Archaeology of Landscape Change in South-West Scotland, 6000 BC – AD 1400:

Excavations at William Grant and Sons Distillery, Girvan

by Iain Banks, Paul R J Duffy and Gavin MacGregor
GUARD, Gregory Building, Lilybank Gardens, University of Glasgow, Glasgow G12 8QQ

with contributions
from Ewan Campbell, John Duncan,
Jennifer Miller, Susan Ramsay, Catherine Smith
and Eland Stewart

illustrations by
John Arthur, Caitlin Evans and Charlotte Francoz

Scottish Archaeological Internet Report 32, 2008
www.sair.org.uk

Published by the Society of Antiquaries of Scotland, www.socantscot.org.uk
with Historic Scotland, www.historic-scotland.gov.uk
and the Council for British Archaeology, www.britarch.ac.uk
Editor Debra Barrie
Produced by Archetype Information Technology Ltd, www.archetype-it.com

ISBN: 978 0 903903 981
ISSN: 1473–3803

Contents

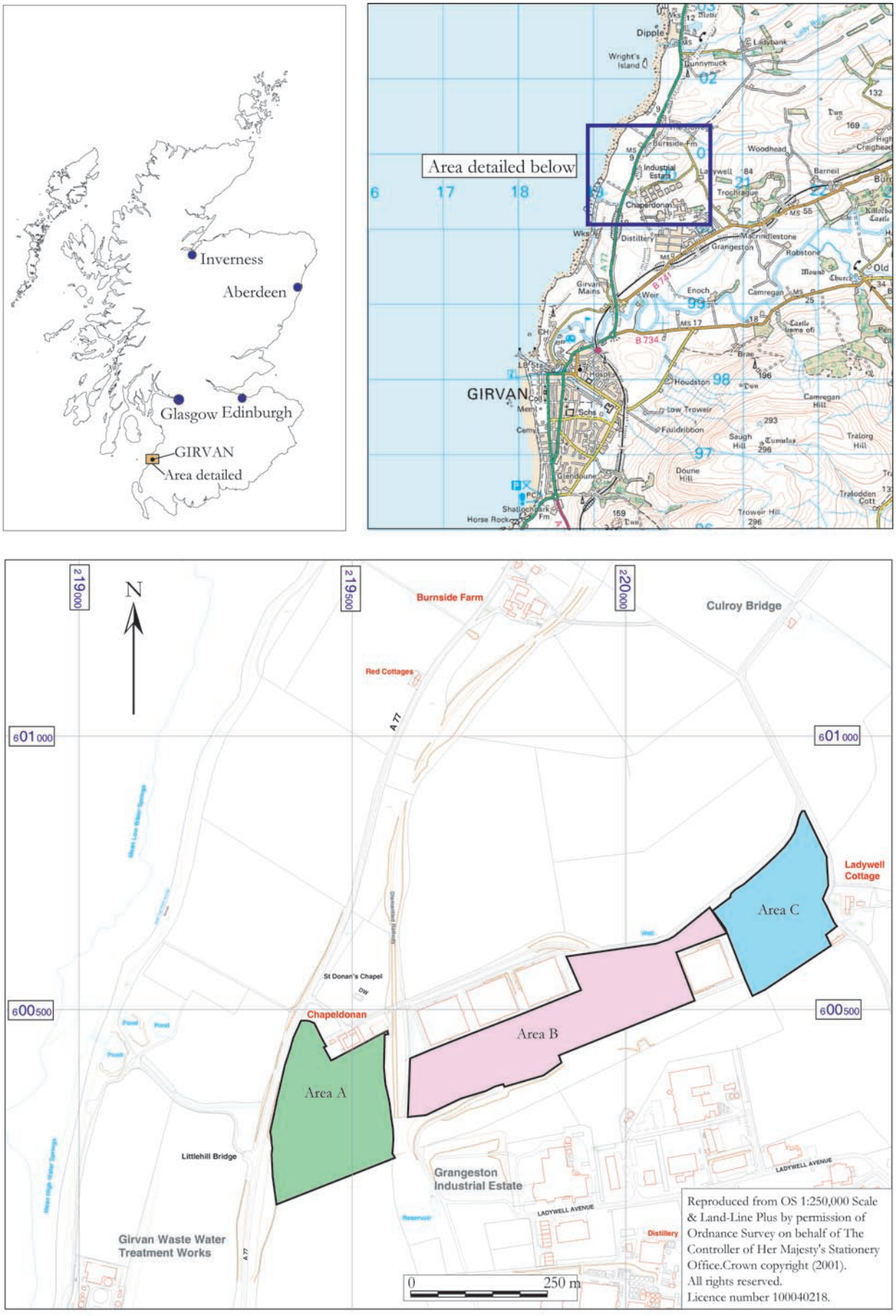
List of Illustrations

List of tables

1 Summary

Between 1996 and 1998, Glasgow University Archaeological Research Division (GUARD) undertook a programme of archaeological investigation at the headquarters of William Grant and Sons Distillers Ltd, Girvan. The work revealed evidence of occupation and use from prehistoric times, including palaeobotanical and pedological evidence of deliberate prehistoric tree clearance, and the presence of six discrete deposits of burnt mound material. The project also confirmed the survival of archaeological deposits relating to the occupation of the medieval moated enclosure of Ladywell. A number of worked lithics, indicative of prehistoric tool making or maintenance, were also recovered.

The excavation and post-excavation work allowed an opportunity to explore the occupational, ecological and geomorphological history of the entire length of the valley, from the immediate post-glacial period to the present day. The results contribute significantly to our understanding of the changing patterns of human interaction with environment and landscape over a period of some 10,000 years, both in the immediate area and beyond.



Illus 1 Grant's, Girvan: Location

2 Introduction *by Paul Duffy*

The headquarters of William Grant and Sons Distillers Ltd are located *c* 2.5km north of the town of Girvan, in the Grangetown Industrial Estate to the east of the main A77 (T) road (see Illus 1). Between 1996 and 1998, a programme of expansion of the existing storage facilities was undertaken, involving the construction of several new bonded warehouse blocks, associated access roads and services. During this time, a series of archaeological investigations, including evaluation, geophysical survey, watching briefs and excavation, were undertaken by GUARD in part fulfilment of archaeological negative suspensive conditions placed upon the development by West of Scotland Archaeology Service (WoSAS), acting on behalf of South Ayrshire Council Planning Department.

The construction work and associated archaeological mitigations focused on an area of warehouse development within a small valley to the north-west of the main industrial estate, between 12m and 25m OD (see Duffy 1997a; Duffy 1997b; Duffy 1997c; MacGregor & Duffy 1997; Speller & Banks 1997; Duffy 1998; Halliday & Will 1998). This valley runs westward from Ladywell Farm to the coast, traversing a raised beach on its route. Prior to the project commencing, the valley was a focus for arable farming for the entirety of its length. In Area B, three warehouses had already been constructed before the commencement of archaeological involvement. On-site observations of stubble remains, however, suggest this area too was originally utilized for arable farming.

The drift geology for Area A consists of raised beach deposits of post-glacial sand, shingle and marine shells. The drift geology for Area B, by contrast, is mapped as later glacial sand, silt and clays (Geological Survey of Scotland 1981). The solid geology of both areas is Devonian lower old red sandstone (Geological Survey of Scotland 1987). All three sites were located within an area termed as undifferentiated alluvial soils (Macaulay Institute for Soil Research Soil Survey of Scotland 1968).

3 Archaeological Background *by Paul Duffy*

The immediate environs of the Grant's complex are a rich palimpsest of archaeological remains, attested from a variety of sources, and the general area has considerable cropmark evidence of human activity from the later prehistoric onwards. Cropmark evidence shows three enclosures and a ring ditch (NMRS: NX19NE 26, NX19NE 50 and NX19NE 31) present to the east of the investigation area, while to the west there is cropmark evidence for a possible fort (NX19NE 29), a ring ditch (NX19NE 28) and undated linear cropmarks (NX19NE 29). To the south, on the lower-lying ground at Girvan Mains, are two possible Roman marching camps (NX19NE 24 and NX19NE 47), and further east, at Enoch, is cropmark evidence of enclosures containing putative timber houses (NX19NW 18, 19, 21 & 22). There are also two possible duns in the area, one located about 2.5km south-east of Gallow Hill at Brae Hill (NX29NW 7) and the other slightly further afield, located on Dowhill (NX19NE 7).

Physical evidence, in the form of numerous surface lithic scatters to the south and west of the valley, has long demonstrated a human presence in the area from the Mesolithic onwards (MacNeill 1973; Morrison 1981; RCAHMS 1983, 7–8; Ashmore 1997). Excavated evidence for this presence was more recently provided by the discovery of a lithic tool preparation area at the nearby site of Littlehill Bridge (MacGregor & Donnelly 2001), and from an excavated pit dated to the late Mesolithic from Gallowhill (Donnelly & MacGregor 2006). The latter site also produced evidence of continuity of human occupation through the Neolithic and Bronze Age, and into the Romano-British period. Significantly for this project, a number of burnt mounds were also identified, in what is effectively the neighbouring valley to the Grant's site. Similar fieldwork has also identified Neolithic activity, attested by the Bargrennan tradition of chambered cairns in the region (Henshall 1972). Bronze Age funerary activity is attested in the form of a cremation cemetery excavated at Coalpots Road (MacKie 1966), and three cairns on Saugh Hill (NX29NW 6 & NX29NW 8).

In the valley itself, little previous work had been carried out. The eastern end of the valley had a considerable amount of cropmark evidence, which included cropmarks interpreted as a medieval moated enclosure at Ladywell (NS20SW 28). This end of the valley also contained the putative site of the Chapel of St Donan, and the now destroyed farm settlement of Littlehill, noted on Roy's map of 1745–7. This range of material testified to an occupational history stretching from at least the early medieval period, while the cropmarks hinted at earlier remains as well. With the wealth of sites in the surrounding area, it was also very likely that prehistoric remains might have been present within the valley. It was considered likely that this would include Mesolithic to Neolithic material, although the potential for Bronze Age or Iron Age remains seemed high.

4 **Methodology** *by Paul Duffy & Iain Banks*

Watching briefs, controlled soil stripping and excavations all followed standard methodological procedures; topsoil was removed by machine, using a flat-bladed bucket, until archaeological deposits were identified. The only exception to this methodology occurred during the stripping of the southern half of the footprint for WH40, where a bulldozer was used to strip the area under sporadic archaeological supervision.

Following machining, cleaning and excavation were by hand. Standard recording methodologies of written, drawn and photographic records documented all deposits.

Geophysical survey in Area C was conducted using a Geoscan RM15 resistivity meter and a Geoscan FM36 fluxgate gradiometer, surveying over 20m grids at intervals of 1m. Twenty resistivity grids and 23 magnetometer grids were surveyed, covering the area to the east and north of the spoilheap. Data were processed at the time of the fieldwork through Geoplot v2.

5 Results *by Iain Banks, Paul Duffy and Gavin MacGregor*

5.1 Introduction

The initial division of the valley into Areas A, B and C, as referred to above, was undertaken as a tool for practical project management. The locations of these areas, and the archaeological sites discovered within them, are shown in Illus 1, 2 and 10, to allow ease of reference to the project archive. The archaeological work undertaken in the valley has, however, revealed a rich palimpsest, with evidence of occupation stretching back to early prehistory. In this light, the academic presentation of the results by nominal area adds little to the readers' understanding of the archaeological discoveries made during the project, and the significance of those findings. Instead, the results of the project and discussions of the findings are presented below in a synthetic narrative, based on the three main evidence strands for occupation in the valley.

5.2 Burnt mound deposits in Areas A and B
by Paul Duffy with contribution from Gavin MacGregor

5.2.1 Discovery and excavation

The archaeological work at Girvan identified eight discrete deposits of burnt mound material, one in Area A (Deposit 1) and seven in Area B (Illus 2). Of the sites identified in Area B, five were subject to full excavation to achieve preservation through record (Deposits 2–6). The remaining sites (Deposits 7 and 8) were identified during a watching brief during soil profiling and were preserved in situ with no further investigative work taking place.

5.2.2 Area A (Illus 3)

Excavation revealed burnt mound material (Deposit 1) that had been extensively eroded and denuded by a combination of complex post-depositional processes. Specialist analysis of the soil morphology (see Section 6.1, below) indicates that these processes were initially a combination of high-energy and low-energy depositional events, suggesting perhaps a salt-marsh environment in which material had been mixed and redeposited by a series of abrading channels continually eroding and silting within the marsh. This was followed by a more sustained low-energy deposition of material in a wet and largely stagnant watery environment, which deposited silts and clays that eventually covered the mound. Although there was considerable alteration of the characteristics of the original deposit by these processes, the dimensions established through excavation suggest that the mound must have been at least *c* 4m by 4m. No trough or associated features were identified.

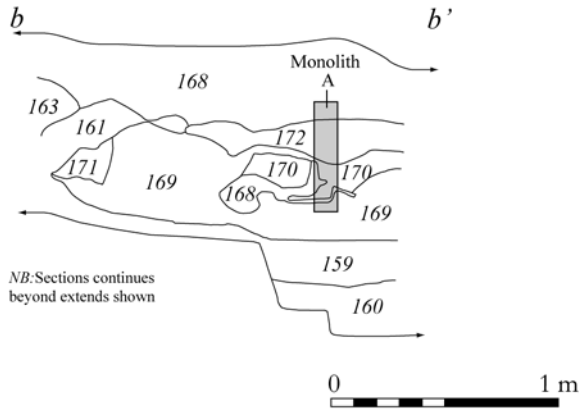
Illus 3 shows a typical section of the mound, as excavated. The primary deposits on site were a series of blue clay sands containing occasional small shells, presumed to represented marine-deposited material laid down when the area was open to the sea (contexts 151, 159, 160, 200, 232; illus 3a). Small channels filled with well-preserved organic material appear to have formed on top of these deposits, suggesting a subsequent change to a marshier environment, reinforced by the pedological analysis of excavated deposits. The main deposit of burnt mound material (contexts 101, 116, 130, 182–185; illus 3b) lay directly on top of these clays, sands and organic-filled channels. It was, in general, composed of black, charcoal-rich silt clay containing small fire- and heat-cracked stones, which ranged from 50–150mm in diameter. Immediately following the deposition of the burnt mound material, small channels formed and filled with organic material (contexts 116–120, 132–139, 252), creating the confusing pattern of erosion and deposition observed during the excavation. Following this phase, material continued to accumulate around the burnt mound deposit, eventually covering it. These water-deposited sediments comprised orange to yellow sands and sandy clays (contexts 100, 122, 123, 141, 167, 168, 201, 202, 218, 238, 239, 242). A later field drain (context 203) and ditch (contexts 161, 163) further truncated the burnt mound deposit, and contexts 142, 143 and 180 appear to have been disturbed by these intrusive digging actions.

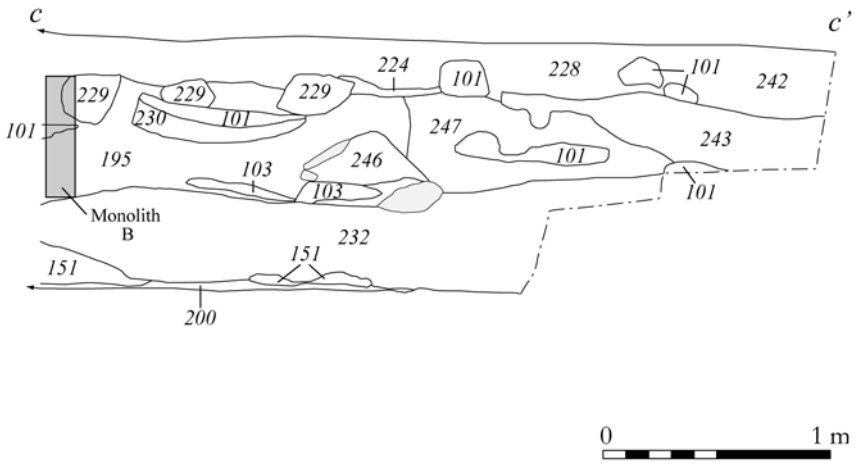
We can perhaps therefore envisage the formation of the burnt mound on a small area of relatively stable ground within a marsh environment. The site appears to have been used only once, as no evidence for successive deposits of material was found, following which it was abandoned. The continually shifting channels and pools within the marsh subsequently mixed, eroded and redeposited the burnt mound material along with other sediments, before the site was eventually covered as further sediments, deposited in an increasingly stagnant watery environment, covered the site entirely.

