

The excavation of two burnt mounds and a wooden trough near Beechwood Farm, Inshes, Inverness, 1999

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with contributions by

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ABSTRACT

An archaeological watching brief undertaken during topsoil stripping operations in the course of sewer construction led to the identification of two burnt mounds and a series of unrelated pits. Subsequent archaeological excavation of one of the mounds revealed the remains of a waterlogged timber trough, the contents of which afforded the preservation of environmental information concerning its use and later abandonment. The trough was radiocarbon dated to the late third millennium cal BC, placing it in the Early Bronze Age.

INTRODUCTION

The work reported upon here was undertaken in 1999 by the Centre for Field Archaeology, University of Edinburgh and commissioned by North of Scotland Water Authority via Mott MacDonald Limited. A water pipeline route crossed arable land known as the Inshes close to the east of Inverness (illus 1), a flat area of former marshland comprising soils dominated by compact clay with associated fluvio-glacial sand and gravel. A desk-based assessment along the route of the pipeline failed to produce any evidence of previously known archaeological remains. However, given the close proximity of the pipeline route to the recently excavated Iron Age cropmark site of Seafield West (Cressey, forthcoming) situated c 50m from the northern end of the pipeline, a watching brief along the route was justified.

During the course of topsoil stripping using a mechanical excavator and hand

cleaning of the subsoil, the remains of two burnt mounds were found, both represented by deposits of fire-cracked stone and rich in charcoal. The northernmost burnt mound was found to contain a well-preserved wooden trough. Other archaeological finds, not related to the burnt mounds, included five pits, two of which contained prehistoric pottery.

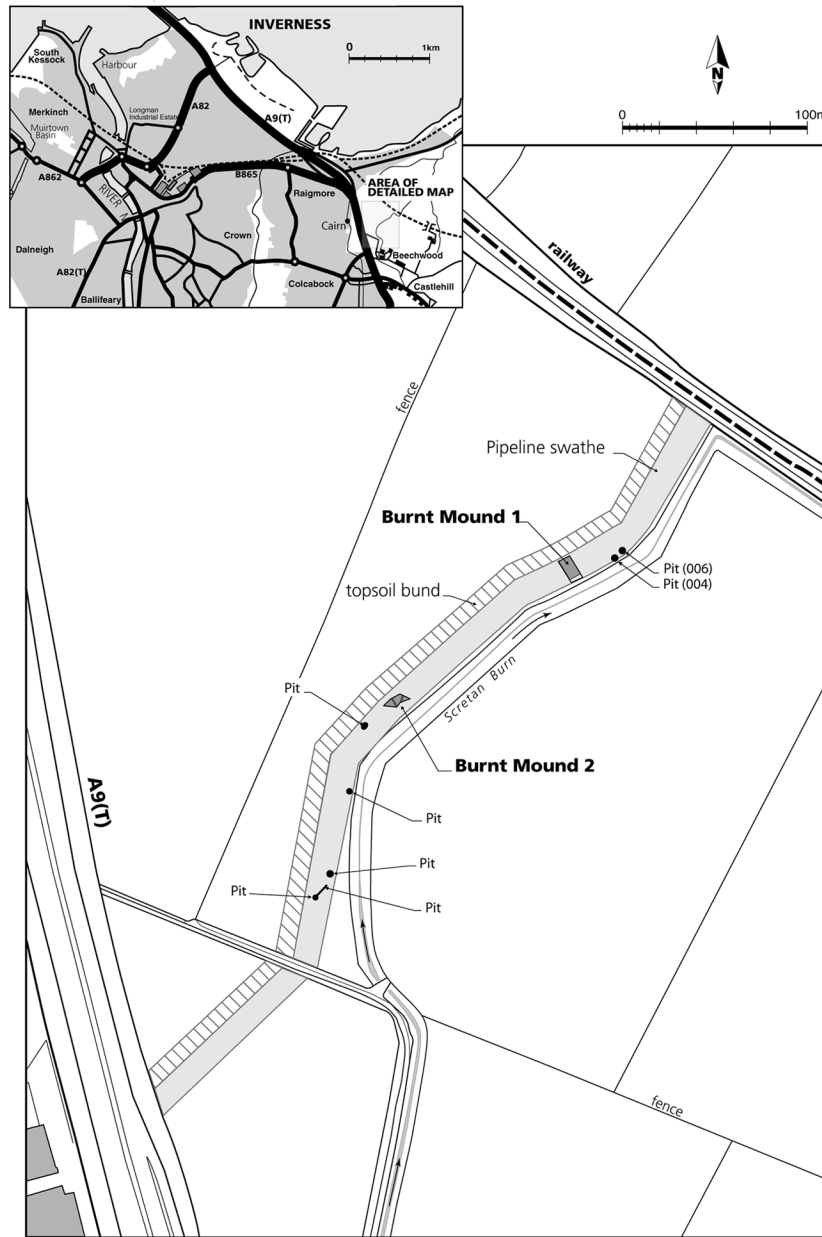
THE EXCAVATION

BURNT MOUND 1

Burnt Mound 1 was located at NH 6919 4516 on an area of level ground on the western side of the Scretan Burn. This area of land was noted to be particularly wet, evidenced by the presence of old field drains and localized flooding after heavy rain. The burnt mound was first revealed as a flattened spread of fire-cracked stones situated close to the edge of a small relict palaeo-channel. During hand cleaning of the fire-cracked stones the outline of the wooden trough (see below) was located close to the edge of the palaeo-channel (illus 2 & 3: A–B).

