and out of the site.

Stone structures at the entrance

After the ditches had largely filled up, stone surfaces were laid over both terminals, although of rather different character. The surface to the north was made up of very large and thick (up to 0.3m) sandstone slabs

(F152). This began with a straight edge 2m inside the butt end, from where it extended at least 4.5m north (Figure 5.9). At its southern limit the paving extended across the full width of the ditch, but the northern part was less regular, perhaps as a result of some stones at the edges having been removed, whether by the plough or some other agency. The purpose of the surface is unclear, but it may be linked to another paved area

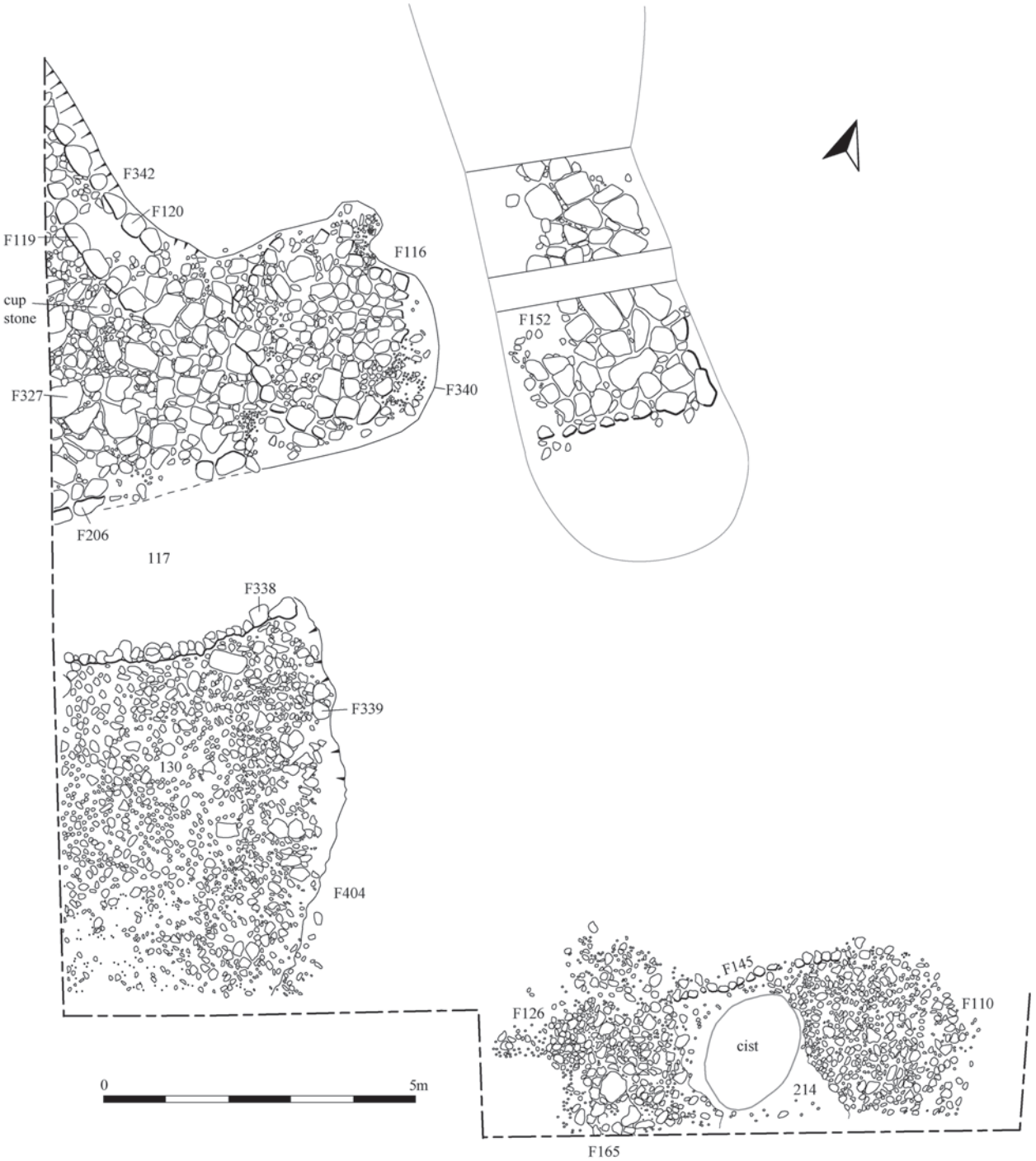


Figure 5.9
Plan of later stone surfaces in the eastern entrance area

Figure 5.10
View of paving F152 over north ditch terminal, with F116 in the background

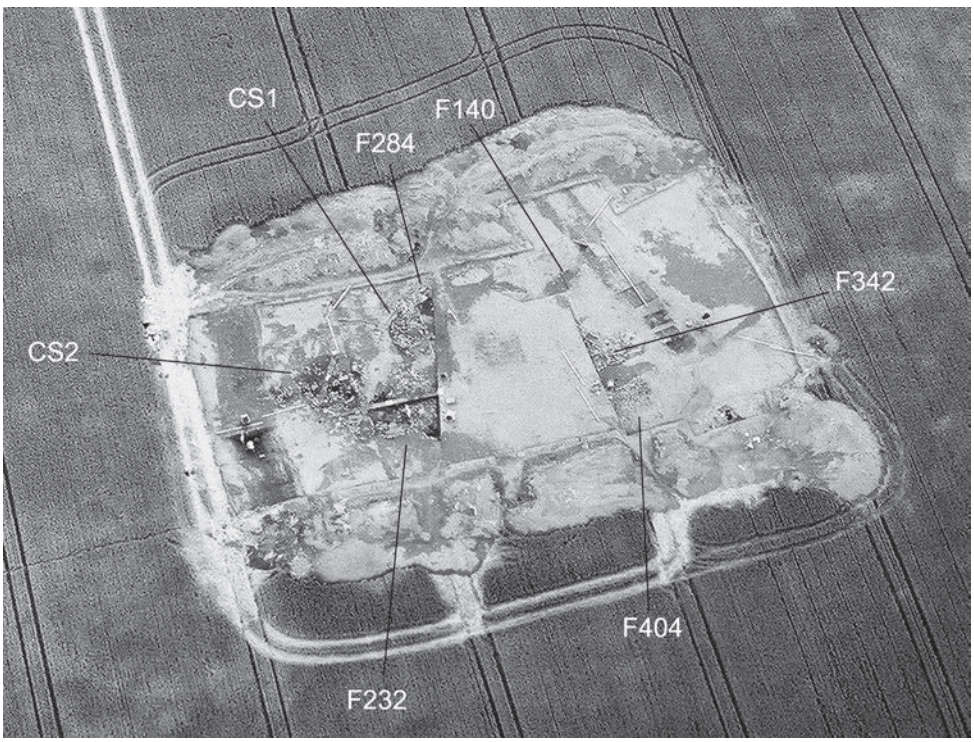


Figure 5.11
Aerial view of the enclosure during the excavation, showing the principal features in the interior (Photo John Davies)

Figure 5.12
Plan of scoop edges (F340, F342 & F404) inside the entrance

to the west (F116 below) (Figure 5.10). The stones were apparently laid directly over the slight hollow at the top of the ditch – no evidence was found of any levelling or bedding layer – and then subsided further into the fills. Over the paving was a thin gravel layer [154], whilst dark brown sandy silt accumulated in the adjacent ditch end beyond it [155], both eventually being covered by the same clayey silt [123] as to the north. A glass bangle (sf 52) was the only notable find from over the stone surface.

Figure 5.13
View of causeway revetment (F338) and early surface F358 at base of scoop F404

The surface laid over the southern terminal was made from smaller cobbles set in silty loam (F110, F126) (Plate 2). Unlike F152 this surface not only covered the whole ditch, where it sloped slightly down towards the centre, but continued a short distance into the interior and may well originally have been continuous with a similar surface in the central scooped area just to the west (F130 below). The cobbles forming F126 were laid around the possible revetment remains F165 and also incorporated the top of wall F145; judging from a few surviving patches of cobbling beyond wall F145, it probably also extended across the entrance causeway. The southern limit of the surface lay beyond the excavation, but its presence may explain the different appearance of this part of the ditch on the geophysical survey. Subsequently, an oval pit (F226) was cut through this surface to hold a stone cist; this is described below.

THE CENTRAL SCOOPED AREA

The main feature of the interior was a large sub-circular sunken area, measuring 28m east–west and at least 24m north–south, and cut nearly a metre deep into the natural subsoil. The western, northern and eastern limits all lay within the trench. The scoop was positioned somewhat asymmetrically within the enclosure, its eastern edge lying closer to the entrance than the western edge is to the ditch (Figure 5.11).

The eastern side and entrance area

On the eastern side, the scoop probably began as a single large feature, with a smaller 'cell' protruding toward the northern ditch terminal, leaving only 1m between the two (Figure 5.12). A causeway was subsequently created across the scoop, dividing it into unequal northern (F342) and southern (F404) halves. Due to the complexity of the structural remains north of the causeway, only the southern part was completely excavated down to natural.

South side: F404

An area some 4.5m E–W by 4m N–S of the southern part of the scoop was exposed (F404). This sloped down from south to north to a flattish base at 0.5m depth, which itself also sloped a little from east to west. Four successive roughly cobbled surfaces had been laid within this area, which may have served as a slightly sunken yard or working area.

The earliest surface was composed of pebbles and small cobbles [358] covering an area roughly 3m E–W by 4m N–S in the base of the scoop. The scoop was then remodelled, with the creation of a raised gravel

causeway *c.* 2.2m wide [117], running east–west and heading out towards the northern ditch terminal. This causeway, which was 0.3m deep, was retained on its south side by a low dry-stone wall (F338) constructed of large and medium stone blocks, 3 courses high (Figure 5.13). Some stones (F339) on the eastern and southern edges of the scoop may be the remnants of either a primary edging or a continuation of this new revetment. It is possible that the causeway succeeded an earlier access point here.

Abutting the causeway, a new surface made of rounded cobbles with some larger stones [329], was placed directly over the first, but extending a little further to the south. Subsequently, the area was levelled with sand [330, 331, 368], on which a third, rather rougher cobbled surface was laid [248]. Radiocarbon dates on two barley grains in the sand indicate a second to first century cal BC *terminus post quem* for surface [248] (SUERC-10595; -10596). Above was a more irregular layer of stones [246] supporting a fourth and final cobbled surface [130]. This spread over a wider area than its predecessors, extending onto the flat ground beyond the southern edge of the scoop (Figures 5.14–5.15). By this time the surface was virtually level with the causeway and the ground outside. This final surface resembles the cobbles overlying the southern ditch terminal [110]; the two may have been contemporary and were perhaps originally continuous.

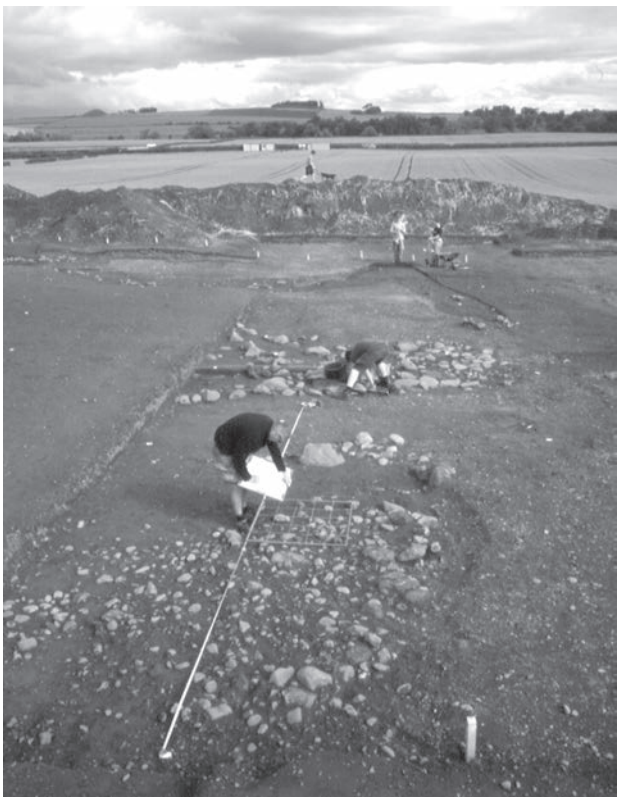


Figure 5.14
View of late surface F130 and entrance to central scooped area

North side: F340 and F342

The northern part of the scoop (F342) seems originally to have been continuous with F404. Patches of pebbles and small cobbles [341] – similar to [358] to the south – were found at the base of the sequence, implying that the whole scoop was originally surfaced in this way. The northern edge was revetted by a single line of boulders (F120) set upright into the edge of the cut and packed with sand [350]; this walling was continuous for about 3m up to the point where the scoop became shallower and projects to the east (F340) (Figure 5.12). Whether or not this projection was originally integral has been obscured by the presence of a later stone structure, but a few stones along the northern edge imply that the revetment originally extended round here too.

When the causeway was inserted, its northern side was retained by a low stone wall like the one on the southern side, but only a few stones remained *in situ* (F206). Its line continues as an irregular slot (F402), which terminates level with F338 on the opposite side of the causeway and is probably the result of removing the stones, rather than a foundation trench for a timber structure, as was thought at the time of excavation. A silty sand deposit [328] was then used to level up the interior of scoop F342, before a paved surface made up of large stone slabs (F327) was laid, including a cup-marked stone (sf 223). This paving extended north as far as a kerb of large vertically-set stones (F119), apparently another wall face parallel to F120 along the edge of the scoop 0.8m to the north. F119 seems to be contemporary with the paving, forming the southern face of a new double-skinned wall with an earth core, utilizing the original revetment F120 as its other side (Figure 5.16). This wall had no clear eastern end, simply stopping to allow the paving to carry on across its line (Figure 5.9 above). A butt end could, however, have been dismantled when the wall was later extended (below); another possibility is that the double-skinned wall is secondary to the paving, with some slabs along the northern edge of F327 having been removed in order firmly to embed the stones of F119.

Paving F327 slopes up slightly to the east, and joins with F116, a polygonal area of paving some 3m across

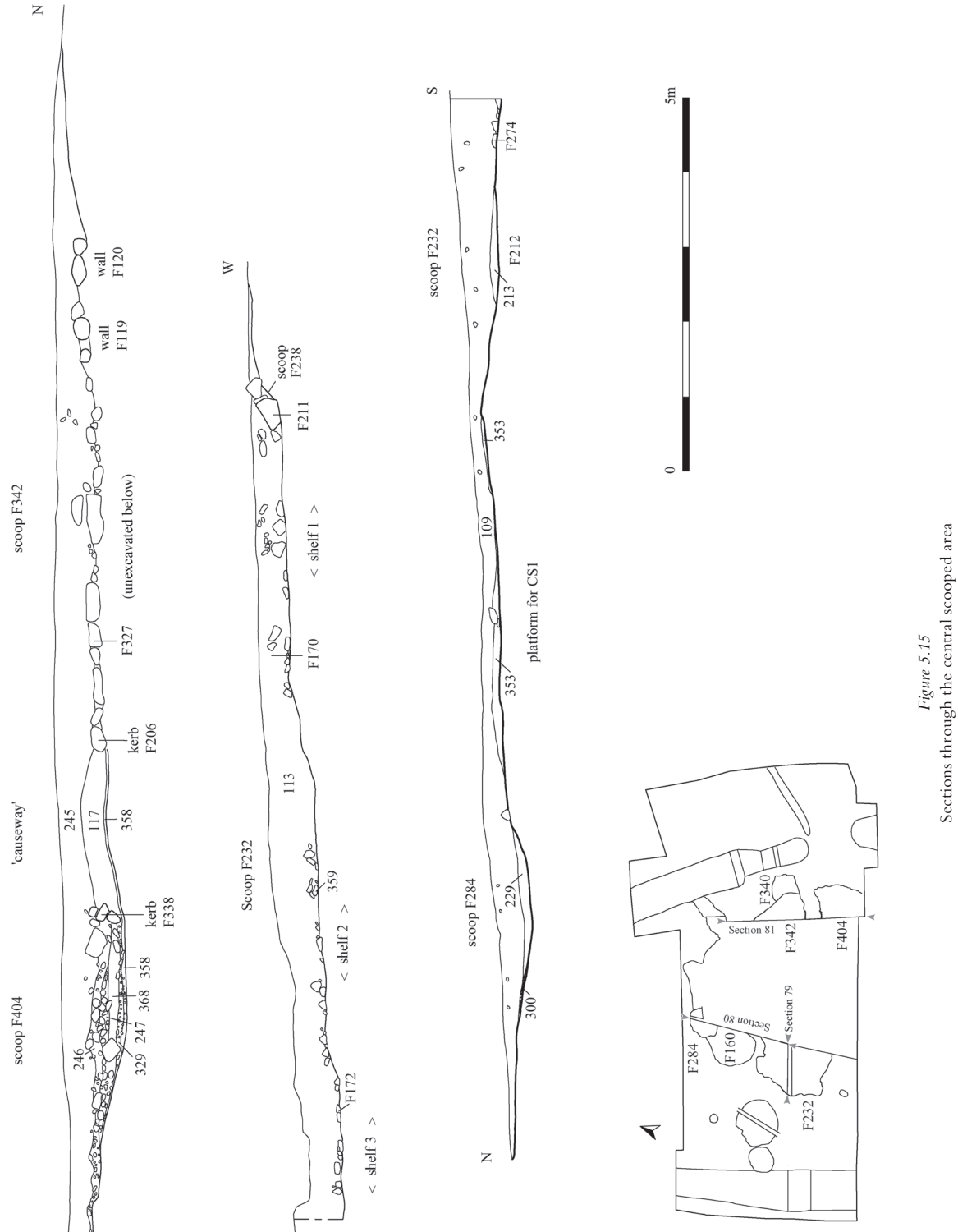


Figure 5.15
Sections through the central scooped area

Figure 5.16
Double-skinned wall F119 and F120

occupying the eastern projection of the scoop (F340). Paving F116 was bedded on a thin layer of dark brown sandy silt [309]; variations in the size of stones used hint at a complex history of construction and/or repair, the stones at the north-eastern corner being worn particularly smooth (Figure 5.17). In plan F340 has the look of an individual 'room' or structure, and there were hints of post-settings at the south-east (F403) and north-east corners. On the other hand, the continuous paved surface created by F116 and F327 aligns perfectly with the stone surface (F152) laid across the top of the adjacent ditch terminal, and could together have formed a paved access into the settlement.

It is thus unclear whether these paved areas represent a series of structures lining the north side of the entrance or whether the access actually shifted here for a period. However, if the latter was the case, it did not last, since a subsequent refurbishment placed a wall across the paving! Prior to this, the northern wall of the gravel causeway was apparently replaced by a new stone kerb just one course deep (F215). Two lengths of walling (F118; F216) were then built over the paved surface, continuing the double wall line built previously along the northern side of the scoop (F119; F120), effectively dividing up the higher and lower parts of the surface (Figure 5.16). At its northern end, this walling curved slightly to join the existing wall end, but was built of smaller stones; at the southern end it abutted the

Figure 5.17
Paved surface F116

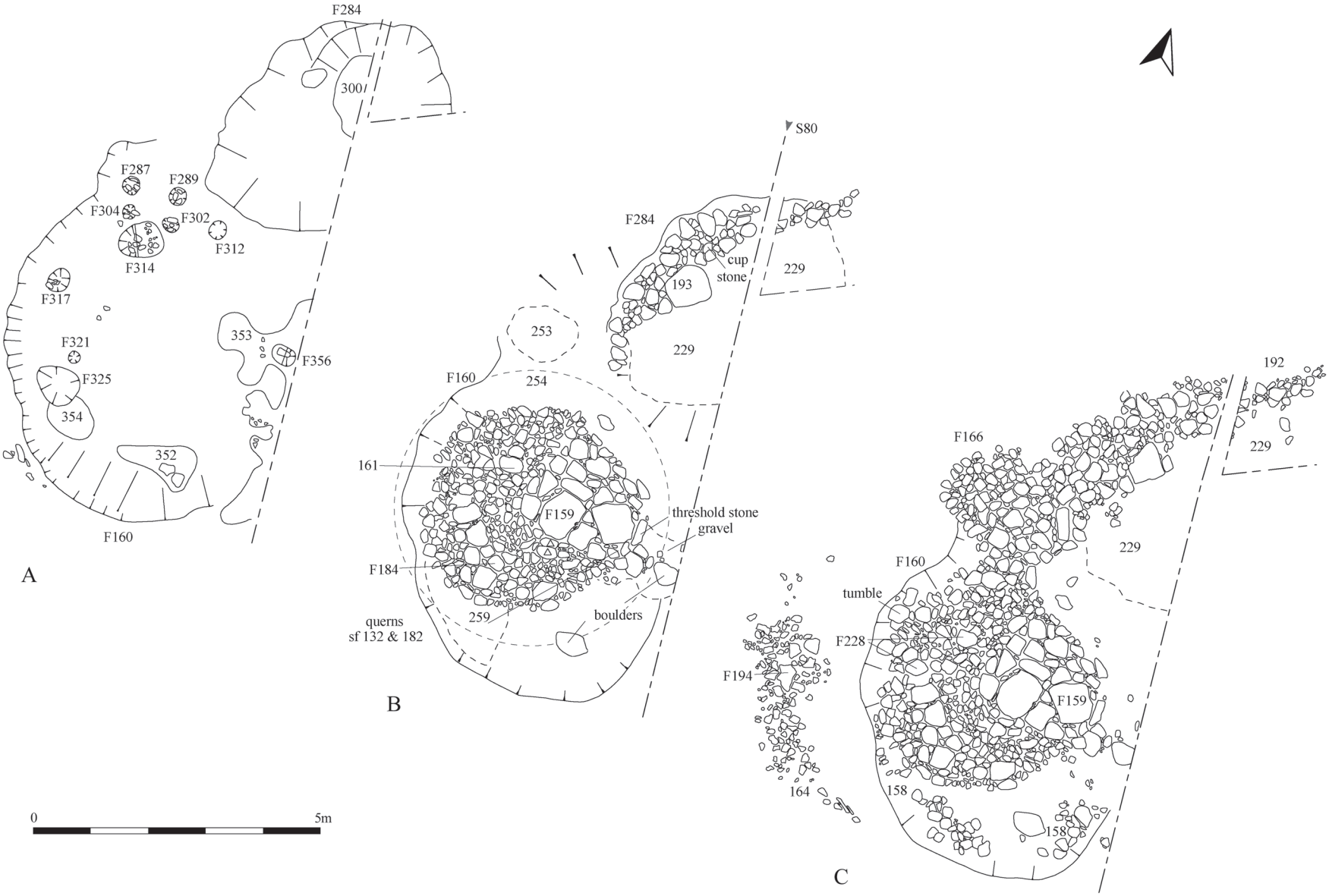


Figure 5.18

CS1: (A) Early features in scoop F160; (B) Paved surface F159 and F184, tumbled revetment F193 to north; (C) CS1 with additional entrance to north and external paving F166

rebuilt southern kerb (F215). A possible post-setting was recorded on the western face of the cross-wall, built of medium sized stones set around a single paving slab.

After the paved structures were abandoned, the scooped areas and gravel causeway were covered by sand [245].

The northern edge of the scoop

The northern limit of the main scoop was not excavated beyond defining its extent. Its shape suggests that it comprised at least two adjacent sunken scoops. The edge was marked by an irregular band of stones [192] – including a cup-stone (sf 168) – which continued around the scoops at north-western corner of the complex (below). From the north-east side of the scoop, a shallow gully with a silty fill, evidently a drain (F140), ran downhill into the eastern ditch. It was relatively rich in charred plant remains, suggesting that domestic refuse may have been dumped there after it went out of use.

The north-west corner of the scoop

Cleaning revealed the north-west corner to comprise two interconnecting scoops (F160; F284), one of them containing a circular building (CS1), effectively discrete from the deeper scooped area to the south (F232, below).

The larger of the two scoops, F160, was a roughly circular area *c.* 5.75m across, terraced into the subsoil on its western side to a depth of *c.* 0.5m, and was evidently the stance for a circular building (CS1) occupying a shelf that continued into the unexcavated area to the east. No relationship could be established with the smaller scoop F284 to the north-east, but there is no reason not to believe them contemporary.

The earliest building phase in F160 is represented by several post-holes of fairly similar dimensions and mostly containing packing stones (F321; F317; F287; F289; F302; F304; F312, F356), along with a small sub-circular pit (F314, 0.25m deep) and a shallow scoop (F325). Whilst the post-holes do not form a regular circle, the way they follow the circumference of the scoop suggests that at least some of them were roof supports for a timber building (Figure 5.18A). Some patches of compact brown silt may be the remnants of an associated surface [352, 353, 354].

Covering these earlier features was a well-preserved floor of roughly polygonal shape about 4m across (Figure 5.18B). The north-eastern quadrant was made up of particularly large, thick slabs, up to 0.8 × 0.6m (F159), extending as far as a worn linear stone, which

Figure 5.19
View of CS1 showing paved surface F159 and repair F228, with F166 beyond and scoop F284 partially excavated

Figure 5.20
View of CS1 and CS2 from the north, looking towards scoop F232

may mark an entrance threshold oriented almost due east (Figure 5.19; Plate 3). It is possible that the paving stones were laid before the rest of the surface (F184), which utilised a mixture of intermediate and smaller slabs set on a levelling layer of dark brown soil [263]. A number of stone artefacts were incorporated into the floor, including a cobble tool (sf 198) and the partial upper stone of a quern (sf 132), on top of which was the broken lower stone of another quern (sf 182). On the western side of paving F159 was a black deposit [161], which probably represents *in situ* burning and may indicate the location of a hearth. From it came the base of a samian platter (sf 185), a fragment of copper alloy ring (sf 184), and fragments of burnt bone. An area of sandy silt [259] around the south-western edge of the floor, filling the gap between the scoop edge and the floor, may either be collapse of the edge, which is somewhat irregular here, or conceivably remnant wall core.

The north-west part of the floor was patched or repaired by adding smaller slabs (F228) on top of F184, although elsewhere the existing floor stones seem mostly to have continued in use (Figure 5.18C). The quern base mentioned above may be a remnant of this repair. Around these higher stones was a blackish green clayey silt [186], which yielded further finds (sfs 105; 134). It was probably at this stage that a second (additional or replacement?) entrance was constructed on the northern side of CS1, providing access to a paved area F166 at a slightly higher level, just outside the scoop (Figure 5.19). This was reached via a step or passageway just over 1m wide. The bedding [241] for this paving contained another cobble tool (sf 194) and was itself laid over pockets of soil, presumably an earlier ground surface [253, 254].

No unambiguous evidence for the wall line or wall structure of CS1 was recovered, but a band of boulders and stones [158] at the southern edge of the scoop may well mark the location of an inner face. An arc of small stone rubble [164], including another quern fragment (sf 46), just outside the western edge of the scoop might relate to the outer face; beneath this was another patch of paving (F194).

Beyond the external paving F166 lay the smaller scoop F284, which was only partially investigated (Figure 5.19). This was a sub-circular area some 3–4m across and 0.25m deep, with remains of a pebble surface [300] surviving on its northern side. A band of mottled silt, sand and burnt material [283] over the pebbles and a thin layer of sandy loam [257] in its base are the only remnants of the earliest use of this structure.

A revetment of boulders F193 was set into the scoop edge. This is probably a primary feature rather than a later modification, as the adjacent surface (F166)

appears to abut the revetment, rather than the other way round. Some of the revetment stones were *in situ*, but many had collapsed, including a very large square stone block that had fallen inwards. The tumble also incorporated a large stone with a cup pecked into it (sf 197). Beneath the stones and filling the scoop was a layer of black clayey silt [229], no doubt the remains of occupation. Charred grain from this deposit was

Figure 5.21
Plan of Scoop F232 and related features

radiocarbon dated to 50 cal BC–cal AD 130 (SUERC-10585). A band of smaller stone rubble [192] on top of F193 running east from scoop F284 implies that the revetment continued round the unexcavated northern edge of the central scoop.

As elsewhere, the features and surrounding area rapidly became covered over with a thick layer of silty sand [109; 115], from which a handful of finds were recovered.

The western end of the scoop

South of CS1 was the main body of the scoop (Figure 5.20). This was cut into the hillslope, and thus was deeper on its southern edge, which was retained by a stone wall; the northern side was only slightly terraced into the ground and had a much gentler slope (Figure 5.15). The scoop seems to have been conceived from the outset as a series of three level platforms or shelves, rising from east to west, the upper one (F238) tailing out close to the western ditch. The two lower shelves effectively formed a separate deeper scoop (F232), of which some 8m east–west by 9m north–south was exposed. The scoop was investigated in two halves, separated by a baulk (Figure 5.21); only the north side was completely excavated to natural. The lowest shelf was 0.7m deep, making it the same level as the base of the opposing scoop (F342) on the eastern side of the site. A squarish lip on the northern edge of F232 near CS1 may represent an access point, or might just be collapse.

Scoop F232

A number of cut features were found in the base of the northern part of F232 (= F273), two of them sealed beneath later stone spreads and thus potentially primary. A broad but shallow linear hollow (F212) ran east–west into the unexcavated part of the site; its charcoal-rich silty sand fill [213] yielded fragments of a copper alloy object (sf 193); three pieces of charcoal were identified as oak. West of it was a large stone packed post-hole (F301). Nearby, at the edge of the scoop, but not sealed by the later spreads, was a second larger post-hole (F323), packed with stones around a void left by a decayed timber. This post-hole, which may be related to the first, appeared to cut the remains of a third possible post-setting (F292). No cut features were found in F232 south of the baulk, but a gravelly layer [355], which may be the original surface, was exposed in several places. Further patches of gravel north of the baulk are evidently part of the same horizon.

Figure 5.22
View of southern half of F232, looking towards revetment wall F234/235

The southern edge of F232 was revetted with a dry-stone wall, incorporating some very large boulders (F234; F235) (Figure 5.22). A silty sand fill [147] was present behind the wall, which survived to two or even three courses high (0.8m) for most of its length. It is possible that this wall originally continued around the upper shelf of the scoop, where a group of stones (F169) appeared to continue its alignment, but this area was not fully excavated. The extant revetment, however, turned sharply inward at its junction with the upper shelf in order to accommodate what appeared to be two steps formed by pairs of flat slabs (F171) leading down into the lower area. Beyond the steps, the wall then turned west again (F168), running across the unexcavated part of the upper shelf, rejoining the original scoop edge a little to the west, where further remains of it were found (F211).

In a later modification, a north–south retaining wall F170 was built along the edge of the upper platform, across the whole western end of the scoop, to support a path leading to a nearby building (CS2, below). Building this new wall seems to have involved blocking the steps at the south-west corner, since several large stones found over the steps appear to be wall stones collapsed from above.

Most of the lowest shelf of scoop F232 was covered by spreads of compact rubble, which may have been deliberately laid, but did not form obvious surfaces. A somewhat polygonal spread (F274) on the north side, which covered some of the cut features described above, was bedded on sand [296]. It included some large flat stones, which might well be the remains of a surface, but, if so, one that was at a higher level and consisted mainly of earth. From the corner of F274, a near continuous stone spread (F172) ran south to the opposite side of the scoop, then along the southern edge; among these stones was the fossilized rootstock of a giant clubmoss (*lepidodendron*), which could have been collected for its appearance. Towards the centre of the scoop were smaller patches of stone (F359) and gaps that might possibly represent the location of settings, but no coherent features were discerned.

The middle section of the southern revetment wall had subsequently collapsed over the rubble spread [236]; a second pile of stones [233] at the eastern end of the excavated area might have been an attempt to prop up the wall, but is more probably further tumble. Finally, the scoop filled up with a thick layer of silty sand [106; 113; 122].

Two radiocarbon dates were obtained from contexts within the scoop. Charred grain from sand [296] beneath the rubble spread in the northern part yielded a date of 210–1 cal BC (SUERC-10591), whilst the sand infill [147] behind the southern revetment wall produced a somewhat later date of 40 cal BC–cal AD 210 (SUERC-10570).

Scoop F238

Between F232 and the western enclosure ditch was what appeared on the surface to be a discrete scooped area, but on excavation transpired to be the site of a well-preserved circular building (CS2) constructed over earlier features at the western limit of the upper shelf (F238). At this point, the upslope edge of the shelf was some 0.5m deep, and had been revetted with large blocks (F211), evidently a continuation of the southern revetment wall for F232 described above. To the west was a smaller scoop (F129), which overlapped the edge of the infilled ditch, implying that by this point at least, little if anything remained of a bank.

A number of features, representing more than one phase of activity, were recorded beneath CS2 (Figure 5.23A). The earliest was a wide shallow hollow (F378, 3m across and 0.2m deep), on the northern side. Samples of onion couch and barley from its upper fill [364] yielded conflicting dates of 1130–910 cal BC and 40 cal BC–cal AD 140 (SUERC-10598; 10597), implying that an earlier feature may have been disturbed here. Cutting the hollow was an L-shaped gully (F370) containing packing stones [371], itself cut by a post-hole (F372), possibly a pair for F360. F374 a short distance to the south may be the remnants of a third post-hole. These post-holes could, however, belong to CS2, as none is sealed by its floor. A crude cobbled surface (F376) lay to the east of these features.

CS2

A circular structure (CS2) about 5.75m in internal diameter was later built in the scoop, perhaps taking advantage of any remaining remnants of the internal bank for shelter. The eastern quarter of this building had a floor of substantial well-set paving slabs F203, but elsewhere only fragmentary paving (F363) was found (Figures 5.23B & 5.24). A distinct patch of dark brown soil [362] at the centre might mark the position of a hearth. In contrast to CS1, there was clear evidence for a wall, best preserved around the southern and eastern sides to either side of the entrance, where the terracing into the slope offered most protection. The inner face was a revetment of large boulders set on edge (F199; F298; F343); one of those belonging to the southern arc proved to be a large cup-stone (sf 224).

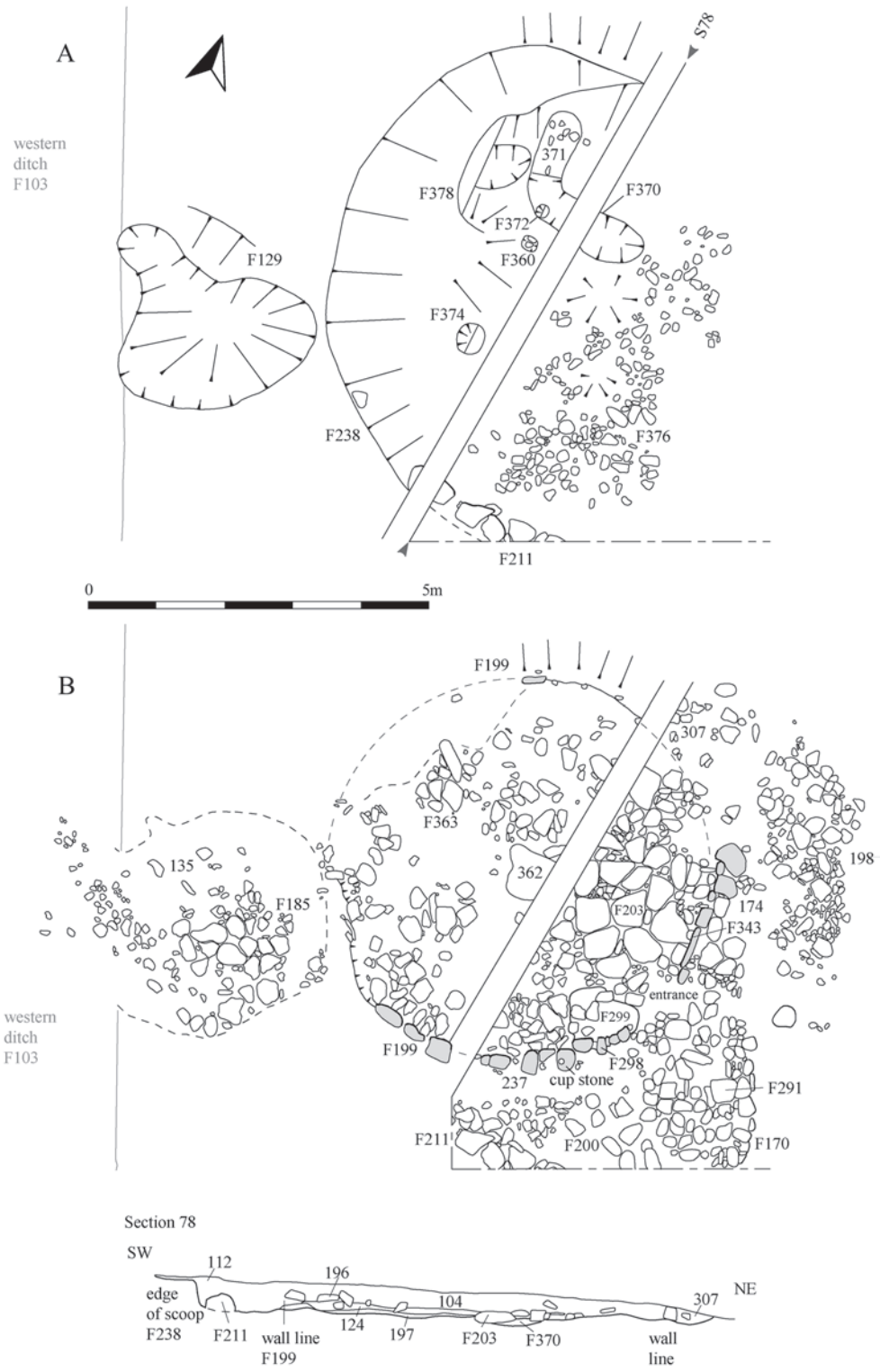


Figure 5.23
Plans and section of CS2: (A) Early features in scoop F238; (B) Paved surface F203 and walling (F199/F298/F343)

The wall most probably had a turf or soil core laid on a slab base, with an outer facing of stone, but none of the latter survived *in situ* and only a few remnants of base and core, near the entrance. A curving band of tumble just to the east of the building (F198) almost certainly derives from the wall line, as does another area of tumble and some larger stones to the south (F200). Pockets of wall fill survived on the southern [237], eastern [174] and northern sides [307]. A single piece of coarse pottery was recovered (sf 110).

A gap of 1.2m between inner wall stones F298 and F343 marks the site of an entrance facing east-south-east, leading from the largest paving stones in the interior to an area of smaller paving outside. The end of the north wall is marked by a transverse alignment of smallish stones and three basal stones on top of which further stones had collapsed (F202). From the entrance, a path (F291) led south across the upper shelf of the scoop and out to the south-west, its eastern edge formed by north–south retaining wall F170 mentioned above. A rough cobble layer [210] over the path might indicate a later repair.

Just inside the entrance to CS2, an oven or hearth (F299) was constructed in a shallow oval pit measuring 1m × 0.7m × 0.2m deep. It lay immediately against the inner wall stones, which showed clear signs of burning (Plate 4). A rim of burnt clay ran around the western and northern sides (F264) and further small fragments of burnt clay or daub were found in its fills, suggesting that it had a clay superstructure. Several burnt stones (both igneous and sandstones) were found in the base, beneath layers of burnt material [261; 281]. A burnt Roman flagon base and fragments of a rotary quern (part of sf 41) were found in the fill, along with alder charcoal and a high density of charred cereal remains. A barley grain from [261] was dated to cal AD 1–220 (SUERC-10586), whilst archaeomagnetic analysis of stones from the base of the oven places its last use between the second century BC and AD 200 (Hounslow and Karloukovski 2004). The Component B magnetisations suggest a relatively mild temperature (120–150°C) for the last heating, whilst the Component A magnetisations (acquired at 200–600°C) imply either that the stones had been moved after they were burnt and/or were cooking stones. The oven lies surprisingly close to the entrance, suggesting it might be a late addition, perhaps even towards the end of the life of CS2.

West of the oven, a charcoal-rich layer [197] built up over the floor, undoubtedly material derived from the oven and perhaps also from an earlier central hearth. Further pieces of the quern and flagon came

Figure 5.24
CS2 in the course of excavation seen from the north

from this deposit, as well as a Roman glass bangle (sf 203), coarse pottery and burnt bone. On top of [197] was a more extensive silty layer [124], which proved even richer in finds, including a chip of Roman glass (sf 55), fragments of a copper alloy spiral finger ring (sf 149) and copper alloy sheet (sf 212), an iron nail (sf 137), stone implements (sf 147; sf 153) and several pieces of coarse pottery (including three rim sherds sf 108, sf 109, sf 145), as well as more fragments of the flagon and quern! A hazel nutshell from [124] was radiocarbon dated to cal AD 1–220 (SUERC-10566), very much in line with the suggested date of the flagon (AD 160–200/230; Chapter 7).

There was no evidence for secondary flooring in CS2. Scatters of stones found over the paving and silt in the eastern and southern part of the building [196, 224; 225] appear to be tumble; one very large flat slab is probably a fallen wall stone caught by the plough. All the indications are that the building fell into disuse around the end of the second century AD, after which both the structure and its surrounds succumbed to an accumulation of silty sand [104, 112, 351], from which a handful of further finds were recovered, including the largest piece of the quern and another Roman glass bangle (sf 18). Interestingly, this quern can be matched to a lower stone found in the top fill of the eastern ditch [123].

F129

Just west of CS2 was a smaller, roughly circular scoop (F129) 3m across (Figure 5.23). This was 0.2m deep, and was largely filled by black sandy silty clay [135], which yielded a rim sherd (sf 81) and a radiocarbon date of 100 cal BC–cal AD 80 (SUERC-10568). Above was a discontinuous paved surface of flat stones (F185), itself covered by sandy silt [134] like that over CS2. F129 is sited where the remnants of the enclosure bank would have been and cut slightly into the top fill of western ditch. It seems likely to be an ancillary structure or working area associated with CS2 or the structures that preceded it.

Isolated features in the interior

The ground surface around the central scoop was largely devoid of features, apart from two pits, both with structured stone deposits. To the north of CS2 was a circular pit, 0.4m deep (F334), which contained numerous large slabs and cobbles, some set against its sides and base, the purpose of which is unclear. Two cobble tools (sf 227; 228) were recovered from the sandy loam fill [335]. South of scoop F232 was a sub-rectangular pit (F251, 0.3m deep), its sides lined with large flat, rectangular stone slabs [260], with others placed over the top, forming a sort of cist, which had subsequently collapsed inwards (Figure 5.25). A broken cobble tool (sf 199) was found in the upper fill [252]. From its dimensions (1.1 × 0.75m), F251 resembled a cist burial, but no human bone was recovered.

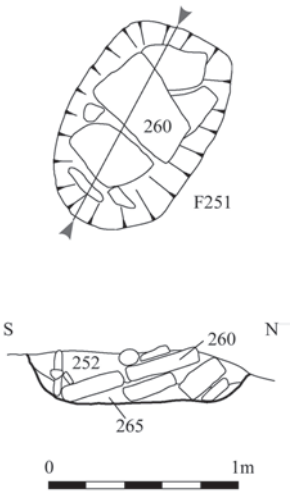


Figure 5.25
Pit F251

THE CIST BURIAL AT THE ENTRANCE

The cobbled surface overlying the southern ditch terminal at the entrance was later disturbed by the construction of a crudely built stone cist F150, housed in an oval pit (F226), 0.5m deep, and orientated due north

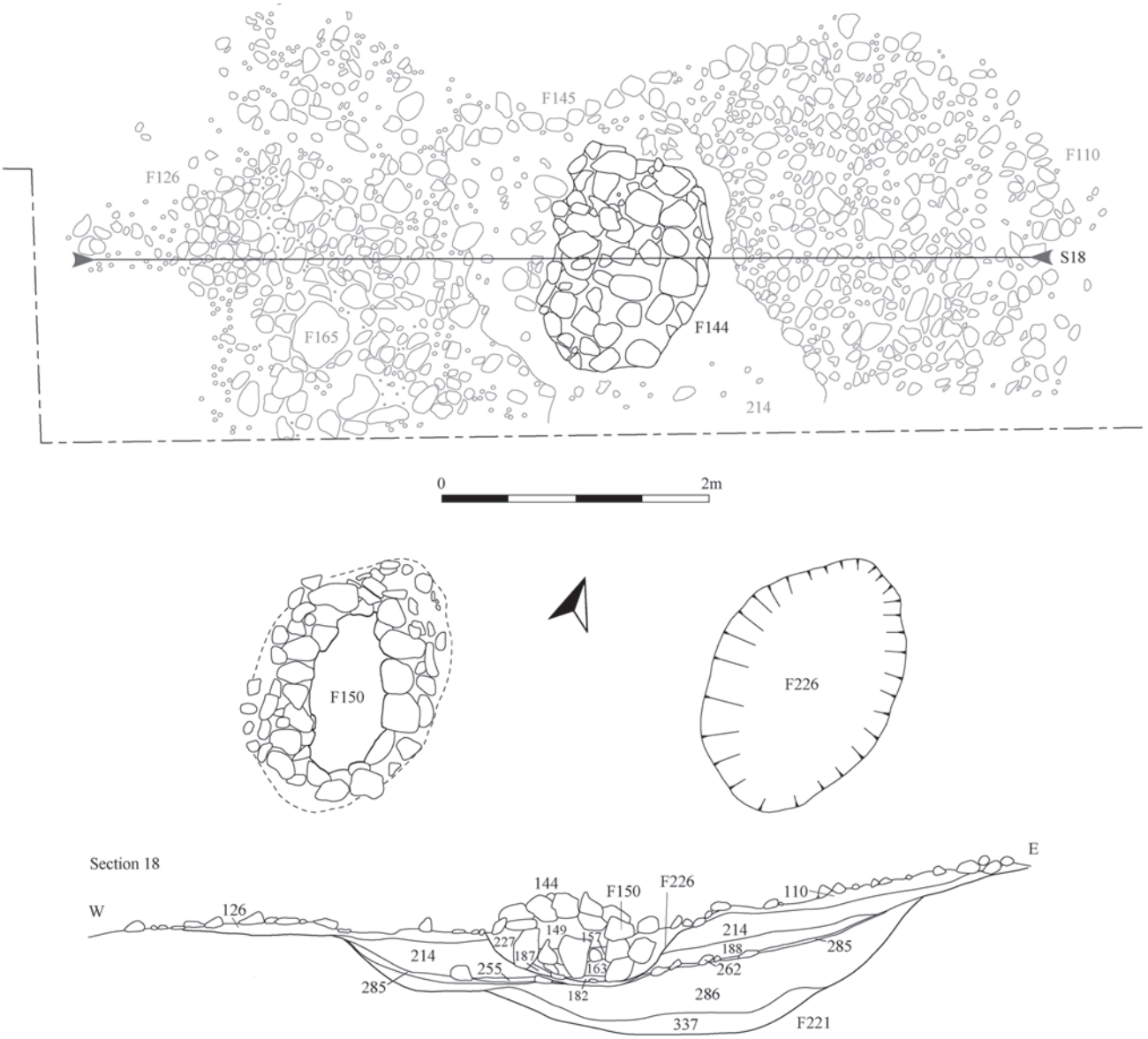


Figure 5.26
Plans of the cist during excavation and section of cist cutting through southern ditch terminal

(Figure 5.26). The cist itself was 1.65m long × 1.2m wide, and sub-rectangular in shape externally with a more oval interior no more than 1.2 × 0.55m (Figure 5.27). The west and east side-walls were constructed from large sub-rectangular blocks and boulders, whilst the ends were built of smaller stones and not as well-structured. Some of the stones were discoloured by burning and heat fractured (Plate 5), perhaps indicating re-use of materials, as there was no evidence of *in situ* burning. Silty clay [227] was packed around the stones; there was no stone base. Capping the cist was a low cairn of large stones (F144), which stood proud of the ground surface to either side (Figure 5.28). Whilst the lack of any intervening deposits over the cobbles might suggest only a relatively short time gap had elapsed between the laying of the surface and the insertion of the cist, not too much should be read into this as the surface could have been kept clean.

Figure 5.27
View of the cist (F150) from the south

The fills of the cist contained several small groups of cremated human bone and other burnt material, conceivably the result of several events. The earliest deposit was a compact silty clay with some charcoal at the northern end of the cist [187]; on top of this, piled in the north-east corner, were seven stones [195]. Above was a layer of black silty loam rich in charcoal [182] and then a more compact layer with occasional stones [163] containing both lumps of charcoal and most of the burnt bone from the cist; a large stone in the middle may have been deliberately placed. The upper fills were brown silty loams, [157] being charcoal-rich, whilst [149] yielded a single sherd of pottery (sf 101).

The cremated human bone – Anwen Caffell

All the soil fills and the wall packing contained fragments of burnt human bone, with eleven discrete scatters being recognized during excavation. No animal bone was found. Following McKinley (2004), the bones were sorted by size, the weight in the different size fractions recorded, and the largest bone measured. Much of it had fuel ash slag adhering. The total weight of bone and fused bone/fuel ash was 581.1g, of which just over two-thirds (400g), including most of the identifiable pieces (by number and weight) came from [163]. Each of the upper fills [149; 157] yielded just over 50g of bone and fused bone/fuel ash, whilst the remaining deposits yielded mostly bone, but in even smaller quantities, [182] having the most (34g). The earliest fill [187] had the least bone overall, but yielded the largest single piece, a fragment of radius shaft, 55mm long. By weight most bone was in the >10mm fraction, the other two contexts with large fragments being [163] and [227].

Most of the bone was buff-white in colour, which implies complete or near-complete oxidation, although the internal surfaces of some long bone pieces were not fully oxidized. Analysis of the burnt residues confirmed that they were fuel ash; to generate such fusion and melting, temperatures of around 1000°C must have been achieved, and the cremation must have taken place on a soil surface with a significant silica (sand) content, such as the site itself would have provided.

Although the majority of fragments were unidentifiable, most parts of the skeleton are present. The skull is mainly represented by cranial vault fragments, [163] also yielding a piece of mandible.

Longbone shaft fragments occurred in most contexts, but it was not always possible to identify which bone: parts of all limb bones are recorded, with upper limbs better represented than lower, including three finger and wrist bones. Fragments of vertebrae and ribs represent the axial skeleton. No elements give a definite indication of age or sex, but a tooth root (premolar?) from [182] is fully formed, implying that this person was over the age of 13–14 years (Ubelaker 1989). On balance, the remains are adult or possibly adolescent. There was no evidence of pathological lesions.

The presence of small hand bones implies either that effort was put into collecting the bones or that both bone and pyre debris was scooped up for deposition, which would be consistent with the charcoal-rich cist fills. From the bones alone, it is unclear how many cremations are represented. There is no duplication of elements, but this does not rule out there being more than one individual; indeed the way the bone is distributed in different fills might favour this. Whatever the case, such a small quantity of bone represents only a tiny fraction of a cremated body or bodies. A full report is in the site archive.

The date of the cist

Two pieces of burnt human bone from the cist were radiocarbon dated (from the bottom [187] and top [149] fills respectively), along with a cereal grain and a birch twig in [163]. The latter samples yielded dates of 50 cal BC–cal AD 130 and cal AD 80–320 (SUERC-10577; 10578), which are not consistent with one another, but perfectly reasonable given the position of the cist in the site sequence.

The two human bone samples, however, generated older dates of 420–200 cal BC and 750–390 cal BC (SUERC-10579; SUERC-10571). These are not only inconsistent with one another, but also much older than both dates from [163]; in addition the older date is from the later context! Unless they are statistical outliers, this both increases the possibility that more than one individual is represented and implies that

Figure 5.28
View of southern ditch terminal showing surfaces F110 and F126, and cairn F144 over cist

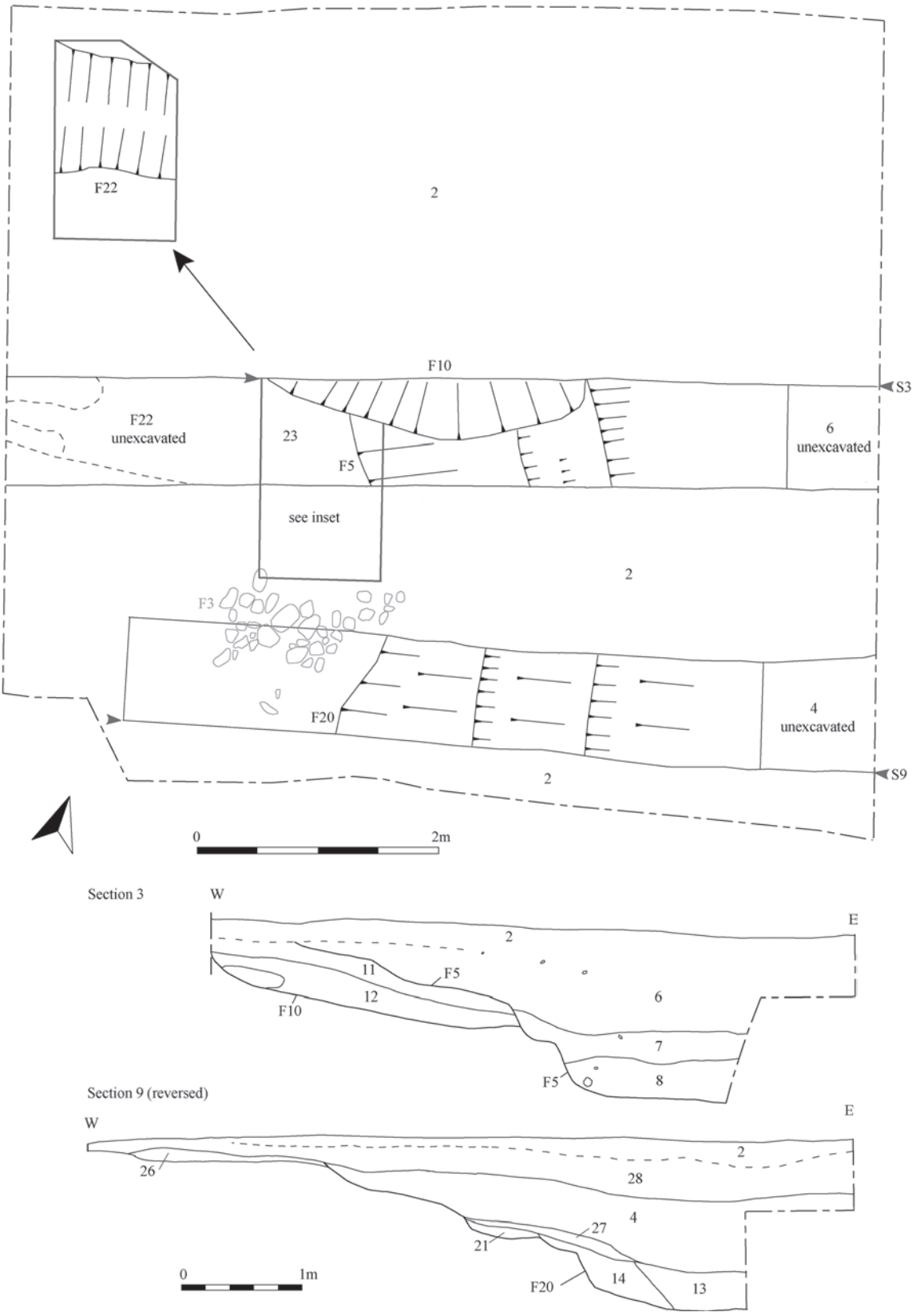


Figure 5.29
Plan and sections of external pit complex

the cist may incorporate the reburial of older, partial remains, particularly as the identifiable bone from [187] is from a single radius and was the largest in the cist. In retrospect, it is unfortunate that none of the bone fragments from [163] was dated, as this has the best claim to be the principal deposit.

THE EXTERNAL PIT COMPLEX

The western side of the large macular feature north-north-west of the enclosure was sampled in 2003 (Figure 5.3 above). The whole area was covered by silty sand [2], very like that filling the scoops inside the enclosure. Since no features were apparent, two 1m-wide trenches were excavated into the deposit, revealing that the anomaly comprised a series of intercutting features dug into natural sand and gravel (Figure 5.29).

The earliest feature was a gully or ditch (F22, 1m wide and 1m deep) running broadly east–west found at the western end of the northern cutting; it had been cut away by later pits to the east. The sandy ditch fills [25; 24; 23] were very like the surrounding subsoil and were only distinguished with difficulty, suggesting that the feature had been rapidly backfilled. The ditch is not apparent on the aerial photographs or the geophysical survey, but there are several other linear features in the general vicinity, with which it may be linked. Cutting this ditch were the truncated remains of a pit or scoop (F10) up to 0.8m deep, filled with sand [12, 11], which lay largely outside the cutting. No finds were recovered from either of these features.

Both features were cut by a much larger pit or scoop F5, undoubtedly the origin of the macular cropmark. This was up to 1.4m deep (within the area opened); the western edge sloped gradually at first, and then stepped down quite sharply to a fairly flat base. The sandy silt in the deepest part of the scoop [8] yielded a large rim of Iron Age tradition pottery (sf 3), whilst a wheat seed from the darker brown sandy silt overlying it [7] gave a radiocarbon date of 50 cal BC–cal AD 130 (SUERC-10565). The upper part of the scoop was filled with more sandy silt [6], which yielded further sherds of pottery (sf 2).

This scoop continued up slope into the southern cutting (F20). Here on the edge was a thin layer of charcoal [15], covered by deposits of sand [21] and silty sand [14], the latter spilling into the base. The deepest part of the feature was again filled with silty sand [13=8], overlain by sandy silts [27, 4], the latter containing some cobbles and pottery (sf 1). A patchy dark grey layer which was cut by the scoop may be the remains of a turf line [26], above which was a layer of silty sand [28] – almost impossible to differentiate from [2] – and a patch of cobbles F3, perhaps the remains of a contemporary surface.

The pottery and the radiocarbon date indicate that the scoop saw activity at roughly the same period as the enclosure. It may well have been dug for sand and later infilled with settlement refuse (see Chapter 8) but, given the limited area explored, this feature could also be another structural scoop comparable to those excavated within the enclosure.

DISCUSSION

The excavations at Knowes revealed a complex history of occupation and structural alteration associated with first enclosed and then unenclosed phases of settlement, probably spanning a period of some centuries and associated with a relatively large and diverse finds assemblage – at least in comparison to the other TLEP sites – which included some quite unusual items such as the amber bead, and several cup stones and glass bangles, as well as the late cist burial containing cremated human remains.

1. Pre-enclosure activity?

No certain traces of activity before the Later Iron Age were found in the excavation, but there are hints that the locality was at least occasionally frequented at an earlier date. A handful of worked flints were recovered, including an Early Bronze Age thumbnail scraper, whilst the Later Bronze Age radiocarbon date from beneath CS2 might indicate that an earlier feature was disturbed there. Some of the human bone in the cist burial was also evidently older than the occupation, but this can be explained in other ways (below). The most likely scenario is that the enclosure was founded on an unoccupied site, although – given the linear features in the vicinity – the area may already have been farmland.

2. The Late Iron Age enclosure

Based on the radiocarbon dates from the secondary cut in the northern ditch terminal and elsewhere around the circuit, the rectilinear enclosure was founded in the second or first century BC at the latest. On both the eastern and western sides, the enclosure circuit was redefined at least twice, although each time the

boundary became shallower than its predecessor. This recutting may explain some of the variations in ditch width around the circuit, but the overall shape of the enclosure changed little, and the easterly entrance was maintained throughout. The entrance terminals showed fewer signs of recutting, but rather than indicating that they were allowed to silt up earlier, this might be due to later structural alterations having removed the relevant evidence.

The retaining wall built across the end of the southern ditch terminal differs from the entranceway revetments found on other contemporary sites in the region like Fishers Road East (Haselgrove and McCullagh 2000) by extending to the bottom of the ditch. The wall was presumably intended to shore up the entrance causeway or even to expand it slightly. A substantial piece of an Iron Age pot recovered from the infill behind the wall appears to have been deliberately placed there. The northern ditch terminal had a different structural history: it evidently held standing water for a time and may have been deliberately lined with clay to facilitate this, presumably to provide a source of water for the occupants and their animals – although we should not exclude a symbolic dimension.

No direct evidence of banks was found, but what seem to be collapsed remnants of a supporting revetment were found at the entrance, which added to the paucity of features just inside the ditch, suggests there must originally have been at least an inner bank. Given the sandy subsoil, both bank and ditch would have been highly unstable and prone to collapse, and even with the evidence of recutting, it would not be surprising if the enclosure phase was short-lived, perhaps only a few decades. When maintenance ceased, it is clear that the ditches began to be used for the disposal of domestic refuse, especially on the western side of the site, and as a result quickly filled up, leaving only a slight hollow at the top.

Nothing was found to indicate the date of the external gully running up to the northern ditch terminal, but it is clearly linked to the use of the entrance and helped guide or control the movement of people and/or animals in and out of the site.

3. The scooped settlement

There is no evidence to establish precisely when the main scoop was originally constructed. A series of second to first century BC radiocarbon dates from its lower levels imply that this may not be far removed in time from the digging of the enclosure circuit. Indeed, in some form at least, the scoop may well be primary, since, apart from the two undated cist-like pits, there were no indications of activity unconnected with the scoop (although earlier features could have been destroyed when this was dug). There are, however, hints from the air photographs and geophysics of further features in the unexcavated portion of the interior, including what may be a second, smaller scoop to the south of the entrance.

What is clear is, firstly, that the central scoop had a complex history of occupation, undergoing several structural modifications, particularly in the area near the entrance; and secondly, that by the time some of the later buildings were in use, in the early centuries AD, only vestiges of the enclosure circuit remained. A number of features linked to the scoop, including a drain, were constructed where an internal bank would have stood, and well-made paved and cobbled surfaces were laid across the ditch terminals on either side of the entrance, both of them with direct relatives inside the scooped area

The excavations produced clear evidence that the entrance to the scoop had been realigned at least once, possibly as many as three times. Exactly where the scoop was originally accessed is unclear, but there is no evident entry point directly opposite the enclosure entrance, one argument for thinking that the scoop may be secondary. The most likely possibility is that the original entrance was from the south-eastern corner (F404), veering left down a gentle slope from the main route into the site.

Subsequently, a new entrance was created by building a gravel causeway on the eastern side of the scoop at a point that would have required the removal of any remaining bank material just inside the enclosure entrance. A third phase of scoop entrance, in all probability, followed, this time taking the form of a paved surface created by F116 and F327, which aligns perfectly with the stone surface F152 laid across the top of the northern ditch terminal – the alternative being that these are the remains of stone structures built along the northern side of the entranceway. If so, this paved access did not last, being blocked by the building of a stone wall, and access shifted back to the gravel causeway, by now flush with a cobbled surface laid on top of what had been the south-eastern corner of the scoop and extending beyond it towards a similar surface covering the southern ditch terminal, with which it probably originally joined up.

From the aerial and ground evidence, the deepest part of the central scoop lay nearly or entirely within

the limits of the excavated area. Its southern, eastern and northern edges were all revetted with substantial stone blocks, up to two to three courses high in the case of the upslope (southern) side, but on the western side it stepped up by means of two successive shelves, the lower of which may have carried on into the unexcavated northern part of the scoop. At these higher levels, a series of discrete sunken areas were identified, cut into the shelf surfaces and surrounding edges. Post-holes and other features suggesting earlier structural phases were identified in the bases of two of these higher scoops, both of which were later used as stances for circular buildings (CS1–2) with stone-faced walls and stone floors. Both buildings had carefully laid flags in the quadrant nearest the entrance, and probably had central hearths; in addition a clay-walled oven was built just inside the entrance of CS2. Adjoining both buildings, at a slightly higher level, were subsidiary paved areas, probably some kind of ancillary structure, with F166 being reached directly from CS1 by means of a short stone passage via a second entrance on the north-west side of the building. At some point, a paved surface was built over the remaining hollow above the western enclosure ditch, presumably to give direct access from the west; the possible fence line along the outer edge of the ditch may also belong to this phase.

The nature of the occupation in the deeper parts of the scoop is difficult to make out, given the small areas exposed. F404 appears to be a sunken yard or working area, whilst the alternative way to interpret the paved surface formed by F116 and F327 is as part of another residential building and adjoining ancillary structure like CS1–2. All that was visible at the western end of the main scoop was a series of stone spreads of various shapes and sizes – in one case at least, sealing earlier features – which may mark the position of further interconnecting buildings, but need not be structural at all. Similar uncertainties exist over the purpose of the large pit complex outside the settlement to the north-north-west; this appears to date to the same general period and might be a second structural scoop, but could just as easily have been dug for sand and then used as a place to dump domestic refuse.

Both the material culture and the radiocarbon dates (Chapter 9) imply that the latest occupation focused on the western margins of the central scoop – leading to the dumping of further midden material in the remaining hollow over the western enclosure ditch. In all probability the site was abandoned by the end of the second century AD.

4. The abandonment and burial of the site

The abandonment of the site appears to have been orderly. One of the latest events was the insertion of a stone cist into the southern ditch terminal, containing some human remains which appear to be appreciably older than the settlement itself, implying that this was an event of high symbolic significance, perhaps an act of closure linking back to the original ancestral claims to the land.

Following abandonment, the scooped areas filled up with silty sand, as did the area over the ditches on the east side of the enclosure, where the ground level was noticeably lower. Apart from the base of this horizon, where the soil is of a slightly darker character, perhaps indicating an admixture of organic material originating from the decay of the built structures, this deposit is remarkably homogenous and undoubtedly due to a combination of wind and rain action. A tiny amount of post-medieval and modern pottery and glass was found in the sand, but there is no evidence of the site being subsequently robbed for building stone and all the indications are that it was rapidly buried in antiquity.

Evidence of subsequent agricultural activity is limited to a field drain at the eastern end of the site and a few larger stones from the higher-up buildings, which had evidently been caught by the plough.

Chapter 6

The evaluations at East Bearford, Foster Law and East Linton

COLIN HASELGROVE and DUNCAN HALE

Three other enclosures near Traprain Law were selected for more limited exploration during the TLEP, both to provide some comparative data for the principal excavations and to validate specific anomalies revealed by the geophysical surveys. The three sites were East Bearford, 2.5km west-south-west of Traprain Law; Foster Law, 8km to its west-north-west, and East Linton, 1.5km due north (Figure 1.3). All three evaluations proved useful, yielding absolute dates and other evidence to complement the main suite of excavations, by establishing the order of the two superimposed enclosures at Foster Law, and by demonstrating the complexity of boundary maintenance both there and at East Linton.

EAST BEARFORD (NT57SE 16)

This rectilinear enclosure is situated on a terrace, which breaks a gentle north-facing slope at about 55m OD to the east of the incised gully of the Bearford Burn. It was first placed on record by Maxwell (1970), who identified the site from vertical aerial photographs (RAF CPE/Scot/UK257: 3124-5, 12/08/1947), although it had also been photographed by CUCAP in 1964. There is a good record of the enclosure, which has been photographed repeatedly (1971, 1976, 1981, 1989, 1990, 1992, 1994, 1995).

The cropmarked evidence records a ditched rectilinear enclosure measuring 67m from east to west by about 60m transversely within a ditch that varies from 2.5m to 4.5m across (Figure 6.1). Allowing 2–3m for a bank (of which there is no trace on the photographs) inside the ditch, the internal area was about 0.32ha. There is an entrance in the east side, where the ditches are at their broadest, broken by a gap about 6m across, although this may have been narrowed by the internal banks. There may be a second entrance

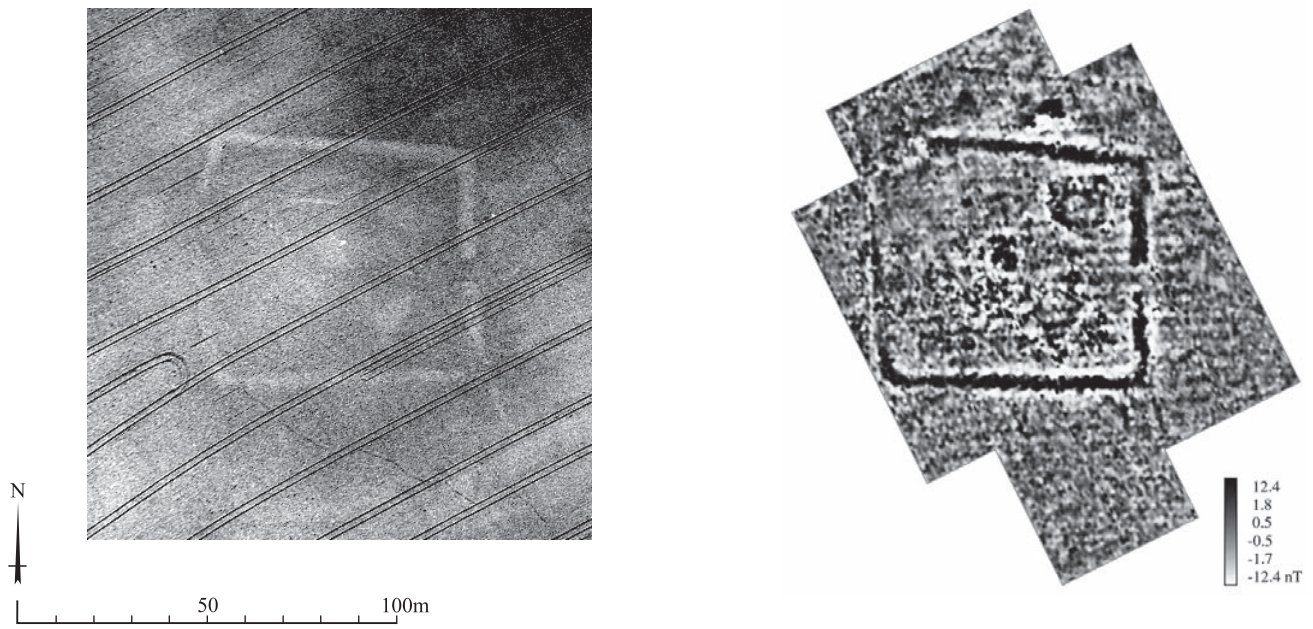


Figure 6.1
East Bearford (NT57SE 16): rectified aerial photograph (C1867) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004475)

towards the north end of the west side, coincident with a slight outward kink in the line of the ditch, which is markedly narrower here than on the east side. In the eastern half of the interior, three oval macular or 'blob-like' cropmarks presumably represent deeper soils marking the locations of scooped or dished areas, which given their size may be roundhouses. Outside the enclosure there are several linear cropmarks, including one roughly parallel to its north side and a short length of ditch, which springs from its south-east corner.

The geophysical survey confirmed the broad characterisation obtained from the aerial photography. Although the enclosure overlies igneous extrusive rock, in this case trachyte, the magnetic susceptibility contrasts between the materials within the enclosure ditch and the surrounding silty sands were sufficiently high to produce intense anomalies. The ditch is especially marked, probably reflecting organic-rich sediments or igneous rocks within the ditch fill, the majority of which comprised a stony deposit of grey-brown gritty clay, probably bank material (below). The parallel linear feature to the north shows clearly some 18m from the ditch, along with a hint of a right-angled turn towards the north-east corner of the enclosure, interpreted at the time as a possible annexe. In the interior, positive magnetic anomalies probably represent soil-filled features such as pits and gullies, while dipolar anomalies may mark the locations of hearths or ferrous/fired materials. A marked east–west grain on the survey plot is a product of ploughing pre-dating the modern field system, which is oriented south-west to north-east; a linear anomaly crossing the south-eastern corner of the enclosure on this axis may be an earlier field division or a drain.

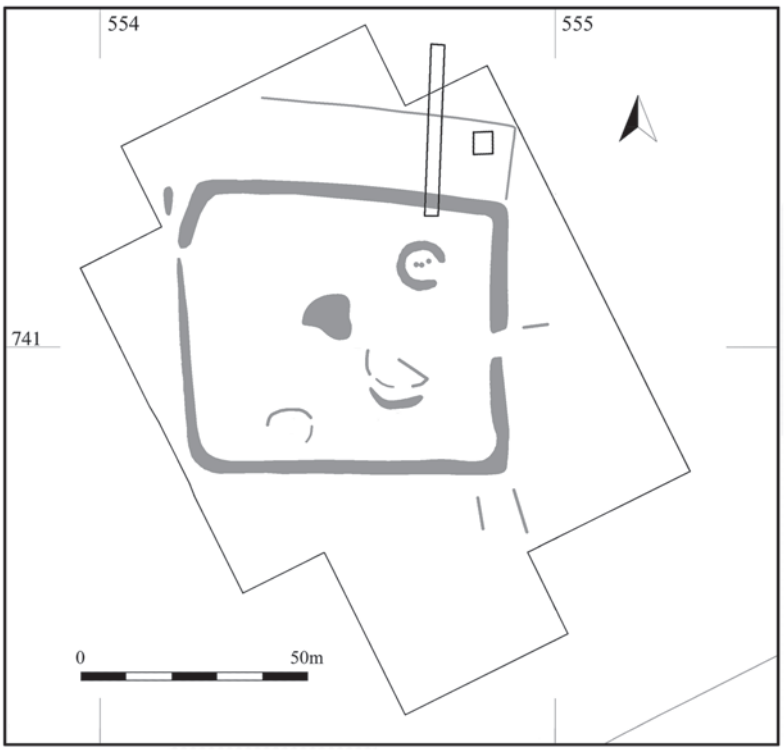


Figure 6.2
The enclosure at East Bearford, showing the principal subsurface anomalies and the location of the 2002 excavations

The excavation

The site was selected for evaluation in 2002 as a typical example of the rectilinear enclosures that are commonplace in and beyond the TLEP study area. The objectives were to investigate the enclosure ditch and the parallel linear feature to the north, and to sample the area inside and outside the possible annexe. A single north–south trench measuring *c.* 38 × 3m was placed across these features (Figure 6.2), no attempt being made to investigate the enclosure interior. A second trench was intended to examine the possible return of the anomaly, but in the event was misplaced; apart from field drains, the only feature revealed appeared to be of glacial origin.

The natural subsoil was an orange-brown silty sand of glacial origin, above which was 0.3m of ploughsoil. A Data Structure Report was submitted to Historic Scotland in March 2003 (ASUD 2003d). The site code is TEB02.

The enclosure ditch

The enclosure ditch (F22) was uncovered at the southern end of Trench 1. It was 4.5m wide and had a total depth of *c.* 1.5m, with a sharply sloping southern edge on the inside and a more gently sloping edge to the exterior,

with a flattish base (Figure 6.3). A deposit of yellow-grey silt [24], which seemed to be collapse, was present on the outer edge, after which the bottom of the ditch filled with a 0.5m thick deposit of black organic clay [23]. A waterlogged alder twig from this deposit was radiocarbon dated to 210–20 cal BC (SUERC-10626). The environmental evidence suggests the dumping of heather and bracken into the ditch, whilst water flea egg cases indicate that water was present in the ditch at least temporarily, although there was no evidence for standing water over any length of time (Chapter 8). In time, a layer of silty clay [26] formed over [23] and more of the ditch side collapsed in from the outer edge [25]. The ditch then filled up completely with a deposit of gritty clay [27], which might include bank material, but extended over the sides.

Other features

Also traversing the southern end of Trench 1 was a shallow gully with sloping sides (F3). This cut diagonally through the top of enclosure ditch and extended a further 3m to the north-west before butt-ending. A large rim sherd of Iron Age tradition pottery (sf 1) was recovered from the fill [2], possibly disturbed from the underlying ditch fill. To the north was a

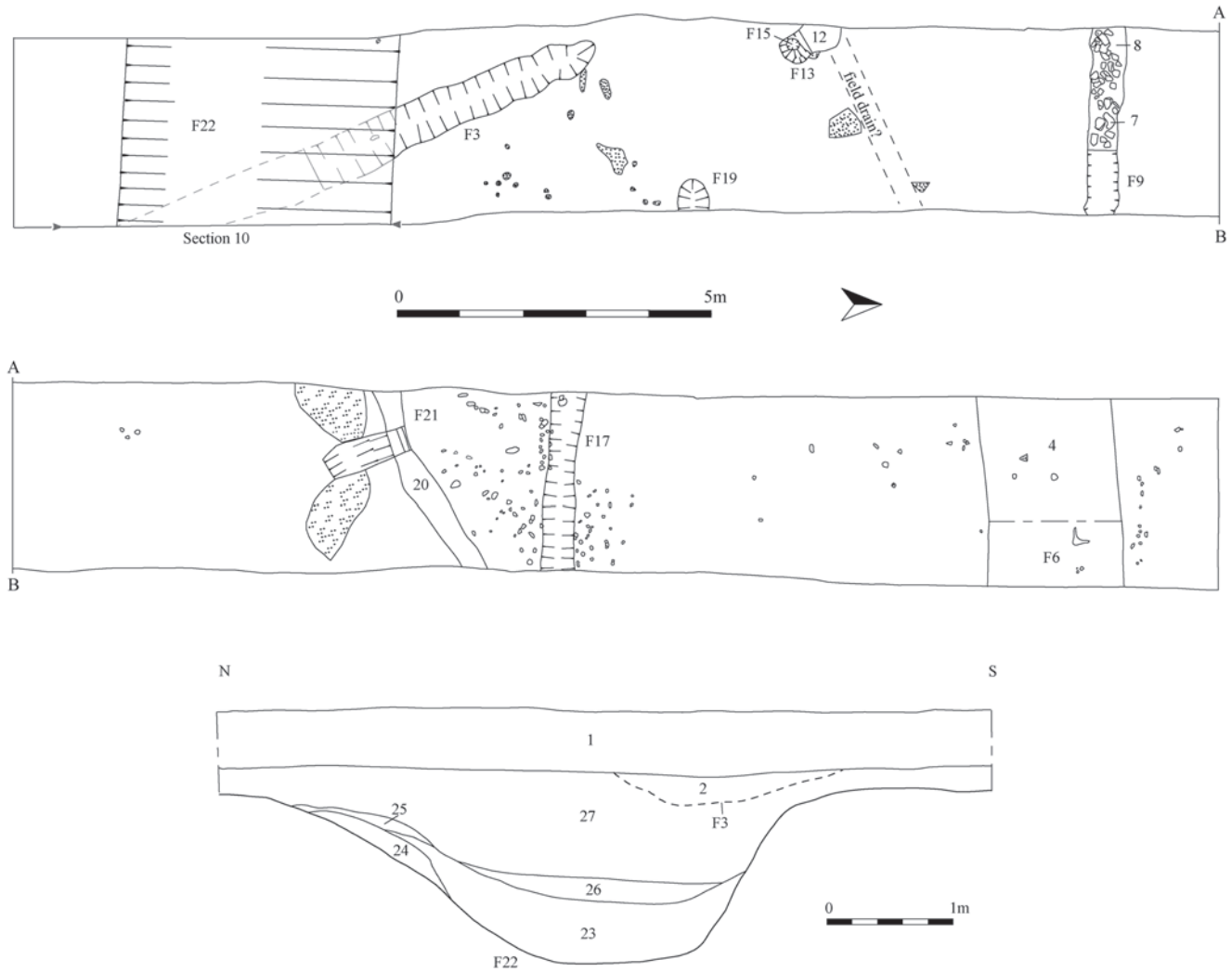


Figure 6.3
East Bearford: plan of Area 1 and section through enclosure ditch F22

Figure 6.4
View from The Chesters looking towards Foster Law on the edge of the ridge beyond (Photo D C Cowley)

shallow hollow (F19) filled with charcoal [18], possibly the remains of a fire, and a post-setting (F15). Finally, an east–west gully (F17, 0.3m deep) with some stones in the fill [16], was located 21m beyond the enclosure. From its alignment, F17 could be linked either to the enclosure or to the later east-west agricultural activity. It seems to lie a little too far north of the enclosure to be the linear anomaly detected by the geophysical survey, but the only other contender was an area of iron-panning running across the trench some 4m south of gully F17.

The remaining features in Trench 1 relate to agriculture. A wide shallow cut (F6) across the northern end of the trench seems to be a plough furrow, whilst a stone-filled field drain containing post-medieval pottery (F9) crossed the central part of the trench to reappear in Trench 2; both appear to be linked to the east–west agriculture apparent on the geophysics. Both trenches were traversed diagonally by clay field drains following the line of the modern ploughing.

Discussion

The single radiocarbon date obtained from the waterlogged material in the base of the ditch implies that the rectilinear enclosure at East Bearford, like its counterpart at Knowes, dates to the Later Iron Age, an interpretation which the Iron Age pot rim found in the shallow gully cutting through the top of the ditch does not gainsay. Equally the presence of this gully and of other features just beyond the enclosure ditch might also suggest that occupation continued after the circuit fell into disrepair, although they could of course be more recent. The survey evidence suggests that the enclosure referenced or was referenced by other linear features, as was also the case at Knowes (chapter 5), but unfortunately none of the other features found in Trench 1 can certainly be related to the enclosure and the evaluation failed to pinpoint the parallel anomaly apparent on the geophysical plot – although it might be the gully identified in the northern half of Trench 1. The remaining features all appear to be linked to later agricultural land use, first by ridge and furrow on a similar axis to the enclosure, and more recently, presumably post-improvement, at right angles to the road through the modern farm.

FOSTER LAW (NT57NW 41)

This roughly oval enclosure occupies a low rise at about 60m OD immediately to the north of 'The Chesters' (Figure 6.4) on a slightly elevated block of ground extending to the north of the Garleton Hills. Another enclosure lies 500m west-south-west at Sixpence Strip

(Appendix 1, no 16) and there are several pit alignments in the vicinity.