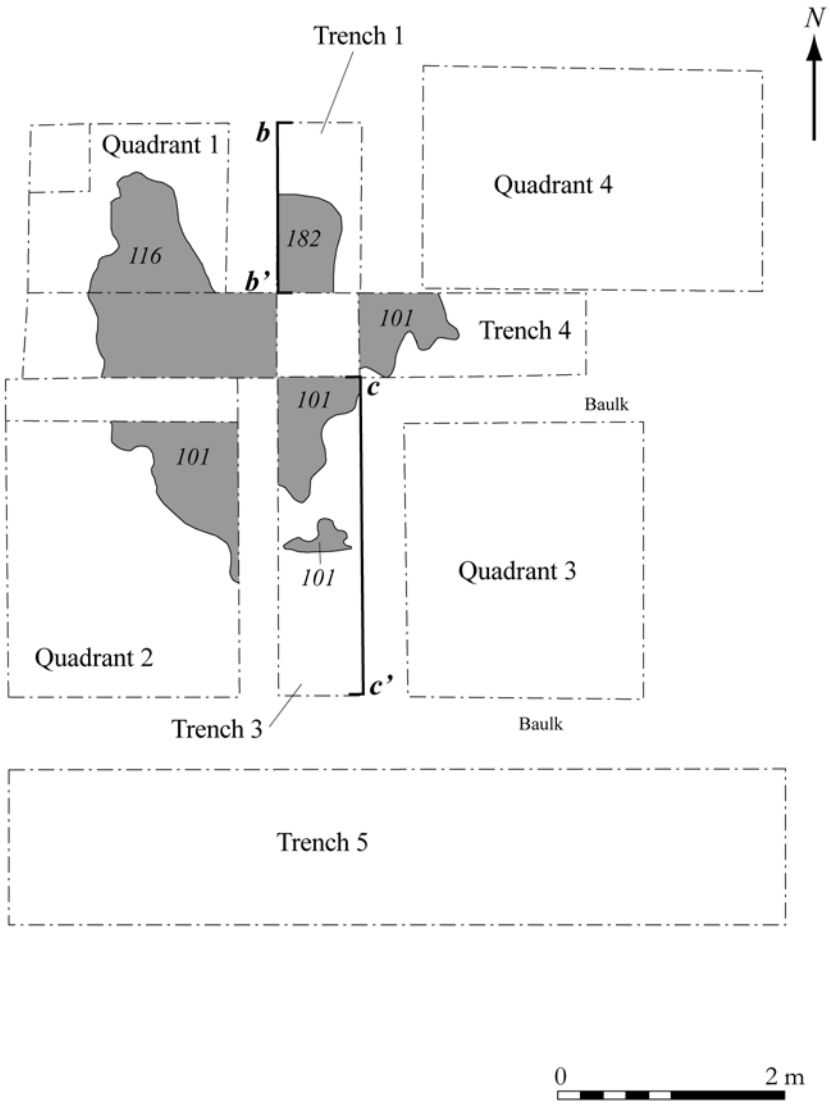
Radiocarbon dates from *Alnus* charcoal contained within burnt mound contexts 101 and 130 produced

Illus 2 (opposite) Area B: Location of wood and burnt mound deposits

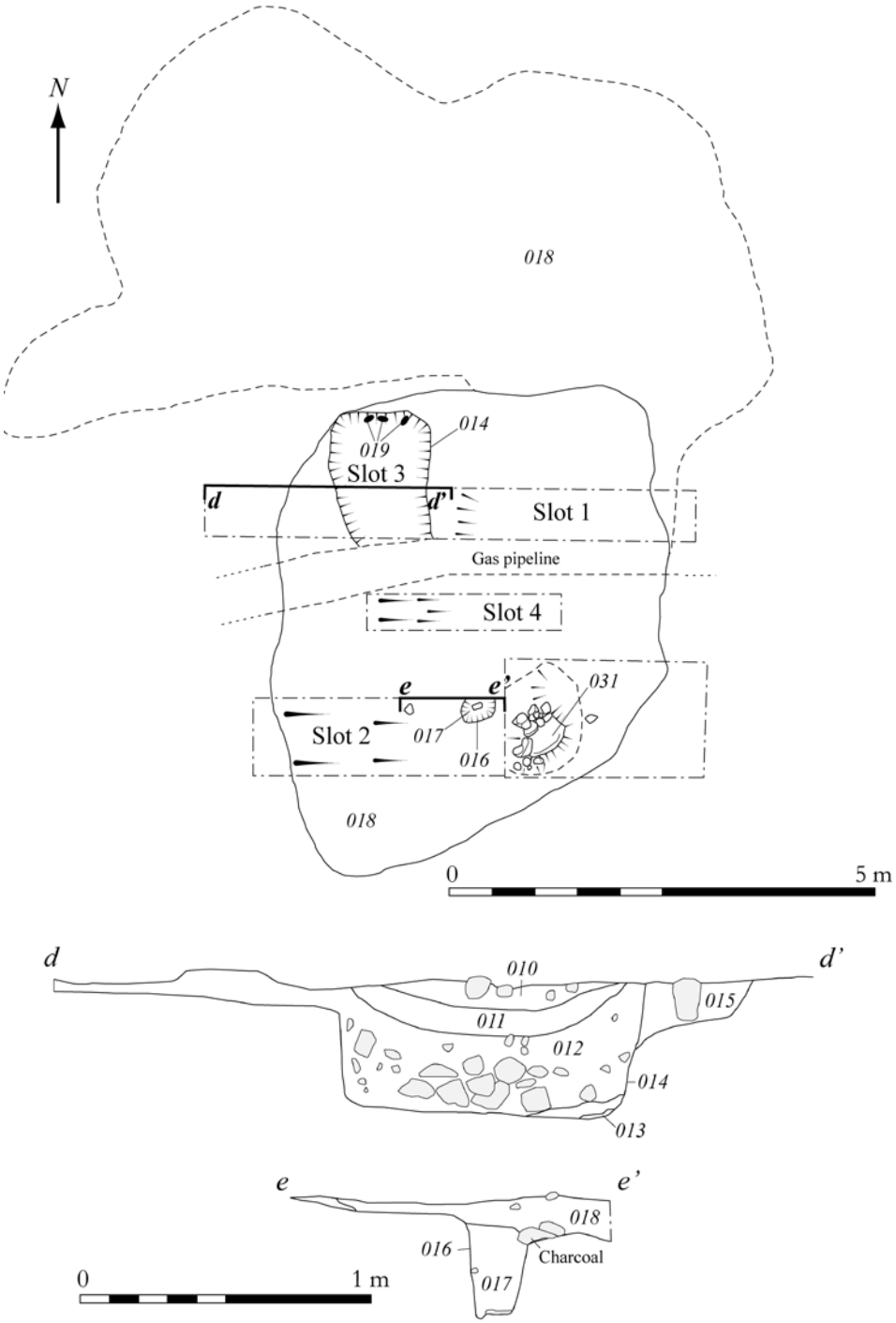

N
Area A
Area B
Area C
1
2
3
4
5
6
7
8
Wood location
(see figure 3)
St Donan's Chapel
(remains of)
Chapeldonan
Littlehill Bridge
Grangeston Industrial Estate
Reservoir
LADYWELL AVENUE
Tanks
Well
Sinks
219 500
219 750
220 000
600 250
600 000
KEY
Burnt Mound Deposit
0
100 m


b
b'
Monolith
A
168
163
161
172
171
169
170
170
168
169
159
160
NB: Sections continues
beyond extends shown
0
1 m


c
c'
224
101
228
101
242
229
229
229
230
101
247
243
101
195
103
246
103
101
101
Monolith
B
232
151
151
200
0
1 m



Illus 3 Area A: Plan of Burnt Mound Deposit 1 and sections



Illus 4 Area B: Burnt Mound Deposit 2 plan and sections

dates of 1610–1410 BC (SUERC-2906) and 1690–1480 BC (SUERC-2907), respectively.

5.2.3 Area B

Burnt Mound Deposit 2 (Illus 4)

Deposit 2 consisted of a spread of fire-cracked stones and black, charcoal-rich soil measuring *c* 9m by 9m. The northernmost part of the mound was a very thin deposit of plough-spread material (context 018), no more than 0.05m thick. The southern portion of the mound was better preserved, to a maximum depth of 0.1m and overlay a layer of silty grey clay (context 003).

Located to the west was an associated sub-rectangular shaped trough, which measured 1.5m by 1m by *c* 0.4m deep. It had been cut through the underlying silty grey clay and glacial subsoils, and was truncated at its southern end by a modern gas pipe. The deposits within comprised a lower fill of burnt mound material

(context 012), above which lay a medium grey clay silt (context 011) and a black sooty silt containing occasional fire-cracked stones (context 010).

In the southern portion of the mound, a post-hole (context 016) was found, filled with loose, dark brown, friable clay silt with frequent inclusions of charcoal. An area of possible paving was also identified in this area, consisting of eight flat, pink sandstone slabs sitting on the surface of layer 012/018.

A single-entity radiocarbon date from *Alnus* charcoal produced a date of 1960–1740 BC (SUERC-2919).

Burnt Mound Deposit 3 (Illus 5)

The burnt mound deposit (context 006) consisted of a thin deposit of plough-spread, burnt sub-angular stones contained within charcoal-rich silt clay and measured *c* 15m east/west by 8m north/south. At the western margin, the deposit (context 006) existed only as a thin surface spread of material, at most 0.03m deep, which overlay the same grey clay observed in other parts of the site. At the eastern side, the deposit extended to a maximum thickness of 0.15m. Underlying the burnt mound material (context 006) at this side was a further deposit of burnt mound material and pale grey ashy mottling (context 007), which lay in a small scoop (context 021), measuring 2.5m by 0.5m by 0.1m deep. This was interpreted as a highly truncated trough.

To the southern and eastern sides of the deposit, the course of the palaeochannel had cut into the side of the mound and eroded some of the deposit, resulting in a layer of clean, heat-affected angular stones, contained within a matrix of silt sand with inclusions of charcoal flecks (context 009). Overlying this context was a layer of well-sorted fluvial silts (context 008).

A single-entity radiocarbon date was obtained from *Corylus* charcoal and produced a date of 2350–2050 BC (SUERC-2918).

Burnt Mound Deposit 4 (Illus 5)

Burnt Mound 4 was a small, irregular spread of fire-cracked stones contained within a charcoal-rich matrix (context 030) measuring 1m east/west by 0.46m north/south. This was sitting in a small pit, 0.11m deep, with steep, almost vertical sides and an irregular flat base. It is possible that this represents the remains of a trough truncated by plough action.

A single-entity radiocarbon date was obtained from *Corylus* charcoal and produced a date of 2400–2130 BC (SUERC-2917).

Burnt Mound Deposit 5 (Illus 6)

Burnt Mound 5 comprised burnt and fire-cracked stones contained in black silty soil (context 026), and measured *c* 13m by 11.5m. A decommissioned gas pipe (context 027) cut through the southern side of the deposit, and to the north the line of an old culvert also truncated the burnt mound deposit. The burnt mound material (context 026) was heavily plough-truncated and had also been disturbed in several places by machine action, which had cut deep tracks into some areas (context 028). The maximum depth of material was *c* 0.42m, but in some places it consisted of only a thin spread of charcoal-smeared clay, particularly towards the western half of the trench. The deposit was underlain by grey silt clay (context 003), but to the western end overlay an area of natural gravel, possibly related to the old watercourse that ran through the area. No associated trough or structural features were found. The original watercourse, beside which the mound was located, may have run east/west.

A single-entity radiocarbon date was obtained from *Alnus* charcoal and produced a date of 2140–1910 BC (SUERC-2920).

Burnt Mound Deposit 6 (Illus 7)

Burnt Mound 6 was actually the first of the mounds excavated in Area B. The deposit comprised charcoal-enriched soil, charcoal lumps and fire-cracked stones, the majority of which appeared to be micaceous sandstone (context 008/010). It had been disturbed to the south by a field ditch. The main putative burnt mound deposit was to the north of the field ditch and extended over an area of *c* 10.8m by 4m. To the south of the field ditch was a smaller deposit of burnt mound material extending over an area *c* 2.2m by 3.2m. Plough furrows were observed cutting into context 008, suggesting that the burnt mound material had been truncated and plough spread.

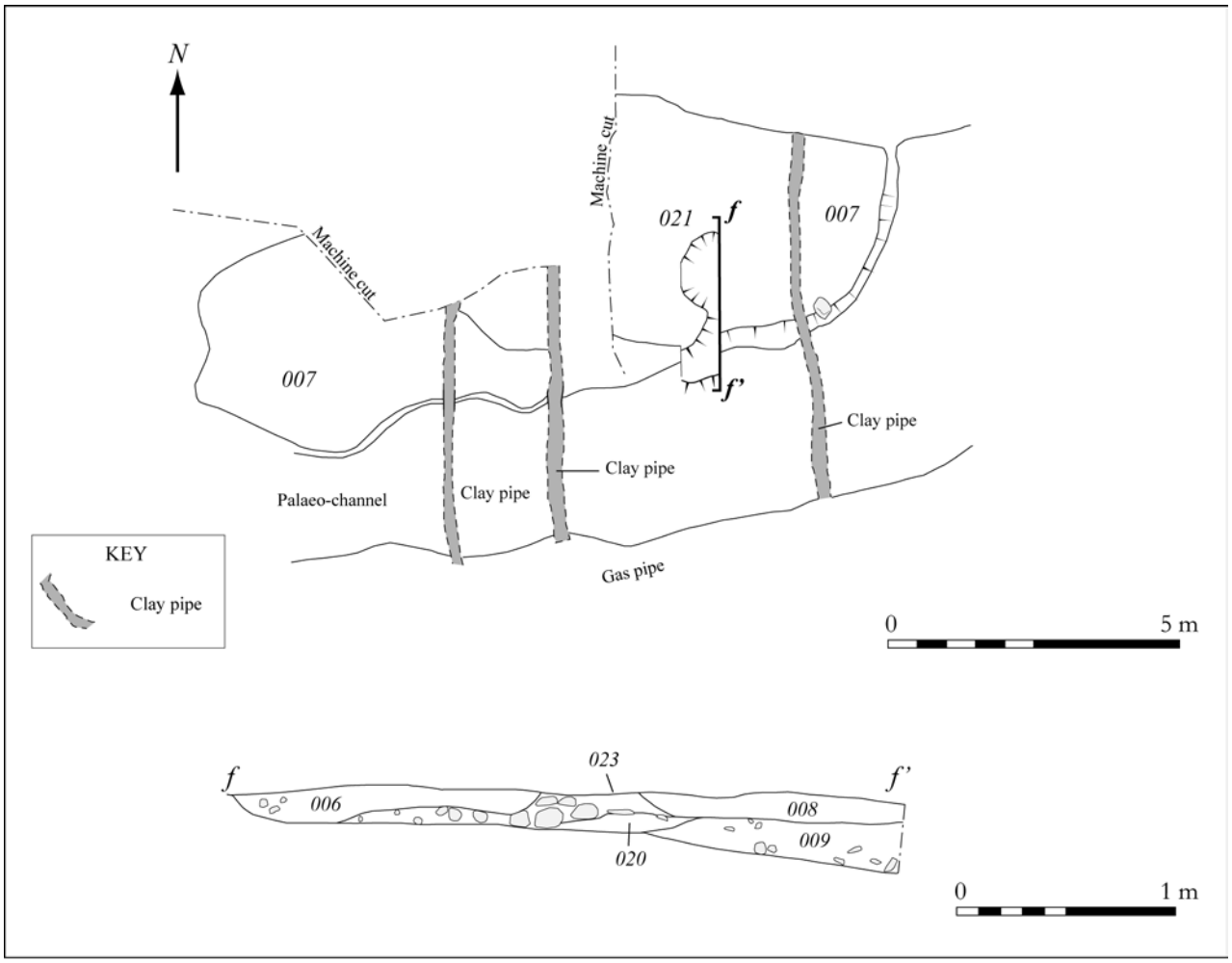
Excavation revealed the burnt mound material (context 008/010) had a maximum depth of 0.15m, and lay directly on grey silt clay (context 004/006/009/016), which itself sealed a peat deposit (context 020). In places, between the two layers there was a thin intermittent layer of mica, roughly 2mm thick. The southern margin of the putative burnt mound was sealed by orange silt clay (context 002). The northern margin of the mound appeared to have been disturbed by water action, with lenses of burnt mound material (context 008) mixed with sands and clays (context 025) sealed by a mixed denuded peat (context 003), which was in turn sealed by the deposit of orange silt clay (context 002).

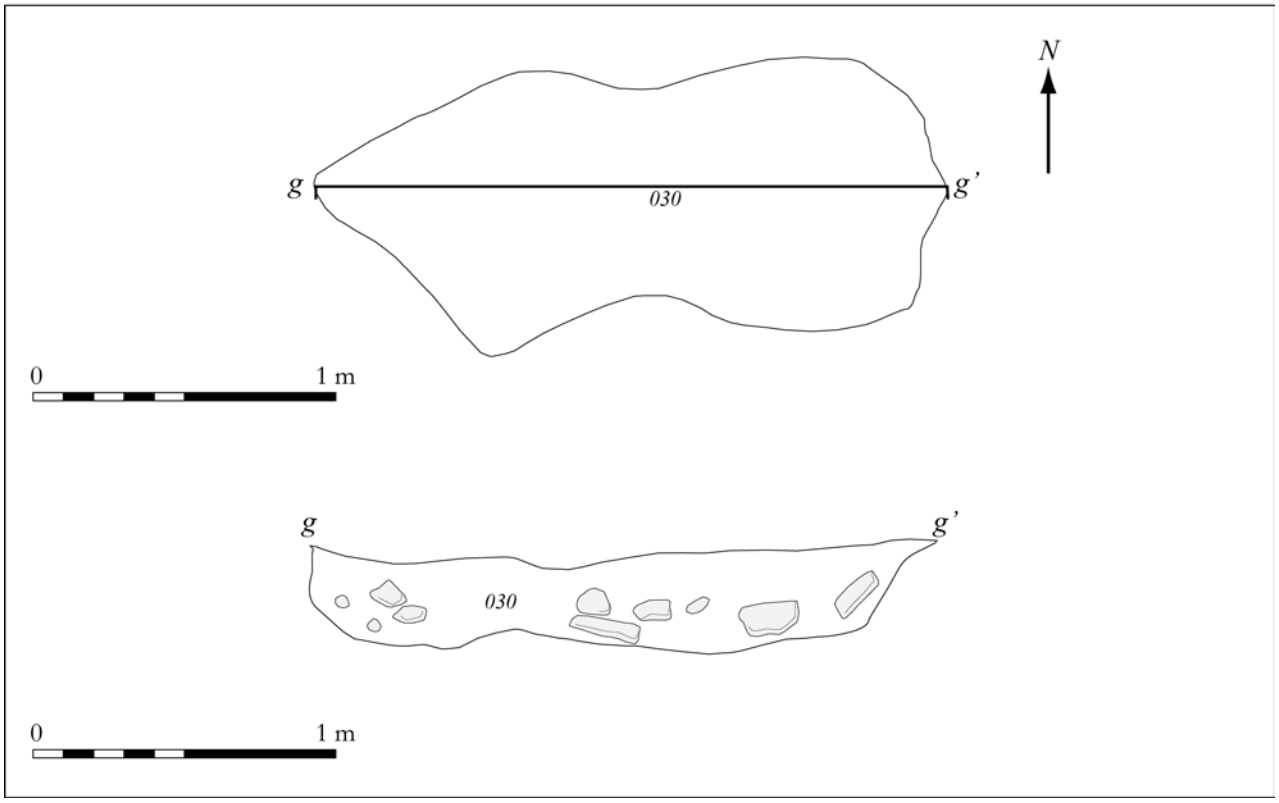
Two struck flints (SF 002 & 004) were discovered during excavation.