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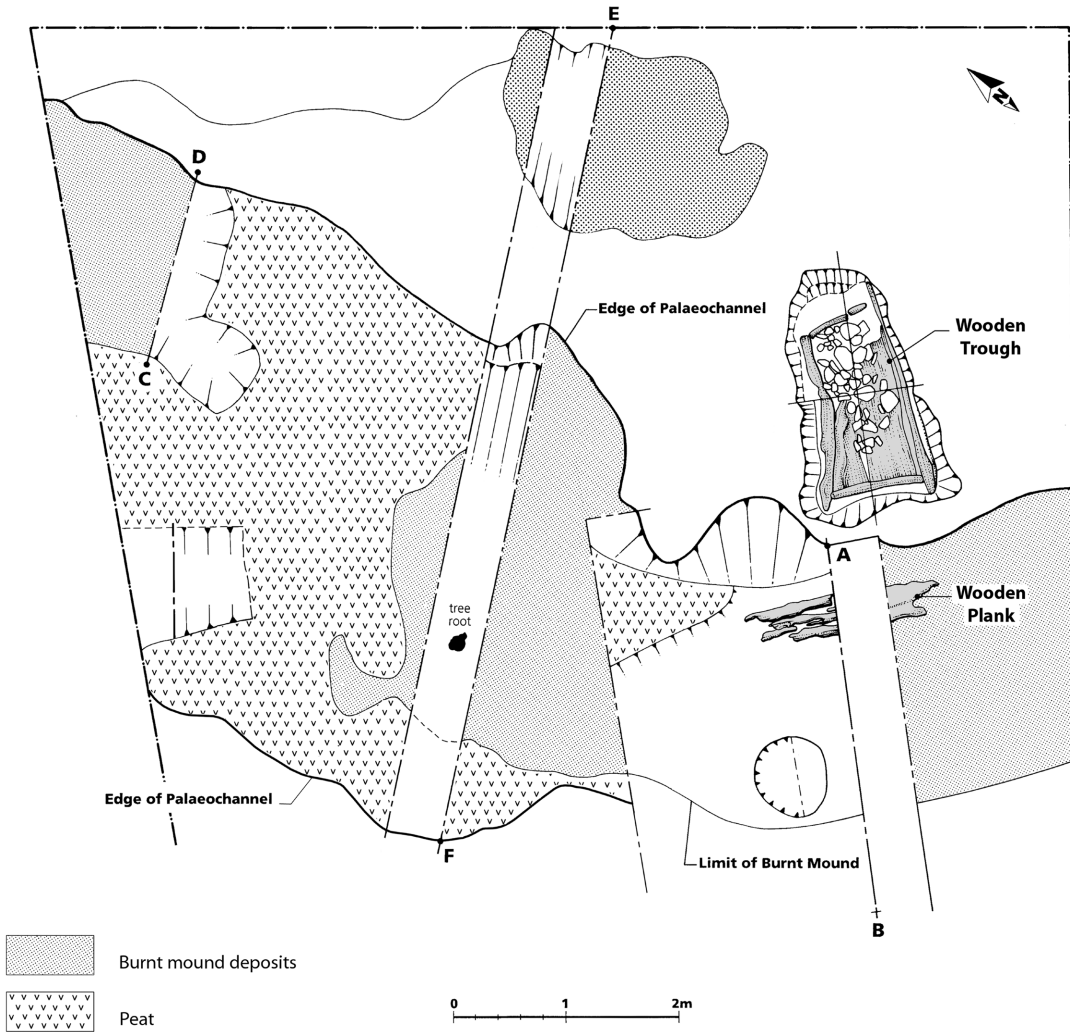
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ILLUS 1 Location map (Based on the Ordnance Survey map © Crown copyright)

The relict palaeochannel comprised an irregular depression within the sand-and-gravel subsoil running approximately SE/NW across the area examined. In one excavated cutting (illus 2: E-F) the remains of a tree-root were preserved in the gravel. In section E-F, the channel was filled with a

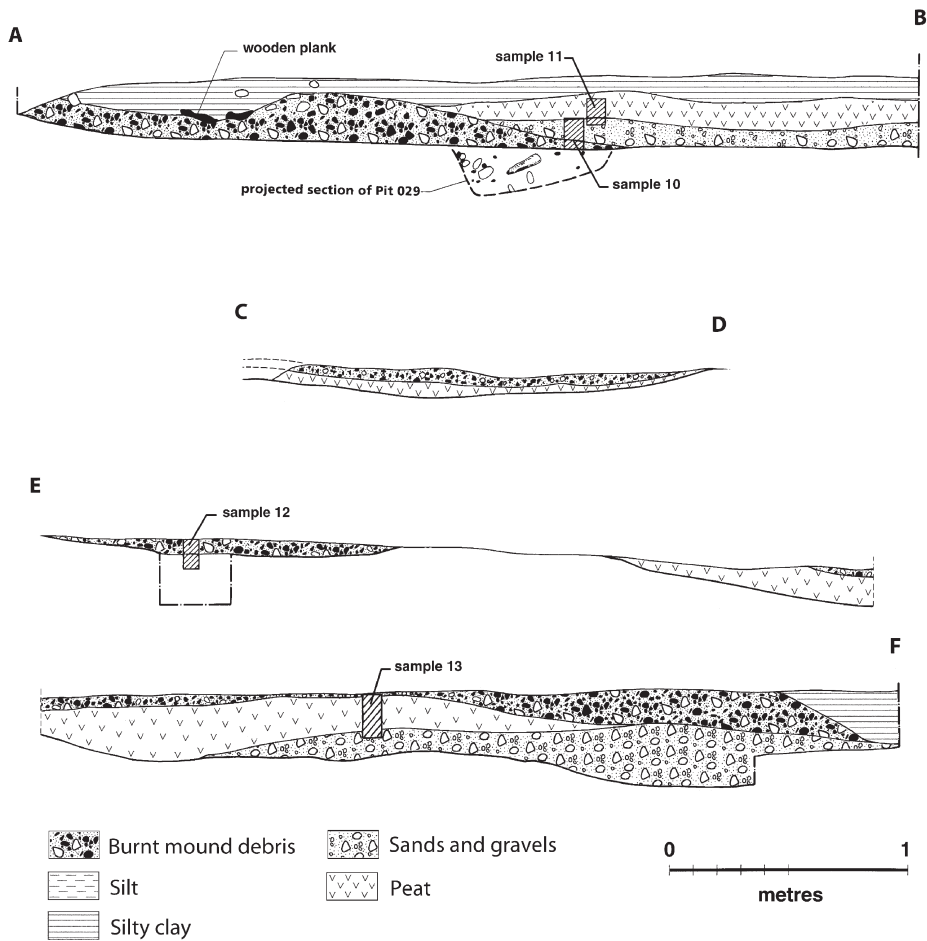
simple sequence of sands, gravels and peat. This peat gravel sequence lay beneath the burnt mound material and thus represented a pre-mound deposit. The peat was not continuous within the channel and its southern edge (illus 2) appeared to have been truncated immediately west of the trough. At