The Chesters has been repeatedly photographed by RCAHMS (1976, 1978, 1979, 1980, 1986, 1990, 1991, 1999, 2003). The aerial photographs (e.g. Figure 6.5) record two ditch circuits, each with a slightly different footprint, indicating at least two separate phases of enclosure – both of them roughly oval, the longer axis running from east-north-east to west-south-west. Quarrying has gradually encroached on the site since

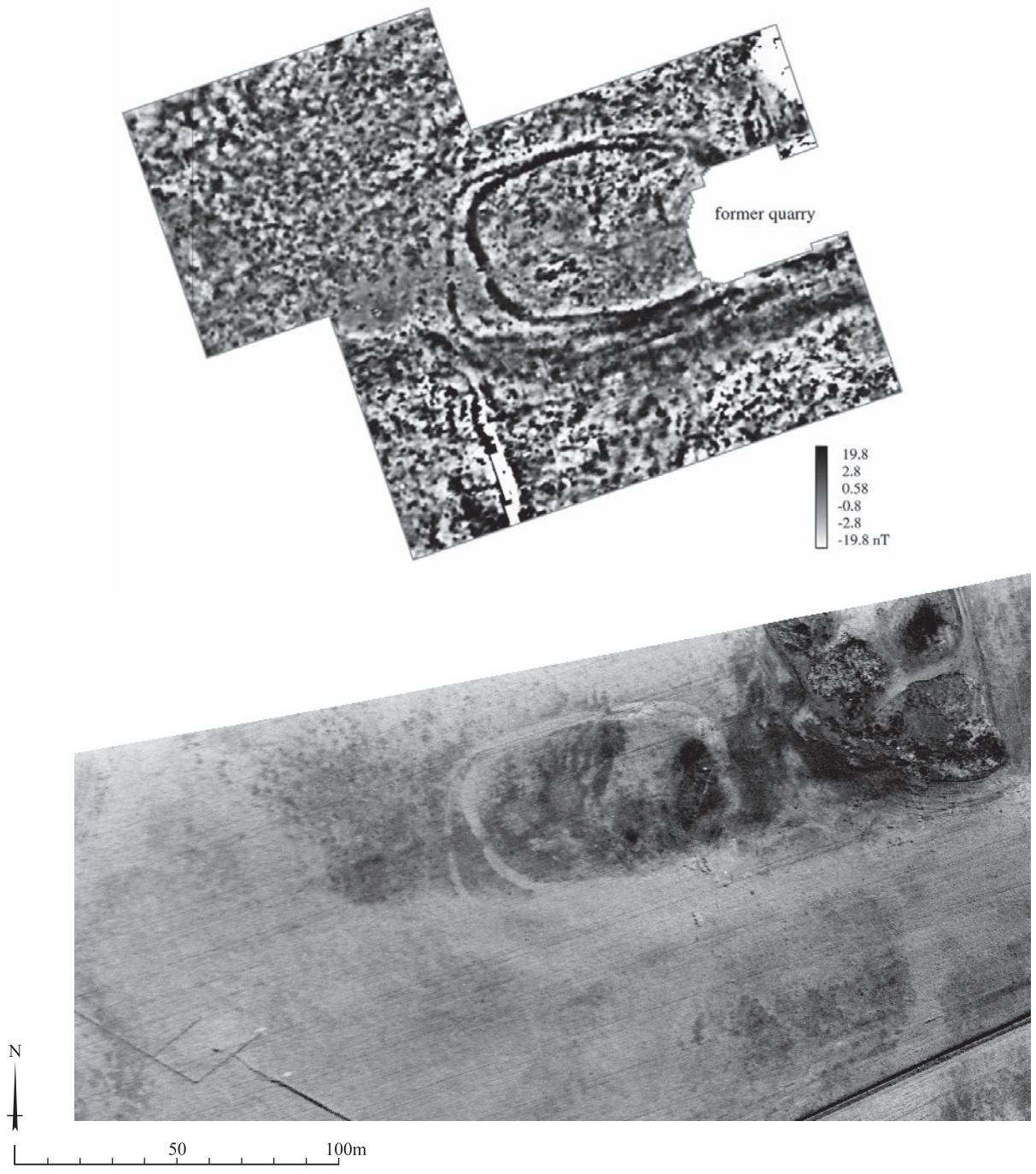


Figure 6.5
Foster Law (NT57NW 41): rectified aerial photograph (EL3990) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004476)

the nineteenth century, removing the ditches at the east end, but enough survives to project the circuit through the line of the quarry, which is now infilled with rubble. The inner enclosure measures about 75m by up to 50m transversely within a ditch about 4m across. Allowing for a bank or rampart between 3m and 4m thick, the internal area would have been about 0.25ha. There is an unambiguous entrance to the west-south-west, with a possibility of a roughly opposed entrance to the east-north-east.

The larger enclosure is clearest at the west, where it extends some 10m beyond the inner enclosure. Though the line of its ditch is not evident in the cropmarks on the south and is visible as a distinct line only intermittently elsewhere on its circuit, the enclosure probably measured about 85m × 56m within a ditch noticeably thinner than that of the inner enclosure, at about 2.6m across. The internal area would have been about 0.36ha. There is an entrance in the west side, offset slightly to the north of the gap in the inner ditch. There may be a small gap in the north, but this is in an area where the underlying extrusive trachyte muddies the cropmark and should be treated with caution. Assuming that an internal bank flanked the outer ditch, the arrangement of the enclosures suggests that the inner circuit post-dated the outer, a supposition confirmed by the excavation (below).

The geomagnetic survey produced a clear image of the ditch circuits, including the possible entrance on the northern side of the outer ditch as well as confirming the continuation of the southern circuit. Probable internal features are indicated by the geophysical survey, but these are difficult to interpret given the high level of background noise produced by igneous rocks in the topsoil.

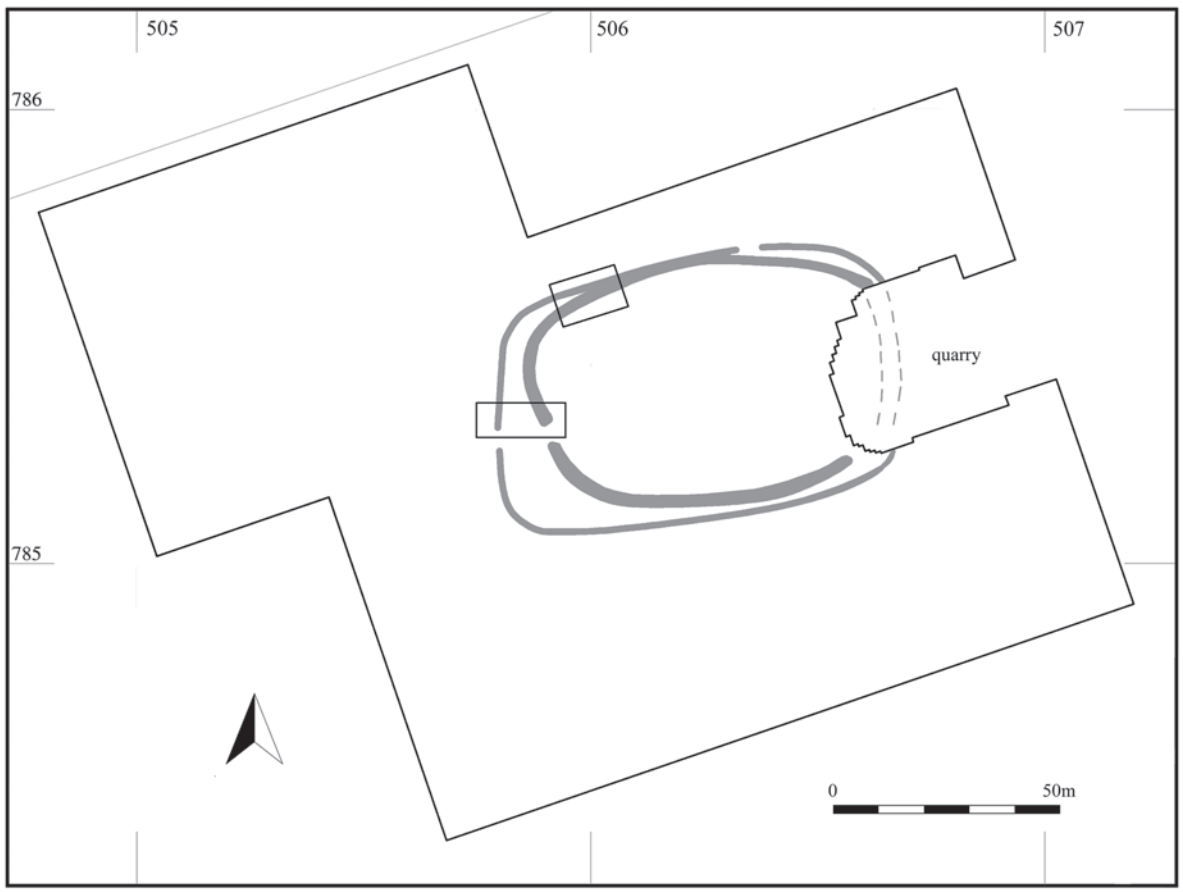


Figure 6.6
Foster Law: plan of the enclosure, showing the location of the 2003 excavations

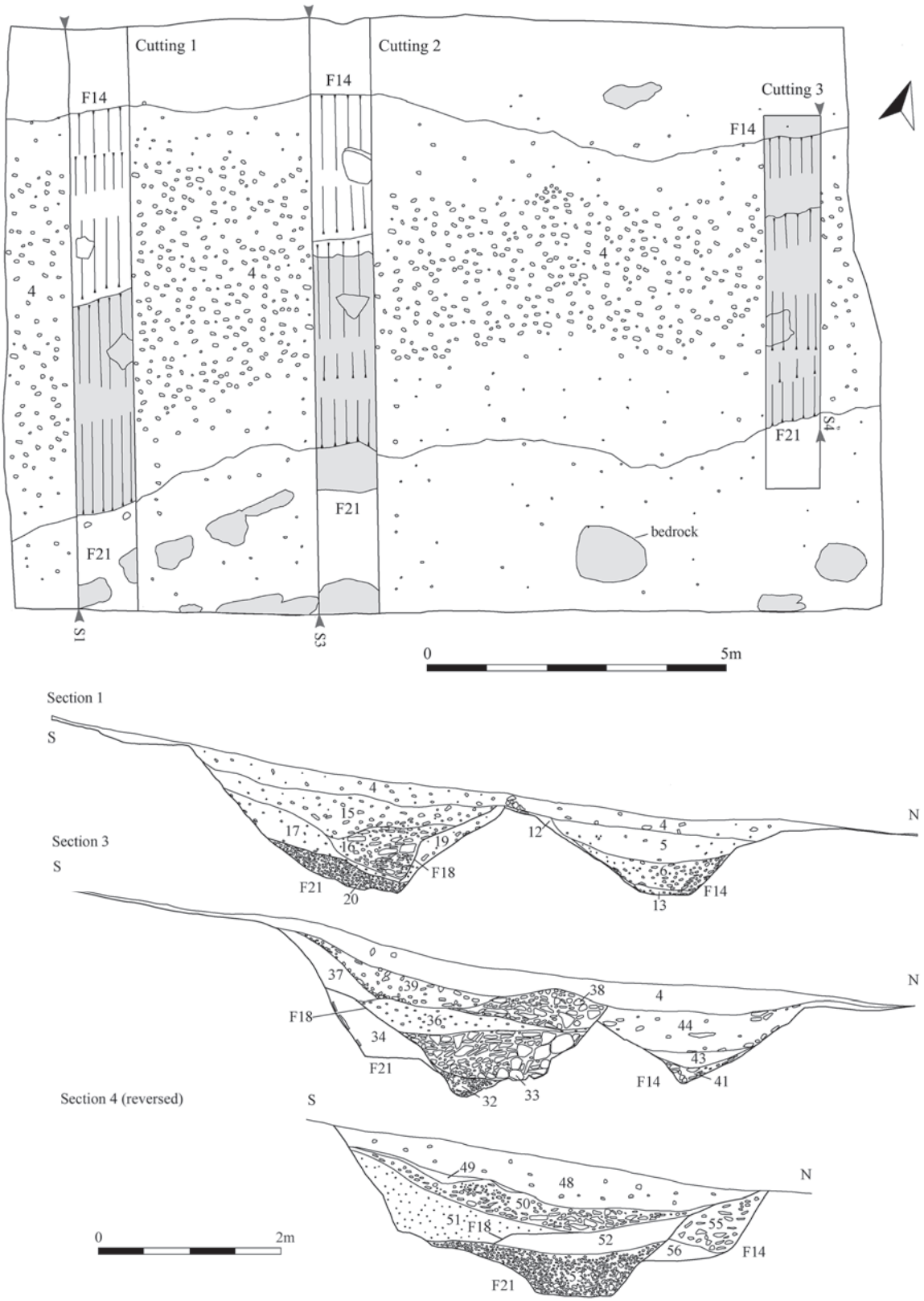


Figure 6.7
Foster Law: Area 1 plan and ditch sections

The excavation

Foster Law provided a rare opportunity to establish the relative sequence and date of two superimposed enclosures, with the added interest that while one of these was curvilinear in form, the other is somewhat more sub-rectangular in shape, albeit not as regular as, for example, East Bearford. Having been photographed regularly, Foster Law also provides a good opportunity to monitor the long-term effects of cultivation on such monuments and cropmark generation; the field was ploughed regularly until relatively recently, but is currently used for silage due to the amount of stone in the topsoil.

Two trenches were excavated in September 2003. The first was located to sample the enclosure ditches on the northern side of the site where the two circuits intersect (Area 1) (Figure 6.6). The second was located across the northern ditch terminals of the western entrances, where on analogy with other Iron Age sites, there was a possibility of recovering structured deposits (Area 2). In Area 2, the bedrock lay directly below topsoil, but in Area 1, it was overlain by compacted yellow brown silty sand. A data structure report was submitted to Historic Scotland in March 2004 (ASUD 2004c). The site code is TFL03.

The enclosure ditches

Within Area 1, three separate sections 1m wide were excavated through the ditches. Cutting 1 to the west was placed where the geophysical survey indicated two distinct ditches; Cutting 2 examined the two ditch circuits as they began to overlap one another; and Cutting 3 to the east was located where the two ditches overlapped to the point where the outer ditch had been almost completely removed by the inner ditch. Both ditches were covered by a broad band of stony loam [4], up to 0.3m in depth at the centre, which when removed, revealed the northern edge of the outer ditch cutting through the clay subsoil and the southern edge of the inner ditch cutting through the bedrock.

The outer ditch

The complete profile of the outer ditch was recovered only in Cutting 1 (F14) and at the entrance. It measured just under 3m in width, with sloping sides and a flat base, and was 0.85m deep (Figure 6.7). The primary fills comprised a thin deposit of sandy silt on the inner edge [12] and sticky clay with frequent stones in the base [13]. Above this was a thick tumble of angular stones concentrated on the outer edge and covered by clayey silt [6], half filling the ditch; together these could represent the remains of a bank. The rest of the ditch was infilled with clay silt [5].

In the adjacent Cutting 2, the partially truncated ditch was V-shaped, in profile, but of similar depth to before. Here, stone was mainly present in the base of the ditch [41], above which was layer of clay silt [43], and then a thicker deposit of clay silt with some stones [44] equivalent to [5]. In Cutting 3, the whole inner side of the ditch had been removed by the later inner ditch (F21), leaving the outer sloping edge and a flat base at least 0.8m broad, here cut directly into rock. Apart from some basal silt [56], the fill was very stony [55].

The inner ditch

The inner ditch (F21) was noticeably more substantial. For the most part, it had sloping sides, the inner side

Figure 6.8
Foster Law: Area 1, Cutting 2, looking north

being slightly steeper, and a broad fairly flat base up to 1m wide, the actual profiles varying slightly according to the presence of bedrock or boulder clay natural. As originally cut, the ditch was *c.* 3.7m wide and 1.3–1.5m deep. The relationship between the inner ditch and the earlier outer ditch was clearly visible in Cuttings 2 and 3.

In all three cuttings, the basal fill of the ditch was composed mainly of stones in more or less silty clay [20, 32; 53]. A hazelnut shell from [53] provided a date range of 760–400 cal BC (SUERC-10636). The ditch then infilled through a mixture of collapse and slumping of material from the edges and bank – evident on the outer edge of the ditch in Cutting 1 [19] and inner edge of the ditch in Cutting 2 [34] – and silting in Cutting 3 [52]. The only finds were cattle and horse teeth from [34].

After it had largely filled up, the ditch was recut to a broadly similar but somewhat shallower profile just over 1m deep (F18). This was clearest in Cuttings 1

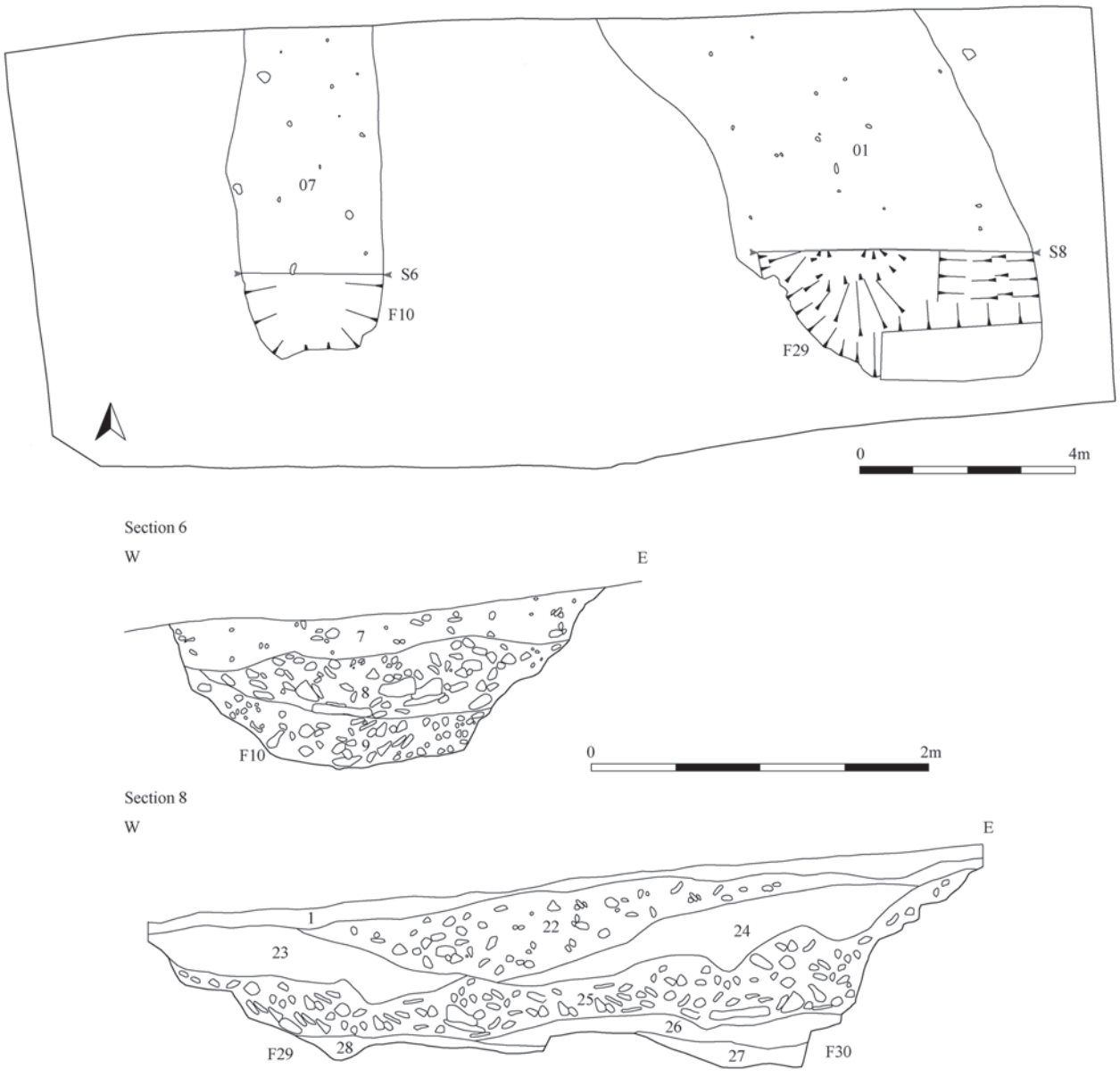


Figure 6.9
Foster Law: Area 2, plan and ditch sections

and 2. In Cutting 3, the recut lay a little to the north of the initial cut, suggesting that it did not always faithfully follow its predecessor. In Cuttings 1 and 3, the recut filled up first with silty deposits [17], gravelly clay silt and [51] with some stones, whilst in Cutting 2, there was a much greater concentration of rubble and shattered bedrock below the silt [33] (Figure 6.8). Further layers of silts and clays [15; 36; 37; 39; 49] and dense deposits of angular stones [16; 38; 50] filled up the ditch. Finally, the loose stony spread [4 = 48] already mentioned lay across the top of the ditch.

A charred twig from the basal fill of the recut [51] yielded a radiocarbon date of 360–50 cal BC (SUERC-10635), whilst sherds of two vessels of Iron Age tradition (sf 7; sf 9) and fuel ash were recovered from the higher fills [15; 50]. A staple-shaped iron object is too dense to be of any great antiquity and is probably intrusive, but its presence might suggest that the overlying stone spread [4] was deposited relatively recently, despite the fact that it too yielded Iron Age finds – part of a triangular-sectioned shale bracelet (sf 4) and an intact thumb pot (sf 6), disturbed either from the underlying ditch fill or from a nearby context, perhaps in the course of levelling the remains of the bank. Several more later prehistoric sherds were found cleaning the area, including a rim of a somewhat thinner walled vessel (sf 10).

The western entrance

Only the northern side of the entrance causeway was investigated (Area 2) (Figure 6.9). The outer ditch terminal was visible immediately beneath the topsoil, cutting the bedrock, whereas the inner terminal lay beneath a layer of topsoil and loose stones similar to layer [4] in Area 1. Whilst the two entrance causeways coincide, the outer ditch here runs north–south so that the entrance faces due west, whereas the inner ditch is aligned north-north-west to south-south-east and its terminals are also slightly offset from one another.

The outer ditch terminal

The butt end of the outer ditch (F10) was fairly square in plan, with sloping sides and a broad, flat base, giving it an overall profile very similar to the segment investigated in Cutting 3, 2.6m wide and 0.9m deep. Here too the fills were largely sub-angular stone [9; 8], apart from a covering of sandy silt [7] directly below the topsoil, which was only 0.1m deep. No artefacts were recovered.

The inner ditch terminal

As indicated, the entrance through the inner ditch (F29) faced more to the south-west. Again, the ditch had gradually sloping sides, with the inner face steeper than the outside, and a flat but uneven base. Here, the evidence of the recut was not definitive, but the width of the ditch at the terminal (up to *c.* 5m) might imply that the cuts had moved even further apart here than in Cutting 3 (above). The maximum depth of the primary cut was 1.2m, comparable to Area 1.

The deepest parts of the base had filled with sandy silt and areas of shattered bedrock [27; 28]. Above was a gravelly layer [26], then a thick deposit of shattered bedrock and silty sand [25]. The upper part of the ditch contained deposits of gravel on the inner side [24] and silty sand with fragments of stone [23] on the outer side, over which a thick layer of silty soil and stones had formed [22], then a thinner deposit of soil and stones analogous to [4] in Area 1. Charcoal from the basal fill [27] yielded a radiocarbon date of 760–410 cal BC (SUERC-10631), consistent with the date from the primary fill in Area 1. Other finds included animal teeth and bone from [25] and [23], and a sherd of coarse pottery from [23].

Discussion

The excavations established clearly that the smaller and shallower outer ditch was the earlier of the two circuits, but no dating evidence was recovered. It had largely filled up by the time the inner ditch was cut, but would presumably still have been visible as a slight earthwork, whilst the coincidence of the entrance causeways implies that the new circuit referenced the earlier one in some way and might not therefore be too far distant in time from it.

On the northern side of the site, the new larger ditch cut away the remains of its predecessor, perhaps to take full advantage of the natural fall in slope at this point. The two radiocarbon dates from its basal fill imply that this circuit was created during the Earlier Iron Age. This ditch was allowed to fill up too, but unlike its predecessor was eventually recut. A single radiocarbon date indicates that this recutting did not occur until the Later Iron Age, whilst the fact that the recut veers off line in places could well indicate that the enclosure was abandoned for a period rather than simply not maintained.

The moderate quantity of pottery recovered from the upper fills of the recut ditch would be consistent

with Late Iron Age occupation, since this is precisely when we see greater use of pottery and increased deposition. Unlike Knowes and other sites in the region, there was no definite evidence of continued occupation after the final ditch circuit had silted up, although this is clearly possible.

EAST LINTON (NT57NE 17)

This multivallate enclosure is sited on the north-west side of the steep-sided, narrow gorge of the River Tyne 2km from Traprain (Figure 6.10). Lying about 850m to the south-west of East Linton village at an elevation of 65–70m OD, the ground rises gently to the west and drops away gently to the north, towards the former A1 road (now the A199). Photographed from the air by CUCAP in 1955, the enclosure is also visible on earlier vertical imagery (RAF CPE/Scot/UK 257: 4119-20, 14 August 1947). Both sources were referred to by Maxwell (1970, 87) when he listed the site as a rectilinear enclosure, whilst admitting that it stood out from others in that class, in particular because of the three ditches. The site has been something of a magnet for aerial surveyors and has been repeatedly photographed by CUCAP and RCAHMS since the 1970s, most recently in 2006.

The cropmarked evidence (Figure 6.11) records a roughly rectilinear enclosure, the south-east side of which is formed by the steep slopes down to the River Tyne. Measuring about 140m from east-north-east to west-south-west by a maximum of 95m transversely (away from the valley edge), the circuit comprising three ditches and the narrow trench of a palisade. The internal area is about 0.87ha after allowance is made for an internal bank. The three ditches vary from 3–4.5m across, and the cropmarks give the impression that the inner and outer cuts are broader than the central one. The spacing between the ditches widens very slightly between the central circuit and the outer. The pencil-thin line of a palisade trench is visible between the inner and central ditches. All the circuits are broadly parallel to one another and are broken on the west side by aligned gaps, presumably an entrance, whilst there is a further gap in the inner ditch south of this entrance. In the eastern half of the enclosure, a narrow ditch extends north-westwards from the valley edge across the interior and might form an enclosure tucked into the (presumably earlier) multivallate circuit. Variations in the tone of the crops presumably reflect differing soil depth, but apart from a small U-shaped ditch to the north-west of the enclosure, no other features of anthropogenic origin were identified.

Figure 6.10
East Linton: view from the site towards Traprain Law

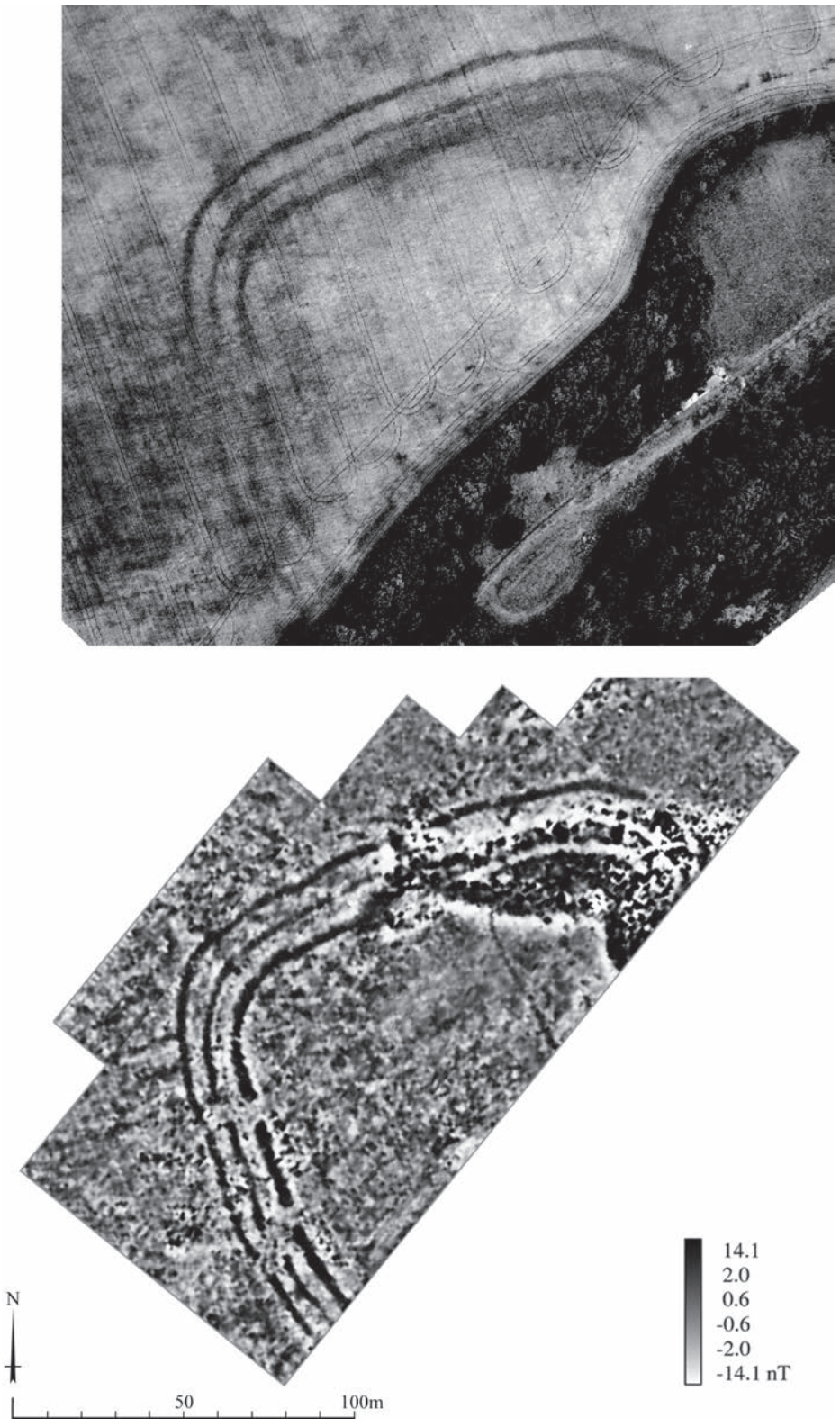


Figure 6.11
East Linton (NT57NE 17): rectified aerial photograph (B38291) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004477)

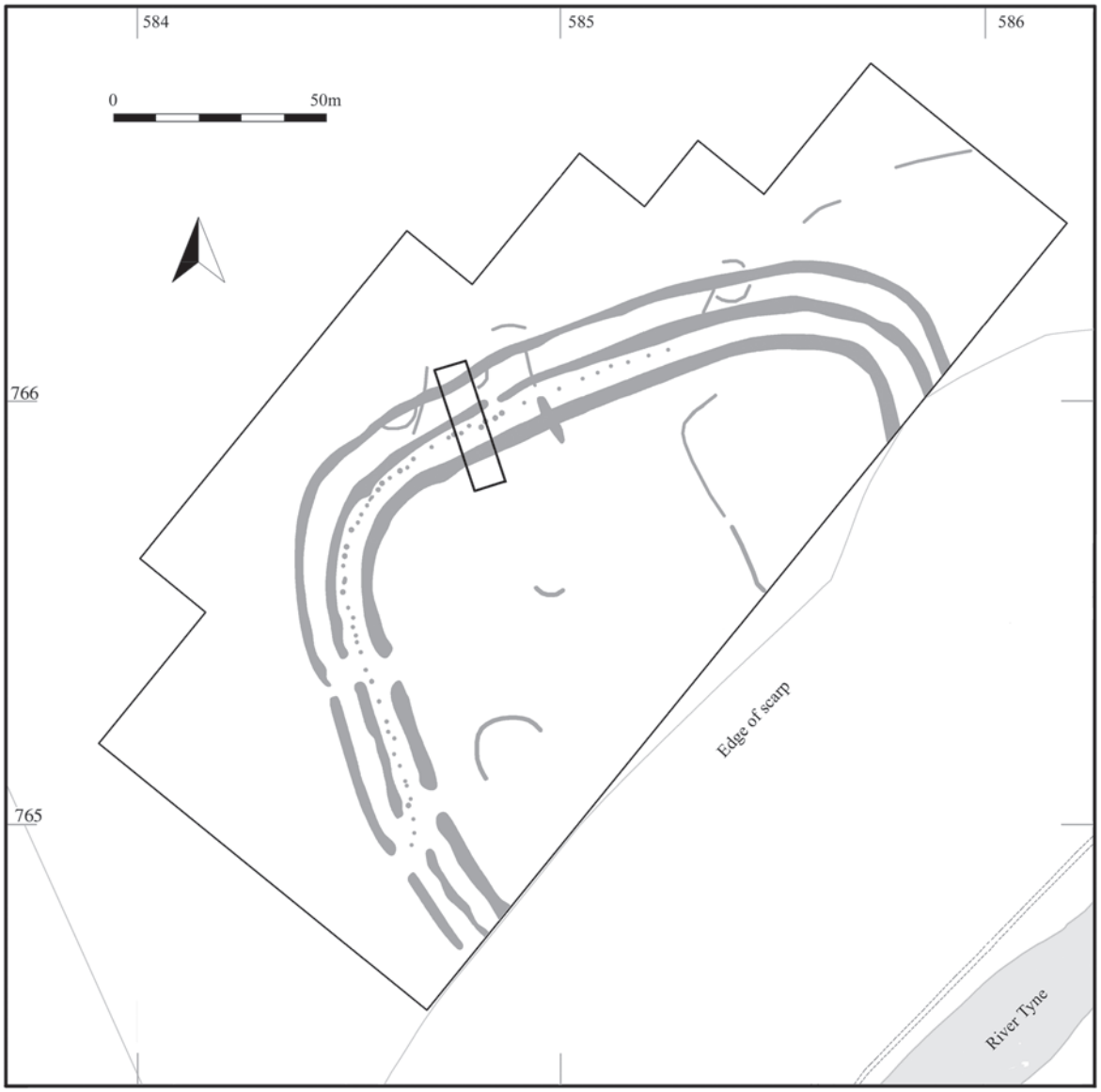


Figure 6.12
The enclosure at East Linton, showing principal subsurface anomalies and the location of the 2004 excavation

Despite concerns that the igneous bedrock would compromise the geophysical survey, good results were obtained, adding information to that derived from the cropmarks. The three ditches are clearly represented, and the entrance gaps in the west are much better defined than by the cropmarks, showing the middle entrance to be off-centre. The gap in the inner ditch to the south is also well-defined. To this feature, the geophysics adds two clear causeways in the central and outer ditches, both of which are staggered so that the entrance – if that is indeed what is represented here – takes a diagonal line through the ramparts, not that much different from the line of the terrace edge.

The palisade trench is also well-defined and can be seen to extend across the northern of the two western entrance causeways and to dog-leg outwards through the southern one, but gives the impression of having a discontinuous foundation. The geophysical survey also adds detail in the eastern half of the interior. The narrow south-east to north-west ditch visible in the

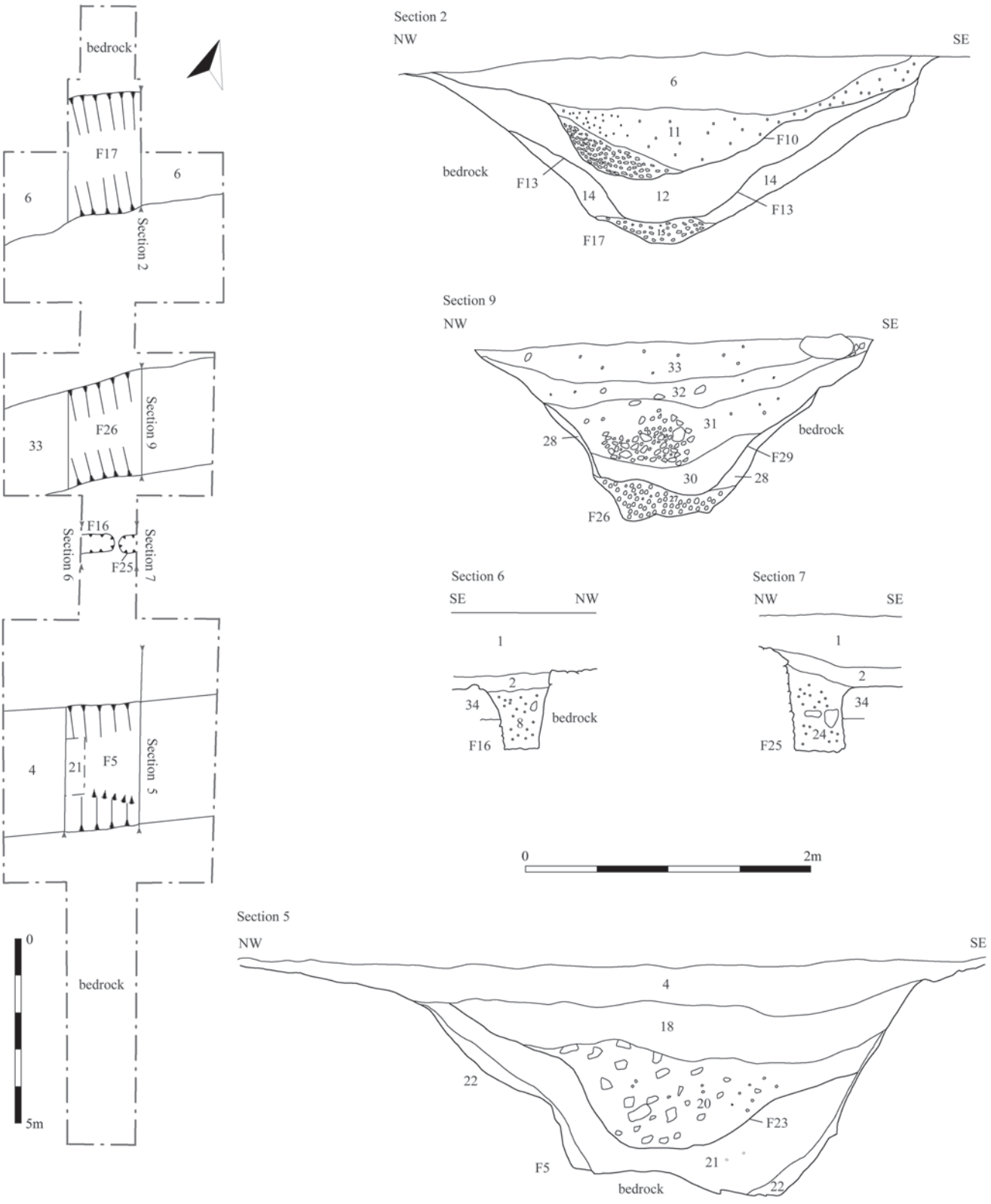


Figure 6.13
East Linton: plan and sections of the enclosure ditches and palisade

cropmarks can be seen to turn sharply to run towards the north-east and there is a hint in the geophysics that this continues to the east, outside the multivallate circuit, so its interpretation as a sub-enclosure is at best provisional. The interpretation of various small anomalies in the interior is more difficult, but they may include roundhouses. On analogy with sites like Broxmouth and Hownam, a number of curving anomalies on the line of the most northern ditch might mark the site of buildings established there after the circuit ceased to be maintained. Intense values in the north-east part of the site are probably geological in origin, while the south-south-east to north-north-west texture evident on the plot is a product of modern ploughing.

Taken together the survey data indicate that this site is likely to have several phases of remodeling and that the earthworks may have been re-used.

The enclosure boundaries

East Linton was chosen for examination as one of the larger and more complex enclosures in the Study Area, as well as one that if anything was sub-rectangular rather than curvilinear in form, with some indication of potentially later activity on the line of the ditches. Along with sampling the three ditches, the other main objective of the evaluation was to confirm the existence of the palisade. A single trench 25m long was excavated in October 2004 across the ditches on the northern side of the site close to the corner, as this was where there were indications of additional anomalies (Figure 6.12), although in the event no traces were found. Bedrock lay *c.* 0.35m below ground level, and was slightly raised towards the centre of the trench; pockets of eroded bedrock were present in places. Beneath the stony topsoil (0.3m deep), a discontinuous layer of clay silt [2] overlay the features, indicating that the modern plough has not always cut deep enough to threaten the underlying deposits.

A data structure report was submitted to Historic Scotland in March 2005 (ASUD 2005b). The site code is TEL04.

The inner ditch

The inner ditch (F5) cut through the bedrock to a depth of 1.6m (Figure 6.13). It had a maximum width of 3.5m, with sloping sides – the inner (southern) side steeper than the outer – leading to a broad roughly flat base around 1m across. A thin deposit of silt and loose stone [22] lined both edges, probably a combination of degraded or eroded bedrock and natural silting when the ditch was open. Above this, the ditch infilled with a sticky sandy silt [21] up to 0.5m deep. A wheat grain from [21] yielded a radiocarbon date of 1370–1050 cal BC (SUERC-10627).

A possible recut was observed cutting through this deposit, creating a boundary with a more U-shaped profile, 1.25m deep (F23). The recut contained a thick fill of sandy silt with frequent stones [20], perhaps the remains of a bank constructed when the ditch was first cut, which had eroded or been backfilled into the ditch. The upper part was filled with a thick deposit of silt with a few stones [18, 0.6m deep] and finally with 0.3–0.4m of sandy silt [4].

The central ditch

The central ditch (F26) was cut through the bedrock to a depth of 1.3m and, as the survey evidence had suggested, proved to be the least substantial overall. It was more V-shaped than the inner ditch, with a much narrower base containing a primary fill of sandy silt with many small stones [27]. A loose stone and silt lens [28] overlay both sides of the ditch, probably material washed into the open ditch. There were signs that the ditch had been re-cut through this deposit, creating a broadly similar but slightly shallower profile (F29). Its primary fill [30] was a sandy silt, 0.2m in depth, from which birch charcoal produced a date of 390–200 cal BC (SUERC-10629). The ditch then infilled with a thick layer of brown sandy silt [31, 0.5m deep] with a marked concentration of medium and larger stones in the outer half of the ditch, tailing off up the slope to the south, suggesting that this is material tumbled from an internal bank. Above the stones, more sandy silt formed [32, 0.3m in depth]. The upper fill [33] was slightly grittier sandy silt. A large boulder on the inner lip may be the remains of a collapsed revetment for the bank.

The outer ditch

The outer ditch (F17) was of similar width to the inner ditch, but comparable to the middle ditch in depth. In profile, it was a broad V-shape, cut through the bedrock to a depth of 1.2m. The primary fill [15] consisted of sticky sandy clay with many angular stones. Firm gritty silt accumulated down both sides [14], after which the ditch seems to have been redefined (F13). This cut had largely infilled with a thick deposit of soft clay silt [12], before again being re-defined – creating a smaller cut less than 1m deep, with a steep side to north, and a shallower

southern edge (F10). Its base contained much angular stone in sticky clay silt [9], lying mainly against the inner slope of the ditch, and thus likely to be bank material. Above this was a thick layer of gritty silt [11, 0.4m in depth], containing gravel lenses – implying deposition over a period of time. The uppermost fill was thick sandy silt [6], up to 0.6m deep and probably of agricultural origin.

Palisade slot

Between the inner and central ditches, *c.* 1.5m inside the latter, were two separate segments of palisade trench (Figure 6.14), confirming that the foundation was not continuous, although the gap was only 0.1m. The 0.4m wide slots were cut through a layer of decayed stone into the solid bedrock. They had vertical sides and a flat base, but the inner side was shallower than the outer side, presumably having been truncated perhaps at demolition or, more likely, through subsequent activity. In addition, the western slot (F16) was shallower (0.5m) than the eastern one (F25, 0.7m). Both were filled with red-brown gritty clay silt [8; 24] containing frequent large stones, but no settings were found. Birch charcoal from [24] yielded a radiocarbon date of 1260–1000 cal BC (SUERC-10628). Covering the palisade was the thin soil layer [2] already mentioned above.

The palisade is likely to have been freestanding. It is too far from the outer ditch and seems too close to the central one to have retained a bank (as at Standingstone, Chapter 4), whilst diverging from both circuits at the southern of the two entrances on the western side of the site. Equally it blocks the northern entrance which goes through all three ditches, which implies that it is not directly contemporary with the inner ditch either – although the radiocarbon dates suggest that they are not far removed in time.

Discussion

Like other multivallate sites in and beyond the region, East Linton clearly had a complex history of enclosure and boundary definition. All the ditches were re-cut at least once and, in the case of the outermost ditch, twice. It is entirely plausible that more than one circuit was in use contemporaneously. In the absence of finds and given the small number of radiocarbon dates, it is not possible to reconstruct the sequence, but some useful pointers were obtained. Both the base of the inner ditch and the palisade yielded charcoal of Late Bronze Age date, indicating that the site was enclosed at this period, although the two boundaries are unlikely to have functioned at exactly the same time. Perhaps the most likely scenario is that the palisade came first, with an entrance at the south, where the palisade kinks near the terrace edge. It was then replaced by the inner ditch and the second, more northerly entrance was created.

The central ditch is also probably later than the palisade, as the latter would have lain beneath the accompanying internal bank, but how much later is another matter. The central ditch seemingly respects the line of the palisade where it swings out at the southern entrance, which implies that they might not be far removed in time, but the recut is of Later Iron Age date, so it may just be the entrance causeway that the ditch respected. The outer ditch seems to curve around the end of the middle ditch at the southern entrance, which may imply that it was a later addition, but in its case no dating evidence was recovered. The outer circuit is the only one with evidence of a second recut, which might indicate that it was refurbished after the others ceased to be maintained.

Figure 6.14
East Linton: the late Bronze Age palisade

CONCLUSIONS

Among the points of interest to emerge from the evaluations was the evidence of Late Bronze Age enclosure at East Linton and Earlier Iron Age enclosure at Foster Law. Owing to the very limited scale of the work, we cannot be certain that the relevant features are of the same date as the burnt material recovered in them, but given the consistency of the relevant radiocarbon dates from each site and the parallel evidence from Whittingehame, Traprain and especially Standingstone, the clear implication is that enclosure was a far more widespread phenomenon in the region at the end of the second millennium BC and the start of the first millennium than we have hitherto appreciated.

All three evaluations yielded evidence of enclosure in the Later Iron Age. At East Linton and Foster Law the evidence took the form of recutting of earlier circuits, whereas the single date from the waterlogged basal fill of the rectilinear enclosure at East Bearford would be compatible with the view that, like Knowes, this was a new foundation in the late first millennium BC. The other interesting feature of the evaluations is the presence of artefacts in the top of the ditches at Foster Law and East Bearford suggesting that both these sites can be added to the growing list of settlements in the region where occupation continued for some time after the original enclosure ceased to be maintained.

Chapter 7

The Material Remains

FRASER HUNTER, PAMELA LOWTHER and ANN MACSWEEN
(with contributions by Dave Heslop, Cath McGill, Jason Mole, Jennifer Price and Steven Willis)

INTRODUCTION

In common with other excavated later prehistoric enclosures in southern Scotland, the TLEP sites yielded modest assemblages of finds. The bulk of the material comprised coarse pottery and a variety of stone implements. Other items are present in small quantities and on particular sites, including Roman pottery, glass, and metal. Easily the largest assemblage was that from Knowes, whilst East Linton was the only site not to yield any artefacts. Residues from the environmental samples were routinely screened for finds as a control on recovery rates, but the only notable find was an amber bead from Knowes.

The artefacts from the excavations are first presented below, with the exception of the Early Bronze Age cinerary urns from Standingstone, which are discussed in Chapter 4. An overview by Fraser Hunter follows, putting the material culture from the TLEP excavations in a broader southern Scottish context.

Abbreviations used in Chapter 7:

D – diameter
H – height
L – length
sf – small find/find number
T – thickness
W – width
Wt – weight

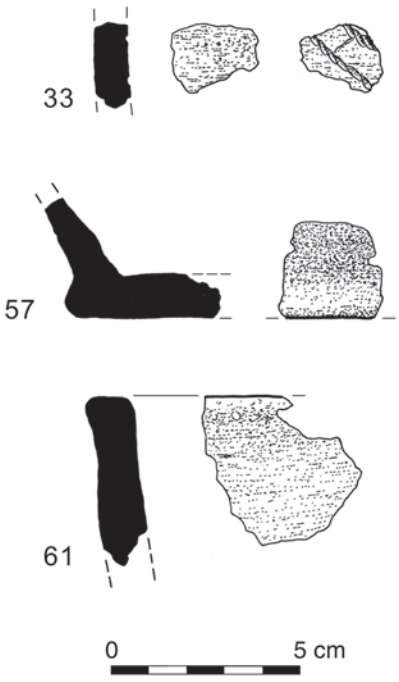


Figure 7.1
Pottery from Standingstone. Scale 1:2
(Gavin Lindsay and Christina Unwin)

THE COARSE POTTERY

ANN MACSWEEN
(with contributions by Cath McGill)

Whittingehame (C McG)

Only five small, heavily abraded body sherds from five vessels, with a total weight of 85g were recovered. Wall thicknesses vary from 11–19mm. The sherds are undiagnostic, but of probable prehistoric date. One sherd of fine clay with 10% of rock fragments came from the palisade (sf 4). Three are of fine sandy clay with 20–30% of rock fragments (sf 2, 8, 11), of which two came from the first cobbled surface (sf 2, 8) and one from the late trackway (sf 11). The fifth sherd, of sandy clay with only occasional rock temper, was unstratified (sf 7).

Standingstone (A MacS)

The cinerary urns apart (Chapter 4), the assemblage from Standingstone comprises 24 sherds and fragments from an estimated 12 vessels. Most of the sherds are either fine sandy clay or fine clay with 20–40% of angular rock fragments. Their colour (mainly grey with a brown/red margin) indicates a short firing; surface finish, if any, comprises a wet-hand smoothing. The only rim sherd, unfortunately unstratified, is a

flat rim from a thin-walled vessel (sf 61), which could date anywhere between the Middle Bronze Age to the Iron Age. The only base (sf 57) and the only decorated vessel (sf 33), along with five other sherds, are all from pit F56 with later Neolithic radiocarbon dates and could conceivably be attributed to the Grooved Ware tradition. Only the illustrated vessels (Figure 7.1) are described here.

- *sf 33 [21, pit F56]*

  Body sherd, decorated on the interior surface with two parallel lines of twisted cord impressions. The fabric is fine sandy clay with *c.* 30% of small angular mixed fragments which has fired hard and is grey with a brown exterior surface. Exterior surface sooted. Slightly abraded. T 10mm, Wt 7g.

- *sf 57 [21, pit F56]*

  Basal sherd, flat with angular walls. From a small vessel, estimated basal diameter only *c.* 50mm. The exterior surface is smoothed. The fabric is fine clay with *c.* 30% of angular black and white fragments, which has fired hard and is red. Abraded. T 7mm, Wt 27g.

- *sf 61 [unstratified]*

  Rim sherd, flat with a slight lip to the exterior. Coil constructed (N-shaped junctions). The fabric is fine clay with *c.* 40% of angular black/white fragments which has fired hard and is red with a grey core. Abraded. T 11mm, Wt 26g.

Knowes (A MacS)

The pottery assemblage from Knowes comprises 84 sherds and fragments from an estimated 46 vessels. Most of the pottery is made from sandy or fine sandy clay with between 10% and 30% of gravel or rock fragments. Coil junctions (mostly diagonal junctions) were noted on the majority of sherds. None of the sherds is decorated and the surfaces are at most smoothed. Most of the sherds are either red/brown with a grey core or grey with red/brown surfaces or margins, indicative of a short firing.

There are a number of rim sherds; those giving an indication of form are illustrated (Figure 7.2). The rims are either plain or slightly flattened and the profiles indicate either straight-sided or slightly inverted bucket-shaped vessels. One vessel (sf 133) has a more open form. Most body sherds are 10–20mm thick and there is a range of vessel sizes from 120–420mm where diameter could be estimated.

There is no indication that the pottery being used changed markedly in either form or fabric throughout the life of the site. The sooting noted on many vessels indicates their use as cooking vessels. Bucket-shaped vessels with plain or inturned rims are a common form of vessel on Iron Age sites in south-east Scotland (below).

- *sf 11, 29, 10 [111, set in surface of S ditch terminal]*

  Slightly inverted rim from a large, probably bucket-shaped, vessel. The fabric is sandy clay with *c.* 10% of mixed rock fragments (angular and moulded), which has fired hard and is grey with brown surfaces. The vessel is coil-constructed with a mix of N-shaped and U-shaped junctions. Below the rim in the interior are fingertip impressions where the rim has been shaped, and finger-smoothing striations. The exterior surface is smoothed with a wet-hand finish. There is extensive fire-cracking over the surface and the surface has spalled along the coil junctions. The exterior is sooted with patches of residue. T (walls) 17mm, D 420mm, Wt 503g.

- *sf 45 [115, silty sand, as 109]*

  Plain rim, inturned, from a coil-constructed vessel with N-shaped junctions. The fabric is sandy clay with *c.* 20% of mixed rock fragments (angular and rounded) which has fired hard and is black. Spalled along coiled junction. Exterior sooted. Fresh. T 11mm, D 120mm, Wt 19g.

- *sf 56 [112, silty sand outside CS2]*

  Plain rim, inturned, from a coil-constructed vessel with N-shaped junctions. The fabric is fine sandy clay with *c.* 20% of mixed rock fragments, some large, which has fired hard and is grey with brown surfaces. Some spalling along the junctions. The exterior is sooted and there is residue in the interior. T 13mm, D 240mm, Wt 38g.

- *sf 133 [158, remnants of CS1 wall]*

  Flat rim with a fingertip groove beneath the rim, from a coil-constructed vessel with N-shaped junctions. The fabric is fine sandy clay with *c.* 20% of mixed rock fragments (rounded and angular) which has fired hard and is grey with brown margins. There is fire-cracking in the interior. Residue on the exterior and light sooting in the interior. T 16mm, D 280mm, Wt 162g.

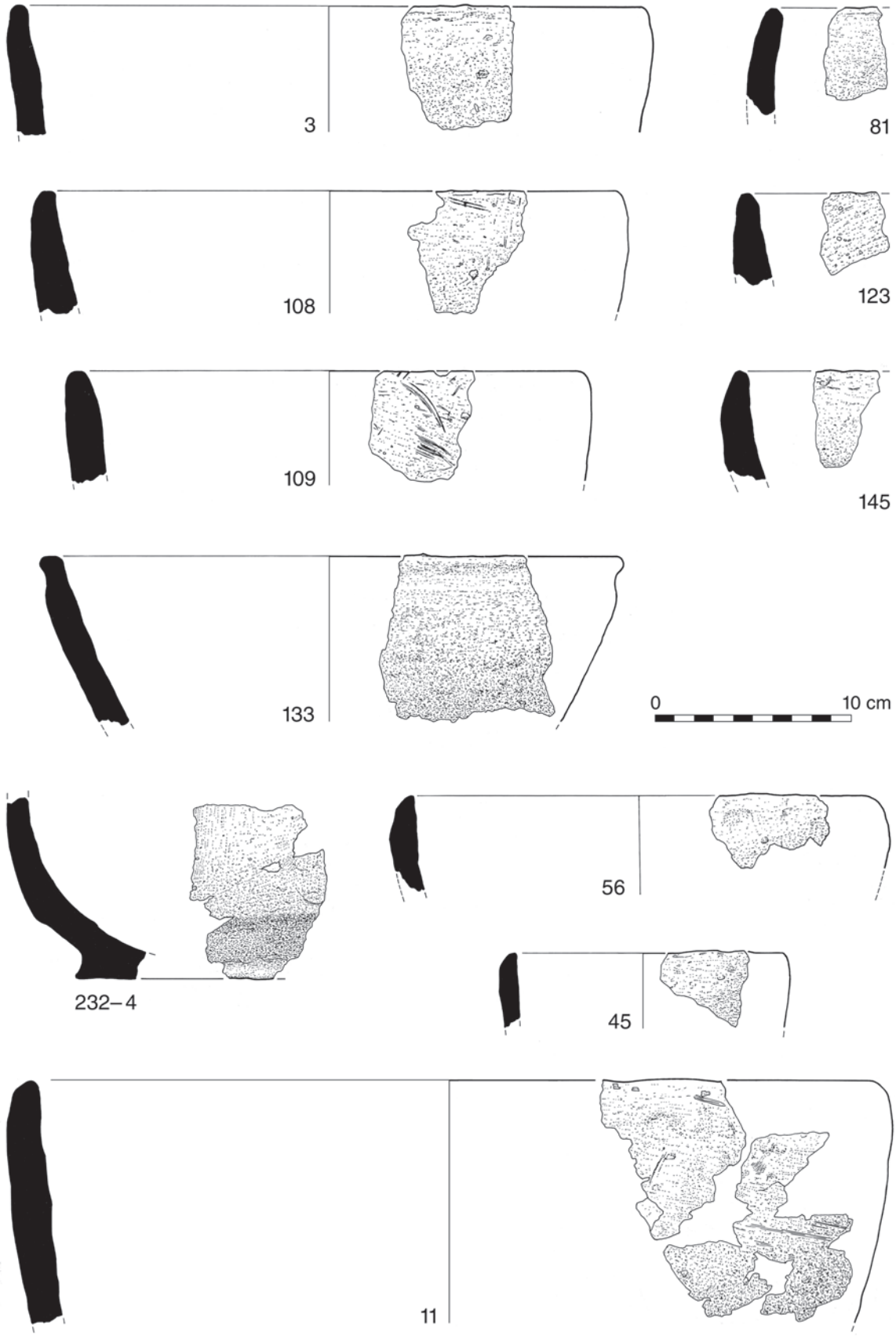


Figure 7.2
Coarse pottery from Knowes. Scale 1:3 (Gavin Lindsay and Christina Unwin)

- *sf 81 [135, scoop F129]*

  Slightly inverted rim with a plain lip from a coil-constructed vessel with N-shaped junctions. The fabric is fine sandy clay with *c.* 10% of mixed rock fragments (angular and round) which has fired hard and is grey with red margins. The exterior surface is sooted and there is light sooting in the interior. Slightly abraded. T 18mm, Wt 32g.

- *sf 232–4 [351, silty sand over path by CS2]*

  Flat base, footed, the walls angling sharply to the base. Coil-constructed with H-shaped and N-shaped junctions. The exterior surface is smoothed. The fabric is coarse sandy clay with occasional large angular fragments which has fired hard and is grey with a red exterior. Light sooting around the pedestal. The interior surface is sooted. T 17mm, Wt 149g.

- *sf 3 [8, external pit complex F5]*

  Plain rim from a coil-constructed vessel with N-shaped junctions. The exterior surface is smoothed. The fabric is sandy clay with *c.* 30% of mixed angular fragments which has fired hard and is black with a red exterior surface. Patches of sooting on both surfaces. T 14mm, Wt 81g.

- *sf 109 [124, silt within CS2]*

  Flat rim, with wiping striations on the exterior. The vessel has a slightly open profile. The vessel is coil-constructed with N-shaped junctions. The fabric is sandy clay with *c.* 30% of angular fragments (buff-coloured) which has fired hard and is red. The pottery has a crumbly texture, possibly due to post-depositional burning or over-use, with fire-cracking on both sides. Slightly abraded. T 18mm, D 280mm, Wt 54g.

- *sf 108 [124, silt within CS2]*

  Slightly inturned rim with a flat lip from a coil-constructed vessel with N-shaped junctions. The exterior surface is smoothed. The fabric is sandy clay with *c.* 10% of mixed gravel (angular and round) which has fired hard and is red with a grey core. Fresh. T 11mm at lip–21mm, D 290mm, Wt 70g.

- *sf 145 [124, silt within CS2]*

  Slightly inturned rim with a plain lip, from a coil-constructed vessel with N-shaped junctions. The exterior surface is smoothed. The fabric is sandy clay with *c.* 10% of mixed gravel (angular and round) which has fired hard and is grey with red margins. Abraded. T 12mm at lip to 19mm, Wt 35g.

Foster Law (A MacS)

Sixteen sherds and fragments were recovered from Foster Law. An estimated 11 vessels are represented, including a large thick-walled bucket-shaped vessel (sf 5) and a smaller vessel with a slightly inverted profile (sf 10). A flat base from a straight-sided vessel (sf 9) and a thumb pot (sf 6) are also present (Figure 7.3). Apart from sf 10, all the vessels in the assemblage are thick-walled (12–21mm thick), and constructed by coil building (N-shaped junctions are visible on many sherds). Again, this is a small assemblage and the sherds are not distinctive enough to be useful for dating. The form of the large rim sherd is, however, different from the rim sherds from Knowes and it is possible that they are chronologically distinct.

- *sf 5 [unstratified]*

  Plain rim from straight-sided vessel. The fabric is fine sandy clay with *c.* 20% of large angular fragments (mixed), which has fired hard and is grey with red surfaces. Coil-constructed with N-shaped junctions. The exterior surface is smoothed and there are wiping striations. There is light sooting on the upper part of the exterior and on the interior of the lip. T 17mm, D 340mm, Wt 233g.

- *sf 10 [unstratified]*

  Plain rim, slightly inturned. The exterior surface is smoothed. The fabric is sandy clay with occasional large fragments which has fired hard and is grey with red margins. Coil constructed with N-shaped junctions. Surface abraded. T 7mm, D 100mm, Wt 22g.

- *sf 9 [50, recut inner ditch F18]*

  Flat base with straight sides. The exterior surface is smoothed/pared and the interior surface is smoothed. The fabric is fine sandy clay with *c.* 20% of large mixed angular fragments which has fired hard and is grey with brown surfaces. The exterior surface is sooted. T 15mm, Wt 93g.

- *sf 6 [4, stone spread over ditches]*

  Thumb pot. The fabric is sandy clay with *c.* 10% of angular fragments which has fired hard and is grey and brown patchy. The interior has been made by

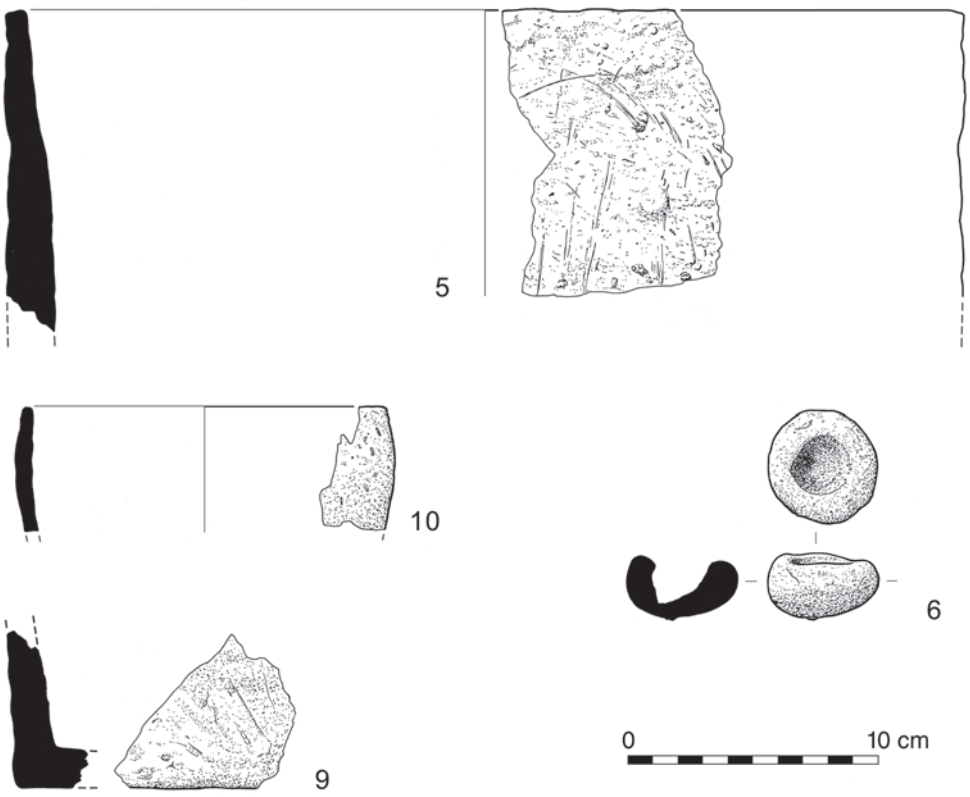


Figure 7.3
Pottery from Foster Law. Scale 1:3 (Gavin Lindsay and Christina Unwin)

sticking a finger into a ball of clay at an angle. Fairly fresh (some surface abrasion). A very similar thumb pot was found at Phantassie (Lelong 2007, fig. 7.3). T 14mm, Ht 23mm, D 42 × 44mm, D of hole 20mm.

East Bearford (C McG)

One sherd was recovered, a plain rim from a vessel with a slightly inverted profile (Figure 7.4).

- *sf 2 [2, gully F3]*

  Plain rim with a slightly inverted profile from a coil-constructed vessel. The fabric is sandy clay with *c.* 10% of angular rock fragments which has fired soft and is grey with red surfaces. T 13mm, Wt 57g.

Discussion

Apart from the possible Grooved ware (above) and Early Bronze Age urns (Chapter 4) from Standingstone, the

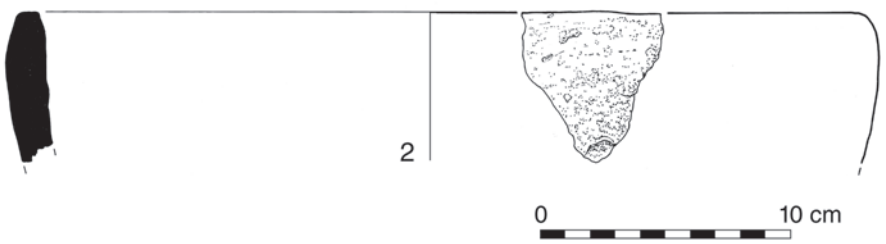


Figure 7.4
Pottery from East Bearford. Scale 1:3 (Gavin Lindsay and Christina Unwin)

TLEP pottery has its parallels with ceramics from later prehistoric sites in southern Scotland and northern England (see Cool 1982 and Cowie 2000 for a list of sites). The simple forms of the pottery of this period and area have made the construction of a ceramic sequence difficult, as has the relatively small size of the assemblages recovered. The excavations at Fishers Road West, Port Seton (Cowie 2000), for example, produced only eight sherds including one inturned rim, and those at Fishers Road East (Gwilt 2000) produced only six sherds representing two vessels from a sizeable area of excavation.

The TLEP has added radiocarbon dates for two contexts yielding rim sherds of later prehistoric tradition, both from Knowes: a date of 100 cal BC–cal AD 80 (SUERC-10568) for the slightly inverted rim with a plain lip (sf 81) from [135] and one of cal AD 1–220 (SUERC-10566) for the flat (sf 109) and inturned (sf 108, 145) rims from [124]. In addition, the stratified pottery from Foster Law was all from the upper fills of the recut inner ditch, which has a *terminus post quem* of 360–60 cal BC (SUERC-10635).

So far, the only published analysis tackling the question of dating this pottery tradition is Cool's (1982) original interim statement on the Broxmouth pottery, in which she identified a 'Middle Assemblage' characterised by Type I pottery – thick-walled (*c.* 20mm) bucket-shaped vessels with plain or occasionally inturned rims, and rim diameters of 250–350mm, made of fabrics with a coarse rock temper, thought to date to the second half of the first millennium cal BC – and Type II pottery – smaller vessels with bucket or barrel forms, thinner walls and finer fabrics – which was considered to date from the first century cal AD. More recently, Cowie (2000, 137) has argued that the currency of Type I pottery extends into the early first millennium AD.

Although there are a number of sites with broadly comparable material, there has been little opportunity to refine the chronology proposed by Cool. The pottery from the recent excavations at Traprain Law itself (Rees and Hunter 2000), for example, was ascribed a 'later prehistoric' date – the internal bevels seen in that assemblage are found at sites from the Late Bronze Age onwards (*ibid*., 420). The ditched enclosure at St Germains, Tranent (Alexander and Watkins 1998), is characterised by bucket-shaped vessels with plain or inturned rims made from coarse fabrics. No clear chronological division between these two rim types was evident and it was concluded that 'In general, the pottery from St Germains can be compared with both types, but perhaps is closer to Broxmouth Type II' (Alexander and Watkins 1998, 226).

There are certainly some vessel 'types' identifiable from a number of the TLEP sites. The rim sherd from East Bearford, for example, is a good example of a 'Type II' rim, and a number of rims from Knowes could also be designated as 'Type II', e.g. sf 56. In addition to Cool's examples of comparable vessels from Broxmouth, Traprain Law, Marygoldhill, Easter Langless, Edgerston, North Berwick Law, Craig's Quarry and Cockburn Law (1982, 85), other examples can now be identified in assemblages from sites such as the Auchlishie souterrain (SF189, A M Dick pers. comm.) and the native assemblage from Cardean Roman fort (McGill forthcoming a), which did not appear to significantly pre-date the fort itself (Cool's date of approximately 200 BC to AD 100 would hold out here).

What has yet to be established, however, is firstly, if there is a clear Type I to Type II chronological development across the region, and secondly, if the picture is more complex than Broxmouth might indicate, i.e. are there other vessel types from other sites that can also be used as chronological indicators? The excavations at Phantassie, for example, produced a fairly large assemblage with a characteristic vessel

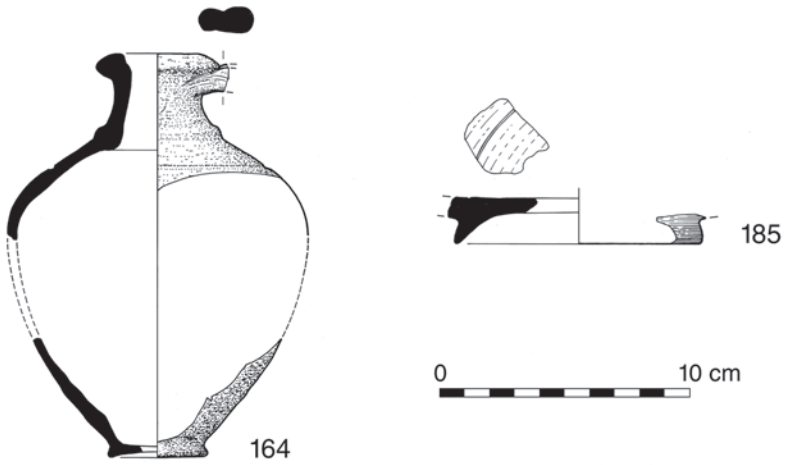


Figure 7.5
Roman pottery from Knowes. Scale 1:3 (Gavin Lindsay and Christina Unwin)

type – the flat-rimmed angular bucket – which is not represented in other East Lothian assemblages (MacSween unpublished).

The most promising approach to understanding this pottery is to compile a radiocarbon-based chronology for the area, one that dates material from contexts containing pottery, or even better, the residues which sometimes survive on sherds. In the meantime, together with the pottery from the A1 sites (Lelong and MacGregor 2007) and that from the recent work on Traprain Law (Armit *et al.* forthcoming), the material from the TLEP adds usefully to the database for this type of pottery.

ROMAN POTTERY

STEVEN WILLIS

Whittingehame yielded three extremely abraded fragments of samian, all from a single Central Gaulish bowl dating to the period *c.* AD 150–200.

- *sf 9 [39] (not illus)*

  Base of Central Gaulish Drag 31 bowl. 3 sherds, Wt 20g

At Knowes, two Roman vessels were forthcoming (Figure 7.5). The first is the footring of South Gaulish samian platter from La Graufesenque. Such vessels have a date range of *c.* AD 40–100. The second is a small flagon, of Gillam's type 15. The form is a late one and does not seem to occur on the Antonine wall, but there are two in the Corbridge destruction deposit (*c.* AD 180); a likely date range for the form is *c.* AD 160–200/230. The fabric family belongs to northern Britain and similar wares were produced at Inveresk and Corbridge in the Antonine period. The flagon has been examined by Viv Swan, who confirms that it is from a military pottery source, but not an Inveresk product, although there might be comparable material at Newstead. The vessel is represented by several sherds found in different contexts associated with CS2, including one from the oven.

- *sf 185 [161, possible hearth deposit, CS1]*

  South Gaulish samian platter footring, either Drag 15/17, or more likely Drag 18. Edge worn, but probably deliberately cut from the vessel. Wt 12g.

- *sfs 164, 173 and 247 [197]; 166 [124]; 204 [261, all CS2]*

  Small flagon. Neck and handle attachment, 2 base sherds and 2 body sherds. Wt 112g.

The low recovery of Roman vessels from the TLEP sites is comparable with other excavated settlements in the region occupied in the early centuries AD, with the sole exception of Traprain Law itself. The large settlement at Phantassie, for example, yielded a single sherd of samian from a plain Central Gaulish Drag 36 bowl, dating to the second century AD (Wallace unpublished; Lelong and MacGregor 2007, fig. 10.9).

THE QUERNS

DAVE HESLOP, PAMELA LOWTHER and FRASER HUNTER

One saddle quern was recovered from Whittingehame and six rotary querns from Knowes. They were examined by Fiona McGibbon, whose geological identifications are incorporated into the descriptions below; her full report can be found in the site archive.

Whittingehame

- *sf 6 [F254, set in natural subsoil] (Figure 7.6)*

  Saddle quern. Made from a large water-rolled boulder, split along bedding plane. Dolerite, presumably an igneous erratic. Top face is slightly dished (concave in two directions), with a neatly pecked surface, probably re-dressed several times to maintain good grinding face and attain this depth. Lower face appears to be natural surface of boulder. Original shape probably sub-oval, but three facets are broken off at one end, squaring-off the corner: perhaps trimmed for re-use? However, the dishing of the grinding face suggests that most of the object survives. Small area of peck marks/roughening on the lower face may be wear from use.

  L 273mm, W 265mm, H 80mm.

Knowes

Ten fragments of rotary querns were recovered, five from the same upper stone (Figures 7.7–7.8). The assemblage comprises a matched pair, together with three other upper stones and one lower stone, all of sandstone. All belong to the 'bun-shaped' variety common in the Later and Roman Iron Age.

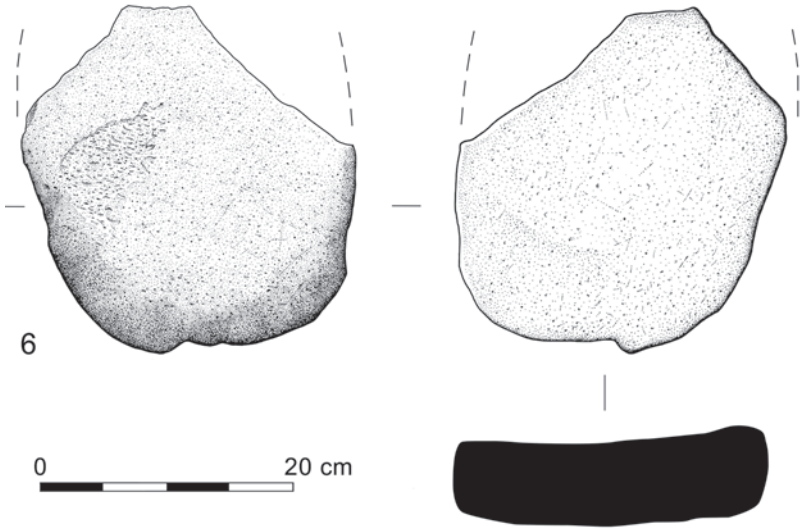


Figure 7.6
Saddle quern from Whittinghame. Scale 1:6 (Mark Hoyle)

- *sf 104 [179, upright in the upper fill of the western ditch F103]*

  Complete upper stone of a bun-shaped rotary quern. Sandstone with fossil voids, very pale for local outcropping sandstone, but most likely from a local Carboniferous source. The outer face of the stone has a rounded profile. A gently tapering, round central hopper, slightly unevenly splayed at the grinding face. There are concentric wear marks on the grinding face, which is worn smooth in places towards the circumference. Parts of three handle holes survive, each coinciding with a facet broken off the grinding face, effectively rendering the handle unusable. Two handle holes, which are set opposite one another, are tapering and have a rounded end; these lie close to the grinding face and may have worn through. At 90 degrees to the axis of these is another handle hole, this time of rectangular section, set further away from the grinding face, and thus presumably a replacement. Opposite this handle, a small facet has been broken off the grinding face. In other words, facets have been struck at effectively the four cardinal points. The stone is slightly higher at one side than the other (uneven wear?) – this matches the position of the paired handle holes. Lack of tooling on outer surface and grinding face.

  D 355–365mm, H 115mm. Hopper: basal D 40–45mm, top D *c.* 120mm. Paired handle holes L 48mm, max D 30mm, and L 40mm, est max D 30mm. Rectangular handle hole L 45mm, aperture W 35mm, H >20mm, tapering to 26 × 10mm.

- *sf 132 [F184, surface within CS1]*

  Roughly half of the upper stone of a low bun-shaped rotary quern. Pink-grey coarse to medium grained sandstone with well-sorted and well-rounded grains, slightly micaceous; no inclusions or fossil pits; local sandstone, Devonian or more probably Carboniferous. Moderate grinding properties. Irregularly shaped, flat form. The circumference of the stone is not terribly even and there is some damage to the outer face. The hopper is funnel shaped, splaying out slightly towards the grinding face. One side of the stone is higher than the other. No traces of handle hole/s. No wear evident on the feedpipe, presumably indicating a wooden spindle. The grinding face has been dressed with a very broad tipped hammer, making circular peck-marks up to 12mm across. Some wear towards the centre of the grinding face. Asymmetrical wear. No sign of regular surface tooling.

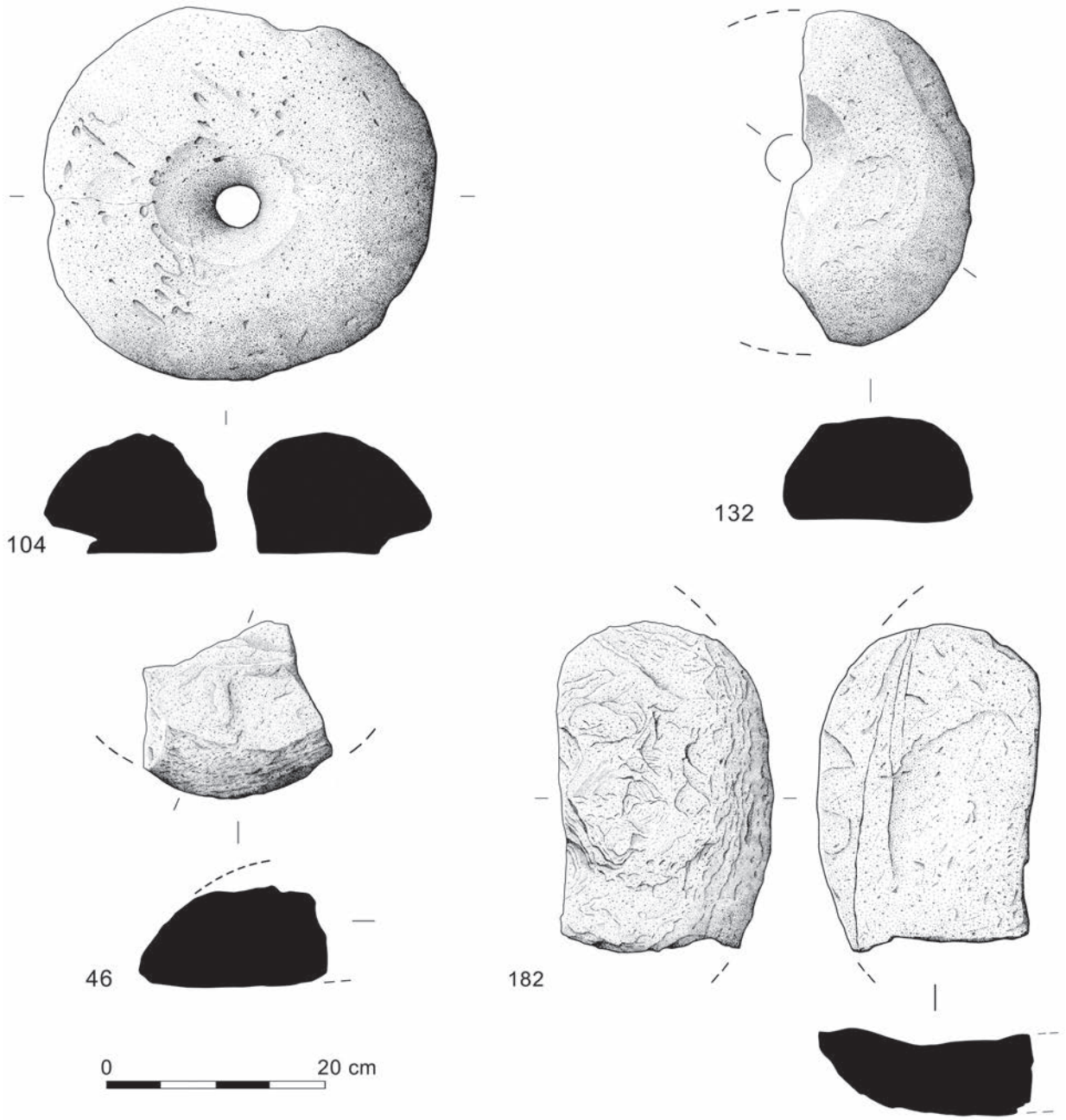


Figure 7.7
Rotary querns from Knowes. Scale 1:6 (Mark Hoyle)

D *c.* 330mm, H 90mm. Hopper: top D *c.* 105mm, narrowest point *c.* 40mm, basal D *c.* 45mm.