A single-entity radiocarbon date was obtained from *Corylus* charcoal and produced a date of 2040–1770 BC (SUERC-2915).

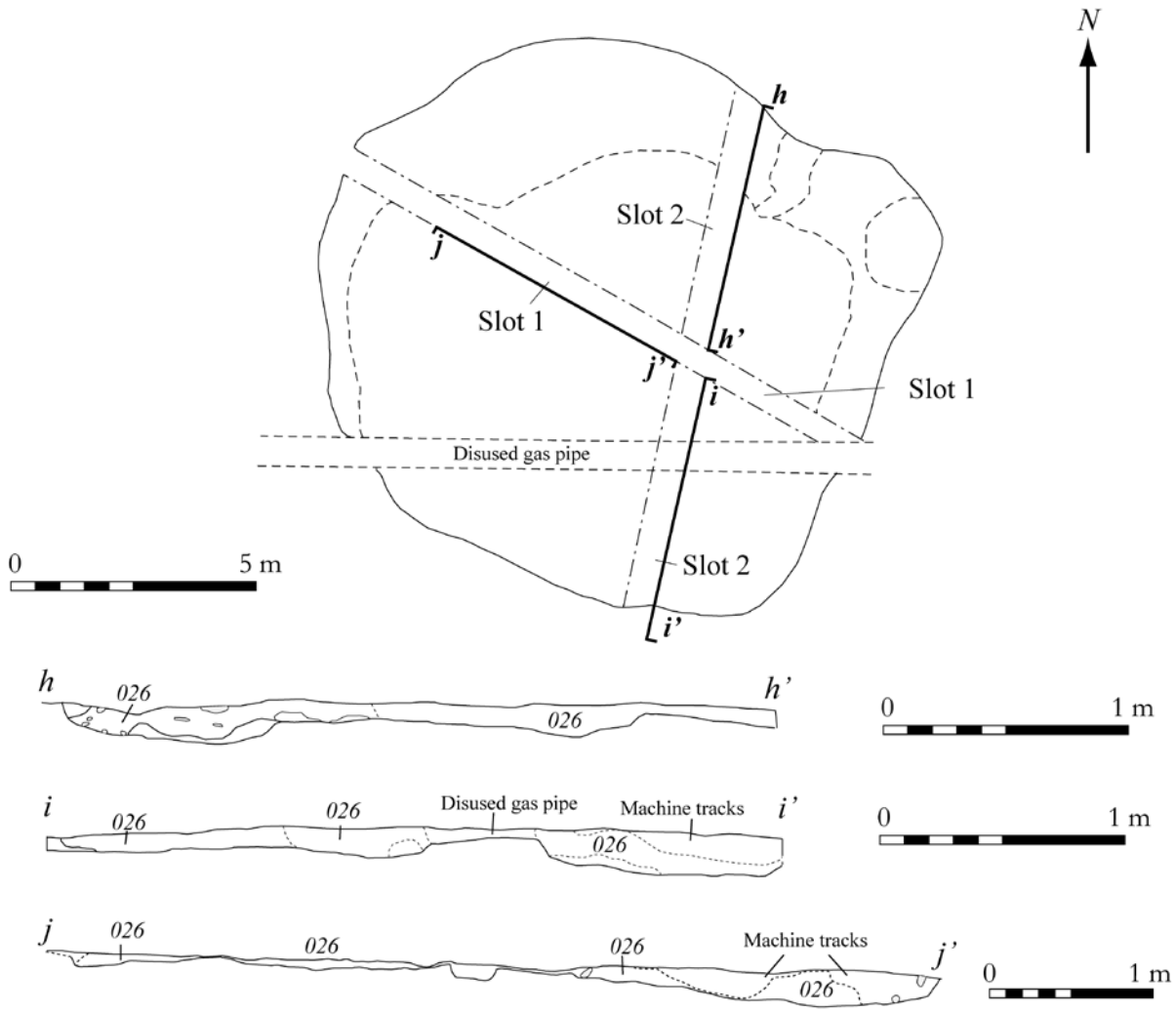
Burnt Mound Deposits 7 & 8

Both these deposits were recorded during a watching brief on a later phase of geological test pitting in





Illus 5 Area B: Burnt Mound Deposit 3 plan and section; Burnt Mound Deposit 4 plan and section



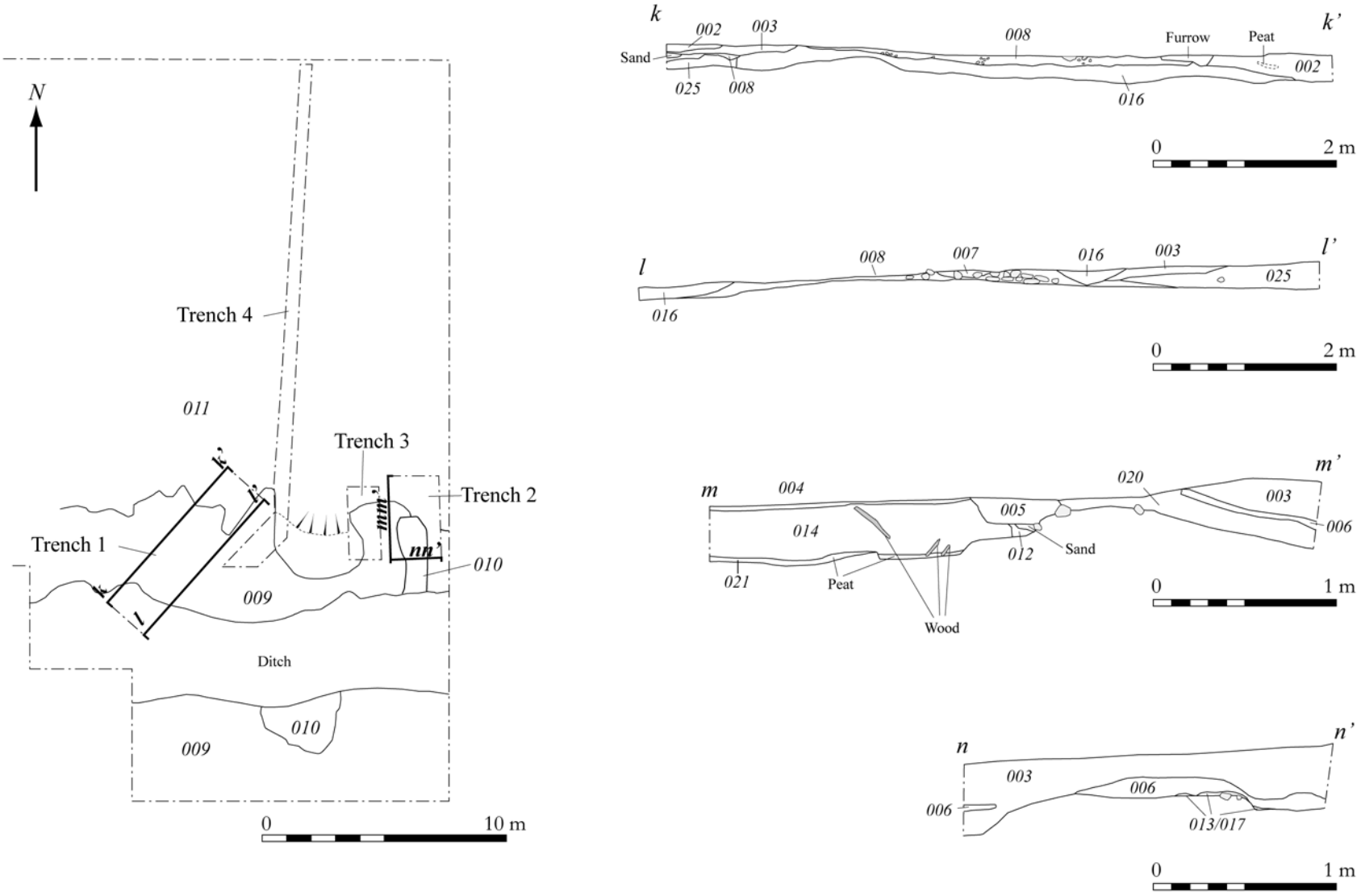
Illus 6 Area B: Burnt Mound Deposit 5 plan and sections

the proposed construction area for Warehouse 35. Both deposits consisted of spreads of charcoal-rich soil and fire-cracked stones that covered the whole 2m by 2m extent of each test pit. Both were located approximately 0.6m below the level of the topsoil, and were overlain by a similar red-brown silt clay deposit as was shown to mask other archaeological deposits in the valley. Preservation was achieved in situ and no excavation or sampling took place.

5.2.4 Discussion

The excavations at Grant's Distillery, Girvan, recorded seven discrete areas that can be classed as site of 'burnt mound material'. Such material is highly distinctive, consisting of heat-shattered stones mixed with charcoal-enriched soil. The type of stone varies, but always shows the effects of being heated in a fire, and identifiable fragments of charcoal are often preserved in the surrounding matrix of charcoal-enriched soil (James 1986; Barfield & Hodder 1987). Although such sites have a wide variability of associated features such as troughs, hearths and structural elements (Barber 1990), these characteristics give broad definition to this class of archaeological site. All of the deposits identified at the Grant's site fulfil these basic defining characteristics, and are part of a wider concentration within the local environs.

The distribution of burnt mounds is widespread in Scotland, with increasing numbers recorded over the past few years (eg Maynard 1993; Banks 1999). They are generally dated to a well-defined period within the Bronze Age, with a predominance of second millennium BC dates (Buckley 1990). Regionally, burnt mounds are known from a number of locations, with excavated examples found from Crawford and Muirhead (Banks 1999), Dykes Farm (NMRS NS30SE 40–45) and Blacklauchrie (NMRS



Illus 7 Area B: Burnt Mound Deposit 6 plan and section

NX38NW 6). Similar dated examples have been excavated around the Stranraer area at Cruise, Gabsonout and Dervaird (Ashmore 1997). More locally, six similar deposits were identified along a relic palaeochannel (Donnelly & MacGregor 2006) at Gallowhill, to the immediate south of the Grant's site. In combination with the burnt mounds from Grant's, the area to the north of Girvan can therefore be seen to offer one of the densest concentrations of such sites in the south-west to date. Of the seven sites identified in the valley, five were excavated and dated and are discussed below.

The range of dates from published sites illustrates longevity of tradition, stretching from the mid second millennium BC to the mid first millennium BC. Dates obtained from the nearby site of Crawford compare broadly with the sites from Girvan: from the northern burnt mound trough a date of 2138–1766 BC (AA-12591) and from the southern trough of 2315–1928 BC (AA-12589). Further afield at Muirhead, dates of 1311–912 BC and 1387–940 BC were obtained from two separate troughs, indicating the long tradition of such sites. Dates from the burnt mounds from Gallowhill ranged from 2460–2130 BC (GU-9802) from Trough 5 to 1440–1260 BC (GU-9803) from Trough 3.

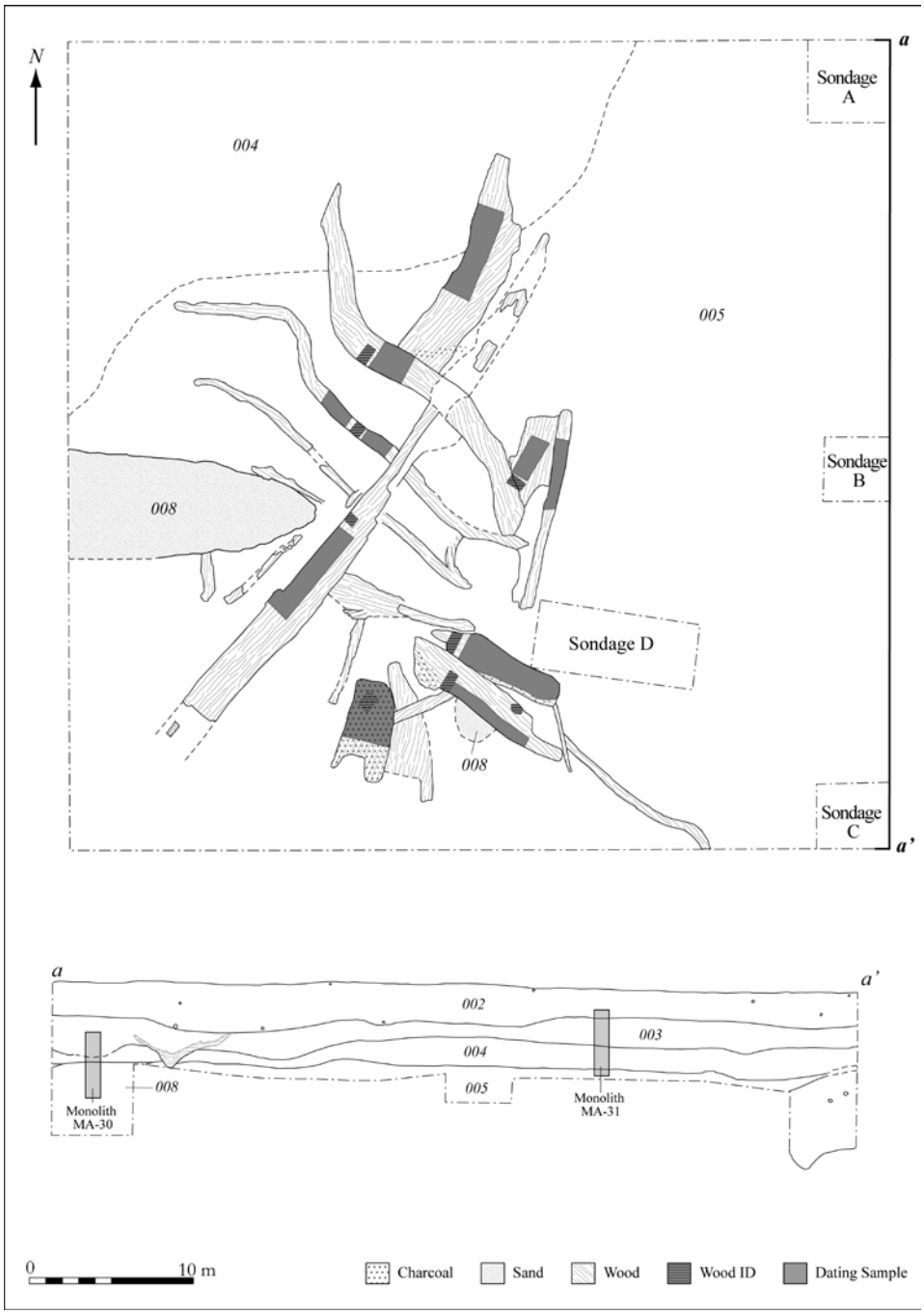
It has been suggested at Gallowhill that a clear phasing can be seen in the distribution of burnt mounds, with later examples dated to the mid to late second millennium BC clustered around a relic palaeochannel, whilst earlier examples from the later third millennium BC are located further away from this feature. No such distribution of the sites can be inferred in Area B from the dating evidence; all date broadly to the later third millennium/early second millennium BC. It could be suggested that sites 2 and 3 do appear broadly contemporary and of earlier date than sites 1, 4 and 5, but the subtleties of the dates confound any real attempts at analysis of phasing. It is of more significance that these burnt mound deposits are of significantly earlier date than that in Area A, which dates to the mid second millennium BC and is broadly contemporary with all but one of the burnt mound sites from Gallowhill.

The variation in date of sites in Area B most likely reflects no more than the occasional reuse of the area over time for activities related to the formation of the burnt mound material. It does, however, suggest that within the local area, this part of the valley was a significant focus of burnt mound activity in the later third millennium/early second millennium BC. Each site appears to have been used only once, suggesting that it was the specifics of the local landscape that motivated the focus for this activity, rather than specific locations. When the coincidence of the location of burnt mound sites alongside streams or on boggy ground, identified by many researchers (for example, Power 1990), is considered along with the environmental evidence from the site, it is not pushing the evidence too far to suggest environmental suitability, in the form of wet marshland, was what encouraged repeated use of the area.

In this light it is tempting to see the location of the later Area A site (and the majority of those at Gallowhill) as part of a process of environmental change: the valley gradually draining towards the sea and the local environment in Area B changed from watery marsh to a more stable waterlogged soil. This change, attested through the analysed environmental evidence from the excavations, may have necessitated the location of later sites further down the valley, where conditions were still appropriate. The changing location of such sites over time may therefore be seen as a pattern reflecting the changing nature of the local environment through time, and related to a requirement for an adjacent water source. Whether this suitability was regarded in purely functional terms or had wider social implications is more difficult to assess.

More complex, however, are the potential uses of such sites. Although the subject of intense functional debate, it is generally accepted that burnt mounds were probably cooking places, where stones were first heated in a fire, and then thrown into a water trough to heat water for boiling meat. Alternative suggestions, including the possibility that they may represent a form of prehistoric sauna, have also been put forward (for example Barfield & Hodder 1987). Banks presents a thorough review of the types of archaeological evidence that may be expected from the signatures of the various hypothesized functions (Banks 1999), and concludes that his examples must have been related to cooking. Whilst such discussions are often site-specific in nature, and can be criticized for failing to explore alternative implications beyond the purely functional, the sites at Girvan are worth considering within this established framework.