ILLUS 2 Wooden trough in relation to the adjacent palaeochannel

this point the burnt mound material lay directly upon the gravels infilling the palaeochannel. This burnt mound material was overlain in turn by inwashed gravel 0.1m deep and a second deposit of peat 0.12m deep was recorded to the south-east in section A-B (illus 3). These later layers clearly accumulated some time after the burnt mound material had been deposited, possibly suggesting that the site had been prone to increased waterlogging. The south-western edge of the burnt mound material was notably silty; indicating that some of this material had been washed downslope. A circular pit (029) measuring 0.65m in diameter by 0.15m

deep lay beneath the south-western edge of the burnt mound material cut into the base of the palaeochannel. This pit contained a concentration of large pieces of charcoal (illus 2 & 3: A-B). Located towards the north-west edge of the excavation area was an isolated spread of burnt sandstone and charcoal, measuring c 1.8m by 2m (illus 2 & 3: C-D). This material was identical to that of the burnt mound to the east and is most likely the same deposit as that infilling a slight depression within the peat. This material continued under the topsoil bund and its overall dimensions were not established. Another area of burnt stone and charcoal



ILLUS 3 A–B north-west facing section of Burnt Mound 1; C–D south-east facing section of localized burnt mound material (036); 3 E–F north-west facing section of burnt spread (038), palaeochannel (035), infill deposits and Burnt Mound 1

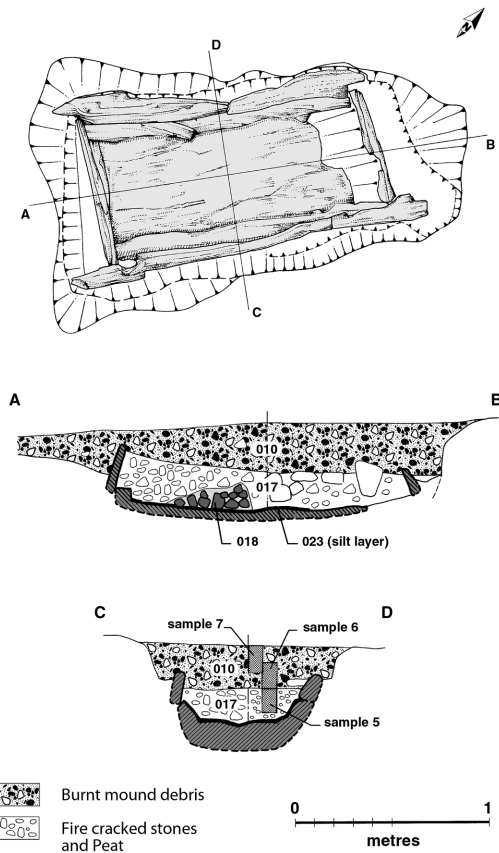
measuring c 2.4m by 1.6m was located c 1m to the north of the trough (illus 2 & 3: E–F). Removal of this deposit revealed the underlying sand and gravel subsoil had been subjected to intense heat suggesting that this area was the position of the fire associated with the heating of stones for the trough.

A piece of degraded timber, possibly the remains of a plank (illus 2), was located 1m from the south-west corner of the trough, sealed below a layer of silty clay and lying above the burnt mound debris at this point (illus 3). The wood (identified as oak) was very degraded and almost mineralized, and appeared to have been split tangentially to form a plank. The relationship between the trough and this timber is not clear. This material was not subjected

to radiocarbon dating owing to its poor state. The wood may have been part of a superstructure related to the trough; and subsequently discarded here. Alternatively the plank may be unrelated to this feature.

Wooden trough

The wooden trough (illus 4 & 5) measured 1.5m by 0.65m by 0.25m deep, and was situated immediately east of the palaeochannel (illus 2). The trough was set within a rectangular cut into the sand-and-gravel subsoil which measured 2.25m by 1.40m by 0.45m. The sides and base of the trough were constructed of oak; only the northern portion of the



ILLUS 4 Post-excavation plan and lower composite profile and sections of the trough



ILLUS 5 Post-excavation photograph of the trough

base was absent (illus 4). The trough contained four fills (010, 017, 018, 023: illus. 4). The uppermost layer (010) comprised burnt mound material of a character identical to that recorded within the adjacent spreads. This layer most likely represents part of the same spread of material that entered the trough as a result of plough action. A deposit of

peat and stones was contained within the trough beneath the burnt mound material. The presence of the peat suggests that the burnt mound material was sufficiently waterlogged after the trough was abandoned for its rapid colonization by wetland plants. Lying within the peat was a deposit of small and medium sized angular and sub-angular stones (018) that occupied the southern half of the trough base. The stones appear to be larger and have less obvious indications of thermal shock, compared to the material forming the surrounding burnt mound debris, which comprises smaller and more degraded sandstone pieces. The stones at the base of the trough are considered to be related to the last water-heating episode. A charcoal-rich silt layer (023) covered the base of the trough where the stones were absent.