- *sf 46 [164, possible remnants of CS1 wall]*

  Part of the upper stone of a rotary quern. Beige-red local sandstone, Carboniferous or more probably Devonian. Part of the pecked outer face survives, indicating a bun-shaped quern. Peck marks are also visible on the lower, grinding face, which is pretty flat. Part of a handle hole survives, measuring >50mm in depth. Its projected circumference lies very close to the grinding face – had it worn

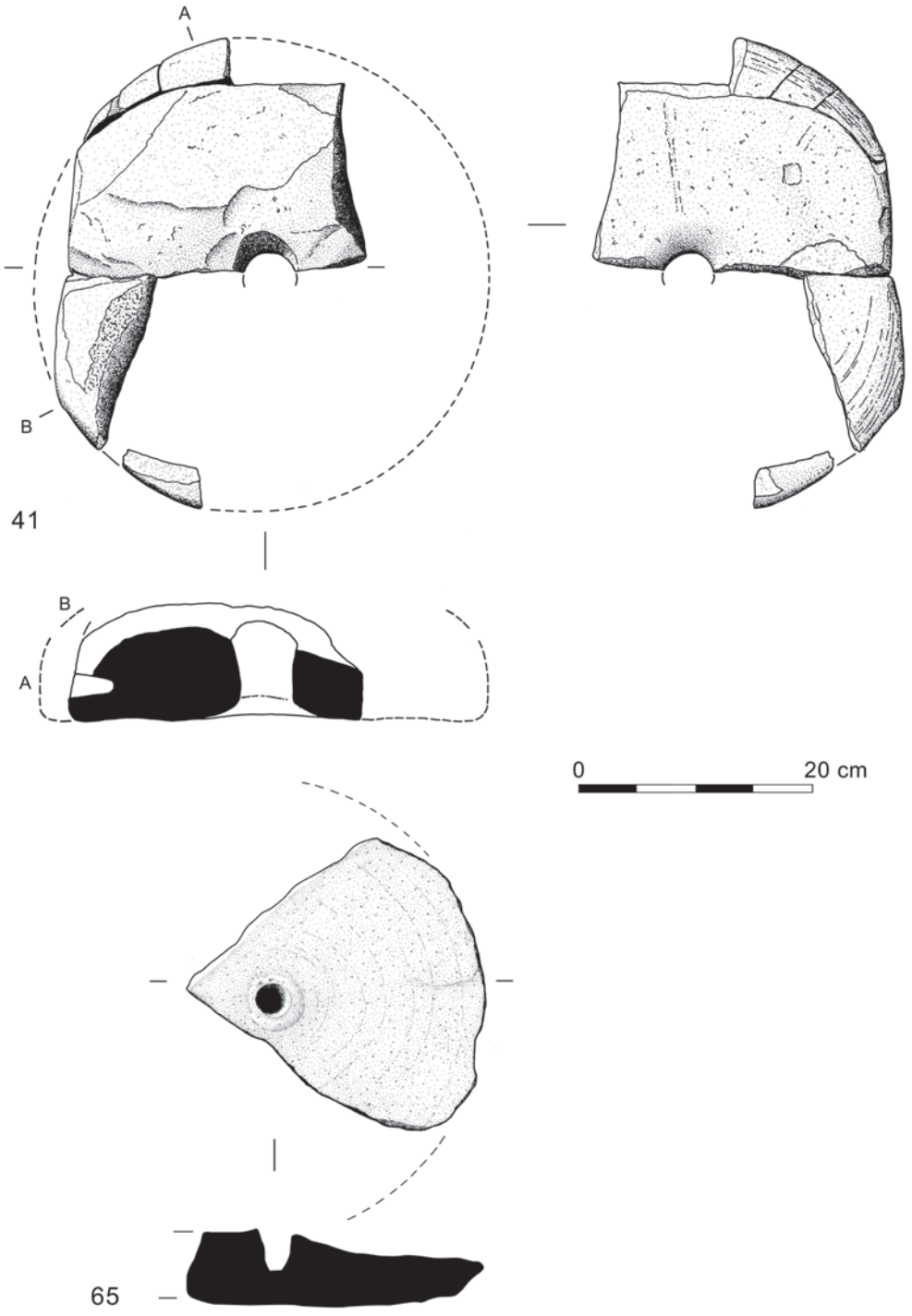


Figure 7.8
Quern pair from Knowes. Scale 1:6. The section of sf 41 is reconstructed from the surviving profile at points A and B (Alan Braby and Mark Hoyle)

through? The stone may have been deliberately re-shaped into a roughly squared block. Very small fragment of small, slightly concave hopper and circular feedpipe extant – too small to measure. Base of feedpipe missing. Grinding face has been dressed with a coarse round hammer. Similar tooling but more distinct on exterior surface.

D uncertain, max surviving H 92mm.

- *sf 65 [123, surface of eastern ditch F332]*

  20% of the lower stone of a rotary quern. Apparently the base for upper stone sf 41 (below). Fine grained, ferruginous sandstone, local Carboniferous or Devonian. The stone is thin, the surviving portion being only 30–65mm high, suggesting that it was set at an angle for use. The base has been pecked and is gently concave in profile. Concentric wear marks are visible on the grinding face, which is concave between the centre and the circumference. The whole of the spindle hole exists, 28mm in diameter and 32mm in depth, and has a slight raised lip around its edge, where a splay at the base of the hopper of the upper stone has not worn the lower stone. Spindle hole is not of penetrating type. Some small black patches on the grinding face may be burning.

  D 380mm, max T 65mm.

- *sf 41 [104, 124, 197, 261, all within or adjacent CS2]*

  Over a third of the upper stone of a bun-shaped rotary quern in six fragments, five of which join. Matched pair with lower stone sf 65 above, the raised lip of which has a matching depression on sf 41 at the base of the feedpipe. Same lithology as sf 65. The grinding face is fairly flat, slightly concave towards the feedpipe, and bears concentric wear marks. A slight groove running across the grinding face from centre to edge is an unusual feature: it can be paralleled on other local querns, one a stray upper fragment from near an Iron Age site at Wallyford with two right-angled grooves, the other, also an upper stone, from the Roman fort of Elginhaugh, with a diametrical groove (McLaren and Hunter 2007; MacKie 2007, fig. 10.57). The purpose of such a groove is unclear; Roman querns had multiple grooves to facilitate grinding and movement of the flour to the edge, and this is occasionally found on indigenous querns (e.g. Woodend Farm, Dumfriesshire, and Loch Glashan, Argyll; Taylor and Simpson 2000, 258, illus 14:1, Clarke 2005, 98, fig. 49), but generally much more closely-spaced. Widely-spaced grooves are known on a lower stone from Crosskirk broch, Caithness (Fairhurst 1984, 128-30, ill 81:540). The Knowes example does not appear to be part of a regular pattern; it may represent an attempt at re-dressing the surface, but may more plausibly be related to its destruction, with the intended subdivision of the quern indicated by the groove; on the Wallyford example, one of the grooves lies along a fracture line. About half of the central hopper survives, measuring from 42–47mm in diameter. Part of a conical handle hole survives, measuring 43mm in depth and from 10–18mm in diameter; it lies parallel to the grinding face, drilled into an edge which has been dressed flat, and may be a replacement. The stone appears to have been deliberately re-shaped into a sub-rectangular block; the resulting facets seem unworn. Little of the original pecked outer surface of the quern survives.

  D 390–400mm, max surviving H 100mm.

- *sf 182 [F184, surface within CS1]*

  Lower stone. Flat block of siltstone, muscovite abundant, defining lens-like ripple drapes. Local sandstone source, most likely Carboniferous. Has partly curved and 2 straight/broken edges. The upper face is hollowed towards the centre, with a particularly smooth area in a roughly circular band around the outside of the hollow; it has a much rougher area towards the circumference (although this may be somewhat damaged?). The outer edge of the lower face has been shaped to give a curving profile and the stone has a roughly flat base. The base stone of a rotary quern, with spindle hole missing. Outer surface is untooled.

  310 × 200 × 85mm

Discussion

The general form and lithology of the Knowes assemblage is typical of sites of this type and date. The querns are derived from sources not too distant from the settlement, and the usual range of handle types and hopper shapes are evident. What is of interest, and what makes this assemblage different from other groups that have been studied in detail, is the pattern of fragmentation and deposition.

Three features are of note. Firstly, the recovery of a matched pair of stones is extremely rare on Late Iron

Figure 7.9
Decorated stone slab from Whittinghame. Scale 1:4 (Drawing Mark Hoyle; photo NMS)

Age and Roman settlements. In central Britain, we know of only one other example of a beehive pair recovered from secure deposits: from Ledston, West Yorkshire (Roberts 2005, 25). Secondly, the overall density of quern fragments is high, given the size of the excavation, and the density of features uncovered. This suggests that there was a special interest in quern deposition at this location, which is not evident on the vast majority of sites.

Thirdly, the presence of multiple fragments from the same stone is highly unusual. The normal pattern in central Britain is for the broken pieces of fragmented querns to be dispersed, so that only one fragment is recovered from each excavation (Heslop

2008). Exceptions do occur – for example two large pieces of a single high-quality top stone were recorded at Stanwick, North Yorkshire (Heslop forthcoming) – but these are not common. Moreover, on the majority of occupation sites, the fragments are detached in a more regular pattern, either to divide the stone into separate portions, each with part of the hopper, feedpipe, grinding face, etc. or to remove parts of the hopper or grinding face for secondary uses, as seen here with upper stone 104 (for general discussion of these patterns see Heslop 2008).

The pattern of fragmentation seen at Knowes is more indiscriminate, resulting from the smashing of the quern to produce a variety of different sized pieces of a more random character. A parallel for this is a larger group from Field Lane, Emsall, West Yorkshire, where a large pit at the centre of an enclosure of uncertain function contained 66 fragments from 11 querns, similarly smashed into random fragments (Heslop 2008). One possible interpretation of this type of deposit is the smashing of querns as part of ceremonies or activities associated with feasting or other communal gatherings, the conclusion of which saw the consumption of the means of production as well as of the products of that production. The presence also of several fragments of the same flagon associated with CS2 might support this suggestion.

OTHER LARGE STONE ARTEFACTS

PAMELA LOWTHER and FRASER HUNTER

Whittingehame

- *sf 14 [unstratified] (not illus)*

  Sub-triangular (almost 'drop' shaped) stone block, thickest at pointed end. Sits well on one face, with flat upper face sloping at an angle – possibly thus for use? A slight 'neck' near the pointed end, as if to enhance attachment, might indicate use as a weight (e.g. roof weight, line weight?) at some stage, perhaps secondary. Greyish colouration on sloping 'upper' face is a ferruginous deposit – may suggest use for crushing or burning in an iron-rich environment. Possibly utilised for pounding or crushing – perhaps a substance such as haematite (for pigment rather than ore?, given the lack of any metal-working evidence from the site).

  331 × 264 × 59mm.

- *sf 15 [2, surface of main ditch F1] (Figure 7.9)*

  Decorated sub-triangular slab, the shape largely natural but with limited edge-flaking. Local red sandstone; most likely Devonian. One face has a near-central small pecked hollow and an incised design. The predominant motif is a triangle, pendant from a line through the cup, with a marginal line along part of one side. The other face has two lines forming an irregular saltire in one corner. One face has ferruginous deposits towards the edges and in part of one incised line. Incised lines were used to mark the intended shape of roughouts (as with the spindle whorl from Knowes, below), but this seems unlikely in this case, as the decoration is not centred on the stone or the central marker hole. Instead, it is best interpreted as a decoration. This is unusual, but not unparalleled, although the phenomenon has seen little study. It is poorly stratified, and could be linked to the fifth–sixth century AD dates for the latest phase, but could equally be redeposited from earlier levels. Early Historic parallels are hard to find, but decorated stones are occasionally recovered from Iron Age sites, although rarely from secure contexts: there is a curved fragment with bifacial linear ornament from St Germains (East Lothian), a sandstone slab from Hawkhill (Angus) with a design of incised horizontal and vertical lines, and an unstratified slab from West Mains of Ethie (Angus) bearing cups and linear decoration, while the Late Bronze Age/Early Iron Age fort of Sheep Hill (Dunbartonshire) produced a sandstone slab with a serrated design incised along one edge. A hut circle at Ormiston (Fife) produced a large slab with an incised border, although it is poorly stratified and could be a medieval gaming board; an unusual decorated stone sphere from Dalladies, Kincardineshire is more securely Iron Age, but typologically more distant (Alexander and Watkins 1998, 238, fig. 18 no 586; Rees and Anderson forthcoming; Wilson 1980, fig. 4; unpublished, Hunterian Museum; Sherriff 1988, 104–5, fig. 4; Hall 1998; Watkins 1980, 159, fig. 20c). Closer to home, there is a small flat slab with incised rectilinear ornament from Traprain, while the site's unusual linear rock art may also be noted (Curle 1920, 72, fig. 7/42; Edwards 1935). The role of such stones is unclear, and is discussed further below. As noted, the dating is poor, and while the growing number of occurrences on Iron Age sites

carries some conviction, where in the 'long Iron Age' they sit is less clear.

Dimensions 240 × 220mm, max T 49mm.

Knowes: hollowed and cup-marked stones

Four boulders of various shapes and sizes each had a cup-shaped hollow pecked into one face (Figure 7.10). There is no evidence of smoothing from use as socket stones or mortars, and the pecking suggests instead use as a knocking stone, perhaps for dehusking barley (cf. Mitchell 1880, 44–5). Three of the four were in a fine-grained micaceous sandstone, the fourth an igneous rock. The lower face of one of the boulders was covered with more than 20 small pecked cups and is probably a re-utilised piece of earlier prehistoric rock art; these are relatively rare in East Lothian (Morris 1981, 138–57; *DES* 1996, 37).

- *sf 197 [F193, boulder revetment of scoop F284]*

  Stone block with a cup-shaped hollow pecked into the upper face. The stone appears to have been roughly shaped into a pentagonal or D-shape. Tooling with a round-tipped hammer or mason's point.

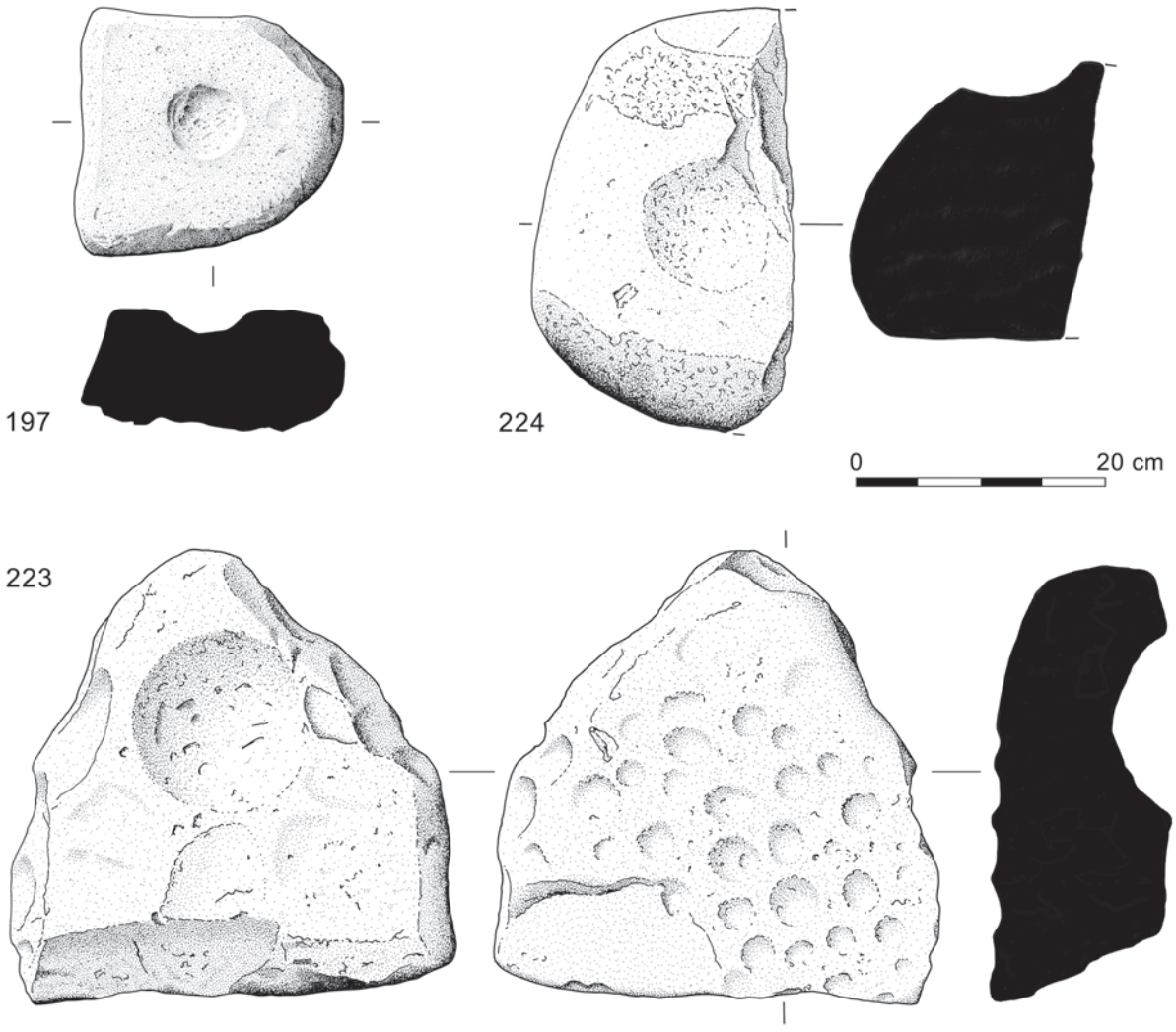


Figure 7.10
Cup stones from Knowes. Scale 1:6 (Alan Braby and Mark Hoyle)

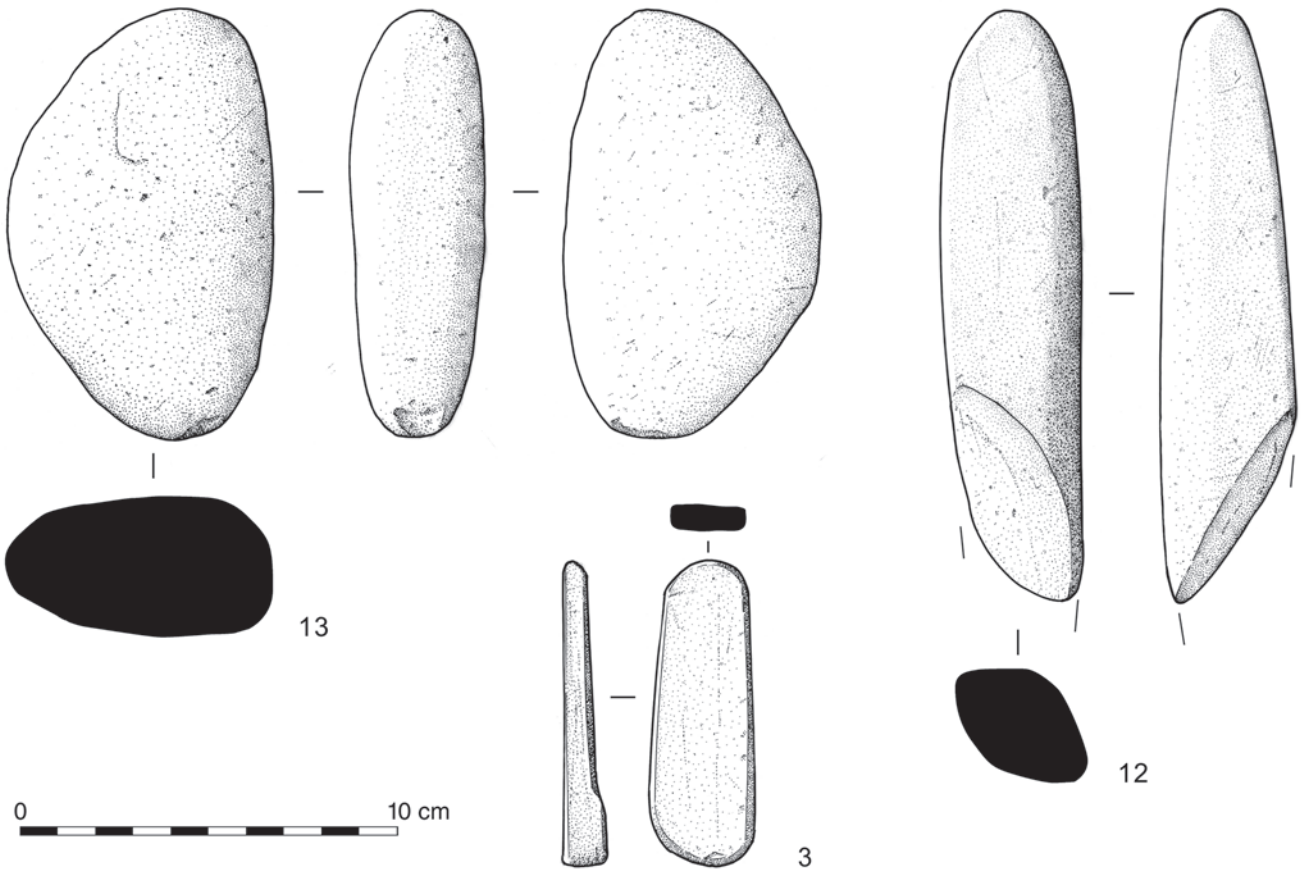


Figure 7.11
Cobble tools from Whittinghame. Scale 1:2 (Mark Hoyle)

Fine grained micaceous white/beige sandstone, typical of local Carboniferous or Devonian sources.

Block 200 × 195 × 95mm H; cup D 65mm, 20mm deep.

- *sf 223 [F327, paved surface in scoop F342]*

  Large sub-triangular block of stone with a large, shallow cup-shaped hollow pecked into 'upper' face. Peck marks are present only in the base, suggesting the sides have been smoothed by wear. The 'lower' face of the block is covered with more than 20 small pecked cups of 25–35mm diameter. Ferruginous brick-red sandstone, from local Carboniferous or Devonian source.

  Block: 415 × 360 × 185mm H; large cup D 145mm, 45mm deep; small cups D 25–35mm, max depth 15mm.

- *sf 224 [F199, wall of CS2]*

  Part of a large igneous boulder with a shallow, oval cup pecked into the upper face. The cup is unworn. One side of the boulder is broken off. The base of the stone has been worked flat; in places the surface of the stone is extremely smooth, elsewhere it appears pecked. Porphyritic igneous rock, gunmetal grey in colour; likely to be a glacial erratic.

  Boulder: 305 × 205 × 225mm H; cup 105 × 90 × 15mm deep.

- *sf 168 [192, stones on north edge of main scoop] (not illus)*

  Part of a small boulder with a basin-like cup pecked into the upper face. Broken through the cup, which is unworn. The sides of the stone appear to have

been roughly faceted. Fine-grained creamy-beige sandstone, local Carboniferous or Devonian source.

Boulder: L >245, W >100, H >150mm; cup est D *c.* 100mm, 42mm deep.

COBBLE TOOLS

PAMELA LOWTHER and FRASER HUNTER

These items are identified through damage or modification resulting from the use of the cobble as a tool; terminology is based on wear pattern, following the criteria of Ballin Smith (1994, 196–202). 'Rubber' is used interchangeably with polisher to indicate stones with a smoothed or polished surface, sometimes associated with residues, but lacking the dishing of a whetstone; none represents classic saddle quern rubbers, and they are likely to be hide-working tools. It is likely that many of them were multifunctional. More than half (12/22) of the objects are of greywacke, the commonest pebble and cobble type found in drift deposits and river beds in East Lothian, a proportion which also reflects its inherent usefulness and properties. The Carboniferous and Devonian sandstones are abundantly available locally. Other lithologies used were felsite, fine sandstone and quartzite, all of which occur locally in the boulder clay drift or in river deposits, and were probably specially selected for their particular density or hardness. The cobble tools were examined by Fiona McGibbon, whose geological identifications are incorporated into the descriptions below; her full report can be found in the site archive.

Whittingehame (Figure 7.11)

- *sf 3 [98, loam over cobbles]*

  Hone. Greywacke. A slabby pebble fragment. One face is very flat and smooth, with an area of wear/polish. The opposite face is roughly broken. The long edges have many fine striations. L 80, W 27, T 11mm.

- *sf 12 [98, loam over cobbles]*

  Hone. Elongated, tapering pebble, of D-shaped section, broken at one end. Greywacke. One face has a very smooth, polished area from wear. Sits well in the palm for use as a whetstone. L 155, W 30, T 32mm.

- *sf 13 [20, post-hole F19]*

  Pounder. Fairly flat heavy triangular greywacke cobble. One of the flat faces is very smooth and has slight polish, probably from secondary use as a rubber; there is also a patch of ferruginous deposit. The tapering end is abraded and has evidently been used as a pounder. Again, it is comfortably held in the hand. L 117, W 68, T 35mm.

- *sf 17 [20, post-hole F19] (not illus)*

  Large heavy cobble of basaltic volcanic rock. The lower face is smoothed and is discoloured grey – it has worn down to the inclusions which are not eroded out. Rubber/polisher? L 123, W 79, T 60mm.

- *sf 18 [43, pit F85] (not illus)*

  Red quartzite cobble with areas of darker red colour and small patches of gloss wear. Utilised as a rubber/polisher? L 88, W 75, T 46mm.

Standingstone (Figure 7.12)

- *sf 42 [101, western ditch terminal F3]*

  Fragment of a large quartzite cobble of roughly triangular section. One 'face' is very smooth and bears an area of high gloss polish, *c.* 50 × 40mm. The whole of the end of the cobble has extensive ground facets, covering a sub-triangular area of *c.* 65 × 40mm. The item has been used as both a polisher and a grinder. Lithology: quartz? Dimensions 88 × 100 × 50mm.

- *sf 20 [48, western ditch terminal F3]*

  Large, heavy, slightly tapering cobble with smooth surfaces. Porphyritic felsite. The more pointed end is roughly fractured from use as a hammerstone – a large facet has broken off one side as well as part of the end. At the other end of the cobble is an area *c.* 55 × 35mm roughened/pecked by grinding wear. A smaller area of roughening occurs along the side of the cobble. Polish and staining on one smooth convex face imply use also as a polisher. Multi-function cobble tool. The piece fits well in the palm of the hand. Lithology: fine grained, metamorphic? L 110, W 77, T 56mm.

- *sf 4 [4, western ditch terminal F3]*

  Small flat cobble of tapering form. Arkosic sandstone. The more pointed end has a small area of roughening

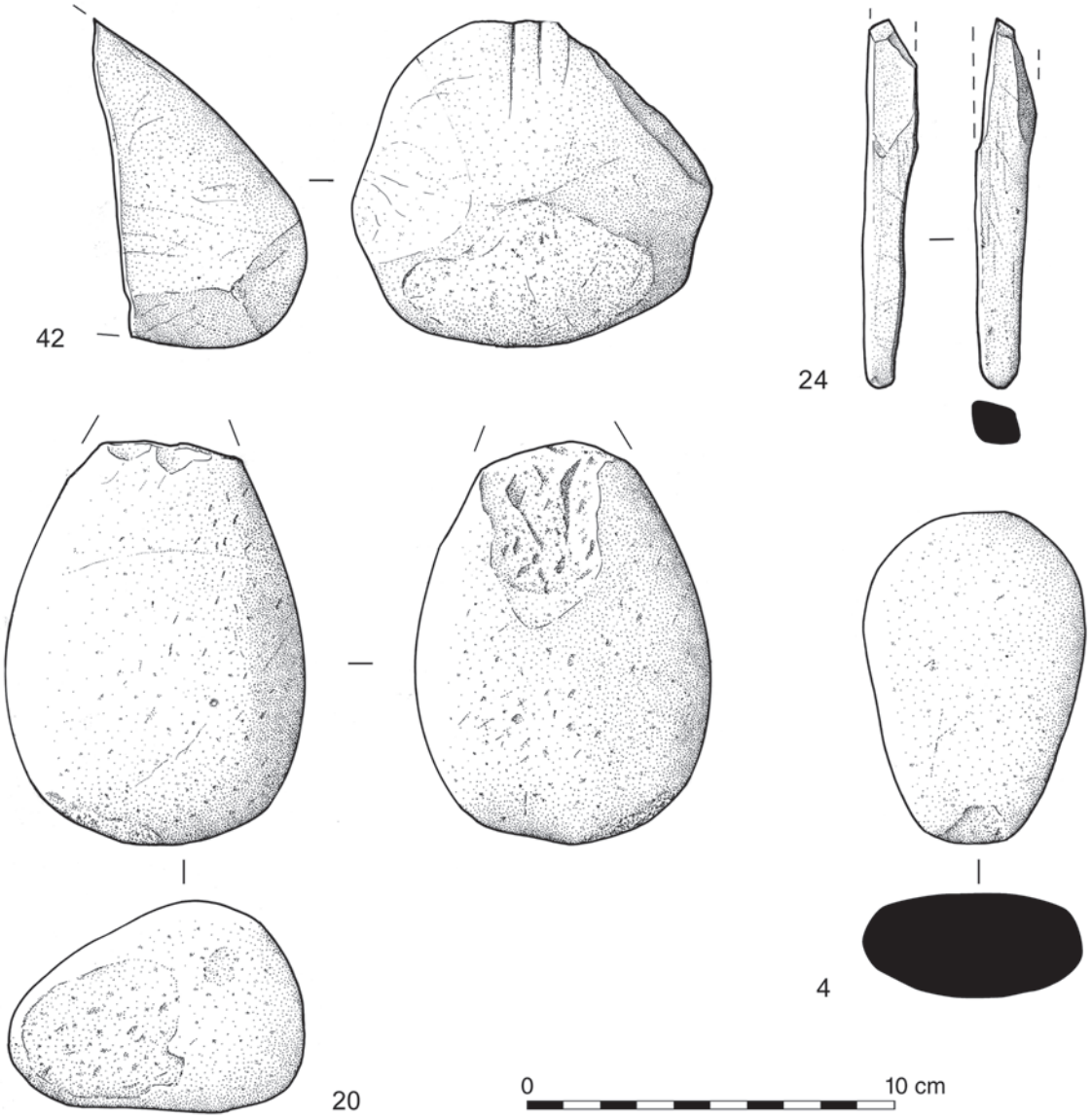


Figure 7.12
Cobble tools from Standingstone. Scale 1:2 (Mark Hoyle)

and a small flake has broken off, implying limited use as a pounder. Slight roughening of the rounded end may also be from use. One of the flat faces is fairly smooth and could have been used for rubbing/polishing, as it has a polished appearance. L 90, W 30–60, T 25mm.

- *sf 24 [58, enclosure ditch F70]*

  Long, thin fragment of very fine-grained greywacke cobble, broken along its length. Three flat faces are smoothed and dished, with fine striations or scratch marks. Whetstone. Petrology: very fine grained grey stone, siltstone? L 98, W 16, T 13mm.

- *sf 25 [48, western ditch terminal F3] (not illus)*

  A flat cobble, broken at one end, probably originally oval. Coarse, quartz-rich grit, from local greywackes. Two areas are worn smooth, along one of the long sides and adjacent to the other long side. Rubber/polisher. L 83, W 67, T 30mm.

- *sf 23 [48, western ditch terminal F3] (not illus)*
  Trapezoidal piece of medium-grained Devonian sandstone, with two deeply hollowed areas on one face. The elongated, tapering hollows are rounded or U-shaped in section. One near the centre of the 'upper' face measures *c.* L 55, W 20, D up to 12mm; the other runs along the end of the stone and is *c.* L 60, W at least 8, D 10mm. Both run out of the stone; the wear does not look natural. The object resembles a mould, but the hollows are incomplete, and the relevant edge of the stone is worn quite smooth and has well-rounded corners. Possibly some sort of a grinder or sharpener? L 105, W 82 tapering to *c.* 55, T 40mm.

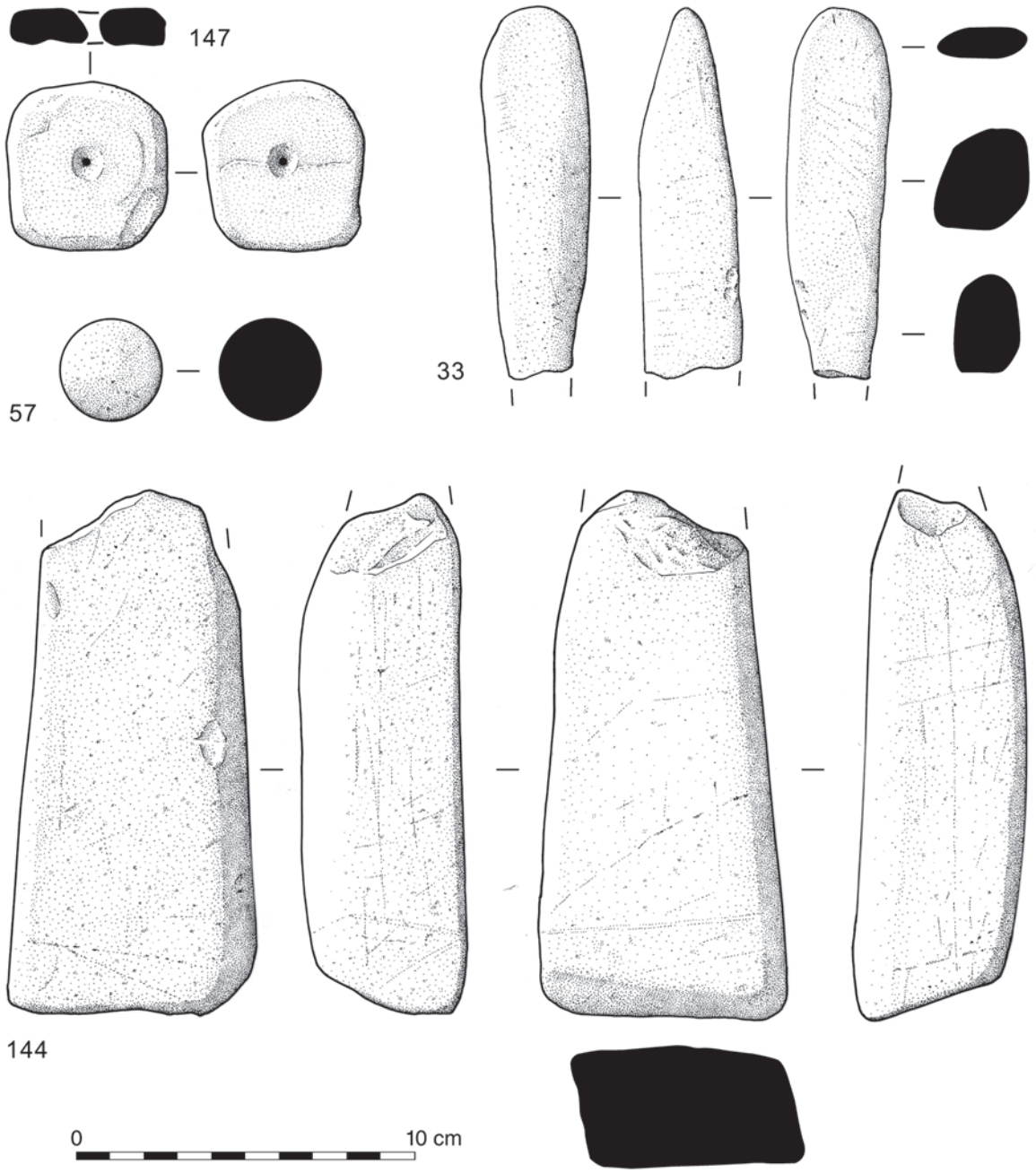


Figure 7.13
Stone whorl, ball and cobble tools from Knowes. Scale 1:2 (Mark Hoyle)

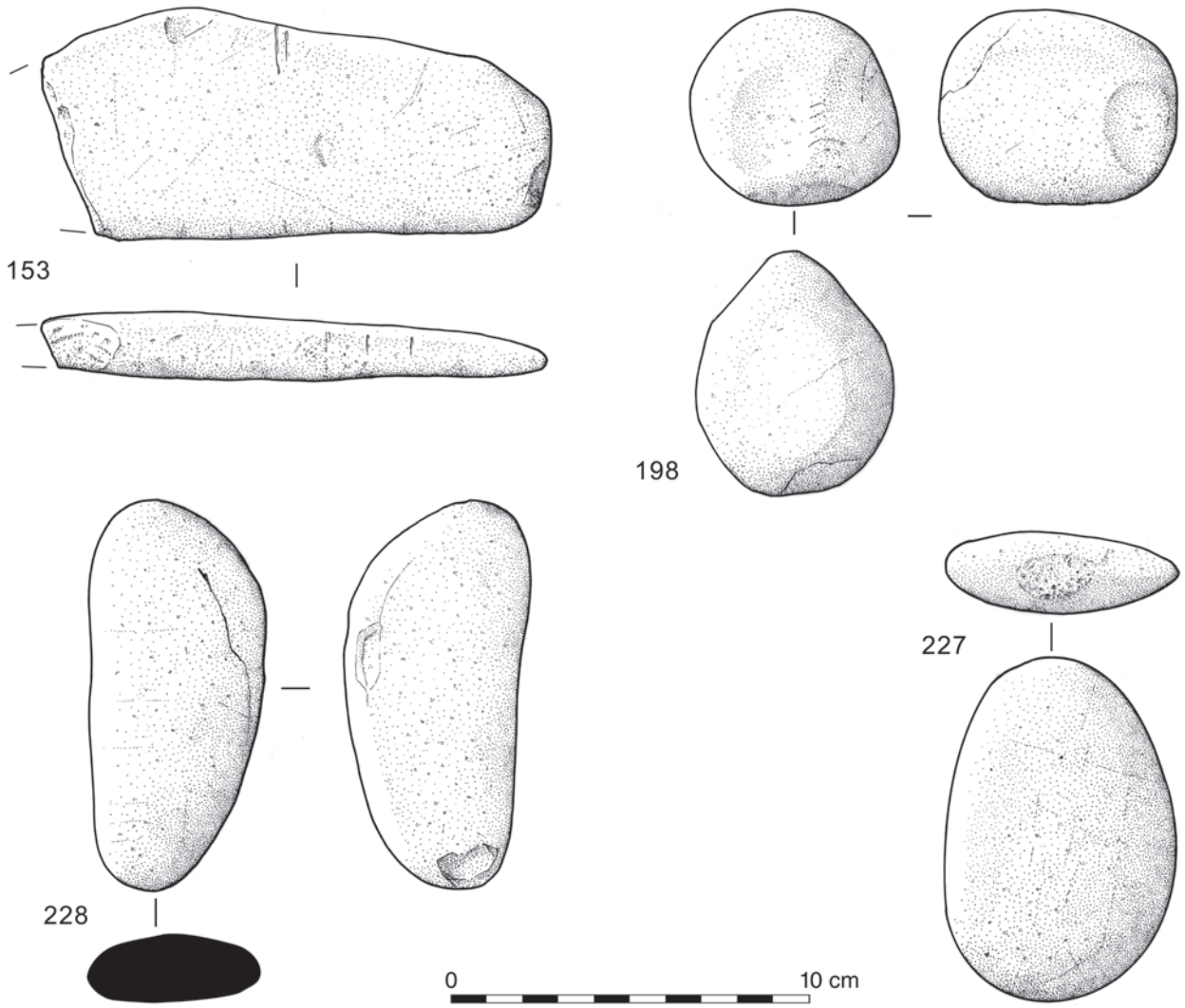


Figure 7.14
Cobble tools from Knowes. Scale 1:2 (Mark Hoyle)

Knowes (Figures 7.13–7.14)

A group of 11 utilised stones or cobble tools was recovered, together with an unfinished stone whorl and a small stone ball. The cobbles had been utilised as hones, pounders, and polishers or rubbers; some were evidently multi-purpose tools. This type of assemblage is not unusual for later pre-Roman or Roman Iron Age sites in the region, as discussed below.

- *sf 147 [124, silt within CS2]*

  Stone whorl. Flat piece of fine-grained red sandstone (Carboniferous or Devonian) shaped into a square with rounded corners, with a central perforation pecked from both sides (D max 9, min 3mm). One face bears an incised arc, which may be a marking out line for an unfinished circular whorl about 30mm in diameter. This method of manufacture finds close parallel in other perforated stone items, such as lignite bangles and beads. Dimensions 47 × 49, T 11mm.

- *sf 57 [122, silty sand in scoop F232]*

  Stone ball. Small spherical ball of fine to medium-grained sandstone/greywacke (probably from a

sand-rich layer within the greywacke sequence). No obvious facets. D 30mm.

- *sf 33 [109, silty sand over scoop F284]*

  Elongated pebble with one naturally wedge-shaped end, broken at opposite end. Fine- grained greywacke. One face is smooth and has a waxy patina suggestive of use as a hide-rubber, and there are possible sharpening grooves on the edges close to the broken end. L 110, W 28, T 28mm.

- *sf 144 [104, silty sand over CS2]*

  Flat, trapezoidal block of fine grained greywacke, broken at the narrower end. The two long, flat sides are worn very smooth. There is a definite angle along one long edge indicating where the side has been flattened, probably by ice or water transport. Used as a whetstone? L 154, W 68 tapering to 49, T 37mm.

- *sf 153 [124, silt within CS2]*

  Flat, elongated pebble, broken at one end. Greywacke. The flat faces are very smooth and have some worn areas. The edges have sharpening grooves. Probably saw very limited use as a whetstone. L 143, W 59, T 22mm.

- *sf 198 [at edge of paving F159, CS1]*

  Reddish quartzite cobble, with several areas of high gloss polish. It has been suggested that such high gloss polish is a residue deriving from the working of organic substances such as leather or plant fibres. A point has been knocked off at one end and subsequently smoothed through use. L 67, W 56, T 53mm.

- *sf 227 [335, pit F334]*

  Flat, sub-oval pebble with extremely smooth upper and lower faces. Greywacke. On the narrower end and part of the circumference are small roughened/pecked areas indicating use for pounding. L 92, W 59, T 25mm.

- *sf 228 [335, pit F334]*

  Flat, elongated pebble with particularly smooth, slightly hollowed area along the flat edge. Colour and shape typical of greywacke, but object is so covered in patina/polish that no fresh surface is visible. The upper face is smooth, possibly also the lower face, which is covered by a brownish ?ferruginous deposit which might relate to use. Polisher. L 107, W 48, T 20mm.

- *sf 127 [106, silty sand west of scoop F232] (not illus)*

  Large ovoid cobble with small areas at each end and intermittently along the sides roughened/pecked by light use as a pounder. Fine-grained sandstone, as sf 194. L 120, W 80, T 70mm.

- *sf 199 [252, pit F251] (not illus)*

  Flake from a large greywacke cobble. One area is very smooth and slightly hollowed, from use as a whetstone. Deposit of rusty brown material. L 132, W 42, T 20mm.

- *sf 194 [241, bedding for paving F166] (not illus)*

  Large ovoid cobble with a few peck marks at the ends. Sandstone. Uncertain whether these are purely natural, or indicate half-hearted use as a pounder. The flat faces appear completely natural and simply water worn. L 168, W 82, T 60mm.

CHIPPED STONE

JASON MOLE

Small groups of chipped flint, chert and quartz artefacts were recovered at Standingstone and Knowes. The flint was probably obtained locally in pebble form from boulder-clay deposits or riverine environments, or perhaps from the nearby coast. Chert is found in numerous locations around Lothian and the Borders (Wickham-Jones and Collins 1978). Quartz can be identified throughout Scotland in both vein and pebble form and is becoming recognised as a commonly utilised material throughout the country (Saville 1994).

Standingstone

Seven flakes and flake fragments were recovered; five flint, one chert, and one quartz. The pieces were categorised following Andrefsky (1998). One of the pieces of flake shatter was proximal, the other two medial. While four whole flakes were identified, the presence of cortex indicated only two secondary flakes and no primary thinning flakes. The primary stages of cortex removal are not represented. The flakes showed variation in size and shape, as well as in the production methods utilised, with both hard and soft hammer percussive techniques, and pressure flaking.

One fragment showed some evidence for platform preparation in the form of trimming. Four of the pieces came from pit F56, two flint, one chert, and one quartz, including a blade fragment.

- *sf 11 [21, pit F56]*

  Medial blade fragment, white chert. Broken obliquely at proximal end, transversally at distal end. Pronounced bulb indicates the use of a hard hammer percussion technique. The size and shape of the piece would normally indicate a late Mesolithic or early Neolithic date, but the associated radiocarbon dates and pottery from the pit are later Neolithic. L 17mm, W 12, T 3.4mm.

Knowes

Three pieces were recovered, a thumbnail scraper, a medial fragment of a thinning flake, both of brown flint, and a yellow quartz core.

- *sf 244 [unstratified]*

  Thumbnail scraper, brown flint. Sub-oval flake, termination type unknown due to retouching at its base. The striking platform is small and flat, showing very little sign of preparation, with a single striking facet. The dorsal side has a small amount of cortex on its right margin (less than 30%). The ventral side is retouched for approximately 40% of its circumference, from the left margin around to its distal end, to a depth of around 7mm. Thumbnail scrapers are most commonly Early Bronze Age (Edmonds 1995). L 25mm, W 22mm, T 8.84mm

- *sf 134 [186, dark silt within CS1]*

  A multi-directional yellow quartz core with six striking faces, most likely citrine. Not diagnostic of period. Maximum L 44mm, W 33mm, T 33mm.

ROMANO-BRITISH GLASS BANGLES FROM KNOWES

Fragments of four glass bangles were recovered, three in pale blue-green glass with central applied trails, the fourth in opaque white glass (Figure 7.15; Plate 6). The bangles were examined by Jennifer Price. The decorated bangles are of Kilbride-Jones Type 2, and find ready parallels on sites in Yorkshire, northern England and southern Scotland. They are essentially of Flavian date, being notably absent from Hadrian's Wall or Antonine period sites. All three bangles are of relatively small diameter (examples from contemporary southern sites such as Usk and Gloucester are frequently rather larger). It is unusual to find such a large fragment as sf 18, which represents very nearly half of the bangle. Opaque white bangles – of which sf 121 is a substantial example – are less

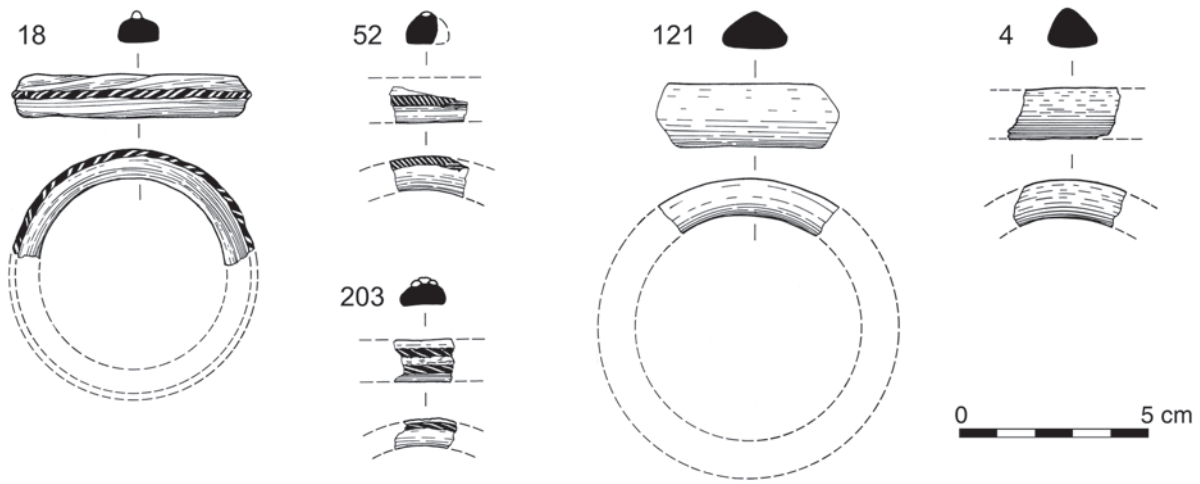


Figure 7.15
Glass bangles from Knowes and shale bracelet (sf 4) from Foster Law. Scale 1:2 (Christina Unwin)

easy to date precisely, occurring from the later first to early second centuries AD. In addition to the bangles, a single tiny flake of yellow-green glass was recovered; it was too small to discern whether from vessel, object or window, but the colour would suggest a slightly later Roman date.

- *sf 18 [104, silty sand over CS2]*

  Half of a bangle in blue-green glass, with a central applied trail of dark blue and opaque white glass twisted clockwise (2 strands white). The trail stands proud of the surface of the bangle. D-shaped section W 12mm × H 8mm; int D 52mm, ext 60mm; 45% of circumference.

- *sf 52 [123, above paving F152 at northern ditch terminal]*

  Small fragment of bangle in pale blue-green glass, with central applied trail of twisted white and brown glass, which has been marvered into the surface of the bangle, standing only slightly proud. D-shaped section W >9mm × H 7.5mm; L 19mm; int D *c.* 60mm; 8% of circumference.

- *sf 203 [197, deposit over floor of CS2]*

  Small fragment of bangle in pale blue-green glass with central decoration consisting of three closely set applied trails which stand only slightly proud of the surface: two dark blue trails twisted loosely clockwise flank a yellow-brown trail which has largely flaked off but was probably also twisted. D-shaped section W 11mm, H 7mm; L 17mm; estimated int D *c.* 60mm; 8% of circumference.

- *sf 121 [179, surface of western ditch F103]*

  Opaque white bangle fragment. Triangular cross-section 17 × 10mm; L 48mm; int D 60mm, ext D 80mm; 22% of circumference.

- *sf 55 [124, silt within CS2] (not illus)*

  Tiny fragment of yellow-green glass. Probably later Roman. 8 × 4 × 1.5mm.

SHALE AND AMBER

Foster Law

- *sf 4 [4, stony spread over ditches] (Figure 7.15)*

  Fragment of 'shale' bracelet, sub-triangular in section, the inner surface flat with circumferential abrasion scars, the outer polished to a low lustre and showing ?post-depositional wear. The material shows a conchoidal fracture and some laminar cracks, suggesting it is a canneloid shale. L 32, internal D 55–60mm (17% survives), section 13.5 × 10.5mm.

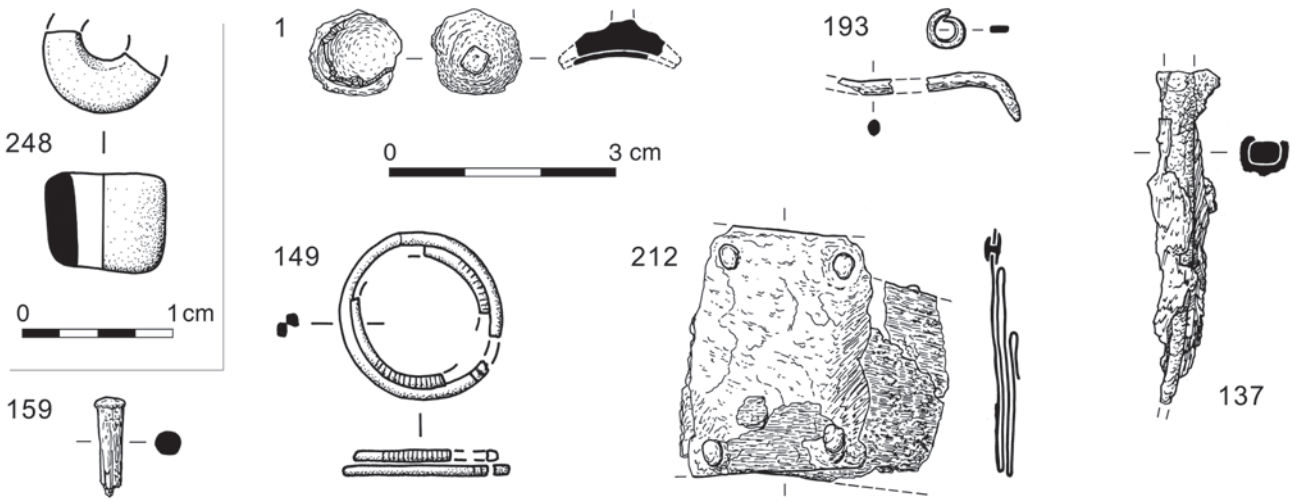


Figure 7.16
Amber bead from Knowes (sf 248). Scale 2:1. Metal objects: stud from Whittinghame (sf 1); copper alloy and iron from Knowes. All scale 1:1 (Christina Unwin and Alan Braby)

Knowes

- *sf 248 [10, western ditch F103] (Figure 7.16)*

  Part of a small amber bead with a weathered surface was recovered from a soil sample from the 2002 trial excavation. The bead is a slightly tapering cylinder, with the top surface at a slight angle. Roughly one third of the circumference survives. H 6.5mm, est D 9mm, T 2.5–3mm; D of perforation tapers from 2.5–5mm.

Amber is unusual in the Scottish Iron Age; a listing is provided in Hunter (1998a), where the significance is discussed.[1] It was clearly an exotic material of restricted availability, and is likely to have been of some social importance.

COPPER ALLOY AND IRON OBJECTS

FRASER HUNTER, JENNY JONES and PAMELA LOWTHER

Whittingehame (Figure 7.16)

- *sf 1 [39, L-shaped setting by SS1]*

  Circular dished copper alloy stud, its margins lost, with the stub of a square-sectioned tang centrally on the reverse. The dished front holds opaque deep blue enamel. Probably a decorative mount; the tang's square section indicates it is not a pin, and its central location would be unusual for a button-and-loop fastener. There is a related mount (in red) from Torwoodlee broch, although with a separate rivet rather than an integral fastener (MacGregor 1976, no 176); their detailed function is uncertain. D 10.5 × 12mm, max T 5.5mm, shank W 3mm.

Knowes (Figure 7.16)

- *sf 193 [213, gully F212 in scoop F232]*

  Copper alloy fragments: (a) Two non-joining pieces of curved wire of circular section, 2.5mm in diameter (L 7 and 12mm). One piece preserves a blunt tip. (b) Small penannular loop or coil, broken off a larger object, D *c.* 4.5 × 6mm, made from a piece of flattened wire 2.5mm wide and 1.5mm thick. Surface EDXRF analysis showed the wire to be either tinned leaded brass, or a quaternary alloy; and the loop to be leaded bronze, possibly tinned. The smaller piece of wire was found passing through the small loop, although this may be coincidental. The EDXRF analysis implies two separate items, although these may have formed parts of one object.

- *sf 149 [124, silt within CS2]*

  Spiral finger ring, in five non-joining fragments. Circular or oval-sectioned rod, the surviving terminal blunt, with two incised lines (absent on the inside) defining a collar. The external surface is decorated with transverse ribbing on the central turn – it is absent on the initial turn. Original extent unknown; external D *c.* 22mm, rod D 2 × 1.5mm. Surface EDXRF analysis detected copper, tin, lead and zinc, probably representing a leaded gunmetal. Rilled decoration of this type is fairly common on spiral rings (e.g. Taylor 1982, 229, fig. 6 no 27; Hunter 2001b, fig. 4.3).

- *sf 184 [161, possible hearth deposit, CS1] (not illus)*

  Fragment of copper alloy ring. Oval-sectioned wire, D 2.5mm, surviving L 19mm. Original D *c.* 25mm. Surface EDXRF indicates bronze with a very high level of tin.

- *sf 159 [104, silty sand over CS2]*

  Fragment of small copper alloy rivet or rivet-headed tack. The head is slightly expanded and domed (D 4mm); the broken shank is 3mm in diameter. EDXRF indicated a leaded bronze with a high level of tin and a small amount of silver (~ 1%). L 13mm.

- *sf 212 [124, silt within CS2]*

  Package of several pieces of sheet copper alloy fragments folded together and bent. Four pieces appear to be present. The top piece is a complete square patch with a solid rivet in each corner, still retaining fragments of sheet. Behind are three further thin sheets of copper alloy, probably adhering by corrosion alone. Some pieces have areas of dark surface, and some of the edges may be original,

[1] The following should be added to this list: Dun Bharabhat, Lewis (Harding and Dixon 2000, 28–9); Buittle, Kirkcudbrightshire (Wilson 2001, 96–7); Dun Ardtreck, Skye (MacKie 2000a, ill 24:39); Covesea, Moray (Benton 1931, 198–9, fig. 19:1–7); Birnie, Moray (*DES* 2006, 109); Dun Vulan, South Uist (Parker Pearson and Sharples 1999, 88); Underhoull, Unst (Small 1966, fig. 9).

possibly clipped. There are traces of a discontinuous thinner dark layer or plating. Surface EDXRF analysis showed the alloy to be bronze; the outer dark coloured surface did not show higher levels of tin. The top layer is evidently a patch, perhaps from a copper alloy vessel, but the current configuration of the pieces suggests that they are scrap. Dimensions 32 × 34.5mm, max T 4mm, patch 32 × 26mm.

- *sf 202 [197, deposit over floor of CS2] (not illus)*

  Tiny fragment of copper alloy sheet and a small tack which passes through another fragment of sheet. The tack has a circular, slightly domed head; the shank is complete but bent. The space (*c.* 3mm) between the head of the tack and the 'clenched' end indicates that it was attached to an organic item. One rounded edge of the sheet appears to be original. Patch or decorative panel. Both sheet and tack are unleaded bronze.

- *sf 242 [179, surface of western ditch F103] (not illus)*

  Sixteen tiny fragments of very thin sheet (T 0.25–0.5mm). One piece retains an original, curved edge, folded round the edge of another sheet. The fragments retain traces of impressed decoration, but could not be joined; one clearly shows a dot with two raised rings, another may have curvilinear repoussé (too small for EDXRF analysis).

- *sf 137 [124, silt within CS2]*

  Iron nail, bent slightly towards the point. Intact; head only slightly expanded. Traces of mineralised wood (not identifiable) on the surface. L 44mm, head 8 × 5mm, shank 5 × 5mm.

THE FINDS ASSEMBLAGES IN THEIR REGIONAL CONTEXT

FRASER HUNTER

The great value of the TLEP finds is that they provide a series of assemblages recovered by a consistent methodology and, for the three larger sites, excavated at a similar scale. While this does not of course eliminate taphonomic differences (in, for instance, intensity of plough damage, nature of subsoil, etc.), it does mean that similarities and differences between the sites are more reliable than is often the case. The aim of this section is threefold: firstly, to tease out the stories behind the more unusual finds; secondly, to characterise and compare the assemblages as a whole; and finally, to put them into their local context, assessing what they can tell us about the later prehistoric societies of East Lothian.

Notable finds

The specialist reports have discussed the material in detail, with largely prosaic finds dominating the picture. A few aspects are worthy of particular comment. The querns from Knowes are a notable assemblage, due in particular to their patterns of deposition. Not only is there a considerable quantity, but the occurrence of a matched upper and lower pair, and of multiple fragments from the one quern, is unusual. Unfortunately, Scottish querns have not yet received the detailed treatment now available for areas of northern England (Heslop 2008), a work which sets the standard in the field, but the Knowes finds provide intriguing pointers to the significance of quern deposition in the region. The intact upper stone seemed to have been laid flat in the hollow of the infilled western ditch, and it is interesting that the lower stone of the matched pair should have been found at precisely the opposite side of the circuit, just north of the entrance.

There is otherwise little in the deposition to indicate anything apart from rubbish disposal at any of the TLEP sites. Two possible exceptions, again from Knowes, are the smashing and scattering of the Roman flagon, which Heslop *et al*. link to the smashed quern from the same structure as a potential feasting-related event; and the rim of the coarseware vessel set in the surface of the southern ditch terminal.

Two other aspects of the finds are worthy of broader comment. One is the issue of decorative metalwork. Both Whittingehame and Knowes produced such items; an enamelled stud from the former, a spiral finger ring and decorated sheet object from the latter. While spiral finger rings are a fairly common find (Clarke 1971, fig. 3), other decorative metalwork is always rare, and its discovery from these two sites is noteworthy. The decorated sheet fragments are particularly interesting, as such items suffer much more than cast ones because of their fragility. Our picture of the sheet products of the Iron Age is partial in the extreme, and while the Knowes fragments offer only tantalising hints, their indications of curvilinear repoussé decoration are further evidence that decorated sheet metalwork was more common than surviving finds would indicate.

The second issue develops this decorative theme. Decorated items are conspicuous by their absence on Iron Age sites, but both Whittingehame and Knowes provide what is, in local terms, quite a broad spectrum of ornament: as well as metalwork, both produced decorated stones, and Knowes also had glass bangles. Decorated stones are unusual, and the two examples raise rather different issues. From Knowes comes sf 223, a knocking stone made from a re-used piece of late Neolithic rock art bearing multiple cupmarks. This is interesting from a number of viewpoints. Early prehistoric rock art is rare in East Lothian compared to other parts of Scotland, and this is a valuable addition to the corpus. More pertinent here is the implication that this stone was deliberately sought out for re-use; it is unlikely to have been accidental or unnoticed, and such creative referencing or re-use of antique items is increasingly recognised in the Iron Age. It is seen, for instance, in the later collection and deposition of Bronze Age finds, most strikingly in the Salisbury hoard (Stead 1998, 118–24), but is also marked by the collection of Neolithic axeheads (well-illustrated by the example from Hyndford crannog; Munro 1899, 379–80), and by Iron Age re-use of older monuments (Hingley 1996). In the specific case of rock art, examples are known from a number of souterrains (Hingley 1992, 29), and it seems there was a clear perception of such finds as significant. The Knowes stone helps build this case for the perceived power of such antiques, whatever meanings they were imbued with. It is worth noting that the cup-marked motif is found on a small number of undeniably Iron Age artefacts in East Lothian, specifically four querns from Traprain, Broxmouth and Phantassie (McLaren and Hunter in prep). It is tempting to suggest that a local Iron Age tradition of cup-decoration emerged from instances exactly like the current one, with creative re-use of much older motifs.

This creative re-use of earlier art is arguably seen also on Traprain Law, with the linear rock carvings overlying earlier cup-and-rings (Edwards 1935). This leads us to the other intriguing decorated stone: slab sf 15 from Whittingehame with incised linear ornament. As discussed above, such ornament is extremely unusual, but a few related pieces are known. Decorated stone is generally rare in the Scottish Iron Age, and in the few instances known it is almost always on functional objects, such as whorls, querns and, very occasionally, lamps; ornaments tend to rely on the inherent qualities of the stone for decorative properties, although there are occasional bangles with carved decoration (MacGregor 1976, nos 279, 334; Jackson 2005, ill 24; McLaren and Hunter in prep; Mann 1925, pl 37). In the present instance, its role is unclear, although it does not fit the normal canons of either earlier prehistoric rock art or Early Historic sculpture and may reasonably be claimed as a later prehistoric specimen (its context, in the surface of the main ditch, does not help greatly). It is a valuable reminder of the range of material, which bore decoration in later prehistory beyond the more familiar metalwork.

The TLEP assemblages

It is important not simply to cherry-pick a few choice finds for discussion; interesting patterns emerge if we consider the assemblages as a whole. Table 7.1 summarises the assemblages from the five sites that produced material, there being no finds from East Linton, occupied in both the Later Bronze Age and the Later Iron Age. The three main excavations, Knowes, Standingstone, and Whittingehame, will be the focus of further discussion.

A number of points are immediately apparent. One is the striking differences between the three major sites, both in terms of quantity and range of finds. Knowes has by far the biggest assemblage on both measures (although the range is restricted compared to sites such as St Germains; Alexander and Watkins 1998); however, while Whittingehame and Standingstone are similar in size, the former shows a broader spectrum of finds. This is largely attributable to a single complex of features at Whittingehame: the scoop structures and associated features of Roman Iron Age date. Whittingehame is an amalgamation of two assemblages, one of Late Bronze Age/Earlier Iron Age character, the other of Late/Roman Iron Age character, which produced the two striking finds from the site, the Roman pot and the decorated stud. This difference has been discussed in outline elsewhere (Hunter 2007a, 84–5), and mirrors patterns noted for southern Britain: the Earlier Iron Age is dominated by a prosaic material culture until the last couple of centuries BC, when a much broader range of ornamental and personal equipment comes into use, a phenomenon plausibly connected with individuals becoming increasingly concerned with issues of status and social identity (Hill 1995). The TLEP results would confirm this, with the essentially prosaic assemblages of Standingstone and Foster Law contrasting with the notably broader range of finds from Late Iron Age–early Roman Iron Age Knowes

Table 7.1
Summary of the finds assemblages from TLEP sites (East Linton produced no finds)

	Whittingehame (TWT)	*Standingstone (TST)*	*Knowes (TKN)*	*Foster Law (TFL)*	*East Bearford (TEB)*
Prehistoric pot (no of vessels)	5	12 (some Neolithic)	46	11	1
Roman pot	1 samian bowl		1 samian platter 1 coarseware flagon		
Glass			4 bangles 1 ?late Roman sherd		
Copper alloy	1 enamelled stud		3 ornaments 4 fittings/fragments 1 part-worked		
Iron			1 nail		
Struck lithics		11 (some in Neolithic pit)	4		
Querns	1 saddle quern		6 rotary querns		
Cobble tools	5	6	9		
Other stone items	2 (decorated slab; ?anvil)		2 ornament/leisure (amber bead, ball) 4 ?knocking stones (1 reused rock art) 1 whorl (unfinished)	1 shale bangle	
Total (small finds + indigenous vessels)	10 + 5v	6 + 12v	38 + 46v	1 + 11v	0 + 1v
Range	6	3	9	2	1

and the Roman–early post-Roman occupation at Whittingehame. The difference is made clear if key elements of the assemblages are drawn out; the evidence for imports and other status or unusual items, and for the activities taking place on the site (Table 7.2).

Typically, the activities represented are everyday tasks such as preparing, storing and consuming food, or preparing hides; other, equally everyday tasks such as textile manufacture or making stone tools are only intermittently represented, emphasising the partial nature of our assemblages. One of the recurring problems is our inability to determine what many tools were used for, notably coarse stone tools (Haselgrove *et al.* 2001, 21). These are an unfamiliar material for modern observers, carrying out unfamiliar functions, and they remain one of the great, untapped resources of the period. Wear patterns may be classified into broad groups (following the methodology from Howe; Ballin Smith 1994, 196–202); while this does not in itself necessarily define functional categories, it provides at least an avenue into the issue. The cobble tool assemblages here are really too small for reliable patterns, and the data collated in Table 7.3 show only hints of trends. The greater incidence of whetting and sharpening stones at Knowes may be a factor of its date, with a greater availability of iron later in the period; in support of this, at Whittingehame both whetstones are from the later phase. It is worth noting that both multi-function tools from Knowes had been used as sharpening stones, while on the other sites rubbing or polishing is the linking factor.

Pounding and grinding tools would be essential for a range of tasks, such as crushing barley or preparing

Table 7.2
Key features of the material culture of the three main sites

	TWT	*TST*	*TKN*
Imports	Roman pot		Roman pot Roman glass Amber
Status items	Enamelled stud		Decorative metalwork Glass bangles
Unusual items	Decorated stone		Reused rock art
Crafts & processes	Food Hides	Food Hides	Food Hides Stone Textiles Sheet Cu alloy

clay for pottery, while the incidence of rubbing tools is most likely linked to hide-working (diagnostic quern-rubbers are excluded from this category for analysis). One further tentative pattern may be noted: there is some variety in the incidence of multi-function tools, with Standingstone having a notably higher percentage. However, it would be unwise to place too much weight on such small assemblages; these are ideas to be tested in further, larger assemblages, and are developed a little further below, in considering the wider East Lothian evidence.

A final area to comment on is copper alloy use. The bulk of the Knowes finds were analysed, and are notable for the scarcity of zinc (detected only in sf 149 and sf 193). This contrasts with Dungworth's results from Traprain (1995, 221 and Appendix 5), where rather mixed quaternary alloys dominated his sample, representing recycling of Roman material. It suggests either variation in alloy use on different sites or a chronological difference, with the copper alloys from Knowes predominantly representing pre-Roman material; if so, this is not evident in the stratigraphy, since apart from sf 193 from the base of the main scoop, all the metal was from late contexts. Little comparable analytical work has yet been done in southern Scotland, since Dungworth only sampled a few sites; these results hint at a complexity within the broad trends he noted, with the possibility of different sites showing different patterns of alloy use.

The TLEP assemblages in their lowland Scottish context

There has been little attempt to characterise broad assemblage patterns and their variability in the Scottish Iron Age, although MacKie (2000b) has renewed effort in this direction with his study of northern mainland sites. Too often, the assemblages are dismissed as poverty-stricken and undiagnostic (e.g. Harding 2004, 81), but this arises largely from the lack of sustained material culture studies; the contrast with the evidence of decorative metalwork from hoards in the area should warn us that the 'poverty' is a misleading impression. Some years ago the author assessed a sample of lowland Scottish sites for the 'Circular Arguments' conference; the proceedings never emerged, but the chance is taken here to update and present aspects relevant to the current project. The sample comprises all lowland Iron Age sites (defined as the Tyne-Forth, Solway-Clyde and North-East provinces of Piggott's (1966) scheme) published in *PSAS* in the period 1945–2006, along with a selection of monographs. Each assemblage was assessed for the range of material and functional types represented. The aim is to create a robust system capable of yielding basic patterns that could then be tackled by more detailed analysis. It can be used either quantitatively or qualitatively, on a presence/

Table 7.3
Cobble tool functions at the TLEP sites. For multi-function tools, each function is recorded individually; thus TST has 6 tools but 10 functions, as three of the tools were multi-function. These latter are recorded in the form p/r, where the first letter of the function (as in the left column) acts as a code for their use.

	TWT (n = 5)	*TST (n = 6)*	*TKN (n = 9)*
Hammer		1	
Pound	1	1	3
Grind		3	
Rub/polish	3	4	3
Whet	2	1	3
Sharpen			2
Combinations	1 (p/r)	3 (g/r; h/g/r; p/r)	2 (r/s; w/s)
No of functions	6	10	11

Table 7.4
Occurrence of materials on a sample of 60 lowland Iron Age sites, and all 32 excavated East Lothian sites (on presence/absence basis; see Table 7.6 for East Lothian sites).

Material	*% of sites lowland Scotland (n = 60)*	*% of sites East Lothian (n = 32)*
Stone	85	78
Pot	77	84
Iron	47	25
Glass	45	28
Copper alloy	43	44
Other ceramic	18	22
Bone	15	50
Other non-ferrous	10	9

absence basis, where the data are poor (e.g. from older excavations). This allows us to move beyond the single site and consider the wider picture. It is, of course, only a sample, but it provides an initial step towards broader understandings of the nature of Iron Age assemblages in the area; further work will doubtless tease out diachronic patterning. To augment this, all known excavated assemblages from East Lothian were collected and analysed in a similar way to present the regional picture.

Turning first to the broad character of the assemblages, a number of points emerge (Table 7.4). Although the area is often dismissed as virtually aceramic, the vast majority of sites in the sample (77%) produce some hand-made pottery, rising to 84% for East Lothian; this compares well with north-east England (Willis 1999, 85). Unsurprisingly, stone is the most common small find, but almost 50% of sites produce copper alloy, iron or glass artefacts. Individual sites may appear impoverished, but cumulatively there is a useful body of data which merits further attention. East Lothian broadly follows wider trends, but with markedly more sites producing worked bone. The under-representation of iron and glass is difficult to explain, although the former may arise from the selective retention policies of antiquarian excavations.

Table 7.5
Functional analysis of activities represented by artefacts on lowland Scottish and East Lothian sites (expressed as the percentage of sites with evidence of the activity).

Activity	*% of sites with evidence lowland Scotland*	*% of sites with evidence East Lothian*
FOOD		
Preparation & eating	78	84
Agriculture	7	9
Hunting &c	2	0
DOMESTIC		
Fixtures and fittings	37	16
MANUFACTURE		
Skins	20	38
Textiles	30	38
Wood	7	3
Bone &c	7	41
Everyday stone	15	16
Stone ornaments	15	28
Iron-working	23	28
Non-ferrous	23	25
OTHER		
Transport	7	9
Weapons	7	6
Ornaments &c	58	56
Games and leisure	28	34
STATUS		
Exotica	12	31
Roman	40	47

When attempting a functional analysis (Table 7.5), taphonomic and research biases are immediately clear. Very few sites produce evidence for such core activities as agriculture or skin preparation in the finds record: this is largely due to issues of deposition and survival, with agricultural items being repaired and recycled rather than deposited, while the bone tools commonly used in skin-working rarely survive. The other major problem is the difficulty in ascribing function to cobble

tools, as discussed above. In the case of East Lothian, the higher percentage of skin working (for instance) is due both to the greater presence of bone tools, and the re-examination of cobble tools to identify likely hide-rubbers.

We are on firmer ground with processes where the residues are primarily inorganic, and thus should survive; it is instructive that under a quarter of lowland sites produce evidence of copper alloy or iron working, supporting models of specialisation in metalworking in this area (although with the caveat that iron slag was often ignored in reports until recently). The high proportion of sites with Roman artefacts (40%) questions simple views of Roman finds as status indicators – and this figure is an underestimate, as the sample includes sites which pre- and post-date the Roman Iron Age. It seems Roman finds were quite widely available in the lowlands, and we need to move beyond simple presence/absence indicators to more detailed analysis, since it is clear that the inhabitants of some sites had preferential access to a wide range of Roman material (see Hunter 2001a); this is considered for East Lothian below.

If we remove Roman finds from the picture, are there other indicators of differences between sites? Most produce a very similar range of material, suggesting a similar range of essentially everyday activities: artefact-rich sites like the lowland brochs of Hurly Hawkin and Fairy Knowe serve mainly to illuminate a wider spectrum of everyday objects than normally survive, such as iron tools. There *are* some potential indicators of status differentiation, but these are relatively subtle. The presence of metalworking appears to be of significance, and exotica (such as amber or La Tène brooches) are also restricted. Decorative metalwork is also quite exclusive, although its occurrence is highly dependent on varying depositional practices (Hunter 1997). The difficulty is that with such small quantities of finds, their presence or absence on any individual site is of little significance unless the assemblage is large; only the wider picture reveals trends. However, in this broader lowland Scottish perspective, these markers do indicate that a small number of sites can be differentiated on the basis of access to exotica or status items; this seems to be largely a Late Iron Age phenomenon, and will be discussed below for the East Lothian situation.

This analysis has been a provisional one, to test out the approach; the results are of interest, in starting to move beyond the rather dismissive treatment of Lowland assemblages which has prevailed (e.g. Harding 2004, 81–2), and point to avenues for further research. For the moment, however, the focus must turn to East Lothian.

The material culture of the East Lothian Iron Age

We can develop these ideas in the specific case of East Lothian, comparing the TLEP finds with all other excavated assemblages known in the region. Two key questions are whether this can cast light on similarities and differences between sites (and thus potentially on social relations, as explored by Macinnes 1984, 189–97), and the relationship between Traprain Law and its surrounds, a topic of prime interest in understanding this great hill and its role.

Of 35 examined sites, 34 produced artefact assemblages; 30 from excavation or recovery from erosion surfaces, four from stray finds or metal-detecting (Table 7.6). In several cases, the publication has insufficient treatment of the finds to allow full study (sadly this is as true of the recent A1 excavations (Lelong and MacGregor 2007) as it is of nineteenth-century work), but for 29 sites it was possible to examine the material first hand (for the large assemblages of Broxmouth and Traprain, this was an indicative assessment rather than the more detailed identifications carried out for other sites). With the exception of these sites, the assemblages are generally small: only Traprain, Broxmouth and Dryburn have more than 50 small finds (excluding pottery), and almost half the sites have fewer than 10 small finds. Given these small quantities, analysis has generally been done on a presence/absence basis.

Table 7.6 summarises the key elements of the assemblages, with Table 7.5 providing a functional analysis. A number of features are worth further discussion: specific finds groups, notably stone tools; the nature of production evidence; patterns in the availability of imports; and finally, what light this throws on social structures and interactions.

Stone tools

As one of the commonest find types, stone tools merit more attention than they often receive. The East Lothian assemblages are dominated by querns (from 17 sites), cobble tools (16 sites), whetstones (12) and stone balls (10). Ornaments (especially of shale) and shale-working are found on nine sites and mortars or similar items on eight, with other categories rather rarer. The quantities on any one site are rarely substantial, although some are notably more productive than

Table 7.6

Summary of assemblages from excavated East Lothian Iron Age sites. Those not examined first-hand are marked with an asterisk. The East Linton site excavated as part of TLEP produced no finds; it is included in the calculations in Tables 7.4–7.5. Some of the sites recorded in Table 7.9 as producing Roman finds are not recorded here, as they are only single stray finds with little more information.

Abbreviations: m/f = manufacture; CuA = copper alloy. Scale of excavation coding: 0 = casual finds; 1 = trial; 2 = moderate; 3 = large-scale. Quern coding: r = rotary, s = saddle.

	Site type	*Exotic/ unusual*	*Decorated items*	*Roman*	*Gaming*	*Bone &c m/f*	*Iron m/f*	*Shale m/f*	*Stone m/f*	*Textile m/f*	*CuA m/f*	*Ornaments*	*Quern*	*Scale of dig*	*Reference*
Aberlady	open			2										0	*DES* 1999, 27
Archerfield 1	cave	spear		2		x				x		bone, glass	r	3	Cree 1909
Archerfield 2	cave			1		x								3	Cree 1909
Biel Water	enc				x									1	Lelong & MacGregor 2007
Broxmouth	hillfort	coral	dec. horse harness (Celtic art)	2	x	x	smelt/ ?smith	x	x	x	x	bone, CuA, glass, shale	r s	3	NMS data
Castle Park Dunbar★	prom fort		gold wire	1	x							bone, shale	r	3	Perry 2000
Craig's Quarry, Dirleton	hillfort		La Tène brooch	2	x	x		x		x	x	CuA	r	2	Piggott 1952, 1958
Dryburn	enclosure			2		x	smelt/ smith	x		x		shale	s	3	Dunwell 2007
Eweford	enclosure						smith						r	1	Lelong & MacGregor 2007
Fishers Road East★	enclosure				x	x	smith			x	x	glass	s	3	Haselgrove & McCullagh 2000
Fishers Road West★	enclosure			1		x	smith			x			r	3	Haselgrove & McCullagh 2000
Ghegan Rock	open/odd?		dec. comb (Celtic art)	1	x	x		x				bone	r	3	Laidlaw 1870
Gilmerton House	enclosure			3				x					r	0	NMS data
Harperdean	open/ enclosed			2								glass		1	*DES* 1995, 51; Appendix 1
Long Yester	enclosure	amber						x		x		stone		0	NMS data
Muirfield, Gullane	open			1				x	x	x	x	glass, shale, stone		2	Younger 1936

Table 7.6 (continued)

	Site type	*Exotic/ unusual*	*Decorated items*	*Roman*	*Gaming*	*Bone & m/f*	*Iron m/f*	*Shale m/f*	*Stone m/f*	*Textile m/f*	*CuA m/f*	*Ornaments*	*Quern*	*Scale of dig*	*Reference*
N Berwick Law	hillfort				x	x	smith					bone		1	NMS records
Phantassie	open		dec. linch pin	2			smith	x	x	x	x	bone, clay, glass, iron, shale	r	3	Lelong & MacGregor 2007
Pincod, Dunbar	open					x						bone		0	PSAS 44 (1909-10), 102
Prestonpans (Edinburgh Rd)★	enclosure			1									r	1	*DES* 2001, 37
Prestonpans (West Loan)★	enclosure													2	Jones 2006
Rhodes Links, North Berwick	cave		pin									CuA		2	Richardson 1907
St Germains★	enclosure	amber		2	x	x			x	x	x	bone, CuA, glass, stone	r s	3	Alexander & Watkins 1998
Seacliff	cave													2	Sligo 1857
Seacliff 2	cave													1	Sligo 1857
South Belton	open													1	Lelong & MacGregor 2007
Thistly Cross	open													1	Lelong & MacGregor 2007
Traprain	hillfort	amber	horse gear	10	x		?	x	x	x	x	CuA, clay, glass, iron, shale, stone	r s	3	Jobey 1976
TWT	enclosure		enamelled stud	1								CuA	s	3	
TST	enclosure													3	
TKN	enclosure	amber	sheet metal-work	2	x				x	x		CuA, glass, stone	r	3	
TFL	enclosure											shale		1	

others; this seems mostly to relate to the presence of stone structures or surfaces, which often re-used stone tools in their makeup.

It is worth focussing on the various types of cobble tool, as these make up the bulk of the TLEP finds. The small quantities pose a problem for analysis, since it can be shown that with small numbers, the range of stone tools is directly proportional to the quantity of finds (McLaren and Hunter forthcoming). In discussion below, only sites with more than five tools are discussed individually; ten would be more robust, but would exclude most assemblages! Taking all the East Lothian cobble tools together gives 171 tools, representing 208 separate functions (*c.* 20% of tools had multiple uses). Analysis will proceed by counting functions rather than tool numbers (Table 7.7). The most common functions are whetting and rubbing/polishing, followed by pounding and grinding; others are markedly fewer and, in the case of hammering, are consistently linked to secondary uses of the tools, with only one tool primarily intended as a hammerstone; indeed the hammering may be linked to deliberate breakage of tools at the end of their life. (On the definition used here, hammering is a heavy-duty use and pounding a lighter-duty one.)

Teasing patterns from the material is tricky, as the quantities per site are small; a few trends can be noted, but their interpretation is not straightforward. Some sites have a surprising lack of pounders, such as Broxmouth and Phantassie; at the latter, the only tool intended primarily as a pounder was a small, perhaps specialised one, the other two being expedient re-use of other tool types. Two other patterns are clear. Some sites show markedly more multi-function tools, with over a third showing multiple uses (St Germains, Phantassie and Standingstone); the reason is opaque. Another group has a preponderance of whetstones: at Knowes, Whittingehame, Phantassie, Whitekirk and Broxmouth they make up a third or more of the tools. This may reflect greater availability of iron tools on these sites; while the Broxmouth phasing data are not yet available, in all other cases these are Late/Roman Iron Age sites or (in the case of Whittingehame), from the late phase of the site. To this may be added the Archerfield caves; both produced only a single whetstone, suggesting a restricted set of activities was carried on within.

Manufacture

As Table 7.5 indicates, there is manufacturing evidence for skins, textiles and bone/antler in over 40% of sites. With bone, the true figure is much higher, as manufacturing evidence is found on over 90% of those sites with bone preservation, indicating it was an everyday, widespread task. It is likely the same is true for skins and textiles.

Other craft activities are less abundant. The working of shale and related items into jewellery occurs on ten sites (29%); this is markedly less common than in the west of Scotland, where virtually every excavated site has such evidence (Hunter 1998b, 51). This may be connected to the relative local availability of raw materials, which are abundant in west central Scotland but less so in East Lothian. Oil shales are reported as coastal exposures from Port Seton to Dunbar (Gibson 1922, 48–52), and there may be inland exposures in river valleys which are not recorded since they were not commercially viable in recent times. Local informants confirm that such materials can be found on various East Lothian beaches. The manufacturing evidence does not suggest distribution from a few centres, as only one site has finished products but no manufacturing evidence. However, although the production process is relatively simple, there are hints that it may have been restricted, as on current evidence it occurs exclusively on sites with other evidence of manufacturing activities or access to exotic material (below). While bangles and other jewellery of shale and such materials are abundant on Traprain and Broxmouth, it is noteworthy that stray finds are exceedingly sparse – again in contrast to western Scotland – hinting that the use of such jewellery may have been comparatively restricted in the area.