The excavated sites from Girvan show a variety of morphological distinctions, and in general are poorly preserved examples of this class of site, due to plough truncation across the entire area. Traditionally, such deposits are often, although not exclusively, associated with a trough capable of holding water, and a hearth where the stones were heated. Site A has a definite trough feature, and a number of structural elements including paving, and possible stakeholes at the northern end of the trough. It may be that these structural elements suggest a more complex function than the other burn mounds in the valley, but this is difficult to assess from the truncated remains excavated. A second possible trough was identified at site 3, whilst site 4 may itself be a trough, similar to the isolated troughs identified at Gallowhill (Donnelly & MacGregor 2006); the absence of mound material may be explained by plough truncation. Sites 1, 5 and 6 all appear to consist only of burnt mound material although all appear to have been located either close to, or within, watery environments and channelling or blocking of these water supplies may have served a similar function to that of the trough. Thus it is entirely possible, given current thinking, that the sites are the dispersed remains of a series



Illus 8 Area B: Plan and section of wood deposit

of cooking events. As such, they represent longevity of tradition which may have been expressed in the area for over 500 years.

5.3 Wood and inundation in Area B *by Gavin MacGregor*

5.3.1 Discovery and excavation

During the course of the watching brief in Area B, peat deposits were revealed below the topsoil (*c* 0.30m deep) and subsoil layer (context 002). Several sondages were hand-dug to test these peat deposits; one of these produced waterlogged wood, leading to further excavation within a 5m by 5m trench (see Illus 2 and Illus 8).

The deposits had a total depth of 1.0m, comprising from top to bottom, orange clay (context 002), brown loamy clay (context 003), probably a degraded peat, grey clay (context 004) and a peat deposit (context 005/007) formed on the glacial till. There were clearly two distinct episodes represented in the trench, the first represented by cessation of peat formation

when the clay (context 002) began to form, while the second was the presence of layer 004 in association with the wood, sealed between layers of peat. Monolith samples were taken from the deposits for pollen and micro-morphological analyses.

Micro-morphological analysis has shown that the upper clay deposits relate to a low-energy water environment (see Section 6.1, below). A sample of fragments of grass, obtained at a depth of 0.20m within the lower peat layer, was dated to 5990–5800 BC (SUERC-2908). This date for the lower peat fits well with the pollen profile and indicates a clear phase of decline in tree pollen that may relate to clearance (see Section 6.2, below). A further date of 790–410 BC (SUERC-2909) was obtained from alder bark within the clay deposit (context 004).

The preserved wood all comprised alder (see Section 6.2, below) and was located on the peat (context 005) at a depth of *c* 0.60m and partially sealed by context 004. The wood comprised a number of roughly parallel lengths, *c* 2m long, of round wood running north-west to south-east. Across these lay another straight length of wood, *c* 3m long, running north-east to south-west (Illus 8). Most of the pieces exhibited signs of burning. All the ends, bar one, were heavily rotted. One piece was embedded downwards and upon lifting exhibited probable chop marks. The wood has been dated to 390–200 BC (SUERC-2910) and 410–200 BC (SUERC-2914).

Further monitoring established that the excavated deposit was discrete in extent, but that several other large, isolated pieces of wood were present within the peat further to the west. It is unclear, however, whether this distribution is real or merely reflects the vagaries of differential preservation. Analysis of the wood has shown that chop marks and traces of burning are present on some of the samples (see Section 6.2, below). One of the pieces of alder wood located to the west, within the peat context 007, was radiocarbon dated to 5480–5310 BC (SUERC-2924).

5.3.2 Discussion

Prior to obtaining the radiocarbon dates, the timbers exhibiting burning and cut marks were considered to relate potentially to a pre-third millennium BC clearance of woodland, as they were stratigraphically lower than the sediments upon which the burnt mounds rested. Radiocarbon dates now indicate these timbers date to the later first millennium BC, a picture supported by pollen analysis, which shows clear evidence of a major episode of woodland clearance in the Iron Age. As such, the discovery and analysis of these timbers is of some significance for several reasons.

The first reason is the chronology of the sediments in Area B, which indicates the timbers sank down through deposits after they had been felled. The burnt mounds dating to the second half of the third millennium BC were probably located adjacent to a mire or pool, but on ground that was firm enough to take human activity at this time. However, the ground subsequently became wetter, allowing the timbers to sink but not the burnt mound material, suggesting that conditions were different even within a localized area. The superficial similarities between the sediments, on which the burnt mounds sat and which sealed the peat holding the timbers, are probably due to similar sedimentary processes and secondary transformations. We can thus suggest that the burnt mounds were located adjacent to a pool or mire that has subsequently filled with sediments. The apparent rough arrangement of the timbers could be suggestive of a platform or trackway that was located at this point, but with the timbers having sunk downwards this possibility cannot be assessed with any certainty.

The second reason is that the timbers show evidence of clearance in the later Iron Age period, for which there are considerable amounts of other forms of palaeoenvironmental evidence in pollen cores. That the evidence is suggestive of slash and burn clearance is perhaps not surprising, as it represents a well-known model of clearance, albeit an archaeologically poorly attested method (Tipping 1994, 35–6). While the timbers may have derived from further upslope, what is more intriguing is the apparent clearance of a relatively marginal and boggy area.

The wood in Area B has evidence for burning and chopmarks together that would be consistent with models of slash and burn clearance. However, as the palaeoenvironmental evidence has confirmed that this was a poorly drained area of ground and would appear unsuitable for agriculture, why then was the area, or at least the slopes around it, cleared at this time, when there are extensive tracts of ground in the wider area more suitable for establishing arable ground? Palaeoenvironmental evidence from elsewhere in the region suggests that there was increased clearance during the second half of the first millennium BC (Birks 1972; Edwards et al 1991; Jones et al 1991). The intensification of clearance during this period has also been noted more widely across southern Scotland and northern England (eg Tipping 1994; Dumayne-Peaty 1999). This has frequently been interpreted as relating to increased demands for agricultural ground (Dumayne-Peaty 1999, 32). The majority of evidence for clearance during the second half of the first millennium BC comes from an upland context, which is potentially problematic for making wider inferences. That the evidence for clearance at Girvan is essentially coastal and lowland is significant to the reassessment of models of Iron Age society generally, and more specifically to our understanding of landscape management during this period.

Within the wider locale the evidence for later prehistoric activity is patchy. There are, however, several sites that may be contemporary with the episode of clearance, although the lack of a secure chronology makes any potential relationship hypothetical. These sites include the fort at Gallow Hill

(NMRS NX19 NE 29), the fort and Dun at Dow Hill (NMRS NX19 NE 7) and the possible Dun at Brae Hill (NMRS NX29 NW 7). There is also limited aerial photographic evidence of enclosures, roundhouses and ring-ditches that could be contemporary with the clearance. There is, however, a significant possibility that some of these sites are Romano-British in date (see Donnelly & MacGregor 2006). When considered in relation to the relative paucity of research into the Iron Age of south-west Scotland (Haselgrove et al 2001, 24–5; Banks 2002), this makes it difficult to place the episode of clearance in a wider cultural or interpretative context. For example, the relevance of the Hownam sequence to the south-west is difficult to assess with the currently available information (see Banks 2000, 273–8). Nonetheless, despite limited evidence of archaeological remains clearly dating to the late first millennium BC in the immediate environs of William Grant's, the discovery of slash and burn clearance suggests that the area was sufficiently densely occupied to require the intake of marginal ground.

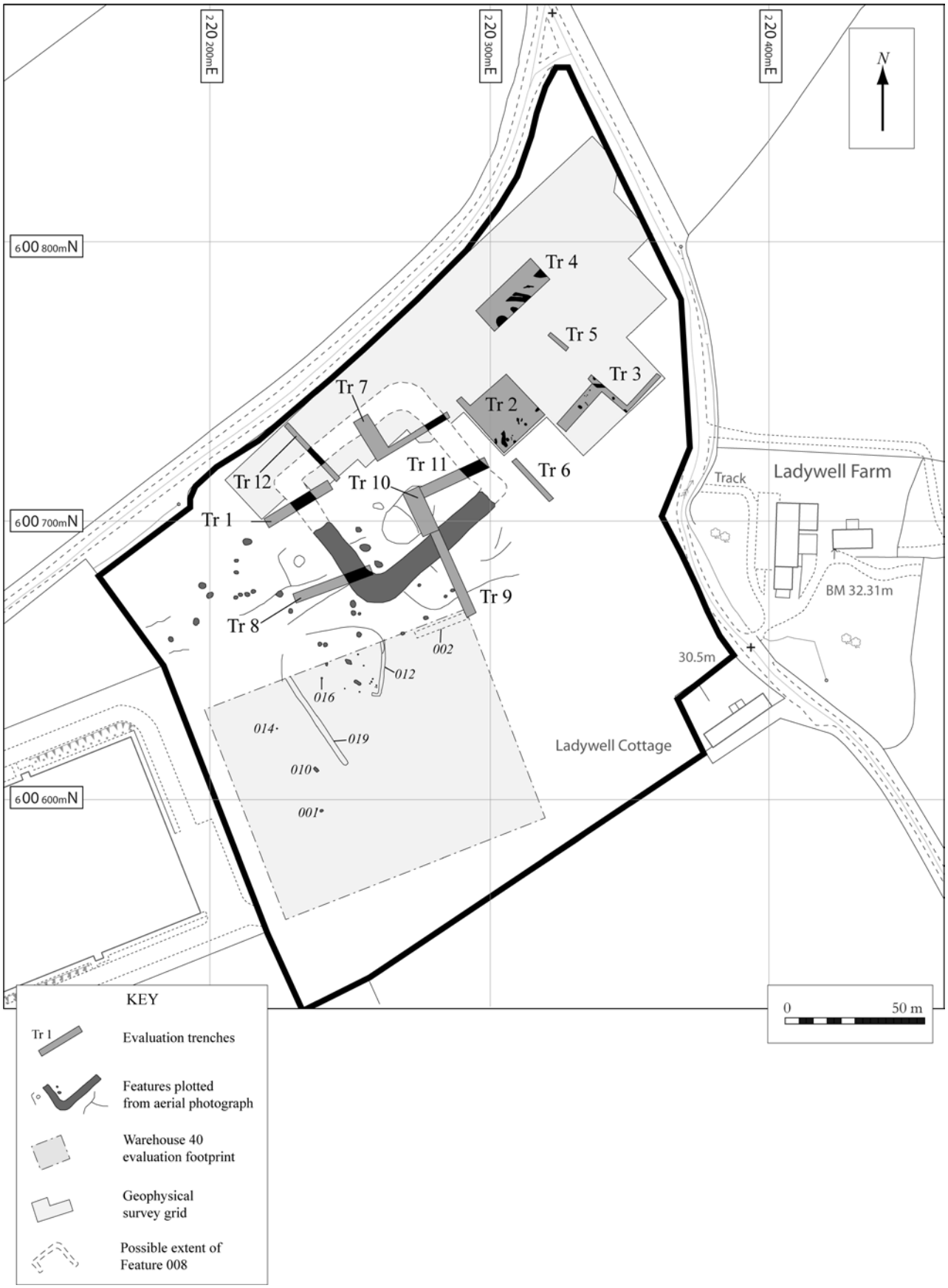
Clearly, then, several questions are raised by the majority of the worked timbers found, which date to within the later Iron Age period. A single isolated example to the west of this concentration was, however, dated to 5480–5310 BC (SUERC-2924). Miller and Ramsay (Section 6.2, below) do note that there are two possible earlier phases of anthropogenic impact on woodland testified in the pollen record, potentially in the Neolithic and Bronze Age. In these circumstances, the status of an earlier, isolated timber is somewhat more difficult to assess.

The burning and chop marks show it was subject to anthropogenic impact, but the purpose of that impact is unclear. The significant numbers of lithic scatters with a microlithic component in the area have led to the suggestion that the Girvan area was a distinct locus of activity during the Mesolithic (Morrison & Jardine 1976). Sites excavated at Little Hill Bridge and Girvan Mains have produced evidence for Mesolithic activity dating to 6355–6012 BC (Beta 108701; MacGregor & Donnelly 2001) and 4800–4550 BC (GU-9806; Donnelly & MacGregor 2006), respectively. Thus, it could be suggested that the wood is the detritus of fires related to a general locus of Mesolithic 'settlement' along the slope of the valley between the seventh and fifth millennia BC; the wood has simply been collected and burnt for fuel. However, the partial burning of the wood, as opposed to full carbonization, may suggest it was not collected as fuel for a hearth. Rather, the combination of chop marks and partial burning is, perhaps, more akin to the traces of slash and burn to clear wood. The clearance of wood along the fringes of a mire may have been undertaken to open up the area, to encourage water and grazing for animals (Mellars 1976). There are several other examples where small-scale clearance of woodland has been suggested in south-west Scotland during the Mesolithic (Edwards et al 1983; Ralston & Edwards 1984; Edwards 1989). At North Holm Plantation, analysis of a pollen core has shown small-scale woodland clearance was potentially taking place at about 6120–5990 BC (OxA–8216; Banks in prep), notably located within 5km of the Mesolithic site of Kirkhill, dated to 6650–6510 BC (Pollard & Donnelly in prep). While there has been debate about the presence of charcoal within peat (eg Ralston & Edwards 1984; Tipping 1994), at Cooran Lane, Galloway Hill charcoal fragment were dated to 6459–6213 BC (Q–874; Birks 1975), and were interpreted as an indicator of anthropogenic activity such as small-scale clearance. Most recently, Gregory states that the evidence 'implies [the] possibility of early woodland interference or management connected with clearance and even with early experiments in pastoralism' (Gregory 2000, 4). The evidence from Girvan supports the view that there were small-scale anthropogenic impacts on woodland during the Mesolithic in the south-west of Scotland. The nature and purpose of these impacts is, however, more difficult to assess.

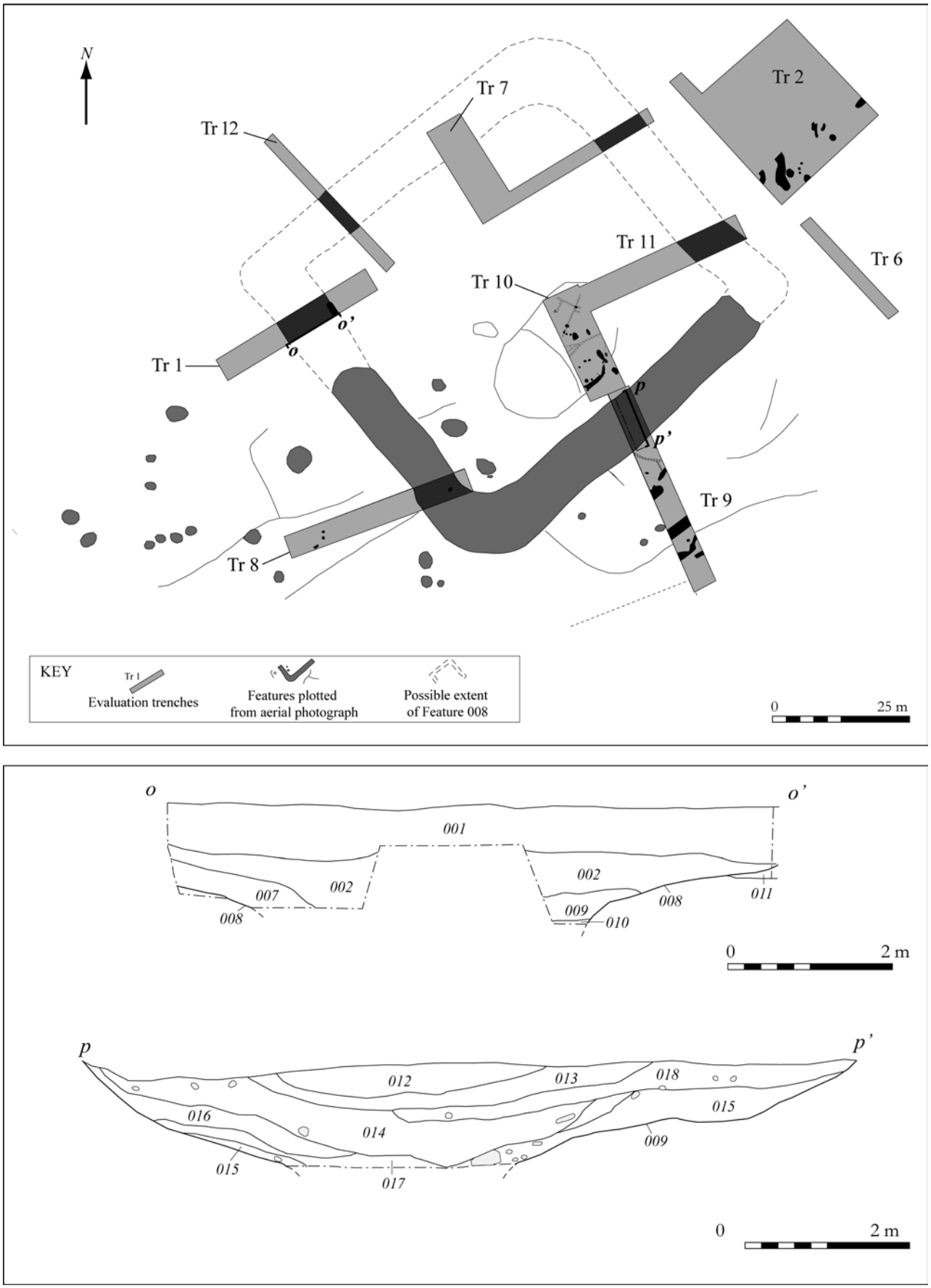
5.4 Moated enclosure and environs *by Iain Banks with contributions by Keith Speller, Paul Duffy, Stuart Halliday & Bob Will*

The Ladywell moated enclosure lies in a field at the head of the valley between the 25m and 20m contours at NGR NS 2026 0070. The site was identified from aerial photographs by the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS), who had recorded the extensive area of cropmark features within the field from aerial photographs taken in 1992 (B.72797; B.79043; B.79044). The cropmarks consist of many different elements and there was no certainty that all of the features would be of a single phase. Most were not chronologically specific, although the large right-angled feature suggested an enclosure of medieval or Iron Age date, thought to be part of a medieval moated enclosure (P Corser, pers comm; McNeill & MacQueen 1996, 431). Similar cropmarks at the site of Carronbridge in Dumfriesshire, however, had proved to be of an Iron Age date (Johnston 1994).