The trough timbers

The trough was constructed from five separate timbers (illus 4). The base and lower sides were formed from a single hollowed-out oak trunk measuring 1.25m long, 0.67m wide with a basal thickness of 0.12m and lay directly upon the sand-and-gravel subsoil. The upper side and end panels comprised individual single, unjointed oak planks, set on end and positioned either on top of the sides of the basal log, or behind it and resting against natural subsoil. There was no evidence to suggest that the wood had been assembled using additional structural components such as pegs or dowels. There was also no evidence to suggest that the base or side panels had been used previously. The preservation of the individual components of the trough varied greatly; the northern portions of the side panel timbers and the northern end panel were the least well preserved. The northern end of the western side panel was especially degraded and heavily mineralized with a putty-like composition. The variation in preservation is most likely accounted for by fluctuations in local ground water levels that has led to poorer preservation of the wood located higher upslope, an exposed position that left the timber periodically above the ground water level.

BURNT MOUND 2

Burnt Mound 2 (illus 1) was located 110m south-west of Mound 1 and was overlain by a deposit of yellowish-grey sand and silt to a depth of 0.15m.

The vestigial remains of this mound comprised a flattened spread of burnt, heat-cracked and degraded stone. This spread measured 15m north/south by 5m east/west and was 0.18m deep. The eastern half of the burnt mound spread was similar to Mound 1 debris but comprised less stone and charcoal, and had suffered heavy truncation by modern ploughing. The burnt mound debris overlay a deposit of well-humified peat that in turn overlay sand and gravel containing occasional peat and organic lenses. No archaeological finds were recovered from this structure. Radiocarbon dating was considered not to be appropriate owing to the poor survival of the mound and the lack of associated artefacts. The site was cleaned by hand and its full extent recorded; no further work was undertaken.

ENVIRONMENTAL ANALYSES

During the course of the excavation it was decided that samples should be obtained for soil micromorphology analyses. The results of this would provide an insight as to the nature of sedimentary deposition after the trough had been abandoned. Additional samples were taken for pollen analyses from the base of the trough. If pollen spores were present then these would offer an insight into the local environment prior to abandonment. Bulk samples were also retained for beetle analyses in order to complement the pollen record. Fossil beetle parts are usually well preserved in waterlogged sediment and it was assumed that the trough could have acted as a pit-fall trap prior to its infilling. However, no identifiable material was recovered.

Bulk samples of 5–20 litres of soil were routinely collected from each secure context and processed using standard wet-sieving methods. Both flots and retents were sorted for environmental and artefactual material. Soil micromorphology samples were obtained using Kubiena tins from stratified deposits. The full report of the results of the environmental work is deposited in the archive. Soil micromorphology was undertaken to investigate the specific character of the sediments within the trough and across the burnt mound debris.

Some 3g of undiagnostic burnt bone were recovered from the burnt mound floatation samples. The highly calcified nature of the bone has led to its preservation within the burnt mound deposits. Bone was not found in any of the other contexts

across the site, due in all probability to the acidic nature of the soil.

SOIL MICROMORPHOLOGY

Adrian Tams

Soil micromorphology was confined to samples obtained from Burnt Mound 1. The aim of the analyses was to determine the soil formation processes that had operated within the trough, and to investigate the composition and formation of the adjacent burnt mound deposits. Soil thin sections were prepared by Dr E A Fitzpatrick, Department of Plant and Soil Science, University of Aberdeen according to standard techniques (Fitzpatrick 1984; 1993). The thin sections were described using the terminology and descriptive scheme proposed by Bullock et al (1985). Four undisturbed samples were collected in 8x5x5cm Kubiena tins from the burnt mound and the sediments within the wooden trough.

Burnt mound (thin section 1772, sample 13)

Analysis corroborates the field interpretation that the section A–B in illus 3 was comprised of peat that has infilled the palaeochannel. The organic components of this thin section are representative of a well-humified peat, having little or no identifiable plant remains within the 8.5cm of the thin section. The only visible indication of anthropogenic activity are three carbonized organic fragments that lie half way down and towards the base of the thin section. These range in size from 2mm to < 1mm, and it is most probable that the fragments were wind-blown onto the surface of the peat at their time of deposition and subsequently buried by the overlying material.

Wooden trough (thin sections 1771 and 1773 a & b: illus 4)

1771 (sample 7) Analysis shows that the sediment filling the trough is poorly stratified which suggests that it has been derived through the displacement of the mound material and importantly through plough activity. The material is composed dominantly of fine ash residue, which is a characteristic of burnt and well-humified peat, with large fragments of wood charcoal randomly distributed through the sediment.

1773 A & B (sample 6) The upper 6cm of section A was composed of four layers that alternate their composition between burnt mound material and well-humified peat. These layers reach a depth of 6cm and indicate successive phases of waterlogging and plant colonization. The burnt mound layers share the same characteristics as the material in sample 7, and it can be assumed that this is the source of the material. The likely mode of deposition of these sediments is flooding, as the micro-morphology indicates a gradual build up of the material in the trough. The humified peat shares the same characteristics as the material that underlies this 6cm of alternating bands and continues into thin section B.