There are clearer signs of specialisation in metal-working, only nine sites producing evidence of iron-working and eight of non-ferrous production. Iron-working evidence is tricky to assess from older excavations, but on current evidence smithing is more frequent than smelting (nine and two sites respectively), as might be anticipated. While by no means monopolised, this does tend to support models of metal production as being rather exclusive.

Imports and status items

Another topic worth considering is the availability of decorated metalwork and related items such as exotic imports. All are fairly exclusive, with amber from four sites, coral from one, and decorative metalwork from seven (plus the related decorated comb from Ghegan Rock; Laidlaw 1870, fig. 3), while Phantassie produced an iron linch pin with decorative inlay (although it was

Table 7.7

Cobble tools on East Lothian sites. Those marked ⋆ have not been examined first-hand. No cobble tools were found at Castle Park Dunbar, Eweford, Ghegan Rock, Pincod, Rhodes Links or Seacliff. (+) The Traprain figures are based on the finds from recent excavations (1996–2006), as these have been recovered and studied systematically.

Site	*hammer*	*pound*	*grind*	*rub/polish*	*whet*	*sharpen*	*combination*	*n tools*	*n functions*	*whet stone ratio*	*functions : tools*
Archerfield 1					1			1	1	1.00	1.0
Archerfield 2					1			1	1	1.00	1.0
Biel Water			1					1	1	0	1.0
Broxmouth	1	1	5	13	13		2	30	33	0.39	1.1
Craig's Quarry			1					1	1	0	1.0
Dryburn Bridge	1	1	6	6	2		3	12	16	0.13	1.3
Fishers Road East⋆		2		2			2	2	4	0	2.0
Fishers Road West⋆			4	1	2			7	7	0.29	1.0
Gilmerton House		3			1			4	4	0.25	1.0
Muirfield		3						3	3	0	1.0
New Mains			1	3	3	2		9	9	0.43	1.0
North Berwick Law	1	1	1				1	2	3	0	1.5
Phantassie	2	3	1	2	5	3	5	9	16	0.38	1.8
St Germains⋆	2	3	4	4	2		4	11	15	0.13	1.4
South Belton					1			1	1	1.00	1.0
Traprain+	2	17	15	12	16	4	10	57	66	0.26	1.2
TKN		3		3	3	2	2	9	11	0.33	1.2
TST	1	1	3	4	1		3	6	10	0.10	1.7
TWT		1		3	2		1	5	6	0.33	1.2
n	10	39	42	53	53	11	33	171	208		

old and worn when deposited). However, it is clear that they are not absolutely rare – they are present on a number of sites, albeit in small quantities. This leads to the question of how such material should be interpreted, which is considered below.

The evidence of manufacturing and 'status' items can also be considered in terms of site type (no detailed discussion of chronological variation can be sustained, beyond the observation that more ornate ornamental items and their manufacture are predominantly Late Iron Age). Table 7.8 divides this evidence by site type, although with caveats; many sites had a complex history, varying in the nature, scale, and presence of enclosing works over their life, and the 'types' are a generalised and shorthand convenience. However, they are retained here on the basis that the enclosure phase

generally remained visible even when out of use, and thus may have impacted on perceptions of the site. Although enclosures dominate the excavated record, they do not monopolise this more unusual material, which is also found on open sites. It is noteworthy that a wide range of enclosed sites is represented, from hilltop enclosures to lowland ones, both square and curvilinear sites, as well as the dominant hillfort of Traprain.

A notable exception is caves, only one of which has produced a 'status marker' – the pin from Rhodes Links. The range of activities in caves is markedly restricted: the limited range of cobble tools has already been noted, while of crafts, only bone- and (in one case) textile-working are recorded. It is notable that human remains are recorded from all bar Archerfield 1, as well as from the unusual coastal promontory site of Ghegan Rock (Laidlaw 1870; Richardson 1907; Cree 1909, 258; Sligo 1857). Such evidence does occur intermittently on settlements (notably Broxmouth), and the cave finds have not been independently dated, but their repeated presence is suggestive. There are other hints of special deposits; the condition of the Rhodes Links pin suggests it could be a deliberate deposit, as may a substantial part of a pot from Seacliff. While the interpretations of Seacliff at the time of its discovery are a little dramatic (with its 'unhappy victims of barbarous superstition' and deposits created by 'the sprinking of the blood of the victim by the priest during the sacrifice'; Sligo 1857), it seems caves fulfilled a rather specialised role in the landscape, including (though not solely) ritual aspects.

Roman imports in East Lothian

The Roman finds from Knowes and Whittingehame provide an opportunity to consider the distribution of Roman finds in East Lothian. It has been previously argued for south-east Scotland that the range of finds from different sites supports a hierarchical system of access (Hunter 2001a, 294-5), with material coming to a central point (in this case Traprain) and being redistributed from there. But could such patterns arise from material being brought to Traprain from surrounding settlements such as Knowes, at times when communities gathered on the site? A more detailed study may provide further insights into the processes involved.

There are 23 sites with Roman finds in East Lothian, two hoards, two burials, five stray finds of artefacts and 12 findspots of 19 stray coins. These are listed in Table 7.9 and plotted in Figure 7.17. The absence of Roman finds so far from North Berwick Law is a striking contrast to Traprain, and suggests different histories for the two dominant hills; although North Berwick has not been excavated, casual finds have been relatively plentiful, but whereas stray finds from Traprain regularly produce Roman pottery, this has not been the case at North Berwick.

Table 7.5 indicates that 48% of excavated settlement sites have Roman finds, but the amount of excavation in the area allows us to see that the true number is much higher. Of the 21 sites with Roman Iron Age evidence, only three have no Roman finds, and in two cases (Eweford and Pincod) the excavations were limited, leaving Fishers Road East as the one instance with Roman Iron Age radiocarbon dates but no Roman finds. This indicates that Roman finds were omnipresent in East Lothian, with virtually every site having access. However, the degree of access varied. Analysis using the methodology of Hunter (2001a) shows that the vast bulk of sites have only one or two

Table 7.8
Restricted activities by site type

	Enclosed sites (20)	*Open sites (8)*	*Caves (5)*	*? (1)*
Exotic items	5			
Decorated metalwork/bone	6	1	1	1
Iron-working	7	2		
Shale-working	6	3		1
Non-ferrous metalworking	6	2		

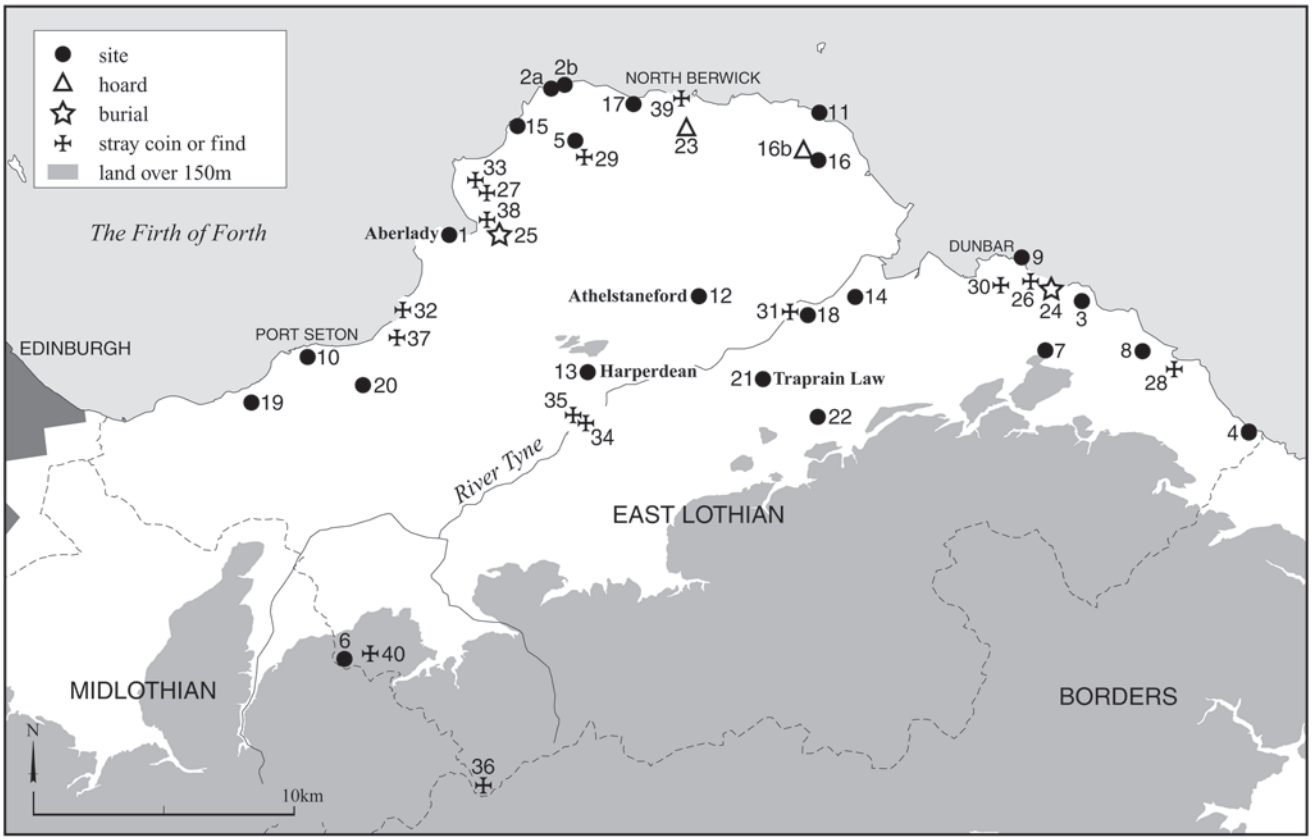


Figure 7.17
Distribution of sites with Roman finds in East Lothian (Crown copyright: RCAHMS, GV004515)

finds categories (12 and six cases respectively): only Knowes, Gilmerton House, St Germains and Dodridge have three find-types, and none approaches the range of Traprain. This is true not just in range but quantity, as the sherd counts in Table 7.9 indicate.

There are also marked differences in the frequency of different finds. Samian, coarseware and brooches dominate, being found on 35–40% of sites excluding Traprain (eight or nine sites); coins and glass occur on under 20% of sites (four). This represents a selective sub-sample of the assemblage found on Traprain, supporting a model of hierarchical access and redistribution; the lack of correlation between the finds on Traprain and those from the environs strongly suggests the material arrived on Traprain and spread out rather than reaching other sites and being brought in. It points to a two-step selection process, with arrival of a wide range of material on Traprain (although not an uncritical selection; for instance, amphorae and mortaria are rare), and the distribution of a portion of this, primarily tablewares and personal ornaments, to neighbouring/subsidiary sites.

There were also marked changes through time. Little of the ceramic material has seen recent study, making differentiation of Flavian from Antonine material uncertain, but the vast bulk of finds are first–second century in date; only Traprain, Knowes, Muirfield, Broxmouth and perhaps Harperdean have late Roman finds. The Muirfield coin, from a midden, may be augmented with stray coin finds from the Gullane dunes, suggesting this beach site was a contact point (with Aberlady perhaps fulfilling a similar role in the earlier period). Late Roman stray coins are otherwise rare, and some are unreliable as they come from modern towns and are probably recent losses. It is unclear how many Traprain environs sites were still occupied in the late Roman Iron Age; Whittingehame is a rare example, while Fishers Road West and Phantassie produced hints of evidence. It may be that late Roman imports, rare and thus more sought-after than earlier

Table 7.9

Roman finds from non-Roman sites in East Lothian. Numbers in the first column provide a location key for Figure 7.17. Numbers of sherds/finds are given in brackets. Date categories of early (E), middle (M) and late (L) Roman Iron Age follow Hunter 2007c, table 1. AE/AR/AV are used for copper alloy/silver/gold coin finds. All finds from the Musselburgh area are omitted, as they most plausibly derive from the Roman fort at Inveresk. Coin finds from modern towns are likely to be much later losses; those with eastern mint marks have been excluded. The ?second century sherd from Fishers Road West post-dates the site's occupation (Thomas 2000). The oculist's stamp from Tranent (Curle 1932, 354) is omitted as the account of its discovery suggests it is from a Roman structure (Simpson 1872, 238).

	Sites	*Material*	*Date*	*Reference*
1	Aberlady, Glebe Field	Brooches (4)	E	Appendix 2
2a	Archerfield I	Samian (3), coarseware (1)	E	Cree 1909; Curle 1932, 353-4; NMS data
2b	Archerfield II	Coarseware (3)	E	Cree 1909; Curle 1932, 353-4; NMS data
3	Broxmouth	Samian (6), LR bracelet fragment	E L	Hill 1982, 169, 188
4	Castle Dykes, Cockburnspath	Glass vessel	?	Hogg 1945
5	Craig's Quarry, Dirleton	Samian (3), coarseware (2)	E	Piggott 1958 & NMS data
6	Dodridge Law	Brooch, bronze vessel, coin	E?	Robertson 1971, 117
7	Doon Hill	Samian (1?)	E	C Wallace pers. comm.
8	Dryburn Bridge	?Brooch, glass vessel	E	Ingemark 2007; Hunter 2007b
9	Dunbar, Castle Park	Samian (3)	E	Cheer 2000
10	Fishers Road West	Coarseware (1)	E?	Thomas 2000
11	Ghegan Rock	Amphora (much of one Dr20 vessel)	E	Laidlaw 1870
12	Gilmerton House, Athelstaneford	Brooches (4), stud, glass vessel (2)	E	Appendix 2
13	Harperdean	Brooch, AE unidentified sestertius, Constantius I	E L	Appendix 2; Bateson & Holmes 2006, 165
14	Knowes	Samian (1), coarseware (1), glass fragment	E L	
15	Muirfield, Gullane	AE Theodosius I	L	Younger 1936
16	New Mains, Whitekirk	Brooch	E	Robertson 1970, table V
17	North Berwick links	AR Caracalla (perhaps from a midden)	M	Macdonald 1918, 235
18	Phantassie	Samian (1), brooches (2)	E	Wallace unpublished; Hunter unpublished; Lelong & MacGregor 2008, figs 7.27, 10.1

Table 7.9 (continued)

	Sites	*Material*	*Date*	*Reference*
19	Prestonpans, Edinburgh Rd	Coarseware (1; Verulamium-region whiteware flagon, not amphora as published)	E	DES 2001, 37; C Wallace pers. comm.
20	St Germains	Samian (6), ?coarseware (1), brooches (2)	E	Alexander & Watkins 1998
21	Traprain Law	Samian, fine- & coarseware, glass vessels, beads & gaming counters, bronze vessels, coinage, brooches & other ornaments, silver hoard, and other objects; >1000 items in total	E M L	Robertson 1970, table X; Curle 1932, 354-362
22	Whittingehame	Samian (1)	E	
	HOARDS			
16b	New Mains, Whitekirk	Skillet and Iron Age material	E	MacGregor 1976, nos 14, 206, 220
23	North Berwick	?Camp kettle, key	?	Wilson 1851, 389
	BURIALS[1]			
24	Dunbar Golf Course	Penannular brooch	E	Baker 2002
25	Luffness	Penannular brooch	E?	*PSAS* 80 (1945-6), 152; Whimster 1981, 413
	STRAY FINDS			
	?	Jug handle	?	NMAS 1892, 223, FT 7
	?	Skillet handle[2]	E	Bosanquet 1928, 252; Collingwood and Wright 1991, 47, no 2415.15; NMS FT 38
26	Dunbar Golf Course	Samian sherd	E	Baker 2002, 205
27	Gala Law, Luffness	Samian sherd	E	Hardy 1885
28	Skateraw	Samian sherd	E	Triscott 1996, 194
	STRAY COINS			
29	Dirleton (near)	AE Augustus	E	Macdonald 1918, 240
30	Dunbar (near)	AV Nero	E	Macdonald 1918, 240
31	East Linton area	AV Augustus	E	N Holmes, pers. comm.
32	Gosford Sands	AR Antoninus Pius	E	Robertson 1971, 122 (perhaps from midden)
33	Gullane Sands	AR Hadrian; AE Valens, Theodosius, ?Valentinian II	E L	Robertson 1950, 146; Bateson 1989, 169

Table 7.9 (continued)

	Sites	*Material*	*Date*	*Reference*
34	Haddington (town finds)	AE Trajan, Faustina I	E	Robertson 1971, 122
35	Haddington (field near)	AE Constantine I	L	Macdonald 1924, 328
36	Huntershall, Soutra	AE Vespasian	E	Bateson & Holmes 1997, 532 ('Hunter's Hill')
37	Longniddry (garden find)	AE Trajan	E	Robertson 1983, 412
38	Luffness	AE Antoninus Pius	E	Bateson & Holmes 2006, 165
39	North Berwick (town finds)[3]	AE Caligula, Antoninus Pius, Diocletian, Constantine I	E L	Macdonald 1939, 243; Robertson 1950, 146; Bateson & Holmes 2003, 250
40	Windymains, Humbie	?	?	Robertson 1971, 122

Notes

1 Penannular brooches of Fowler's type A series were found in two East Lothian burials. These are often seen as Iron Age types which continue into the Roman period (indeed the author has argued this previously; Hunter 2002). The issue was reconsidered in studying one from Phantassie, and all available data collated, but curiously and regrettably the excavators chose not to publish the finds reports. In summary, the spread of types A1–4 within the province and differences from earlier penannular brooches (type A and Aa) in decoration and use of copper alloy rather than iron make it unlikely that they represent a continuing indigenous tradition. Instead (like trumpet and dragonesque brooches), they are best seen as a Romano-British development formed by an amalgam of indigenous and Roman traditions. Their frequency on Iron Age sites suggests the preferential adoption of types consistent with local traditions; there are subtle differences in preferences for particular types between Roman and Iron Age sites.

2 Sadly the records of these two bronze vessel fragments are poor. Both were acquired by NMS before 1892; although the dates and provenances would allow FT 38 to be the vessel recorded from Dodridge, there is as yet no archival information to confirm this was ever donated to the museum.

3 The coin of Diocletian was found in a field immediately north of North Berwick Law.

ones, were retained by an elite on Traprain; or it may reflect a movement of settlement onto Traprain from the surrounding landscape.

The re-use suggested of the Knowes samian is quite a common feature. The samian from Craig's Quarry had been cut down and abraded, and one of the Broxmouth sherds represents a footring cut from a small vessel, perhaps to form a smaller receptacle, while around 60% of the Traprain samian had been reworked in various ways. Samian was a particular focus for such efforts, perhaps because of its perceived status, perhaps due to the properties of its fabric for pigments or other uses. Other Roman pottery was not treated in such a fashion, with the notable exception of the Dressel 20 amphora from Ghegan Rock. The surviving sherds comprise a large part of the vessel; the neck was found separately, deliberately cut off and with the handle detached – reminiscent of Gaulish treatment of Dressel 1 amphorae (Poux 2004, 29–34). To this should be added more prosaic reworking, hinted at by the occasional zinc-containing alloys at Knowes, which point to recycling of Roman material.

In the shadow of Traprain?

Traprain Law casts a long shadow on the East Lothian Iron Age. The paired Laws of Traprain and North Berwick are the physical landmarks of the county, but although North Berwick's history is poorly known, on current evidence it does not have the Roman Iron Age dominance which Traprain does. The range of finds from Traprain, both indigenous and imported, is remarkable, with its wealth of Late Bronze Age material and unparalleled range and quantity of Roman finds. This is not solely due to the scale of excavation; total excavation of the Broxmouth hillfort produced a large assemblage, but not one comparable to Traprain in its range and wealth. The hill remains poorly understood despite various excavation campaigns, but there are clear signs of a complex history, arguably with phases of intense occupation centred on the Late Bronze Age and Roman Iron Age sandwiching a period with less obvious material culture, when it may have been a place to visit rather than to live (Armit *et al.* forthcoming).

This changing role over a thousand years or more cautions against glib interpretations of function but, based on the finds, a few comments can be made about these broad phases. In the Late Bronze Age, Traprain is markedly different from the contemporary sites examined during the TLEP; the radiocarbon dates put occupation at Standingstone, Whittingehame and East Linton in this period, but their finds are markedly prosaic compared to the bronzes and mould evidence from Traprain. Some of the Traprain ramparts are likely to date to this time, and contemporary middens have also been located (Armit *et al.* forthcoming); while details remain opaque, it seems likely to have been quite intensively settled. There are hints that North Berwick may have been a similarly early hillfort, with discoveries of socketed bronze axes from the hill (Coles 1960, 68).

The Early and Middle Iron Age are poorly represented both on Traprain and elsewhere in the county. Elements of Traprain's rampart systems may fall into this period, and Cath McGill's reappraisal of the pottery (forthcoming b) would place some at this time as well. From the TLEP work, the Early Iron Age is poorly represented, with only Foster Law showing activity, and indeed the bulk of excavated sites show a sequence starting in the Middle Iron Age. This is generally seen as the classic period of the 'hillfort'; the dates from Broxmouth and the La Tène II brooch from Craig's Quarry provide some support for this, although the TLEP results emphasise the variability of settlement at this time and the Fishers Road sites show the variety of enclosures established (Haselgrove and McCullagh 2000). Artefactually, there are major problems in trying to define the period, as (apart from Broxmouth for the Mid–Late Iron Age) we have few well-contexted assemblages to show what an Early–Mid Iron Age assemblage looks like and the evidence so far is largely undiagnostic. The imminent reappraisal of the Broxmouth material will throw valuable light on this; Cool's original identification of chronologically-distinct assemblages (1982) was a valuable indicator of potential, although more recent work has started to cast doubt on elements of this (such as the dating of stone balls; Clarke 2004, 103), and a full treatment is long overdue.

There is more meat for discussion for the Late Iron Age onward, as more sites show evidence of this period. Traprain clearly did not have a monopoly of prestige items or craft activities at this time as the above discussion has indicated; they are spread across a range of site types (Table 7.8), with individually striking items from a number of sites – such as the linch pin and drawplate from Phantassie and the decorated comb from Ghegan Rock. This more unusual material (excluding Roman finds for the moment) is found at 19 of the 34 sites, indicating it was not highly restricted. However, such indicators must not be looked at in isolation – what correlations exist between them? Do

certain sites have preferential access or is the apparent spread a genuine one? Of the 19 sites, eight have only a single category of unusual finds. In three cases, these are 'art objects' which could represent the distribution of desirable material to dependent sites through social relations. Four cases are of iron-working (almost half the known total of this craft), suggesting its practice was not linked socially to the other categories considered here. Eight sites have two categories of material, but there are only two with three (Whitekirk, Dirleton), one with four (Phantassie) and two with all five (Traprain Law, Broxmouth). This would support a model of small-scale hierarchies, with a reasonable number of sites having some access to a variable palette of status tools, but only a small number showing a broad range.

In all cases, we are reliant on worryingly small quantities of finds to create the picture. Here, the Roman finds can play an important supporting role: since they are more frequent, if we accept that they followed existing social networks in moving through indigenous society, they can act as an archaeological tracer die in revealing patterns otherwise hard to see. The picture of fairly flat hierarchies is one which the Roman finds support; there are few marked differences between those sites which have Roman goods. However, Traprain still towers over the rest. As discussed above, the Traprain evidence does not support an 'accumulative' model whereby the inhabitants of neighbouring sites came to Traprain at certain periods and returned to smaller enclosure sites at others, since its material is markedly greater in range than the sum of the smaller assemblages (such a model could perhaps be applied more successfully to the other hillfort assemblages). Increasing work in the surrounds of the hill is serving to emphasise again and again Traprain's dominant position.

While much in this analysis is necessarily speculative, it shows that there is potential for social interpretation in the often-dismissed assemblages of later prehistoric Scotland. Further work will help to confirm, deny or develop some of the ideas in this overview, but the TLEP sites provide valuable information to fit into this developing picture.

Chapter 8

Environment and subsistence economy: the charred and waterlogged plant remains and animal bones

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(with a contribution by Louisa Gidney)

INTRODUCTION

A key objective of the TLEP concerned reconstructing the agricultural economy of enclosed settlements in the region and how this changed over the lifetime of the excavated sites. In the anticipation that sub-soil acidity would minimise the recovery of faunal remains, particular emphasis was placed on the recovery of charred plant remains, both in order to permit the investigation of changes in crop husbandry and spatial patterning on individual sites, and to retrieve material suitable for radiocarbon dating. As in the earlier excavations at Fishers Road East (Huntley 2000), the intention was to exploit the possibility of directly dating plant remains, as well as to obtain an absolute dating framework for the sites.

The methodology of the environmental research programme is set out first, after which the archaeobotanical evidence from Whittingehame Tower, Standingstone and Knowes is described, followed by the data from the evaluations. The very few faunal remains from the TLEP sites are then presented, prior to an overall synthesis of the evidence.

Sampling methodology

To maximise possibilities both for palaeobotanical research and radiocarbon dating, a blanket sampling policy was applied on each of the TLEP excavations. Bulk soil samples were taken from all significant features and deposits, and were processed in Durham. Wherever possible a sample of 20–30 litres was retained for each context, although smaller features such as post-holes even in their entirety often yielded far lower volumes. This procedure of sampling even small features paid off at Standingstone, where an otherwise undistinguished post-hole proved to contain a cache of grain. Occasional larger samples were taken where features appeared to contain a higher than average incidence of burnt material. Waterlogged deposits were encountered at East Bearford and Knowes.

All samples were manually floated and sieved through a 500μm mesh. Initially, 5-litre sub-samples were processed to permit a quick assessment of the samples to enable effort to be focussed on samples containing enough material to warrant further processing. Other samples were targeted for full analysis to see whether dateable material could be obtained from them. In most cases, this procedure identified a good spread of samples for full analysis, but at Whittingehame Tower – the first major excavation processed – a high proportion of the initial 5-litre samples were barren. Consequently, a random 15% of samples were selected for full processing as a control. Both flots and residues were retained to 500μm. The >10mm fractions of residues were scanned for charred remains and any artefacts before being discarded, acting as a further control on material recovery rates.

After drying, the flots were scanned under a stereomicroscope at magnifications of up to ×50, notes made of the matrix components and any seeds or identifiable plant remains sorted and identified by comparison with modern reference material held in the Department of Archaeology, Durham University. Unless otherwise stated, the whole flot was sorted. Nomenclature for non-cereal taxa follows Stace (1997). For all sites, concentrations of seeds were standardised to 100 litres processed, thus avoiding fractional values produced with the more usual seeds per litre. In the tables, the identified remains are allocated an ecological code; the first letter denotes whether they are c = charred or w = waterlogged, the second indicates their habitat: a = arable; c = cultivated/grain; g = grassland; h = heath; m = maritime; r = ruderal; s = chaff; t = tree/shrub; w = wetland; x = broad niche.

The majority of the radiocarbon dates obtained for the TLEP sites are on charred material retrieved from the environmental samples, although due to poor preservation, the proportion of dates on cereals is lower than originally envisaged (Chapter 9). Larger pieces of wood charcoal recognised on site were separately

collected in order to investigate the utilisation of local wood resources, but only Knowes produced a significant quantity of identifiable charcoal; none of the hand-collected samples was used for dating.

WHITTINGEHAME TOWER: THE CHARRED PLANT REMAINS (JPH)

Samples were collected from 74 contexts at Whittingehame. Following the initial assessment, 21 samples were fully processed, but four that produced only the occasional seed were not deemed worth further analysis. Few of the samples targeted for archaeological reasons proved to contain seeds, although charcoal from short-lived woody species was sometimes present. Full data can be found in the site archive.

The charred material was often crazed and highly friable, so that some remains may well have been lost during processing, which was particularly challenging due to the heavy clay – more intractable than on any of the other TLEP sites. Furthermore, cereal grains were generally of a puffed and worn character, although some hulled barley was reasonably well-preserved. All of these point to an assemblage that is more or less certain to be biased, hindering detailed discussion of crop processing stages. Coal, clinker and partially burnt coal remained in many flots and strongly imply the use of coal as a fuel. Charcoal was moderately common as well, at least some of it from smaller roundwood, which might represent kindling or simply tidying up of the site. There is no evidence that peat was used either as a fuel or bedding/roofing material that subsequently got burnt. A very few samples produced fragments of calcined mammal bone.

As noted, an additional 15% sample of contexts with barren 5-litre sub-samples was selected for full processing as a control, using randomly generated lists of numbers. This was done not only to test whether the original approach was valid, but also to see whether the methodology might need to be altered for future TLEP sites, if the project aims were to be adequately addressed. Five of the nine randomly selected 'barren' samples produced no seeds after processing the remaining material (totals 13–24 litres); the other four did produce a few fragments. Their seed concentrations were calculated as between 8 and 48 items per 100 litres, which is very low, but does overlap with the densities in some samples at the 'poorer' end of the range among those initially identified as potentially 'botanically significant', though in the end proving not to contain further material pro rata.

The implication is that, in these latter cases, the occurrence of the occasional one or two fragments in the 5-litre sub-samples was simply by chance. It therefore seems reasonable to conclude that sub-sampling does not lose significant data, whilst gaining in effective processing and scanning of more samples in a given time. It also suggests that many low occurrence samples might not be worth further processing either.

Results

Figure 8.1 presents concentrations of seeds standardised to 100 litres processed as a frequency histogram (the x-axis is non-linear). As is typical with well-sampled sites, the majority have low concentrations and represent contexts away from areas of specific activity or discard of plant remains. In all, 29 contexts

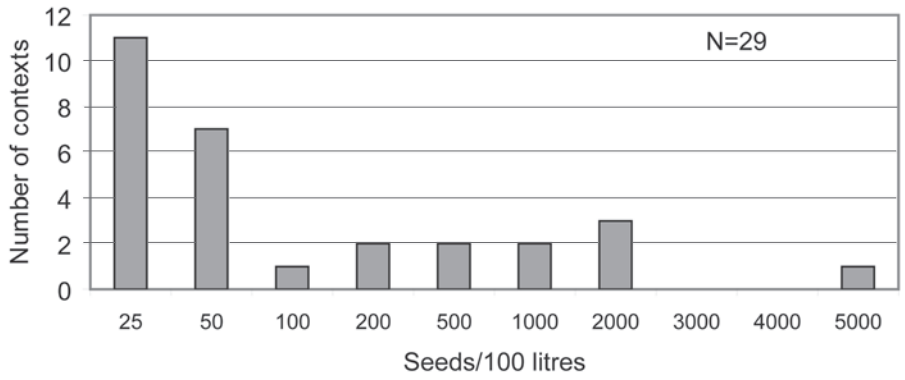

Figure 8.1
Whittingehame: Frequency of seed concentrations

Table 8.1
Whittingehame: percentage occurrence of taxa

ecol	*Taxon*	*count of contexts*	*percentage occurrence*
cc	Cerealia undiff.	20	67
cc	*Hordeum* hulled	13	43
cc	*Hordeum* indet.	9	30
ct	*Corylus avellana* nutshell	9	30
cx	Compositae (immature head)	7	23
cx	Polygonaceae undiff.	6	20
cc	*Avena* grain	5	17
cm	*Fucus* – thallus/frond	5	17
cr	*Rumex obtusifolius*-type	3	10
ca	*Chenopodium album*	3	10
cc	*Triticum dicoccon*	2	6.7
cc	*Triticum* sp(p). grain	2	6.7
cs	*Hordeum* rachis internode	2	6.7
cs	*Triticum* glume	2	6.7
cs	*Avena* awn	2	6.7
ca	*Fallopia convolvulus*	2	6.7
cw	*Carex* (trigonous)	2	6.7
ce	*Pisum sativum*	2	6.7
cg	Poaceae 2–4mm	2	6.7
cs	*Triticum aestivum* internode	1	3.3
cs	*Triticum dicoccon* glume base	1	3.3
cr	Chenopodiaceae undiff.	1	3.3
ch	*Danthonia decumbens*	1	3.3
cs	Culm nodes	1	3.3
cg	*Plantago lanceolata*	1	3.3
ca	*Stellaria media*	1	3.3
ca	*Persicaria lapathifolia*	1	3.3
cw	*Carex* (lenticular)	1	3.3
ca	*Galeopsis tetrahit*	1	3.3
cx	*Bromus* sp(p). grain	1	3.3
cx	Legume < 4mm	1	3.3
ca	*Chrysanthemum segetum*	1	3.3
cx	*Ranunculus repens*-type	1	3.3

contained some charred seeds but only from 33 taxa. Percentage occurrence values were calculated for the assemblage as a whole (Table 8.1). As is clear, few taxa are widespread, most being present in relatively few samples.

Cereal grains comprise 92% of the grain/chaff/weed assemblage; weed seeds are 7% and chaff 1%. Many of the remains are fragmentary or abraded, however, and 'unidentifiable' is the most frequent category, suggesting that material has been lost to an adverse burial environment. The assemblage is thus almost certainly biased and may not represent a fully processed crop, as suggested by the percentage types. Indeterminate cereal grains occur in more than a third of the contexts, followed by *Hordeum* (barley) grains – either clearly hulled or sufficiently abraded as to be classified as undifferentiated. None clearly of naked barley was recorded. Hazel nutshell fragments are also reasonably common. More unexpected were the common fragments of immature heads of Composites – possibly *Anthemis* or more probably *Matricaria* (mayweeds). Whilst they are large and fairly robust, hence more likely to survive, their presence might just indicate threshing debris. However, the culm nodes typical of this processing stage are very rare.

Avena (oat) grains occur in about one fifth of the samples and are the next most abundant cereal after barley, whilst wheat is present in less than 10%. This was somewhat unexpected. Oats typically suggest later material in Scottish or northern English sites (see below). The grains had the characteristic long, V-shaped embryo and thus were not from other large grasses. Chaff was absent and thus they could have been wild oats, *Avena fatua*, but this too is rare on prehistoric sites, making it doubly important for this material to be dated – in the event, only one oat grain could be directly dated (SUERC-10619), but they clearly belong with the latest occupation. Counter to the later date suggested by the oats, emmer wheat (*Triticum dicoccon*) is present, tentatively as grain and definitively as chaff. Single occurrences of bread wheat node plus *Chrysanthemum segetum* (corn marigold) compound the dating issue, as these species tend to be later (or Neolithic, in the case of bread wheat). The two occurrences of *Pisum sativum* (peas) provide slim evidence for another crop plant. The weeds seeds are typical of moist to damp, generally nutrient enriched soils.

Brown seaweed thallus fragments (*Fucus* spp) occurred in a sixth of the samples. This must have been brought from the coast 8km away, and may have been

Table 8.2
Whittingehame Tower botanical data (seeds/100 litres)

		Ditches and palisade							*Pre-cobbles*				*Cobbles*		
	Context number	58	38	103	114	211	65	68	181	233	17	238	123	118	241
	Feature No	F49	F258	F258	F207	F207	F64	F8	F130	F234	F16	F237			F242
ecol	*Volume floated (litres)*	5	12	18	16	17	26	11	13	7	21	5	30	20	5
cc	*Avena* grain														
cc	*Cerealia* undiff.	20					4	9	8				10	10	
cc	*Hordeum* hulled													10	
cc	*Hordeum* indet.	20			6										20
cc	*Triticum dicoccon*											20			
cc	*Triticum* sp(p). grain														
cs	*Avena* awn														
cs	*Hordeum* rachis internode														
cs	*Triticum aestivum* internode									14					
cs	*Triticum dicoccon* glume base														
cs	*Triticum* glume														
cs	Culm nodes														
ca	*Chenopodium album*														
ca	*Chrysanthemum segetum*														
ca	*Fallopia convolvulus*														
ca	*Galeopsis tetrahit*														
ca	*Persicaria lapathifolia*														
ca	*Stellaria media*														
ce	*Pisum sativum*		8												
cg	Poaceae														
cg	*Plantago lanceolata*														
ch	*Danthonia decumbens*														
cm	*Fucus* – thallus/frond														
cr	Chenopodiaceae undiff.														
cr	*Rumex obtusifolius*-type														
ct	*Corylus avellana* nutshell										10		3		20
cw	*Carex* (lenticular)														
cw	*Carex* (trigonous)														
cx	*Bromus* sp(p). grain														
cx	Legume < 4mm														
cx	Polygonaceae undiff.			6					8						
cx	*Ranunculus repens*-type														
wx	Compositae (head/pappus)					18				29	19	20			

Over cobbles			*Pit complex*				*Late post-holes*							
98	52	11	42	106	13	34	183	184	185	194	195	197	206	20
			F86	F85	F12	F33	F182			F193		F196	F205	F19
18	18	36	24	27	1	9	19	10	19	19	3	3	16	7
						68	784	260	126				13	
6	17	92	4	4	200	511	126	160	226	11	2167		6	71
22	83	322			300	1178	1184	530	168	16	2100	67		14
					100	267	200	100					6	29
						11					100			
					100	33								
							16							14
6						11								
						11								
				4										14
							5							
						11	32				33			
				4										
						22		10						
							11							
							32							
							5							
								10						
		3					5							
										5				
						11								
17	278	117							5	5				
		3												
							11			11				43
17	11		4	7		11						33		
					100									
				4	200									
							16							
											233			
		6				11		10	5					
							5							
						22	5		5					

deliberately used as manure. It was also used to produce potash for glass making, but an inland site seems unlikely for such a process when the potash would be more easily transported than the raw material. It has been found both on inland sites in northern England (Huntley and Stallibrass 1995) and commonly occurs on almost all Viking/Norse sites in northern Scotland (Huntley 1992; 1994; 1995).

Table 8.2 presents the botanical data with the samples arranged in appropriate archaeological order. Unfortunately, very little material was found in any of the ditch fills. Only one of seven samples from the outer ditch produced charred cereal [58], consisting of a few fragments of indeterminate cereal and barley grains, although birch [111] and oak charcoal [63] were found in the recut. Similarly, only two of the five samples from the main ditch, both from the recut, contained charred material, this time pea and weed remains in very low concentrations [38, 103], along with more birch charcoal. This lack of material in the ditches is not, however, particularly surprising, if these fills are indeed mainly inwash from the sides and the result of normal processes of erosion. The smaller inner ditch was also largely devoid of material: one of the fills [211] did produce several fragments of an immature Composite head that may have originated in a single item, but the only fill [114] with charred cereal remains is from a point where the ditch was cut through by later features rich in seeds. Attempts at radiocarbon dating the Composite head unfortunately failed through too low a graphite yield, whilst a fragment of parenchymatous tissue submitted from the base of the outer ditch proved to be geological in age (SUERC-10611) indicating that the feature was overdug or the incorporation of older material during the lifetime of the ditch.

Two of the four palisade samples produced occasional indeterminate cereal grains that offered little in the way of interpretation, whilst the features belonging to the earliest occupation in the interior were also relatively unproductive. The few remains from post-hole F234 probably indicate the mixture of general soil with inwash from its sides, although the presence of bread wheat is noteworthy [233]. Post-hole F237 yielded emmer, whilst the fill [17] of scoop F16 contained a few hazel nutshell. All three features contained immature Composite head fragments.

The richer samples all appear to be associated with the phases of occupation post-dating the laying of the cobble surfaces. Few of the samples directly associated with the cobbled area contained plant remains, none in any quantity. The deposits that formed over the cobbled surfaces in the scooped area [11, 52, 98] produced moderate assemblages of indeterminate cereal and barley grain, as expected, but it was also here that nearly all the seaweed survived. Whilst this does not assist in determining the use to which the seaweed was put, it strongly implies that it was a spatially and chronologically restricted activity. As expected given the marine influence, two dates on seaweed from [11] (SUERC-10601; 10605) were older than those on barley and charred hazel nutshell from the same context (SUERC-10599; 10600). The laboratory had expected still earlier dates, but the seaweed was a *Fucus* species; these are not submerged continuously and therefore respire in air, which might alter the marine effect of radiocarbon. From the other pair of dates, this deposit lies between the fourth to sixth centuries cal AD.

Gully F12 and a related post-hole F33 beside pit F85 produced two rich samples [13, 34]. Cereal and barley grains dominated their assemblages and they were the only two contexts on the site to produce wheat grains. [34] produced emmer chaff in limited numbers as well as barley chaff. Oats were moderately common as well. Some considerable amounts of sedge nutlets were retrieved from [13], absent elsewhere except in very low amounts in one context. They may reflect cereals being grown in rather wetter fields or indicate incorporation of dung into the gully. Consistent fifth to sixth century cal AD dates were obtained on emmer-type wheat and hulled barley from [34] (SUERC-10607; 10608), from which it is reasonable to conclude that both cereals were being used at this time. This is a late date for emmer in general, but might reflect a much longer tradition in using this species in lowland Scotland than otherwise indicated. For example, at East Coldoch, near Stirling, emmer, to date, is the most abundant wheat although very much a minority species compared with the overwhelmingly abundant barley (Huntley forthcoming). Whilst only one emmer grain was recovered, fragments of clear emmer glume bases were also present, so the grain is unlikely to be residual. The adjacent pit F85 was well-sampled, but produced minimal remains.

The three fills of post-pit F182 contained some of the highest concentrations on the site [183, 184, 185]. All three contain hulled barley, oats, and indeterminate cereal grains with clearly better preservation towards the top. Peas survived in the middle layer. Wheat was absent. The low numbers of chaff and weeds may reflect the generally poor preservation on this site. F12,

the other feature that contains moderate numbers of oat grains, is spatially remote from F182, but belongs to the same period of activity. An oat grain and a pea from [184] were dated but gave different results. The oat dated to cal AD 410–570 (SUERC-10619) consistent with other late features, but the pea gave a post-medieval date (SUERC-10620). As the pit lay beneath a later hollow-way though the site, this may explain the intrusion.

The fills [194, 195] of the nearby post-pit F193 produced two samples. The lower fill [195] produced the highest concentration of material on the site, with hulled barley and indeterminable cereal grains in almost equal quantities. Small legumes and probable emmer grain were next most abundant, although no chaff was recorded. This assemblage is thus clearly very different from that of F182, but this does not appear to reflect a significant temporal or functional difference. Probable emmer returned a date of cal AD 330–540 (SUERC-10625) in line with the grain from [34], adding further weight to the conclusion that emmer was being grown at Whittingehame much later than known elsewhere in southern Scotland or northern England. Hulled barley from [195] produced a date consistent with the emmer (SUERC-10621); in all probability they are contemporary.

Most of the remaining features produced little in the way of interpretable plant remains. The fill [18] of post-hole F19 was quite rich in charred cereal and barley grains and contained moderate numbers of *Rumex* (dock) seeds. However, preservation was poor and the material may well have been moved around for some time, or on several occasions, before it became incorporated into this deposit. Both the post-hole and its contents resemble other late features from the site, but a barley grain from the fill yielded a post-medieval date (SUERC-10606).

Charcoal

Abundant charcoal was present in a small number of the environmental samples. The material from four contexts was deemed worth full analysis to investigate the utilisation of wood, probably originating in local woodlands. A number of charcoal samples were recovered by hand during the excavation, but never more than a few pieces from any one context. They are thus unlikely to be representative and were not analysed, but included oak and birch.

For the four contexts analysed, larger charcoal pieces were chosen subjectively as easier to fracture, but none was greater than 1cm and most <5mm. Transverse, radial longitudinal and tangential longitudinal fractures were made by hand. Initially, the transverse face was examined under a Wild stereomicroscope at ×25 and pieces grouped into types. All three faces of a selection of each type were then examined under a Leitz DM/LM epiluminescent microscope at magnifications of up to ×200. Identification was by comparison with Schweingruber (1978) and Hather (2002) and reference material belonging to the author.

Table 8.3
Whittingehame charcoal by taxon

Context	*13*	*55*	*96*	*181*
Betula	39	20	1	38
Corylus	4	21		4
Alnus	1	10		
Salix/Populus	1			
Fraxinus/Quercus	1			
Rosaceae – *Crataegus*-type		1		
Sambucus		4		
Calluna			20	
Pinus-type				1
Rootwood			80+	
Bark				5
Indet. cindery and glassy	9	1	1	9

Table 8.3 presents the counts by taxa. Like the other botanical remains, the charcoal was often crazed and highly friable, but in all cases it was relatively easy to find sufficient fragments to identify. The smaller material was less well-preserved in general. Fragments selected but not identifiable were simply classed as cindery or glassy, which might reflect the temperature of that part of the fire from which they came originally.

Post-hole F130 was the only feature pre-dating the cobbled surfaces to yield a significant amount of charcoal. All the charcoal was <4mm. The assemblage [181] was dominated by birch with a certain amount of hazel and indeterminable material as well as some bark. One fragment of *Pinus* (pine) was recorded. This was characterised by the presence of resin canals but

rather short rays compared with the longer rays typical of *Picea/Larix* (spruce/larch).

The other three assemblages of charcoal belong to the later stages of the occupation. [97] was a burnt patch filling a scoop (F96) cut into the first cobbled surface. It was dominated by very gnarled root wood showing little or no structure in terms of vessels, etc. as expected from root wood. The majority of identifiable fragments were from Ericaceae stems – probably *Calluna* (heather) given their size rather than *Erica* spp. Root pieces reached *c.* 20mm, although most were considerably smaller. [55] came from a charcoal-filled hollow (F54) in the upper cobbled surface, initially thought to be a hearth. Birch and *Corylus* (hazel) were the most frequent taxa and, again, all material was < 10mm. The interesting taxon record in this assemblage was *Sambucus* (elder), with vessels in very obvious clusters and also quite densely packed. One fragment was of Rosaceae *Crataegus*-type (more or less solitary pores, rays 2–3 wide and possible hints of spiral thickening, although the fragment was small and this was not clear). The last sample [13] is from the gully with post-holes (F12) around the pit complex. All of the charcoal was < 10mm and generally in quite good condition. The assemblage was dominated by *Betula* (birch), some extremely slow grown; the occasional fragment of gnarled birch was also recorded. There was one fragment each of *Alnus* (alder) and *Salix/Populus* (willow/poplar).

The taxa recorded are mostly likely to have been available near to the site as evidenced from local pollen diagrams such as Letham Moss and Fannyside Muir (Dumayne-Peaty 1998), both only some few tens of kilometres to the west of Whittingehame. Elder is likely to have been a local shrub too, although its pollen is not recorded in these diagrams. The most commonly occurring taxa and with the most numerous fragments tend to be large shrubs to small trees, with surprisingly little evidence, at one level, for large timber producing taxa such as oak. This might indicate the presence of open, secondary woodland predominantly in the near vicinity of the site, although with only four assemblages this cannot be conclusive. This also, of course, assumes that the charcoal originated in woodland close to the settlement. The elder is interesting, as it is a species that does not burn well and also has a huge folk-lore associated with it – Mrs Grieve devotes no less than 12 pages to elder (Grieve 1998) – such that it is rarely brought into dwellings or burnt for fear of attracting various witches, demons and dryads! On the other hand, its wood has been recorded from a variety of artefacts, especially musical instruments (Gale and Cutler 2000); this is due to its large central pith that is easily removed leaving behind a tube of fine-grained timber.

The contexts are such that they may not reflect wood burnt on domestic hearths but could easily represent clearance of ground prior to building. The latter is certainly possible for [96] with all the root charcoal. There is no evidence for use of off-cuts or waste from structural timbers. The fragments are generally too small to say whether they were from roundwood or large timbers – ring curvature is not obvious in such small pieces.

Whittingehame: summary and discussion

Although only five contexts produced what can be called reasonably rich assemblages of charred cereals, Whittingehame has, nonetheless, made a significant contribution to our understanding of lowland Scottish arable agriculture at the end of the prehistoric period. Hulled barley seems to have been the most common cereal and this is typical of all sites along the eastern coast of northern England and southern Scotland from the Earlier Iron Age onwards. There is no record of naked barley at Whittingehame. This is not surprising given the dates of majority of the excavated contexts as naked barley seems not to have been cultivated much at all into the Iron Age.

Of the relatively small amounts of wheat recorded, only emmer was confirmed from the chaff remains. This may well reflect a genuine absence of spelt and would normally suggest an earlier rather than later first millennium BC date, but there can be little doubt from the radiocarbon dates that emmer was in use here until well into the first millennium AD. The absence of spelt is unusual but perhaps the occupants of Whittingehame remained firmly conservative until the end. On the other hand, the appearance of oats in some abundance in the latest stages of the occupation fits well with evidence from elsewhere. Oats do occur sporadically at central and northern Scottish sites from the Middle Bronze Age, as at Howe (Dickson 1995) and Suisgill (Barclay 1985), and from the Iron Age at Lairg (Holden 1998), but otherwise tend to appear in moderate numbers only from the middle of the first millennium AD. In north-east England, likewise, they mostly appear during later Roman times or later (Huntley and Stallibrass 1995).

Seaweed was apparently used only around the later cobbled surface. Earlier radiocarbon dates were

anticipated on account of marine influence and there is no reason to suppose that it was not contemporary with the barley and hazelnut with which it was associated in [11]. Seaweed might have been used as fodder for livestock, although transporting it from the coast for this reason seems rather unlikely, or it might result from the dung of animals grazed at the coast, or have been purchased, exchanged or raided from a coastal farm. It could also have been used as a manure and perhaps stored at the site to rot or be burnt prior to application on the fields. Manuring is probably the most likely use for this commodity even though the site is some way away from the coast.

Seaweed was highly valued for manuring even in lowland Scotland, although the practice perhaps faded rather earlier here than in northern Scotland and the islands (Fenton 1986). Kerr (1809) suggests that the common practice was to plough cartloads of seaweed into the land immediately upon collection, although composting with any 'long litter" was also favoured at times. Fenton (1986) notes that it was applied at a rate of some 30 double cartloads per acre on many East Lothian farms and that here it was considered as good as an equivalent amount of dung. It was especially applied to barley crops, the barley then favoured for malting, although it would also be used to produce two or even three cuttings of clover. The seaweed could indicate a move towards a more animal-orientated husbandry and/or specialisation of particular farms in the centuries around the mid-first millennium AD, perhaps as a result of social changes at this time. This could also account for the low amounts of wheat, which would have been primarily for human food and, perhaps, largely bought in as grain hence considerably less chance of being burnt and preserved. Unfortunately, the lack of faunal evidence prevents testing this hypothesis.

STANDINGSTONE: THE CHARRED PLANT REMAINS (JPH)

Samples from 122 contexts were assessed, of which 57 were completely analysed. Full details can be found in the archive. As at Whittingehame, the charred remains from Standingstone were often highly friable and sometimes abraded and it is possible that some remains have been lost post-deposition. Cereal grains were again generally of a puffed and worn character, although some of the hulled barley was reasonably well-preserved. This assemblage, too, is sufficiently biased to restrict discussion. The indications are once again that coal was used as a fuel, since coal, clinker

Table 8.4
Standingstone: percentage occurrence of taxa

ecol	*Taxon*	*count of contexts*	*percentage occurrence*
cc	*Hordeum* hulled	21	48.8
ct	*Corylus avellana* nutshell	15	34.9
cc	Cerealia undiff.	16	37.2
cs	*Triticum dicoccon* glume base	10	23.3
cc	*Triticum* sp(p). grain	9	20.9
cs	*Triticum dicoccon* spikelet	7	16.3
cs	*Hordeum* 6-row rachis internode	6	14
cs	*Triticum* glume	5	11.6
cc	*Triticum dicoccon*	5	11.6
cs	*Hordeum* rachis internode	5	11.6
cx	*Bromus* sp(p). grain	4	9.3
ch	*Danthonia decumbens*	3	7
cg	*Plantago lanceolata*	3	7
cc	*Hordeum* indet.	3	7
cg	Poaceae >4mm	3	7
cs	Culm nodes	3	7
cs	*Triticum* brittle rachis internode	3	7
cx	Polygonaceae undiff.	3	7
cs	*Triticum spelta* glume	3	7
ca	*Persicaria lapathifolia*	2	4.7
cc	*Avena* grain	2	4.7
ca	*Fallopia convolvulus*	2	4.7
ch	*Pteridium aquilinum*	2	4.7
cs	*Avena* awn	2	4.7
cr	Chenopodiaceae undiff.	2	4.7
cx	Poaceae <2mm	2	4.7
cw	*Carex* (lenticular)	2	4.7
cr	*Galium aparine*	2	4.7
cm	*Fucus* – thallus/frond	1	2.3
ca	*Chenopodium album*	1	2.3
cc	*Hordeum* naked	1	2.3
cg	Poaceae 2–4mm	1	2.3
cr	*Raphanus raphanistrum* pod frag.	1	2.3
cr	*Rumex obtusifolius*-type	1	2.3
cs	*Hordeum* basal internode	1	2.3
ct	*Malus/Pyrus*	1	2.3
cw	*Carex* (trigonous)	1	2.3

and partially burnt coal remained in many of the flots. Charcoal was moderately common as well, some of it from smaller roundwood, although much was flaky fragments of oak. Whilst this probably indicates some use of wood for fuel, none of the contexts is primary and the charcoal could equally represent tidying up the site. There is no evidence that peat was used as a fuel or bedding/roofing material that was subsequently burnt. One context did contain bubbly and laminated material with no diagnostic features, which might have been burnt dung. Very occasionally samples produced a few fragments of calcined mammal bone but this could just indicate casual disposal of domestic waste in a convenient fire. Otherwise the acidic nature of the sediments precluded good survival of bone.

Forty-three contexts contained charred seeds, although not always more than the occasional one. Only 37 taxa are represented, with most samples containing rather fewer (Figure 8.2). Equally, as the percentage occurrence values show, most taxa are present in relatively few samples (Table 8.4). Not surprisingly for a charred assemblage the most common elements were cereal grains and chaff as well as the almost ubiquitous hazel nutshell fragments. Although widespread, they are not in sufficient concentration in any single context to suggest anything other than casual consumption and disposal.

Excluding one exceptionally rich context [46] containing around 1000 grains, the assemblage comprises 43% cereal grains, 36% cereal chaff, 11% taxa arguably classified as weeds, and 10% taxa not likely to be weeds, such as hazel nutshell. Table 8.5 presents the summary cereal data, again excluding the grain from [46], 84% of which was emmer-type, the rest barley. Elsewhere barley grains predominate. Only 25% of the grains were classed as indeterminate even though preservation was not considered 'good'. This is probably because hulled barley grains are determinable through their angled profile and 'tram-lines' along the ventral groove even when poorly preserved, whilst wheat has the characteristic rounded ventral side. Most of the wheat was *Triticum* sp. with only the occasional grain showing a slight teardrop shape and high dorsal ridge characteristic of emmer. Oat grains are present, but only in very small numbers. Occasional 'large Poaceae' might also have been cereals but could represent wild grasses of a similar size growing amongst the crops.

Looking at the chaff, there were three times the numbers of wheat related items to those of barley. Of the species-identifiable wheat fragments, by far the majority were from emmer, with only seven glume bases attributable to spelt with their strong tertiary venation and obtuse angle (total of 76 identifiable). This strongly suggests that emmer was the main wheat crop. Other remains were from glume wheats, i.e. emmer or spelt, but not identifiable. *Avena*-type awns were the next most abundant cereal chaff with their characteristic twist. However, these are also found in large grasses such as *Helictotrichon*. Culm nodes were rare suggesting that straw was not deposited in these contexts. They are more robust than the glumes so should survive as well if not better if originally present.

Barley chaff confirms the presence of the expected 6-row barley, 2-row generally appearing during the

Table 8.5
Standingstone: cereal grain and chaff fragments in the total assemblage (excluding context 46)

Grain	*No*
Hordeum hulled	69
Hordeum indet.	27
Hordeum naked	6
Triticum dicoccon	7
Triticum sp(p). grain	19
Avena grain	3
Cerealia undiff.	46
CHAFF	
Hordeum 6-row rachis internode	10
Hordeum basal internode	2
Hordeum rachis internode	18
Triticum brittle rachis internode	4
Triticum dicoccon glume base	51
Triticum dicoccon spikelet	18
Triticum glume	16
Triticum spelta glume	7
Avena awn	16
Culm nodes	4

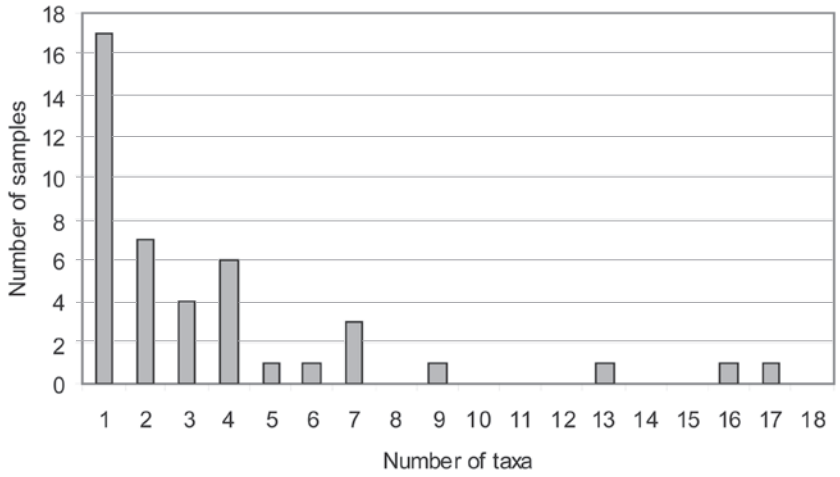

Figure 8.2
Standingstone: Frequency of seed concentrations

medieval period. The grains are not well enough preserved to determine the proportions of twisted to straight embryos in more than the occasional case; many reports classify grains as *Hordeum vulgare* without supporting evidence from the embryos. Other probable food remains are *Malus* (apple) (in one context) and *Corylus avellana* (hazelnut) but numbers are so low that it seems unlikely that these were a major source of food. Both are likely to have been locally picked.

The weed taxa, although not common, are indicative of damp and well-manured land on the whole, with some indications of a wetter habitat. However, some taxa, such as the sedges (*Carex* spp.) may have found their way to the site as fodder, dung, or even bedding, rather than as weeds amongst cereals; that they do grow amongst cereals is clear from modern work in Shetland (Hinton 1990). The *Rumex obtusifolius*-type (docks) could indicate areas of fallow or waste ground, but other evidence for this, for example nettles and thistles, is absent.

Disappointingly, only seven cereal samples were successfully radiocarbon dated (Chapter 9). Interestingly, barley from [46], [298] and [428] (including replacement samples) dissolved during pre-treatment or produced too little graphite, whereas emmer from the first two contexts dated satisfactorily. Clearly the barley grains have charred in a different manner to the emmer – perhaps they had a higher moisture content when burnt.

Archaeological results

Pre-enclosure activity (Table 8.6)

The fill [21] of the early pit F56 contained hulled barley and emmer remains, but also some clear, transversely wrinkled naked barley grains and moderate numbers of fragments of apple pips. Septae from the apple 'core' were also common, but not counted. Grains of naked and hulled barley each yielded a late Neolithic radiocarbon date (SUERC-10535; 10536), consistent with the cord-impressed pottery.

Neither of the Bronze Age cremations produced any seeds. Three of the nearby pits were sampled, but apart from one wheat grain and one fragment of 6-row barley rachis from [244 in F243], these too were barren. The irregular gully or burrow (F270) cutting Cremation 2 contained a fragment of cereal grain.

The other pre-enclosure features yielded very little material and many samples were barren, including those from the linear ditch F31. The main exceptions are provided by three of the pits with burnt material identified on site. The fill [42] of pit F41 yielded one of the richer samples from the whole site in terms of range of taxa. Emmer glume bases and spikelet forks were the most common cereal, but hulled barley grains are also represented; weed seeds suggest nutrient-enriched soils and, possibly, burnt turf or grassland material. Only charcoal was found in the base of the possible oven F227, but its upper fill [228] yielded a few hulled

Table 8.6
Standingstone: early features (seeds/100 litres)

	Context	21	42	51	127	146	197	203	209	213	228	231	244	271	293	314	347
	Feature	F56	F41	F50	F125	F145	F196	F212	F208	F212	F227	F230	F243	F270	F292	F313	F346
ecol	*Volume floated (litres)*	7	7	2	2	5	2	2	10	4	4	5	10	2	4	8	3
cc	Cerealia undiff.	143	14				50	100		25		20		50			
cc	*Hordeum* hulled	271	29		50	20					50						33
cc	*Hordeum* indet.	343		50													
cc	*Hordeum* naked	86															
cc	*Triticum dicoccon*														50		
cc	*Triticum* sp(p). grain	50	17										17				
cs	*Hordeum* 6-row rachis internode												10				
cs	*Triticum dicoccon* glume base		100	50				50	10								
cs	*Triticum dicoccon* spikelet		14														
cs	*Triticum glume*			50													
cs	Culm nodes											20					
ca	*Chenopodium album*		43														
ca	*Persicaria lapathifolia*								10								
cg	*Plantago lanceolata*		14	50													
ch	*Danthonia decumbenss*		43														
cm	*Fucus* – thallus/frond							50									
cr	Chenopodiaceae undiff.								10								
cr	*Galium aparine*										25					13	
cr	*Raphanus raphanistrum* pod											20					
ct	*Corylus avellana* nutshell		43					150									
ct	*Malus/Pyrus*	86															
cx	Polygonaceae undiff.								10								

barley grains. The third pit (F230) contained a radish pod fragment, a part of a cereal grain and one piece of straw in its fill [231].

The upper fill [203] of pit F212 to the south-west of the enclosure yielded a piece of charred brown seaweed – the only record from this site – as well as hazel nutshell, and its basal fill [213] had a cereal grain fragment. The fill [209] of post-hole F208, cutting the pit, produced a few weeds, an emmer glume base and moderate numbers of small fragments of what might have been burnt dung. Some of this honeycomb material clearly contained weed seed fragments too, possibly suggesting herbivore dung. Otherwise, the only finds were from odd post-holes around the site. F292 produced two emmer-type grains [293]; F346 [347] and F145 [146] yielded one hulled barley grain each; and F50 had indications of grassland taxa [51].

The Late Bronze Age enclosure and palisade (Table 8.7)

Most of the 15 ditch samples were unfortunately barren; the only finds were hazelnut shell fragments from [283], a hollow or possible post-setting where the north terminal peters out in the bedrock, and [253], one of the upper fills in the eastern section.

A number of samples were taken from along the palisade trench, but most were barren and none of those with material [10, 12, 104, 269] contained more than a fragment or two of barley, wheat or hazel nutshell). Radiocarbon dates were obtained from a wheat grain from [12] (SUERC-10530), and a hulled barley grain [8] from post-hole F7 that cuts the palisade and is probably related to it (SUERC-10528).

Easily the most productive feature from this phase, and indeed from the whole TLEP, was a small pit F45 close to the palisade and probably sealed beneath the bank. The 1.5 litres processed from its fill [46] was

Table 8.7
Standingstone: enclosure features (seeds/100 litres)

		Palisade					*Ditch*		*Other*				
	Context	10	104	269	12	8	253	283	46	60	160	217	428
	Feature	F13	F13	F13	F11	F7	F273	F282	F45	F61	F159	F216	F427
ecol	*Volume floated (litres)*	6	12	8	2	6	14	8	2	15	5	13	9
cc	Cerealia undiff.												11
cc	*Hordeum* hulled	67			50	33			*7000*				
cc	*Hordeum* indet.											15	
cc	*Triticum dicoccon*								*43000*				
cc	*Triticum* sp(p). grain				33	33							
cs	Culm nodes		17										
ch	*Danthonia decumbenss*									20			
cr	Chenopodiaceae undiff.								100				
ct	*Corylus avellana* nutshell		17	13			7	63		7	20		
cw	*Carex* (trigonous)									7			
cx	*Bromus* sp(p). grain	17											
cx	Poaceae < 2mm											15	
cx	Polygonaceae undiff.								50				

Table 8.8
Standingstone: circular structures (seeds/100 litres)

		CS1					*CS2*									*CS3*	
	Context	82	94	110	461	329	130	140	109	112	344	345	352	462	469	298	302
	Feature	F79	F106	F106	F106	F328	F451	F139	F359	F359	F359	F359	F359	F359	F468	F297	F301
ecol	*Volume floated (litres)*	6	11	11	12	8	14	16	10	9	11	11	6	13	7	16	12
cc	*Avena* grain															13	8
cc	Cerealia undiff.		9	27		13					27	36	17		71		83
cc	*Hordeum* hulled	17	18		17		21	6			9	55			157	31	25
cc	*Hordeum* indet.		9														
cc	*Triticum dicoccon*						7								14	19	
cc	*Triticum* sp(p). grain			17							50				33		67
cs	*Avena* awn															81	25
cs	*Hordeum* 6-row rachis internode			9							9				43	19	8
cs	*Hordeum* basal internode															13	
cs	*Hordeum* rachis internode						21				9				43	38	42
cs	*Triticum* brittle rachis internode			9												13	8
cs	*Triticum dicoccon* glume base			82		13					9				71	106	67
cs	*Triticum dicoccon* spikelet		9	9		38	14									31	42
cs	*Triticum spelta* glume						7								29		33
cs	*Triticum* glume			27							9				14		83
cs	Culm nodes														14		
ca	*Fallopia convolvulus*											9					8
ca	*Persicaria lapathifolia*														14		
cg	Poaceae >4mm		9							11							8
cg	Poaceae 2-4mm															13	
cg	*Plantago lanceolata*																25
ch	*Pteridium aquilinum*						7										8
ch	*Danthonia decumbens*				8												
cr	*Rumex obtusifolius*-type															6	
ct	*Corylus avellana* nutshell	17			17		29		10			9		8		13	8
cw	*Carex* (lenticular)				17										14		
cx	*Bromus* sp(p). grain	17													14	6	
cx	Poaceae <2mm															25	
cx	Polygonaceae undiff.															13	

almost pure grain, the whole sample comprising some thousand or more grains. Of 400 grains counted, about 84% was emmer-type with the high dorsal ridge and slight tear-drop shape, the remaining 16% hulled barley. Preservation was not good and it was not possible to determine attitude of the embryos on the barley grains to a sufficient extent to determine whether this was *Hordeum vulgare* or *H. distichon*, although chaff in other contexts strongly suggests the former. Only three weed seeds were recovered, suggesting that the content was fully processed grain. An emmer grain produced a date of 1030–830 cal BC (SUERC-10537), although the barley grains failed to date.

Four of the possible rectilinear post-hole structure near the palisade yielded material: [60, F59] and [160, F159] both have charred hazel nutshell; [217, F216] barley and [428, F427] unidentifiable cereal.

The Iron Age circular structures (Table 8.8)

All but one of seven contexts sampled from the CS1 sunken-floored feature F79 were barren, apart from surface fill [82], which produced hulled barley, hazel nutshell and a brome grass seed. In contrast, the four samples from the outer gully F106 were all productive: [110] contained emmer and 6-row barley chaff as well as some indeterminate glume wheat chaff and a few cereal grains; [94] produced hulled barley grain and emmer glumes; [461] hulled barley and hazel nutshell; whilst post-setting F328 [329] at the end of the gully contained two emmer glume bases and spikelets.

The outer gully of CS2 (F359) was again productive, with six of the eight samples – from both phases – yielding some material. Two samples from the southern terminal [344; 345], each produced moderate numbers (for this site) of hulled barley and emmer-type wheat grain and chaff. Those from elsewhere on the circuit had less material, with [462] producing a little barley rachis and hazel nutshell, [352] a single mineral concreted cereal grain, [109] hazel nutshell and [112] a large grass or possibly cereal. In addition, a relatively rich sample came from an indistinct feature [F468, 469], which may well be a continuation of the gully but had frustratingly been disturbed by an animal burrow! As well as hulled barley, emmer and spelt glumes, and some weeds, it contains material akin to burnt daub.

The fill [130] of the deep end of the sunken-floored feature (F451) was also quite rich: not only emmer and hulled barley were present, but also a possible spelt glume, although not well enough preserved to be sure. Unfortunately none of the other fills of this feature was sampled. The fill [140] of one of two intercutting post-pits (F139), which might be associated with CS2, produced only a scrap of rush stem and a modern grain (SUERC-10549).

The northern and southern parts of the third sunken-floored feature F297 yielded markedly different samples. A sample from the northern part was barren, whilst two samples from the bulbous southern end were both relatively rich. Emmer glumes were common in [298], as were the ubiquitous hulled barley grains; 6-row barley chaff confirmed the presence of this species. Oat grains and oat-type awns were also present, although the awns were the twisted ones characteristic of some large meadow grasses as well as of oats. Weeds are recorded as well as taxa more common in grassland. There might, as a result, be a turf component present. The sample from [302] was extremely similar in taxa composition, but included a few fragments of bracken frond and some spelt glume bases.

Discussion

Many of the samples produced rather sparse plant remains, limiting interpretation. Clearly 6-row hulled barley and emmer wheat were the main crops being used. Spelt evidence is low and might just reflect weeds amongst other crops, although the three contexts with spelt all have Later Iron Age associations, emmer seeds from two of them yielding radiocarbon dates in that period (SUERC-10547, 10558). Occasional oats are present but lack the diagnostic floret bases, so it is impossible to be sure whether they are cultivated or wild. The low numbers might well suggest wild. The presence of grains and chaff of the major species indicates that they were being processed to a certain degree locally and it can be assumed that they were also grown locally. The nature of the preservation might have lost some of the more delicate remains so there may be a bias towards the more robust material, the grains.

Hazel nutshell fragments are scattered throughout many contexts. They are always in low numbers and no doubt represent casual disposal of locally collected fruit. Of more interest, apple remains – pips and septae – were moderately abundant in the later Neolithic pit F55, which also contained naked barley grains. Few settlements have had naked barley dated. At Lairg, where several sites of Bronze Age date were excavated, naked six-rowed barley is the only cultivar present, apart from occasional grains resembling hulled barley (Holden 1998). Likewise

Table 8.9
Knowes: charred plant remains from the western enclosure ditch (seeds/100 litres)

		F12 (2002)					*F103*										*F267*	*F269*
	Context	7	8	9	10	11	105	132	136	137	143	146	156	162	179	189	268	270
ecol	*Volume floated (litres)*	5	5	5	5	5	5	18	5	26	21	10	5	7	20	3	4	5
cc	*Avena* sp. grain (Oats)																	20
cc	Cerealia indet. grain	180		100	140	60	20	67		77	19	100		214			29	20
cc	*Hordeum* sp. grain (Hulled barley)	40	120	440	260	220		44		69	10	220		200	20			
cc	*Hordeum* sp. grain (Barley)							17		189	24	30	40	114	15	67		
cc	*Triticum* sp. grain (Wheat)		40	40	100		20	11	20	35	14	40	20	29		33		
cc	cf. *Triticum dicoccum*				20	40												
cs	*Hordeum* sp. rachis internode (Barley)	60	20		180	80				15		10						
cs	*Hordeum* sp. basal rachis node	20		20	20													
cs	*Hordeum* sp. rachis internode (6-row)			400	100					8				29				
cs	*Triticum* brittle rachis internode				40													
cs	*Triticum* sp. glume base			140	120													
cs	*Triticum dicoccum* glume base (Emmer)	20		180	420			6		4		20		43	5			
cs	*Triticum dicoccum* spikelet fork (Emmer)				20	40		6				10						
cs	*Triticum spelta/dicoccum* spikelet base									12		20		43				
cs	*Triticum spelta* glume base (Spelt)				80	80				8				14				
cs	monocot culm node			20														
ca	*Chenopodium album*			140	40	60												
ca	*Persicaria lapathifolia*	120		140	20	80												
ch	*Danthonia decumbens* (Heath-grass)	40	140	520	760	760				65		10		171	5			
ch	Empetrum nigrum fruit			20														
cr	Cirsium sp. (thistle)				20													
cr	*Plantago lanceolata* (Ribwort plantain)			20						4		10		14				
cr	Polygonaceae (Knotgrass)			20		40						10		14				
ct	*Corylus avellana* (Nutshell)							11		12								
cw	*Carex* sp. trigonous nutlet (Sedge)	100	40	380	220	200				39		20		29				
cw	*Carex* sp. lenticular			200	300													
cw	Montia fontana ssp. chondrosperma				20													
cx	*Mentha* sp. (Mint)											10						
cx	Poaceae (Grass)	40		340	380	120				19		30		71				
cx	Ranunculus repens-type				20													
cx	*Rumex* sp. (Dock)	20		20	40			6		27	5	10		14				
cx	Potentilla erecta-type				20													
cx	*Veronica hederifolia* (Ivy-leaved speedwell)	20		40														
cx	*Vicia* sp. (Vetch)							6										

at Suisgill, naked barley was dominant during the Bronze Age, although wheat and oats were recovered in low numbers (Barclay 1985). Both sites, however, are considerably further north. At Howe, naked barley dominated throughout the Iron Age (Dickson 1995), but in southern Scotland, it seems to have been replaced by hulled barley at some stage during the first millennium BC (Huntley 2000).

The few weed seeds that were found, indicate well-manured slightly heavier soils. Sedges, grasses, and bracken remains might all indicate burning of turves, either from roofing or fuel (Hall 2003). Only a single fragment of seaweed is present, in contrast to its relative abundance at Whittingehame. It might have been used as manure or arrived at Standingstone as 'packing' for shellfish in order to keep them alive and fresh on their journey from the coast. Presumably it was burnt by accident.

It is unusual for ditch terminals to be barren, since these are often places where botanical material is dumped or falls in. It may be that the occupants of the Late Bronze Age enclosure, although growing some cereals, were not producing a large excess and hence generated little crop processing debris. The Iron Age curvilinear structures are clearly the richest in terms of both concentrations and numbers of taxa recorded and it may be that crop processing activities were being undertaken in or near them.

KNOWES: THE CHARRED AND WATERLOGGED PLANT REMAINS (CO'B)

Samples were collected from 121 contexts, of which 47 were processed in their entirety. Anaerobic conditions in one of the ditch terminals permitted the preservation of waterlogged plant remains, but otherwise the free-draining nature of the site resulted in preservation being restricted to charred macrofossils. 62 contexts contained charred plant remains, of which all but two included cereals. However, cereal remains were mostly

Table 8.10
Knowes: charred plant remains from the entrance area (seeds/100 litres)

		North terminal				*Gully*	*S terminal*		*Cist*	
	Context	219	250	271	272	178	127	285	149	163
	Feature	F151	F151	F151	F151	F177	F221	F221	F226	F226
ecol	*Volume floated (litres)*	5	5	41	11	5	10	5	41	35
cc	Cerealia indet. grain					20				
cc	*Hordeum* sp. grain (Hulled barley)				9		10	20		
cc	*Hordeum* sp. grain (Barley)			2					2	6
cs	*Hordeum* sp. rachis internode (Barley)				9					
cs	*Hordeum* sp. rachis internode (6-row Barley)				27					
cc	*Triticum* sp. grain (Wheat)	20	20							
cs	*Triticum dicoccum* glume base (Emmer)				9					
cs	*Triticum spelta/dicoccum* spikelet base (Spelt/emmer)				9					
cs	*Triticum spelta* glume base (Spelt wheat)		40		46					
cg	*Arrhenatherum elatius* ssp. *bulbosum* (Onion couch)									3
ch	*Calluna vulgaris* twig (Heather)				9					
ct	*Corylus avellana* (Nutshell)								2	
cx	Poaceae (Grass)	20								

present in very low numbers, although a few samples yielded high concentrations (>500 remains/100 litres), notably from the western enclosure ditch, the CS2 oven and drain F140. Grains of barley and wheat occurred regularly, along with the chaff of 6-row barley, emmer and spelt and occasional oats The samples produced small flots ranging from 1–225ml. A large number of residues contained shattered stones, but as these did not appear fire-blackened, they were presumably cracked by natural causes. A fair number of residues contained small fragments of burnt and unburnt bone, as well as occasional tooth fragments. Several cereal samples were radiocarbon dated, helping to confirm that the occupation lies in the Later Iron Age and Roman period.

Archaeological results

The enclosure circuit

The basal fill of the primary cut of the western enclosure ditch was barren, but several of the fills of the recuts contained abundant charred cereals, the highest concentrations coming from [162] and from [9, 10, 11] in the 2002 evaluation. These samples were dominated by grains of hulled barley and indeterminate cereals, with lower numbers of wheat grains (Table 8.9). Barley rachis internodes were present in eight contexts and the better-preserved fragments were identified as 6-row barley. Emmer chaff was present in nine contexts; four of which also contained spelt chaff. The relatively large number of fills with charred cereals and charcoal suggests that the re-cut enclosure ditch on this side was used to dispose of domestic waste. This is corroborated by the presence of animal bone fragments and mussel shells in many of them. An oat grain was found in one of the post-holes beside the ditch (F269).

Only low numbers of charred cereals were preserved in the entrance terminals (Table 8.10). These included a few grains of wheat and hulled barley. Chaff of 6-row barley, emmer and spelt occurred, with spelt being the most abundant. By contrast, a diverse range of uncharred seeds was present in the waterlogged basal deposits [271] and, to a lesser extent, [272] of the northern terminal (Table 8.11). These are scored on a 1 to 5 scale (1 representing the lowest values, the highest). Nettles were abundant, and pale persicaria, sedges, and marsh pennywort were growing in and around the water. Ruderal taxa such as prickly sow-thistle, knotgrass and thistle will have occupied nearby areas of waste and disturbed ground. Buttercups, violets, pinks, cinquefoils, fat-hen and mosses were also common.

Table 8.11
Knowes: waterlogged plant remains from northern ditch terminal (relative abundance)

	Context	271	272
ecol	*Volume assessed (ml)*	200	30
wa	*Chenopodium album* (Fat-hen)	2	1
wr	*Cirsium* sp. (Thistle)	1	
wr	*Polygonum aviculare* (Knotgrass)	1	
wr	*Sonchus asper* (Prickly sow-thistle)	1	
wr	*Urtica dioica* (Common nettle)	5	1
ww	*Carex* sp. biconvex nutlet (Sedge)	1	
ww	*Carex* sp. trigonous nutlet (Sedge)	2	1
ww	*Hydrocotyle vulgaris* (Marsh pennywort)		1
ww	*Montia fontana* (Blinks)		1
ww	*Persicaria lapathifolia* (Pale persicaria)	3	
wx	Caryophyllaceae sp. (Pink family)	1	
wx	*Musci* spp. (Mosses)	2	
wx	*Potentilla* sp. (Cinquefoil)	3	1
wx	*Rumex acetosella* (Sheep's sorrel)		1
wx	*Ranunculus Ranunculus* (Buttercup)	2	1
wx	*Viola* sp. (Violet)	1	

Many of the cist fills contained charcoal, which might be from the funeral pyre, but very few other plant remains were found: a charred tuber of onion couch, a hazelnut shell fragment and two barley grains. The barley and hazelnut might represent the remains of food offerings placed on the pyre. Onion couch tubers, from ungrazed grassland, have often been found in Bronze Age cremations (Robinson 1988) and in this context, this grass may have been used as kindling. It is also suggested that they were collected for food (Godwin 1975). A barley seed and birch twig from [163] yielded overlapping, but statistically inconsistent, radiocarbon dates pointing to the early centuries AD (SUERC-10577; SUERC-10578).