Medieval moated enclosures are relatively rare in Scotland. Of roughly 5400 known from mainland Britain, only around 120 are known from Scotland (Coleman 2004, 146), and this is one of the few known examples from the south-west. Only five other Scottish examples have been the subjects of any archaeological investigation: two in Kirkcudbrightshire (Bombie, Anderson 1948; Dunrod, Burdon-Davis 1966); one in Aberdeenshire (Castle of Wardhouse, Yeoman 1999); a fourth in Renfrewshire (Elderlie, Alexander 2000); and the most recent at Irvine in Ayrshire (Perceton House, Stronach 2004). None of these investigations has involved complete excavation. The investigation at Ladywell was constrained by the development, and consisted mainly of limited and targeted evaluation, the exception being the footprint of Warehouse 40 (Halliday & Will 1998).



Illus 9 Area C: Location of excavation trenches and cropmarks



Illus 10 Area C: Trenches 1–2 and 6–12 and Area C: ditch sections

5.4.1 Geophysical survey (Illus 9)

Resistivity survey

The results of the resistivity were disappointing. Low resistance values were the norm across the entire survey, reflecting the underlying clay soils. The main features to stand out in the results were two linear anomalies running across the plot, which were interpreted as modern pipes. A faint trace of the eastern section of the moat was also recorded, albeit truncated by one of the pipelines. The best information provided related to the geological conditions and thus to an explanation of the distribution of cropmarks within the field, with underlying clays clearly visible across most of the survey area as low resistance areas.

Magnetometer survey

The overall level of magnetic anomalies was low, suggesting either little differentiation in magnetic susceptibility between topsoil and sub-soil, or considerable overburden. The results were plotted at a narrow band of values, between –3 and +3 nT, resulting in considerable 'noise' in the plot. The two linear anomalies noted in the resistivity data were also apparent in the gradiometer data but nothing that could be immediately identified as being unequivocally archaeological was identified. A very strongly magnetic anomaly interpreted as a decommissioned gas pipeline also ran along the fence line on the northern edge of the field (see also Abernethy 1996). To negate the magnetic distortion caused by this pipe only the last 5m of each grid was surveyed along its route.

Although somewhat tentative, the results did indicate areas of archaeological potential and were used as the basis for the layout of the trenches. Although the clay exposed in the initial stripping contained only minor features that bore little resemblance to the geophysical plots (see below), removal of this clay layer exposed features that corresponded much more closely to the survey results. With the benefit of hindsight it is possible to map the features to anomalies in the plots. In particular, the faint line of the large AP feature could be discerned in the magnetometer plot. It was also apparent that the non-appearance of the northern part of the enclosure ditch was likely to be the disturbance associated with the decommissioned gas pipe.

Moated enclosure

Trenches 1–7 were excavated in 1996, while Trenches 8–12 were excavated in 1998 (see Illus 10); in the same year, the footprint of a new warehouse (Warehouse 40) was excavated as part of a controlled topsoil strip. In most cases, identified features were not excavated but recorded by surface description only.

Topsoil across the site was found to be between 0.2 and 0.4m in depth. In two areas (Trench 2 and Trench 6), topsoil had been previously removed, and imported material comprising clay, sand and stones covered the subsoil to a depth of 1m. The topsoil in Trench 6 had been replaced with a dump of clay/sand and stones to a depth of *c* 0.9–1m, which would have removed any of the features noted in other trenches.

Enclosure ditch

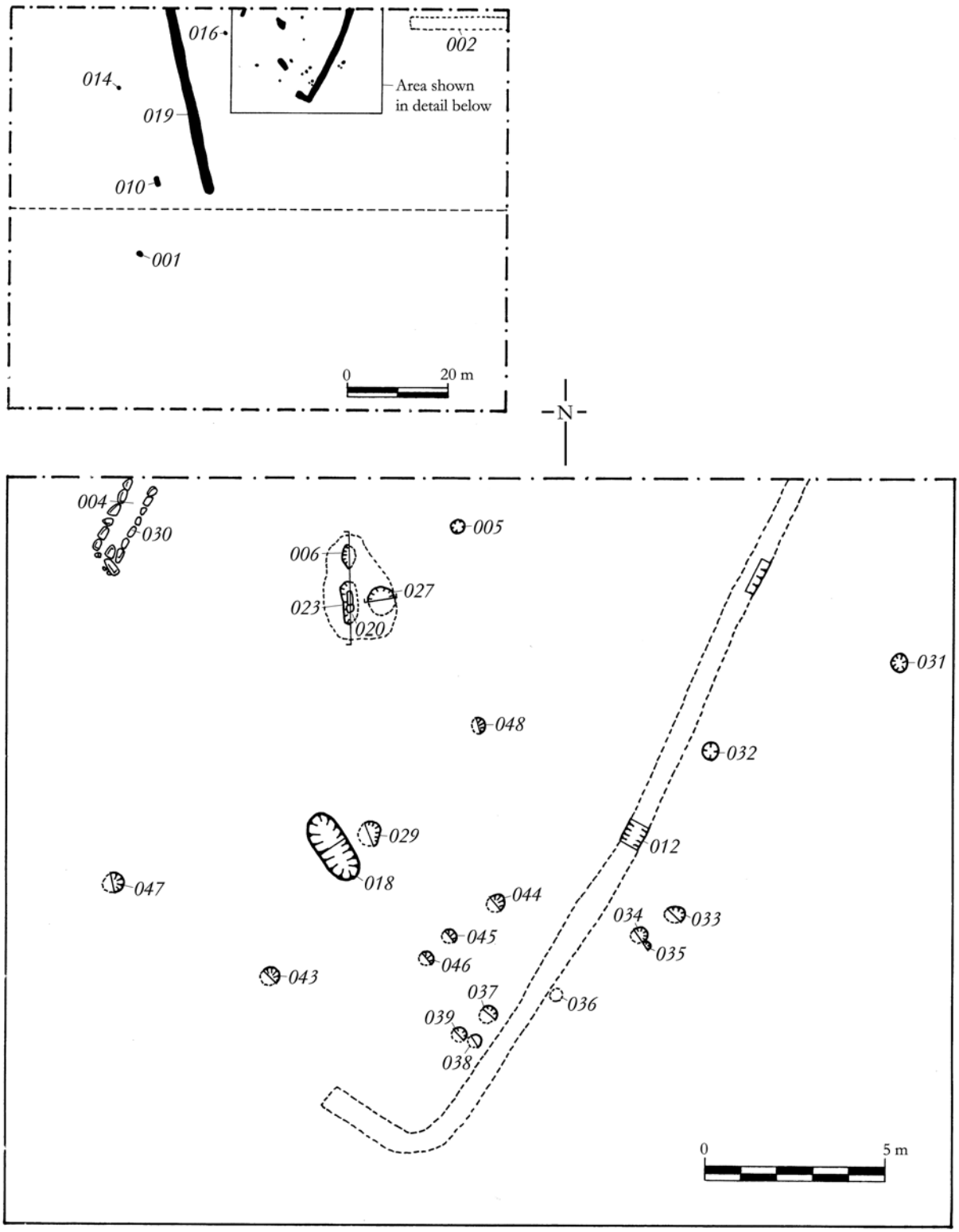
Trench 1 (Plan Illus 10; Section O–O') contained the western side of the enclosure running north/south across the trench. The lower fill contained pottery date to the 12th to 16th centuries AD. The profile of the ditch was steeper on the west side of the trench, suggesting that it had been designed to restrict access from the west. This western side of the enclosure was also present in Trench 8. Here, the ditch was 7.5–9m wide and started to turn eastwards, indicating the start of the corner of the enclosure. Trenches 7 and 11 contained the eastern side of the enclosure, Trench 12 contained the northern side, while Trench 9 contained the southern side. A sondage through the ditch in Trench 9 produced frequent sherds of medieval pottery, dating to the 13th to 14th centuries AD. This matches the dates from other features relating to the enclosure, such as the features from Warehouse 40 (below). There were also several other archaeological features in the trench, including a pit that produced alder and oak charcoal as well as charred oat, wheat and corn marigold seeds.

Interior

Trench 10 produced a number of post-holes, pits and linear features, which represented features from the interior of the enclosure (Illus 10). The features produced a range of botanical material, but in small amounts, and it was not possible to get any dates from these features. The linear features were of particular interest as they intersected one another at right angles, and seem to have been structural in origin; unfortunately, it was not possible to determine a building plan from them.

Exterior

The features outside the enclosure consisted of additional ditches, pits, post-holes, stakeholes and linear features. Several of these features were rich in organic material, and produced a range of agricultural species and weed species. Various of the pits and post-holes contained significant quantities of charred grain, with one in particular (Post-hole 024) containing significant amounts of bread wheat (Illus 11). This is a very rare occurrence on Scottish sites,



Illus 11 Plan of features

and is indicative of high status. The other important information to emerge from the fills of the features in this area was that a lot of the charcoal came from oak, which suggests that this was the main building material on the site. As oak was a relatively valuable wood in the medieval period, it again suggests that the settlement was high status and of some importance in the area.

Radiocarbon dates from the features all indicated a range of roughly 1240–1400 AD cal, which was supported by the artefactual material (mainly pottery). This dating matched the material that was recovered from the interior of the moated enclosure, and it is a reasonable interpretation to associate the material from inside and outside the enclosure ditch as belonging to the same settlement.

Environs of the moated enclosure (Illus 9)

Trenches 2, 3 and 5 revealed a layer of light grey silt clay 0.4m deep and virtually stone-free; this was an inundation deposit relating to deposits noted elsewhere within the valley. Trench 4 contained another inundation deposit, but in this case the clay was a red/brown colour; however, it was a similar 0.4–0.5m in depth. It also sealed a number of archaeological features cut into the natural subsoils. This suggests that the moated enclosure was on a slightly higher piece of ground that stood above the boggier ground of the rest of the valley. It also creates a vivid picture of the environment within which the moated enclosure operated.

The clay sealed a number of linear, curvilinear and sub-circular features in each of the trenches. A sherd of medieval pottery and a single flint flake were retrieved from Trench 2, but this was the only artefactual material recovered. These undated features probably relate to a period earlier than the moated enclosure.

The finds

A variety of types and dates of artefacts were recovered from Area C. Some of this material, such as the pottery (Section 6.6, below), clearly relates to the occupation of the moated enclosure during the medieval period. Other artefacts are less clear-cut.

The lithics (Section 6.4, below), which are more numerous in Area C than in the other areas, do not form a coherent group and are not capable of close dating. The find spots suggest that the material is residual; some of it was recovered from the ditch in different trenches, while other pieces came from truncated contexts. This material can be taken to show that there was prehistoric activity in this area, which does little other than support the results of fieldwork elsewhere in the Girvan area, such as Littlehill Bridge (MacGregor & Donnelly 2001), or Gallowhill (Donnelly & MacGregor 2006).

The glass bead from a layer of silting in Trench 3 (3002) is also problematic. It is not sufficiently distinctive to be dated confidently, although the likelihood is that the bead dates to the early medieval period (Section 6.5, below). It is, however, another residual stray find, and, as with the lithics, it indicates that there was activity in the valley that pre-dates the medieval moated manor. It may be that some of the undated cropmark features also date to this period.

5.4.2 Discussion

The four sides of the enclosure ditch were all located, indicating that it was between 7.5m and 9m in width, had a V-shaped profile and was in excess of 1.2m deep. The fills indicated that the ditch silted up over time and was not deliberately backfilled. The pottery from the ditch was all medieval, suggesting a date of the 13th to 15th century AD; this is matched by the radiocarbon dates from the external features, which ran from 1240 to 1400 cal AD.

The interior of the enclosure was only partially investigated. Trench 7 produced a single sub-circular pit; Trench 11 contained four sub-circular probable pits and a linear feature. The highest number of features came from Trench 10, where 26 separate features were identified (illus 10). The majority were pits and post-holes, although too little of the interior was exposed to identify building plans. There were also various linear features, including part of the curious bisected oval from the aerial photograph. Unfortunately, not enough carbonized material was present to allow radiocarbon dating of any of these.

A group of ephemeral cross-cutting linear features that ran at right angles to one another in Trench 10 were also identified through differential drying. They were located in the northern end of the trench and it seems clear that these features represent structural elements, although it is not possible to distinguish them as either part of a building or of the internal sub-division of the enclosure. There were associated post-holes, but these are to be expected whether they were for fencing or for walling. It is likely, however, that these features are of a different date from the oval feature as they lie within the oval but are much more ephemeral.

The finds relating to the enclosure were nearly all derived from the enclosure ditch, and the vast majority came from Trench 9. This may reflect the lie of the land, with a slight slope from north to south in this part of the valley, or it might reflect patterns of waste disposal. It is striking that there were no artefacts from the interior of the enclosure. This may reflect the damage to the site caused by repeated ploughing over the centuries. Equally, however, it could reflect cleaning of the interior during its occupation.

There is little else to be said about the interior of the moated enclosure. Working from English examples, there would be at least one substantial building within the moat; at Bear Rails (Old Windsor) in Berkshire, records mention a hall, chamber, wardrobe, kitchen, gatehouse and granary (Anon 1919, 1920). Generally, the expectation would be to have several buildings standing within the moat, forming the centre of an estate, with the moat acting as a status symbol: although the truly rich and powerful would have had stone castles instead. Over time, the moat came to represent the minor nobility more firmly, and wealthier merchants also began to use moated enclosures. In Scotland, however, there has been little or no evidence of internal buildings, although excavations so far have not investigated the entirety of the interiors of the enclosures. At Bombie, no evidence of internal buildings was uncovered (Anderson 1948). At Dunrod, a large amount of stone suggested there had been stone buildings within the enclosure, although there was little to show the ground plans of the buildings and nothing from which to establish the functions

or even numbers of the buildings. The excavator, however, believed that there had been a structure in the north-east quadrant of the enclosure (Burdon-Davis 1966). Unlike Bombie, which produced no dating evidence at all, Dunrod produced a reasonable assemblage of pottery. Most was 13th to 15th century in date, although there was a single sherd of 15th- to 16th-century pot.

Castle of Wardhouse similarly produced no definite evidence for structures. The interior trench produced a scatter of pits, post-holes, later robber trenches and a paved area (Yeoman 1999, 589—92), but no clear evidence of the nature or form of any internal buildings. Indeed, the conclusion of the excavator was that:

> The rest of this area is characterized by concentrations of cut features, which might represent the remains of one or more timber buildings. Alternatively, these might simply represent fence-lines of scaffolding of unknown periods (Yeoman 1999, 613).

This is similar to the results at Girvan; there was a scatter of pits and post-holes but with no obvious patterns emerging and the cross-cutting linear features in Trench 10 may represent fencing rather than parts of buildings. It is likely that the oval feature in this trench was a structure, although probably an animal pen rather than a building, while it may be the case that this feature dates to a different period than the enclosure and that its presence within the enclosure is coincidental. Elderslie similarly produced no unequivocal evidence of medieval structures within the enclosure. There certainly would have been structures within the enclosure, which appears to have had stone facing to the internal enclosure wall, but subsequent activity has left little, if any, indication of the buildings (Alexander 2000, 175).

The exception is Perceton, where the first phase described as the 12th- to 13th-century steward's farmstead included some lean-to structures, although these seem to have been located at the edge of an internal palisade (Stronach 2004, 151). There were agricultural elements, such as a corn-drying kiln, but there was again a lack of definite evidence for buildings. This is true for the second phase at Perceton, dating to the 14th to 15th centuries, where the excavated area did not reveal any of the buildings that must have stood within the enclosure (Stronach 2004, 155).

Castle of Wardhouse could only be dated by its pottery, which was largely a mixture of redware and Scottish East Coast White Gritty Ware. There were also a small number of imported sherds, with Scarborough ware and German Langerwehe stoneware both present (Will 1999, 604–5). This would suggest a date of 14th–15th century AD for the occupation of the site, broadly similar to Dunrod. Perceton produced White Gritty Ware for the first phase, dating to the 12th–13th centuries, and Late Medieval Reduced Ware, dating the second phase to the 14th–15th centuries. The artefactual dates were supported by radiocarbon dates that indicated two broad dates of 1040–1300 AD and 1290–1500 AD.

No faunal remains were reported from Bombie, Dunrod, Elderslie or Perceton but the Castle of Wardhouse assemblage produced a similarly small and poorly preserved assemblage as Ladywell. Here a mix of species was identified, with some pig, fowl and caprines, together with those of two cats. The Ladywell assemblage was also small and poorly preserved, although in a worse condition. In this case, the identifiable material came from cows. Unfortunately, both assemblages are too small to be considered as representative. The only thing that can be said with confidence is that beef was a part of the diet at Ladywell, while pork and mutton/lamb were eaten at Castle of Wardhouse.

Exterior

There have been a number of successful investigations of the external setting of medieval monuments that have revealed the presence of subsidiary structures. This was previously recognized with Scottish medieval towerhouses, that they stood at the centre of settlement complexes and were not isolated within the landscape (Tabraham 1988, 275). Recent work at Urquhart Castle revealed a range of external structures, largely relating to light industrial processes (Banks in prep). It is also clear from a wide range of historical sources that medieval lordly buildings had a level of settlement based around them. At Ladywell, several of the pits and post-holes produced botanical evidence of the crops available to the moated enclosure. As is common on medieval sites in Scotland, the major crops appear to have been oats and barley; this was the case at Perceton as well, the only other site to report significant levels of botanical material (Hastie 2004, 165). The evidence of the weed seeds suggests the crops are likely to have been produced locally, as it was only partly processed, and that they were likely to have been spring crops (Section 6.2, below); it would also appear that the crops are likely to have been grown on the higher ground and not on the valley floor, as the weed seeds favour lighter soils. The botanical analysis also notes that the weed seeds differ between the oat and barley crops, suggesting that they were grown in separate fields rather than together.