Section B is composed of the same well-humified peat as section A, with a 2mm band of well-decomposed organic matter continuing through this thin section. Two further bands of well-decomposed organic matter lie at approximately 4cm and 6cm depths within the thin section. These bands are similar in composition to the band described earlier. These bands of organic matter are possible indicators of more stable periods during the accumulation of the trough fill. There has been waterlogging for a sufficient period to allow wetland plants to become established and upon their decay, a peat layer has formed.

Conclusion

The upper 10cm of the trough fill is composed of burnt mound material. There is no stratification within this material which would suggest a gradual build-up of sediment and the most likely conclusion

is that the upper part of the trough has received the bulk of its fill as a result of ploughing. The thin sections below this material are dominated by bands of well-humified peat, which has accumulated naturally and possibly represents successive phases of post abandonment waterlogging. Bands of well-decomposed organic matter represent three periods of peat growth.

CHARCOAL ANALYSES

Charcoal analyses were undertaken on samples obtained from the flotation of bulk samples obtained from between the fire-cracked stones in order to determine the suitability of this material for radiocarbon dating. Identification of the charcoal can also provide a useful index of the types of wood that were exploited for fuel. In the absence of a local pollen record, the charcoal provides a useful indicator of the type of woodland that was growing near the site (Cressey & Sheridan 2003).

Routine identification methods were applied to 650 fragments of charcoal measuring not less than 4–6mm in the longitudinal plane. The general condition of the charcoal examined from the burnt mound contexts showed evidence of rounding, implying that individual fragments had been moved from their original depositional environment and altered by the abrasive nature of the surrounding soil matrix (sand, gravel and burnt mound stones); consequently, the charcoal was considered to be unreliable for radiocarbon dating. However, the charcoal does provide an insight into what types of wood were exploited for fuel (Table 1).

TABLE 1
Summary table of the identified charcoal in the range of 4mm or greater

Feature	Context	Species	Weight (g)
Burnt Mound 1	010	<i>Betula</i> sp	0.48
		<i>Corylus avellana</i>	8.86
		<i>Quercus</i> sp	0.5
		<i>Pinus silvestris</i>	0.04
		Rosaceae type	0.05
		<i>Alnus glutinosa</i>	0.72
		<i>Corylus avellana</i> shell	0.35
Wooden trough	017	<i>Quercus</i> sp	0.06
		<i>Corylus avellana</i>	4.6
		<i>Betula</i> sp	0.3
		<i>Corylus</i> nut shells	0.6
Burnt Mound 2	051	<i>Quercus</i> sp	3.3
		<i>Corylus avellana</i>	0.1
		<i>Pinus silvestris</i>	0.04

Hazel dominated the samples obtained from Burnt Mound 1 that contained charcoal. Hazel nutshell fragments were also present. Oak (*Quercus* sp), birch (*Betula* sp) and lesser amounts of Pine (*Pinus sylvestris*) and Rosacea type charcoal (apple, pear, hawthorn or quince) were also represented. The wooden trough contained charcoal from oak and hazel nutshell fragments. Soil samples from Burnt Mound 2 produced oak, hazel and pine, the last represented by a single fragment. All of the wood species would have grown locally and are suitable as fuel.

Local woodland composition

While there are no regional detailed pollen studies of the Holocene vegetation history of the immediate area around Beechwood Farm (cf Tipping 1994b), cremation pits, forming part of a Bronze Age cemetery at Seafield West (Cressey & Sheridan 2003), c 1km from the site of the burnt mound, produced a similar charcoal assemblage to that identified in this study. Based on this evidence, the local woodland in the vicinity of the burnt mounds would have included stands of hazel possibly as an understorey shrub below oak. Birch is a light-demanding pioneer and would prefer more open areas such as forest glades. Pine might have been more extensive locally in more acidic areas of moorland. Based on numerous charcoal studies from Scottish contexts, pine appears to be underrepresented, and this may be due in part to its high resin content and its ability to burn hotly and rapidly (Taylor 1981) lowering its potential for conversion to charcoal. Alder would have grown alongside streams and areas of the flood plain. Hazel nuts may have been exploited for food suggesting that mature stands of hazel might have been a major component of the local woodland during the period of use of the mounds. While all of the tree and shrub taxa represented as charcoal are native to Scotland, no natural woodland remains today in the area of Beechwood Farm, due to past and recent agricultural and grazing practices.

POLLEN ANALYSIS

Pollen analysis was undertaken on a sample taken from the silt layer overlying the base of the wooden trough. The aim of this work was to assess the presence of pollen types associated with the palaeo-hydrology during the abandonment phase of the trough.

Methods

Standard pollen preparations were applied using the method devised by Moore et al (1991). Pollen was identified using an Olympus BX40 light microscope at x400 magnification with critical identifications made at x1000 and assisted by a pollen reference collection and photomicrographs (Moore et al 1991).

In order to provide information about the depositional environment of the trough, each grain was assessed for its state of preservation using the five categories; normal, broken, crumpled, corroded and degraded (Berglund & Ralska-Jasiewiczowa 1986; Tipping 1987). Grains that are broken and/or crumpled are likely to indicate damage due to mechanical processes such as through abrasion during transport. Pollen is best preserved in water-logged (anaerobic) and acidic conditions and so corrosion and degradation suggest chemical processes whereby pollen is 'digested' by microbial activity under drier aerobic conditions.

Results

The preservation of the pollen was exceptionally good with a Total Land Pollen (TLP) count of 300 pollen grains. The arboreal pollen is dominated by *Alnus glutinosa* (alder) which attained 42% of the TLP. Both *Betula* (birch) and Coryloid type pollen (hazel) are lower with 8% and 9% respectively. Poaceae pollen (grasses) are present making up 26% of the TLP. Herbaceous pollen is very low at below 2% TLP and is too low in frequency to make any assumptions regarding nearby herbaceous ground cover. Microscopic charcoal is frequent with the majority of this material falling within the 50–100µm size category.

