

# Excavations at a Multi-period Site at Greenbogs, Aberdeenshire, Scotland and the Four-post Timber Architecture Tradition of Late Neolithic Britain and Ireland

By GORDON NOBLE<sup>1</sup>, MOIRA GREIG<sup>2</sup>, and KIRSTY MILLICAN<sup>3</sup>

with contributions by SUE ANDERSON, ANN CLARKE, MELANIE JOHNSON,  
DAWN MCLAREN and ALISON SHERIDAN

*This report outlines the unexpected discovery of a group of Late Neolithic structures at Greenbogs, Monymusk in Aberdeenshire, along with a series of later prehistoric features in the mid-1990s. Recent radiocarbon dating shows that two four-post timber structures found here date to the period 2890–2490 cal BC. These were found in association with a range of other features including an oval structure and diffuse areas of burning. The closest parallels for the four-post structures can be found in a slowly growing body of Late Neolithic timber structures, some being interpreted as roofed dwellings and others as roofed or unroofed monuments. This article places the Greenbogs structures in their wider context, identifies a number of unexcavated parallels in the aerial record and addresses the nature of the four-post structures found across Late Neolithic Britain and Ireland and suggests that four-post structures were a more common element of Late Neolithic architecture than previously identified. A common building type appears to have been shared across large areas of Britain and Ireland in a variety of contexts, from the seemingly mundane to the more ‘charged’, as part of elaborate monument complexes. The later prehistoric features identified at Greenbogs include a concentration of Middle Bronze Age features including graves containing cremated human bones, one with an upright urn, and a number of Iron Age pits and other features.*

The multi-phase site at Greenbogs was discovered through fortuitous circumstances. The landowner, Sir Archibald Grant of Monymusk, noticed small dark circles in the subsoil during topsoil stripping to infill a nearby ditch in February 1995, and recognising their archaeological origin, he contacted Aberdeen Archaeology Service. The topsoil stripping uncovered a large number of features and opportunity was taken

to complete a full survey and a small evaluative excavation was undertaken to obtain some chronological control. The survey and excavation were directed in early 1995 by one of the authors (MG). After the evaluative work had been completed and following discussion with the landowner, the site was reinstated to preserve the remaining features and all gravel extraction and infilling operations ceased.

The site lies in central Aberdeenshire in north-east Scotland on the 90 m contour on a river terrace of the Don, on a series of low gravel knolls that stretch north–south for around 200 m, overlooking a broad bend in the river (NGR NJ 680 161) (Fig. 1). In Area I the gravel stripping revealed a multitude of pits, two ring-ditches, two possible timber structures, and a small number of deposits of cremated bone

<sup>1</sup>Department of Archaeology, University of Aberdeen, St Mary’s, Elphinstone Road, Aberdeen AB24 3UF

<sup>2</sup>Planning & Environmental Services, Aberdeenshire Council, Woodhill House, Westburn Road, Aberdeen AB16 5GB

<sup>3</sup>Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS), John Sinclair House, 16 Bernard Terrace, Edinburgh EH8 9NX