Table 8.12
Knowes: charred plant remains from the interior (seeds/100 litres)

	Feature	*F342*	*F232*	*F234*	*F232 F292*	*F274*	*F301*	*F323*	*scoop F404*			*drain F140*	*pit F251*
	Context	138	139	147	293	296	310	367	330	331	368	142	265
ecol	*Volume floated (litres)*	22	5	42	5	29	5	5	5	5	5	15	5
cc	Cerealia indet. grain	46				4			20		80	73	
cc	*Hordeum* sp. grain (Hulled barley)	50				4			100	60		127	
cc	*Hordeum* sp. grain (Barley)	77	20	7				20				387	20
cc	*Triticum* sp. grain (Wheat)				20		20				60	53	
cs	*Hordeum* sp. rachis internode (Barley)	5										13	
cs	*Hordeum* sp. rachis internode (6-row barley)									40			
cs	*Triticum dicoccum* spikelet fork (Emmer)									20			
cs	*Triticum dicoccum* glume base (Emmer)											13	
cs	*Triticum spelta/dicoccum* spikelet base											20	
cs	*Triticum spelta* glume base (Spelt wheat)	9										7	
ch	*Danthonia decumbens* (Heath-grass)	9										40	
cr	*Persicaria maculosa* (Redshank)											13	
cr	*Plantago lanceolata* (Ribwort plantain)											13	
ct	*Corylus avellana* (Nutshell)											7	
cw	*Carex* sp. trigonous nutlet (Sedge)											67	
cx	Poaceae (Grass)	36							20			53	
cx	*Rumex acetosella* (sheep's sorrel)	18											
cx	*Rumex* sp. (Dock)	14										40	

Table 8.13
Knowes: charred plant remains from the circular structures (seeds/100 litres)

		CS1 area				*CS2 area*														
	Context	161	259	316	229	364	365	366	371	361	373	375	261	281	124	197	362	134	135	185
	Feature	F160	F160	F314	F284	F378	F378	F378	F370	F360	F372	F374	oven	oven	F128	F128	F128	F129	F129	F129
ecol	*Volume floated (litres)*	28	5	3	5	12	5	6	5	5	5	5	10	5	9	18	5	5	9	5
cc	*Avena* sp. grain (Oats)							17												
cc	Cerealia indet. grain	4	20		40	25	20	50	20	40	132	20	50	80	56	39		20	44	
cc	*Hordeum* sp. grain (Hulled barley)	4			20	42		50		60	434	20	610	360		139		40		
cc	*Hordeum* sp. grain (Barley)		20			8							40		100	22			11	
cc	*Triticum* sp. grain (Wheat)	4						17			38		50	20	33	28	20			20
cs	*Triticum dicoccum* spikelet fork (Emmer)												10							
cs	*Triticum spelta/dicoccum* spikelet base (Spelt/emmer)										19		50	40						
ca	*Raphanus raphanistrum* (Wild radish)				20															
cg	*Arrhenatherum elatius* ssp. *bulbosum* (Onion couch)					8														
cr	*Plantago lanceolata* (Ribwort plantain)										19		10	20	11					
ct	*Corylus avellana* (Nutshell)			33											11			20		
cw	*Carex* sp. trigonous nutlet (Sedge)										19									
cx	Poaceae (Grass)												10							
cx	*Rumex* sp. (Dock)								20										11	

The interior

Contexts associated with the deeper scoops generally yielded low numbers of charred plant remains (Table 8.12), implying that the area was kept relatively tidy. A few barley, wheat and indeterminate cereal grains were present in contexts associated with the western end of the scoop (F232), whilst chaff of 6-row barley, an emmer spikelet fork and more barley grains were in deposits used as levelling in scoop F404 at the eastern end. More grain, and barley and spelt chaff, as well grass seeds were recovered from material accumulating in scoop F342 north of the scoop entrance. The only context with a significant density of charred remains was the fill of the drain (F140) leading away from the scoop towards the enclosure ditch. Barley grains, chaff of both barley and wheat, and a variety of weed seeds were all present, suggesting that waste may have been dumped there after the drain passed out of use

Although a range of contexts was sampled in the area of CS1, few yielded charred remains, comprising some barley, a hazel nutshell fragment and a pod of wild radish (Table 8.13). However, several contexts associated with scoop F238 and CS2 did contain moderate numbers of charred remains, with high concentrations in the oven [261, 281]. These were again dominated by hulled barley grains with lesser numbers of indeterminate cereals and some wheat present. An emmer spikelet fork was recorded in [261] and spikelet bases of emmer or spelt were present in three contexts. Another onion couch tuber occurred the hollow F378 underlying CS2. Charred weed seeds included ribwort plantain, sedge, grasses and docks. The large number

Table 8.14
Knowes: charred plant remains from the external pit complex (seeds/100 litres)

	Feature	*F5*				
	Context	4	6	7	8	27
ecol	*Volume floated (litres)*	28	16	14	5	5
cc	Cerealia indeterminate grain	4	6	50	40	
cc	*Hordeum* sp. grain (Hulled barley)	21	38	50		
cc	*Hordeum* sp. grain (Barley)	4	31	200	20	
cc	*Triticum* sp. grain (Wheat)	4	25	50		
cs	*Hordeum* sp. rachis internode (Barley)			7		
cs	*Hordeum* sp. rachis internode (6-row Barley)			21		
cs	*Triticum dicoccum* glume base (Emmer)			21		
cs	*Triticum dicoccum* spikelet fork (Emmer)		6	7		
cs	*Triticum spelta* glume base (Spelt wheat)		6	50		
ch	*Danthonia decumbens* (Heath-grass)			50		
cr	*Plantago lanceolata* (Ribwort plantain)		6			20
cw	*Carex* sp. biconvex nutlet (Sedge)			7		
cw	*Carex* sp. trigonous nutlet (Sedge)			71		
cw	*Persicaria lapathifolium* (Pale persicaria)			7		
cx	Poaceae (Grass)			29		
cx	*Rumex* sp. (Dock)			21		

Table 8.15
Knowes: charcoal by context

Context	*Feature*	*Taxon*
102	F103	Alder
104	CS2	Alder; Oak
138	F340	Oak
124	CS2	Alder × 2; Oak
197	CS2	Alder; Oak
222	Cist	Oak
213	F212	Oak × 3
261	CS2 oven	Alder
344	CS2	Oak

of cereal remains associated with the oven suggests that at least one of its functions was as a grain-drier. Scoop F129 adjacent to CS2 yielded a few more cereal grains and another hazelnut fragment.

The external pit complex

The 12 samples from the pit complex outside the enclosure were dominated by coal and charcoal; only five samples yielded charred plant remains, all of them fills of scoop F5. Its upper fills, especially, contained moderate quantities of barley grains, with low numbers of 6-row and undifferentiated barley chaff, but also wheat grains and both emmer and spelt chaff (Table 8.14). Charred weed seeds were frequent in [7], including heath-grass, sedges, pale persicaria, grasses and docks, whilst ribwort plantain occurred in [6] and [27]. The results suggest that domestic waste, including fuel waste, was deposited in the scoop.

Charcoal

A number of charcoal samples recovered by hand were scanned at up to ×500 magnification to analyse the macroscopic and microscopic characteristics. Charcoal from 26 contexts was examined, of which 15 fragments were identified to species, all either alder or oak (Table 8.15). No signs of working were evident on any of the pieces, nor was any bark present. Over half the pieces came from CS2, perhaps reflecting their use as building material or firewood. Only alder was present in the oven, whilst a lump of oak charcoal from the cist implies that oak was among the wood used on the pyre.

Discussion

Cereal remains were only abundant in the fills of the western enclosure ditch, in the CS2 oven and in the drain (F140). These assemblages were very similar to one another. Barley and wheat chaff also occurred, but always in relatively low numbers compared to grain. In all cases, barley was the most frequently recorded taxon, and a large proportion of the grains were hulled. No naked barley was identified, but abrasion of the surface of the grains led to approximately 50% of them being recorded as undifferentiated. At least some, if not all, of the barley was from the 6-rowed variety

None of the wheat grains was securely identified to species, but spikelet forks and glume bases of emmer and spelt indicate that both taxa were in use. Although the numbers of emmer and spelt chaff fragments were low, they occurred in roughly similar proportions, neither appearing dominant. Emmer chaff was present in 11 contexts, while spelt occurred in eight and they occurred together in five. The chaff was often damaged and several glume bases could not be differentiated between emmer or spelt. Both species seem to have formed a component of the wheat used throughout the occupation. Single oat grains occurred in a post-hole by the western ditch and in the hollow F378 beneath CS2. Without chaff, it was not possible to identify if they were from a wild or cultivated species, but the low number implies that they were not grown as a crop.

In order to investigate whether crop processing was undertaken at Knowes, the ratios of chaff and weed seeds to grains were calculated. According to Hillman (1981), a ratio of 1 for the glume wheats would indicate the presence of complete ears, while a greater ratio would suggest fine sieving residue. For 6-row barley, a ratio significantly greater than 0.3 suggests winnowing or coarse sieving debris. In the same way, a higher proportion of weed seeds than grain would indicate crop-processing waste. The ratios were calculated for the 10 contexts with more than 50 items. The figures for emmer and spelt were combined and the barley was assumed to be all of the 6-row variety. All charred weed seeds were included, except those in the heathland and tree/shrub categories.

For the wheats, four contexts from the western enclosure ditch [9–11, 162], produced high ratios

(between 3.0–8.0). This suggests that some crop processing took place and that by-products were discarded in the ditch. The other wheat ratios ranged from 0.7 to 1.6 with an average of 1.1, suggesting that the crop was already to a large extent processed. The wheat seems to have been dried and stored as spikelets, as the ratio of the wheat associated with the oven was 1.2. For barley, three contexts from the western ditch [9– 11] had ratios above 0.3 (between 0.36–1.15); the remainder had lower values (between 0.03–0.11), suggesting that this barley was fully processed. The same three ditch samples had high ratios of weed seeds to grain (3.8–4.8) and so almost certainly include fine sieving debris, whereas the average for the rest was only 0.5, implying that fine sieving more often took place away from the site.

Hazelnuts were gathered as an additional food source and local hazel woodlands may have been coppiced to increase the productivity, but the low number of nutshells suggests they were not a dominant part of the diet. An onion couch tuber found in the cist burial might have been used as kindling for a funeral pyre. It also occurred in association with the oven in CS2, which may indicate that the tubers were also used as a food source.

A range of other seeds preserved through charring or waterlogging give a picture of the ecological habitats present at or near the site. *Danthonia decumbens* may have grown as an arable weed, or may indicate the presence of damp sandy or peaty acidic heathland (Stace 1997). Sheep's sorrel would also have grown on acid heath. Onion couch would have grown in ungrazed grassland areas that needed to be maintained by cutting to prevent its succession to scrub and woodland (Rodwell 1992). By contrast the occurrence of ribwort plantain, which is often associated with pasture (Behre 1986), suggests that domestic animals were grazing locally. Sedges and pale persicaria suggest areas of damp ground. These taxa may have been collected for bedding or thatching, or the sedge rhizomes may have been used for food. Ruderal taxa included docks, knotgrass and redshank, which would have grown on areas of disturbed, waste ground.

In summary, the botanical remains from Knowes imply the use of barley, emmer and spelt wheat throughout the occupation of the site. The greatest numbers of charred remains relate to the disposal of domestic waste and accidental charring of cereals in the CS2 oven. The proportion of chaff and of arable weeds to grains is generally low, suggesting that crop processing at the site was not the norm. Charred seeds suggest areas of damp ground and heathland nearby, in addition to grazed and ungrazed grassland.

EAST BEARFORD: THE WATERLOGGED PLANT REMAINS (JPH)

Bulk samples were taken from five contexts. Initial assessment established that four of them had little potential for charred plant remains, with only one indeterminate cereal grain fragment and one emmer glume [2] present, but a sample from the basal fill of the enclosure ditch [23] was obviously waterlogged and therefore analysed. Two litres of material was floated to 500 μm and the flot then kept wet.

The wet flot consisted almost entirely of a very fine amorphous organic material with some *Calluna* wood, shoots and flowers, occasional other woody fragments, bracken frond fragments and occasional large grass stems. A few *Daphne* ephyppia were present, as were moderate numbers of fragments of insects and the occasional fly puparium. For the volume of material sorted, seeds were surprisingly uncommon (Table 8.16).

Although the fine organic amorphous material might reflect plants growing around the ditch, the

Table 8.16
East Bearford: waterlogged seeds

Context	*23*
Volume processed (litres)	2
Persicaria lapathifolia	1
Urtica urens	3
Cirsium sp.	1
Potentilla erecta-type	1
Carex (lenticular)	1
Torilis sp.	2
Poaceae >4mm	2
Galium palustre	1
Stellaria alsine	1
Urtica dioica	1
Ranunculus repens	1

heather and bracken fragments seem more likely to represent material dumped there, although these heathland/moorland plants might have been growing locally if occupation was not particularly intense in the area. The *Daphnia* ephyppia indicate the presence of water. Some of the seeds are from damp-wet loving plants but generally on edges of fens or especially wet fields, for example the *Stellaria alsine, Galium palustre* and possibly the *Carex*. Otherwise the plants are rather broad in their preferred habitats although several grow best in nitrogen enriched soils, especially the *Urtica* species. *Urtica urens* and the *Polygonum* are also typical weeds and there must have been open ground nearby.

An attempt to radiocarbon date the emmer glume from [2] failed, but one on an alder twig from [23] suggests a Later Iron Age date for the ditch (SUERC-10626).

FOSTER LAW: THE CHARRED PLANT REMAINS (JPH)

Assessment of samples from 19 contexts in the Foster Law ditches suggested that three [4, 15, 53] were worth further effort, but in the event only [15] was processed in full.

The assessment of the stony spread over the top of the ditches [4] produced four barley grains (Table 8.17). Like the rest of the flot material, these were extremely silty, making any characteristic cell patterns extremely difficult to see. Brief treatment in an ultra sonic bath removed a little silt, but the underlying charcoal was so fragile that it, too, broke up, so no further work was undertaken on this context.

The upper fill [15] of the recut inner ditch yielded several hulled barley grains, a spelt glume base and a few weed seeds, along with quite a few fragments of twigs or small roundwood, cindery charcoal and occasional metallic honeycomb debris. Much of the charcoal was heavily abraded. Another spelt glume was recorded from the primary fill [53] of the inner ditch. Radiocarbon dates suggest that this was dug in the Earlier Iron Age (Chapter 9), but that the recut belongs to the Later Iron Age (SUERC-10635). A hulled barley grain from the basal fill [13] of the outer ditch proved to be modern (SUERC-10630) and must have fallen into the ditch.

The limited plant remains indicate that both hulled barley and spelt wheat were being used at Foster Law, possibly grown in the case of the wheat given that only chaff survives. The few weeds indicate reasonably well-manured soil with hints of waste ground.

Table 8.17
Foster Law: charred plant remains (seeds/100 litres)

	Context	*4*	*15*	*17*	*25*	*27*	*43*	*53*
ecol	*Volume floated (litres)*	5	25	5	5	5	5	5
cc	Cerealia indet.				20		20	40
cc	*Hordeum* (hulled) grain	60	28					
cc	*Hordeum* indet	20						
cs	*Triticum* glume base							20
cs	*Triticum spelta* glume base		4					20
cr	*Plantago lanceolata*					20		
cr	*Rumex obtusifolius*-type		8					
ct	*Corylus avellana* nutshell			20				20
cw	*Persicaria lapathifolia*		4					
cx	Poaceae 2-4mm		4					

EAST LINTON: THE CHARRED PLANT REMAINS (CO'B)

The 19 samples taken from the three ditches and palisade at East Linton produced very low volumes of flot, in which charred plant macrofossils were virtually absent. A single charred wheat seed from the basal fill [21] of the inner ditch was dated to the Late Bronze Age (SUERC-10627), as was birch charcoal from the palisade [24] (SUERC-10628). Pieces of birch charcoal were also identified in [21] and in the recut [30] of the middle ditch, but this yielded an Iron Age date (SUERC-10629).

ANIMAL BONE

LOUISA GIDNEY

None of the TLEP sites yielded animal bones in any quantity, the generally acidic soils of the region clearly being anything but conducive to the preservation of faunal remains. Minimal amounts of fragmentary animal bone – mostly calcined bone, or teeth and tooth enamel – were found, mostly hand recovered on site, but some from the environmental samples.

At Standingstone, various ditch, palisade and pit fills yielded a small amount of very fragmentary calcined animal bone, none of which could be identified apart from a charred cattle tooth from the Late Bronze Age ditch [101]. A single cattle tooth from the fill [38] of the main enclosure ditch (F1) was similarly the only identifiable item from Whittingehame.

Foster Law yielded a small group of bones, mostly tooth or tooth enamel with the remains of one long bone, all of them from the Iron Age inner ditch (F31), in most cases at the entrance (F30). Both cattle and horse are definitely represented (Table 8.18).

Knowes was the only site to yield a modest assemblage, and even this comprised only one box. Preservation was presumably aided by the lighter, sandy soils, although even here conditions were clearly still hostile to bone survival, since the greater part of the fragments recovered had been burnt to a white, calcined, stable state. There were a few unburnt finds, mostly decomposing flakes of tooth enamel, but also some long bone fragments.

The species positively identified at Knowes are cattle, horse and sheep/goat. There is a strong possibility that pig is also present, but no unequivocal evidence. The western ditch (F103) was the most prolific source of identifiable remains. These were principally teeth of horse and cattle, and in several cases suggest the deposition of tooth rows in skulls or mandibles, the bone of which has long since decayed. The comparatively high proportion of horse teeth is of interest in suggesting a substantial component of non-household refuse being dumped in the ditch. Other finds from here include definite sheep/goat and possible pig bone fragments. The upper ditch fill [276] produced a concentration of winkle and mussel shells.

Table 8.18
Animal bone from TLEP sites

Species	*TWT*	*TST*	*TFL*	*TKN*
cow	•	•	•	•
sheep/goat				•
horse			•	•
pig				?
indet	•	•	•	•
winkle; mussel				•

The two house areas produced few recognisable finds. Despite this, it is of interest that scoop F128 produced definite sheep/goat teeth, while scoop F160 yielded identifiable cattle teeth. None of the burnt bone from the cist in the southern ditch terminal (F221) could be positively identified as animal.

Shell fragments and a fish scale were also found in a sample taken one of the undated features (F19) outside the enclosure at East Bearford. A fragmentary large mammal longbone from a late field drain was the only other find there. Nothing was recovered at East Linton.

ENVIRONMENTAL SYNTHESIS

All told, 360 bulk samples were taken from the six TLEP sites, all but 43 coming from Knowes, Standingstone and Whittingehame. Methodology was the same across the sites with, initially, 5-litre sub-samples being assessed. Those that produced moderate numbers of seeds were normally taken to full analysis. The validity of this approach was tested at Whittingehame, where a randomly selected group

Table 8.19
Summary of plant remains from TLEP sites

Taxon	*TFL*	*TKN*	*TST*	*TWT*	*Total*
Cerealia indet	4	175	46	252	477
Avena grain		2	3	207	212
Avena awn			16	4	20
Hordeum indet.	1	214	27	79	321
Hordeum naked			6		6
Hordeum hulled	10	327	69	625	1031
Hordeum rachis internode		27	18	2	47
Hordeum 6-row rachis internode		37	10		47
Hordeum basal internode		3	2		5
Triticum sp(p). grain		80	19	5	104
Triticum dicoccon		3	7	4	14
Triticum dicoccon spikelet fork		9	18		27
Triticum dicoccon glume base		45	51	1	97
Triticum spelta glume base	2	29	7		38
Triticum sp. spikelet base		20			20
Triticum glume base	1	13	16	2	32
Triticum aestivum internode				1	1
Triticum brittle rachis internode		2	4		6
Culm nodes		1	4	1	6
Arrhenatherum elatius ssp. *bulbosum*		2			2
Bromus sp(p). grain			4	3	7
Calluna vulgaris twig		1			1
Carex (lenticular)		26	3	1	30
Carex (trigonous)		82	1	3	86
Chenopodiaceae undiff.			3	1	4
Chenopodium album		12	3	8	23
Chrysanthemum segetum				1	1
Cirsium sp.		1			1
Compositae (head/pappus)				14	14
Corylus avellana nutshell	2	10	29	14	55
Danthonia decumbens		157	7	1	165

Table 8.19 (continued)

Taxon	*TFL*	*TKN*	*TST*	*TWT*	*Total*
Empetrum nigrum fruit		1			1
Fallopia convolvulus			2	3	5
Fucus – thallus/frond			1	97	98
Galeopsis tetrahit				2	2
Galium aparine			2		2
Legume < 4mm				7	7
Malus/Pyrus			6		6
Mentha sp.		1			1
Montia fontana		1			1
Persicaria lapathifolia	1	19	2	6	28
Persicaria maculosa		2			2
Pisum sativum				2	2
Plantago lanceolata	1	12	5	1	19
Poaceae	1	80	11	2	94
Polygonaceae undiff.		3	4	7	14
Polygonum aviculare		1			1
Polygonum convolvulus		1			1
Potentilla erecta		1			1
Pteridium aquilinum			2		2
Ranunculus repens-type		1		1	2
Raphanus raphanistrum pod		1	1		2
Rumex acetosella		4			4
Rumex obtusifolius-type	2	29	1	7	39
Stellaria media				1	1
Veronica hederifolia		3			3
Vicia sp.		1			1
Total	25	1439	410	1365	3239
Total volume processed (samples with material)	55	678	348	435	1516
Average items/litre	0.5	2.1	1.2	3.1	2.1

of barren samples was fully processed as a control. No more than the occasional seed was recovered and it was decided that, for these types of soils, assessment of 5-litre sub-samples was an efficient way to proceed. This would not necessarily apply to other sites or soils, but it is suggested that such a methodology is tested elsewhere.

Many samples produced few if any plant remains limiting the interpretation of some of the sites. East Linton produced no useful assemblage of plant remains, but given the Late Bronze Age date on the single wheat grain from the inner ditch, supported by another from the palisade, it is disappointing that no other grain was recovered. East Bearford seems likely to be contemporary with Knowes, but the single emmer glume base had too low a graphite yield for dating. This overview of crop husbandry practices will therefore focus on the three main sites and Foster Law, which between them represent well over three millennia of activity from the Neolithic to the start of the Early Historic period.

In almost all cases preservation of plant remains was by charring with uncontroversial evidence of waterlogging found only in the base of the ditches at East Bearford and Knowes. The remains from East Bearford suggest dumping of heather and bracken into the ditch, but otherwise little indication of anything except ruderal communities nearby. Knowes likewise yielded primarily ruderal taxa. The water flea egg cases at East Bearford suggest the presence of water in the ditch at least temporarily, but there was no evidence for standing water over any length of time.

As expected of charred assemblages, cereal grains and chaff were the most commonly recovered taxa. There were, however, only approximately 4200 plant remains in the four main assemblages, reducing to just over 3200 when the cache of burnt grain from Standingstone is excluded (Table 8.19). This equates on average to only 2.1 seeds/litre, with Whittingehame ironically exhibiting the highest recovery rate of the three main sites despite having the most intractable soils, although this is largely due to the grain-rich samples from the latest phase.

Barley (*Hordeum* sp) was by far the most commonly recovered grain, representing 45% of the total assemblage and 72% of the identified cereals, with most being the hulled variety. A small amount of naked barley was present at Standingstone. All determinable rachis internodes were from the 6-row *Hordeum vulgare*, which is the most commonly recovered barley until the medieval period. Wheat (*Triticum* spp) represented less than 11% of the assemblage and oats (*Avena*) only 7%. No oat chaff was present and therefore it is not possible to say whether the oats were cultivated or wild, although the low numbers at Knowes and Standingstone point towards wild. Nearly all the oats came from the mid-first millennium AD occupation at Whittingehame, where they formed around 23% of the identified grains. Oats become more common from the first centuries AD and by the seventh century AD can be dominant, which possibly reflects the generally accepted downturn in climate at this time (Lamb 1981). Wheat grains are not reliably determined to species (Hillman *et al.* 1996), but the chaff shows that both emmer (*Triticum dicoccon*) and spelt (*T. spelta*) were being used.

Even without the cache, emmer is most abundant at Standingstone in terms of both chaff and grains. The grains showed the characteristic high dorsal ridge and slight twist over all. Spelt and emmer are more or less equally represented at Knowes, which might well reflect the Late Iron Age to Roman date of the site. This would fit with Standingstone, where spelt is only present in contexts relating to the Later Iron Age occupation, and Foster Law, where it was associated with the later enclosure. Evidence from Port Seton (Huntley 2000) and several sites in north-east England (Van der Veen 1992) points to emmer remaining the dominant wheat until the Roman period north of the River Tyne. This dominance is further emphasised when Whittingehame is considered; although hardly any identifiable cereals were recovered from the earlier phases of occupation, emmer is the only wheat certainly present in the late phase, although it has to be admitted, in very low numbers.

Evidence for other crops or foodstuffs is rare – two peas (*Pisum sativum*), fragments of apple (*Malus*), and hazel nut (*Corylus avellana*). The latter two were almost certainly growing around the area. Weed seeds are not common in any of the sites. This may reflect the lack of crop processing debris in any quantity although, as suggested for Whittingehame, it also might reflect poor preservation. In terms of percentage of the grain + chaff + weed assemblage however, weeds vary with Foster Law = 25% of 20 seeds, Knowes = 36% of 1240 seeds, Standingstone = 22% of 225 seeds and Whittingehame = 6% of 1243 seeds. Those that are present demonstrate presence of well-manured, nutrient enriched soils with some damp areas and some grassland. Turves are almost certainly represented at all sites to some degree. The few weeds characteristic of more modern deposits

are only present in Whittingehame, for example *Chrysanthemum segetum*, the corn marigold.

For the wider region, the obvious comparator is Port Seton – on the coast just over 10km from Foster Law and a little over 20km from Knowes – where two major assemblages of plant remains were studied. At both Fishers Road West and East, the main activity lay in the late centuries BC and early centuries AD, with some later agriculture (Haselgrove and McCullagh 2000). They therefore coincide closely with Knowes and have a significant overlap with other TLEP sites. Their plant remains, too, were dominated by barley, but spelt wheat was quite an important component at Fishers Road East, as evidenced by its chaff (Huntley 2000), whilst naked barley was recorded at Fishers Road West (Miller *et al.* 2000). Both Port Seton sites produced a little bread wheat (but with one sample radiocarbon dated to the Later Iron Age, the other Early Historic) and somewhat more oats. As with the TLEP sites, seed concentrations at Port Seton were generally low: at Fishers Road East, they averaged 1.8 seeds per litre, whilst weeds represented 35% of 5422 grain + chaff + weed seeds.

Barley is the most commonly recovered cereal throughout and oats only seem to be a definite crop at Whittingehame. In other respects, Whittingehame appears conservative in its use of cereals; whilst spelt never became a dominant crop at any of the TLEP sites, even the post-Roman occupants of the enclosure did not seem to use it at all. This raises the question whether they were essentially practising animal husbandry and relying on trade with other sites for cereals; alternatively they may only have been using the abandoned site for very specific purposes (Chapter 3). Knowes and Standingstone seem to have produced wheat for themselves, although still a minority crop. Whittingehame is different too, in the small amount of weed seeds recovered, although this might be partly due to poor preservation.

Turning briefly to animal husbandry, the only faunal assemblage of any consequence, from Knowes, confirms that its inhabitants kept cattle, horses and sheep/goat and had access to coastal resources. Only the remains of large, robust species are present at the other sites: cattle and horse at Foster Law, cattle at both Whittingehame and Standingstone. If the Port Seton sites with their better preserved and more plentiful assemblages are any guide, sheep is likely originally to have been the commonest species by number, at least in the Iron Age phases, and pig, dog and deer would all also have been expected (Hambleton and Stallibrass 2000; O'Sullivan 2000). Large domestic mammals also dominated the similarly poorly preserved faunal assemblages from the later prehistoric A1 sites, which did however yield more records of sheep/goat as well as some definite identifications of pig: at Biel Water, Eweford Cottages and South Belton (Lelong and MacGregor 2007, 127).

In summary, the TLEP sites fit well within the subsistence pattern in lowland Scotland so far as there is one. Barley is the most frequent cereal with rather less wheat. Both emmer and spelt are present, with hints that spelt became more common in the Later Iron Age, although emmer is clearly preferred at all sites studied. Little evidence of specific crop processing stages was apparent at site level, but the presence of moderate amounts of chaff suggests local production. There do seem to be differences between Whittingehame and the other TLEP sites, including the presence of seaweed in some quantity; these may relate to the late date of the main deposits sampled there and/or nature of activity in the enclosure in the post-Roman period, as well as poor preservation.

Chapter 9

Absolute Dating

DEREK HAMILTON and COLIN HASELGROVE

INTRODUCTION

As at other prehistoric settlements in East Lothian, it was anticipated that relatively little material culture would be recovered in the TLEP excavations, so that establishing chronologies for each site would depend on obtaining an adequate number of radiocarbon dates from suitable contexts. This of course is no easy undertaking, since the survival rate of dateable material such as animal bone, let alone *in situ* structural remains, was unlikely to be any better – as proved to be the case. In order as far as possible to offset this and to maximize the recovery of carbonised material which could ultimately be used for radiocarbon dating, bulk soil samples were taken routinely from all contexts and subsequently screened in the laboratory, at the same time fulfilling another key objective, that of reconstructing the agricultural economy (Chapter 8). This strategy had proved successful at Fishers Road, Port Seton, enabling developments at the adjacent enclosures to be related chronologically (Haselgrove and McCullagh 2000). Whilst relying heavily on cereal seeds and other items from bulk samples is certainly not without difficulties – their taphonomy can never be as certain as single-entity samples from an *in situ* deposit – it does also have some advantages, notably the relative ubiquity of such material and the enhanced possibilities for economic reconstruction opened up by directly dating individual cultigens.

Dating strategy

Following completion of the fieldwork and post-excavation phasing of the individual sites, a detailed radiocarbon dating strategy was developed and submitted to Historic Scotland for approval. For the three main excavations, at Whittingehame Tower, Standingstone and Knowes, the radiocarbon programme was designed as far as possible to provide an overall chronological framework for each site within which estimates of the start, end, and duration of activity at the sites, and for specific horizons or features, could be made. In the case of the three evaluations, at East Bearford, Foster Law, and East Linton, the objectives were limited to dating when the major enclosure features within the limited areas explored were open.

In line with the principles set out by Ashmore (1999), short-lived, single entity samples were employed for dating. Ideally, only samples with a clear relationship to their context would have been selected, but this was rarely possible for the TLEP sites. There were hardly any cases of organic waste that had been put fresh into their context or even of probable structural charcoal in the fill of post-holes, let alone identifiable charcoal from a short-lived species such as hazel. The presumed primary deposits were not without their problems either: the grain cache from Standingstone was recovered by flotation, whilst the human bone fragments from the Knowes cist turned out to be much older than the other contents!

The taphonomic relationship between a sample and its context is the most hazardous step in the whole dating process, since the mechanisms by which a sample came to be in its context are always a matter of interpretative decision rather than certain knowledge. With the TLEP sites, this was compounded by most of the dated material having derived from bulk soil samples, rather than being found *in situ*, although both the environmental sampling and dating strategy were constructed to mitigate the twin risks of contamination and residuality as far as possible. Samples were routinely taken from the base of deposits, any which contained modern cultivars or uncarbonised plant remains were rejected, and contexts directly beneath the ploughsoil avoided unless no alternative existed. To reduce the risk of residuality, cereal grains and crop-processing waste were privileged for dating, since such fragile items are less likely to survive long periods of exposure or repeated episodes of transport and/or redeposition than robust materials such as twigs. The environmental analysis detected no obvious indicators of grain spread from a cache or other single act of deposition, as seems to have occurred in an Early Bronze Age context at

Eweford (Lelong and McGregor 2008, 90–1). Dates were as far as possible spread spatially and by species.

With any dating programme, demonstration of consistency in the results is important. Second dates were therefore sought from deposits mixing two cereals or other species to test whether they were of the same actual age, providing a check on the 'security' of the context and also answering archaeobotanical questions about whether the crops might have been cultivated together (Chapter 8). To test for consistency, a chi-square test is run on the results following the method of Ward and Wilson (1978). Where two or more radiocarbon measurements from a single context or archaeological phase are consistent at 95%, it is possible that the material dated is the same actual age or derived from a relatively short period of activity. If the measurements are not consistent, this is frequently the result of residual or intrusive material.

In the event, the intended dating strategy had to be significantly modified. A substantial number of environmental samples proved barren of carbonized plant remains of any kind and those cereal seeds that were recovered were often in appalling condition. This had an impact both on sample selection and subsequent processing. At both Whittingehame Tower (19) and Knowes (26), the number of samples submitted was less than originally intended and at all the main sites, the dating of some key contexts could not be addressed. This was compounded by the very poor condition of the botanical material. As many as one third (33.7%) of the 86 samples initially submitted either broke up during pre-treatment or proved too small for dating. Most of these were replaced by other samples from the same context, but nine dates were lost altogether. The final failure rate was worst at Standingstone (5), where the material was in particularly wretched condition – for example, not only the original sample, but all the replacement hulled barley from the cache [46] dissolved in pre-treatment, although happily the emmer seed did yield a date.

These difficulties had a differential effect on the main sites. At Standingstone – which had the largest number of samples originally (31) – and Knowes, there are still enough dates from key contexts to generate a reasonable overall framework and permit probabilistic modelling, but only 15 dates are available at Whittingehame and these are nearly all from late contexts. An indication of just how far it proved necessary to depart from the intended dating strategy is the relatively low proportion of determinations on cereals: 75% at Knowes – a reflection of the lighter sandier soils here – but falling to 40% at Whittingehame, 39% at Standingstone and a mere 14% for the three evaluations. The other samples consisted mainly of birch charcoal and charred hazel nutshells, along with small quantities of waterlogged alder and hazel, charred seaweed, human bone, and a cattle tooth.

Results and calibration

All the samples were submitted to the Scottish Universities Environmental Research Centre, East Kilbride (SUERC). The samples were pre-treated following standard methods, with the exception of three samples of cremated human bone, which were processed as outlined by Lanting *et al.* (2001). They were then graphitised using the methods outlined in Slota *et al.* (1987) and measured by Accelerator Mass Spectrometry (AMS), as described by Xu *et al.* (2004). SUERC maintains continual programmes of quality assurance procedures, in addition to participation in international inter-comparisons (Scott 2003). These tests indicate no laboratory offsets and demonstrate the validity of the measurements quoted.

In total, 77 radiocarbon age determinations were obtained from the TLEP sites, all but seven from the three main excavations. The results are given in Tables 9.1–9.4 and are quoted in accordance with the Trondheim convention (Stuiver and Kra 1986) as conventional radiocarbon ages (Stuiver and Polach 1977). Calibrated date ranges were calculated using the calibration curve of Reimer *et al.* (2004) and OxCal v4.0.5 (Bronk Ramsey 1995; 1998; 2001) and are cited in the text (here and in other chapters) at 95% confidence. They are quoted in the form recommended by Mook (1986), with the end points rounded outwards to 10 years if the error term is greater than or equal to 25 radiocarbon years, or to five years if it is less. The ranges quoted in italics in Tables 9.1–9.3 and in the text are posterior density estimates derived from mathematical modelling of archaeological problems (see below). The ranges in plain type in Tables 9.1–9.4 have been calculated according to the maximum intercept method (Stuiver and Reimer 1986). All other ranges are derived from the probability method (Stuiver and Reimer 1993).

Methodological approach

A Bayesian approach to the interpretation of the chronology has been applied to all three main sites (Buck *et al.* 1996).

Although simple calibrated dates are accurate estimates of the age of samples, this is not usually what archaeologists really wish to know. It is the dates of the archaeological events represented by those samples that are of interest. At Standingstone, for example, it is the chronology of the enclosure and of the start and end of the use of the site in general that is under consideration, not the dates of individual samples. The dates of this activity can be estimated not only by using the absolute dating from the radiocarbon measurements, but also by using the stratigraphic relationships between samples and the relative dating information provided by the archaeological phasing.

Fortunately, methodology is now available which allows the combination of these different types of information explicitly, to produce realistic estimates of the dates of archaeological interest. It should be emphasized that the posterior density estimates

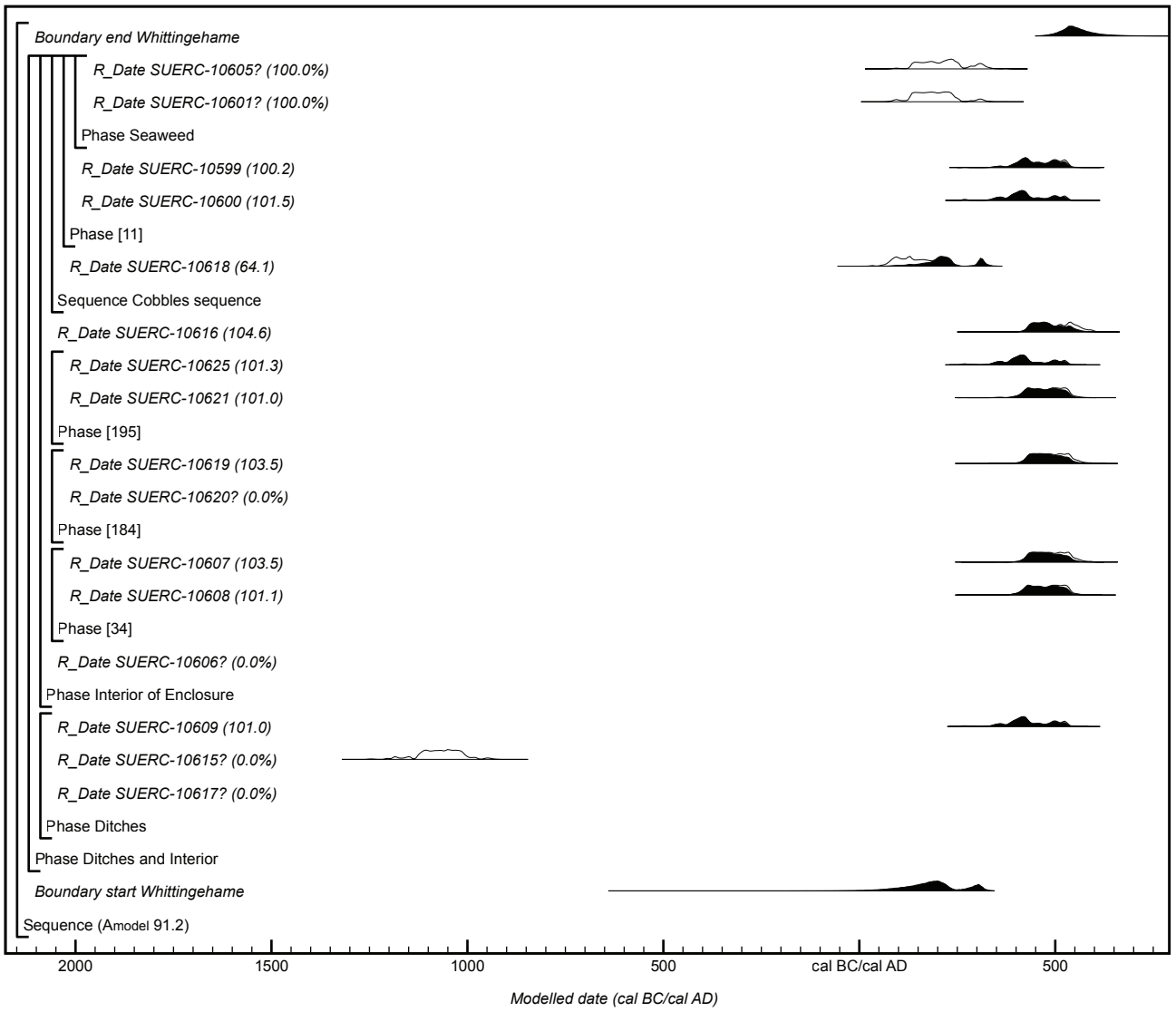

Figure 9.1

Probability distributions of dates from Whittingehame Tower. For each of the radiocarbon measurements two distributions have been plotted, one in outline, which is the result of simple calibration, and a solid one, which is based on the chronological model used. The other distributions correspond to aspects of the model. For example, the distribution '*Boundary end*' is the estimated date for the end of activity, based upon the radiocarbon results. The large square 'brackets' along with the OxCal keywords define the overall model exactly. The model structure is described in the text

Table 9.1
Radiocarbon results from Whittingehame Tower

Lab ID	*Sample ID*	*Context interpretation*	*Material type*	*Radiocarbon age (BP)*	*$\delta^{13}C$ (‰)*	*Calibrated date (95% confidence)*	*Posterior density estimate (95% probability)*
SUERC-10599	TWT02 11a	Over later cobbled surface	Charred grain, hulled barley	1615 ± 35	−21.4	cal AD 350–550	*cal AD 350–370 (2%)* or *cal AD 380–540 (93%)*
SUERC-10600	TWT02 11b	Over later cobbled surface	Charred hazel nutshell	1635 ± 35	−24.2	cal AD 330–540	*cal AD 330–540*
SUERC-10601	TWT02 11c	Over later cobbled surface	Charred seaweed	1820 ± 35	−16.4	cal AD 80–330	*cal AD 80–260 (91%)* or *cal AD 290–330 (4%)*
SUERC-10605	TWT02 11d	Over later cobbled surface	Charred seaweed	1800 ± 35	−15.3	cal AD 120–340	*cal AD 120–340*
SUERC-10606	TWT02 20	Post-hole F19	Charred grain, barley	235 ± 35	−22.8	cal AD 1520–1960	–
SUERC-10607	TWT02 34a	Post-hole F33 beside pit F85	Charred grain, hulled barley	1570 ± 35	−23.1	cal AD 410–570	*cal AD 410–550*
SUERC-10608	TWT02 34b	Post-hole F33 beside pit F85	Charred grain, emmer type	1590 ± 35	−21.9	cal AD 400–560	*cal AD 400–550*
SUERC-10609	TWT02 38	Main ditch recut F258, upper fill	Charcoal, birch	1630 ± 35	−25.0	cal AD 340–540	*cal AD 340–540*
SUERC-10610	TWT02 55	Hollow F54	Charcoal, hazel	1660 ± 30	−26.6	cal AD 250–530	*cal AD 260–290 (4%)* or *cal AD 320–440 (89%)* or *cal AD 480–530 (2%)*
SUERC-10611	TWT02 63	Outer ditch recut F255; overdug?	Charcoal, parenchyma	52,900 ± 1400	−23.3	Beyond calibration	–
SUERC-10615	TWT02 103	Main ditch, lowest fill of recut F258	Charcoal, birch	2885 ± 30	−25.7	1200–940 cal BC	*1200–970 cal BC (94%)* or *960–940 cal BC (1%)*
SUERC-10616	TWT02 106	Pit complex F85, lower fill	Charred grain, cereal	1550 ± 35	−20.7	cal AD 420–590	*cal AD 420–570*
SUERC-10617	TWT02 111	Outer ditch recut F255, lowest fill	Charcoal, birch	4490 ± 35	−25.2	3350–3030 cal BC	*3350–3080 cal BC (93%)* or *3060–3030 cal BC (2%)*
SUERC-10618	TWT02 118	Repair to first cobbled surface	Charred grain, hulled barley	1870 ± 35	−21.8	cal AD 60–240	*cal AD 90–260 (76%)* or *cal AD 290–340 (19%)*
SUERC-10619	TWT02 184a	Post-pit F182	Charred grain, oat	1570 ± 35	−24.0	cal AD 410–570	*cal AD 410–550*
SUERC-10620	TWT02 184b	Post-pit F182	Charred pea	160 ± 35	−28.1	cal AD 1660–1960	–
SUERC-10621	TWT02 195a	Post-pit F193	Charred grain, hulled barley	1590 ± 35	−23.1	cal AD 400–560	*cal AD 400–550*
SUERC-10625	TWT02 195b	Post-pit F193	Charred grain, emmer type	1635 ± 35	−22.8	cal AD 330–540	*cal AD 330–540*

produced by this modelling are not absolute. They are interpretative estimates, which can and will change as further data become available and as other researchers choose to model the existing data from different perspectives. The technique used is a form of Markov Chain Monte Carlo sampling, and has been applied using the program OxCal v4.0.5 (http://c14.arch.ox.ac.uk/). Details of the algorithms employed by this program are available in Bronk Ramsey (1995; 1998; 2001) or from the on-line manual. The algorithm used in the models described below can be derived from the structures shown in Figures 9.1, 9.3, and 9.6.

SITES, SAMPLES AND MODELS

As elsewhere in the volume, the results from the three main sites are considered first in the order of excavation, followed by the results for the three evaluations.

Whittingehame Tower

A total of 18 dates were obtained and are shown graphically in Figure 9.1, excluding SUERC-10611, which most likely represents contamination through over-digging into natural (ironically, the parenchyma sample was preferred to a piece of oak heartwood charcoal from the sample fill, owing to the longevity of the latter species). The Bayesian approach has been adopted with some caution at Whittingehame, as not enough dates were obtained from the earlier stages of occupation in the interior to provide a reliable estimate for the start of activity. While the model presented is likely to provide poor estimates for the start of all activity at Whittingehame, most of the dated deposits appear to be part of the same phase of activity, which is characterized by an abundance of charred cereals and other burnt remains. The model ought therefore to estimate the start of this phase of activity and when the site went out of use fairly accurately.

Only three samples were available from the main enclosure ditches. Birch charcoal from the base [111] of the recut outer ditch yielded a Neolithic date (SUERC-10617); a second piece from the base [103] of the recut main ditch gave a Late Bronze Age date (SUERC-10615). At face value, there is no reason not to accept these dates, but the possibility of residuality cannot be ruled out, especially as there are no comparable dates elsewhere on the site. They are therefore excluded from the model in Figure 9.1, as denoted by the ? next to the laboratory number. A third piece of birch charcoal from higher in the fill of the main ditch [38] appears, however, to be contemporary with dated activity in the interior and is therefore retained (SUERC-10609).

No dates were obtained from the small inner ditch or other internal features underlying the first cobbled surface. Stratigraphically, the earliest dated sample from the interior was a barley seed from secondary cobbling [118] (SUERC-10618). This deposit may be a repair to the earliest cobbles, or part of the second surface. On either view, this date gives a *terminus post quem* for a series of deposits rich in charred remains that subsequently accumulated over the later surface, and, what is more, one consistent with the abraded piece of later second century AD samian, found on the later surface.

Four samples came from the deposits over the second surface [11]: a charred hazelnut shell (SUERC-10600), one barley grain (SUERC-10599) and two of charred seaweed (SUERC-10601, SUERC-10605). The latter samples were submitted to investigate whether any marine reservoir effect could be observed. This does seem to be the case, since the four dates are not statistically consistent ($T' = 8.3$; $\nu = 3$; $T'(5\%) = 7.8$), whereas the pair of measurements on the seaweed ($T' = 0.2$; $\nu = 1$; $T'(5\%) = 3.8$) is consistent, as are the barley and hazelnut ($T' = 0.2$; $\nu = 1$; $T'(5\%) = 3.8$). The laboratory expected an even older date (G Cook pers. comm.), but *fucus* is an inter-tidal variety and would obtain carbon from both the ocean and the atmosphere, thus reducing the influence of the former (Chapter 8). Given these uncertainties, no attempt has been made to correct the radiocarbon ages of the seaweed, and they have been excluded from the model. The measurements on the barley and hazelnut are inconsistent with the barley from the underlying cobbles, suggesting that this derives from a different phase of occupation ($T' = 33.1$; $\nu = 2$; $T'(5\%) = 6.0$).

The remaining dates derive from features surrounding the surfaces, many of which were again rich in charred remains. They include three from the pit complex (F85): a single charred cereal grain from the lower fill [106] (SUERC-10616) and two from post-hole F33, which may be part of a screen (SUERC-10607, SUERC-10608). All three measurements are statistically consistent ($T' = 0.7$; $\nu = 2$; $T'(5\%) = 6.0$) so these samples could be of the same actual age. The pit was infilled after the later paved surface was laid, but could have been in use at the same time. Also of note is a pair of dates from pit F193 – one on emmer, the other on barley (SUERC-10621, SUERC-10625)

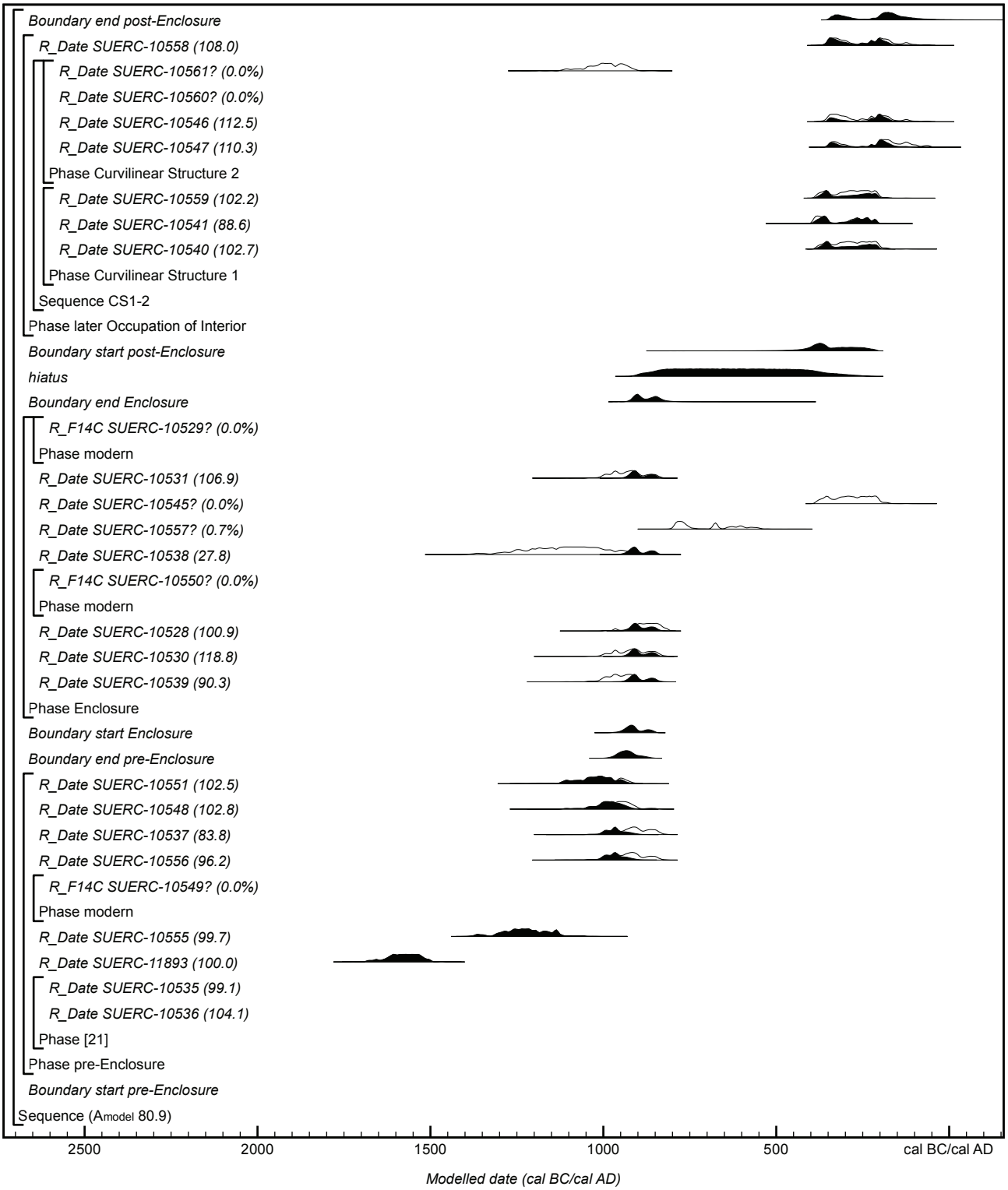

Figure 9.2
Probability distributions of dates from Standingstone. The model structure is as described in Figure 9.1

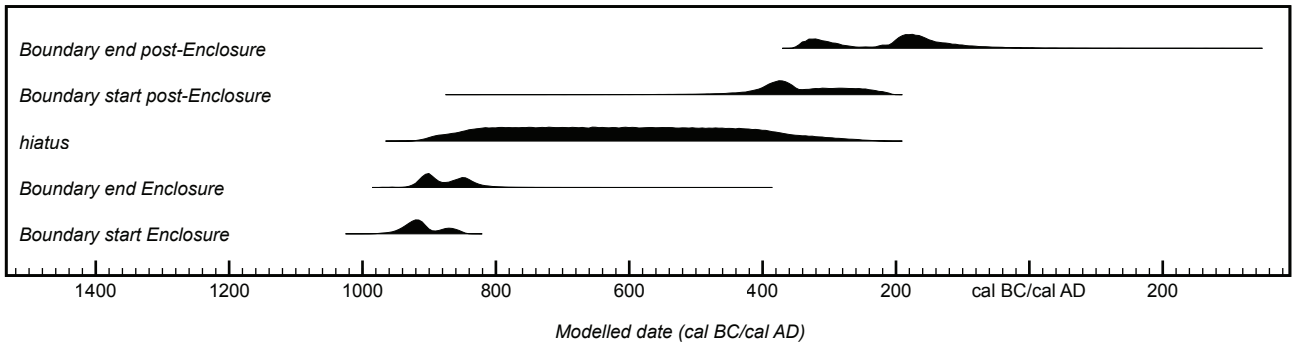

Figure 9.3
Probabilities for the start and end of two identified phases of activity along with the date for the hiatus in activity between use of the enclosure ditch and the post-enclosure interior features at Standingstone, as derived from the model shown in Figure 9.2

– since emmer is not normally thought to be have been cultivated at such a late date. The two measurements are statistically consistent (T' = 0.8; ν = 1; T'(5%) = 3.8). A barley grain from post-hole F19 is either intrusive or the feature is post-medieval (SUERC-10606). A charred pea from post-pit F182 also yielded a post-medieval date (SUERC-10620), but as this feature is beneath the later trackway and yielded an oat of much earlier date (SUERC-10619), the pea is likely to be intrusive. These post-medieval dates are excluded from the model.

The model places the radiocarbon dates into a phase of activity with the only stratigraphy being that SUERC-10618 can be placed at an earlier stage of the stratigraphic sequence in the interior than [11]. The model has good agreement (A_{model} = 91.2%) and estimates that the phase of activity which gave rise to the richer archaeobotanical samples began by *cal* AD *30–330* (*95% probability*; *start Whittingehame Tower*; Figure 9.1), but perhaps in *cal* AD *120–230* (*59%*) or *cal* AD *290–320* (*9%*). Dated activity at the site ended in *cal* AD *470–670* (*95% probability*; *end Whittingehame Tower*), but probably in *cal* AD *510–590* (*68%*).

Standingstone

A total of 26 results were obtained and are shown graphically in the model in Figure 9.2. Due to the very poor condition of botanical material from the site, this is significantly fewer than had originally been hoped for, but they nevertheless provide a good overall framework for the site. Despite all the precautions, three samples proved to be modern (SUERC-10529, SUERC-10549, SUERC-10550) and are excluded from the model.

Eight results are available from seven unrelated pre-enclosure contexts. The two from pit F56 (SUERC-10535, SUERC-10536) are statistically consistent (T' = 0.5; ν = 1; T'(5%) = 3.8), with SUERC-10536 providing the best estimate for the date of the feature. A further seven measurements come from contexts that were not stratigraphically related, but are assigned to the construction and occupation of the enclosure, including fills and features associated with the palisade and ditch. The seven measurements are not consistent (T' = 213.0; ν = 6; T'(5%) = 12.6). Two of the results (SUERC-10545 and SUERC-10557) are too young when compared to the other results and presumably represent later material incorporated in these deposits when the site was reoccupied. After excluding these, the remaining results are consistent (T = 4.3; ν = 4; T'(5%) = 9.5). Finally, eight samples are available from an equivalent number of contexts associated with the three curvilinear structures. Again the results are not consistent (T' = 2188.1; ν = 7; T'(5%) = 19.1), but after excluding SUERC-10560 and SUERC-10561 as residual material incorporated in the fills of later features, the remaining measurements are statistically consistent (T' = 8.9; ν = 5; T'(5%) = 11.1).

The model places the radiocarbon results into three groups based on archaeological phasing (e.g. the various pre-enclosure features; the enclosure phase; and the later curvilinear structures) and has good overall agreement (A_{model} = 80.9%) with the stratigraphic relationships of the various samples. Figure 9.3 estimates that the construction of the enclosure began in *960–850 cal*

Table 9.2
Radiocarbon results from Standingstone

Lab ID	*Sample ID*	*Context interpretation*	*Material type*	*Radiocarbon age (BP or FM)*	*$\delta^{13}C$ (‰)*	*Calibrated date (95% confidence)*	*Posterior density estimate (95% probability)*
SUERC-10528	TST03 8	Post-hole F7 cut into outer palisade F555	Charred grain, hulled barley	2735 ± 35	–23.5	980–810 cal BC	*940–830 cal BC*
SUERC-10529	TST03 10	Palisade F13	Charred grain, hulled barley	1.2383 ± 0.0052	–27.0	cal AD 1950–1990	Intrusive modern grain
SUERC-10530	TST03 12	Post-hole F11, palisade F13	Charred grain, *Triticum*	2770 ± 35	–22.9	1010–830 cal BC	*940–840 cal BC*
SUERC-10531	TST03 14	Palisade F13, upper fill	Charcoal, birch	2780 ± 35	–25.5	1010–830 cal BC	*940–840 cal BC*
SUERC-10535	TST03 21a	Pit F56	Charred grain, naked barley	4120 ± 35	–25.4	2880–2570 cal BC	*2860–2800 cal BC (10%)* or *2780–2570 cal BC (85%)*
SUERC-10536	TST03 21b	Pit F56	Charred grain, hulled barley	4085 ± 35	–24.8	2870–2490 cal BC	*2860–2810 cal BC (7%)* or *2760–2560 cal BC (78%)* or *2540–2490 cal BC (10%)*
SUERC-10537	TST03 46b	Grain cache in scoop F45, foundation deposit?	Charred grain, emmer type	2770 ± 35	–21.6	1010–830 cal BC	*1030–890 cal BC*
SUERC-10538	TST03 49	Middle fill of ditch terminal F3	Charred tooth, cattle	2900 ± 75	–20.0★	1370–900 cal BC	*950–840 cal BC*
SUERC-10539	TST03 60	Post-hole F61, next to palisade	Charred hazel nutshell	2790 ± 35	–26.4	1020–830 cal BC	*950–840 cal BC*
SUERC-10540	TST03 82	CS1, sunken floor feature F79	Charcoal, birch	2215 ± 35	–24.9	390–200 cal BC	*380–200 cal BC*
SUERC-10541	TST03 94	CS1, gully F106	Charcoal, hazel	2270 ± 35	–27.8	400–200 cal BC	*400–340 cal BC (36%)* or *320–200 cal BC (59%)*
SUERC-10545	TST03 104	Palisade F103	Charred hazel nutshell	2215 ± 35	–23.6	390–200 cal BC	Intrusive in earlier context
SUERC-10546	TST03 110	Second cut of CS2 gully (F360)	Charcoal, hazel	2170 ± 35	–25.5	370–110 cal BC	*360–280 cal BC (32%)* or *270–150 cal BC (63%)*
SUERC-10547	TST03 130	CS2, sunken floor feature F451	Charred grain, emmer type	2145 ± 35	–23.0	360–50 cal BC	*360–280 cal BC (31%)* or *260–110 cal BC (64%)*
SUERC-10548	TST03 132	Post-hole F131, inside palisade	Charcoal, birch	2815 ± 35	–25.6	1110–840 cal BC	*1080–900 cal BC*
SUERC-10549	TST03 140	Post-hole F139	Charred grain, hulled barley	1.4418 ± 0.0061	–26.5	cal AD 1960–1980	Intrusive modern grain
SUERC-10550	TST03 146	Post-hole F145	Charred grain, hulled barley	1.4420 ± 0.0057	–26.2	cal AD 1960–1980	Intrusive modern grain

Table 9.2 (continued)

Lab ID	*Sample ID*	*Context interpretation*	*Material type*	*Radiocarbon age (BP or FM)*	*$\delta^{13}C$ (‰)*	*Calibrated date (95% confidence)*	*Posterior density estimate (95% probability)*
SUERC-10551	TST03 197	Post-hole F196, outside enclosure, pair to F200	Charcoal, hazel	2850 ± 35	–25.6	1130–910 cal BC	*1130–930 cal BC*
SUERC-10555	TST03 228	Pit F227, cut by enclosure ditch	Charcoal, birch	2985 ± 35	–25.3	1380–1090 cal BC	*1380–1110 cal BC*
SUERC-10556	TST03 231	Pit F230, near palisade end	Charcoal, hazel	2780 ± 35	–25.2	1010–830 cal BC	*1030–900 cal BC*
SUERC-10557	TST03 253	Enclosure ditch F273, upper fill	Charred hazel nutshell	2555 ± 35	–22.3	810–540 cal BC	
SUERC-10558	TST03 298a	CS3, sunken floor feature F297	Charred grain, emmer type	2165 ± 35	–24.4	370–100 cal BC	*370–160 cal BC*
SUERC-10559	TST03 329	CS1, post-hole F328 at end of gully F106	Charcoal, birch	2225 ± 35	–24.9	390–200 cal BC	*390–200 cal BC*
SUERC-10560	TST03 345	CS2, first cut of gully F359	Charred hazel nutshell	3815 ± 35	–24.5	2560–2140 cal BC	Residual in later context?
SUERC-10561	TST03 462	CS2, second cut of gully F360	Charred hazel nutshell	2835 ± 35	–23.6	1120–900 cal BC	Residual in later context?
SUERC-11893	TST03 233b	Cinerary urn F232	Cremated bone, human	3300 ± 35	–24.4	1680–1490 cal BC	*1680–1500 cal BC*

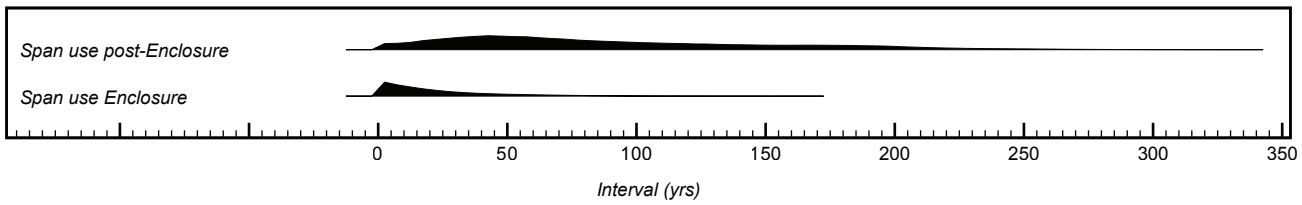

Figure 9.4
Probabilities for the spans of use for the enclosure ditch, post-enclosure interior features, and estimated length of hiatus at Standingstone, as derived from the model shown in Figure 9.2

BC (*95% probability*; *start Enclosure*), and probably in *950–900 cal BC* (*60% probability*) or *880–860 cal BC* (*8% probability*). Its use finished in *940–800 cal BC* (*95% probability*; *end Enclosure*), and probably in *920–880 cal BC* (*38% probability*) or *870–830 cal BC* (*30% probability*). The overall span of enclosure activity was *1–80 years* (*95% probability*; *use Enclosure*; Figure 9.4) and probably *1–30 years* (*68%*). There was then a hiatus between the use of the enclosure and the later re-occupation represented by the curvilinear structures, which lasted between *380–690 years* (*95% probability*) and probably between *450–620 years* (*68%*). The building of the curvilinear structures began in *470–200 cal BC* (*95% probability*; *start post-Enclosure*; Figure 9.3), and probably in *410–340 cal BC* (*38% probability*) or *330–250 cal BC* (*30% probability*). This activity ended in *360–50 cal BC* (*95% probability*; *end post-Enclosure*), and probably in *350–290 cal BC* (*22% probability*) or *210–120 cal BC* (*46% probability*). The overall span of activity associated with these structures was *1–220 years* (*95% probability*; *use post-Enclosure*; Figure 9.4) and probably *1–120 years* (*68%*).

Even if further samples had been available from post-enclosure contexts, it is unlikely they would have overcome the bi-modality seen in the posterior distributions. Simulations with up to two-dozen additional dates were run and suggested that very little extra precision would be gained without the addition of stratigraphic constraints.

Knowes

A total of 25 measurements are available from the enclosure ditch and scooped settlement at Knowes. The results are shown graphically in Figure 9.5. One date is modern (SUERC-10581) and has been excluded from further modelling. The occupation may be separated into two phases. The enclosure ditch was certainly dug first, but was almost certainly not completely infilled when the scooped settlement was occupied. As such, the model allows for the possibility of overlap between the start of the scooped settlement and the final use of the ditch circuit.

Dates were obtained from sections through the western ditch and the northern terminal of the eastern ditch. Taking the western ditch first, three dates are from the basal fill [162, 189] of the first recut (SUERC-10575, SUERC -10576, SUERC -10580); a fourth is from the primary fill [146] of the second recut (SUERC-10569); whilst the last derives from one of its higher fills [132] (SUERC-10567). While these samples form a vertical sequence, all five measurements are statistically consistent ($T' = 2.6$; $\nu = 4$; $T'(5\%) = 9.5$) and could be the same age, suggesting that deposition was fairly rapid. The samples from the northern terminal consist of four from the recut ditch, two of them from the lowest fill [271], one of them barley, one waterlogged hazel (SUERC-10587, SUERC-10588), and two from an overlying deposit of sand [272], both charred barley (SUERC-10589, SUERC-10590). As with the western ditch, all four measurements are statistically consistent ($T' = 4.4$; $\nu = 3$; $T'(5\%) = 7.8$), implying that, here too, deposition was fairly rapid.

All the results from the ditch fills were subjected to a chi-square test, but were found not to be statistically consistent ($T' = 19.4$; $\nu = 8$; $T'(5\%) = 15.5$). Results from a preliminary run of the model suggested that SUERC-10590 was not in the correct position. Given the archaeological evidence and the fact that the measurement passes tests of consistency within its smaller group, it seems likely to be an outlier. After excluding the date, the model shows that there is only a *0.5% probability* of the measurement being correct, or in the correct position.

A total of 14 radiocarbon results was obtained from the features associated with the scooped settlement.

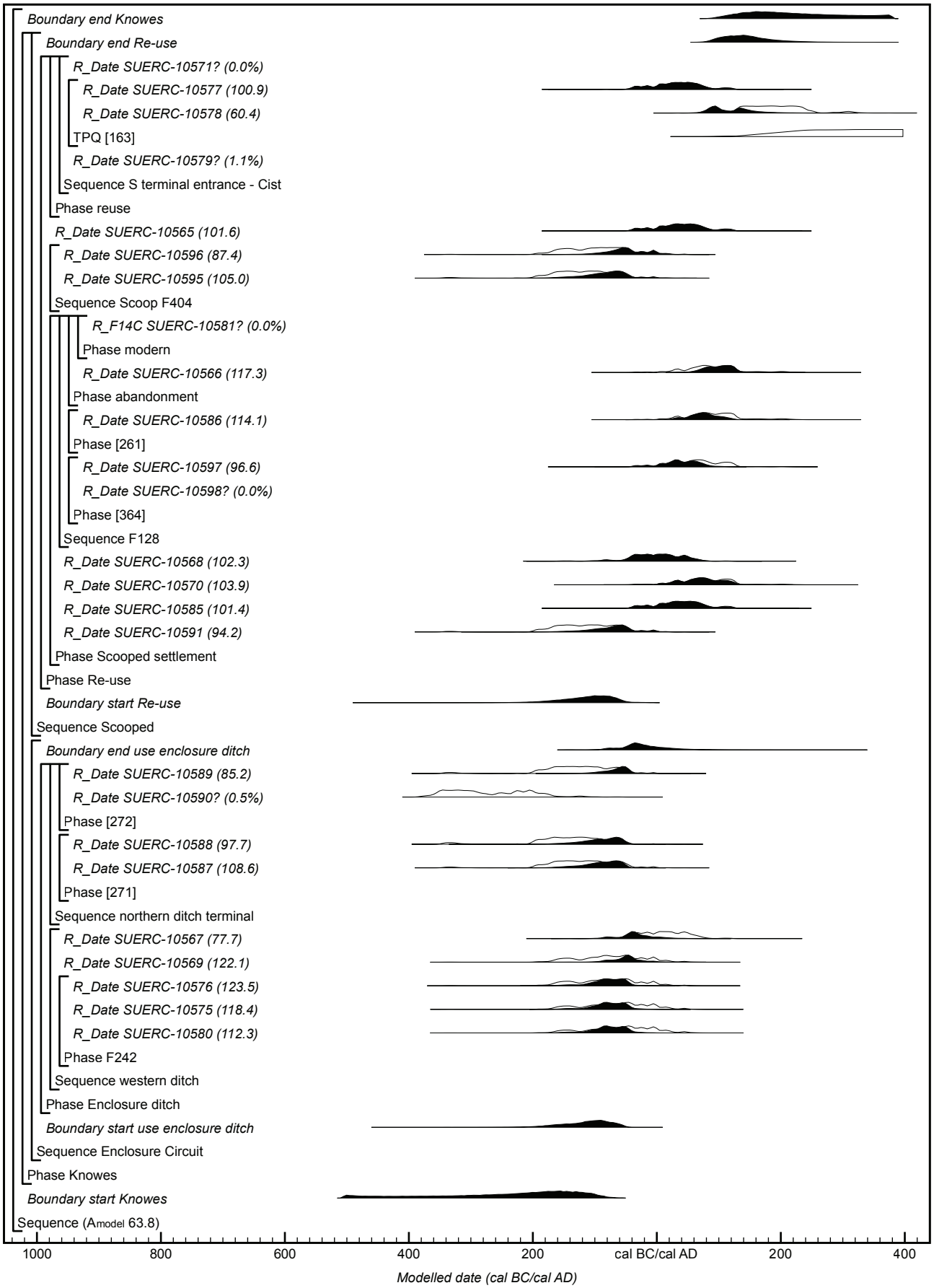

Figure 9.5
Probability distributions of dates from Knowes: the model structure is as described in Figure 9.1

Table 9.3
Radiocarbon results from Knowes

Lab ID	*Sample ID*	*Context interpretation*	*Material type*	*Radiocarbon age (BP or FM)*	*$\delta^{13}C$ (‰)*	*Calibrated date (95% confidence)*	*Posterior density estimate (95% probability)*
SUERC-10565	TKN03 7	External pit complex NNW of enclosure	Charred grain, wheat	1960 ± 35	–22.8	50 cal BC–cal AD 130	*40 cal BC–cal AD 90 (91%)* or *cal AD 100–120 (4%)*
SUERC-10566	TKN04 124	Silt within CS2	Charred hazel nutshell	1915 ± 35	–25.0	cal AD 1–220	*cal AD 50–160*
SUERC-10567	TKN04 132	Western ditch, higher fill of 2nd recut F243	Charred grain, wheat	1990 ± 35	–22.8	90 cal BC–cal AD 90	*100 cal BC–cal AD 30*
SUERC-10568	TKN04 135	Scoop F129, fill	Charred grain, barley	2000 ± 35	–21.0	100 cal BC–cal AD 80	*60 cal BC–cal AD 80*
SUERC-10569	TKN04 146	Western ditch, primary fill of 2nd recut F243	Charred grain, wheat	2055 ± 35	–22.6	170 cal BC–cal AD 30	*100 cal BC–cal AD 10*
SUERC-10570	TKN04 147	Main scoop F232, behind revetment wall	Charred grain, barley	1925 ± 35	–22.4	40 cal BC–cal AD 210	*cal AD 1–120*
SUERC-10571	TKN04 149	Cist, upper fill	Cremated bone, human	2405 ± 35	-17.9	750–390 cal BC	–
SUERC-10575	TKN04 162A	Western ditch, primary fill of 1st recut F242	Charred grain, barley	2050 ± 35	–23.7	170 cal BC–cal AD 30	*160–30 cal BC*
SUERC-10576	TKN04 162B	Western ditch, primary fill of 1st recut F242	Charred grain, wheat	2060 ± 35	–23.1	180 cal BC–cal AD 20	*160–30 cal BC*
SUERC-10577	TKN04 163A	Cist, middle fill	Charred grain, barley	1965 ± 35	–22.1	50 cal BC–cal AD 130	*50 cal BC–cal AD 90 (92%)* or *cal AD 100–120 (3%)*
SUERC-10578	TKN04 163B	Cist, middle fill	Charcoal, birch	1825 ± 35	–25.9	cal AD 80–320	*cal AD 60–200*
SUERC-10579	TKN04 187	Cist, lower fill	Cremated bone, human	2305 ± 35	–21.8	420–210 cal BC	–
SUERC-10580	TKN04 189	Western ditch, primary fill of 1st recut F242	Charred grain, wheat	2045 ± 35	–22.6	170 cal BC–cal AD 30	*160– 20 cal BC*
SUERC-10581	TKN04 197	CS2, deposit over floor	Charred grain, barley	1.3140 ± 0.0055	–24.8	cal AD 1950–1990	Intrusive modern grain
SUERC-10585	TKN04 229	Scoop F284, fill	Charred grain, barley	1960 ± 35	–22.6	50 cal BC–cal AD 130	*50 cal BC–cal AD 120*
SUERC-10586	TKN04 261	CS2, fill of oven	Charred grain, barley	1915 ± 35	–23.5	cal AD 1–220	*cal AD 20–130*
SUERC-10587	TKN04 271A	Northern ditch terminal, lowest fill of recut F405	Charred grain, barley	2095 ± 35	–22.8	340–1 cal BC	*160–40 cal BC*

Table 9.3 (continued)

Lab ID	*Sample ID*	*Context interpretation*	*Material type*	*Radiocarbon age (BP or FM)*	*$\delta^{13}C$ (‰)*	*Calibrated date (95% confidence)*	*Posterior density estimate (95% probability)*
SUERC-10588	TKN04 271B	Northern ditch terminal, lowest fill of recut F405	Waterlogged wood, hazel	2110 ± 35	–27.1	350–40 cal BC	*160–40 cal BC*
SUERC-10589	TKN04 272A	Northern ditch terminal, sand over 271	Charred grain, barley	2100 ± 35	–23.0	350–40 cal BC	*120–20 cal BC*
SUERC-10590	TKN04 272B	Northern ditch terminal, sand over 271	Charred grain, barley	2185 ± 35	–23.8	380–160 cal BC	–
SUERC-10591	TKN04 296	Scoop F232, sand below paving F274	Charred grain, barley	2090 ± 35	–23.0	210–1 cal BC	–
SUERC-10595	TKN04 330	Scoop F404, levelling for 3rd cobbles 248	Charred grain, barley	2090 ± 35	–24.1	210–1 cal BC	*160 cal BC–cal AD 10*
SUERC-10596	TKN04 331	Scoop F404, levelling for 3rd cobbles 248	Charred grain, barley	2075 ± 35	–22.3	200 cal BC–cal AD 10	*120 cal BC–cal AD 30 (94%)* or *cal AD 40–50 (1%)*
SUERC-10597	TKN04 364a	Scoop F238, hollow F378	Charred grain, barley	1935 ± 35	–21.3	40 cal BC–cal AD 140	*40 cal BC–cal AD 90*
SUERC-10598	TKN04 364b	Scoop F238, hollow F378	Charcoal, onion couch	2860 ± 35	–27.2	1130–910 cal BC	Residual in this context

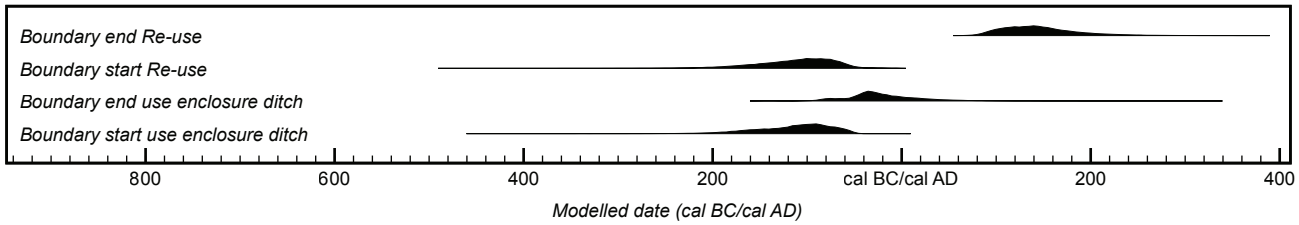

Figure 9.6
Probabilities for the start and end of the two spatially identified phases of activity at Knowes, as well as the beginning and end of the overall use of the site as derived from the model shown in Figure 9.5

Two came from sand [330, 331] used as bedding for the third of four surfaces [248] in scoop F404 near the entrance (SUERC-10595, SUERC-10596). Three more came from elsewhere within the central scooped area: one from beneath the tumbled revetment along the northern edge of scoop F284 (SUERC-10585), a second from behind the revetment of scoop F232 (SUERC-10570), and a third from sand [296] below paving in the northern part of the same scoop (SUERC-10591).

Another group of four dates came from contexts within the western scoop F238 and CS2. Two were obtained from the fill [364] of a shallow depression F378 in the base of the scoop (SUERC-10597, SUERC-10598), but SUERC-10598 has been excluded from the modelling as it is 1000 years too early and is clearly reworked material. A third came from deposits [261] within the CS2 oven (SUERC-10586), providing a date for the use of the structure, whilst a fourth came from silt [124] that accumulated after the structure went out of use (SUERC-10566). Another date came from the smaller adjacent scoop F129, to the west (SUERC-10568).

Four dates were obtained from the contents of the stone cist inserted in the top of the southern terminal of the enclosure ditch after this had almost completely filled up. Two of the measurements are on fragments of cremated human bone from the lower [187] and upper [149] fills (SUERC-10579, SUERC-10571), whilst the other two were on charred barley and birch charcoal from the middle [163] fills of the cist (SUERC-10577, SUERC-10578). The cremated bone turned out to be not only much older than the charcoal in the middle fill, but also older than the dated material found in other ditch sections, suggesting that it is curated or redeposited. The two dates on the human bone have therefore been excluded from the model, whilst those from middle fill have been retained, providing a *terminus post quem* for the filling of the cist.

Finally, a single date was obtained from charred wheat found in the pit complex F5, 30m north of the enclosure (SUERC-10565), suggesting that it is contemporary with the settlement.

The model shown in Figure 9.5 has good agreement ($A_{model} = 63.8\%$) with the stratigraphic relationships of the samples. Based upon this, it estimates that the enclosure was constructed by *200–50 cal BC* (*95% probability*; *start use enclosure ditch*; Figure 9.6) and probably by *140–60 cal BC* (*68%*). The ditch was open for *1–230 years* (*95% probability*; *span enclosure ditch*;

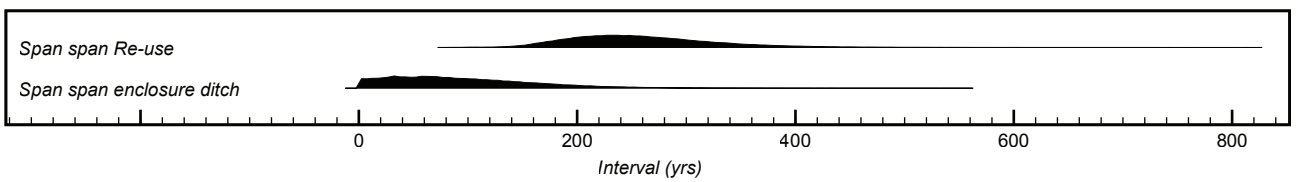

Figure 9.7
Probabilities for the spans of use for the enclosure ditch, post-enclosure interior features, and the site as a whole for Knowes, as derived from the model shown in Figure 9.5

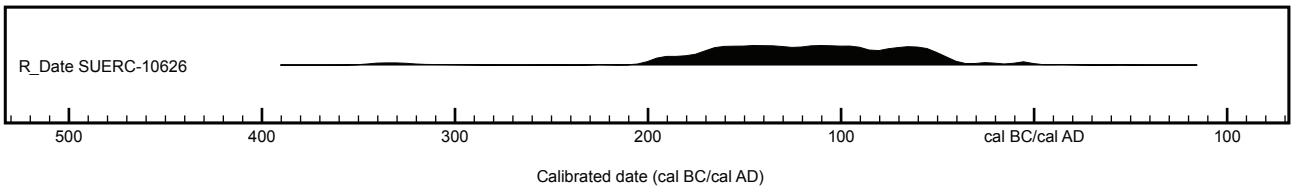

Figure 9.8
Calibrated radiocarbon date for East Bearford

Figure 9.7) and probably *1–120 years* (*68%*). It was largely infilled by *100 cal BC–cal AD 70* (*95% probability*; *end use enclosure ditch*; Figure 9.6), probably in the period *60 cal BC–cal AD 20* (*68%*).

The use of the interior represented by the scooped settlement and associated features began in *220–40 cal BC* (*95% probability*; *start Re-use*; Figure 9.6) and probably in *150–60 cal BC* (*68%*). The scooped settlement persisted for *140–410 years* (*95% probability*; *span Re-use*; Figure 9.7), ending in *cal AD 80–230* (*95% probability*; *end Re-use*; Figure 9.6) and probably in *cal AD 90–170* (*68%*). The model estimates that there is a *97% probability* that the scooped settlement was constructed while the enclosure ditch was still open.

The evaluations

Dates were also obtained from the enclosure ditches of the three evaluated sites, although the programme was limited by a lack of suitable samples from relevant contexts. A single date from a waterlogged alder twig in the basal fill [23] of the enclosure ditch at East Bearford (SUERC-10626) is consistent (Figure 9.8) with the dates from the very similar rectilinear enclosure at Knowes. At Foster Law (Figure 9.9), samples from the primary fill in different sections of the inner ditch [27, 53] both yielded Earlier Iron Age dates (SUERC-10631, SUERC-10636), whilst a third from the fill of the possible recut [51] higher up the ditch produced one in the Later Iron Age (SUERC-10635). Unfortunately, a barley grain submitted from the basal fill [13] of the earlier, outer ditch had a modern result and must have fallen in (SUERC-10630).

Three dates were obtained for the multivallate enclosure at East Linton (Figure 9.10). Charred wheat from the primary fill [21] of the inner ditch and birch charcoal from the fill [24] of the palisade trench both produced Late Bronze Age dates (SUERC-10627;

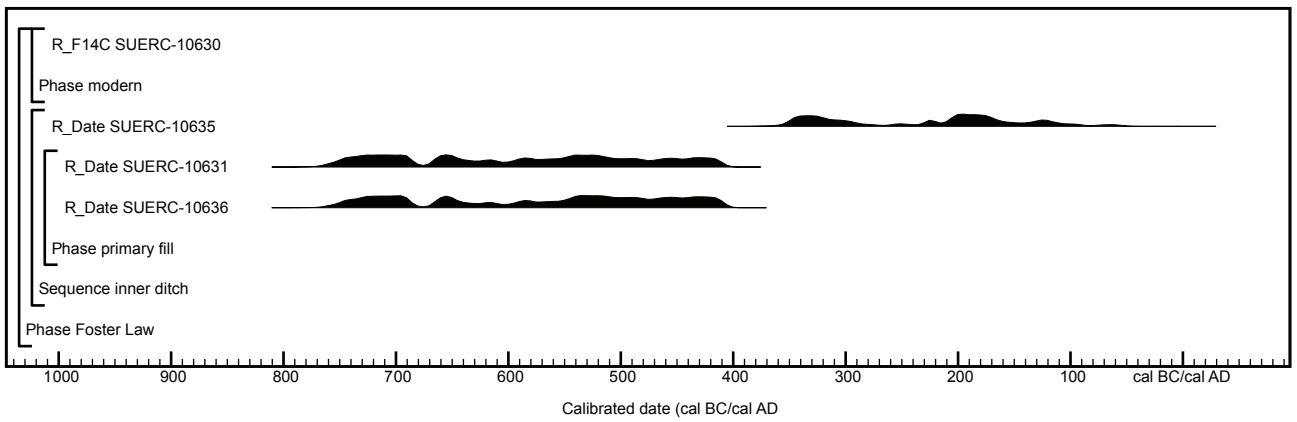

Figure 9.9
Calibrated radiocarbon dates for Foster Law

Table 9.4
Radiocarbon results from the evaluations

Lab ID	*Sample ID*	*Context Interpretation*	*Material Type*	*Radiocarbon Age (BP or FM)*	*$\delta^{13}C$ (‰)*	*Calibrated date (95% confidence)*
EAST BEARFORD						
SUERC-10626	TEB02 23	Enclosure ditch F22, basal fill	Waterlogged alder twig	2095 ± 35	–26.6	340–1 cal BC
FOSTER LAW						
SUERC-10630	TFL03 13	Outer ditch F14, basal fill	Charred grain, hulled barley	1.9323 ± 0.0081	–22.2	cal AD 1960–1970, evidently intrusive
SUERC-10631	TFL03 27	Inner ditch terminal F30 (=F21), primary fill	Charcoal, ?hazel twig	2455 ± 35	–25.0	760–410 cal BC
SUERC-10635	TFL03 51	Inner ditch F21, fill of recut F18	Charcoal, twig	2155 ± 35	–28.4	360–60 cal BC
SUERC-10636	TFL03 53	Inner ditch F21, primary fill	Charred hazel nutshell	2445 ± 35	–23.5	760–400 cal BC
EAST LINTON						
SUERC-10627	TEL04 21	Inner ditch F5, primary fill	Charred grain, wheat	2975 ± 35	–24.0	1370–1050 cal BC
SUERC-10628	TEL04 24	Palisade F25	Charcoal, birch	2910 ± 35	–24.5	1260–1000 cal BC
SUERC-10629	TEL04 30	Middle ditch F26, basal fill of recut F29	Charcoal, birch	2235 ± 35	–25.4	390–200 cal BC

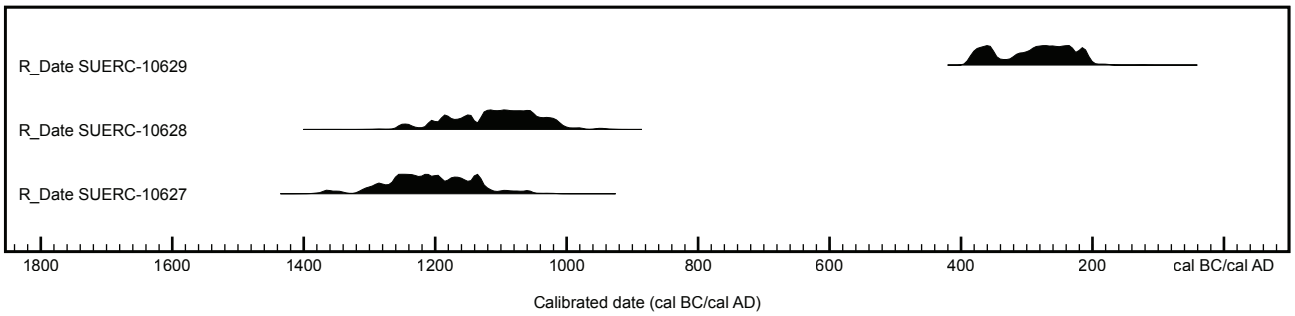

Figure 9.10
Calibrated radiocarbon dates for East Linton

SUERC-10628), whilst birch charcoal from the base [30] of the recut middle ditch yielded a Later Iron Age date (SUERC-10629), comparable to that from the recut ditch at Foster Law.