Interpretation

The abundance of alder pollen within the samples is not surprising given the troughs close association

with the relict palaeochannel. It is highly probable that alder trees were well established along this watercourse. Alder is a tree that thrives along river margins and particularly where soils are predominantly waterlogged or prone to seasonal flooding. Birch and hazel pollen is represented and these trees were present locally, which is in accord with the charcoal record. Both trees would have thrived on the dryer soils close to the site. A fragment of hazel charcoal recovered from the base of the trough produced a date of 3660 ± 35 uncal (2200 cal BC see Table 2).

PLANT MACRO-FOSSIL REMAINS

Mike Church

The flots from 12 wet-sieved samples were assessed for archaeobotanical potential.

Methods & results

The bulk samples were processed using a flotation tank (Kenward et al 1980) with the residue held by a 1.0mm net and the flot caught by 1.0 and 0.3mm sieves respectively. All the flots and residues were dried and assessed using low-powered stereo/binocular microscope at x15–x80 magnification. The flots were assessed using a semi-quantitative scale of presence and abundance for the main classes of archaeobotanical remains.

The samples can be divided into two sets; samples with charcoal dominating and those samples from the trough that contained uncarbonized plant macrofossils. The charcoal-rich samples contained few carbonized plant macrofossils apart from a few badly-preserved barley grains (*Hordeum* sp) and wild seeds in Samples 002 (010 Burnt Mound Trough fill) and 019 (Burnt Mound 2) and a few carbonized hazelnut fragments (*Corylus avellana* L) in Sample 002. Some of the samples also contained carbonized fungal sclerotia that could have been incorporated into the assemblage through the selection of fallen timber and wood for fuel. The low numbers of these remains and their poor preservation means further analysis would be of little interpretative value. The five samples that contained a mix of carbonized and uncarbonized plant macrofossils all came from within or adjacent to the trough. It is clear from the wet-sieved flots that the uncarbonized assemblage consists largely of the stems of grasses (*Poaceae* undiff) with a few

pieces of bracken (*Pteridium* sp) and heather (*Erica/Calluna* sp). A few seeds and some uncarbonized wood of other wild species were also noted. The remains of *Hordeum* sp point to cereal cultivation in the vicinity of the site. The wild seed component within the assemblage possibly relates to the deliberate burning of discarded waste from crop cleaning. The presence of bracken and heather implies a rather open marginal environment, possibly in the form of small glades in areas where woodland cover was not extensive.

POTTERY ANALYSES

Catherine McGill

The pottery from Burnt Mound 1

Two body sherds and 18 fragments of pottery were recovered from context 010, the uppermost fill within the wooden trough (illus 4). These were all made of the same fabric (Fabric 1), and almost certainly derive from a single vessel. The fabric is fine and slightly micaceous, is very pale brown throughout (with the exception of two fragments that display a pale grey core) and is fairly hard with a slightly laminated fracture. It is tempered with a moderate quantity of poorly sorted angular quartzite chunks (1–6mm across) that occur in patches. This thick-walled vessel was handmade and probably coil-constructed. The surface is fairly even, although no wet-smoothing is apparent. Two fragments have slight traces of sooting on the outside that could relate to the firing, use or destruction of the vessel, and are therefore uninformative as to the vessel's function. No diagnostic sherds were recovered, but the fabric and the thick vessel walls would not be out of place in a prehistoric context.

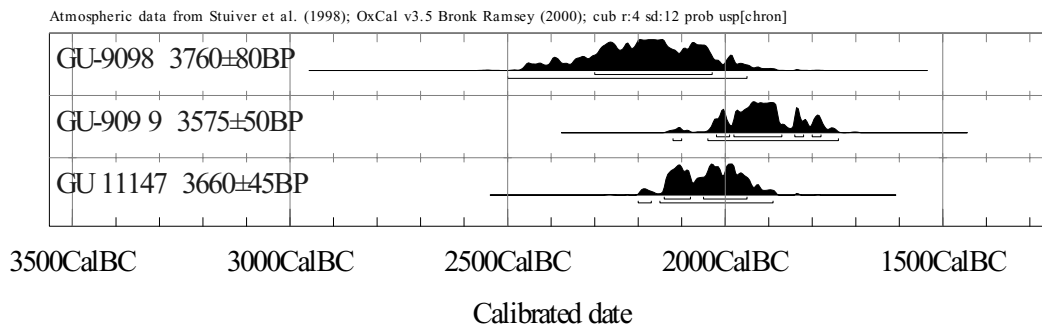
RADIOCARBON DATING

Two samples of wood from the trough, and charcoal obtained from the primary fill, were submitted to the Scottish Universities Research Reactor Centre (SURRC) for AMS radiocarbon dating. The dates cited are at 2 sigma (Table 2). The calibrated age ranges are determined from the University of Washington Quaternary Isotope Laboratory, Radiocarbon Dating Program Rev 4.0 1998.

The late third millennium BC dates obtained from the side panel and the sample taken from the base overlap at the 2 sigma range only when

TABLE 2
Radiocarbon dates from Beechwood Farm

Sample	Context	yrs BP	1 sigma	2 sigma	Delta ¹³ C
AA-39811 (GU-9098)	021 Oak side panel	3575 ± 50	2010–1829 BC	2110–1751 BC	-26.6%
AA-39811 (GU-9099)	022 Oak base timber	3760 ± 80	2291–2036 BC	2460–1942 BC	-26.5%
GU-11147	Charcoal 023 trough fill	3660 ± 45	2050–1950 BC	2150–1890 BC	-27.1%



ILLUS 6 Calibrated radiocarbon ages

calibrated. A Chi-squared test was run to determine if the dates were statistically the same. The test failed, showing that the dates are indeed different and that the timbers exhibit different radiocarbon dates. The charcoal sample taken from the fill of the trough is apparently older than the date obtained from the side panel. This suggests that the charcoal is residual and hence the use of a priori stratigraphic relationship is not possible. The best that can be suggested is that it is likely to be of a similar date to the trough and possibly associated with its use.