Unusually for medieval Scotland, in addition to the oat and barley on the site, there was also wheat and, in particular, bread wheat. This was found in several post-holes and pits across the side as a minor element, but a single post-hole on site (F024), produced 419 breadwheat seeds out of over 1300 seeds from a 500ml soil sample from the context. Wheat, being less robust than oats or barley, has been a rare occurrence on Scottish medieval sites, and is considered to be a high status and expensive foodstuff; there were four seeds of bread wheat from

the entire Perceton assemblage, despite similar rich deposits of charred seeds (Hastie 2004). This Ladywell material could be taken to be part of the site's production, but the evidence of the weed seeds indicates that the crop had been heavily processed and is likely to have been grown elsewhere (Section 6.2, below). The level of processing indicates a commodity crop, sold for profit. It may have been bought and brought to Ladywell, or it may represent a tithe or other form of tax or offering.

Another interesting fact to emerge from the botanical report is that oak was heavily utilized on site. In fact, oak is the most widespread species present in the charcoal examined, and appears in greater amounts than any of the other species; in contrast, no examples of oak were reported from Perceton (Hastie 2004). Oak would have been rare in the Girvan area in the medieval period, and would have been an expensive material to use. It is interesting that the oak derives from contexts in this area lying outwith the enclosure, in an area that should consist of subsidiary settlement and non-domestic activities; perhaps this suggests that the site was wealthy, if peripheral buildings could be built from oak. From a similar period, the analysis of botanical remains from a timber building outside Urquhart Castle has shown that the building, which appears to be a workshop of some form, was oak-built and that oak was used as a fuel in its internal hearths (Section 6.2). The building was constructed for a wealthy castle owner, and the use of oak does appear to denote a large budget.

Ladywell Manor or Ladywell Grange?

It seems clear from the presence of oak and of a bread wheat crop, that the occupants, or more correctly, the owners, of the moated enclosure were fairly wealthy individuals. It is, however, more difficult to say whether they were secular or ecclesiastical, and either could have generated the archaeological evidence found on the site. There is unfortunately no historical evidence to settle the question. If the site were ecclesiastical, it would have been a monastic offshoot of Crossraguel Abbey, itself an offshoot of Paisley Abbey. If this were the case, then the site would have been Cluniac, and thus part of the process of bringing the Church fully under the control of the Papacy and away from lay control. It would have been an important part of the local landscape, as, in contrast to the Benedictines, the Cluniacs sought to engage with the secular world and bring the laity closer to the Church.

However, there are problems with an ecclesiastical explanation of the moated enclosure. Very near to the site of the moated enclosure at Ladywell are the remains of Chapel Donan (NS10SE 1). This chapel, dedicated to St Donan of Eigg, who died in 617 AD (Watson 1926), was extant in the period that the enclosure was in use; a charter of Robert III (1390–1406) that confirms the chapel to Crossraguel Abbey (Paterson 1852) at this time. It seems unlikely that Crossraguel Abbey would have had two small religious properties so close together, but with only one being mentioned in the charter. The moated enclosure might have been a grange, although it would be unusual for an ecclesiastical site to have a moat. Distance from the world was normally demonstrated through a wall or vallum, which was more often a stone wall by the medieval period. However, the moated enclosure might have been a gift to the abbey, to be run as a grange. In such circumstances, the occupants of the house would probably have been lay brothers. It is then difficult to determine how the material culture would have differed from a secular site.

The alternative explanation is that the site was secular and aristocratic, most likely as part of the Bruce family group, belonging to either a relative or a supporter. The site was in the lands of the Earldom of Carrick in 1214–16, when Duncan, Earl of Carrick gifted some of his lands to Paisley Abbey. In 1274, Robert the Bruce was born and was seventh Earl of Annandale and second Earl of Carrick, so by the end of the 13th century the site at Ladywell stood on the lands of the future king of Scotland. The house at the moated enclosure of Ladywell would have been known to Robert the Bruce, who had been born in Turnberry.

For a secular explanation, the site would have been of reasonably high status, as demonstrated by the plant remains, and the moat of the enclosure should be seen as a public demonstration of that status. This was probably following the traditional pattern in Scotland, where status was shown in physical terms by the elaboration of the defences of aristocratic sites. This idea comes from the Irish early medieval law codes, where status was displayed by extra ramparts around a rath. In Irish mid-first millennium AD texts such as the *Críth Gablach*, the extra rampart was the right of a *rí* (a king) and part of the *drécht gíallnae* (Kelly 1988, 30; Críth Gablach, l 570); the *drécht gíallnae* was the labour service owed to a lord by his subordinates, both free and unfree. It is unlikely that there was any real connection between the *drécht gíallnae* and the moat of the enclosure, but it would have fitted into the tradition of architectural social signifiers that had meaning in Scottish society. The moat was a social signifier in England as well, where the Celtic legacy was further in the past, but it certainly means that the idea of an individual's status being displayed in the way their settlement was defended was part of a clear tradition.

However, the argument cannot be pushed too far. The highest status was shown by a stone castle rather than a house surrounded by a moat. While many of the moated enclosures belonged to high-ranking nobles, many also belonged to the minor nobility. It should also be noted that the bulk of the botanical evidence indicates that the site was using locally produced foodstuffs that had only been partially cleaned (Section 6.2, below). The bread

wheat grains occur as a small part of the scatter of cereal grains across the site, apart from Post-hole F005, which might be taken as an indication that there was bread wheat coming into the site from time to time, not as part of the local farming, but equally not as a single event. The barley and oats indicate that the moated enclosure was the centre of a working farming estate, which would again suggest that the occupants of the enclosure were not the upper reaches of the nobility. They may have been monks or lay brothers; they may have been minor gentry, either running their own estate or operating the estate on the behalf of their feudal lord. Unfortunately, there is insufficient evidence to determine the true status and nature of the owners, particularly as the site is historically invisible. There are no charters extant that mention the site, either as an ecclesiastical site or as a farming manor.

6 Specialist Contributions

6.1 Soils *by John S Duncan*

6.1.1 Burnt mound site

In general, the majority of the layers investigated from the burnt mound site show evidence of a relatively low-energy system, where fine-grained material is deposited by the action of very slow-moving or stagnant water. The main exception to this is layer 10A/11A (context 101), which is very poorly sorted and of mixed particle size in addition to containing abundant inclusions of burnt stone and charcoal. This layer is best interpreted as a dump of 'burnt mound' material.

6.1.2 Timber site

Most samples indicated a very low energy environment, with waterlogging almost entirely due to limited fluctuations in groundwater/overbank flooding rather than episodes of flash flooding.

A clay layer that sealed, and was covered by, peat deposits indicated erosion further up the valley, with the mineral layer deposited at the site. The small grain size was strongly indicative of low-energy deposition where there was also standing water. During an erosion event, material is disturbed and transported; in general, the energy in such a system will reduce with increasing distance from the erosion site, and the smaller the particles, the further they are carried. In this case, the layer covered a large area, which implies over bank flooding, or that standing water covered this area, as it would be sensible to conclude that this event was limited by natural topography rather than human activities. The ultimate origin of this layer may have been human deforestation further up the valley. Another source of this mineral material could relate to increases in arable cultivation. This increase would lead to increased hill wash erosion and position downstream (French 2003, 111). Subsequent low-energy freshwater flooding over a large area would lead to the deposition of silts and clays. Similar results have been observed elsewhere (French et al 1992; French 1998). It is likely that, following this phase of deposition, events stabilized and the influx of mineral material decreased, allowing the peat to form again, indicating that the area continued to be wet.

6.2 Botanical evidence *by Jennifer Miller & Susan Ramsay*

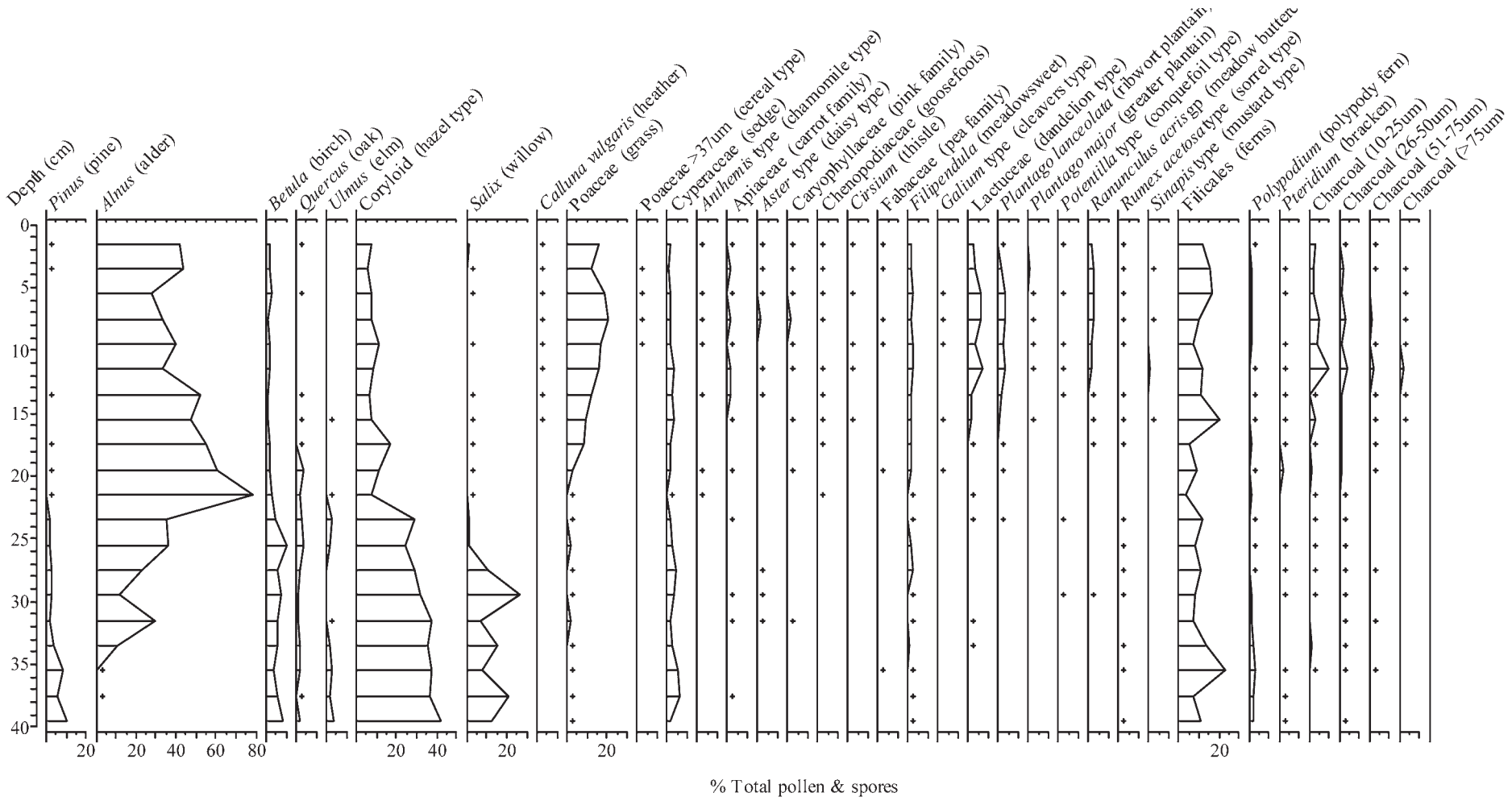
6.2.1 Phase 1: Vegetation history at the time of peat accumulation and the formation of overlying alluvial deposits

Radiocarbon dating has shown that the date of peat inception is prior to 6000 cal BC. During the early post-glacial period, the area was a wet, marshy environment, with woodland initially dominated by willow and haze, with some pine. By around 5500 cal BC, alder had become established in the area, and subsequently flourished (Illus 12). Alder outcompeted and eventually displaced willow as the dominant tree, providing an abundant resource for the local prehistoric population.

Oak and elm required drier conditions and never formed a significant component of the wet, valley floor woodland. By contrast, oak and hazel were the dominant charcoal types from the nearby Mesolithic site of Littlehill Bridge (MacGregor & Donnelly 2001). However, that site has a different topography and underlying geology, with slightly higher, well-drained soils able to support the mixed oak woodland characteristic of lowland Scotland.

The first evidence for human impact on the valley woodland occurred as short duration episodes around 4500 cal BC and 2250 cal BC. More substantial, sustained clearance began around 600 cal BC, with increased counts of agricultural indicators. This cleared landscape was maintained to the top of the sequence, although agricultural indicators were never high, as the wet valley floor would not sustain arable, or even pastoral, agriculture. The drier valley sides were probably used for cereal cultivation and grazing from the Neolithic onwards, with a significant expansion in the Iron Age. The agricultural signal coincides with steadily increasing counts of microscopic charcoal, especially the smallest size fraction often associated with particles from domestic fires.

The first substantive evidence of agriculture coincided with the end of peat formation and the deposition of grey clay, suggesting this might represent hillwash from destabilized soils caused by woodland clearance. Analysis of waterlogged deposits showed local wetland taxa mixed with others favouring drier habitats, in a sandy matrix, suggesting some hillwash has occurred.



Illus 12 Botanical analysis: pollen diagram monolith 030

6.2.2 *Phase 2: The formation of the burnt mound deposits*

Alder was the most abundant charcoal from the burnt mounds overall, with other types only present in trace amounts in some cases. The pollen evidence indicated that alder dominated the local woodland during the Bronze Age. Consequently, utilization of local resources is implied. A few burnt mounds had a more mixed charcoal assemblage, and radiocarbon dating has shown that these mounds are earlier than those dominated by alder charcoal. This suggests that the mounds were formed over an extended period of time, using whatever wood types were abundant in the local environment at the time.

Much of the charcoal from the mound in Area A was indeterminate, unlike that from Area B mounds. This suggests the wood used in Area A was either wet, or was subjected to repeated burning or exceptionally high temperatures. Repeated burnings seem most likely as no furnaces were found, and indeterminate charcoal would have recurred if burning wet wood were normal practice. Several carbonized cereal grains (six-row barley) recorded from the Area A mound deposits were probably incorporated accidentally from other, possibly unrelated activities.

The charcoal assemblage from the burnt mound site at nearby Gallow Hill (Donnelly & MacGregor 2006) was noticeably different from Grant's. The abundance of birch and scarcity of alder charcoal at Gallow Hill implies this local woodland was better drained than that present around Grant's. This further suggests that the mounds were utilized by small, local communities rather than as a focus for regional activity.

6.2.3 *Phase 3: Medieval activity*

Post-hole fills from the medieval moated enclosure yielded abundant carbonized cereal grains and the remains of oak posts burnt in situ, suggesting that this group of features represents an oak-built grain store or barn destroyed by fire. Hazel charcoal was also frequently recorded, perhaps from internal wattle screens or structural walls. Radiocarbon dating of cereal grains from several contexts dates the use of this structure to within the range of 1240–1400 AD.

Oats were abundant on this site, which concurs with the heightened importance of this cereal during the medieval period. However, six-row barley also constituted a significant component of the grain assemblage, together with abundant arable weed seeds, suggesting the storage of locally grown, partially processed crops. The almost total absence of chaff from this site, but abundance of small weed seeds, indicates that these crops have only undergone partial processing. This is indicative of a locally grown crop rather than a traded commodity, the latter being well cleaned to maximize commercial value.

The weed seeds were characteristic of spring-sown crops (Greig 1988), but samples primarily comprising oats or barley had different weed floras, implying separate crops rather than maslin cultivation (Van der Veen 1995). Fat hen was more common in barley-rich contexts and corn marigold more prolific in oat-rich samples. Although barley and oats can grow in poorer, wetter soils (Hinton 1991), the weeds are those that prefer fertile, nitrogen-rich arable land (Williams 1963; Howarth & Williams 1972), with corn marigold favouring light, sandy soils. This implies that the valley floor was not used for arable cultivation, with oats and barley crops probably grown in separate areas on the better-drained slopes of the valley.