DISCUSSION

Despite fewer determinations being obtained than we would have liked, the scientific dating programme has proved extremely valuable both for individual sites and by highlighting some consistent patterns across a number of TLEP sites. At site level, the most important outcomes are undoubtedly, first, the tight dating of the Standingstone enclosure to the ninth century cal BC; second, the dating of the secondary occupation to the Later Iron Age, and third, the identification at Whittingehame of a late phase of re-use in the fifth and sixth centuries cal AD. None of these would have been inferred on either morphological or material grounds. Without scientific dating, the abandonment of Whittingehame would probably have been put in the second to third century cal AD on the basis of the worn samian platter from what is stratigraphically one of the latest contexts on the site. At the same time, the dates obtained directly on cereals from the site have made a significant contribution to our knowledge of crop husbandry in the coastal plain, on the one hand furnishing persuasive evidence for the continued cultivation of emmer at an unexpectedly late date in this part of Scotland, on the other indicating that oats were introduced here by the mid-first millennium cal AD.

Standing back from the individual sites, certain broader patterns are apparent. At least three of the TLEP enclosures apparently originated in the Late Bronze Age rather than the Iron Age, since there are Late Bronze Age dates from East Linton and Whittingehame as well as Standingstone. The first enclosure at Foster Law might well date to this period too, since the primary fill of the later enclosure yielded Early Iron Age dates, but this is not certain. The Later Iron Age was another period of enhanced enclosure, with the ditch circuits at two TLEP sites showing evidence of refurbishment at this period (East Linton, Foster Law), whilst other sites seem to be new foundations, including the two rectilinear enclosures investigated in the TLEP (East Bearford, Knowes); the ditched enclosure at Eweford Cottages and the small palisaded homestead at Biel Water on the A1 (Lelong and McGregor 2007); and both enclosures at Fishers Road (Haselgrove and McCullagh 2000).[1] As in many parts of Britain (Haselgrove *et al*. 2001; Haselgrove and Pope 2007), the Earlier Iron Age is notable for its low profile, with only the second enclosure at Foster Law and midden material from a scoop at South Belton on the A1 (Lelong and McGregor 2007) having produced determinations of this date.

At several TLEP sites, the construction and refurbishment of the enclosures were merely episodes in a much longer history of human activity at the particular locations. At Standingstone and Whittingehame, frequentation of the locale goes back at least to the Neolithic, and all three extensively-excavated enclosures were used on some scale after their ditch circuits ceased to be maintained. At Knowes, intensive occupation continued for up to two centuries after the ditch had largely filled up, a pattern we also find at Eweford Cottages on the A1 (Lelong and McGregor 2008) and probably – from the finds in the top of ditches – at Foster Law. In contrast, there was a hiatus of anything from four to six centuries at Standingstone between the short-lived enclosure

and the establishment in the later Iron Age of a new settlement inside the silted up ditch circuit. Finally at Whittingehame, intensive activity involving cereals is attested within the remains of the enclosure as late as the mid-first millennium cal AD, although owing to the lack of dates from earlier contexts, it is unclear quite how this relates to the earlier occupation or whether or not there was a hiatus between the enclosure and the later phases of occupation in the interior.

At Whittingehame, the dates from the ditches unfortunately raised more questions than they answered. Once again, this highlights the risks in relying on a handful of radiocarbon dates to establish the chronology of any site, as too many excavators still do (Haselgrove *et al*. 2001), rather than obtaining enough determinations to construct a rigorous model. The problem is compounded if, as at Whittingehame and some other TLEP sites, the dates are obtained on a substance like birch charcoal that could easily have been disturbed from a much earlier context and redeposited, rather than on a sample with a more certain taphonomy. The waterlogged alder twig from the base of the ditch at East Bearford, for example, seems less likely to have been disturbed from a context centuries or even millennia earlier than the ditch, so that the single date that it yielded – or more strictly, the *terminus post quem* it provides for the silty clay above the waterlogged horizon – is not only consistent with the plentiful evidence from Knowes, but can probably be relied upon as reasonably secure.

NOTE

1. The first two enclosure phases at Fishers Road West are undated and might be earlier, whilst Fishers Road East appears to have originated as an open settlement.

Chapter 10

The Traprain environs in a regional perspective

DAVID C COWLEY

INTRODUCTION

This chapter sets out aspects of the detailed investigations reported on earlier in this volume in a regional context. It draws on work undertaken by the TLEP and a wider programme of archaeological mapping of East Lothian carried out by RCAHMS, as well as material held in the National Monuments Record of Scotland (NMRS).

Although the definition of the TLEP study area is essentially arbitrary, centred on Traprain Law, and defined by modern map grid lines, it is broadly representative of the administrative area of East Lothian (Chapter 2). The gently undulating coastal plain is broken by low hills and the ground generally rises to the Lammermuir Hills and the Lothian Edge to the south. The broad pattern of land use for the last 200 years is fairly simple, with by far the greater part of the coastal plain set to arable, increasing proportions of improved pasture on the higher ground and unimproved pasture and heather moor on the hills themselves. Discrete shelterbelts and larger coniferous plantations are scattered across the plain, while built-up areas are limited in extent.

THE SURVEY RECORD IN EAST LOTHIAN – SOME GENERAL OBSERVATIONS

The impact of land use and aerial survey on the character of the archaeological record in East Lothian has been commented on in Chapter 2. The combination of predominately arable land use and a relatively dry climate have served to create an archaeological record that is dominated by plough-levelled sites recorded during aerial survey as cropmarks (Figure 10.1). The few remaining earthwork monuments survive in patches of ground that have not been improved, usually because bedrock is close to the surface (Figure 10.2). Across the

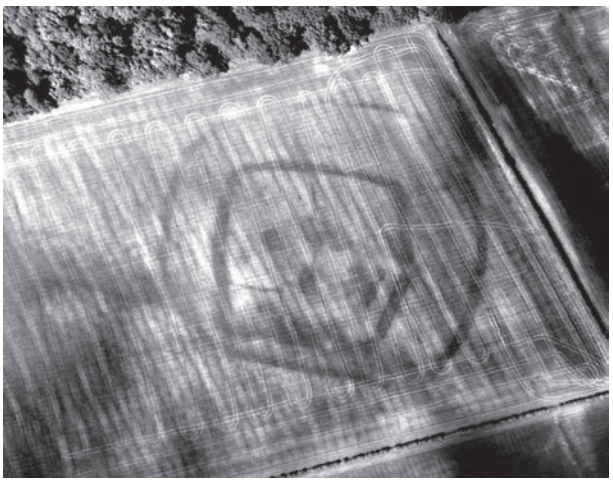

Figure 10.1
This ploughed-down settlement at Broomrig (NT46NW 6) has been recorded as cropmarkings and is a good example of the many such sites now known in East Lothian after decades of patient aerial survey (rectified version of EL4867, Crown Copyright: RCAHMS)

Figure 10.2
Oblique aerial view of The Chesters, Drem (NT57NW 1), one of the handful of earthwork monuments to survive centuries of intensive arable land use on the East Lothian plain because of its location on a rocky ridge (D76371, Crown Copyright: RCAHMS)

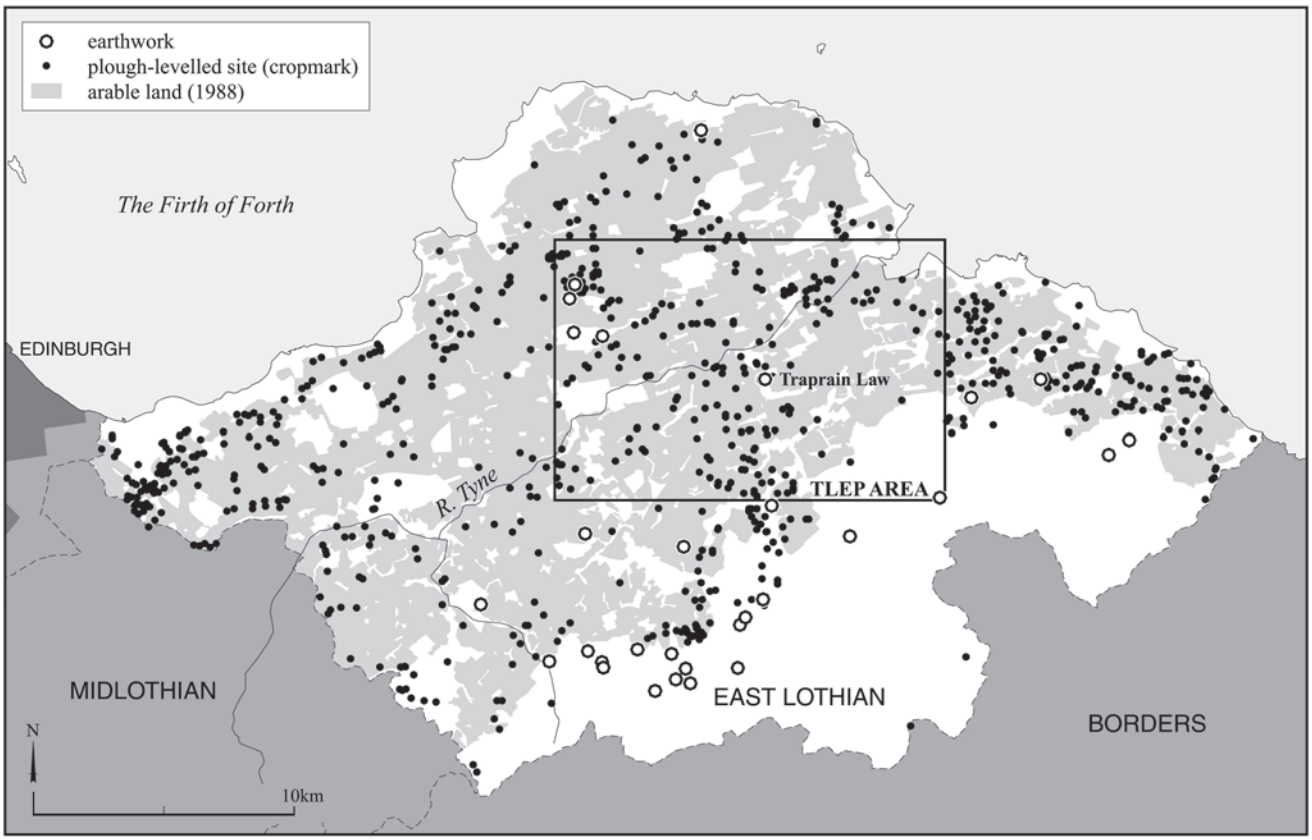

Figure 10.3
The distribution of plough-levelled monuments and earthworks of potentially later prehistoric date in East Lothian shown against the extent of arable ground (Crown copyright: RCAHMS, GV004478. Arable ground derived from MLURI mapping based on 1988 aerial photography)

coastal plain as a whole, ongoing aerial reconnaissance has recorded hundreds of plough-levelled sites, the broad pattern of which was established by the early 1980s. In common with the TLEP study area (Chapter 2), the distribution of sites in East Lothian as a whole (Figure 10.3) is one of dense clusters of sites on patches of well-drained soils, broken by dispersed scatters of sites and complete gaps in site distribution. Blank areas generally lie within areas set to pasture, with only intermittent arable breaks, or within imperfectly drained soils that are also characteristically deeper (Cowley and Dickson 2007; Soil Survey of Scotland 1966).

The ongoing programme of aerial survey in this area of high potential has been very productive in the numbers of new sites discovered, but it has produced a dataset that has limitations. There are evidently complex, but poorly understood, relationships between soil types, soil depth and the formation of archaeological cropmarks. Areas of deep, imperfectly drained soils have remained stubbornly blank despite repeated examination from the air. For some areas, these factors have produced a distribution that is clearly unreliable in reflecting past settlement patterns and land use, but appears in other areas to reflect these to some degree (Cowley and Dickson 2007, 47–50). Beyond spatial bias in the dataset, there is also variability in the visibility of features to the airborne surveyor. Thus, regular enclosures are easily identified, while small features, such as pits, or irregular features, such as scooped yards, which might only show as a smudgy cropmark, defy ready interpretation and are more likely to escape record. In addition, survey is undertaken within frameworks of existing knowledge: features that are familiar tend to be identified more easily than those that fall outside such frameworks (see Cowley 2002 and Brophy and Cowley 2005 for discussion of issues of bias and subjectivity in aerial survey).

Beyond these limitations, the aerial survey data is essentially coarse-grained, providing information on site location and general characteristics. Indeed, excavation has consistently shown how coarse a filter of buried features cropmarks and geophysical survey are (see Chapters 1–2). When complexity is visible in the cropmark record (or geophysical data), relative sequences between overlapping components are difficult to establish with any certainty. Thus, analysis of sites is largely dependent on relatively simple criteria and characteristics, such as morphology, distribution, landscape context and very broad dating. The following discussion is therefore structured around the sites investigated in detail by the project. Analogy, the identification of shared characteristics, and a dating framework drawn from excavated sites are fundamental to ordering this material. It is inevitable that certain classes of site are better understood than others, and it is the rag-bag of oddities, comprising small groups or one-offs, that will always be difficult to marshal in a coherent framework.

Later prehistory has suffered from a tendency to be a dustbin for all sorts of sites, generally enclosures, the contexts of which are not known on the basis of analogy with the few excavated sites. In many respects Humphrey Welfare's comments, written after the first two seasons of aerial survey by RCAHMS (Welfare 1978), are still pertinent three decades later. On the one hand, Welfare points out the enormous potential of aerial survey, but identifies that the use of frequently highly subjective typologies has left the picture fuzzy and confused; he also noted the requirement for research excavations to refine chronology in particular. To this can be added the problems of the sheer mass of data that have been collected since Welfare's observations, little of which has been marshalled in an interpretative framework. In fact, in adding material to the RCAHMS database, there has been a tradition of applying ambiguous classifications, such as 'enclosure' or 'cropmark', in order to avoid imposing incorrect interpretations on sites. Moreover, even though knowledge has increased with new discoveries and excavations, it is only in the last few years that known material has been systematically revisited to review classifications. Thus, the sites recorded in the NMRS carried ambiguous classifications that had limited utility for rationalising sites in morphological groups or robust regional settlement frameworks.

A prerequisite for such frameworks is the systematic mapping and interpretation of monuments and this has only recently been completed by RCAHMS for East Lothian. That exercise has placed the plough-levelled sites recorded as cropmarks on a sound footing from which structured analysis can be built. Most sites are now accurately located in the landscape, and have a depiction that is accurate, removing the distortions introduced by the oblique angle of the photography (which, for example, might make a circular enclosure appear oval). The basic attributes of shape, size (of interior/boundaries) and location are therefore reliable. Even such basic attributes have a ready utility, for example in characterising the investment in ramparts for display or defence or the available internal area. Over and above this, the distributions of sites can be analysed, looking at factors such as location (e.g. hilltop) and relationships with other monuments (e.g. clustered or dispersed).

Such is the nature of this record that bringing order to the mass of material is heavily dependent on typology, drawing on analogy with the few excavated sites to suggest broad chronologies. However, the excavated sites only shed light on aspects of the cropmark record, and these will be the primary focus for this chapter. While allowing for the limitations of the cropmark record, it remains the only effective means of examining large areas, recovering regional settlement and land use patterns and creating broad-brush representations of past activity in lowland areas. The challenge in using this material successfully lies in integrating the detailed 'point information' derived from excavation, with the extensive, but less detailed, broad-brush evidence from aerial (and other) survey.

SITES AND MONUMENTS: CLASSIFICATION AND CHARACTERISATION

There is considerable variation in the extent to which the cropmarked record can be usefully marshalled. Some classes of settlement, such as Later Iron Age rectilinear settlements and unenclosed scooped settlements dating to the first–third centuries AD, can be identified with some certainty, drawing on the results of over 40 years of excavation and survey in northern England and southern Scotland. A small group of forts, characterised by multiple ramparts and dominant positions, can be identified, some of which share remarkably similar forms (e.g. Kaeheughs and Hanging Craig, Figure 10.4), but these can only be dated very broadly on the basis of a few comparanda. This ambiguity is even more marked when dealing

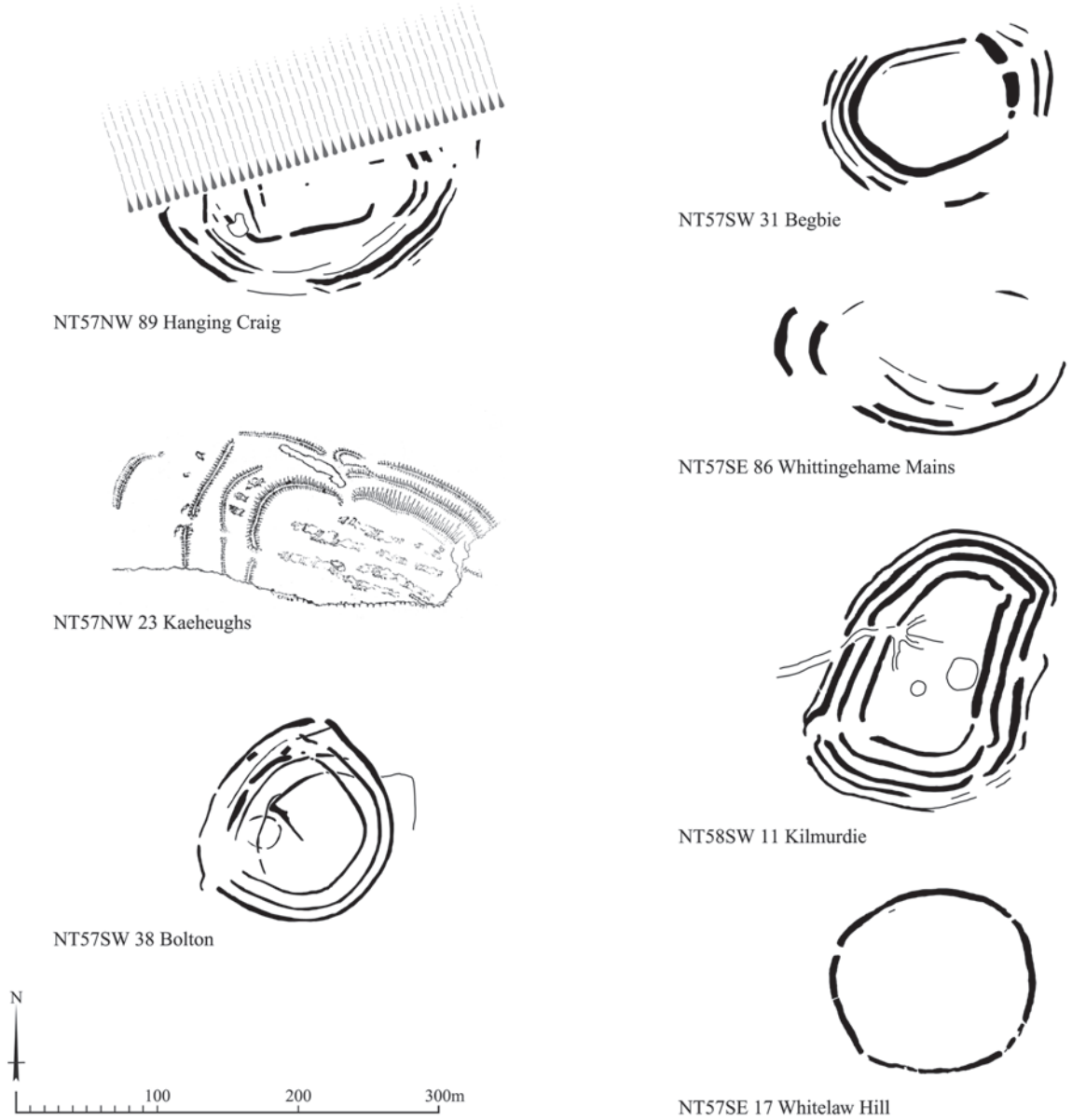

Figure 10.4
Comparative plans of selected forts in East Lothian, mostly from the TLEP study area
(Crown copyright: RCAHMS, GV004479)

with the mass of predominately curvilinear (circular and oval) enclosures, the potential date range and associations of which are manifold. However, even in this area, basic distinctions in size and shape can be made, though excavations will be required to place these minor groupings in a settlement framework.

There is a danger that artificial distinctions may be drawn between surviving earthworks and plough-levelled sites. This is manifest in the use of classifications. By way of illustration, earthworks with substantial ditches in elevated positions are more likely to be referred to as 'forts' than their plough-levelled equivalents. In the case of plough-levelled sites the size of ditches is not evident without accurate mapping, and significant differences in scale between a ditch 2m across and another 4m across may not be readily

appreciated from aerial photography alone. On the other hand, the scale of ditches is all too apparent when sites are excavated, and this is commented on in the report on St Germains (Alexander and Watkins 1998, 246–7). The forts at Kaeheughs and Hanging Craig (Figure 10.4) share basic morphology, location and likely chronological and social context, but they appear in the record very differently, one surviving as an earthwork, the other plough-levelled.

The TLEP was designed to explore a sample of the known settlement types in the area, and this is reflected in both the 30 sites selected for more detailed survey (Chapter 2 and Appendix 1) and those chosen for excavation. These include basic morphological types such as curvilinear, multivallate, rectilinear and unenclosed sites. The structure of this chapter will reflect these basic types, expanding discussion from the excavated sites to the broader characteristics, with brief digressions into other site types such as forts and pit-alignments not directly investigated by the TLEP, and some discussion of the 'rag-bag' of sites that at present defy easy classification.

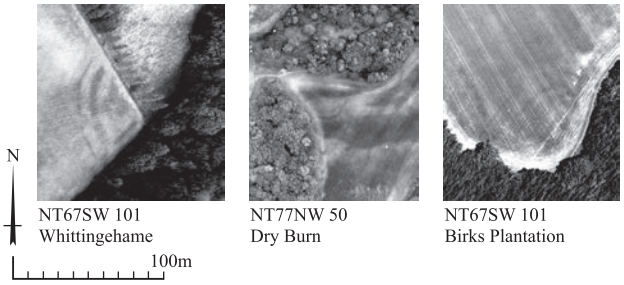

Figure 10.5
Rectified aerial photographs of Whittingehame Tower and analogous sites (Crown copyright: RCAHMS, GV004480)

CURVILINEAR SETTLEMENTS

The sites investigated by TLEP at Whittingehame Tower and Standingstone are part of a general grouping of curvilinear enclosures, which account for a significant proportion of the cropmarked sites. The paucity of excavated sites and the variety of basic morphological forms make it difficult to structure this material in a chronological framework. However, the broad attributes of Whittingehame and Standingstone can be identified more widely, and this section will begin with a brief summary of the main components of these two sites, with additional reference to Foster Law and East Linton (Chapter 6), St Germains (Alexander and Watkins 1998) and Fishers Road, Port Seton (Haselgrove and McCullagh 2000).

Whittingehame Tower

As noted in the cropmark record, Whittingehame Tower is a bivallate enclosure, comprising two concentric arcs of ditch set against the steep slopes on the north side of Whittingehame Water. It is broadly representative of a group of enclosures that have been sited to make use of the deeply incised valleys, or deans, of East Lothian. Some 60 enclosures in East Lothian utilise a deeply incised gully, watercourse or escarpment as part of the circuit of enclosure. However, the variation in morphology within this grouping demonstrates that they are not a homogeneous class, including large (i.e. 0.6–1.1ha) heavily defended forts and smaller (i.e. less than 0.5ha), more lightly enclosed settlements, of which Whittingehame Tower is probably one (albeit with a depth of one ditch that is exceeded only by Broxmouth among other excavated prehistoric sites in the region). There are only three, or possibly four, sites in East Lothian (Figure 10.5) that bear direct comparison with Whittingehame Tower, though these are a sub-set of a loose grouping of sites that take advantage of a promontory or stream-side location. In these cases, while the adjacent watercourse and/or deeply incised gully is clearly integral to the creation of the enclosure, the significance of this is not known. Perhaps the location carried special associations, or was it merely the pragmatic exploitation of a topographic location that is a feature of parts of the county? With this imponderable in mind, in the first instance it may be more useful to focus on the attributes shared by Whittingehame Tower and the mass of other curvilinear enclosures, while recognising the variability in form and the presence of small sub-groups of sites that share distinct characteristics.

The main components of Whittingehame for the purposes of a broad comparison are the two ditch circuits visible as cropmarks, together with the palisade trenches and smaller inner ditch discovered during excavation. Due to the lack of stratigraphic relationships between features and the paucity of dateable material, the sequence of enclosures can only be guessed at. The concentricity of the ditch circuits suggests that they at the very least referenced each other and, whatever the possible sequence(s) of

construction, were extant or visible in some form throughout the life of the enclosure. Various scenarios are discussed in Chapter 3, but perhaps the most likely are that the two principal circuits represent individual remodelling episodes, or that the main ditch and bank went with the palisades, which were then replaced by an outer ditch and bank. Taken at face value, the discrepant radiocarbon dates from the ditches would favour the former, but given their secondary context, this cannot be relied on. The suggestion of a Late Bronze Age chronological context at least for the main enclosure ditch is, however, echoed elsewhere, whilst the radiocarbon date from higher up the fill would seem to confirm that there was still a significant remnant earthwork when the site was (re-)occupied in the mid-first millennium AD.

Standingstone

This site appears in the cropmark record as a ditch describing the incomplete circuit of a curvilinear enclosure. On excavation (Chapter 4) this gap was found to coincide with an area of outcropping bedrock and, while no trace of a continuation of the enclosure ditch was found, it seems likely that the original conception of the enclosure was a more complete circuit. A palisade trench, lying roughly parallel to the inner lip of the ditch and about 4m from it, may have formed a revetment at the back of a bank that has been completely removed by ploughing. Radiocarbon dating shows that both the ditch and palisade were constructed at the end of the second or beginning of the first millennium BC (Chapter 9), with Later Iron Age reuse some 300–600 years later.

Moreover, the dating evidence estimates that the construction of the enclosure ditch and palisade began in 960–850 cal BC (95% probability) and its use finished in 940–790 cal BC (95% probability), with an overall span of enclosure activity at only 1–80 years (95% probability), or 1–40 years (68% probability). There is a widespread expectation, usually implicit, that monuments that required a significant resource to construct will have been occupied for long periods of time. Standingstone challenges this assumption with an occupation that may not even have spanned a generation. This adds to the considerable body of evidence that suggests settlement at certain periods may have been typically short-lived at any given location with a tendency to move around in the landscape (e.g. Halliday 1999, 2007; Barber and Crone 2001; Cowley 2003). While this paradigm has been more readily accepted for upland areas and Bronze Age contexts, the Standingstone dating supports the evidence that would extend this pattern into lowland areas, which are often characterised as 'cores' with continuous and long-lived settlement.

From the cropmark record, a nearby site at Hedderwick (Figure 10.6) appears to be a direct analogy with Standingstone. The cropmarks describe a similar incomplete circuit of ditch, which is confirmed by the geophysical survey (Figure A1.12), though in this case an inner palisade can be seen in both aerial photographs and geophysics describing a complete circuit. Standingstone and Hedderwick share the same basic characteristics (broad ditch and internal palisade) and other analogous sites are evident, such as Sixpence Strip (Figure 10.6). Ranging slightly in size (i.e. between 0.15ha and 0.2ha in area) and including strictly circular (Standingstone, Sixpence Strip) and oval (Hedderwick) examples, these settlements generally occupy unremarkable locations in the landscape, although the hillslope location of Standingstone does give very extensive views to the west.

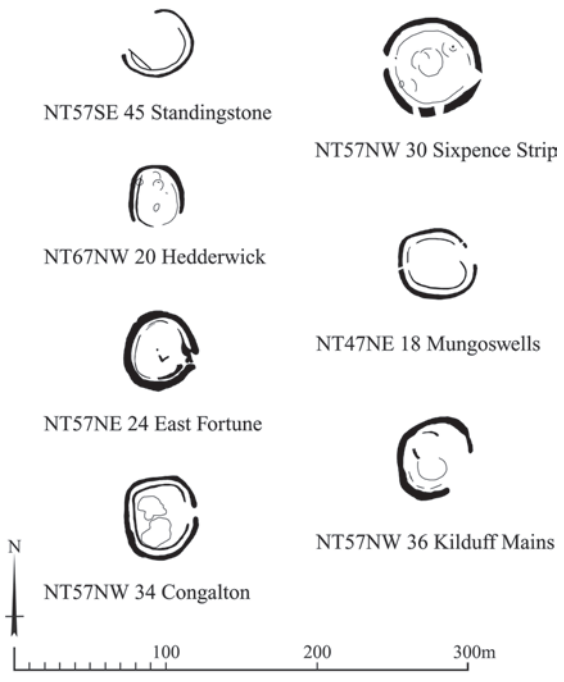

Figure 10.6
Comparative plans of Standingstone and analogous sites
(Crown copyright: RCAHMS, GV004481)

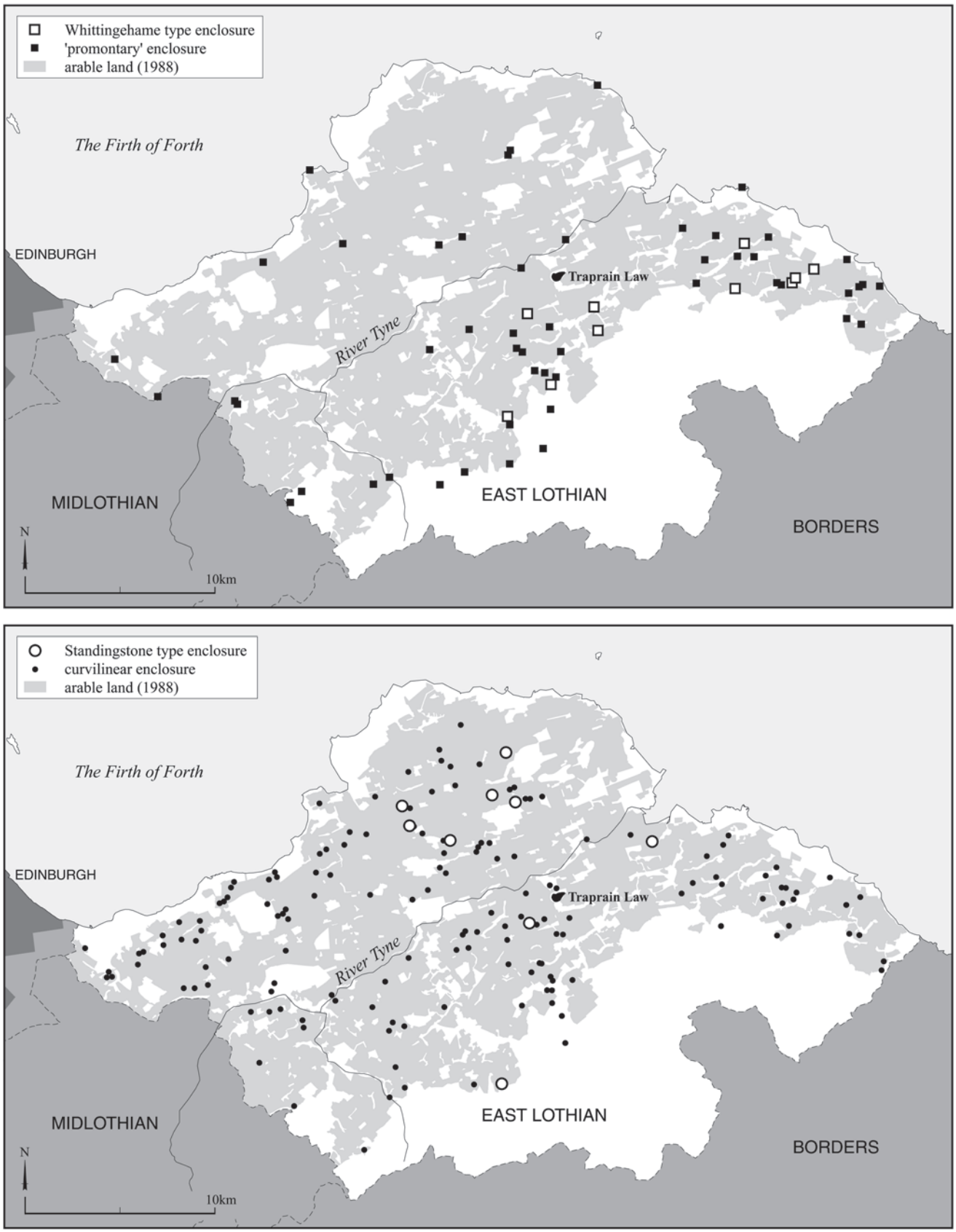

Figure 10.7
The distribution of curvilinear settlement enclosures in East Lothian with Whittingehame Tower and Standingstone and their comparable sites identified (Crown copyright: RCAHMS, GV004482)

The distribution of this site type across the county is difficult to judge because their identification is heavily dependent on the visibility of a palisade. The cropmark record cannot be relied on in this respect as demonstrated at Standingstone, where the palisade was only revealed during excavation. It is thus difficult to disentangle the Standingstone-type enclosures from the 'rag-bag' of curvilinear enclosures (below) that characterise a significant proportion of the later prehistoric settlement sites. For this reason, the Standingstone-type settlements are identified against the general distribution of curvilinear settlements, amongst which there may be other unidentified examples of the same type of enclosure (Figure 10.7).

Late Bronze Age enclosures

Standingstone and, more hesitantly, Whittingehame establish a Late Bronze Age context for some of the settlement enclosures that to date have tended to be assigned to the Iron Age. To these can be added the site at East Linton (Chapter 6), where the evaluation produced dating evidence at the end of the second millennium BC for a palisade with an inner ditch.

Although morphologically a very loose group (varying in size, shape and location, and only sharing the most basic of attributes – a combination of ditches and palisade), the broadly Late Bronze Age dating for all three is significant. Together with Traprain Law they establish a multiplicity of settlement forms of Late Bronze Age date in East Lothian, which could support an interpretation as representing a hierarchy or specialisation in settlement form by this date. The rock-cut multiple ditches at East Linton would have been a significant investment of resource and its position in a commanding, if not dominant location in the landscape, may suggest a more elevated status than Whittingehame Tower or Standingstone. Apart from one of the ditches, the scale of the Whittingehame earthworks do not come close to those at East Linton and, while the arrangement of the palisade suggests a deliberate elaboration of the entrance, the rather retiring location in the landscape is also worth noting. Perhaps Whittingehame aspired to status that it did not have, while Standingstone may represent another component in a putative settlement hierarchy. While the foregoing discussion is undoubtedly simplistic and capable of sustaining other explanations, it highlights the differing forms of the Late Bronze Age sites. To this can be added the dating evidence from Standingstone, which indicates the potential for occupation to have been short-lived, warning against an uncritical assumption that investment of resource in construction automatically equates to extended occupation (Cowley 2003, 81–1).

The 'rag-bag': Iron Age enclosures in East Lothian

The difficulties of bringing order to the many broadly curvilinear enclosure forms in the cropmark record have been discussed above. Working from the excavated sites, robust classes of similar sites are difficult to construct. Between St Germains (Alexander and Watkins 1998), West Loan (Jones 2006) and Fishers Road, Port Seton (Haselgrove and McCullagh 2000), the excavated sites of putatively mid to later first millennium BC date exhibit a wide range of forms – in morphology, scale and details of occupation (Figure 10.8). The problems of marshalling this material are amply illustrated by Foster Law (Chapter 6) and Fishers Road West (McCullagh and Mills 2000), which bear superficial similarities. While there are a handful of potential analogies in the cropmarked sites, they all tend to exhibit subtle differences that make groupings unsatisfactory. Vast differences in size are also evident, from small enclosures (e.g. 0.05ha) that cannot have accommodated more than a single house, to sites that may have been packed full of households (1ha).

The two main characteristics of the settlement enclosures of the mid and late first millennium BC are variety in form and very individual site histories. Specialisation and variability in enclosure function is likely (e.g. Fishers Road West; McCullagh and Mills 2000, 83) and there is a wide range in settlement size.

KNOWES AND THE RECTILINEAR SETTLEMENTS OF EAST LOTHIAN

Rectilinear ditched enclosures have long been recognised as a component of the East Lothian settlement record (Maxwell 1970), extending a distribution of similar sites known in northern England (Jobey 1966; McCord and Jobey 1968). Indeed, survey has extended the distribution of such sites across much of southern Scotland (e.g. Cowley 2000, 172–3; RCAHMS 1997, 154–5). Excavations in northern England (e.g. Jobey and Jobey 1988) and in south-west Scotland (Haggarty and Haggarty 1983; Johnston 1994) have established that the origins of these settlements may lie in the middle centuries of the first millennium BC, with a *floruit* in the last two centuries BC–first two centuries AD.

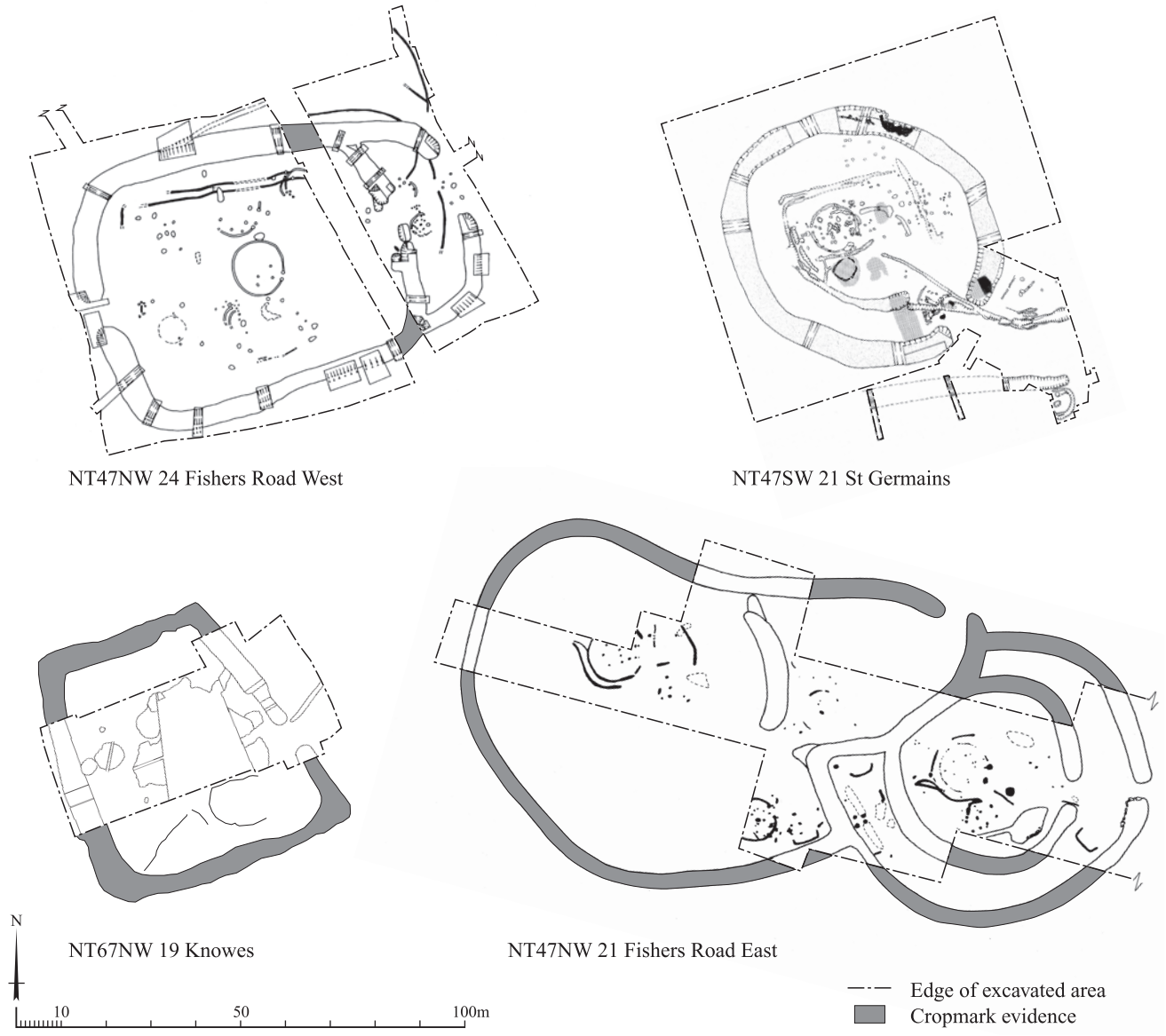

Figure 10.8
Simplified comparative plans of excavated Iron Age enclosures in East Lothian, drawn from both the TLEP and earlier campaigns (after Alexander and Watkins 1998, Haselgrove and McCullagh 2000 and RCAHMS mapping, GV004483)

There are many enclosures that have a tendency to rectilinearity, which may include defensive sites and others that may be agricultural in origin, or belong to medieval and later farmsteads, or simply of unknown context (Figure 10.9). However, the rectilinear settlement enclosures can be teased out from amongst the general grouping. They are square, rectangular or trapezoidal on plan, usually with sharply turned corners and mostly ranging from about 0.1ha to 0.5ha in internal area. Like the curvilinear sites, the rectilinear enclosures evidently housed domestic groups of varying size, but there is no evidence that they fall into discrete size categories, as has been suggested for their counterparts in north-east England (Haselgrove 1982). Their basic shared morphology is visually arresting (Figure 10.10). They tend not to

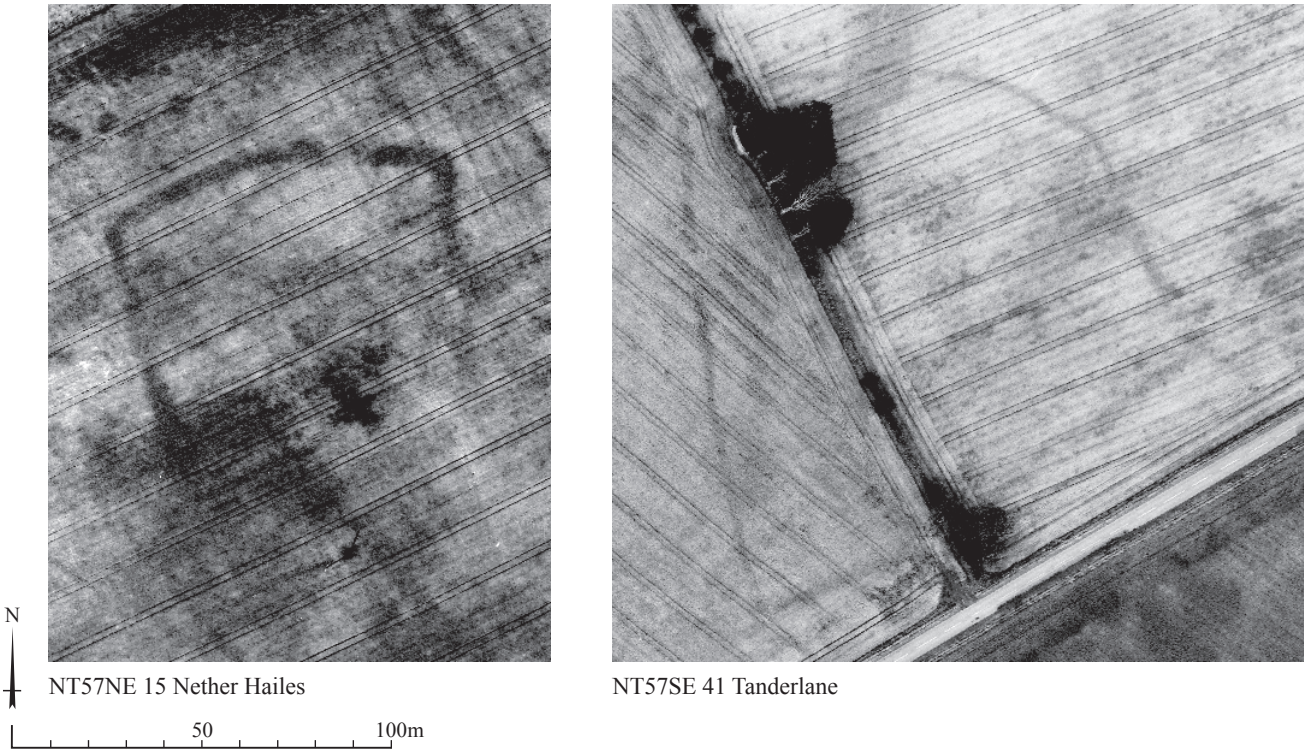

Figure 10.9
Rectified aerial photographs of Nether Hailes (NT75NE 15) and Tanderlane (NT57SE 41) illustrate the variety of rectilinear enclosures, the former perhaps a late Iron Age settlement and the latter probably not of prehistoric date at all (rectified versions of D74523 and A30450 respectively, Crown copyright: RCAHMS, GV004484)

occupy hilltop or dominant locations, but in some the enhancement of entrances and the digging of large ditches that often seem out of keeping with the interior space may indicate the importance of display, though water storage may also have been a factor.

At the smaller end of the rectilinear enclosure size range there are some rather irregular enclosures that invite comparison with the polygonal enclosure surrounding a single wall-trench and post-ring (ring-groove) house identified at St Germains (Figure 10.10; Alexander and Watkins 1998, 215–6). Although the St Germains polygonal enclosure was placed early in the sequence in the excavation report, this relationship is entirely inferential (D Alexander pers. comm.) and in view of the weight of dating evidence for predominantly rectilinear enclosure forms in the Later Iron Age, it may post-date the curvilinear enclosure.

Internal features are visible at many sites, most taking the form of amorphous 'blobs' which are assumed to be the scooped floors of roundhouses and yards. The excavations at Knowes (Chapter 5) have demonstrated that a settlement of scooped houses and yards overlies the rectilinear enclosure, though the enclosure ditch was still present as a feature of the site. This is a trend that can now be identified widely across East Lothian (see below). The excavated evidence (Jobey and Jobey 1988; Haggarty and Haggarty 1983; Johnstone 1994) indicates that wall-trench and post-ring houses may have been the norm within rectilinear settlements generally but, since Knowes was not fully excavated, it is not clear if this pertains in East Lothian. It seems likely, then, that the majority of macular cropmarks in the settlement enclosures may be the remains of scooped roundhouses, in a widespread pattern of essentially unenclosed settlement overlying derelict enclosures (below).

Knowes (Chapter 5) and East Bearford (Chapter 6) are good representatives of the some 50 rectilinear settlements identified to date in East Lothian (Figure

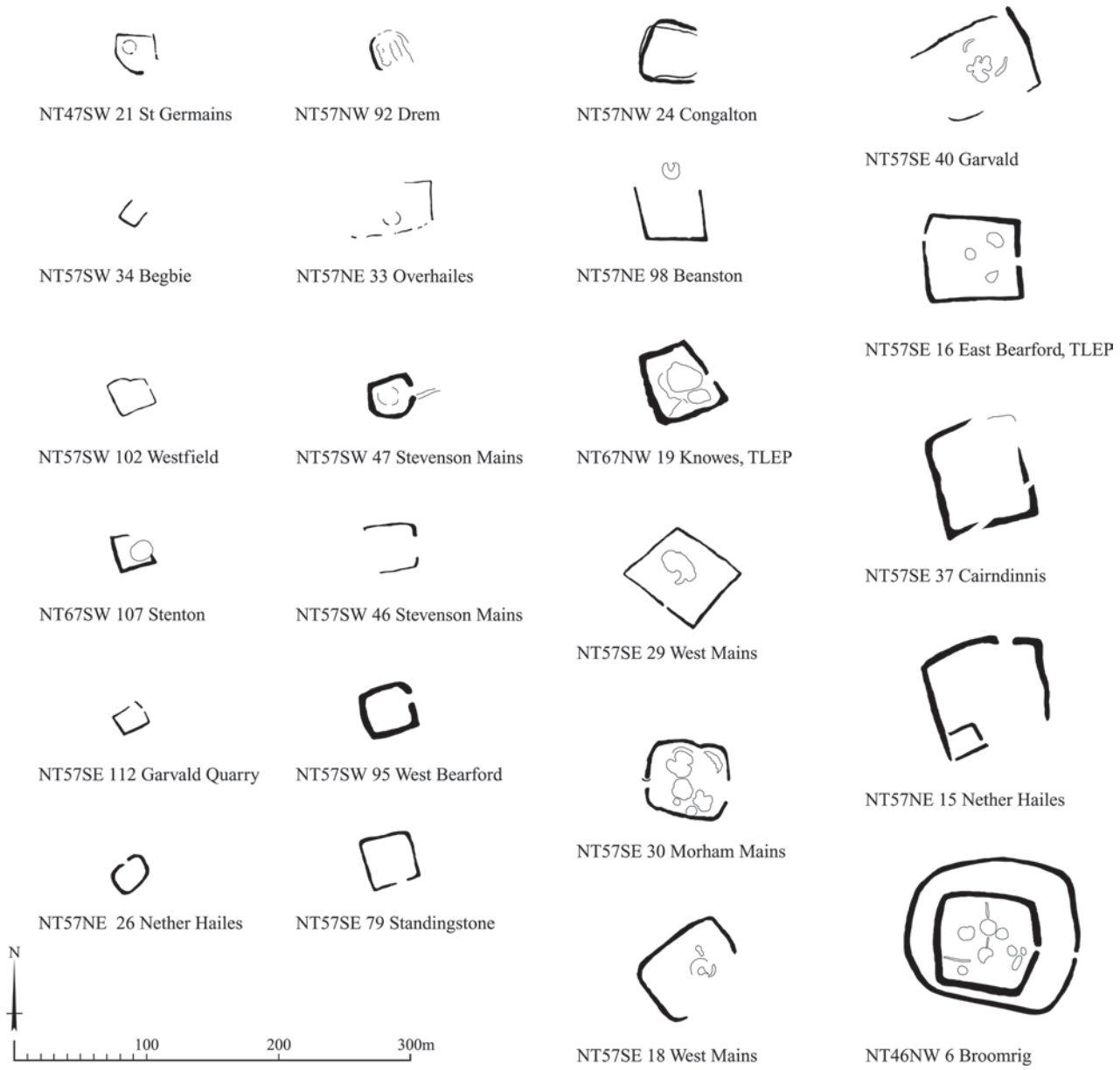

Figure 10.10
Comparative plans of selected late Iron Age rectilinear settlements, mostly from the TLEP study area (Crown copyright: RCAHMS, GV004485)

10.11). Evidence from both sites confirms a Later Iron Age date, which is in line with excavated sites in northern England and elsewhere in southern Scotland. At Knowes the settlement enclosure may have gone out of use somewhat earlier than comparable sites in south-west Scotland, where they may have continued into the early centuries AD (Cowley 2000). Although this may point to some regional variation in settlement pattern and trajectory in southern Scotland at this time, at Brixwold, just outside East Lothian there is some weak evidence to suggest that the ditches may have been refurbished in the first to second century AD (Crone and O'Sullivan 1997).

The apparent clustering of these sites in the vicinity of Traprain Law has become established in the literature (Armit 1997; Armit and Ralston 1997,

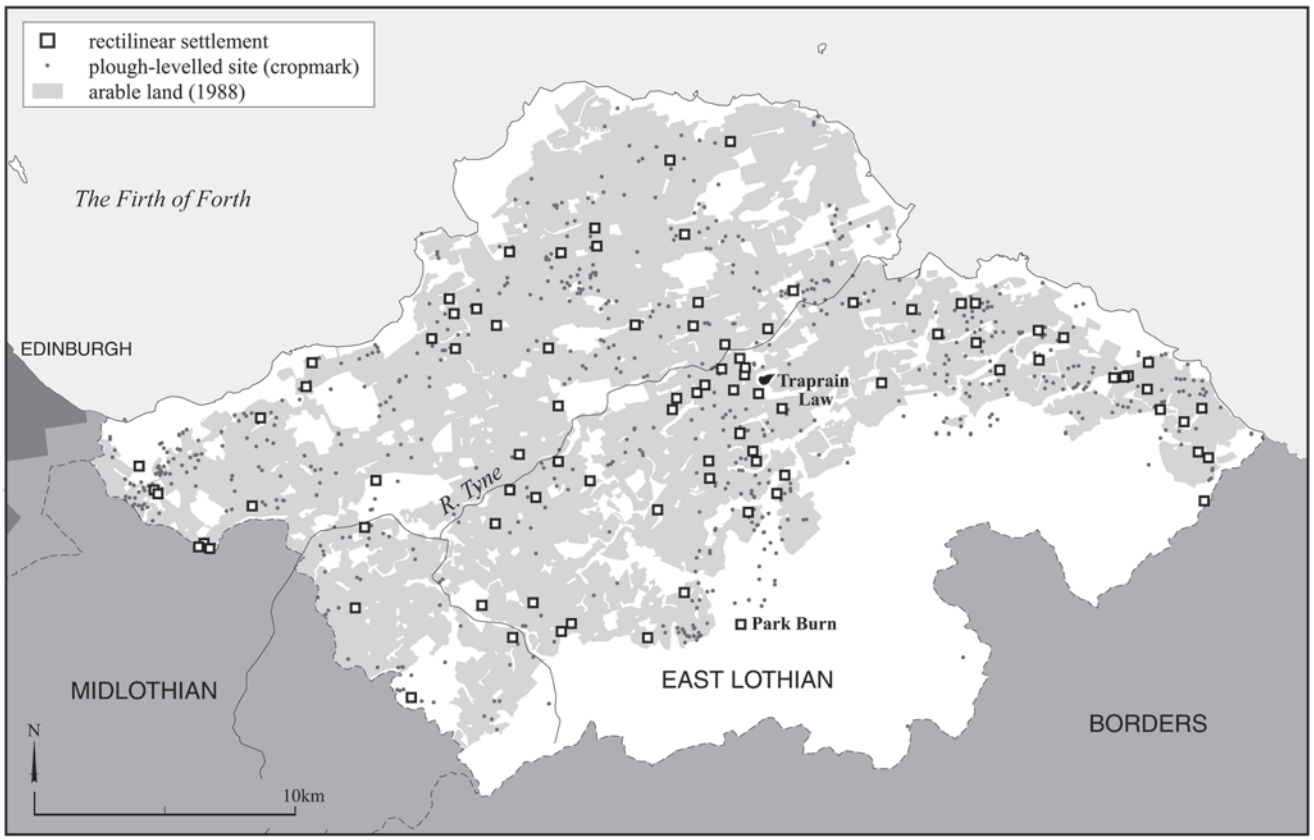

Figure 10.11
The distribution of late Iron Age rectilinear settlement enclosures in East Lothian (Crown copyright: RCAHMS, GV004486)

179; Macinnes 1984, 183–6), originating in the first distribution map published by Maxwell (1970). However, the distribution of sites now known from aerial survey (Figure 10.11) demonstrates that they are widely dispersed across the county. The localised clusters in their distribution, including the group near Traprain Law, reflect little more than the general clustering of cropmarked sites. Thus, the Traprain Law group is likely to reflect the responsiveness of the soils to cropmark formation and the concentration of aerial survey in an area with guaranteed returns (see Cowley 2002 for a commentary on survey bias). The more general gaps in the distribution coincide with the areas of imperfectly drained soils (Cowley and Dickson 2007; Cowley 2007), and urban development and opencast mining. The cluster around Traprain Law and the scatter of sites extending along the line of the A1 to the east illustrate how common the rectilinear settlements may have been, with a marked regularity in their disposition in the landscape. On the basis of these denser distributions they may have been disposed across the landscape at intervals of about 1km, establishing them as the basic farmsteads of the Later Iron Age. It is worth noting that this distribution has echoes in that of nineteenth-century farmsteadings and, in considering possible gaps in the distribution of rectilinear settlements, the sites occupied by medieval and later farms may be candidates, as may also be the case in parts of north-east England (Haselgrove forthcoming). In addition, the scatter of later first millennium BC dates from other types of site (see *The 'rag-bag': Iron Age enclosures in East Lothian* above) warn against an expectation that the Later Iron Age was a mono-culture of rectilinear settlements. Rather, the rectilinears are more likely a significant component of a settlement pattern comprising a multiplicity of forms, expressing both hierarchical structures and specialisation in function.

Figure 10.12
Two distinct phases of enclosure can be seen in the cropmark evidence for this rectilinear settlement at Congalton (NT58SW 24) near East Fortune (rectified version of C52622, Crown copyright: RCAHMS)

A further noteworthy element of the distribution of rectilinear enclosures is that they rarely overlie other sites. Indeed, while there is evidence for two successive phases of rectilinear enclosure at Congalton (Figure 10.12; Cowley 2007, 6–8), there are only three further sites in East Lothian where a rectilinear overlies an earlier enclosure. At the plough-levelled fort at Hanging Craig (Figure 10.4) the enclosure in the interior may be a rectilinear settlement, while at Park Burn (Figure 10.13) the only rectilinear settlement to survive as an earthwork in East Lothian has been constructed over the interior of a fort.[1] The third example is a plough-levelled site at Broomrig where a rectilinear settlement lies in the interior of a potentially earlier oval enclosure (Figure 10.1). This pattern has been identified more widely in south-west Scotland (Cowley 2000, 173) and, probably, in north-east England. For example, at Fawdon Dene, Northumberland, there is a rare example of a small round enclosure, dating perhaps to before 200 BC, which is overlain by a more sub-rectangular settlement (Oswald *et al.* 2006, 61–5). These are the exceptions, and it seems likely that many of the rectilinear sites may be new foundations in the Later Iron Age, perhaps reflecting an increase in settlement and a consequent intensification of agriculture. This possibility is in contrast to the number of rectilinears that appear to have essentially unenclosed settlements overlying their derelict remains (see below). Few of the rectilinears have any relationship to landscape features; the one exception at Congalton appears to overlie a pit-alignment (i.e. pit-defined boundary), probably of mid-first millennium BC date (Halliday 2002).

UNENCLOSED SETTLEMENT

Although settlements of unenclosed roundhouses have been recognised in East Lothian (e.g. Macinnes 1984), they have been difficult to identify with any certainty from the cropmark record, in contrast to other areas, such as Angus, Fife and Perthshire (e.g. RCAHMS 1994), and, as a consequence, have been under-represented in the record. The paucity of evidence has been compounded by a tendency to assign such unenclosed settlements to the Bronze Age. However, the Broxmouth excavations produced two distinct types of unenclosed settlement (Hill 1982a). The first predates the various phases of enclosure and comprises

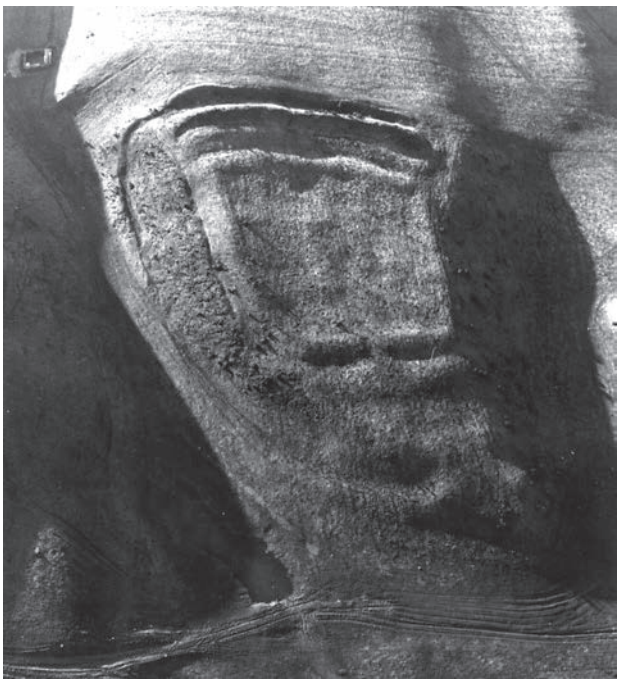

Figure 10.13
Oblique aerial view of the complex earthworks at Park Burn on the foothills of the Lammermuir Hills, showing the only known rectilinear settlement to survive as an earthwork in East Lothian overlying the interior (EL 4615, Crown Copyright, reproduced courtesy of Historic Scotland)

several ring-ditch houses, probably dating to the earlier and middle centuries of the first millennium BC. This is probably the case with the houses at Dryburn Bridge (Hill 1982b, 12–15), although it has been suggested on rather weak evidence (Dunwell 2007) that the early ring-ditch houses at the latter site may be enclosed. The second phase at Broxmouth comprises smaller, less regular roundhouses with scooped floors, and post-dates at least some of the enclosure circuits.

The TLEP has added little to the evidence from East Lothian for unenclosed settlement dating to the mid-first millennium BC. At Standingstone (Chapter 4) there are two phases of severely plough-truncated remains, apparently dating to the later first millennium BC. These may be the heavily truncated remains of ring-ditch houses but, in common with the remains of a possible unenclosed settlement at Fishers Road East (Haselgrove and Lowther 2000, 171–2), the state of preservation of these structures attaches considerable ambiguity to their interpretation. However, the TLEP excavations have produced much better information for Roman Iron Age unenclosed houses at Knowes, and these have directly helped to develop the interpretation of otherwise ambiguous cropmarked data.

Unenclosed settlement of the Roman Iron Age

The excavations at Broxmouth identified three houses with scooped floors, which have been interpreted as post-dating the various defensive enclosed phases of settlement (Hill 1982a, 169, 171–5) and are assumed to be a small unenclosed settlement.[2] All were built in scoops up to 1m in depth, indicating that sunken floors were a deliberate feature of the building, rather than simply a by-product of the levelling of a stance for the house (*ibid*., 173). More widely, Hill (1982b, 8–12) identified a pattern of unenclosed settlement across the Tyne–Forth area, often overlying derelict settlements and fortifications. A date range between the very end of the first millennium BC and the first two centuries AD is indicated. In East Lothian, excavations at St Germains produced evidence comparable to that from Broxmouth, comprising scooped floors and paved areas set within the derelict remains of an Iron Age enclosure, and possibly dating to the first to the third century AD (Alexander and Watkins 1998, 247–8).

To this evidence can now be added that from Knowes, Whittingehame Tower and Standingstone, investigated by the TLEP, and from Eweford and Phantassie, excavated in advance of the upgrading of the A1 (Lelong and Macgregor 2007). At Knowes (Chapter 5) the remains of paved areas and scooped floors of roundhouses post-date the rectilinear settlement enclosure, although the ditches may still have been actively silting when the excavated scooped features were created, or the scooped area as a whole could even be a primary feature (Chapter 9). The occupation of the scooped settlement probably spans the first century BC and first and second centuries AD. This dating compares directly with that for paved surfaces and stone-built structures that expanded out over derelict ditches at Eweford (Innes 2007, 140–2). Less comprehensible occupation evidence dating between the first to third and fourth to sixth centuries AD was excavated at Whittingehame Tower (Chapter 3). However, Whittingehame shares the scooped and paved/cobbled components identified above, lying within the derelict remains of an earlier settlement enclosure. The very complex suite of houses, yards and paved areas from Phantassie are broadly analogous and span the last two centuries BC and early centuries AD (Lelong 2007). As noted above, the features at Standingstone that post-date the Late Bronze Age enclosure are difficult to interpret due to severe plough-truncation, but they may include broadly comparable buildings; similar ambiguity attends the interpretation of the remains of a possible unenclosed settlement at Fishers Road East (Haselgrove and Lowther 2000, 171-2). Undated, but also potentially comparable, is the possible scooped house at Brixwold, Midlothian (Crone and O'Sullivan 1997, 391–4, 402). Finally, and considerably less certain, is the suggestion from the geophysical survey at East Linton that houses may have extended across the slighted ramparts (Chapter 6).

This excavation evidence can now be marshalled to sustain a compelling case for unenclosed settlements of scooped houses and yards as a widespread component of the settlement pattern in the period between the second to first centuries BC and the second or third century AD. That this might be extended slightly later is suggested at Whittingehame (Chapter 3), where the accumulation of material on the second surface in and beside the scooped feature has a first–third century AD *terminus post quem* and contains material of fourth–sixth century AD date on the top. The evidence, in particular from Broxmouth and Knowes, bears directly on the interpretation of irregular features (blobs) recorded as cropmarks on aerial photographs, both within enclosures and also in apparently unenclosed contexts. For example, at Morham Mains such blobs in the interior of the enclosure are, in places, hard

Figure 10.14
Rectified aerial photograph of Morham Mains (NT57SE 30) showing the 'blobs' in the interior hard up against the inner lip of the enclosure ditch, suggesting they belong to an overlying settlement of scooped floored houses similar to those excavated at Knowes (rectified version of EL4144, Crown copyright: RCAHMS)

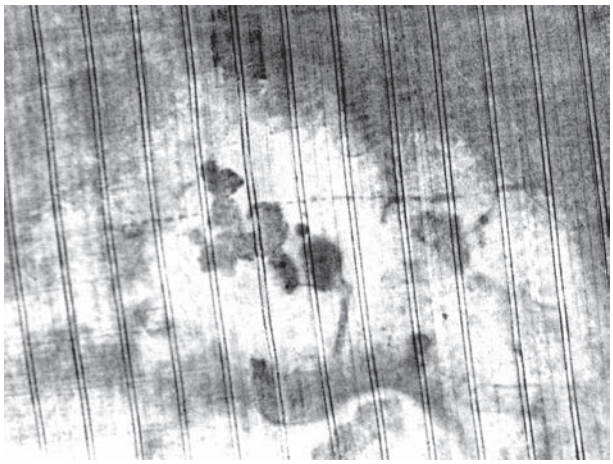

Figure 10.15
Rectified aerial photograph of the complex intercutting scooped house floors and yards recorded as cropmarks at Congalton (NT58SW 25) reflecting similar features to those excavated at Knowes (rectified version of C52622, Crown copyright: RCAHMS)

up against the inner lip of the ditch (Figure 10.14), indicating that the internal bank had been slighted or removed and that the scooped houses, which are marked by the blobs, post-date the enclosed phase of settlement. One consequence of the widespread pattern of unenclosed settlements of scooped floored houses and yards occupying derelict enclosures that has been suggested is that these later features will obscure earlier buildings, including any that might be primary to the enclosure.

Of course, there is potential for these morphologically rather diverse and poorly defined features to be confused with other features, such as quarry- and gravel-pits, but the examples overlying many of the settlement enclosures, and well-defined examples such as Congalton (Figure 10.15), form a reference collection against which less well-defined examples can be assessed. Adding to the problems of identification from the cropmark record, these features are very vulnerable to plough truncation as, for example, was the case at St Germains (Alexander and Watkins 1998). The distribution map of possible Roman Iron Age unenclosed settlements (Figure 10.16) is therefore somewhat speculative, including both excavated examples and putative sites identified on the basis of admittedly coarse cropmarked data, but does serve to illustrate the positive symbiosis between the excavation evidence and its bearing on the interpretation of cropmarks. To the cropmark evidence can be added the instances of earthwork remains of similar settlements. At The Chesters, Drem, (Figure 10.2; RCAHMS 1924, fig. 47) scooped floored houses and yards can be seen in earthwork form overlying the ramparts and extending across the interior. The small scooped houses and yards at North Berwick Law (Figure 10.17) are a further good illustration of the evidence from earthwork remains.

The variation in the locations of these unenclosed scooped settlements demonstrates a complexity to settlement foci and continuity in the Late/Roman Iron Age. In some cases, such as Knowes, there may be continuity, or perhaps a relatively short gap, in occupation between the rectilinear enclosure and the unenclosed houses. On the other hand, at Whittingehame Tower, there was probably a break of many centuries before the scooped settlement occupied the long derelict prehistoric enclosure. Both Knowes and Whittingehame share the very deliberate choice of inhabitation of a derelict enclosure. At Congalton (Figure 10.15) in contrast, the intercutting scooped house floors do not appear to overlie any

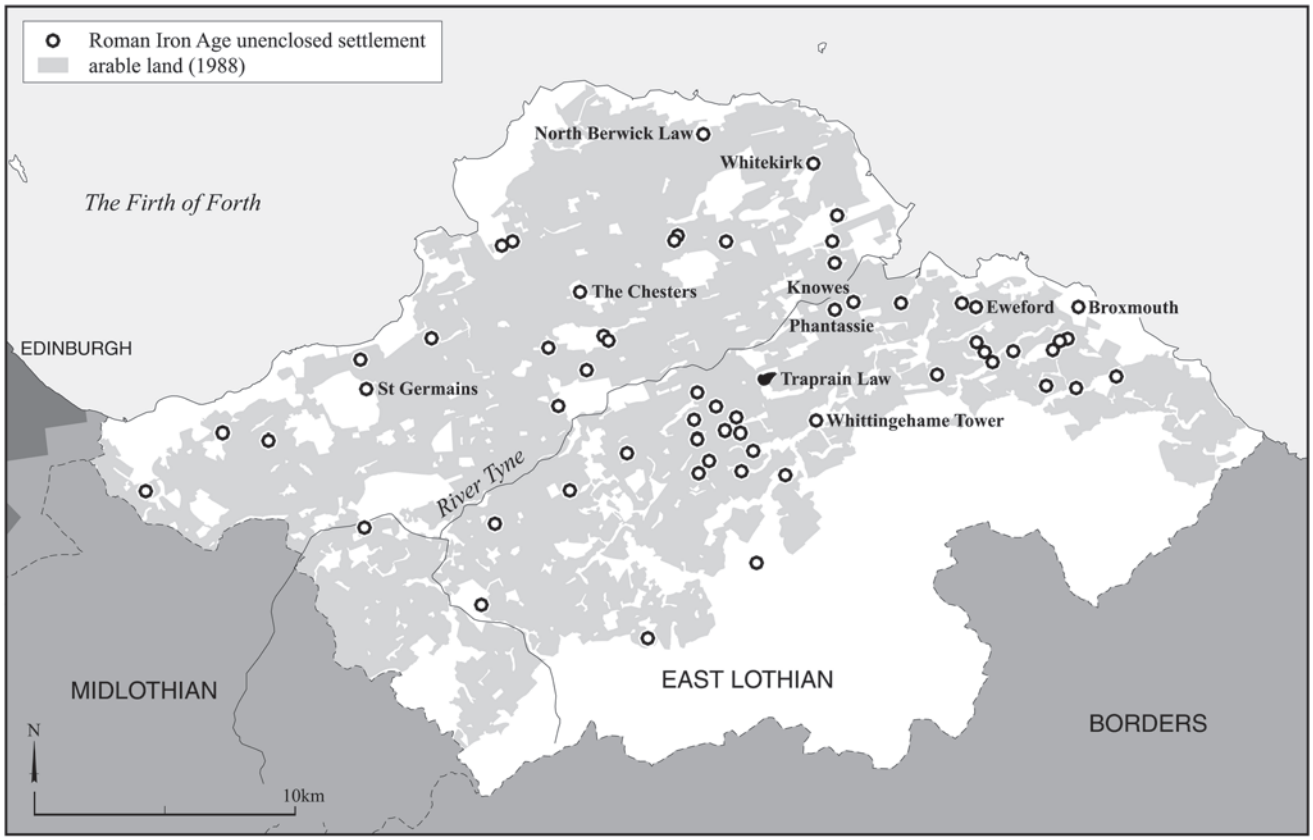

Figure 10.16
The speculative distribution of possible unenclosed settlements of Roman Iron Age date in East Lothian
(Crown copyright: RCAHMS, GV004487)

earlier settlement or, in turn, to be overlain by later settlement. This variation points to at least three potential trajectories in the evolution of settlement at this time: new foundations; broad continuity of occupation; or (re)occupation of long derelict sites.

The widespread 'speculative' distribution of unenclosed settlements of Roman Iron Age date suggests a dense pattern of occupation of the East Lothian plain, probably on a scale similar to that of the Later Iron Age. The mid-first millennium AD occupation at Whittingehame Tower also illustrates the potential for this material to fill a marked lacuna in settlement sequences, though the relevant features at Whittingehame would be almost impossible to identify with certainty as cropmarks. It is also worth noting that Phantassie singularly failed to register as a cropmark, probably due, amongst other factors, to the high proportion of cobbled surfaces and made ground, and the almost complete absence of negative features of any size, such as ditches.

SETTLEMENTS IN THE LATER PREHISTORIC LANDSCAPE: SEEING COMPLEXITY AND CHANGE

The modern day landscape of the East Lothian plain (e.g. the lowland area) is one of extensive enclosure and arable cropping, ordered field patterns, discrete built-up areas and predominantly nineteenth century farmsteadings. There are few landscape features that are much more than two centuries old, reflecting the clean sweep of the wider landscape that is so characteristic of the agricultural improvements of the late eighteenth and early nineteenth centuries. While some continuity in settlement location from the medieval period, if not before (see *Knowes and the Rectilinear Settlements of East*

Lothian above), is highly likely, this is clearly not a general model of landscape that should be extended into the past (Cowley and Dickson 2007). Indeed, what emerges from the work of the TLEP, the excavations in advance of the upgrade of the A1 (Lelong and MacGregor 2007) and the survey data is of a landscape in which multiple periods of remains survive routinely in a patchwork of settlement and land use.

For example, by the mid-first millennium BC, the remains of long derelict settlements may have been common features in the landscape, in some cases inviting re-use in later periods, born out by the evidence for the recutting of earlier ditches and other activity dating to this period from three of the TLEP sites (East Linton, Foster Law and Standingstone). The differing patterns of settlement foundation, abandonment and re-use identified above suggest that later prehistoric communities occupied much more dynamic landscapes than those that characterise the recent past in Britain. Settlement may have been relatively mobile, sites being characterised by intermittent occupation and periodic abandonment, played out over perhaps one or two centuries at a time, and possibly considerably less. Thus communities may have established new settlements on virgin sites, or reoccupied long abandoned enclosures that were evidently still referenced. This dynamism can be extended beyond the boundaries of settlements into the wider landscape, which is likely to have been fragmented by woodland rough ground, poorly drained areas, and a plethora of watercourses, which have been subsequently smoothed out, in particular over the last two centuries.

Beyond this general commentary on landscape, specific elements of the settlement record are

Figure 10.17
These scooped floored houses and yards at the foot of North Berwick Law are likely to be a Roman Iron Age settlement (based on survey drawing ELD/2/3, 12 May 1954, Crown copyright: RCAHMS, GV004488)

considerably better understood as a result of recent work, while in other cases new possibilities have been opened up. The identification of a variety of Late Bronze Age enclosure forms, within which hierarchies of settlement may be present, is a considerable advance on our knowledge of settlement at this date, especially in lowland contexts. The early dates for these enclosures, which might otherwise have been assigned to the Iron Age on present knowledge places East Lothian in the vanguard for this development, certainly in Scotland.

The expression of hierarchy, or social scale, in the Late Bronze Age settlements may also be increasingly evident in other periods. For example, the considerable variation in the scale of the ditches in the Later Iron Age rectilinear settlement enclosures and their internal area, suggest significant variation in community size, the expression of status and potentially the functions of sites. A further manifestation of this settlement pattern may also lie behind the wider patterning in the division of the landscape by pit-defined boundaries, probably in the mid-first millennium BC.

While pit-defined boundaries have not been discussed earlier, lying outwith the main settlement-based focus of the TLEP, they are relevant to the consideration of wider patterns in the landscape. A widespread, but uneven, distribution has been recorded in the cropmarks and the contrast of the pit-alignment distribution with the general spread of other cropmark sites demonstrates that their disposition is not random, nor distorted by survey bias, but rather a real reflection of a patterning in the past (Figure 10.18). Indeed, many of the pit-alignments concentrate around major hillforts, and in a few cases form relatively coherent systems of enclosure, of which Kaeheughs, Barney Mains is an excellent example (Figure 10.19). This distribution and associations probably reflect patterns

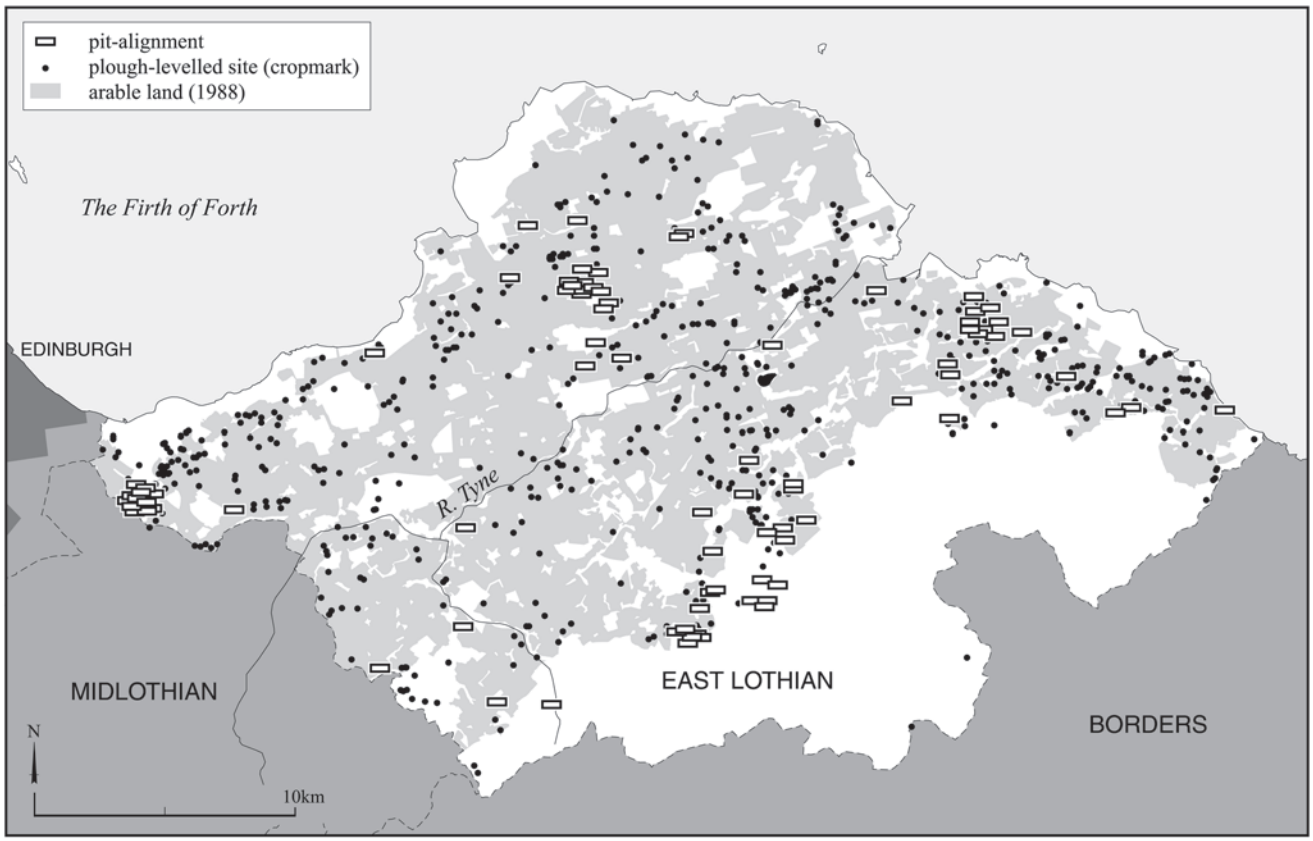

Figure 10.18
The distribution of pit-defined boundaries in East Lothian shown against the generalised extent of arable ground and all sites recorded as cropmarks (Crown copyright: RCAHMS, GV004489. Arable ground derived from MLURI mapping based on 1988 aerial photography).