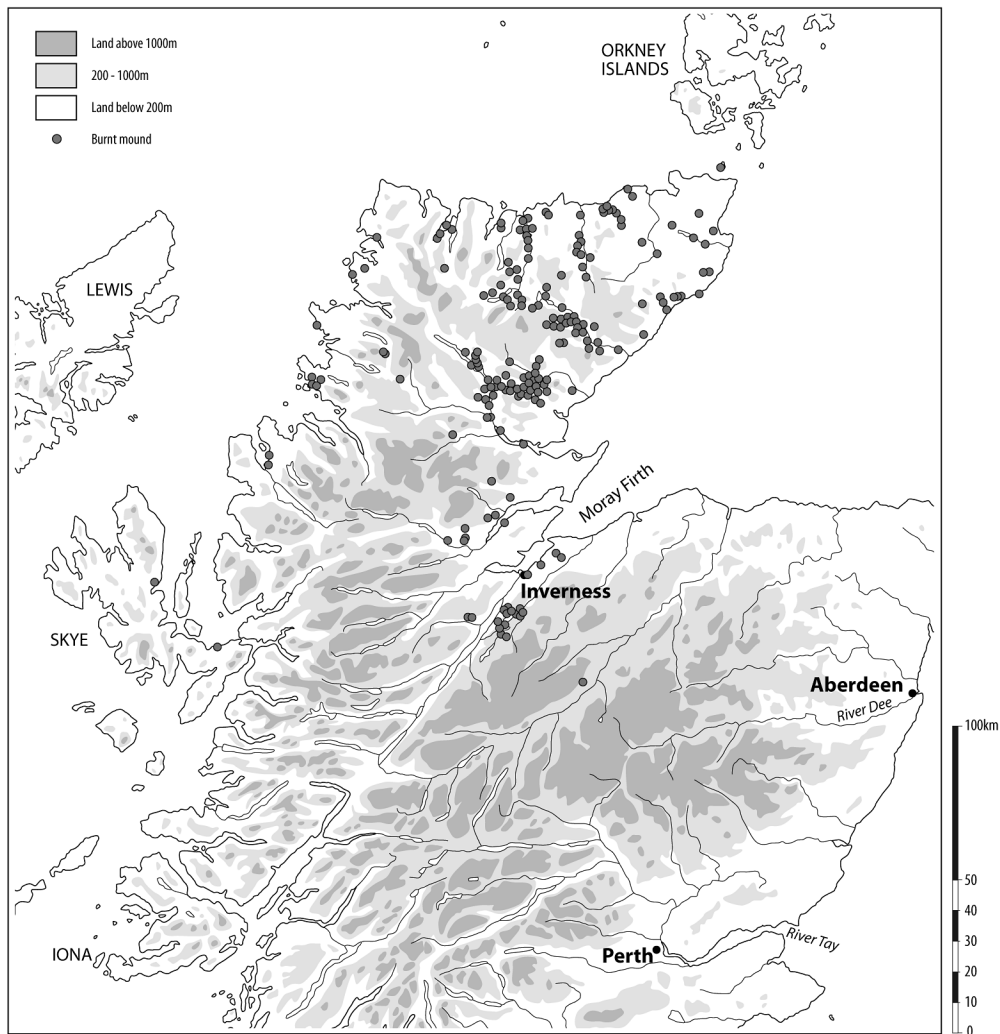
On the basis of the radiocarbon date range of 2110–1751 cal BC the trough falls within the Early Bronze Age and is consistent with several radiocarbon dates for burnt mounds recorded elsewhere in Scotland. Similar date-ranges are recorded on four burnt mounds at Machrie North on the Isle of Arran, (2560–1530 cal BC: Barber 1990, 102, Table 4). Early Bronze Age radiocarbon dates with corresponding date-ranges are more numerous in Ireland where more radiocarbon dates have been obtained from wooden troughs below burnt mounds (cf Brindley & Lanting 1990, fig 25).

DISCUSSION

Burnt mounds are possibly one of the most numerous of the prehistoric features in the

Scottish landscape. Over a decade ago Halliday (1990, 60) noted that approximately 800 burnt mounds were then known in Scotland. Subsequent discoveries recorded in the NMRS and *Discovery and Excavation in Scotland* (1991–2000) now take the total well over 1000. The Sites and Monument Record at Highland Council holds 265 individual records of burnt mounds for the mainland part of Highland (Sutherland 182; Caithness 37; Inverness 28; Ross & Cromarty 18). These are widely distributed (illus 7). While the greatest number is in Sutherland, clusters of recorded burnt mounds are also present in Easter Ross and to the south of Inverness.

There has been a wide debate on the function of burnt mounds; the generally accepted explanation is that these sites were used primarily to heat water. Barber (1990, 101) argued that there was no reason not to assume that some burnt mounds could have been multifunctional and used for bathing, washing and as sweathouses alongside a wide range of other semi-industrial functions of which we have as yet little indication. The use



ILLUS 7 Burnt mound distribution in Highland (Based on the Ordnance Survey map © Crown copyright)

of ethnographic parallels by Barfield & Hodder (1987) and more recently by Armit & Braby (2002) provides us with another important perspective for the interpretation of burnt mound sites where evidence of structural remains survives.