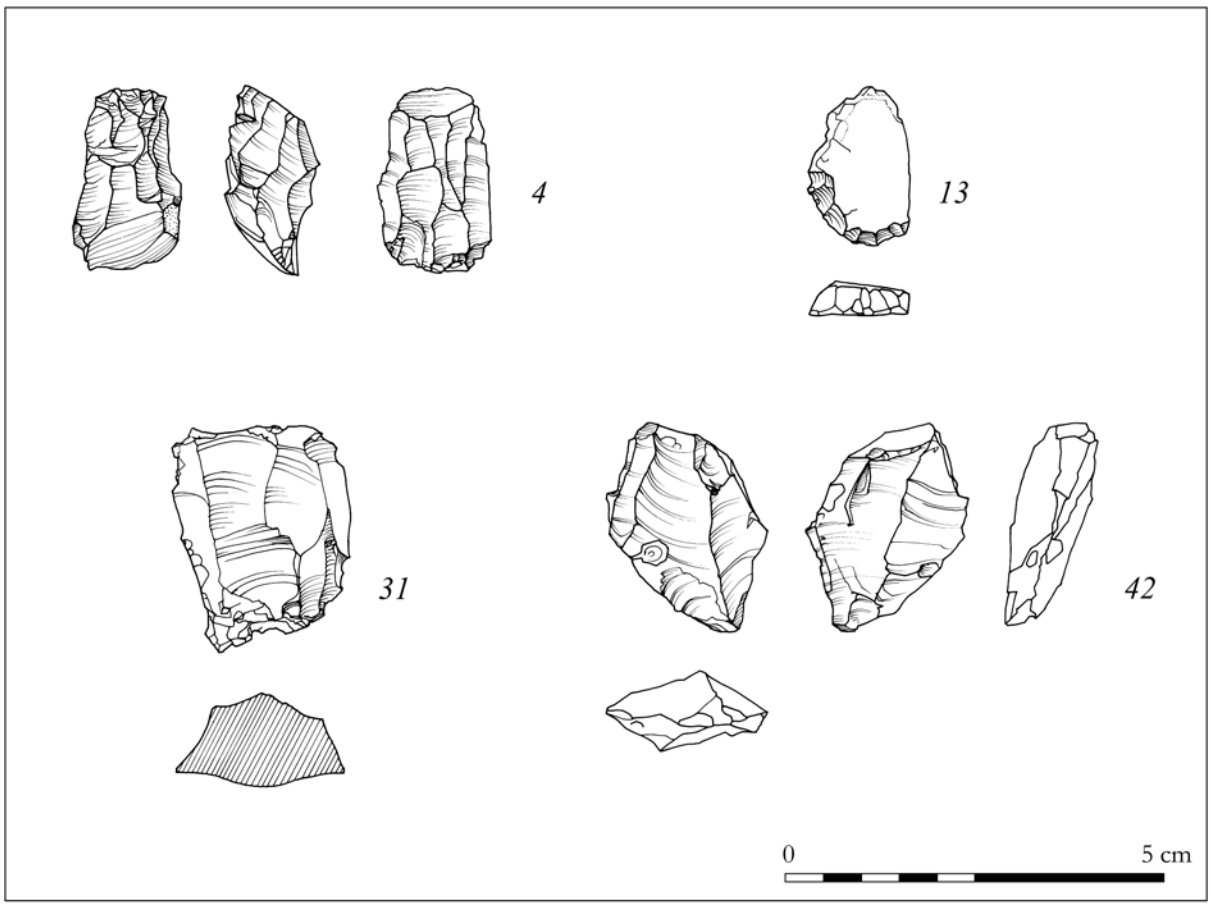
One context (Post-hole F005) was dominated by wheat (bread wheat, emmer and possible spelt), yet contained very few weed seeds. The weed seeds present were those of similar size to the cereal grains, indicating a finely cleaned crop. The apparent scarcity of wheat on the site implies that context 005 represents a higher status, more valuable crop. In Scotland, wheat cultivation is more problematic than either barley or oats, and hence was a more valuable commodity throughout history (Miller et al 1998; Dickson & Dickson 2000). This cleaned wheat crop would have had a higher value than a partially processed one, and suggests an expensive commodity, unlikely to have been lost through carelessness.

Although there are few archaeobotanical studies from rural medieval sites in Scotland, investigations of the urban sites of Elgin, Perth and Aberdeen (Fraser 1981) recorded the presence of barley, wheat, rye and especially oats. However, these assemblages are from waterlogged cesspits, not grain storage areas, and so are not directly comparable with Grant's, although the similarities are clear. Analysis of the drains at Paisley Abbey showed these same cereals to have been present in the medieval monastic diet, and records indicate the monks also collected grain as rents from the surrounding settlements (Dickson & Dickson 2000). The large quantity of grain, especially the wheat, stored at Girvan suggests a similar wealthy monastic or manorial tithe system may have operated there.

The abundance of oak charcoal in these medieval contexts is in stark contrast to the prehistoric samples examined. The pollen profile shows oak to have been a rarity in the area throughout prehistory, and it would have been even scarcer by the medieval period. This suggests that timber for the medieval oak-built structure was imported from elsewhere, further indicating a high status structure, given the extensive cost of timber importation.

6.3 **Animal bone** *by Catherine Smith*

The animal bone recovered from the moated enclosure ditch and its fills was poorly preserved, consisting of fragmented animal teeth and small bone fragments, most of which were burnt or calcined. The sandy clay



Illus 13 Lithics analysis: lithics 4, 13, 31, 42

was assumed to have been acidic in nature, hence the poor preservation of bone.

The only species identified at the site was cattle, represented by tooth fragments. The teeth were molars that had disintegrated into their component parts, and came from adult animals. Long bone fragments, described in the catalogue as large ungulate, were probably also from cattle. Two conjoining long bone fragments came from the upper ditch fill (small finds no 009 and n/a).

6.3.1 Discussion

As the animal remains were so poorly preserved, it is not surprising that only one species was identified. Cattle bones, being larger and more robust than those of sheep and pigs, tend to survive in a more recognizable condition under adverse burial conditions. It is unlikely, however, that sheep and pigs would have been absent from the site, both being well established in the medieval economy.

6.4 Chipped stone *by Eland Stuart*

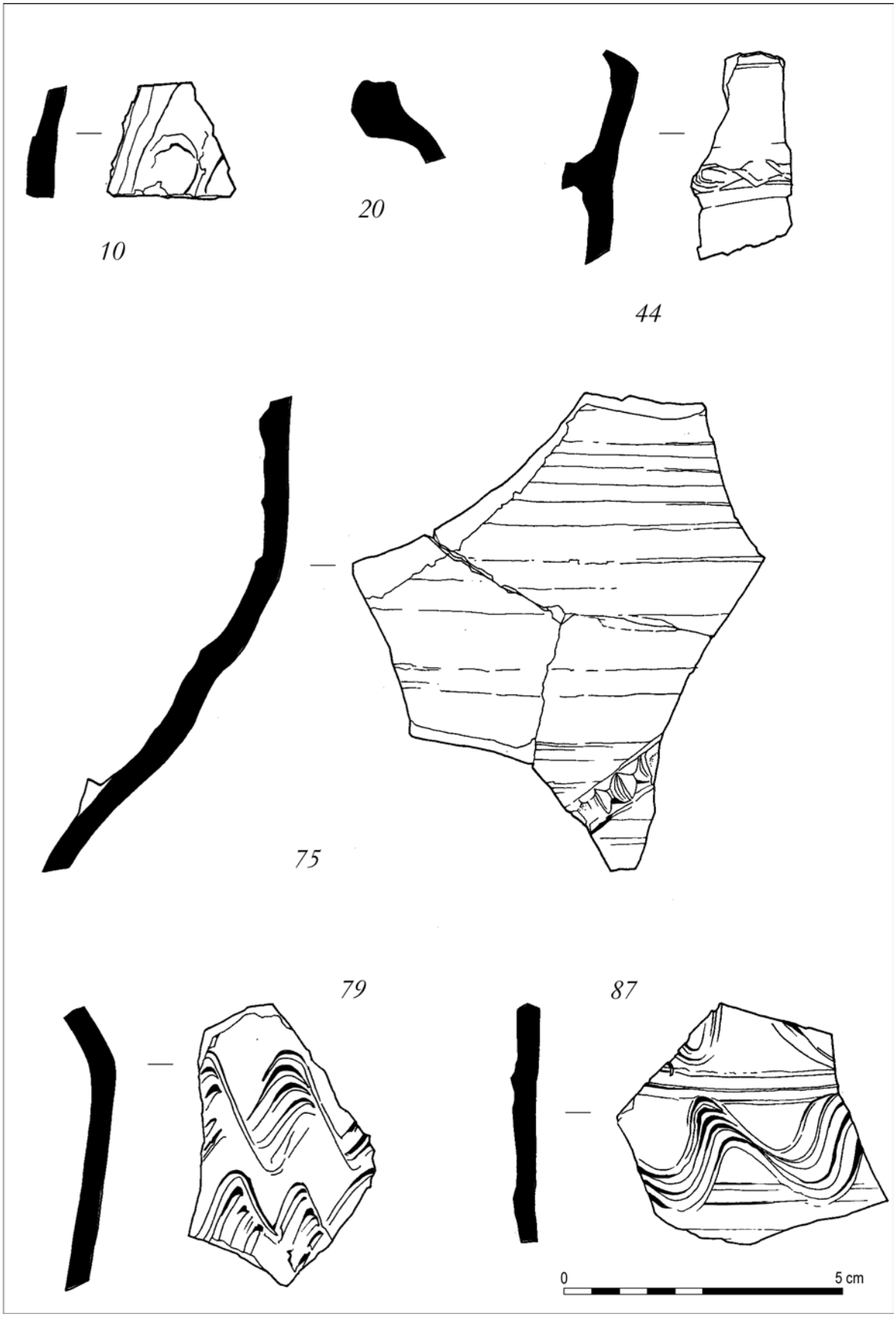
The assemblage consisted of 35 pieces, deriving from all three Areas A, B and C. The assemblage was in good condition and most pieces were fresh, although breakage was common. It appeared that the lithics in Areas A and B had been more disturbed than those from Area C. There were 30 flints, four agates and one well-rolled chert chip, probably natural. Only two pieces had definitely been modified, an end scraper from Area A (Cat no 13) and an indeterminate piece (Cat no 28) from Area C.

6.4.1 Discussion (Illus 13)

Most of the flakes were small and broken, and the lack of formal tools and the small size of the assemblage made dating the material difficult. Blades were not significant, which argues against the idea that the material is Mesolithic, yet at least two of the cores (Cat nos 4, 20, 32 and 42) were well-worked platform cores that easily could be Mesolithic (Cat nos 4 and 20), while a third burnt bipolar core is not (Cat no 42). At the same time, the abundance of flakes might suggest a later date: Neolithic or Bronze Age. Indeed, one piece (a thick flake from a formal platform core) appeared typically Neolithic (Cat no 31). However, as the material came from across the entire valley, it would be a mistake to try to view this as a coherent assemblage. This is a small piecemeal set of material where the pieces

Table 1 Catalogue of lithics referred to in text

ID	Location	Material	Colour	Red seq.	Blank	Sub-blank	Broken	L	W	T	Bulb type	Scar	Edge Damage	Modified
4	Area C	Flint	Dark grey	Tertiary	Core	Platform	n	20	14	11		N	N	N
13	Area A	Flint	grey-White/red	Primary	Flake	Regular	y	20	15	5		N	Y	Y
20	Area C	Agate	Pink/white	Tertiary	Core	Platform	n	22	14	11		N	N	N
28	Area C	Flint	Pink/grey	Tertiary	Flake	Irregular	y	11	12	4		Y	N	Y
31	Area C	Flint	Grey	Tertiary	Flake	Regular	n	27	22	10		Y	Y	N
32	Area C	Flint	Pale grey	Secondary	Core	Platform	n	15	31	23		N	Y	N
42	Area C	Flint	White/grey	Tertiary	Core	Bipolar	n	30	18	9	n	N	N	N



Illus 14 Medieval pottery analysis: sherds 10, 20, 44, 75, 79, 87

are not related to one another; this is supported by the colours of the lithics, where no two pieces came from the same parent rock. Some might be Mesolithic, others Neolithic. Small pebbles were used, and when of good quality, they were worked right to the limit. The best description of assemblage is the result of the expedient manufacture and use of tools. The small size of the assemblage and overall lack of small debitage, particularly from the samples, suggests that the sites were not knapping sites.

6.5 Glass bead *by Ewan Campbell*

A single glass bead was recovered from Area C in the top of the intrusive silt layer (3002) during the initial archaeological evaluation. The form of this bead is not distinctive, being found in both prehistoric and later beads, but the colour is unusual in that it incorporates a trail of opaque white glass in otherwise colourless material. It looks as if the bead has been fairly crudely made from melting down sherds of a glass vessel decorated with opaque white trails. While there can be no certainty about the origin of this material, such vessels were characteristic of the early medieval period in western Britain, when they were imported from France in the sixth and seventh centuries AD. The major collection in Scotland was found at Whithorn, where glassworking took place on site (Campbell 1997). The bead could therefore date to this period, though the possibility remains that it could be prehistoric. However, there are no obvious parallels from prehistoric contexts.

6.6 Medieval pottery *by Bob Will*

The excavations at Girvan uncovered a small but important assemblage of medieval pottery. In total, 107 sherds (448.3g) were recovered from the excavations at Girvan. All the sherds date to the medieval period and consist of the two main medieval pottery fabric types found in Scotland, Scottish White Gritty ware and Scottish Medieval Redware. Many of the sherds are well made, with thin walls and pronounced rilling marks on the inside; these features would suggest a date from the late 12th or early 13th century. Many of the White Gritty sherds demonstrate a strong Yorkshire influence in terms of the vessel form and decoration (eg Illus 14, SF nos 10, 20, 44, 75, 79 & 87). Most of the sherds were recovered from the moated enclosure. The Scottish White Gritty ware formed the largest group of sherds, which generally dates from the late 12th century through to the mid 15th century; the sherds from Girvan probably date to the 13th century or early 14th century. Most of the sherds appear to be from jugs, but several sherds may be from cooking pots or storage jars. Many of the sherds show a Yorkshire influence and may in fact be from one of the several Yorkshire potteries that were in production in the 13th and 14th centuries. Twelve Scottish Medieval Redware sherds were recovered from the excavations. These Redwares tend to date from the 13th century through until the 15th century.

6.6.1 Discussion

The Girvan material is an important assemblage as very little is known about the pottery from this area and the local pottery industry in the south-west of Scotland in general. Although a number of excavations have been carried out across the region, most of these are presently unpublished (Ayr, Dreghorn, Dundonald). What information is available shows that White Gritty sherds are present in reasonable numbers, suggesting that a number of kilns could be operating in the area (the small published assemblage from Dundrennan Abbey contained 41 sherds of White Gritty Ware). The Girvan material also shows a high level of skill and craftsmanship, not previously recognized from the larger unpublished assemblages. It may be that Girvan pottery is a bit earlier in date and could mark the beginning of pottery production in the area. The sherds display a combination of traits, vessel form, glaze and decoration that would suggest a Yorkshire influence or possibly origin, but whether that reflects trade or the settlement of Yorkshire potters in the area is impossible to determine at the moment. A note of caution should be made as this is a very small assemblage and may only represent a small number of vessels.

6.7 Radiocarbon dates *by Paul Duffy*

Sixteen single-entity dates were submitted to Scottish Universities Environmental Research Centre for dating. Fifteen dates were obtained, with one sample failing to produce a date.

Table 2 Radiocarbon dates

Lab code	Sample ref	Material	δ13C	Age BP	Cal BC 2 sigma
SUERC-2906	Area A C130 S003	*Alnus*	–27.8‰	3290 ± 35	1690–1460 BC
SUERC-2907	Area A2 C101 S001	*Alnus*	–27.5‰	3230 ± 40	1610–1410 BC
SUERC-2908	Area B Sample A #30 37–39cm	Monocotyledonous fragments	–28.9‰	7020 ± 35	5990–5800 BC
GU-11881	Area B Sample A #30 33–35cm	Nutshell fragments from peat	Failed	Failed	Failed
SUERC-2909	Area B Sample A #30 19–21cm	Bark from peat (prob *Alnus*)	–28.8‰	2495 ± 35	790–410 BC
SUERC-2910	Area B CB006 Sample H#20	*Alnus*	–31.8‰	2235 ± 35	390–200 BC
SUERC-2914	Area B CB006 Sample B#12	*Alnus*	–28.9‰	2285 ± 35	410–200 BC
SUERC-2915	Area B C008 S003	*Alnus*	–27.9‰	3580 ± 35	2040–1770 BC
SUERC-2917	Area B2 C 001 S030	*Corylus*	26.6‰	3800 ± 35	2400–2130 BC
SUERC-2918	Area B2 C007 S005	*Corylus*	–27.8‰	3790 ± 35	2305–2050 BC
SUERC-2919	Area B2 C012 S008	*Alnus*	–27.3‰	3540 ± 35	1960–1740 BC
SUERC-2920	Area B2 C026 S015	*Alnus*	–26.1‰	3650 ± 35	2140–1910 BC
SUERC-2924	Area B2 S014	*Alnus*	–28.8‰	6415 ± 35	5480–5310 BC
SUERC-2925	Area C2 C022 S005	*Avena* sp	–25.1‰	645 ± 35	AD 1280–1400
SUERC-2926	Area C2 C005 S006	*Triticum aestivum ss*	–22.5‰	705 ± 35	AD 1240–1400
SUERC-2927	Area C2 C037 S011	*Avena* sp	–25.6‰	675 ± 35	AD 1270–1400

7 Conclusions *by Paul Duffy*

The archaeological work at Girvan provided a rare opportunity to examine, not only a series of archaeological sites, but also the archaeological and palaeoenvironmental development of a landscape from the earliest times of human occupation through to the present day. As such, the results of the project are more than the sum of its parts: the work carried out contributes to the current understanding of human occupation within the Girvan area and the relationship such activity had to a constantly changing environment over time. In particular, the project clearly demonstrated the high potential for organic preservation of material dating back as far as the Mesolithic, and the potential that such material has for providing rarely glimpsed evidence of the inter-relationship between human agency and environment in past landscapes. The organic potential of similar such valleys in this part of south-west Scotland is clear.

Perhaps the most striking aspect of the project was the temporal depth of human activity explored. Most certainly, the area to the north of Girvan is well known for evidence of Mesolithic activity, and the project demonstrated that humans have been active in the area from the sixth millennium BC onwards. What is more interesting is that, save for a few isolated examples, such evidence did not come from the usual debitage of stone tool production and discard, but rather from direct evidence of early 'slash and burn' woodland clearance. This type of evidence is rare but not unknown from Scotland; its value here is perhaps to remind us that archaeological signatures of activities and human agency in the landscape at this time can and do extend beyond the ubiquitous lithic scatter. Such evidence reinforces interpretations of early settlers in Scotland as proactive and dynamic social groups, actively modifying the environment around them to meet specific needs, rather than hiding at the fringes of such landscapes, at the mercy of the local conditions.