Figure 10.19
The fort at Kaeheughs, Barney Mains, survives as earthworks, while the complex remains of an enclosure system and a palisaded enclosure have been recorded as cropmarks in the field below. Much of the enclosure system is made up of closely spaced pits, arranged as a string of beads and referred to as pit-alignments; these are likely to have been supplemented by an upcast bank. The enclosures may relate to stock control at a site that may have been locally pre-eminent (Copyright: D W Harding, EL/4122)

in later prehistoric economic and political structures (Cowley and Dickson 2007, 49–50), with the emergence of specialised delineated areas of landscape, perhaps associated with power centres within socially and economically differentiated settlement systems and potentially specialised forms of landuse, mixing stock and arable. The dating of the pit-alignments and the sites with which they may have been associated suggests that this pattern may have emerged by the mid-first millennium BC (Halliday 2002). A Neolithic date for pit-alignments has been suggested on the basis of the Ewart Park, Northumberland, excavations (Miket 1981) but, as this is based on Grooved Ware that may well be residual, such dating should not be sustained (Barber 1985; Halliday 2002).

The ability of survey to record certain types of remains has been a recurrent theme, and here the positive symbiosis between excavated structures, such as scooped houses, and the identification of their equivalents in the cropmark record is worth highlighting. This has allowed a distribution map, albeit speculative, of Roman Iron Age unenclosed settlements to be built (Figure 10.16), populating a previously poorly represented period of settlement. The occupation in and around the amorphous scooped feature at Whittingehame (above) is less helpful in this respect, but its identification at least provides one clue to why settlement remains of the mid-first millennium AD have proved so illusive. The recognition of a variety of more or less certainly Late Bronze Age enclosures is a development that requires a long hard look at our expectations of what are frequently assumed to be Iron Age enclosures. It is these challenges in differing sources of archaeological information speaking to each other that is the clue to effectively painting the regional pictures of settlement, where the detail and the broad-brush complement and challenge each other.

NOTES

1. The 'enclosure' at the eastern end of the East Linton site (Chapter 6) might also come into this category, but its perimeter is much slighter than these other three examples.
2. There is, however, a possibility that some of the ramparts continued in use and that a complexity of possible sequences must be allowed for, within which the interpretation of the houses as unenclosed is only one option.

Chapter 11

Characterising the Traprain Law environs: some reflections

COLIN HASELGROVE

The preceding four chapters have reviewed the absolute dating of the TLEP sites and sought to place the enclosure types and excavated finds in a wider regional context (Chapters 7–10). In addition, there have been two major studies of the later prehistory of the region since the fieldwork was completed, the first arising from the excavations along the new A1 dual carriageway (Lelong and MacGregor 2007), the other part of a wider survey of northern Britain (Harding 2004). Although written from differing theoretical standpoints and thus sometimes at odds over the significance and interpretation of particular features of the record, these two syntheses together offer an excellent overview of later prehistoric societies in East Lothian, which it would be superfluous to repeat here.

This concluding discussion will therefore be restricted to three main areas: first, to review the extent to which the TLEP results have expanded our knowledge of later prehistoric settlement in the immediate vicinity of Traprain Law itself; second, to review some features of the individual TLEP sites which stand out as unusual or call for comment on other grounds; and last, to reflect on some lessons of the project for future research in East Lothian and outstanding issues and questions with which this could profitably engage next.

SETTLEMENT DYNAMICS IN THE TRAPRAIN LAW ENVIRONS

After a nearly a century when the Traprain Law area was more notable for the lack of excavations at other sites, the new millennium has seen a burst of activity, with no less than 13 being excavated inside the TLEP study area since 2001 (Figure 1.3 above). Eight of these were later prehistoric settlements, of which four were explored on a reasonably large scale: the enclosures at Knowes, Standingstone and Whittingehame, and the unenclosed settlement at Phantassie. Smaller evaluations were undertaken on the enclosure ditches at East Bearford, East Linton and Foster Law, and a tiny homestead was exposed in its entirety at Biel Water (Lelong and MacGregor 2007). The A1 programme also uncovered isolated Iron Age cist burials at Pencraig Hill and Eweford West; two more later prehistoric occupation sites at South Belton and Thistly Cross; and part of another enclosed settlement at Eweford Cottages, the last four all just to the east of the formal TLEP study area.

Knowledge of later prehistoric settlement has been further expanded by the mapping programme undertaken by RCHAMS in East Lothian (Chapter 10) and by geophysical survey of 24 other cropmark sites as part of the TLEP. Most of the latter fit within the general umbrella of ditched curvilinear or rectilinear enclosures, but they included a palisaded site at Nunraw Barns; an open settlement at Tyninghame, and (less certainly) another at Preston Mains; and a large rectangular building at Sled Hill (Appendix 1, nos 14, 28–30). The latter structure is reminiscent of the well-known timber halls at Doon Hill, Dunbar (Hope Taylor 1980) and like them – and two more at Whitekirk (Brown 1983; Lelong and MacGregor 2007, 209–11) – could fit either into an early Neolithic or into an Early Historic context. And whilst there were no surface finds from the geophysical surveys, metal-detecting and fieldwalking have yielded an interesting assemblage of Roman finds from Athelstaneford and Harperdean, both within the TLEP area, and at Aberlady on the coast (Appendix 2). This latter site also yielded several Anglo-Saxon finds, suggesting that a so-called 'productive site' similar to those known in other coastal locations in southern Britain existed here.

Other recent advances include the final report on the influential excavations at Dryburn Bridge, 7.5km from the eastern edge of the TLEP area (Dunwell 2007), leaving nearby Broxmouth as the only one of the three major 1970s rescue excavations in East Lothian yet to be published. Meanwhile, small-scale excavation of another enclosure at West Loan, Prestonpans (Jones 2006) has brought to four the number of excavated sites near Port Seton, 10km west

of the TLEP area, the others being Saint Germains (Alexander and Watkins 1998) and the two Fishers Road sites (Haselgrove and McCullagh 2000), where a third enclosure has recently been recorded from the air (Chapter 1). Although the 'Port Seton' and 'Dunbar' clusters – the latter also including the promontory fort and later Anglian settlement at Castle Park, Dunbar (Perry 2000) – are probably too far from the TLEP sites and certainly from each other to be part of a single local community, they could well have belonged to the same regional grouping – what Hill (2006) terms a 'cluster of communities' – and participated in the same embedded social networks. Either way, therefore, these other sites provide a useful comparative resource.

Even with all the new data, no one would pretend that the settlement evidence from the Traprain Law area comes anywhere near to the resource painstakingly built up over nearly four decades for Danebury hillfort and its hinterland in southern England (e.g. Cunliffe 2000; 2008). In many respects, it never will, given the quite different depositional and soil regimes in the two areas. Nevertheless, there is now a far more substantial body of archaeological evidence with which to discuss the structure and dynamics of later prehistoric settlement in the TLEP area than was the case even a few years ago. The data are also far better than for many supposedly equivalent paramount centres elsewhere in Britain or on the continent (cf. Haselgrove *et al.* 2001) and have three additional strengths: firstly, the relevant sites all have some radiocarbon dates, aiding chronological comparison. Secondly, much of the environs data was collected by concurrent projects, applying similar methodologies to complementary aspects of the record. Whilst we must continue to beware of the possibility of taphonomically-induced differences between sites, this reduces many of the uncertainties inherent in inter-site studies (Chapter 7). Finally, two further clusters of excavated sites lie just beyond the project area, near enough to be useful for direct comparison and for analysis on a regional scale, but far enough away for purely local differences to emerge.

Chronological patterning

One of the more interesting outcomes of the TLEP was the plentiful evidence it yielded for Later Bronze Age settlement, with up to four of the enclosures being occupied at this period (Figure 11.1). Standingstone, where the Late Bronze Age hillslope enclosure proved to overlie an open or semi-enclosed settlement of late second millennium BC date, is the best documented, but the palisade and at least one ditch circuit at East Linton are also clearly of Late Bronze Age date, whilst the Whittingehame enclosure may date to this period. The earlier of the two Foster Law enclosures is another contender, given that its successor is Earlier Iron Age. Only the two rectilinear enclosures at Knowes and East Bearford seem to be new foundations in the Later Iron Age, although this cannot be pushed too far, since Knowes yielded a radiocarbon date and flints implying that the location was periodically frequented in the Bronze Age, whilst trenching at East Bearford was confined to the exterior of the site.

The precise extent and chronology of the Later Bronze Age/Earliest Iron Age settlement on Traprain Law will undoubtedly become clearer when the results of the recent work on the summit are published (Armit *et al.* forthcoming). According to the interim reports, this occupation probably began in the later second millennium BC, but most of the radiocarbon dates fall in the tenth or ninth centuries cal BC, consistent with intensive settlement at this period (Armit *et al.* 2002; 2005; 2006). This was probably when the terraced bank defining the so-called 'summit' enclosure was built. On the western shelf, however, some occupation probably continued into the eighth or even seventh centuries BC, judging from the Hallstatt C razor and the early iron socketed axe, but for how long and what scale is quite unclear. *Contra* Coles (1960), most of the bronzes and moulds found in the earlier excavations probably belong to the Ewart Park horizon (B O'Connor pers. comm.), as does the small hoard of socketed axes found in 2004 (Armit *et al.* 2005; O'Connor forthcoming).

In general, the new excavations found little to contradict prevailing wisdom that there was limited activity on Traprain Law for most of the Iron Age, although some traces of possible Iron Age buildings were found. It still seems most likely, however, that the inner and outer ramparts were built then rather than earlier, although the inner rampart was already long abandoned when the hilltop was reoccupied in the early centuries AD (Armit *et al.* 2006). It seems, however, that we can now discount Hill's (1987) argument that Traprain Law was primarily a ceremonial centre during Roman Iron Age, since the recent work suggests the presence of a sizeable resident population, especially in the third and fourth centuries AD.

Although the detail remains to be filled in, the TLEP results imply a more complex pattern of Later Bronze Age settlement than previous discussions of the area

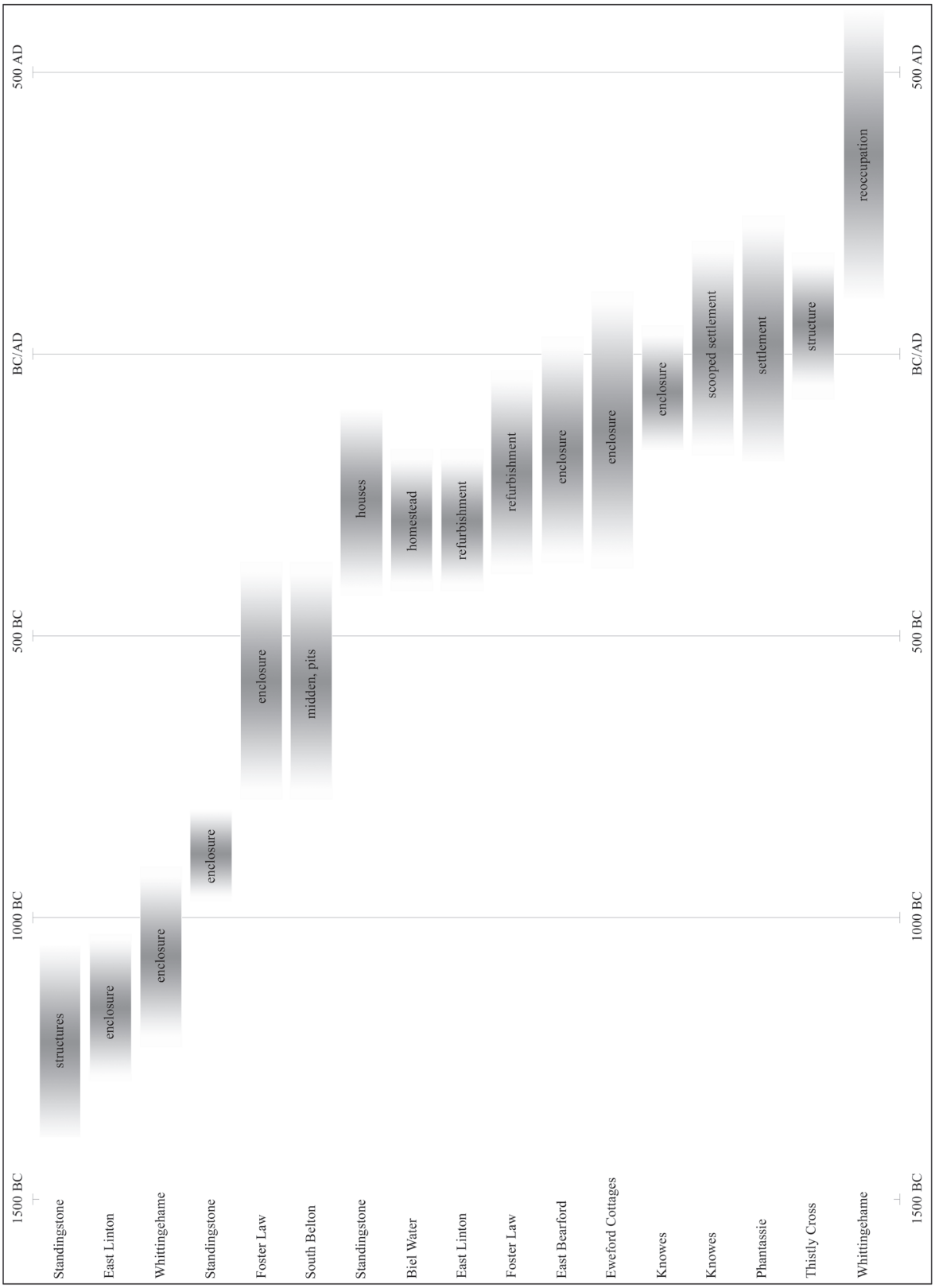

Figure 11.1
The chronological span of activity on later prehistoric settlements in the Traprain Law environs excavated as part of the TLEP and A1 investigations

have allowed. Whilst invoking terms like settlement hierarchy perhaps runs a risk of overemphasising the distinctions between sites, it is clear that by *c.* 1000 BC, a wide range of enclosure types existed in East Lothian. Leaving aside the unusually extensive and artefact-rich settlement on Traprain Law, they include both large and smaller enclosures, defined by substantial ditches and banks, not just by palisades, and in two cases, apparently subject to multiple acts of enclosure within the Bronze Age. The examples we know about so far were situated on high ground and/or at ravine edges, although this picture may change with further work; two of them at least occupy locations first frequented in the Neolithic, and, at Standingstone and Traprain Law, the act of enclosure was secondary to a phase of open settlement. Whilst it is unlikely that all these sites were inhabited at the same point in time in the Later Bronze Age – at Standingstone, the enclosed phase was quite short-lived, perhaps suggesting a significant element of mobility in the settlement pattern – they nevertheless give the impression of a reasonably high population density at this time.

If the Later Bronze Age stands out as one of the high spots in the occupation history of the TLEP sites, it is noteworthy that the exact opposite applies to the sites excavated along the A1. None of these yielded any obvious traces of Later Bronze Age settlement, and only four of over 120 radiocarbon dates are even partly within the range 1300–800 cal BC. Three are from late second millennium BC cremations at Eweford West, whilst the fourth, which falls between 900–780 cal BC (SUERC-7530), came from an outlying pit at Howmuir on the site of an earlier Bronze Age semi-enclosed settlement and/or field system, slightly earlier than, but in other respects comparable to the pre-enclosure phase at Standingstone (cf. Lelong and MacGregor 2007, 284–7).

Such a disparity between the two datasets deserves an attempt at explanation. Given that the A1 aimed to avoid known cropmark sites – and assuming that the difference is not simply due to chance – the most likely scenario appears to be that Later Bronze Age settlement was more focused on enclosure than either periods before or after. This would help account for the absence of sites in the road corridor, but begs another question: why is it that, unlike Traprain Law, neither of the Bronze Age enclosures excavated by the TLEP yielded much evidence of internal occupation? At Standingstone, this could admittedly be due to the severity of the ploughing, and at Whittingehame earlier features could have been lost when the scoop was dug, but even so, there were fewer traces of occupation than might have been expected; for instance, there were few crop remains and even less evidence of *in situ* crop processing, although this too might have other explanations.

One plausible alternative might be to envisage the excavated enclosures not as settlements, but as enclosed spaces used for communal activities and purposes such as ritual, storage, assembly and providing defence when required for a population most or all of whom lived outside. A possible analogy is the Late Bronze Age complex at Malleville-sur-le-Bec (Eure) in northern France, where – clustered outside a ditched and palisaded enclosure of the same size as Standingstone and equally devoid of internal features – are numerous roundhouses and other settlement features, which from building replacements probably represent the remains of a community of no more than four or five households spanning a period of several generations (Carozza and Marcigny 2007, 59–62). Recent geophysical survey at Castle Hill, Wittenham (Berks), suggests a similar spatial arrangement may have existed there (R Bradley pers. comm.).

In contrast to the Later Bronze Age situation – and setting to one side the question of continuing activity on Traprain Law – there is as yet very limited evidence for Earlier Iron Age settlement in the environs area. The only significant event detected on any of the TLEP sites between the eighth and the fourth centuries BC was the construction of a new enclosure at Foster Law (its undated predecessor might also belong within this period rather than earlier). Apart from this, there is a single radiocarbon date from the upper fill of the ditch at Standingstone, which implies that the abandoned Bronze Age enclosure may occasionally have been frequented at this time. The picture from the A1 sites is similar, with signs of settlement activity restricted to two scoops at South Belton, one of which yielded midden material dated to the Earlier Iron Age (Lelong and MacGregor 2007, 125).[1]

The other relevant find along the A1 was a well-built rectangular stone cist dug into the Neolithic burial mound at Eweford West (just beyond the TLEP area), containing the cremated remains of an adult of Earlier Iron Age date and a child (*ibid*., 122–3). Ironically, given the scarcity of Iron Age burials of any period in Britain, one of the pieces of curated human bone incorporated in the later cist built on top of the infilled ditch terminal at Knowes (Chapter 5) was also apparently of Earlier Iron Age date. It is just possible therefore that the Eweford cist – which contained

lithic artefacts and beaker sherds mixed in with the human remains (although these could be residual) – is in fact a later construction, although it is true that in form, the Eweford cist is quite different from the one at Knowes, which much more closely resembles the example excavated on Pencraig Hill (Lelong and McGregor 2007, 123–4). As it happens, this contained cremated remains of Later Iron Age date and of similar age to the other curated human bone in the Knowes cist.

The low profile of Earlier Iron Age settlement in the TLEP area is consistent with the picture in many other parts of Scotland and central Britain (cf. Haselgrove *et al*. 2001; Haselgrove and Pope 2007), but it is too early to be certain whether this reflects a genuine reduction in the number of occupied sites compared to the Later Bronze Age or the Later Iron Age. As Ralston and Ashmore emphasise (2007, 231–2), when poor radiocarbon dates are excluded and only well-dated sites considered, the differences in site numbers between periods are small enough to have arisen by chance alone. Nevertheless, given the complementary coverage provided by the TLEP and the A1 investigations, it is looking increasingly likely that there were fewer Earlier Iron Age sites in this part of East Lothian than either before or after.

On the other hand, there is sufficient evidence from elsewhere on the coastal plain to suggest that the Earlier Iron Age settlement pattern was not appreciably less complex than in the Later Bronze Age, even if it involved fewer sites. At Dryburn Bridge, the palisaded enclosure, cemetery and several of the houses, although not closely dated, are all earlier than 400 cal BC (Dunwell 2007), whilst at Broxmouth, the early open settlement of large houses, the initial enclosure of the hilltop, and at least some of the burials, probably belong to this period, despite the problems with the quality of some of the radiocarbon dates (Ralston and Ashmore 2007). There are hints, too, of some Earlier Iron Age activity at Fishers Road, possibly involving enclosure, although a clear context for this is lacking (Haselgrove and McCullagh 2000). In short, a wide variety of settlement types are attested in the region during the Earlier Iron Age – large and small, open and enclosed, ditched and palisaded – even if as yet there is little prospect of defining any more detailed spatial or temporal trends within the four or five centuries in question.

At Broxmouth and Dryburn Bridge, the buildings belonging to the earlier settlement phases were rebuilt several times, implying lengthy occupations (cf. Hill 1982a). This could yet prove to be one of the fundamental distinctions between the Later Bronze Age and the Earlier Iron Age, with fewer settlements occupied in the latter period, but often for much longer. In addition, the substantial timber houses found on them could have accommodated larger households, so that despite the much smaller site numbers, the overall population densities may have been fairly similar (although this is not to say that they were). A variant of the model proposed by Cowley (1998; 1999) for later prehistoric settlement in Sutherland might well apply to the Earlier Iron Age in East Lothian, with occupation focused on long-lived sites in the most favourable areas and a decline in the number of short-lived sites particularly on the poorer soils and/or more marginal topographies, whether due to climate change or for other reasons. This would accord with the pollen evidence, since it is not until the later first millennium BC, and mostly after 350 cal BC, that we see the start of the well-documented assault on the remaining woodland across much of southern Scotland and northern England (Tipping 1994; 1997), evidently driven on by a combination of agricultural intensification and sustained settlement expansion into hitherto sparsely-occupied areas (e.g. Haselgrove 1982; Van der Veen 1992).

In the TLEP area, the resurgence in settlement numbers in the Later Iron Age was accompanied – at least to begin with – by an increased emphasis on enclosure. At both East Linton and Foster Law, the earlier circuits were refurbished (although like Broxmouth, both sites could have been continuously occupied since the Earlier Iron Age), but many were constructed anew. Sites where this can be demonstrated include the two sub-rectangular enclosures sampled by the TLEP at East Bearford and Knowes, and another at Brixwold (Crone and O'Sullivan 1997), and several of broadly curvilinear form, ranging from the small palisaded homestead at Biel Water and more substantial ditched enclosure at Eweford Cottages on the A1, to the two Port Seton sites, West Loan, St Germains and Craig's Quarry, Dirleton (Piggott and Piggott 1952; Piggott 1958), in the surrounding area – although the dating evidence for the earlier phases of these two latter sites is weak.

The variation in individual site histories, exacerbated by plough truncation and/or the limited areas explored at many of them, makes it difficult as yet to offer much by way of substantive generalisation. Some Later Iron Age enclosures were apparently new foundations (Knowes, Brixwold, Fishers Road West?), whereas

others arguably developed from open or semi-enclosed settlements (St Germains, Fishers Road East?). At some sites, the enclosure boundaries tend to become larger and more elaborate over time (Port Seton, St Germains), but elsewhere intervention was restricted to the periodic redefinition of an existing boundary, potentially over several centuries if the dating evidence from Brixwold is accepted at face value (Crone and O'Sullivan 1997), but probably not for more than a few decades on the unstable sandy subsoil at Knowes.

On current evidence, the building of sub-rectangular enclosures seems essentially to be a Later Iron Age phenomenon, although this cannot be pushed too far, given that Maxwell (1970, 87) included the larger enclosure at East Linton – now shown to have Bronze Age beginnings – in his inventory of rectilinear sites in East Lothian, whilst accepting that it stood out from the rest of this class, particularly because of its multiple ditches. What this Later Iron Age enthusiasm for simple rectilinear enclosures might imply socially or economically, or whether it has any value as a chronological indicator within the period are not, however, questions that we can readily answer at present. As Cowley notes, in general terms it does not seem unreasonable to link their foundation to the process of settlement expansion and agricultural intensification underway at this time (Chapter 10), particularly as there are slighter linear earthworks linked to the enclosures at Knowes and East Bearford, which clearly reflect contemporary organisation of the surrounding landscape.

So far there is little to suggest that open settlement was a major component of the settlement pattern in the earlier centuries of the Later Iron Age, but initial impressions may yet prove misleading as they did in north-east England (Fitts *et al.* 1999). After a hiatus of several centuries, a settlement represented by a form of ring-ditch house was established within the vestigial Bronze Age earthwork at Standingstone, probably in the fourth or third centuries cal BC; this settlement had a duration of up to two centuries, before the site was abandoned for good. A similar development occurs at Dryburn Bridge, where a group of ring-ditch houses overlie the earlier palisade; here, however, there is a tension between certain features of the site, which imply an element of continuity between the enclosed and unenclosed phases, and other finds indicating that that the site was inhabited into the Roman Iron Age, which would require a very lengthy period of continuous occupation (Dunwell 2007). On balance, it seems likely that, here too, there was a hiatus in occupation. Finally, as already noted, the Fishers Road East and St Germains enclosures may have begun as open settlements, but if so they were probably fairly rapidly enclosed, and in neither case is the preferred sequence totally secure (Chapter 10).

In the last two centuries BC, we see major changes in the character of occupied sites, with the enclosure circuits at more and more settlements first falling into disrepair and eventually being completely disregarded. At Knowes, occupation focused around the central scooped area continued uninterrupted for up to two centuries after the ditch had largely filled up, and paved surfaces and stone structures were built over the original enclosure boundary. Comparable changes can be seen at several other sites in the area, including Eweford Cottages, St Germains and Broxmouth, where the occupants constructed smaller, sunken stone houses just like those at Knowes on the stances of the earlier timber buildings and over the former earthworks (Hill 1982a).

Within the TLEP area, there are hints of similar developments at Foster Law, East Linton, Gilmerton House and Chesters (Chapter 10). At Phantassie, what began in the second or first century BC as a minor settlement on a shelf above the River Tyne had by the first century AD developed into sizeable hamlet of stone-walled buildings and their associated yards, paths and ancillary structures (Lelong and MacGregor 2007). This is also when Traprain Law apparently re-emerged as a significant population centre (Armit *et al.* 2002). Given the existing bias towards cropmark sites, it could well be that many other Later Iron Age settlements which were never substantially enclosed await discovery, whether like Phantassie or like the isolated stone structure found at Thistly Cross just along the A1 (Lelong and MacGregor 2007, 129–31). Those cropmark sites that developed into unenclosed settlements may even be only the tip of the iceberg.

Whilst a certain number of sites in East Lothian seem to have been abandoned around the time the Roman incursions into Scotland started (e.g. both Fishers Road sites; Haselgrove and McCullagh 2000, 188), occupation continued uninterrupted into the Roman Iron Age at many others, as the sequences from Knowes and Phantassie show. From the widespread distribution of Roman finds, it is clear that the lowlands remained densely inhabited throughout the second century AD – although more of the Roman material is unstratified or from superficial contexts than we might wish (Chapter 7), leaving open the possibility that it reflects post-abandonment deposition. It is not yet clear, however,

whether the process of infilling and expansion which been underway since the Later Iron Age continued or was now significantly attenuated, but some sites are likely to be new foundations dating to the second century AD, notably Whittingehame where the long abandoned enclosure was re-occupied and the scoop constructed.

In the later Roman Iron Age, however, the picture changes significantly. The only sites definitely occupied after the early third century AD are Traprain Law, Whittingehame and Castle Park, Dunbar (Perry 2000), although there are hints of renewed or continued activity at a few more, including Phantassie and Fishers Road West (Chapter 7). A lack of radiocarbon dates (the sole source of dating at Whittingehame and Dunbar) and plough truncation may have depressed numbers, but the virtual absence of third and fourth century AD Roman finds is still difficult to explain given their relative abundance at Traprain Law, which shows that there was no (permanent) interruption of supply to the region (Hunter 2006). There are signs, too, of a renewed concern with enclosure on the sites that were occupied: Traprain Law was refortified, probably in the fourth century AD (Armit *et al.* 2006, 606); the middle of the three ditches at Dunbar was dug in the Roman period (Perry 2000, 28–9); whilst at Whittingehame, the remains of the main ditch would have provided a perfectly functional barrier without more than minor cleaning out and it only fell finally into disrepair in the post-Roman period.[2]

The thriving occupation of Traprain Law did not outlast the mid fifth century AD (Hunter 2006), leaving Whittingehame and Dunbar as the only sites with occupation dated to the fifth and sixth centuries AD – although at neither place is the nature of the continuing activity very clear. At Whittingehame, it involved deposition of quite large amounts of carbonised cereals, but this could be the result of no more than occasional use of the interior for crop processing, whilst at Dunbar, the dates are all from timber buildings (one sunken-floored) and other contexts attributed to the Anglian occupation of the site, and separated from the Roman Iron Age occupation by a sterile deposit (Perry 2000). Anglian settlement in the area is not usually thought to have begun before the seventh century AD, whereas a number of the relevant dates are earlier; if not residual or from long-lived wood, the answer, given the lack of diagnostic artefacts, might well be that the post-Roman inhabitants of the site were (initially) of native origin.

One other site worth mentioning in this context is Castle Rock, Edinburgh (Driscoll and Yeoman 1997). Up to the fourth century AD, the highs and lows of occupation on the hill appear to mirror those on Traprain Law. Thereafter, they diverge, with activity on the Rock continuing in some guise through the post-Roman period and into Early Historic times, as happened at Dunbar, but not at Traprain Law nor any of the other sites in the TLEP area (although sites such as Sled Hill or Whitekirk with timber halls resembling Doon Hill might well fill the gap, unless all such structures are Neolithic). After the sixth century AD, the only activity in evidence at the TLEP sites, apart from the later trackway at Whittingehame, was agriculture, much of it post-Improvement but including the remnants of ridge and furrow fields, which may in some cases go back to the Middle Ages and were probably responsible for the final levelling of the earthworks at several sites.

The Environs sites in long-term perspective

At both Standingstone and Whittingehame, the construction of the enclosures proved to be just one episode in a far longer history of human frequentation of the site, repeating a pattern found on many other enclosures including Broxmouth, Dryburn Bridge, St Germains and Traprain Law itself. Between them, these two TLEP excavations provided various snapshots of domestic and funerary behaviour in the Neolithic and Earlier Bronze Age that resonate well with the patterns documented in more detail by the A1 excavations (Lelong and MacGregor 2007). The ravine edge at Whittingehame was apparently occupied in the late fourth millennium BC, whilst at Standingstone there are traces of settlement on the hillside in the early third millennium BC; this was followed by an urnfield cemetery of early second millennium BC date. At some point a ditch was dug across the area, perhaps reflecting a period of agricultural use in the Middle Bronze Age, before the hillside was again occupied for settlement; alternatively, the ditch may have been dug in the later second millennium BC to define the edge of the inhabited area. There are some slight indications that the Tyne terraces at Knowes were also frequented in the Bronze Age, although the rectilinear enclosure was the first permanent settlement on the site.

Whittingehame and Standingstone were both reoccupied (at different times) after a long period of abandonment, although there are hints that the latter

site retained some significance for the local community in the intervening centuries and was occasionally visited. It remains to be seen, however, whether these places truly retained significance in communal memories and consciousness over the centuries and even millennia, or whether their intermittent use merely reflects a society in which regular frequent shifts in settlement site within a preferred settlement territory were the norm, and thus from time to time people returned to the most advantageous locations.

Collectively, the waxing and waning of activity over four millennia at the TLEP sites spans broadly the same timescale and exhibits some of the same rhythms as occupation on Traprain Law itself. At the same time, it is now clear that the relationship between Traprain Law and its neighbours changes significantly through time and that we must look to a range of settlement models. In the Later Bronze Age (enclosed?) and in the early Roman Iron Age (unenclosed), the sizeable settlements on the hilltop were only one element of a complex regional settlement pattern. In the Roman period, there are some indications of a hierarchical relationship, with (some of) the inhabitants of Traprain Law sitting at the apex of the social and political system, whence they dispensed a selection of Roman goods to other communities through the social networks which bound all them together at regional level, although the lack of marked distinctions between sites implies a only limited degree of social differentiation at a local level (Chapter 7). A similar model might well apply to the Late Bronze Age settlement pattern, but as yet we do not have any detailed evidence, although the content of the bronze hoard found on Traprain Law in 2004 implies that hilltop community enjoyed far flung connections at this period too (O'Connor forthcoming).

At other periods, the picture appears quite different. The discovery of *in situ* rock carvings on Traprain Law (Armit *et al*. 2006) reinforces the view that the hill was an important ceremonial and ritual focus from early in the second millennium BC. In the Earlier Iron Age, the hilltop may have reverted to these roles and perhaps acquired new ones as a place of refuge and communal assembly, but there is little evidence of settlement there and not much in the environs. Traprain Law remained quiet through most of the Later Iron Age, but the surrounding landscape was increasingly densely populated; initially most settlements were enclosed, but over time their boundary earthworks lost their significance and many sites expanded over them. Finally, in the later Roman Iron Age, we encounter a new situation: a large resident community on Traprain Law, but few signs of contemporary occupied sites elsewhere, implying that many of the local population were now living on the hilltop.

What caused the collapse and abandonment of the hilltop settlement in the fifth century AD is still unclear, but there is little sign of people returning to the environs, implying that population levels may have fallen significantly from those of the early first millennium AD (although as the Whittingehame excavations demonstrated, sites occupied in the late and post-Roman periods are inherently difficult to recognise and more may yet come to light). There are fleeting indications that Traprain Law was again used for burial in the Early Christian period (Armit *et al*. 2006, 606), but nothing to indicate that it ever again played a central role in the settlement pattern, which by the seventh century AD was evidently focused on new power centres and dwelling sites like those at Dunbar.

UNUSUAL ATTRIBUTES OF THE INDIVIDUAL TLEP SITES

Many features of the TLEP sites are readily paralleled on other excavated sites in the region, but a few are more unusual and call for brief comment here. With regard to the enclosure boundaries, they include the 'ankle-breaker' profile of the recut outer ditch at Whittingehame; the width and depth of the main ditch in relation to the size of the site as a whole; and the incomplete circuit at Standingstone. At the latter site, there is no sign of an entrance, which was presumably situated in the unditched sector on the north-west side of the site. On the other hand, the two rectangular enclosures at East Bearford and Knowes both had their main entrances on the east, echoing the situation at many other Iron Age sites in East Lothian and beyond, e.g. the two Fishers Road sites (Haselgrove and McCullagh 2000). Foster Law, too, appears to have had an entrance on the east opposing the surviving west-facing entrance.

Later ploughing and other activity severely affected the survival of internal structures at Standingstone and Whittingehame, but both sites yielded hints of unusual building types. At Standingstone, possible traces of Later Bronze Age circular structures belonging to the open settlement phase were found, as well as curving sunken-floor scoops dating both to this period and to the Later Iron Age reoccupation. The Iron Age sunken-floor features with their flanking gullies are

best interpreted as the remains of houses of ring-ditch type, although given their depth on the downslope side, more of the circuits might have been expected to survive. An affinity with miniature souterrains like those from Dubton, Angus (Cameron 2002) seems unlikely, given the much greater depth of the Dubton structures. The Standingstone features bear more resemblance to a paved depression in the centre of Ednie Structure 2, near Peterhead, Aberdeenshire (Strachan and Dunwell 2003), although the Ednie feature is shallower and likely to be of Later Bronze Age date (albeit not dated directly), whilst the attribution of the Standingstone structures to the Later Iron Age appears secure. The environmental samples from their fills were amongst the richest from the site, implying that cereal processing took place close by.

The extensive cobbled scoop at Whittingehame was only partially explored, but sits within a regional tradition of large sunken-floor structures with cobble floors, of which there are examples at Brixwold (also of unknown extent; Crone and Sullivan 1997, 391–4) and Fishers Road East (Haselgrove and McCullagh 2000, 107–10), the former probably and the latter certainly dated to the early centuries AD, contemporary with the Whittingehame scoop. Such structures have a long history of use in the region, as the discovery of earlier examples at South Belton and Biel Water on the A1 shows (Lelong and MacGregor 2007). Returning to Whittingehame, the adjacent stone-paved structure (SS1) also has numerous counterparts at local sites, including Dunbar (Perry 2000), Eweford Cottages, Phantassie (Lelong and MacGregor 2007) and St Germains (Alexander and Watkins 1998), although the paving stones used at Whittingehame are rather smaller than normal. There was nothing to indicate the nature of the accompanying superstructure, if any.

Next to the Whittingehame structure was a smaller paved area, potentially the remnants of a second, ancillary structure or surface. The pairing of a larger walled structure and a smaller structure or surface is a phenomenon that recurs several times at Knowes, where both the scooped buildings (CS1–2) and some of the surfaces within the central scooped area are accompanied by smaller paved areas (or in the case of CS2, a smaller scoop). The surface belonging with CS1 appears to be secondary, and when it was laid, a new entrance was made on the north-west side to give direct access from one structure to the other. Further examples of paired house and ancillary structure are not immediately obvious in East Lothian – possible candidates are timber structures H5 and H6 (if contemporary after all), and H1 and H4 respectively at Dryburn Bridge (Dunwell 2007) – but a looser analogy may perhaps be drawn with the occasional examples of conjoining stone-walled buildings reported north of the Firth of Forth such as Carlungie (Wainwright 1963), Ceann nan Clachan (Armit and Braby 2002) and in upland Perthshire (Harris 1984), or the cellular building configurations on the western shelf of Traprain Law (Smith 1990, chapter 5) and at Phantassie. At a more general level, the siting of the two late scooped houses at Knowes on the far edge of the central scoop from the entrance recalls the arrangement of many rectilinear and curvilinear stone-built settlements with sunken yards in the Cheviots, such as Kennel Hall Knowe, Knock Hill, Middle Hartside Hill, Riding Wood and Woolaw (e.g. Jobey 1960; 1964; 1978), some of them undoubtedly contemporary with Knowes.

Stone-walled scooped houses like those at Knowes are well-known from Broxmouth (Hill 1982a) and other East Lothian sites. A more unusual feature of CS1–2 is the way that the surface in the quadrant to the right of entrance was made of carefully laid flags, whereas the rest of the floor was made of earth or of smaller stones. The nearest parallels are from outside the region, confusingly at two sites called Hawkhill, one in Angus, the other in Fife (Dunwell and Ralston 2008, 102–4; Rees and Anderson forthcoming). At both Hawkhill sites, the scooped buildings are larger than CS1–2 and the Angus example is more oval than circular, but they are otherwise very similar. The paving in the Fife building is again to the right of the entrance, but in the Angus house it is to the left (of a south-east facing entrance). The Angus building also had a central hearth like Knowes and the paved area incorporated the upper stones of two rotary querns (those from CS1 came from the less well-made part of the floor). Dunwell and Ralston (2008) note that the rest of the floor at Hawkhill (Angus) could have been made of organic material, whilst it has been suggested that the sunken area in the Fife building might be a cellar.[3]

All three main excavations yielded probable instances of deliberate placing of querns or other types of object, intact and broken, in significant locations. At Knowes, the complete upper stone of one quern and part of the lower stone of another were laid on the infilled ditches midway along the western and eastern sides respectively, whilst a large rim fragment from a bucket-shaped pottery vessel was placed at

the very end of the southern entrance terminal. At Standingstone, five of only six cobble tools from the site came from the western ditch terminal, whilst two of the five found at Whittingehame came from one post-hole, cut into an earlier ditch. Many instances were observed of the reuse of old objects in buildings, such as the two quernstones (and a cobble tool) in the floor of CS1 at Knowes, or the broken saddle quern in an early post-setting at Whittingehame. Whilst it would perhaps be going too far to interpret all of these as deliberate acts of incorporation of elements of the past in the present, some undoubtedly were; a good example being the inclusion of a knocking stone made from a piece of late Neolithic rock art in a paved surface beside the entrance to the central scoop at Knowes (Chapter 7). Other symbolically charged actions include the placing of older human bone in the burial cist constructed in the southern ditch terminal, perhaps as an act of closure by the departing inhabitants, which simultaneously restated their ancestral claims to the land. Nothing was found, however, to indicate that the other cist-like structure at Knowes contained a burial, nor was there any sign of human bone in other contexts (apart from the Earlier Bronze Age graves at Standingstone) to suggest that they treated their dead in similar ways to the inhabitants of Phantassie, with its disparate scatter of burnt human remains from occupation deposits all over the settlement (Lelong and MacGregor 2007).

Apart from the grain cache buried under the bank at Standingstone, possible evidence of ritual activities connected to the agricultural cycle was restricted to the smashed Roman flagon and quern from CS2 at Knowes. One interpretation would be that these derive from ceremonies associated with communal gatherings, which required the consumption not just of the products but also of the means of production. As on the A1 and at most other later prehistoric settlements in the region, next to no evidence of animal husbandry was recovered, with only cattle, horse and sheep/goat attested for certain, although pig is probably present at Knowes. The inhabitants of all three main TLEP sites also had access to coastal resources, as the presence of shellfish at Knowes (and East Bearford) and of seaweed at Standingstone and Whittingehame shows (Chapter 8). As elsewhere, barley was easily the commonest cereal, with wheat a long way behind. There are signs that more spelt was being grown in the Later Iron Age, as at Port Seton (Huntley 2000), but emmer remained the dominant wheat into the Roman period and – one of the surprises of the TLEP – was still cultivated at Whittingehame in the mid-first millennium AD. On the other hand, the appearance of oats there in the latest stages of occupation fits well with evidence from elsewhere suggesting that oats became more widespread in Scotland at this time, whilst the relative abundance of both cereals and seaweed in late contexts might mean that by that stage, the abandoned enclosure was being used mainly for agricultural activities and then perhaps only on a few occasions.

EAST LOTHIAN: THE NEXT PHASE?

The overarching aim of the TLEP was to investigate the date and changing character of smaller enclosed settlements in the hillfort environs, contributing to wider research on the development of later prehistoric society and economy in southern Scotland, and on the nature of Roman impact and indigenous responses. An important subsidiary aim was to evaluate the effectiveness of geomagnetic survey on the complex and supposedly unresponsive East Lothian geology. In the event, whilst the survey results were of variable quality, overall they were significantly better than expected and many of them pinpointed anomalies that were not apparent on the cropmark record but were later confirmed by excavation. There is no longer any doubt that geomagnetic survey offers future projects in East Lothian a powerful tool for investigating sites and moreover one that is capable of covering large areas relatively rapidly. Equally, as the work at Gilmerton House shows, systematic metal detecting and fieldwalking can also add an extra dimension to our knowledge of both on- and off-site activity.

That geomagnetic survey can now cover large areas quickly and effectively is largely due to advances in instrumentation, recording and processing that have place over the last 20 years (cf. Hale *et al.* 2006). Another major methodological advance from which the TLEP has benefited enormously has been the application of Bayesian statistics to radiocarbon dating. As Hamilton's modelling of the Knowes and Standingstone sequences shows (Chapter 9), this should enable us to establish with a high degree of certainty whether two settlements, or even occupation phases, were contemporary, or whether archaeological events occurred before or after a particular calendar date, for example whether a site was abandoned before the Flavian advance into southern Scotland. It should by now go without saying that comprehensive radiocarbon dating programmes should be routinely undertaken on excavated prehistoric settlements (cf.

Haselgrove *et al*. 2001) – without radiocarbon dating, the abandonment of Whittingehame would have been put in the second century AD, based on the samian ware from the latest stratified deposits – but a useful lesson from the TLEP is that excavators should as far as possible devise a radiocarbon dating strategy whilst still on site, so that key contexts are actively targeted for suitable material rather than relying on *ex post facto* recovery of suitable material from bulk environmental samples.

In 2008, a research project began at Bradford University, which will result in the final publication of Peter Hill's 1977–8 rescue excavations at Broxmouth that, along with those at Dryburn Bridge and St Germains, did so much to shape current thinking about later prehistoric settlement in southern Scotland. If all goes to plan, along with the present volume East Lothian can now expect to see no fewer than five monographs on later prehistoric settlement excavations published in as many years, the other three being the reports on Dryburn Bridge (Dunwell 2007), the A1 (Lelong and MacGregor 2007) and the Traprain Law Summit Project (Armit *et al*. forthcoming). However, as Armit (1999, 77) noted 10 years ago, it is greatly to be hoped that this unparalleled wave of publication is not seen as an act of closure or allowed to usher in a period of neglect like the one that followed the 1970s excavations, but rather that a new generation will now come forward to begin research projects in East Lothian exploiting the foundation that the work of the last 30 years has laid.

It will be primarily for future researchers to determine the detailed content of this 'post-Broxmouth' research agenda. Nevertheless, it will do no harm to conclude this discussion by briefly highlighting some key questions which the TLEP did not address and might usefully form part of any future agenda, along with more general lacunae that remain in our understanding of later prehistoric settlement and society in the region, even after the work that has been carried out in the past few years. These fall into three main areas: (1) the wider landscape organization within which sites existed; (2) the relationships between different settlements and types of site; and, not least, (3) the perennial problem of reconstructing the social and political frameworks that bound people together at different scales and of writing more general narratives for a period of two millennia from the kind of data provided by what is still only a handful of extensive excavations.

To date, fieldwork undertaken in East Lothian has nearly all been enclosure-focused, but several of the TLEP surveys provided glimpses of an inhabited and sub-divided landscape (of pre-first millennium BC date at Standingstone, of Later Iron Age date at Knowes and East Bearford) intimately linked to the occupation of that site, the remnants presumably of more extensive systems of linear land divisions and cord-rig fields like those that still exist at Hut Knowe or Tamshiel Rig in the uplands (Harding 2004, figs. 3.13, 3.16). At Gilmerton House, the finds all came from outside the enclosure, as is the cemetery at Broxmouth, whilst the A1 work yielded plentiful evidence of other kinds of human presence in the landscape, for instance in the form of possible short lived activity areas used for particular purposes (South Belton, Thistly Cross?), or the reuse of early monuments for burials (Eweford West, Pencraig Hill). The possibility that the Standingstone enclosure served as the focus of a more extensive open settlement like Malleville-sur-le-Bec in northern France has also been mentioned.

All this underlines the need for future fieldwork in the Traprain Law environs to look beyond visible enclosure boundaries and to examine the larger inhabited zone within which the inhabitants of individual sites played out their everyday lives (Haselgrove 1999), a task now well within the capabilities of geomagnetic survey, backed up by focused excavation. A very obvious target in an East Lothian context would be the pit-defined boundaries which occur frequently throughout the lowlands and in some cases seem to form relatively coherent systems of enclosure linked to specific groups of sites, as in The Chesters–Newmains–Kaeheughs area (Chapter 10; Harding 2004, fig. 3.14). Previous trial excavations (MacKay 1980) imply that the individual pits are often quite shallow and the parallel alignments at Newmains (Appendix 1, no 15) did not respond very clearly to geomagnetic survey, but this was one of the less informative TLEP surveys and elsewhere magnetometry proved more than capable of detecting shallow gullies that could well escape attention from the air away from the immediate vicinity of an enclosure. In the right circumstances, tracing landscape divisions around settlements should be perfectly feasible.

As I have noted previously (Haselgrove and McCullagh 2000, 186–9), a second set of key questions revolves around the high densities of enclosures on the better quality soils of the coastal plain and the frequent existence of two or more sites within a stone's throw of one another, as at The Chesters or Fishers Road, Port Seton. Do such clusters reflect socially meaningful

'neighbourhood groups' focused on a particular natural territory or resource, or are they simply palimpsests created by regular shifts in site location over the centuries? If the Fishers Road evidence provided some evidence in support of the first scenario (with the proviso that the enclosures probably had different roles some of the time; *ibid*., 185), the TLEP results imply that the truth lies somewhere between the two, with many enclosures occupied at different periods, but also to prone to reuse over the centuries.

A possible example of a 'neighbourhood group' linked to a specific resource is provided by the concentration of sites around the Garleton Hills. Just as the proximity of the Edin's Hall broch to a copper source (Dunwell 1999) is most unlikely to be simple coincidence, the availability of good quality iron ore would provide an obvious rationale for the exceptionally high density of settlements here (including Foster Law and The Chesters), which together could easily have controlled and exploited the haematite source. On the other hand, the presence of Standingstone-type enclosures at Kilduff Mains and Sixpence Strip (Appendix 1, nos 16, 18) implies a substantial time depth to the distribution, taking it back to an era pre-dating any working of the iron. With Bayesian modelling, however, we now possess a means of establishing with reasonable certainty which settlements were contemporary and a logical strategy to pursue in East Lothian would be to privilege the excavation of further sites in the three areas (Dunbar, Port Seton and Traprain Law) where previous work has focused, whether through dedicated research projects or by differentially grasping any opportunities created by modern development. Bayesian methods also offer a framework for investigating the relationship between environmental changes documented in pollen cores and settlement developments in their catchments, although on current knowledge this is probably an unrealistic aspiration for most of the East Lothian lowlands.

There can be little doubt, however, that the most difficult challenge of all facing us in the future is how to reconstruct the higher order social, economic and political networks in which individual households and settlements participated, when only a handful of sites have been excavated in any given locality. In East Lothian, the lithology of quernstones does not unfortunately offer the potential for tracing social and economic relationships that has been so successfully exploited in, for example, north-east England (Hayes *et al*. 1980; Heslop 2008) or the south-west (Moore 2006), although it may eventually prove possible to delineate some meaningful differences in procurement patterns across the region. Scientific methods of analysis may also be able to make a greater contribution in future, as in Jay and Richards' (2007) search for dietary signatures associated with consumption of marine resources, of which we see some physical evidence at inland sites such as Whittingehame and Knowes. And as Fraser Hunter shows in Chapter 7, at a very general level, certain differences *can* be identified between settlement assemblages from across the region, which from the Later Iron Age onward are perhaps susceptible to interpretation in terms of the existence of localised social hierarchies, for example whether there is evidence of metalworking (< 25% of sites) or the inhabitants had access to Roman material (> 40% of sites).

It is above all in the realm of material culture that Traprain Law stands out from the other settlements in its environs, emphasising its primate status in the Roman Iron Age and probably in the Later Bronze Age as well. But while the TLEP has provided valuable first impressions of the evolving settlement pattern and economy of the hillfort environs over two millennia between the Later Bronze Age and the dawn of the Early Historic period, there are inevitably other questions that it cannot answer (and was not designed to do so), such as the ethnogenesis of the Votadini. Were they largely an artificial creation of Roman intervention, as seems to be the case with their neighbours, the Brigantes (Haselgrove forthcoming)? Or had the 'cluster of communities' (Hill 2006) inhabiting East Lothian in the Later Iron Age developed a shared political identity and capacity for common action, which enabled them to dominate a much larger region? If so, friendship with Rome may merely have consolidated their pre-eminence. These, too, are questions that the 'post-Broxmouth' research agenda needs to confront, but to answer them, the agenda needs to be extended to the rest of southern Scotland and the Cheviots, helping to ensure that new archaeological data collected on both sides of the border are adequate to evaluate the similarities, differences and relationships between the constituent peoples at the appropriate scales and levels of detail.

NOTES

1. The relevant radiocarbon date (SUERC-8199) appears to be misquoted in the report (Lelong and McGregor 2007, 289). The calibrated range of one of the determinations for Phantassie (SUERC-7345) is similarly at variance with the quoted date of

2480 BP; if the latter value is correct, this might suggest some Earlier Iron Age activity here at this period, although this has to be weighed against the 54 dates which fall in the Later Iron Age and Roman periods (and three earlier prehistoric dates).

2. The middle ditch at Castle Park has a *terminus post quem* of 80–340 cal AD, whilst charred wood from deposits postdating its disuse gave a combined date of 240–390 cal AD. The outer ditch could have been dug at the same time or earlier. As discussed in Chapter 3, a date as late as the Roman Iron Age for the observed recutting of the main ditch at Whittingehame cannot absolutely be ruled out; alternatively, another episode of recutting might simply not have been apparent in the stratigraphy.
3. A large circular stone building excavated at Whitrighill, Mertoun (Borders), may be another candidate. This appears to be partially paved with large basalt blocks (Dent and McDonald 1997, 58, pl 12).

Appendices

APPENDIX 1
CROPMARK EVIDENCE AND GEOPHYSICAL SURVEY: A COMPARISON OF RESULTS FROM SITES INVESTIGATED BY THE TLEP

DUNCAN HALE and DAVID C COWLEY

The comparison of cropmarked evidence for plough-levelled sites and geophysical survey data provides a valuable means of developing the interpretation of both datasets, elaborating where they complement each other and exploring the strengths and weakness of both sources of information. The overall context of these sources was outlined in Chapter 2, while both the cropmarked and the geophysical evidence for the six excavated TLEP sites is incorporated in the relevant site discussions (Chapters 3–6). The purpose of this appendix is to compare the aerial photographic evidence and the geophysical surveys for a further 24 sites within the TLEP area. Some contextual information will also be presented placing the site surveys in a wider settlement framework (see Chapter 10). The site numbering corresponds to Table 2.1 and Figure 2.5.

1. NT57SW 31 Begbie (Figures A1.1 and 2.6)

This multivallate 'fort' is situated on a relatively level terrace at an elevation of about 60m OD, overlooking the former floodplain of the River Tyne to the north with a gentle hillside rising to the south. Discovered by RCAHMS from RAF photography (CPE/Scot/UK257: 3152-3, 14 August 1947), it was repeatedly photographed by RCAHMS and CUCAP during the 1970s, 1980s and 1990s, producing a suite of images with good cropmark detail. At the time of geophysical survey, the field contained a young cereal crop. As might be predicted over Calciferous Sandstone Measures the data produced a reasonably clear image with good contrast between the magnetic susceptibility of the materials filling the cut archaeological features and the surrounding subsoil.

The cropmarks recorded on aerial photographs and the geophysical survey provide a broadly similar record, differing only in matters of detail. The enclosure is oval in plan, measuring about 105m from west-south-west to east-north-east by up to 80m transversely, within up to four ditches. Allowing about 4m for a rampart, the internal area is *c.* 0.6ha. The innermost ditch is the broadest, varying from some 4m across to about 9m on either side of the entrance, which lies on the east-north-east. The gap in the inner ditch extends out through the two further ditches visible on the east. The geophysics implies a smaller entrance gap on the west, not visible in the cropmarks. A possible fourth circuit of ditch is visible on the west, but cannot be traced elsewhere. The outer three circuits are relatively uniform in character, measuring about 2m across, and while the disposition of these ditches in the cropmarks appears uniform, the geophysical data suggests that on the south the inner, broad ditch cuts the innermost of the narrow ditches. Finally, the northern, western and southern sides of the fort are bounded by what is probably an infilled natural water channel.

In the interior there are minor differences between the registration of features as cropmarks and in the geophysics. The cropmarks record a series of narrow straight ditches, which defy easy interpretation, but are conceivably practice trenches excavated by the Home Guard during WW II. These are less clearly registered in the geophysics, which does however show a number of weak and discontinuous anomalies, some of which may be underlying geology. A weak texture across the geophysical data, aligned broadly from east to west, reflects the contemporary plough regime.

This is one of a group of multivallate enclosures known from East Lothian, most of which are sited in slightly more prominent/defensive locations. At least two phases of enclosure can be suggested from the survey data, with the inner, broad ditch cutting an outer ditch. It is likely that a site like Begbie has a long and complex settlement history spanning the mid and later first millennium BC, such as that evidenced by the excavations at Broxmouth (Hill 1982a).

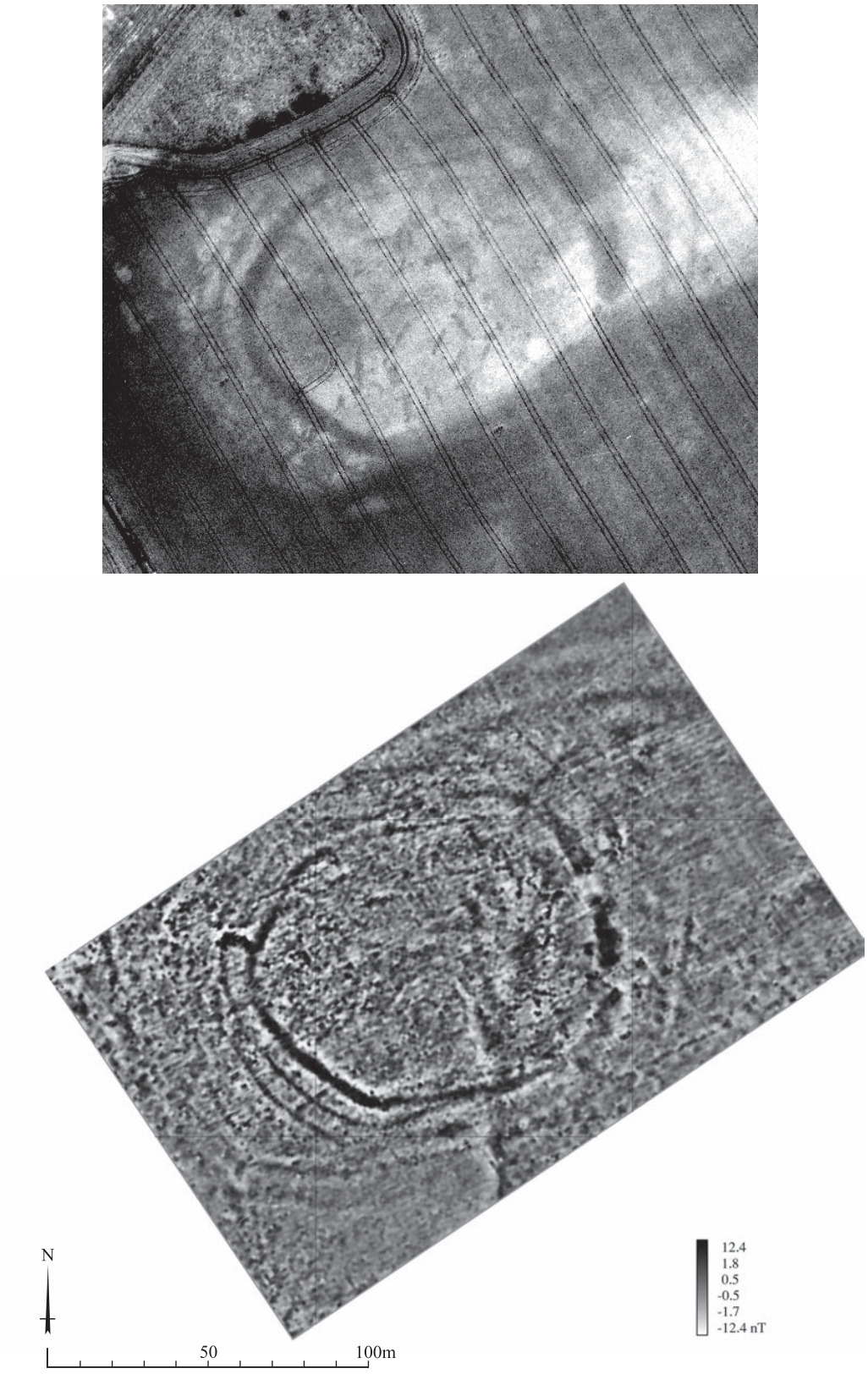

Figure A1.1
Begbie (NT57SW 31): rectified aerial photograph (A29865) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004490)

2. NT57NE 17 East Linton (Chapter 6)

3. NT67NW 19 Knowes (Chapter 5)

4. NT57SW 46 Stevenson Mains (Figure A1.2)

This rectilinear enclosure is situated on a slight terrace at 60m OD, breaking a very gentle north-facing hillside to the south of the River Tyne. Recorded from the air by CUCAP in 1968, it has been photographed by RCAHMS in 1977, 1979, 1989 and 2000, never producing especially distinct cropmarking. The geophysical survey (below) produced even poorer results.

Based on the cropmark evidence alone, only three sides of the enclosure are visible, the west side obscured at the edge of the field. However, the beginnings of a return can be seen at the west end of the north side, suggesting that the enclosure was rectilinear in plan. It was probably roughly square, measuring about 34–36m across within a ditch that is generally no more than 2m across, but expands to some 3m on the east, where there is a wide gap in the cropmarking, presumably the entrance. Making allowance for a bank, the internal area was probably about 0.09ha.

The field, which was under cereal stubble at the time of the geophysical survey, overlies Calciferous Sandstone Measures. Anomalies, which may relate to the enclosure, can just be identified in the geophysical data, but these are very weak and discontinuous and would almost certainly not have been identified without direct reference to the aerial photography. The poor results may be due to at least three factors, either acting singly or in combination. Firstly, the lack of magnetic susceptibility contrast between the ditch fills and the surrounding soils might indicate that the ditch was backfilled with the same material shortly after excavation. Secondly, the enclosure may not have been used for stock or human occupation, and finally, that the monument is now in an extremely poor state of preservation.

While neither the aerial photography nor the geophysical survey allow a categorical classification of this enclosure, the broad morphology of Stevenson Mains comfortably places it amongst the late/Roman Iron Age rectilinear settlements, such as Knowes or East Bearford (Nos 3, 5), whose distribution extends across much of the East Lothian plain (Chapter 10).

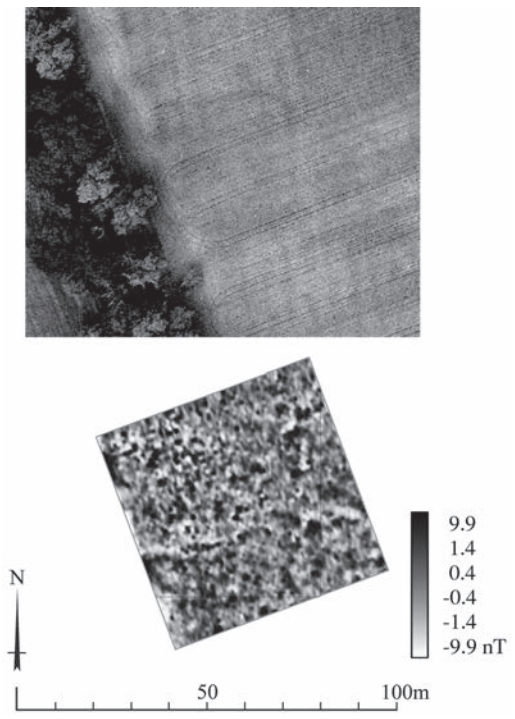

Figure A1.2
Stevenson Mains (NT57SW 46): rectified aerial photograph (EL4258) and TLEP geomagnetic survey
(Crown Copyright: RCAHMS, GV004491)

5. NT57SE 16 East Bearford (Chapter 6)

6. NT57NE 16 Overhailes (Figure A1.3)

This rectilinear enclosure is situated in an area of igneous rock on a south-east-facing slope at 65m OD, set above the steeply sloping valley side on the north bank of the River Tyne. First identified by RCAHMS from RAF aerial photographs (CPE/Scot/UK257: 4122-4, 14 August 1947), it was photographed intermittently during the 1970s and most recently in 1980. At the time of the geophysical survey the field carried a young cereal crop.

The cropmarked evidence and the geophysical survey are broadly similar, showing a roughly rectangular enclosure, open on the south and, where visible, with notably sharp angles. The likely location of the southern end is obscured by a field boundary, and with this qualification, the enclosure may have measured about 66m from north-north-west to south-south-east by 46m transversely, within a ditch about 3.5m across. Allowing *c.* 3m for a bank, the internal area would have been about 0.23ha. The entrance may have been on the east.

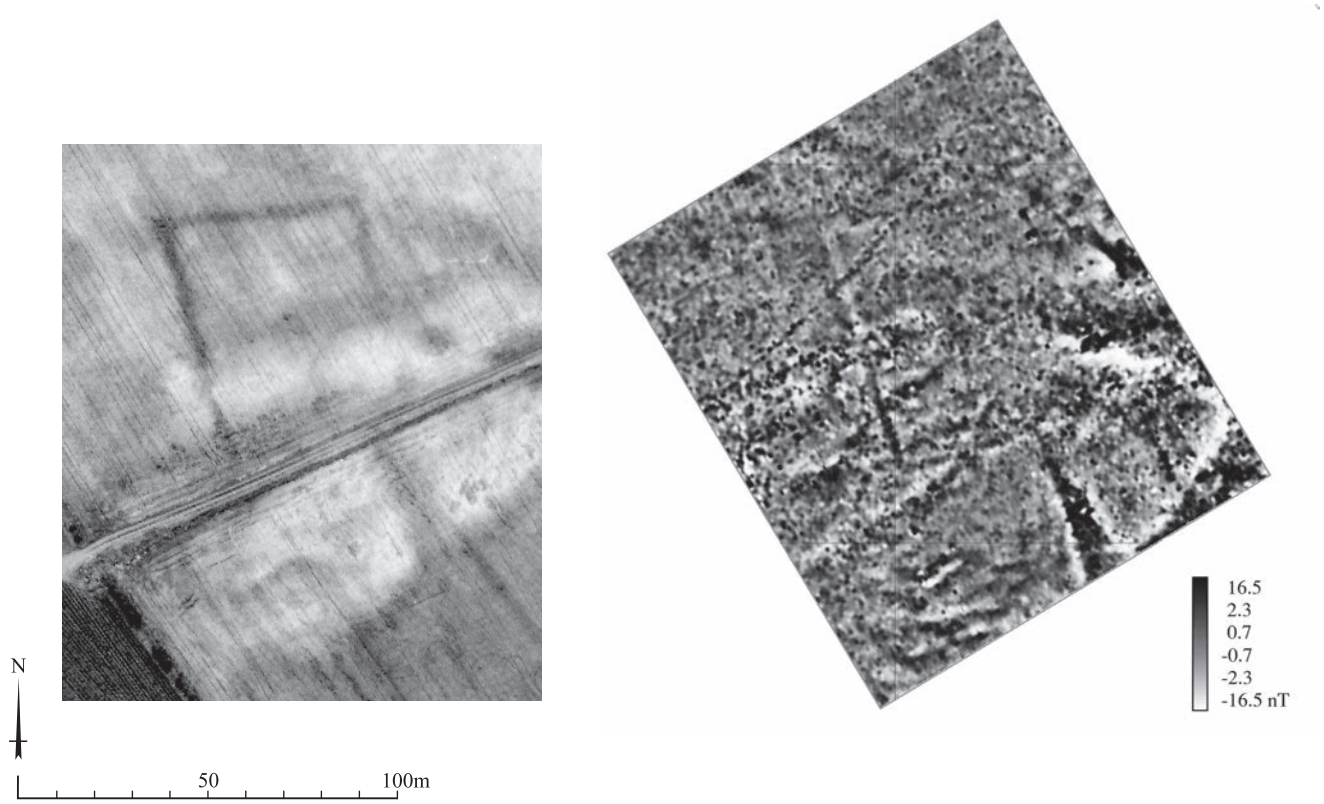

Figure A1.3
Overhailes (NT57NE 16): rectified aerial photograph (B89195) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004492)

Curiously, the geophysical data exhibits a change in polarity halfway along the west side of the enclosure. Reference to geological maps demonstrates that the irregularly shaped feature underlying the southern part of the enclosure (evident on both the geophysical plot and as lighter tones on the aerial photographs) is a near-surface basalt intrusion from which the overlying boulder clay has been eroded. The change in polarity of the ditch anomaly corresponds neatly to the northern limit of this intrusion. Curvilinear anomalies in the geophysics within the interior defy easy explanation, but may be houses, while a later ditch cuts across the north-western corner of the enclosure.

This enclosure is included in the original listing of possible rectilinear settlements in East Lothian (Maxwell 1970) and has been marshalled in that context since. While on present evidence, the late/Roman Iron Age is the most likely context for this site, its distinct tendency towards a rectangular plan sets it apart from the core of the rectilinear settlement grouping, which are generally squarer in plan. As such, it offers a good illustration of a basic tension in creating morphological groupings of sites with fairly simple attributes between fragmentation into smaller groups and agglomerating monuments on the basis of cruder attributes.

7. NT57SE 37 Cairndinnis (Figure A1.4)

This rectilinear enclosure, less than 1km west of the foot of Traprain Law, lies at about 80m OD on a gentle north-west-facing slope. First recorded from the air by CUCAP in 1964, it has only been recorded on a few occasions since (in 1976, 1979 and 1995). At the time of the geophysical survey, the field carried a young cereal crop; the location is underlain by extrusive trachyte.

The clearest information comes from the cropmarked evidence, with the geophysical survey providing only weak evidence for the ditch. Measuring about 70m from north-north-west to south-south-east by some

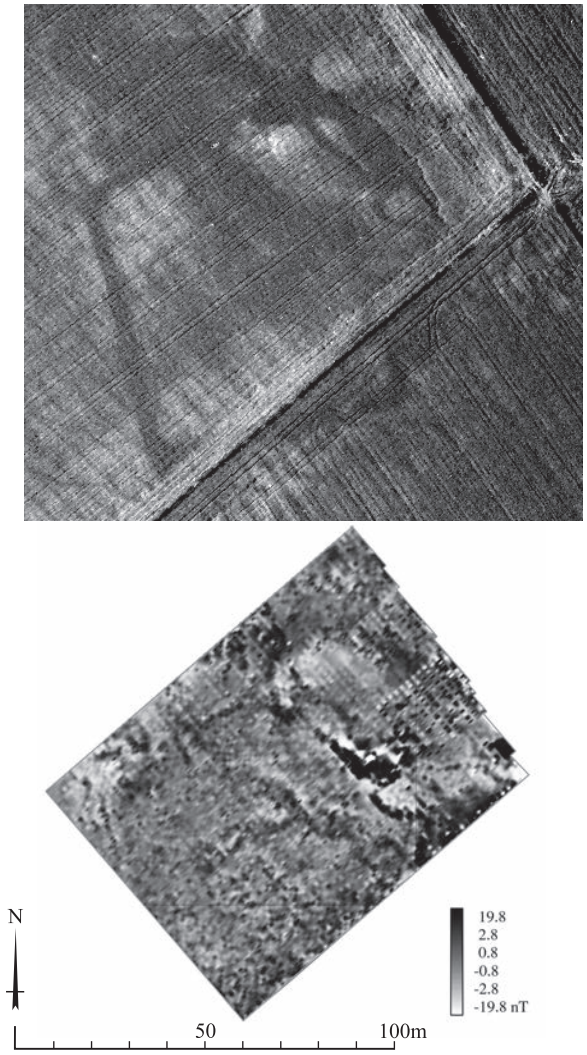

Figure A1.4
Cairndinnis (NT57SE 37): rectified aerial photograph (EL4131) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004493)

62m transversely within a ditch up to 6m across, the enclosure's internal area is about 0.34ha, once allowance has been made for a bank. There are gaps in the visible ditch circuit on the south, east and north, the first two caused by modern field boundaries; the most likely location for an entrance is in the east. Some positive magnetic anomalies may be soil-filled features, but the larger and more intense magnetic anomalies are almost certainly underlying geological features.

On present evidence this enclosure is identified as a late/Roman Iron Age rectilinear settlement, comparing directly with East Bearford (No 5).

8. NT57SE 79 Standingstone (Figure A1.5)

This rectilinear enclosure is situated just over 300m from the south-west foot of Traprain Law on a south-east-facing slope at about 95m OD. It was photographed by CUCAP in 1968 and has not been recorded since. The limited cropmarked evidence does, however, produce a reasonably clear impression of the site. This is not matched by the geophysics, carried out over a young cereal crop overlying extrusive basalt and tuffs.

The enclosure is roughly square on plan, measuring about 35m across within a ditch that varies between 2m and 3m across. Allowing for a

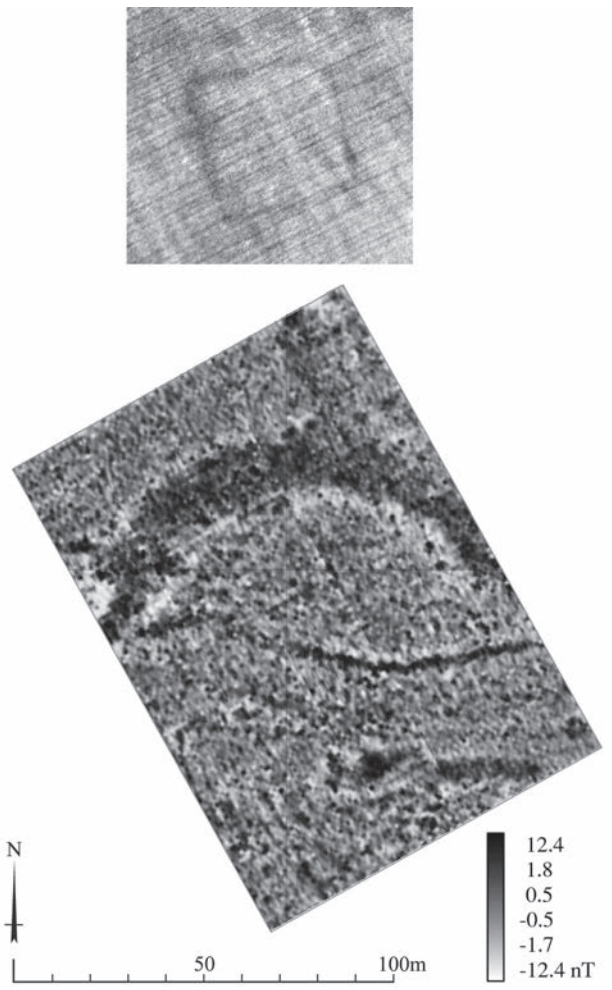

Figure A1.5
Standingstone (NT57SE 79): rectified aerial photograph (EL2829) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004494)

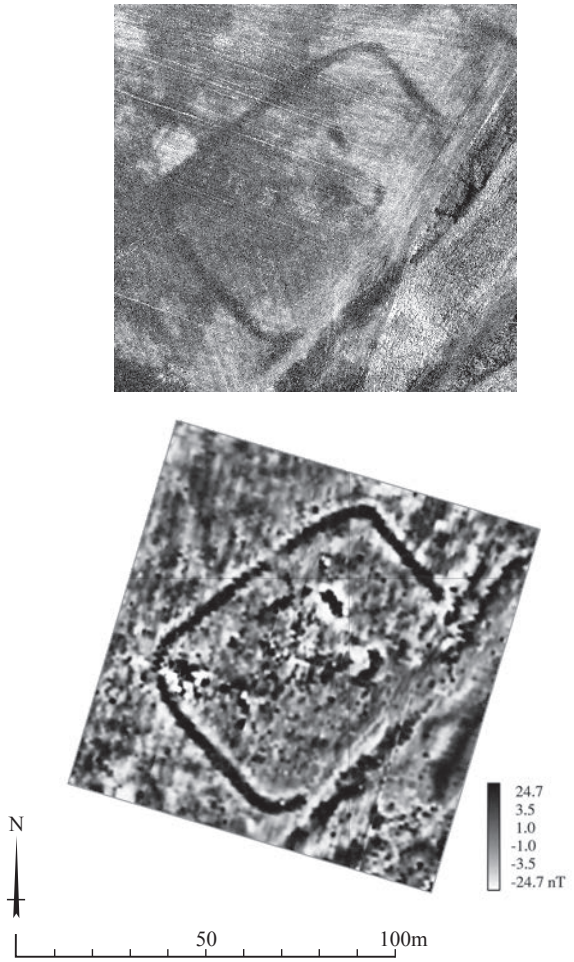

Figure A1.6
West Mains (NT57SE 36): rectified aerial photograph (B24406) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004495)

bank, the internal area is about 0.08ha. The entrance is in the south side, set slightly off-centre to the east. Several geomagnetic anomalies may reflect soil-filled archaeological features, but these, and other features such as a possible small circular enclosure in the south-east of the survey block, are difficult to interpret. The failure of the geophysical data to register the enclosure, while still producing other areas of strongly contrasting anomalies that may include archaeological deposits, raises the possibility that the settlement has been severely truncated by the plough since it was photographed (see also No 4).

The most appropriate context for this enclosure is as a late/Roman Iron Age rectilinear settlement.

9. NT57SE 36 West Mains (Figures A1.6 and 2.6)

This rectilinear enclosure is situated on a spur projecting from the north-west flank of Whitelaw Hill at about 145m OD. It was discovered by RCAHMS from RAF aerial photographs (CPE/Scot/UK257: 3133-4, 14 August 1947). It was photographed by CUCAP in 1964 and then on thirteen separate occasions by RCAHMS between 1977 and 2004. At the time of the geophysical survey the field had just been ploughed.

The cropmarked evidence and the geophysical data provide a clear plan of the site. The enclosure has

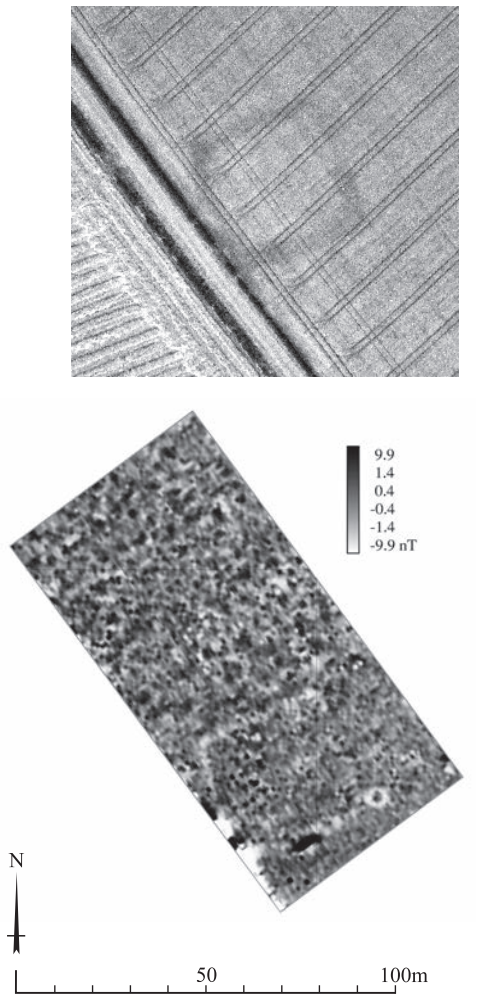

Figure A1.7
West Bearford (NT57SW 95): rectified aerial photograph (B23939) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004496)

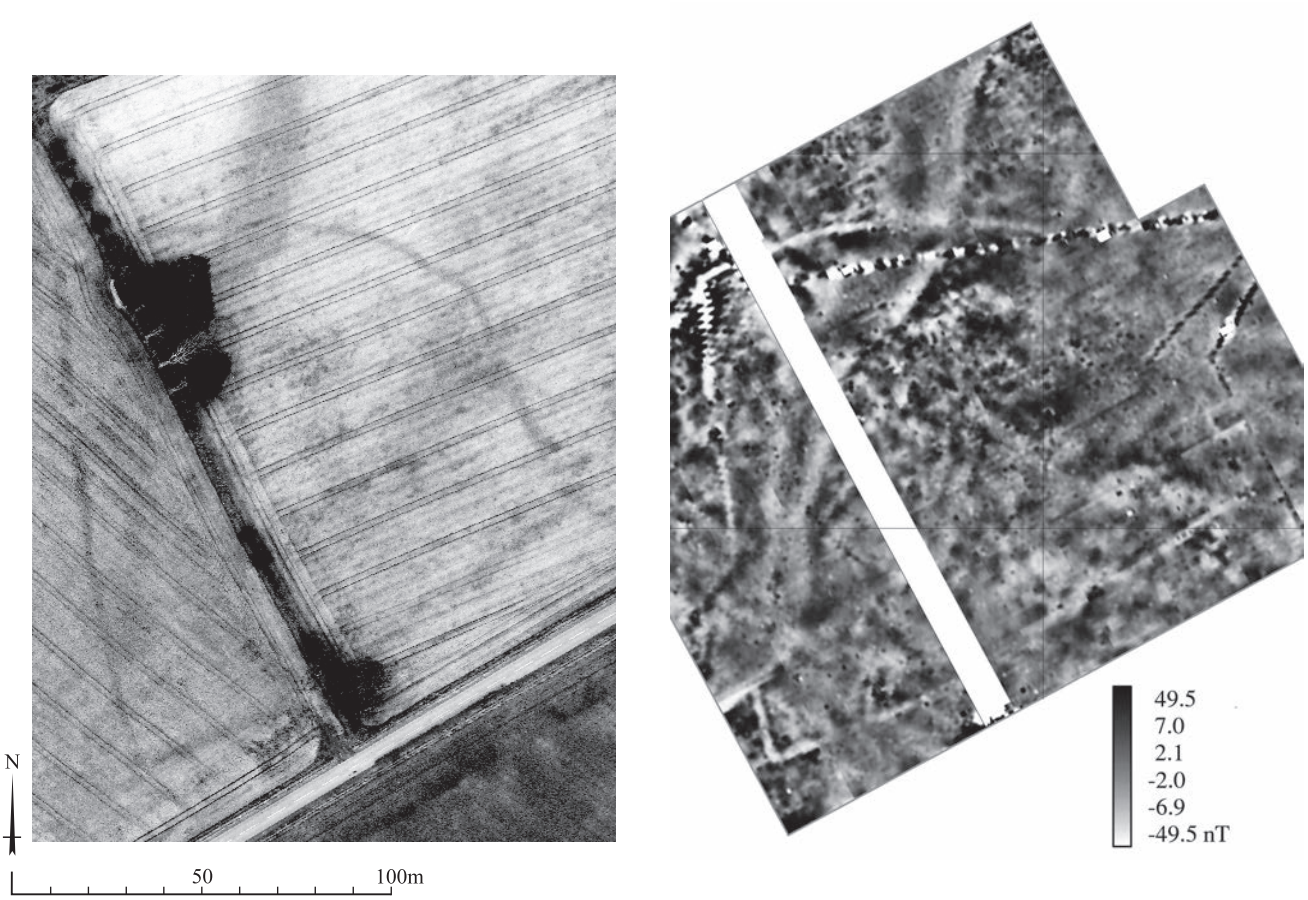

Figure A1.8
Tanderlane (NT57SE 41): rectified aerial photograph (A30450) and TLEP geomagnetic survey
(Crown Copyright: RCAHMS, GV004497)

rounded corners, measuring some 69m from north-east to south-west by about 50m transversely within a ditch between 3m and 4m across. The south-east side of the enclosure has not been recorded where it lies against the side of a small gully. However, extrapolating this side, and allowing 3–4m for a bank, the internal area is about 0.25ha.

In the geophysics the ditch is evident as a very strong positive magnetic anomaly, suggesting that it is cut through drift deposits rather than the underlying igneous rock. The geophysics indicates a small causeway across the ditch on the north-west, not evident in the cropmarks. Concentrations of intense magnetic anomalies and macular cropmarks in the interior are probably scooped areas and other occupation remains such as hearths, ovens or other features with thermoremanent magnetisation.

This enclosure figures on the original list of possible rectilinear settlements in East Lothian (Maxwell 1970) and has been marshalled in that context since. The late/Roman Iron Age remains the most appropriate context for this site.

10. NT57SW 95 West Bearford (Figure A1.7)

This rectilinear enclosure is situated on a terrace on the spine of a low ridge at about 70m OD. Discovered from the air by RCAHMS as a well-defined cropmark in 1989, it has not been photographed since. At the time of the geophysical survey oilseed rape stubble had recently been ploughed-in.