The most common feature on burnt mound sites is the presence of a local supply of water. Recent excavations have clearly shown that in some circumstances, artificial channels or modifications to natural watercourses provide positive evidence for water procurement. The

containment of water appears to have been an essential requirement related to the burnt-mound process and was achieved either by the use of timber, hurdle panels, or stone slabs, as was the case at Gallow Hill, Girvan (Donnelly 1999). In its simplest form a cooking trough may require nothing more elaborate than a hole dug into a clay subsoil. Clay was used as a liner in a series of troughs at Gallow Hill and shows that if the subsoil was impermeable with a high clay content, then there was little need for more elaborate containers. The excavation

of a burnt mound site at Cleuchbrae, near Johnstonebridge in Annandale (Duncan 2001) produced a trough lined with the remains of a possible canoe which was found to be exceptionally well preserved. Although such preservation is rare, a number of troughs with similar linings have been found elsewhere in Scotland, as at Mound 1, Dervaird in the East Rhins of Galloway which had a similar layout to the Cleuchbrae trough, albeit with a smaller oak lining (Russell-White 1990). In the absence of timber for trough construction, stone and peat would have been used. This was the case at Tangwick on Shetland, where Moore & Wilson (1999) identified a stone-lined trough with a sub-compartment. The trough was associated with a specialized, non-domestic structure of Bronze Age date.

The use of timber as a lining material may be more common than the archaeological record would suggest, but the lack of published Scottish material and the problems of poor preservation make it impossible as yet to quantify the frequency of wooden troughs even though burnt mound sites are common.

Within the excavated area of the pipeline corridor near Beechwood Farm there was no archaeological evidence to suggest the presence of occupational structures related to the mound. However as with numerous other Scottish examples, Burnt Mound 1 and its trough were associated with a watercourse which survived as a peat filled palaeochannel. The soil micromorphology study carried out on samples from the trough show that, after abandonment, the trough became inundated with water from the burn or the land immediately adjacent and remained waterlogged allowing formation of peat within the trough. Could it be the case that increased flooding led to the abandonment of the site?

The charcoal recovered from the site shows that branchwood from a variety of trees was gathered for fuel. The charcoal provides indirect evidence that hazel was a major component of the local woodland. The timber used in the construction of the trough also suggests that

mature oak was readily available for exploitation in the vicinity of the site. Pollen analyses strongly suggests that the trough site was situated on the edge of a wetland environment.

The excavation of the two burnt mounds has provided additional evidence for early Bronze Age activity between Beechwood Farm and the known concentration of Bronze Age burial and activity at nearby Seafeld West (Cressey & Sheridan 2003) and provided the first wooden trough to date in Highland Region.

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REFERENCES

- Armit, I & Braby, I 2002 'Excavation of a burnt mound and associated structures at Ceann nan Clachan, North Uist', *Proc Soc Antiq Scot*, 132, 229–58.
- Barber, J 1990 'Scottish burnt mounds: variation on a theme', 98–104.
- Barfield, L & Hodder, M 1987 'Burnt mounds as saunas, and the prehistory of bathing', *Antiquity*, 61, 370–9.
- Berglund, B E & Ralska-Jasiewiczowa, M 1986 'Pollen Analyses and Pollen diagrams', in Berglund, B E (ed) *Handbook of Holocene Paleocology and Palaeohydrology*, 455. Chichester.
- Buckley, V (ed) 1990 *Burnt Offerings, International Contributions to Burnt Mound Archaeology*. Dublin.

- Bullock, P, Federoff, N, Jongerius, A, Stoops, G & Tursina, T 1985 *Handbook for Soil Thin Section Description*. Wolverhampton.
- Brindley, A & Lanting, A N 1990 'The dating of fulachta fiadhs' in Buckley, V (ed), 54–5.
- Cressey, M forthcoming 'The excavation of a later prehistoric cropmark site at Seafield West, near Inverness, Highland'.
- Cressey, M & Sheridan J A 2003 'The excavation of a Bronze Age cemetery at Seafield West near Inverness, Highland', *Proc Soc Antiq Scot*, 133, 47–84.
- Donnelly, M 1999 *Gallow Hill, Girvan Sewer Pipeline Corridor*. Unpubl report.
- Duncan, J S 2001 'The excavation of burnt mound at Cleuchbrae, Johnstonebridge, Annandale, Dumfries and Galloway', *Trans Dumfries Galloway Natur Hist Antiq Soc*, 6, 1–26.
- Fitzpatrick, E A 1984 *Micromorphology of Soils*. London.
- Fitzpatrick, E A 1993 *Soil Microscopy and Micromorphology*. London.
- Halliday, S P 1990 'Patterns of fieldwork and the distribution of burnt mounds in Scotland', in Buckley, V (ed), 98–104.
- Kenward, H K, Hall, A R & Jones, A K G 1980 'A tested set of techniques for the extraction of plant and animal macrofossils from waterlogged archaeological deposits', *Science Archaeol*, 22, 3–15.
- Moore, P D, Webb, J A & Collinson, M E 1991 *Pollen Analysis*, 2nd edn. Oxford.
- Moore, H & Wilson, G 1999 'Food for thought: a survey of burnt mounds of Shetland and excavations at Tangwick', *Proc Soc Antiq Scot*, 129, 203–37.
- Russell-White, C 1990 'The East Rhinns of Galloway', in Buckley, V (ed), 70–81.
- Stuiver, M & Kra R S 1986 *Radiocarbon*, 28 (2B) OxCal v3.
- Taylor, M 1981 *Wood in Archaeology*. Aylesbury.
- Tipping, R 1987 'The origins of corroded pollen grains at five early post-glacial sites in western Scotland', *Rev Palaeobotant Palynology*, 35, 151–61.
- Tipping, R 1994 'The form and fate of Scotland's woodlands', *Proc Soc Antiq Scot*, 124, 1–54.

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