Similarly interesting was the evidence of burnt mound creation in the Late Neolithic through to the Middle Bronze Age. Such sites are common throughout Scotland, and the dating evidence fits well into an increasingly well-defined prehistoric tradition. At Girvan, the sites were all badly damaged through various human and natural agents, rendering any contribution towards ongoing debate about the function of such sites somewhat problematic. It is instead the distribution of the sites that is most illuminating. The density of such sites in the area and the immediate environs is certainly unusual in this part of Scotland. When considered along with the dating evidence, it become clear that earlier sites cluster within the middle of the Grant's valley, whilst later site location is on the periphery of this area towards the eastern end of the valley and to the south at Gallowhill. Findings from the environmental and pedological analysis from the project would appear to suggest that this may be a reaction to environmental change, with the gradual stagnation of existing marsh, and subsequent drying of the valley as land continued to rise following the retreat of the ice. The location of the burnt mound deposits, with an apparent requirement for an adjacent water supply, has therefore been actively altered by the environmental landscape in which human activity was occurring, and by natural changes within that landscape.

Further changes within the landscape and local environment were attested through the discovery of a concentration of chopped, burnt timbers dated to the Iron Age. The suggestion that this may represent a trackway, deliberately laid to facilitate movement over a still partially boggy landscape, is tantalizing, but unfortunately inconclusive. More certainly, the wood deposit demonstrates that, as in the Mesolithic period, woodland was being deliberately cleared from the slopes of the boggy valley floor though 'slash and burn' methods as part of a deliberate manipulation of the environment in which people lived. That this manipulation was both widespread and far-reaching in its impact is attested microscopically by the pollen evidence, which shows a widespread clearance of tree types at this time, and macroscopically by the layer of fine-grained grey clay that accumulated over the peat at this time. Although other potentials exist, it is probable that the clay deposit formed as a direct result of deforestation and/or as an indirect result of increased agricultural practices, potentially both a reaction to increasing population densities in the area and land pressures.

The descendants of such populations undoubtedly continued to use the valley throughout the Iron Age and into the early medieval period; evidence for this is scarce, but striking, in the form of a glass bead tinged with an opalescent bluish lustre. Such artefactual evidence provides limited insight into how the valley was used and perceived in this period, but gives pause for thought to question what the history of the object is: who made it, how did they use it and why was it lost in this area? More strikingly, the evaluation of the Ladywell moated enclosure in Area C demonstrated that by the time of the 13th–14th centuries AD the valley had become the focus of a rich settlement, the location of which, on a small gravel knoll, again reflects the relationship between human occupation and environment in the valley. This environmental alteration is borne out by

the presence of locally grown crops on this site, in all probability on the slopes of the valley that were initially impacted on in the Mesolithic and finally cleared of trees in the Iron Age. Whether the site was ecclesiastical or secular in nature is still open to question, but more certainly the owners of the moated enclosure possessed sufficient wealth not only to cultivate crops in the immediate area, but also to import highly processed breadwheat, and to store such crops in oak-built buildings. The potential of imported pottery from Yorkshire, or alternatively of a resident potter from Yorkshire creating these styles in local fabrics, only enhances the status of the site.

The subsequent history of the valley and its environment is one of agricultural use; two post-medieval farmsteads are known from cartographic evidence in the valley but were not investigated as part of this project. The fact that these activities also relied on a series of modifications to the local environment, in common with human activity over time in the area, was demonstrated by the observations of numerous field drains throughout the valley, testament to 18th- or 19th-century attempts to improve drainage in the area. It was the wetter soil conditions and boggy areas which probably first attracted Mesolithic people to the area, and in part acted as a stimulus for burnt mound construction. These were ultimately modified by people in the Iron Age and medieval periods, and the vestiges of these conditions could thus still be seen as active forces on the modern landscape during the project.

The construction of new bonded warehouses for William Grant and Sons Distillers Ltd, the ultimate motivations for the excavations, can therefore be seen not as a unique act, but as a repeat of processes that have continued for generations. The construction process offered a rare opportunity to examine the history of an entire valley, and the archaeological findings contribute both towards a wider understanding of local and regional patterns of activity through time, and towards an understanding of an environmental and archaeological potential that extends in all temporal directions. Ultimately, the modifications of the valley environment that such works necessarily entailed are not a new process but part of a continuum of human agency and action in the valley that has existed from earliest times of the first local inhabitants.

8 Acknowledgements

The excavations and fieldwork over the three-year duration of the project were directed at various times by Iain Banks, Paul Duffy, Stuart Halliday, Gavin MacGregor, Keith Speller and Bob Will. The field archaeology team consisted of Duncan Abernethy, Diane Aldritt, Susan Bain, Chris Barrowman, Kevin Brady, Irene Cullen, Mike Donnelly, Jo Finkel, Cathy Foreman, Tara Hunter, Lorna Innes (nee Johnston), Matt King, Aileen Mauled, Gerry Cradle, Liam McIntyre, John Pressley, Biddy Simpson, Eland Stuart, Matte Thompson and Karen Wilson. GUARD management was by Alan Leslie and Iain Banks. Specialist environmental support was provided in the field by Rupert Housely, Jennifer Miller and Susan Ramsay. Technical support was provided by Melanie Richmond and Kenny Dunlop, while clerical and administrative support was provided by Jen Cochrane. Thanks go to all.

Alan Hunter of William Grant and Sons Distillers and Arthur Fowler, Barr's site manager, deserve particular special thanks. The project would also have been impossible without the skill and co-operation of the Barr Construction staff. The monitoring advice and co-operation of WoSAS must be acknowledged and in particular, the input and enthusiasm of Paul Robins. Olivia Lelong copyedited the report.

9 References

Abernethy, D 1996 'Girvan Mains (Girvan parish), flint scatter', *Discovery Excav Scotland 1996*, 97.

Alexander, D 2000 'Excavation of a medieval moated site in Elderslie, Renfrewshire', *Scot Archaeol J* 22, 155–77.

Anderson, W A 1948 'Report on excavations at Bombie', *Trans Dumfries & Galloway Natur Hist & Antiq Soc* 25 (1946–7), 27–35.

Anon 1919 'Archaeological Notes', *Journal of the British Archaeological Association* 25, 275–7.

Anon 1920 'Archaeological Notes', *Journal of the British Archaeological Association* 26, 208–9.

Ashmore, P J 1997 *Neolithic and Bronze Age Scotland*. Batsford/Historic Scotland, London.

Banks, I 1999 'Investigating burnt mounds in Clydesdale and Annandale during motorway construction', *Glas Archaeol J* 21(1998–9), 1–28.

Banks, I 2000 'Excavation of an Iron Age and Romano-British enclosure at Woodend Farm, Johnstonbridge, Annandale, 1994 & 1997', *Proc Soc Antiq Scot* 130, 223–81.

Banks, I 2002 'Always the bridesmaid: the Iron Age of south-west Scotland', *in* Ballin-Smith, B & Banks, I (eds) *In the Shadow of the Brochs*, 27–34.

Banks, I in prep *Motorway to the Past: The Archaeology of the M74*.

Banks, I & Will, R in prep *Urquhart Castle: Excavations in the Twentieth Century*.

Barber, J 1990 'Scottish burnt mounds: variations on a theme', *in* Buckley, V M (ed) *Burnt Offerings: International Contributions to Burnt Mound Archaeology*. Wordwell Ltd, Dublin.

Barfield, L H & Hodder, M A 1987 'Burnt mounds as saunas and the prehistory of bathing', *Antiquity* 61, 370–9.

Birks, H H 1972 'Studies in the vegetational history of Scotland, I: two pollen diagrams from the Galloway Hills, Kirkcudbrightshire', *J Ecol* 60, 183–217.

Birks, H H 1975 'Studies in the vegetational history of Scotland, IV: pine stumps in Scottish blanket peat', *Phil Trans Roy Soc* B270, 181–226.

Buckley, V M 1990 *Burnt Offerings: International Contributions to Burnt Mound Archaeology*. Wordwell Ltd, Dublin.

Burdon-Davis, Lt Col E F 1966 'The moated manor at Dunrod, Kirkcudbrightshire', *Trans Dumfries & Galloway Natur Hist & Antiq Soc* 43, 121–36.

Campbell, E 1997 'The early medieval imports,' *in* Hill, P (ed) *Whithorn and St Ninian: The Excavations of a Monastic Town 1984–91*, 297–322. Sutton Publishing/Whithorn Trust, London.

Coleman, R 2004 'Moated sites', *in* Stronach, S (ed) 'The evolution of a medieval Scottish manor at Perceton, near Irvine, North Ayrshire', *Med Archaeol* 68, 146–8.

Dickson, C A & Dickson, J H 2000 *Plants and People in Ancient Scotland*. Tempus, Stroud.

Donnelly, M 1998 'Gallow Hill, Girvan parish, watching brief', *Discovery Excav Scotland 1998*, 86.

Donnelly, M & MacGregor, G 2006 'The excavation of Mesolithic activity, Neolithic and Bronze Age burnt mounds and Romano–British Ring Groove Houses at Gallow Hill, Girvan', *Scot Archaeol J* 27(1), 31–69.

Duffy, P 1997a *William Grant and Sons Distillery, Girvan: Area A Watching Brief*. GUARD 396A, University of Glasgow, Glasgow.

Duffy, P 1997b *Archaeological Mitigation Measures and Excavation in Area A, Grant's Distillery, Girvan*. GUARD 396A2, University of Glasgow, Glasgow.

Duffy, P 1997c *An Archaeological Watching Brief and Controlled Strip of Deposits in Area B, Grant's Distillery, Girvan*. GUARD 396B2, University of Glasgow, Glasgow.

Duffy, P 1998 *An Archaeological Evaluation in Area C, William Grant and Sons Ltd Distillery, Girvan*. GUARD 396C3, Dept of Archaeology, Glasgow.

Dumayne-Peaty, L 1999 'Late Holocene human impact on the vegetation of southeastern Scotland: a pollen diagram from Dogden Moss, Berwickshire', *Rev Palaeobotany & Palynology* 105, 121–41.

Edwards, K J 1989 'Meso-Neolithic vegetational impacts in Scotland and beyond: palaeoecological considerations', *in* Bonsall, C (ed) *The Mesolithic in Europe*. Edinburgh University Press, 143–63.

Edwards, K J, Ansell, M & Carter, B A 1983 'New Mesolithic sites in south-west Scotland and their importance as indicators of inland penetration', *Trans Dumfries & Galloway Natur Hist & Archeol Soc* 58, 9–15.

Edwards, K J, Hirons, K R & Newell, P J 1991 'The palaeoecological and prehistoric context of minerogenic layers in blanket peat: a study from Loch Dee, southwest Scotland', *Holocene* 1, 29–39.

Fraser, M J 1981 *A Study of the Botanical Material from Three Medieval Scottish Sites*. MSc Thesis, University of Glasgow.

French, C A I, Machlin, M, Passmore, D 1992 'Archaeology and palaeo-channels in the Lower Wellan and Nene valleys: alluvial archaeology

at the fen-edge, eastern England', *in* Needham, S & Machlin, M (eds) *Alluvial Archaeology in Britain*. Oxford Monograph, Oxford, 169–76.
French C A I 1998 'Soils and sediments', *in* Pryor, F, *Etton: Excavations at a Neolithic Causewayed Enclosure near Maxey, Cambridgeshire, 1982–7*. Archaeological Report 18, English Heritage, London. 331–21.
French, C A I 2003 *Geoarcheology in Action: Studies in Soil Micromorphology and Landscape Evolution*. Routledge, London.
Geological Survey of Scotland 1987 Sheet 7 – Girvan, Drift, 1:50,000.
Geological Survey of Scotland 1981 Sheet 7 – Girvan, Solid, 1:50,000.
Gregory, R A 2000 'Prehistoric landscapes in Dumfries and Galloway, Part 1: Mesolithic and Neolithic landscapes', *Trans Dumfries & Galloway Natur Hist & Archeol Soc* 74, 1–26.
Greig, J 1988 'Traditional cornfield weeds – where are they now?', *Plants Today* 1, 183–91.
Halliday, S & Will, B 1998 *An Archaeologically Controlled Topsoil Strip and Excavation on the Site of Warehouse 40, Area C, William Grant & Sons Distillery, Girvan*. GUARD Report 396C.2.
Haselgrove, C, Armit, I, Champion, T, Creighton, J, Gwilt, A, Hill, J D, Hunter, F & Woodward, A 2001 *Understanding the British Iron Age: an Agenda for Action*. Wessex Archaeology.
Hastie, M 2004 'The plant remains', *in* 'The evolution of a medieval Scottish manor at Perceton, near Irvine, North Ayrshire', *Med Archaeol* 68, 143–66.
Henshall, A S 1972 *The Chambered Tombs of Scotland*. Edinburgh University Press: Edinburgh.
Hinton, P 1991 'Weed associates of recently grown Avena strigosa Schreber from Shetland, Scotland', *Circaea* 8, 49–54.
Howarth, S E & Williams, J T 1972 'Chrysanthemum segetum L', *J Ecology* 60, 573–84.
James, H 1986 'Excavations of burnt mounds at Cames, near Fishguard', *Bull Board Celt Stud* 33, 245–65.
Johnston, D A 1994 'Carronbridge, Dumfries and Galloway: the excavation of Bronze Age cremations, Iron Age settlements and a Roman camp', *Proc Soc Antiq Scot* 124, 233–92.
Jones, V J, Stevenson, A C & Battarbee, R W 1991 'Acidification of lakes in Galloway, south west Scotland: a diatom and pollen study of the post-glacial history of the Round Loch of Glenhead', *J Ecol* 77, 1–23.
Kelly, F 1988 *A Guide to Early Irish Law*. Dublin.
Macaulay Institute for Soil Research 1968 Carrick – Sheet 8 and part of Girvan –Sheet 7, 1:63,360. Soil Survey of Scotland.
MacGregor, G & Duffy, P 1997 *William Grant and Sons Distillery, Girvan: Area B Watching Brief, Evaluation and Excavation*. GUARD 396B, University of Glasgow, Glasgow.
MacGregor, G & Donnelly, M 2001 'A Mesolithic scatter from Littlehill Bridge, Girvan, Ayrshire', *Scot Archaeol J* 23, 1–14.
MacKie, E 1966 'A burial ground of the Middle Bronze Age at Girvan', *Trans Ayrshire Arch Nat Hist Collections* 7 (1961–6), 9–27.
MacNeill, M 1973 'Ayrshire, Mesolithic flints', *Discovery Excav Scot 1973*, 14.
McNeill, P G B & MacQueen, H L 1996 *Atlas of Scottish History to 1707*. Edinburgh.
Maynard, D 1993 'Burnt mounds around a pipeline in Dumfries and Galloway', *Trans Dumfries & Galloway Natur Hist Antiq Soc* 68, Third Series.
Mellars, P A 1976 'Fire ecology, animal populations and man: a study of some ecological relationships in prehistory', *Proc Prehist Soc* 42, 15–45.
Miller, J J, Dickson, J H & Dixon, T N 1998 'Unusual food plants from Oakbank Crannog, Loch Tay, Scottish Highlands: cloudberry, opium poppy and spelt wheat', *Antiquity* 72, 805–11.
Miller, J & Ramsay, R in prep 'The botanical report', *in* Banks et al *Urquhart Castle: Excavations in the Twentieth Century*.
Morrison, A & Jardine, W G 1976 'The archaeological significance of Holocene coastal deposits in south-western Scotland', *in* Davidson, D A & Shackley, M L (eds) *Geoarchaeology*, 175–95.
Morrison, A 1981 'The coastal Mesolithic in south-west Scotland', *in* Gramsch, B (ed) *Mesolithikum in Europa. Veröffentlichungen des Museums für Ur- und Frühgeschichte in Potsdam*. Band 14–15, 441–50.
Paterson, J 1852 *History of the Counties of Ayr and Wigton*, Vol 2. Edinburgh, 244.
Pollard, T P & Donnelly, M in prep *Kirkhill*.
Power, D 1990 'Fulachta Fiadh in County Cork', *in* Buckley V M (ed) *Burnt Offerings: International Contributions to Burnt Mound Archaeology*. Wordwell Ltd, Dublin, 13–17.
Ralston, I & Edwards, K 1984 'Post-glacial hunters and vegetational history in Scotland', *Proc Soc Antiq Scot* 114, 15–34.
RCAHMS 1983 *North Carrick, Kyle and Carrick District, Strathclyde. The Archaeological Sites and Monuments of Scotland*, 17. Edinburgh.
Speller, K & Banks, I 1997 *William Grant and Sons Distillery, Girvan: Area C Ladywell Farm Evaluation*. GUARD 396C, Cruithne Press, Glasgow.
Stronach, S 2004 'The evolution of a Medieval Scottish manor at Perceton, near Irvine, North Ayrshire', *Med Archaeol* 68, 143–66.
Tipping, R 1994 'The form and fate of Scotland's woodlands', *Proc Soc Antiq Scot* 124, 1–54.
Tipping, R 1995 'Holocene evolution of a lowland Scottish landscape: Kirkpatrick Fleming. Part II, regional vegetation and land-use change', *Holocene* 5, 83–96.
Tabraham, C J 1988 'The Scottish medieval tower-house as lordly residence in the light of recent excavations', *Proc Soc Antiq Scot* 118, 267–76.
Van der Veen, M 1995 'The identification of maslin

crops', *in* Kroll, H & Pasternak, R (eds) *Res Archaeobotanicae. 9th Symposium of the International Workgroup for Palaeoethnobotany, Kiel 1992*. Oetker-Voges Verlag, Kiel, 335–44.

Watson, W J 1926 *The History of the Celtic Place-names of Scotland: Being the Rhind Lectures on Archaeology (expanded) Delivered in 1916*. Edinburgh, 165.

Will, R 1999 'Pottery', *in* Yeoman, P 'Excavations at Castle of Wardhouse, Aberdeenshire', *Proc Soc Antiq Scot* 128, 604–5.

Williams, J T 1963 '*Chenopodium album* L.', *J Ecology* 51, 711–25.

Yeoman, P 1999 'Excavations at Castle of Wardhouse, Aberdeenshire', *Proc Soc Antiq Scot* 128, 581–617.