The clearest evidence for the form of the enclosure comes from the cropmarks. It is roughly square on plan, measuring about 30m across within a ditch varying between 4m and 5m across. There is an entrance on

the east-north-east. Making an allowance for a bank, the internal area is about 0.06ha. The low magnetic susceptibility readings from the geophysics could indicate stone wall-footings adjacent to the ditch, or that the ditch is filled with rubble rather than organic-rich sediments – although the latter is unlikely from the cropmarked evidence.

The basic morphology of this enclosure places it amongst the other late/Roman Iron Age rectilinear enclosures, though it lies at the smaller end of the size

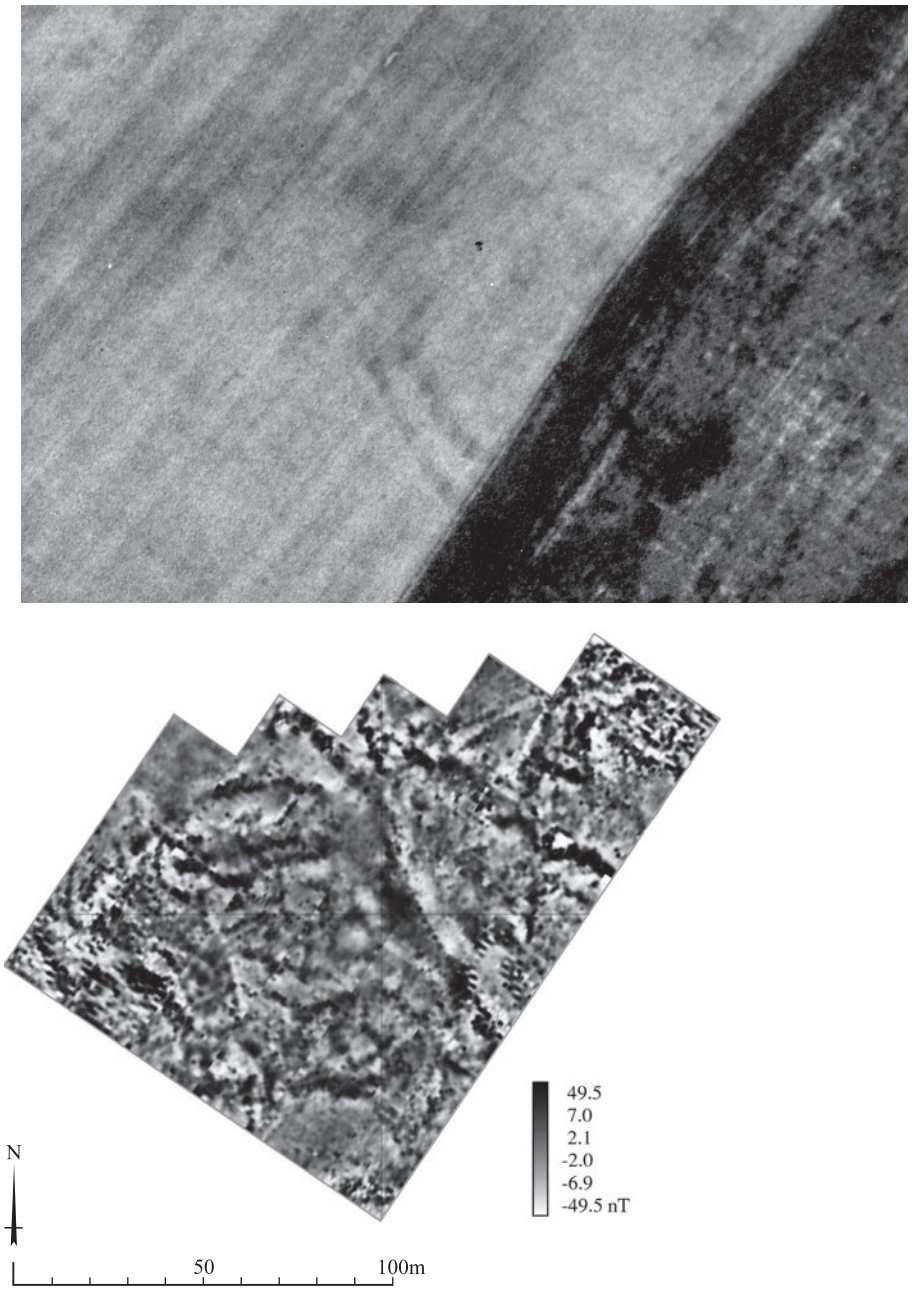

Figure A1.9
Garvald (NT57SE 39): rectified aerial photograph (0S77120) and TLEP geomagnetic survey
(Crown Copyright: RCAHMS, GV004498)

range, and its ditches are broad relative to the internal area.

11. NT57SE 41 Tanderlane (Figure A1.8)

This subrectangular enclosure is situated on a slight north-facing slope at about 145m OD between the B6370 road and the Ninewells Burn. It has been photographed by RCAHMS in 1976, 1977, 1984, 1986 and 1994, producing a good cropmarked record of the enclosure. At the time of the geophysical survey, which produced weak, but reasonably clear data, the field carried a young cereal crop.

The enclosure is somewhat irregular, but describes a rough D-shape on plan; the west and south sides are fairly straight, while the east and north sides take a slightly curved line. Measuring a maximum of about 130m from north-west to south-east by about 123m transversely within a ditch between 2m and 3m across, the enclosure has an internal area of about 1.08ha. The ditch was recorded in the geophysics as a negative magnetic anomaly, reflecting materials of low magnetic susceptibility, which, given its location on Upper Old Red Sandstone, could indicate the presence of stone wall-footings or revetments, or a ditch filled with rubble rather than sediment. The latter is unlikely from the crop-marked evidence. There are no visible internal features, in the case of the geophysics such identifications are hampered by numerous magnetic anomalies and features of more recent origin, including ferrous service pipes, land drains and the field boundary that bisects the enclosure. There are gaps in the ditch on the west, north and east, as well as those in the cropmark caused by the modern field boundary, but none can clearly be identified as an entrance.

This enclosure is difficult to place in a chronological context. It does not fit well in to the grouping of late/Roman Iron Age rectilinear settlements and there are no analogous sites in the excavation record with which to compare it. Thus, in seeking a context, all options must remain open, with a medieval or later date as likely as a prehistoric one.

12. NT57SE 39 Garvald (Figure A1.9)

This enclosure is situated just to the west of Garvald village and lies at about 165m OD at the top of the steeply incised gully of the Donolly Burn. Discovered from the air by RCAHMS in 1976, it has subsequently been photographed only in 1977 and 1999, but at no time has it been especially well-defined. At the time of the geophysical survey the field carried a young cereal crop over intrusive igneous rock, presumed to be highly magnetically susceptible and effectively masking much of the potential for registering cut features. The many other geomagnetic anomalies recorded most likely reflect underlying geological features.

Primarily from the cropmark evidence it appears that the site is bivallate, roughly rectilinear and laid out against the steep valley sides that form the south-east of the enclosure. Measuring about 68m from north-east to south-west by some 50m transversely internally, the internal area was probably about 0.3ha,

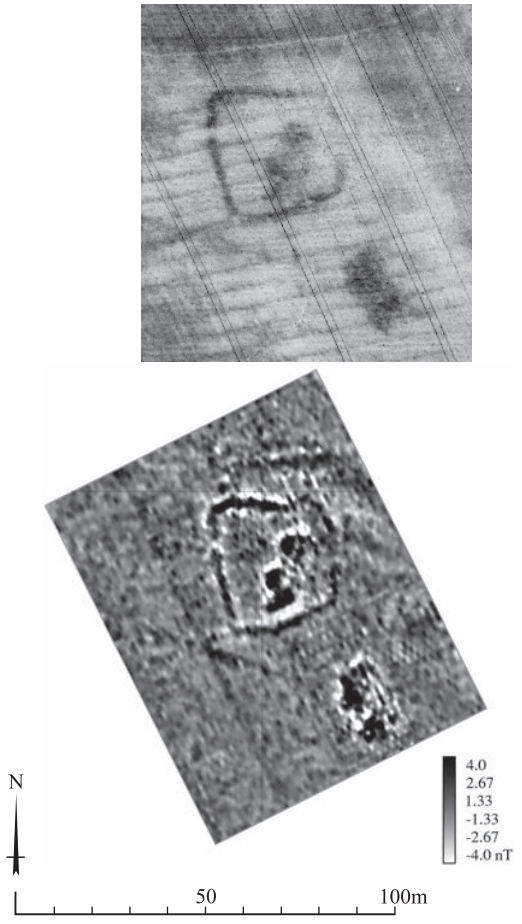

Figure A1.10
Haddington (NT57SW 77): rectified aerial photograph (B5135) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004499)

once allowance has been made for a bank. The ditches are clearest on the south-west, where two roughly parallel cropmarkings up to 6m across can be seen, with the slight possibility of a third line of defence on the west. Around the north and east, the ditches are poorly defined.

Garvald bears comparison with the enclosure at East Linton, which has Late Bronze Age components (Chapter 6), sharing a similar basic plan with a tendency towards rectilinearity and a location on the edge of a deeply incised gully.

13. NT57SW 77 Haddington (Figures A1.10 and 2.6)

This rectilinear enclosure is situated at about 60m OD on a gentle south-east-facing slope, 40m west of St Laurence House Burn, on the south-western outskirts of Haddington. Photographed by CUCAP in 1951, it has subsequently been recorded by RCAHMS in 1981, 1988 and 1990. At the time of the geophysical survey the field carried a young cereal crop.

The cropmarked evidence and the geophysical survey have produced a broadly similar record of the enclosure. Sub-square on plan, it measures about 30m across within a ditch about 2.5m broad, broken by an entrance on the west, and, in the geophysics, a possible causeway across the ditch near the south-western corner. Within the interior, which is about 0.06ha in area, there are scooped, soil-filled features, that are probably dished house floors such as those excavated at Knowes (Chapter 5). What appears to be a secondary enclosure is attached to the west side of the rectilinear; to the south is what may be a conjoined set of scooped, soil-filled features, visible as dark cropmarking and in the geophysics as intense magnetic anomalies that may point to the presence of hearths.

The rectilinear enclosure compares well with known late/Roman Iron Age rectilinear settlements such as Knowes and East Bearford (No 5). The proximity of the internal features to the inner lip of the ditch suggests a similar general settlement history to Knowes, where an essentially unenclosed settlement of Roman Iron Age date overlies the derelict enclosure. The features recorded to the south of the Haddington example may also belong in this general context. The secondary enclosure to the west is relatively unusual, and while it may belong with a phase of later prehistoric settlement, it is as likely to represent much later re-use of the site.

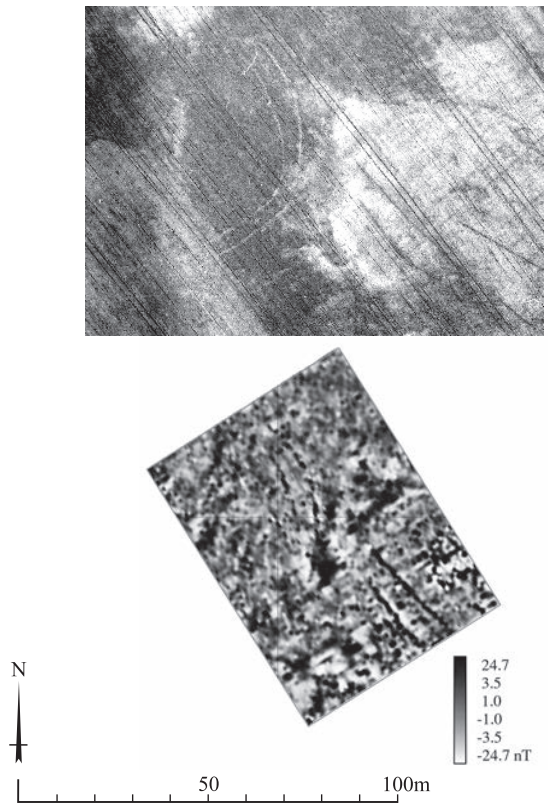

Figure A1.11
Nunraw Burns (NT57SE 104): rectified aerial photograph (C1980) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004500)

14. NT57SE 104 Nunraw Barns (Figure A1.11)

This enclosure is situated on the Upper Old Red Sandstones, at about 185m OD on a north-east-facing slope to the north-west of Nunraw Abbey. Discovered from the air by RCAHMS in 1992, it was photographed again in 1994 and 1996. At the time of the geophysical survey the field was set to grass.

Although a geologically noisy background obscures both the cropmarked evidence and geophysical survey, both sources produce a similar record for the eastern half of what is assumed to have been a roughly oval or sub-rectangular enclosure. In the cropmarks, two pencil-thin lines, neither of which can be much more than 1m across, describe an arc from the south, around the east to the north, while nothing is visible on the west. These are palisade trenches and register in the geophysics as chains of positive magnetic anomalies. Given that the western half of the enclosure is not visible, an internal area is somewhat speculative,

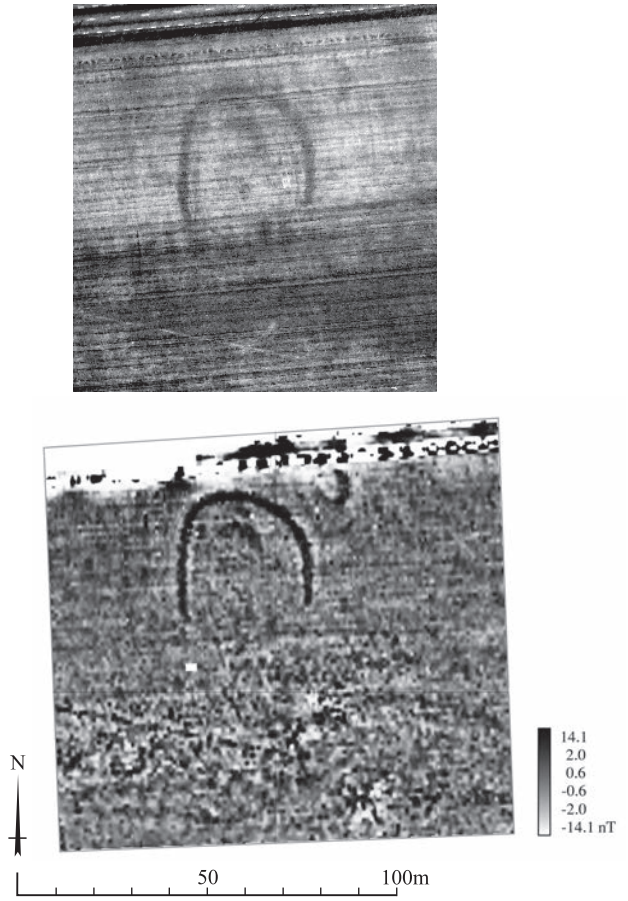

Figure A1.12
Hedderwick (NT67NW 20): rectified aerial photograph (A22255) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004501)

but an extrapolation of the palisade circuit suggests about 0.19ha. Lying between 3m and 4.5m apart, the palisades run parallel on the south, but diverge slightly on the east where there may be a staggered gap in both, presumably an entrance. Modern field drains to the south are evident on both sources.

Timber palisades are a recurrent feature of Scottish later prehistoric settlement architecture and often appear in conjunction with dump ramparts. Palisades are present as components of the enclosures at Whittingehame Tower (No 27), Standingstone (No 26) and East Linton (No 2), all of a broadly Late Bronze Age date, and at Dryburn Bridge in a context also apparently antedating the mid-first millennium BC (Dunwell 2007). However, while this form of construction may have its origins in the early and middle centuries of the first millennium BC, it is worth noting that early medieval contexts can also be cited (Barclay 2001; Cowley 2008, 14–15; Hope-Taylor 1980).

15. NT67NW 20 Hedderwick (Figures A.12 and 2.6)

This curvilinear enclosure is situated at about 20m OD on a very gentle north-facing slope, with the A199 (formerly the A1) to the north and the mainline

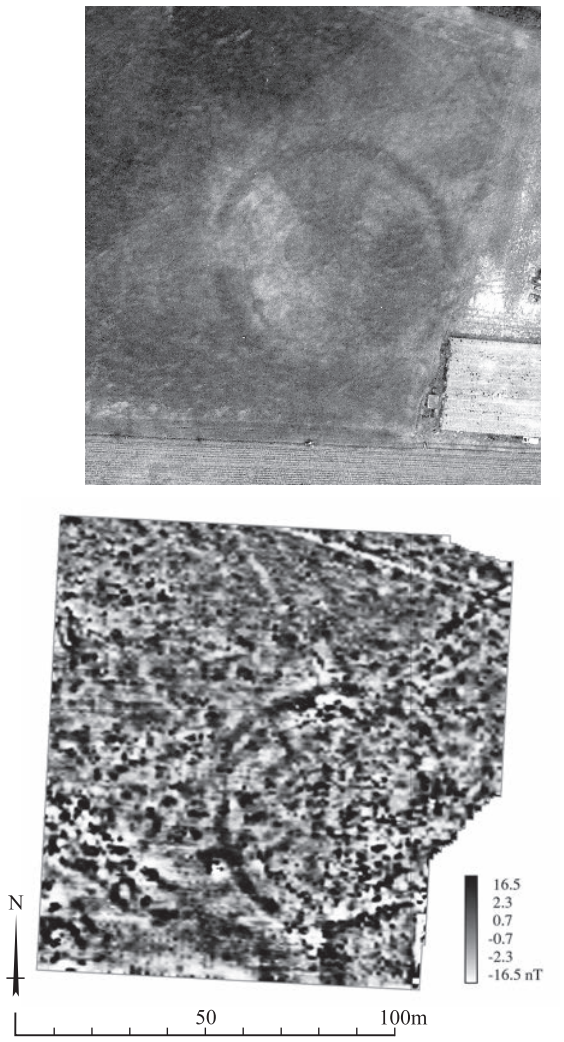

Figure A1.13
Sixpence Strip (NT57 NW 30): rectified aerial photograph (EL4252) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004502)

east coast railway to the south. Discovered from the air by CUCAP in 1962, it has since been photographed in 1975, 1976, 1981, 1984 and most recently in 2000. At the time of the geophysical survey the field carried cereal stubble over the Calciferous Sandstone geology.

Both cropmarked evidence and the geophysical survey provide clear evidence for the form of the enclosure. A ditch measuring between about 2.5–3.5m across describes a U-shape, which is open to the south and measures about 30m from east to west by at least 35m transversely. Some 2m inside this ditch is the pencil-thin line of a palisade trench, which describes an almost complete oval measuring about 36m from north to south by some 26m transversely, running roughly symmetrically to the inner lip of the ditch. The footprint of the palisaded enclosure is about 0.07ha in area. In the interior there is one well-defined roundhouse and three possible examples, including one on the west that overlaps the line of the palisade and is hard up against the inner lip of the ditch. The narrow positive magnetic anomaly to the south of the enclosure is a narrow trench, perhaps a water supply pipe.

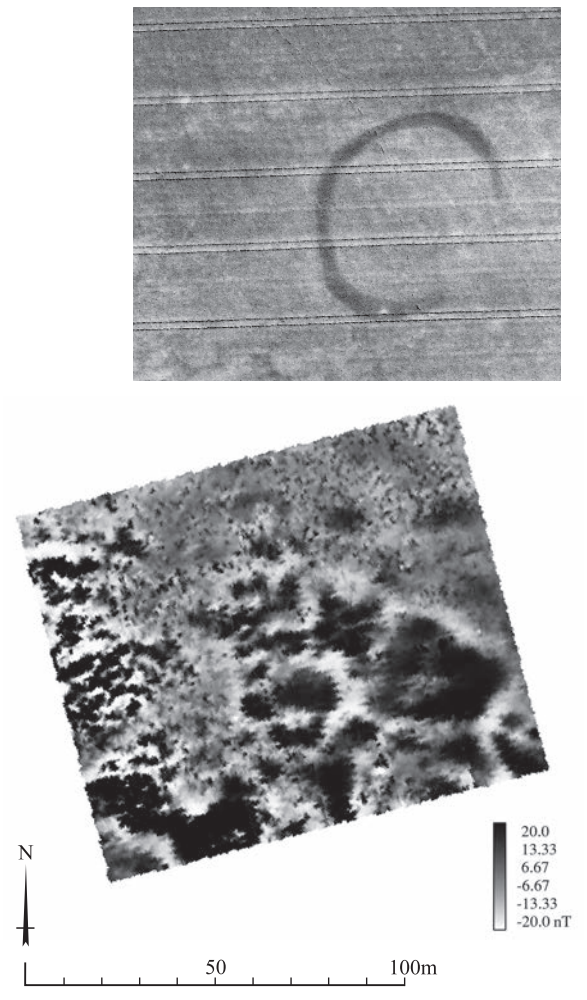

Figure A1.14
Kilduff (NT57NW 35) rectified aerial photograph (C28612) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004503)

The excavated site at Standingstone (Chapter 4) provides a very direct analogy, sharing the incomplete outer circuit and the inner palisade, although Hedderwick is oval in plan in contrast to the circularity of Standingstone. It seems most likely that Hedderwick, too, is Late Bronze Age in date. At least one of the roundhouses in the interior post-dates the ditch and perhaps the palisade. This may be a component of the unenclosed settlement recorded as cropmarks to the east and perhaps dating to the mid or late first millennium BC, echoing developments also observed at Standingstone.

16. NT57NW 30 Sixpence Strip (Figure A1.13)

This circular enclosure is situated at about 50m OD on a gentle west-facing slope to the west-north-west of 'The Chesters' (Chapter 1), one of only a few surviving earthworks on the coastal plain. Sixpence Strip is noteworthy as one of the first monuments to be recorded as a cropmark in Scotland when Wing-Commander Insall photographed it in about 1930. It was then photographed by RCAHMS in 1979 and on seven subsequent occasions, most recently in 2001. At the time of the geophysical survey the field carried cereal stubble. Whilst the magnetic data complement the aerial photographic evidence, they are relatively noisy, almost certainly due to the extrusive trachyte strata and igneous rocks within the soil.

The enclosure has two components: an outer ditch measuring 3–4m across encloses an area 56m or 57m in diameter (*c.* 0.19ha) within which there is a palisade trench, which is set some 4m to 6m from the inner lip of the outer ditch. Both palisade and broad ditch are broken by an entrance gap on the west and set more or less centrally within the interior there is a large roundhouse. A few linear magnetic anomalies outside the enclosure are probably recent drains and geological features.

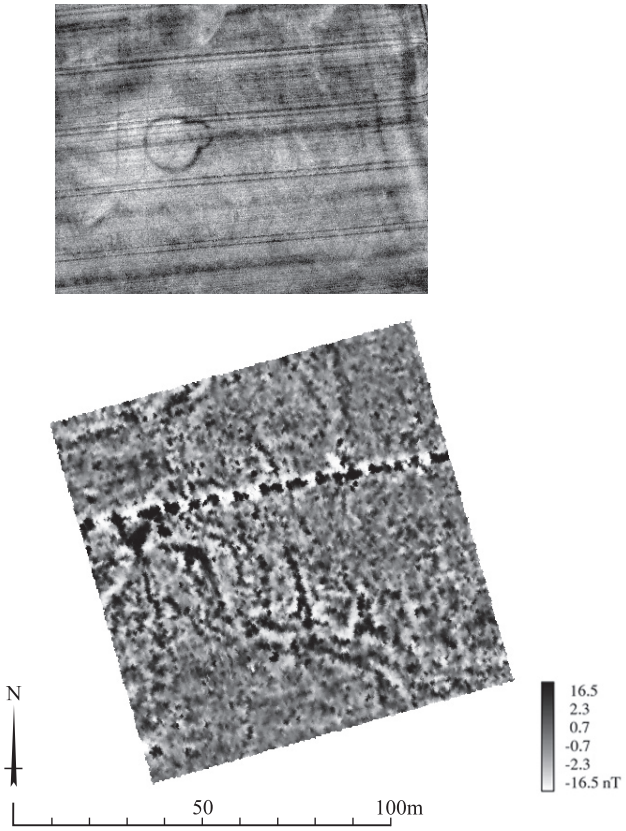

Figure A1.15
Newmains (NT57NW 38): rectified aerial photograph (C28594) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004504)

The broad ditch and a more or less symmetrical internal palisade are attributes shared by Standingstone (No 26). If it is accepted that these are sufficient shared traits to create a regionally and chronological distinct site type (Chapter 10), then Sixpence Strip probably belongs in a Late Bronze Age context.

17. NT57NW 41 Foster Law (Chapter 6)

18. NT57NW 35 Kilduff (Figure A1.14)

This curvilinear enclosure is situated at about 90m OD on the ridge extending eastwards from Kilduff Hill. First photographed in 1976, it has subsequently been recorded on five occasions, most recently in 2001, often producing highly contrasting, strong cropmarking. At the time of the geophysical survey the field carried cereal stubble. The geophysical survey data are not readily interpreted: the enclosure cannot be identified and the negative magnetic anomalies may be soil-filled fissures in the igneous rockhead.

However, from the cropmarked evidence the site comprises an oval enclosure, broken on the south-east by a gap in the ditch some 26m across. The enclosure measures some 48m from north-east to south-west by about 40m transversely within a ditch between 3m and 5.5m across. Allowing for a bank, the internal area is about 0.12ha. In the south-west arc of the interior, set some 2.5m from the inner lip of the ditch, there is what may be a palisade trench. In the interior there is at least one roundhouse, slightly to the south of centre.

Kilduff is one of the many late prehistoric curvilinear settlement enclosures on the coastal plain. The penannular ditch and the shadowy traces of what may be an internal palisade invite comparison with the Late Bronze Age site at Standingstone (Chapter 4), but its basic morphology is also shared by St Germains (Alexander and Watkins 1998), whereby a date in the second half of the first millennium BC would be an option.

19. NT57NW 38 Newmains (Figure A1.15)

This circular enclosure is situated at about 45m OD on a slight rise breaking the undulating ground to the north-east of 'The Chesters'. Discovered from the air by RCAHMS in 1976, it has been photographed on seven subsequent occasions, most recently in 1994, providing a good suite of images with strong cropmark registration. At the time of the geophysical survey the field carried cereal stubble; the underlying igneous geology is probably responsible for a number of curvilinear positive magnetic anomalies visible in the data. The enclosure cannot be identified, although a ferrous service pipe cuts across it.

From the cropmarked evidence the enclosure measures 16m in diameter (*c.* 0.02ha) within a ditch 1m to 1.5m across. On the east, the ditch hooks outwards in two antennae to form a 'porch' at the entrance. This site falls in a grey area between settlement enclosures that may contain multiple roundhouses, and large unenclosed houses. In the light of the substantial 'porch' on the east, in the case of Newmains, an interpretation as a massive (apparently unenclosed) roundhouse is preferred. Although there is no evidence for chronological context, it could be marshalled as a regional type of the substantial roundhouses of later prehistoric date that are attested across Scotland (cf. Hingley 1992, 12–20).

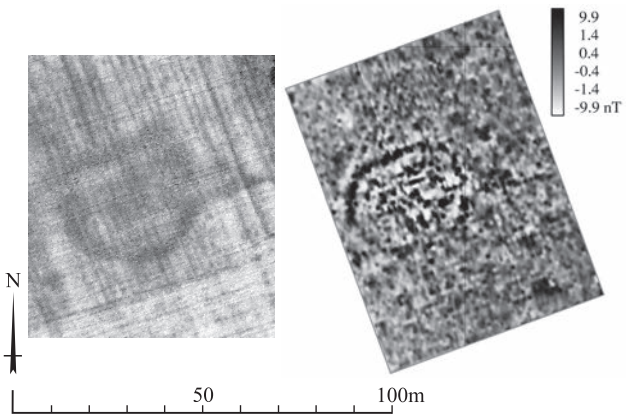

Figure A1.16
Stevenson Mains (NT57SW 47): rectified aerial photograph (EL4258) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004505)

Two parallel pit alignments on a near north-south axis are apparent as cropmarking about 50m to the east of the enclosure, but the parts in the area covered by the geophysical survey do not show at all clearly.

20. NT57SW 47 Stevenson Mains (Figure A1.16)

This roughly curvilinear enclosure is situated at about 60m OD on predominantly level ground. First recorded by CUCAP in 1968, it has since been photographed by RCAHMS in 1976, 1977, 1979 and 2000. At the time of the geophysical survey oilseed rape stubble had recently been ploughed in.

The cropmarked evidence suggests that the enclosure is roughly D-shaped, with a straight northern side and relatively sharp angles at the north-east and north-west corners, contrasting with the curvilinearity of the rest of the circuit. This is not, however, as marked a feature in the geophysics, where the enclosure looks more oval. Measuring some 27m by 24m internally within a ditch about 4m across, the enclosure has an internal area of about 0.04ha. A ditch extending eastwards from the southern ditch terminal is evident in both cropmarks and geophysics. A possible roundhouse is visible in the interior in the cropmarks and the many more small intense geophysical anomalies within the enclosure than outside it presumably reflect a concentration of past activity in the interior.

This enclosure lies in a morphological no-man's land between curvilinear and rectilinear settlements, in common with a small group of other sites. The presence of the possible roundhouse indicates that a context in the panoply of later prehistoric settlements, most likely in the second half and later first millennium BC, would be appropriate.

21. NT57SE 50 Northrig (Figure A1.17)

This site lies at about 70m OD on a low rise between the Bearford Burn and the Morham Burn. Discovered from the air by RCAHMS in 1977 it has only been photographed once since, in 2003. At the time of the geophysical survey the field was freshly ploughed.

The site comprises two overlapping enclosures, one circular, and the other oval, which represent at least two distinct phases of construction. These are

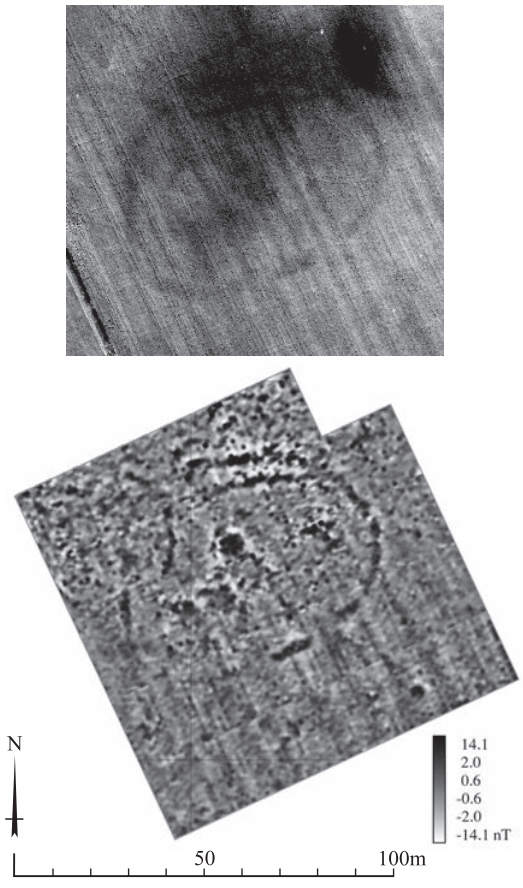

Figure A1.17
Northrig (NT57SE 50): rectified aerial photograph (EL3632) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004506)

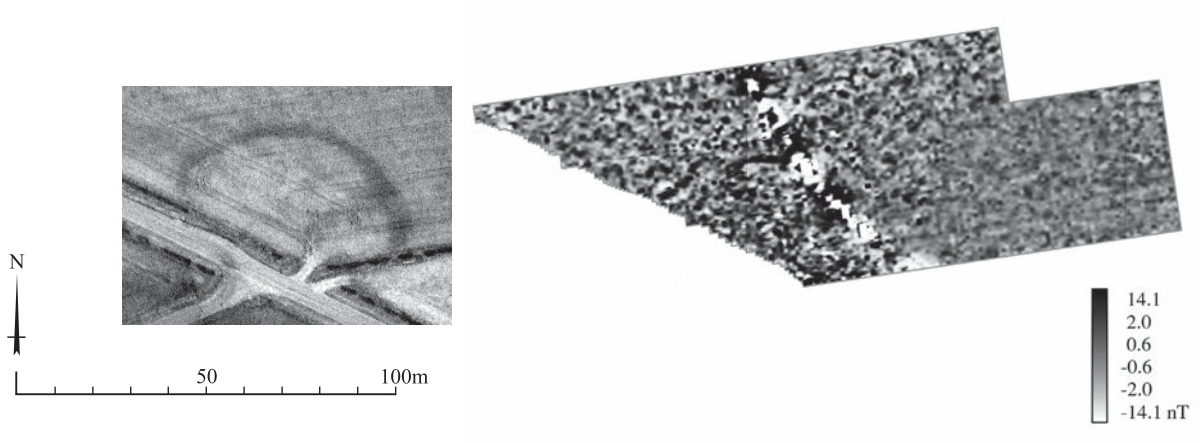

Figure A1.18
Coldale (NT57SE 91): rectified aerial photograph (B23641) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004507)

visible most clearly on the aerial photography, with the geophysical data reproducing the same features with a reasonable degree of clarity.

The oval enclosure is the larger, measuring about 66m from east-north-east to west-south-west by 50m transversely within a ditch about 3m across (*c.* 0.2ha internal area). The ditch is broken in two places on the south-east. Internal features include what are probably roundhouses and areas of burning. In the north of the interior, a length of ditch runs at a slight tangent to the oval enclosure ditch. This is likely to represent a phase of remodelling, though whether later or earlier cannot be ascertained from the survey evidence alone. The same ambiguity in phasing attaches to the relationship of the oval enclosure to the circular one that overlaps the north-west of it. This circular enclosure measures 35m in diameter within a ditch no more than 3m across, giving an internal area of about 0.08ha.

This is a relatively rare example of a site where distinct phases both of remodelling (of the oval enclosure) and enclosure construction are evidenced in the survey data. However, it is in the nature of the somewhat coarse grain of the survey data that the interrelationships are ambiguous. The general context of both enclosures is probably as later prehistoric settlements.

22. NT57SE 91 Coldale 1 (Figure A1.18)

This enclosure is situated at just below 70m OD on a gentle north-west-facing slope, immediately beside the public road and opposite a junction with a minor road. It has only been photographed from the air once, in 1989, when it registered as a very strong cropmarking.

The field, which overlies extrusive trachyte, had just been ploughed at the time of the geophysical survey. This failed to produce clear evidence, which may be due to two factors. Firstly, anecdotal evidence gathered during fieldwork indicated that the ground in this corner of the field has been mechanically removed and replaced with spoil from elsewhere since the aerial photographs were taken. Secondly, a pipe or drain has been laid across the north-east of the enclosure, further obscuring possible archaeological features.

From the cropmarked evidence the enclosure appears to be roughly curvilinear in plan, recorded in an arc from the west, around the north to the east, but overlain by the road around the remainder of the projected circuit. The projected circuit would give a diameter of about 40m (e.g. internal area of about 0.11ha) within a ditch that varies between 3m and 6m across.

Although there is little evidence from which to assign a context for this enclosure, it is most likely a curvilinear settlement of later prehistoric date.

23. NT57SE 56 Coldale 2 (Figure A1.19)

This circular enclosure is situated at about 80m OD on the north-west flank of a low hill. Discovered from the air in 1964 by CUCAP, it was not

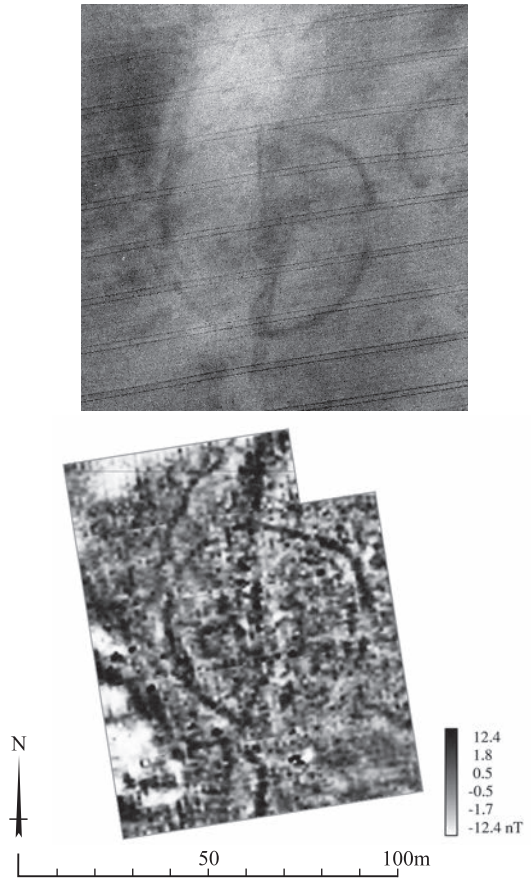

Figure A1.19
Coldale (NT57SE 56): rectified aerial photograph (B23645) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004508)

photographed again until 1989, and then in 1995, 2000 and 2003. At the time of the geophysical survey, this part of the field was set-aside, overlying extrusive trachyte.

The cropmarked and geophysical evidence produce a similar characterisation of the enclosure. It measures about 54m in diameter (0.18ha internally) within a narrow ditch no more than 2m across, which is broken on the east and the south-west; the former is the most convincing candidate for an entrance. Internal features include two possible roundhouses and several large pits near the entrance. What is probably an infilled quarry lies to the east and a scatter of broad, diffuse magnetic anomalies around the enclosure are likely to be geological in origin.

In the absence of other evidence, this enclosure is probably a later prehistoric settlement.

24. NT57SW 50 Mitchell Hall (Figure A1.20)

This circular enclosure is situated at about 80m OD on the crest of a low ridge south-east of Haddington. It has been photographed from the air only twice, in 1977 and 1978, recording strong cropmarking. At the time of geophysical survey the field contained cereal stubble and since magnetic susceptibility contrasts in this area were very weak, no anomalies were detected which might relate to the enclosure ditches or other features.

From the cropmarked evidence two roughly concentric circular enclosures can be seen, the outer measuring about 32m in diameter internally (0.05ha internally), the inner some 19m in diameter, both within ditches between 2.5m and 3m across. There are gaps in both ditches on the north-east and the symmetry of their arrangement suggests that the two

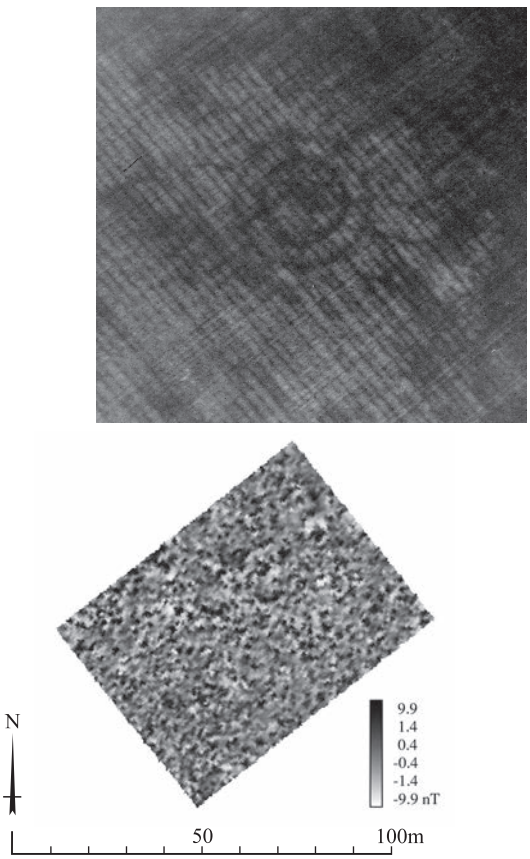

Figure A1.20
Mitchell Hall (NT57SW 50): rectified aerial photograph (EL3802) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004509)

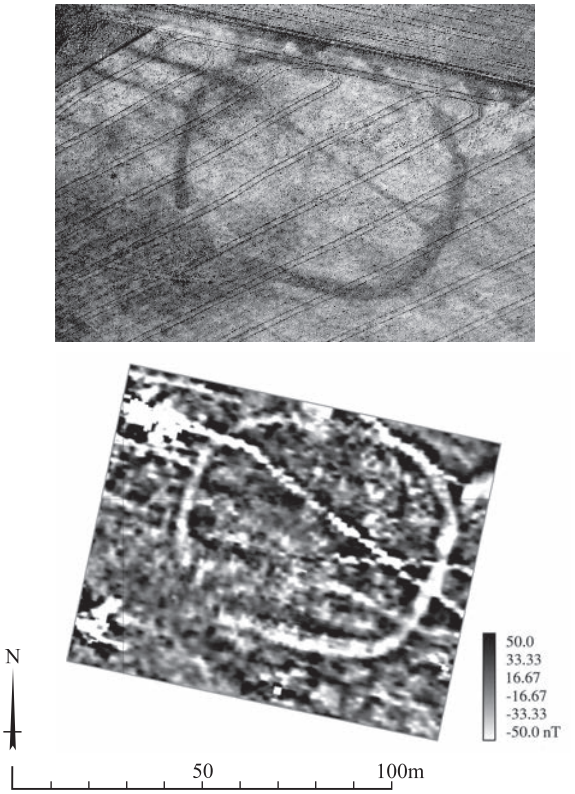

Figure A1.21
Chesters Quarry (NT57SE 27): rectified aerial photograph (EL3032) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004510)

enclosures coexisted (at some point at least). In the interior of the inner enclosure, a macular cropmark indicates the presence of a patch of deepened soils.

This is an unusual arrangement of enclosures that suggests some elaboration of settlement form. In the absence of other evidence its best context is as one of the many later prehistoric settlement enclosures from East Lothian. The inner enclosure is very large for a house, but it is possible that the arrangement of concentric ditches confers a degree of elaboration around a very large roundhouse of which the macular cropmark is only a part. On the other hand, the macular cropmark might be an 8–9m diameter roundhouse within the inner enclosure. The rationalisation of these issues may be helped by further survey, but will require excavation to explore more fully, and highlights the problems of interpreting sites that have no excavated analogies from the coarse-grained survey data alone.

25. NT57SE 27 Chesters Quarry (Figure A1.21)

This curvilinear enclosure is situated at about 145m OD on a level terrace to the south of Ninewells Burn. Discovered in the 1950s by RCAHMS on RAF aerial photographs (CPE/Scot/UK257: 3134-5, 14 August 1947), this site has been photographed on ten separate occasions between 1975 and 2003, producing a good suite of images. At the time of the geophysical survey the field was under set-aside. Both sources yielded comparable data.

The enclosure is oval on plan, measuring about 70m from east-south-east to west-north-west by some 54m transversely within a ditch up to 5m across. There is a break in the ditch on the south-west, which is probably an entrance, while the break in the north is probably

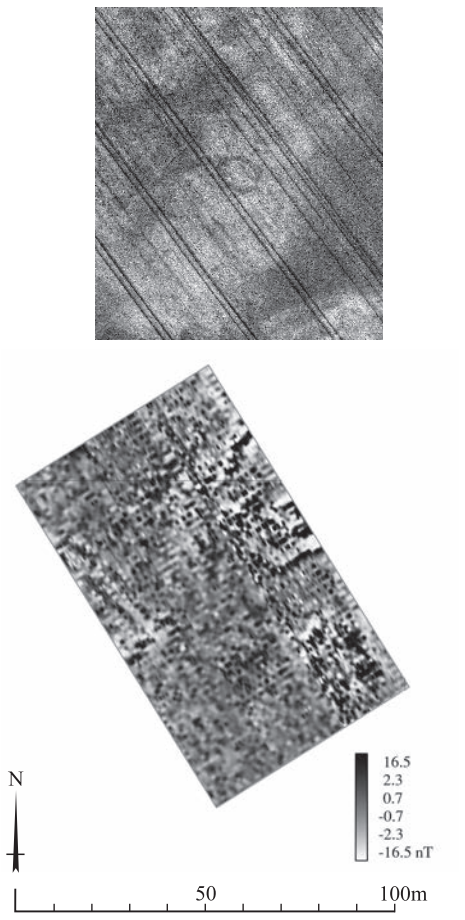

Figure A1.22
Preston Mains (NT67NW 18): rectified aerial photograph (C56794) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004511)

an edge-of-field effect. Making allowance for a bank, the internal area is about 0.22ha. An assumption of the high magnetic susceptibility of the underlying intrusive igneous rock is borne out by the registration of the ditch as a clear negative magnetic anomaly. In the interior one possible roundhouse is visible in the cropmarks, and both cropmarks and geophysics record linear features extending across the enclosure roughly from east to west. These are likely to be trackways leading to the quarries a short distance to the west.

Like many roughly oval and circular enclosures and in the absence of further evidence from the site, Chesters Quarry is one of the 'rag-bag' of later prehistoric settlements (Chapter 10) for which only a very general context can be suggested.

26. NT57SE 45 Standingstone (Chapter 4)

27. NT67SW 15 Whittingehame Tower (Chapter 3)

28. NT67NW 18 Preston Mains (Figure A1.22)

This site is situated on a very gentle south-west-facing slope set above the floodplain of the River Tyne at about 15m OD. Discovered from the air by RCAHMS in 1977, it has since been photographed six times, most recently in 1997, often recording detailed cropmarking. At the time of the geophysical survey, the field carried oilseed rape stubble and produced very noisy data, which are not readily interpretable. Indeed, the remains visible as cropmarks cannot be identified at all in the geophysics, while other possible features in the magnetic data are difficult to interpret at all.

The cropmarked record remains the clearest record of the site, the main focus of which is a small oval ring-ditch, which measures about 9.5m from north-west to south-east by 6.5m transversely within a ditch about 1.75m across. There is an entrance gap on the south-east. Across much of the field patchy cropmarking indicates variable soil depth, while a mottling indicates considerable differences in the underlying geology.

The variability in the cropmarking makes the categorical identification of further features difficult, but the ring-ditch has been assumed to be a part of an unenclosed settlement extending across the terrace and including a cluster of pits to the north-east. However, the ring-ditch is markedly oval in plan and its interpretation as a later prehistoric roundhouse must remain provisional, with other possibilities presented by Neolithic and Bronze Age funerary and ritual enclosures.

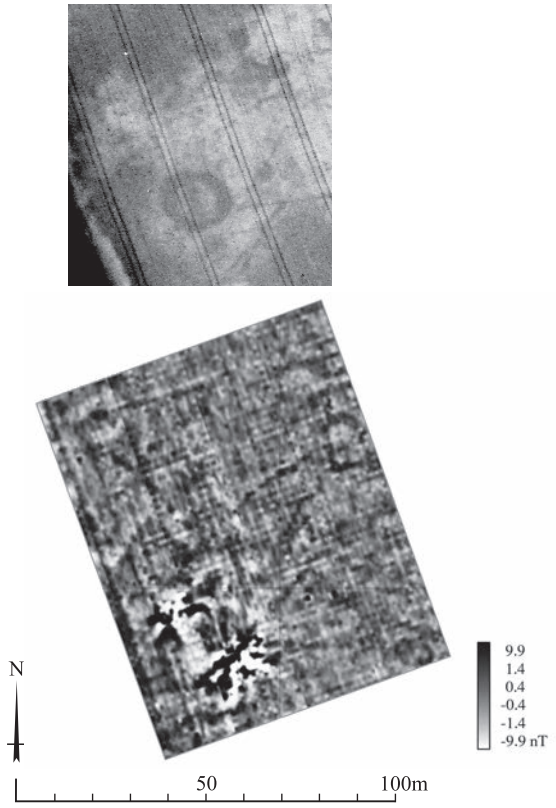

Figure A1.23
Tyninghame (NT67NW 16): rectified aerial photograph (C56789) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004512)

29. NT67NW 16 Tyninghame (Figure A1.23)

This unenclosed settlement is situated on a slight rise at about 20m OD to the north-east of Lawhead Hill. It was discovered from the air by RCAHMS in 1976 and has since been photographed on four occasions, most recently in 1996. At the time of the geophysical survey the field carried cereal stubble. The geophysics is dominated by intense anomalies caused by the near-surface igneous rockhead, effectively limiting the detection of weaker magnetic anomalies typically associated with soil-filled features.

The cropmark record shows a scatter of circular, oval and crescentic macular features and, at the west end of the field a circular ring-ditch. The various macular cropmarks are assumed to be the remains of roundhouses, most of which incorporate dished floors or other sunken features. The ring ditch to the west measures about 10m in diameter within a continuous

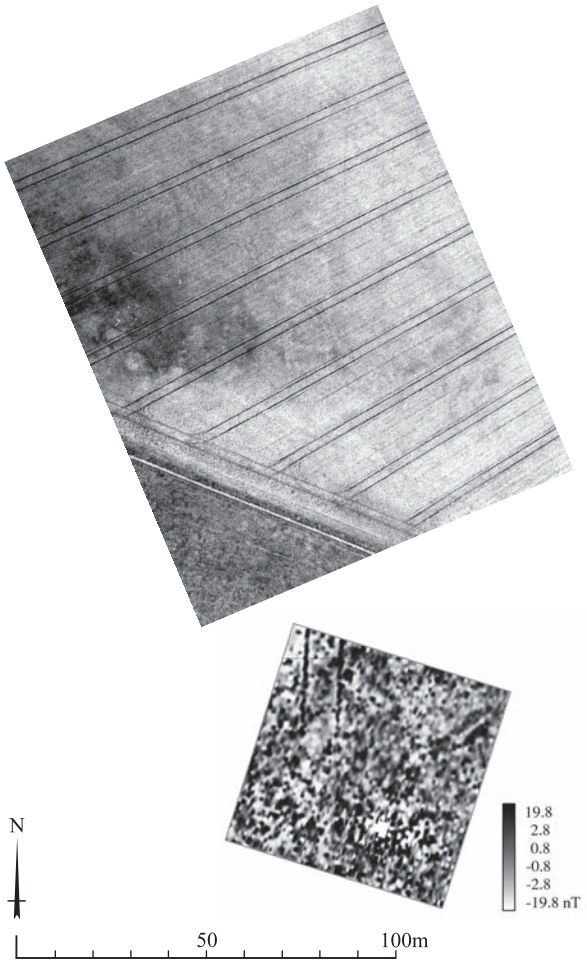

Figure A1.24
Sled Hill (NT57SE 103): oblique aerial photograph (C1951) and TLEP geomagnetic survey (Crown Copyright: RCAHMS, GV004513)

ditch just under 4m across. There are at least two possibilities for interpreting this feature: on the one hand it may be a large later prehistoric roundhouse, while on the other it may be a ditched barrow of Bronze Age date.

30. NT57SE 103 Sled Hill (Figure A1.24)

This possible timber hall is situated at about 180m OD near the summit of Sled Hill. It was discovered from the air by RCAHMS in 1992 and then photographed again in 1996, but unfortunately in neither instance did the photography capture sufficient map detail to permit the archaeological features to be transcribed. The land was set-aside at the time of the geophysical survey. Its data are noisy, with many small, intense dipolar anomalies probably of geological origin that may have obscured weaker, possibly archaeological, features. The comparison of the cropmarked evidence and the geophysical survey is compromised by the ambiguity of the geophysics and the inability to map the cropmarked features.

However, the cropmarks appear to show a roughly rectangular building with its long axis lying north–south, and probably measuring about 15m × 6m. There may be three compartments, or two and an annexe at the south end, though interpretation of the south end is complicated by a suggestion that a different phase of building, set at right angles, may overlap this end. There may be some post-holes in the interior. The geophysical survey detected two parallel, positive magnetic features set some 10m apart and continuing for 28m. While these could be the beam slots or other foundations for the building, it is more likely that they are the field drains visible on the aerial photographs to the north of the building. Finally, on the 1992 aerial photographs, a scatter of small pits to the west of the building may be post-holes from further timber buildings, or, on the basis that several are slightly elongated 'maggot-like' cropmarks, they may be east-west aligned graves.

The interpretation of large timber buildings, or halls, is a somewhat vexed issue, with reliable evidence for such structures of both Neolithic and early medieval date (e.g. Hope-Taylor 1980; Ralston and Armit 1997, 226–9; Brophy 2007). The somewhat mixed survey data will require considerable amplification to resolve this issue for Sled Hill.

Figure A2.1
Gilmerton House: (A) site location; (B) cropmark and distribution of later prehistoric and Roman finds (Distribution plot Alan Braby; Map, Crown copyright: RCAHMS, GV004514)

APPENDIX 2
RECENT WORK ON 'STRAY FINDS' OF ROMAN OBJECTS IN EAST LOTHIAN

FRASER HUNTER
(with a contribution by Jennifer Price)

Introduction

As discussed in Chapter 2, aerial photography, geophysics and excavation can usefully be complemented by a consideration of stray and metal-detecting finds. These can reveal new sites and provide new information on known sites with minimal intervention. This appendix reports on three East Lothian find clusters where 'stray finds' can be put into a landscape context and inform us about the underlying archaeology. Two, Gilmerton House (Athelstaneford) and Harperdean (Haddington), were known from cropmarks but had seen little or no previous investigation; the third, Aberlady, is a previously unknown site revealed by metal-detecting. The key findings from all three have been incorporated in the discussion in Chapter 7; the purpose of this appendix is to put the finds and their circumstances on record.

Gilmerton House, Athelstaneford (Figures A2.1–A2.3)

Metal-detecting by Ian Kinloch in a field immediately south-east of Gilmerton House in 2007–8 produced a remarkable cluster of four Romano-British trumpet brooches and a probable Romano-British stud. Aerial photographs show a later prehistoric sub-circular enclosure some 70m in diameter in this field (NT 555 775; NMRS NT57NE 34). Mr Kinloch also reported that a pair of rotary quern stones were found here after sub-soiling some twenty years ago, and he recovered stray finds of flints, a coarse stone tool and medieval material from this and the adjacent field to the north. Although fieldwalking is often overlooked as a technique for later prehistoric sites in this area, indications here suggested it might be worthwhile. The results of a day's walking proved this to be correct.

Key for present purposes is the later prehistoric and Roman material, summarised in Table A2.1 and catalogued below. The fieldwalking finds clustered to the west of the enclosure; the metal-detecting finds lay to the north-east and south-east (Figure A2.1). This lack of correlation with the known cropmark may reflect a more extensive open settlement in the area.

Table A2.1
Summary of later prehistoric and Roman finds from Gilmerton House

Material	*Description*
Non-ferrous	4 trumpet brooches (one silver) Disc-headed stud (copper alloy)
Glass	2 sherds of Roman glass, prob from a cylindrical bottle
Pottery	1 later prehistoric body sherd
Stone	3 pounders 1 (perhaps 2) whetstones Rotary quern pair (lost) Cannel coal roughout

However, it may equally reflect the off-site disposal of settlement debris, perhaps in the spreading of midden material; this is a valuable corrective to the oft-stated material poverty of the lowland Scottish Iron Age, which is likely simply to reflect habits of rubbish deposition, with the material ending its life off-site.

Vitrified material was found in some quantity, although little was securely related to iron-working, and the bulk is probably post-medieval. A very thin scatter of struck lithics (only five pieces) included two Mesolithic blades and a post-medieval gunflint. A cluster of medieval and post-medieval pottery at the northern edge of the field is probably connected to a site in the adjacent field suggested by finds of hammered coinage.

As discussed in Chapter 7, Roman finds reached virtually all contemporary Iron Age sites in East Lothian. However, the quantity and range of material, and the presence of a rare silver brooch, suggests the Gilmerton House site was of above-average importance. It also shows the value of metal-detecting and fieldwalking such sites.

The finds are with East Lothian Museums Service; Treasure Trove reference numbers are given.

Metal

- Copper alloy trumpet brooch in very poor condition (Figure A2.2, A): the original surface is lost, foot broken off and bow tip bent, the spring and pin lost and the hook which held the spring broken. Plain, with full acanthus

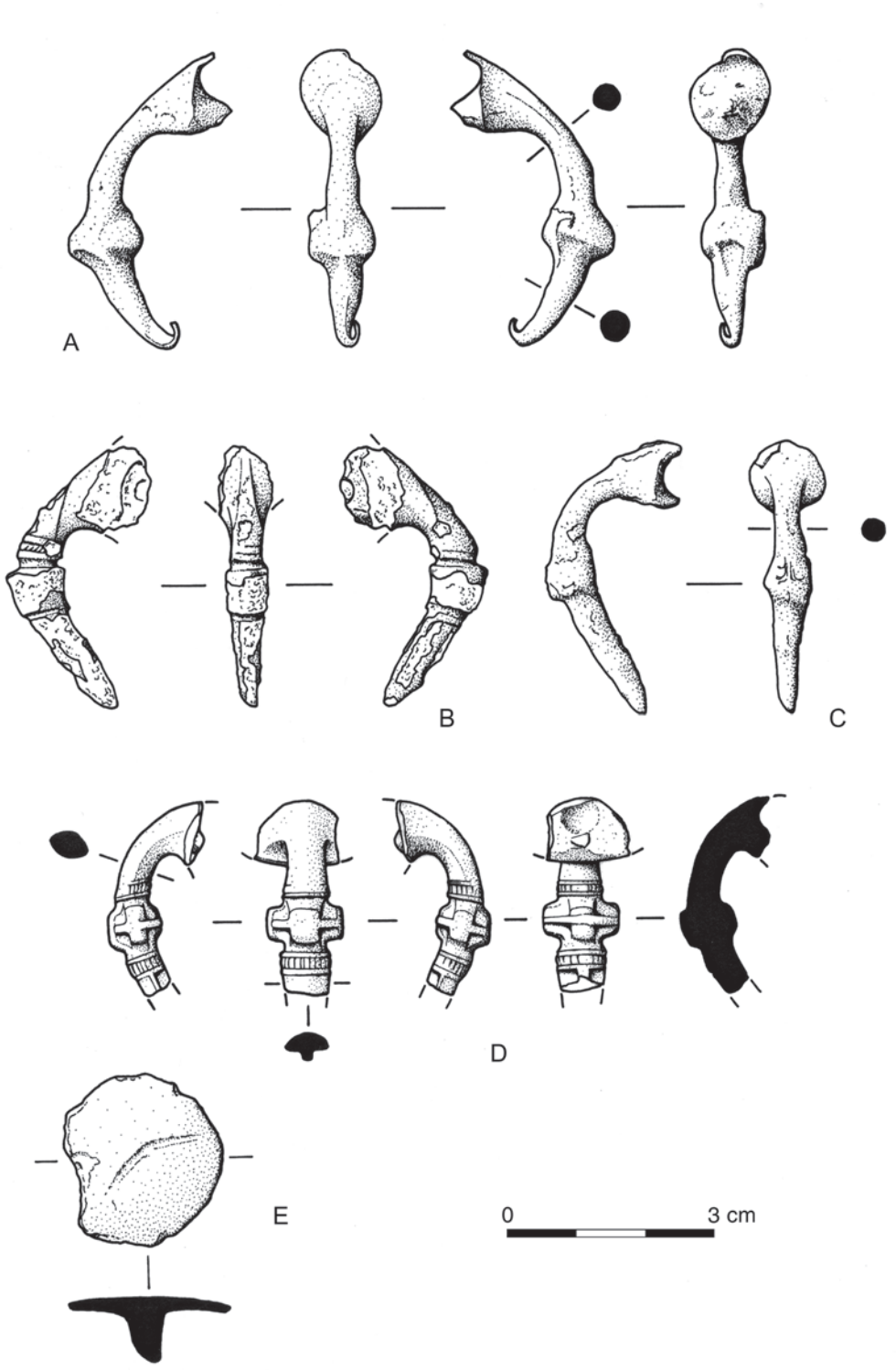

Figure A2.2
Roman brooches and Roman Iron Age stud, Gilmerton House (Alan Braby)

moulding (Collingwood & Richmond (1969, 297) type R(ii); Hull type 158A; Bayley & Butcher (2004, 160-4, 235-6) type A). L 42, W 12, H 19mm. (TT 79/07)

- Decorated copper alloy trumpet brooch (Figure A2.2, B). Much of the surface is lost; the catchplate is broken off, the pin is missing and the edges of the head are destroyed. Surviving traces on the badly-damaged central knob imply it was a full acanthus moulding flanked by triple ribs, the central one with worn incised cable decoration (type R(ii)/Hull 158A). The head is decorated with an incised line on either side, curving from the lower edge of the knob and meeting in a point on top of the head, creating a series of curved areas. Most of the head is lost; the underside has a solid bar pierced to hold the iron axis of the spring. L 37, W 7, H 18mm. (TT 46/07)

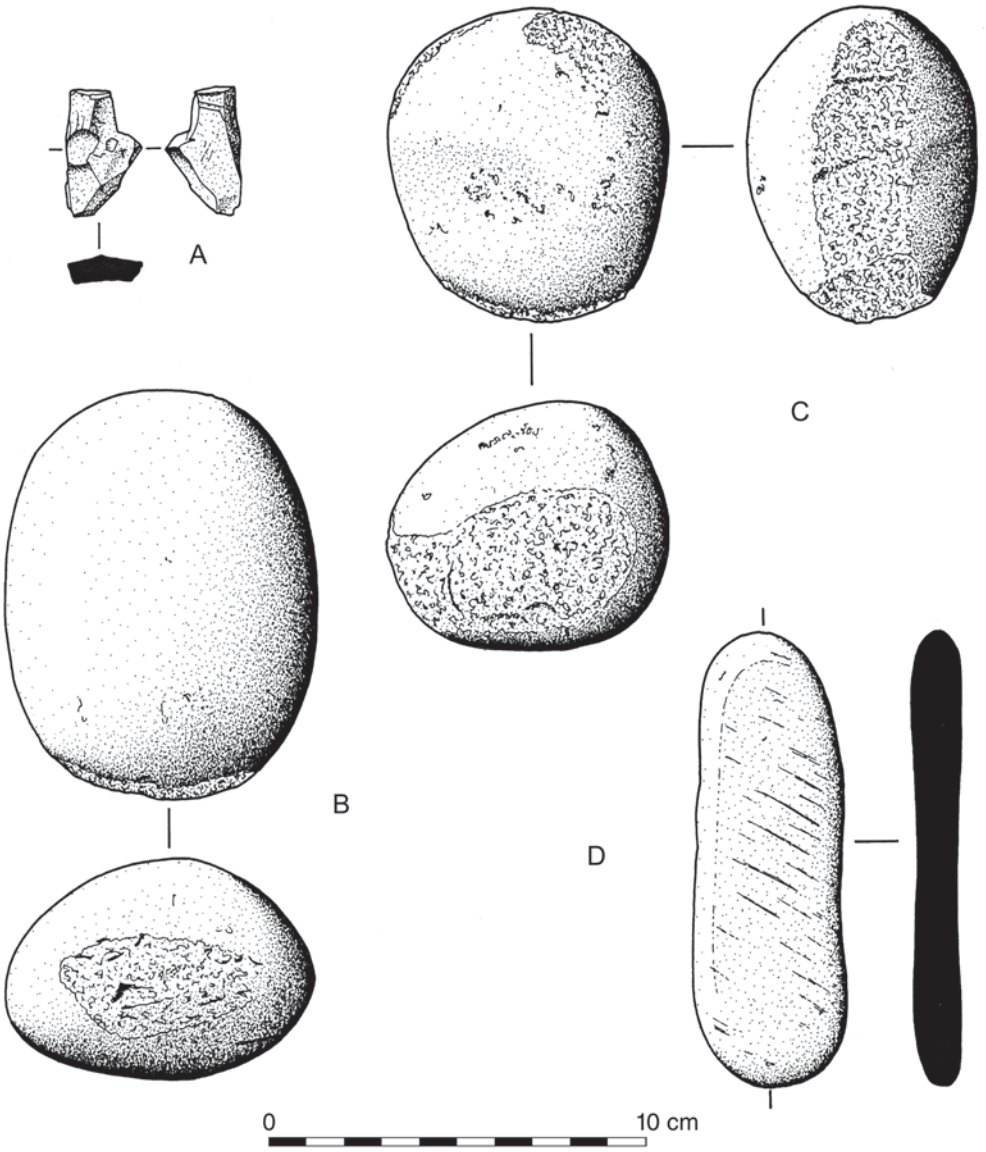

Figure A2.3
Stone finds, Gilmerton House (Alan Braby)

- Copper alloy trumpet brooch in very poor condition (Figure A2.2, C), the original surface almost entirely lost, catchplate broken and pin lost. The surviving morphology implies it had a full acanthus moulding (type R(ii)/Hull 158A); plain ovoid head, hollowed underneath with an integral broken central hook for the spring. L 39.5, W 11, H 17mm. (TT 46/07)
- Silver trumpet brooch (Figure A2.2, D), the bow lost a little below the knob; head margins damaged and pin lost. It had seen heavy use, with extensive wear, especially on the upper surface, and post-depositional scratching. The brooch is plain, with a full acanthus knob on the bow flanked by triple-rib mouldings, the central one bearing incised ladder decoration (type R(ii)/Hull 158A); the rib nearest the head is split in two on the underside by an additional incised line. The catchplate ridge runs up to the mouldings. The rather D-shaped head is slightly hollowed to accommodate the spring, with the broken stump of a fastening hook. It is likely the brooch broke in use. L 29.5, W 12, H 11mm. (TT 38/07)
- Disc-headed stud (Figure A2.2, E). Cast, with the short broken stub of an oval-sectioned tang and a plain disc, slightly plano-convex in section, the margins slightly damaged. D 24.5mm, H 10.5mm, shank D 3.5–4mm. Although not a diagnostically Romano-British type, similar studs are frequently found on such sites (e.g. Allason-Jones and Miket 1984, nos 3.975-8) but are unusual on Iron Age ones; its patina is consistent with such a dating. (TT 79/07)

Glass – Jennifer Price

- Two small curved blue-green body sherds, with elongated bubbles; probably from a cylindrical bottle, perhaps from the same vessel. Wall thickness 2–2.5mm. Such bottles are late first–early second century in date (Price & Cottam 1998, 191-4). sf 87, 99.

Stone

- Rotary quern stone pair, found in subsoiling 'about twenty years ago'; now lost, type unknown.
- Cannel coal object, probably a broken roughout (Figure A2.3, A). Triangular, one corner broken off; both faces flaked; one edge snapped square, others bifacially flaked. The shape suggests it may have been intended as a pendant, although it is an unusual form and the identification is not certain. The good conchoidal fracture and lack of laminations identify it as cannel coal. 33 × 20 × 8.5mm. sf 88.
- Pounder (Figure A2.3, B). Ovoid cobble with pecked facet (47 × 27mm) at one end. 108 × 82 × 58.5mm. Found by Ian Kinloch in the field to the north. sf 143.
- Pounder (Figure A2.3, C). Irregular pyriform cobble with broad pecked facet on the narrow

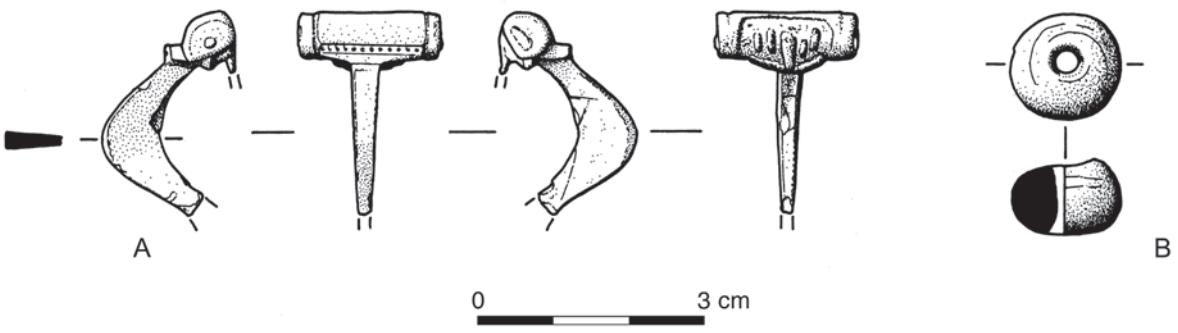

Figure A2.4
Finds from Harperdean (Alan Braby)

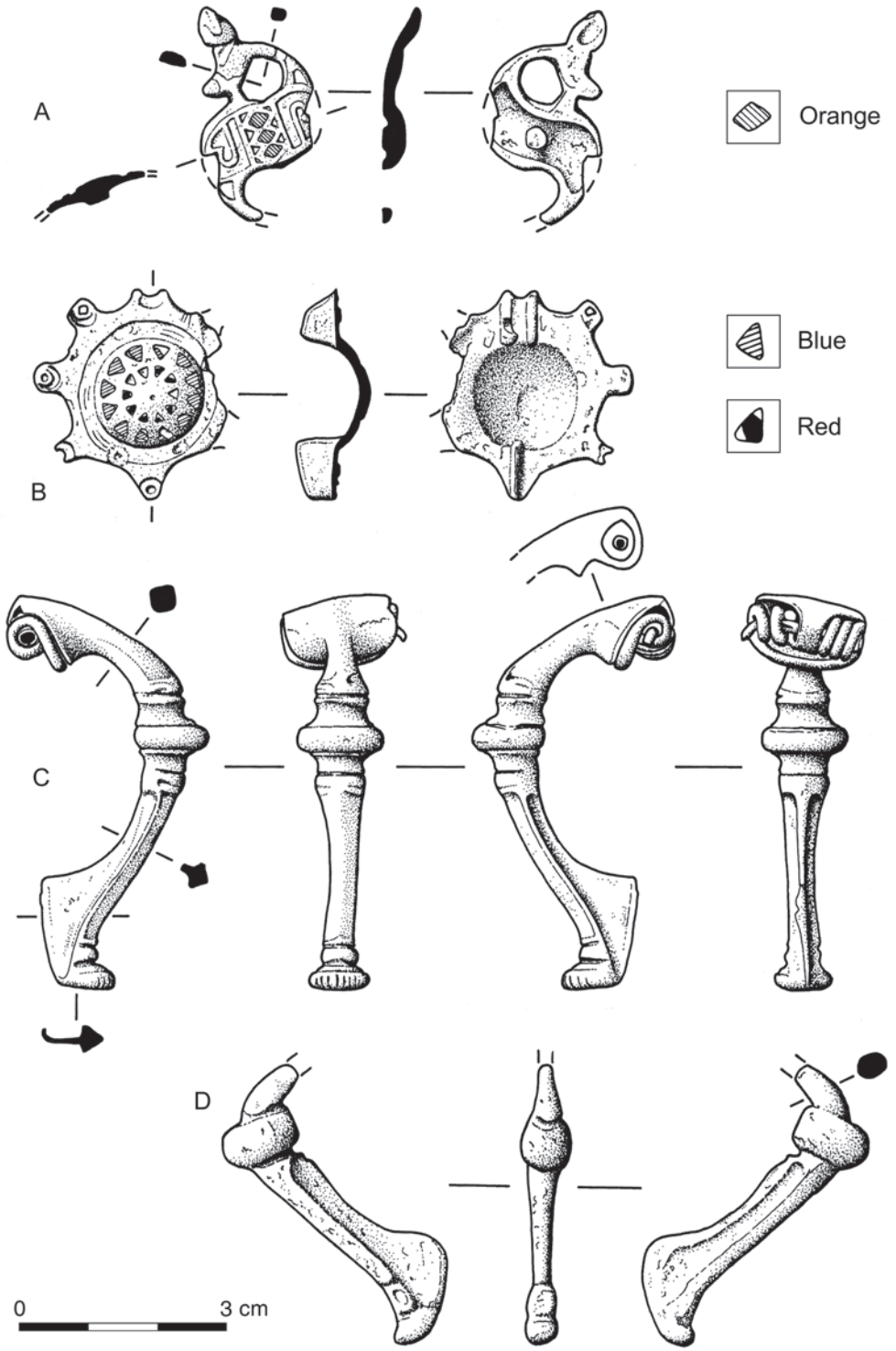

Figure A2.5
Roman brooches from Glebe Field, Aberlady (Alan Braby)

tip running up one edge; small facet on one corner of broader end. 83.5 × 76 × 66mm. sf 81.

- Barely-used pounder. Discoid cobble with lentoid section, one end with three small pecked hollows over an area 28 × 8mm, the other with a very small, narrow pecked facet (L 33mm) largely destroyed by a single flake removed due to hammering. 105 × 89 × 49mm. sf 28.
- Probable whetstone (Figure A2.3, D). Flat elongated cobble with rounded ends and lentoid section. Faces slightly smoothed and dished, one with staining. 120 × 41 × 12.5mm. sf 125.
- ?Whetstone/sharpener. Broken end of a rather irregular tabular pebble, one face smoothed and bearing fine diagonal striations. Too small for certain identification. 29.5 × 25 × 23mm. sf 123.

Pottery

- Single later prehistoric body sherd; relatively fine, with oxidised red-brown exterior, reduced interior, and <5% small grit temper. Wall T 9mm. sf 112.

Harperdean (Figure A2.4)

In 2007 Gerald McAleer found a Roman brooch and a glass bead at Harperdean, immediately north of the A1 at Haddington, in a field known to contain later prehistoric settlement evidence (NT 512 747; NMRS NT57SW 53, 93, 117). An enclosed settlement lies to the north of the findspot, but these finds probably derive from the nearby open settlement – of unknown extent – located in trial trenching ahead of the A1 upgrading (*DES* 1995, 51).

Two Roman coins are also recorded from the farm, both recent detecting finds: a sestertius of uncertain date and a follis of Constantius I (AD 313–7; Bateson and Holmes 2006, 165). These are likely to derive from the same settlement cluster: the sestertius is from NT 514 746, very close to the recorded open settlement; the follis is a little more distant, some 300m west of the brooch findspot at NT 509 746.

While Roman brooches are one of the commonest finds from Iron Age sites in the region (Chapter 7), knee brooches are conspicuously rare, and do not seem to have caught local tastes. The main exception is Traprain Law, where there is an unusually large quantity of such brooches. Given this, it may well be that the Harperdean brooch came first to Traprain and was passed on from that power centre to a dependent settlement in the vicinity.

At the time of writing the finds have been claimed as Treasure Trove (TTDB 2007/47); it is anticipated they will be allocated to East Lothian Museums Service.

- Romano-British knee brooch (Figure A2.4, A); lower part of bow, foot and most of pin lost. The sharply-angled bow has a tapered rectangular section; the cylindrical head has a slight incised groove round each end and a transverse bar at the head-bow junction, decorated with a row of dots. Four-coil spring with internal chord, held by a copper alloy solid rod axis. Most surfaces show filemarks from finishing; the brooch has a white metal coating, probably tin (based on other analysed examples). This variant (Hull type 176 (Bayley and Butcher 2004, 179-80); Snape (1993, 19) type A) is a Continental type with a broad distribution in Britain (Bayley and Butcher 2004, 256; Snape 1993, 19 records 16 from the Stanegate frontier, and there is one from Newstead; Curle 1911, pl LXXXVII, 33). It dates to the period *c.* AD 150–200. L 16, W 19, H 24mm.
- Glass bead, globular, in translucent dark blue glass (Figure A2.4, B); the swirls of the glass from forming it round a core are clearly visible, with small protrusions at either end where it was twisted off the rod. It is slightly uneven in shape. D 14mm, H 10.5mm, perforation D 3.5mm. In Guido's classification (1978), this is a medium globular bead of group 7 (iv), a common and long-lived type with a currency from the Later Iron Age throughout the first millennium AD.

Aberlady (Figure A2.5)

Metal-detecting by Roger McWee over a number of years in fields close to the shore at Aberlady has revealed a 'productive site' with an assemblage predominantly of Anglo-Saxon and Medieval date; the small Roman Iron Age component is of interest here (for some of the Anglo-Saxon finds see Lowe 1999, 55; for geophysics, *DES* 1995, 48–9). Four brooches are known, all from the Glebe field (centred on NT 4600 8000). In addition, a dupondius of Antoninus Pius and a samian sherd are recorded

from Luffness, on the opposite side of the bay (Bateson and Holmes 2006, 165; Hardy 1885), part of a general scatter of material along the coastal dunes from Gosford to North Berwick (Figure 7.17). While the Anglo-Saxon material is more spectacular, it seems clear that the site had its origins in the Roman Iron Age if not before. The brooches cannot be more tightly dated than later first – second century, except the umbonate brooch, for which Bayley and Butcher (2004, 173) suggest a later first century date.

The finds are in the National Museum.

- Dragonesque brooch (Figure A2.5 A), reverse-S form, lozenge and scroll type (Feachem 1951, type ii), lacking the pin and one head. Vertical ear with central lentoid ridge, separated from the head by a brow; flat head with no eye, the nose lost, joined to the body by a short cylindrical sprue attached to a low marginal lip flanking the outer curve of the body. Enamelled decoration comprises a central row of orange lozenges flanked by discoloured triangles (with some stray orange chips). This discoloured enamel (surviving as a pale translucent blue-green; original colour unknown) also fills the main scrolls, which enclose a small field of discoloured dark enamel; the latter also survives in a triangular field on the neck. The underside is hollowed, with the central stub of a casting sprue. L 31, W 18, T 3.3mm. NMS FT 113.
- Umbonate disc brooch of Hull's type 267C (Figure A2.5 B; Bayley and Butcher 2004, 173), with eight marginal protruding discs (two now lost), each with a ring and dot motif. These show no trace of enamel; in some, the dot is a perforation, in others the motif is off-centre. A shallow circumferential groove (unenamelled) surrounds the boss; this carries two concentric rows of enamelled triangles, the lower a dark translucent blue, the upper an opaque red; the central dot is plain. Damaged fittings on rear for a hinged pin, the catchplate return and part of the hinge lost. D 31mm, H 10.5mm. NMS FT 114.
- Plain trumpet brooch (Figure A2.5, C), intact apart from the pin, the head slightly twisted. Plain central disc moulding with low flat collars (Collingwood and Richmond (1969) type R(i); Hull type 153C), flanked by triple mouldings; those nearer the head curve slightly to form lipped motifs. Foot decorated with edge ribbing; two collars demarcate it from the bow. The integral cast hook holds a six-coil spring with internal chord, the axis formed of a rolled sheet cylinder. L 58, W 18, H 27.5mm. NMS FT 102.
- Trumpet brooch fragment, head lost (Figure A2.5, D); the full moulding is too worn for detailed identification. Plain bow and foot, with collar at foot. L 45, W 7.5, H 28mm. NMS FT 123.

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Plate 1
Standingstone 2003 excavation from the air, looking towards Traprain Law (photograph John Davies)

Plate 2
The enclosure at Knowes under excavation in 2004 from the east

Plate 3
Knowes: Circular Structure 1, showing the paving in the north-east quadrant

Plate 4
Knowes: oven in Circular Structure 2

Plate 5
Knowes: the cist in southern ditch terminal

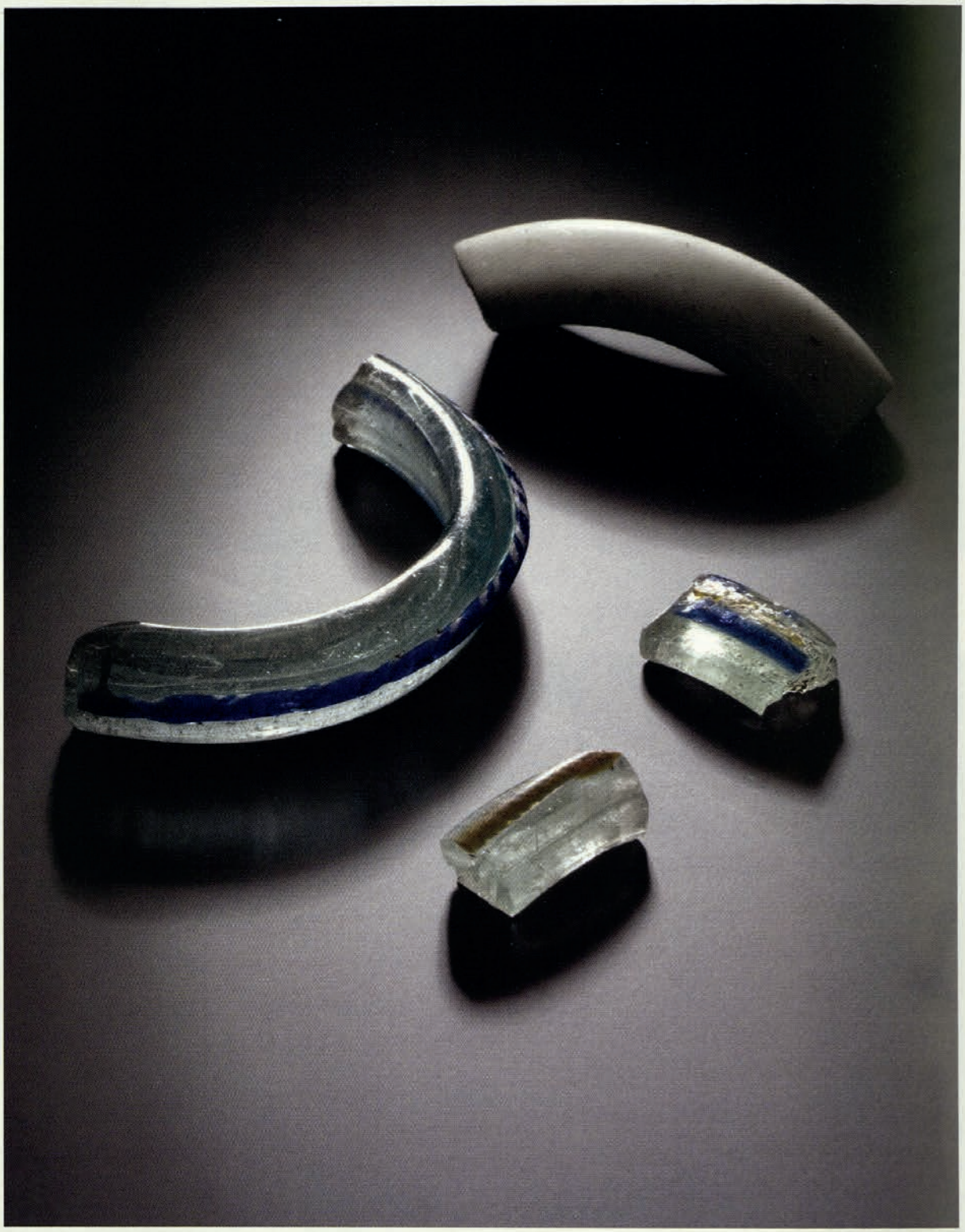

Plate 6
Glass bangles from Knowes (photograph NMS)