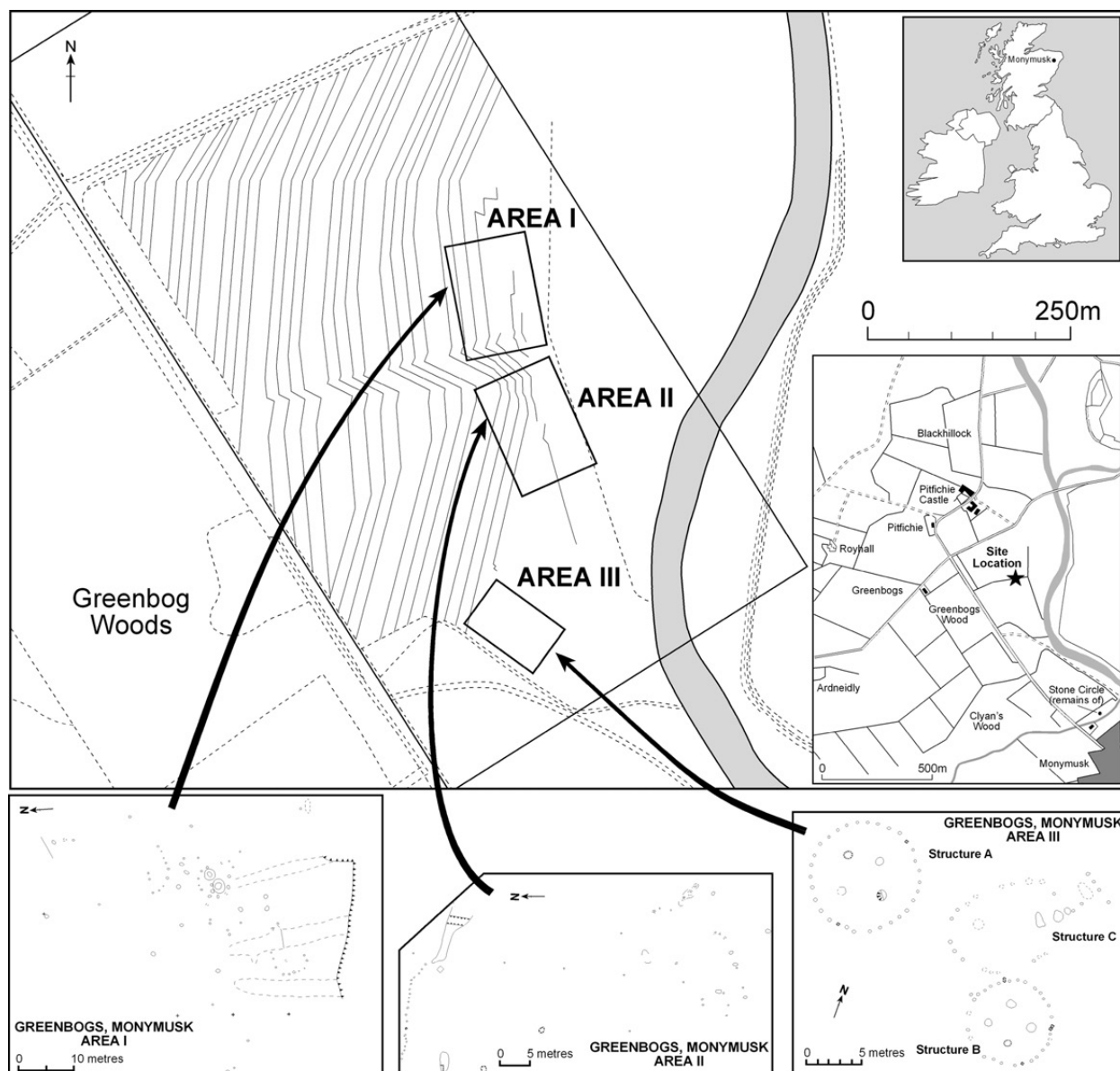


Fig. 1.  
Location of Greenbogs (drawn by Alison Sandison)

(Fig. 2). Radiocarbon dates suggest that at least some of this activity dates to the Middle Bronze Age. In Area II a section of a large ditch over 2 m wide and at least 7 m long was identified, associated with Neolithic pottery (Fig. 3). Extending from the terminal of the ditch was a palisade. Two pits dating to the later 1st millennium BC were also identified in this area, along with a scatter of other features. The

most coherent features were located on the most southerly of the three gravel knolls in Area III (Fig. 4). Features identified included what we now know are two Late Neolithic timber structures, but during excavation were identified as Iron Age round-houses. Part of an oval timber structure was found in association with these. There were also a number of scattered pits over the area (see below).

## EXCAVATION RESULTS

### *Area I cremation cemetery, pits, ring-ditches, and timber structures*

A small group of features was excavated in Area I (Fig. 2), two of which proved to be Middle Bronze Age deposits of cremated bone (AA and AB), with two other Middle Bronze Age features (pit 42 and ring-ditch 39) and one pit (AF) that may have been a cooking pit; its date is discussed below.

#### PIT AND URN AA

This small pit was 0.30 m in diameter and 0.20 m deep, with a very dark, charcoal-rich fill. After an initial clean the full diameter of a largely intact small pottery urn was revealed within the pit. The pot<sup>1</sup> (Fig. 8) had been deposited upright and contained the cremated remains of a juvenile (Anderson below). Alder charcoal from the pit has been dated to 1400–1120 cal BC (SUERC-28261; Table 1).

#### PIT CONTAINING CREMATED BONE AB

This feature, *c.* 12 m south-east of AA, showed as a small roughly square area (diameter *c.* 0.25–0.3 m, depth 0.2 m) of very black, slightly sticky soil with cremated bone in the centre. The bone was from a young adult or older sub-adult human, possibly male (Anderson below). The feature has been dated to 1430–1210 cal BC (SUERC-28262; Table 1). The upper fill of AB contained fragments of a small copper ring (McLaren below).

#### OTHER PITS

Pits AC and AE were two similar, undated pits with no finds in the vicinity of AB. Both were 0.4–0.45 m in diameter, AC with a dark clayey fill and AE with dark charcoal-rich fill. Pit AF, to the east of these, was large (0.91 x 0.88 m; depth 0.13 m) and marked by a distinct concentration of fire-cracked stones overlying a group of 16 pottery sherds of two different fabrics, from an estimated four pots; one sherd decorated with diagonal incised grooves. The pottery may date to the Bronze Age (see Johnson and Sheridan below). The matrix was a dark clayey soil. The pit included burnt bone (see Anderson below). The fill of fire-cracked stone and pottery may suggest this was a cooking pit. Pit 42, towards the eastern half of the trench, was large and circular, 0.8 m in diameter. Alder charcoal recovered from the fill provided a Middle Bronze Age date (SUERC-28263 1490–1260 cal BC; Table 1). The pit included very small amounts of burnt bone (Anderson below).

#### RING-DITCHES 39 AND 40

Two very small ring-ditches lay close together in the eastern part of Area I. One of these (39), 2.10 x 2.50 m in maximum size, appeared to have stones set into an 0.18 m deep ditch. The other (40) was 2.10 x 1.90 m with its ditch

only 0.06 m deep. A series of small pits lay round both ring-ditches. Alder charcoal recovered from a small sondage through ring-ditch 39 produced a Middle Bronze Age date (1460–1310 cal BC, SUERC-33433; Table 1), roughly contemporary with the cremation features AA and AB.

Many further features were evident in Area I after further topsoil stripping on the knoll and were planned, but not excavated. These included two arcs of post-holes that may represent timber structures (structures I and II), possibly the remains of oval buildings. In addition a range of other pits, post-holes and other features make it clear that there was extensive activity on this knoll, which may relate to the dated Middle Bronze Age features. Only further fieldwork would clarify their nature and chronology.

### *Area II Ditch, palisade and pits*

On the central knoll the remains of a timber palisade or pit alignment, a substantial ditch and a number of pits were recorded after the topsoil stripping (Fig. 3).

#### PALISADE/PIT ALIGNMENT

This consisted of a curved line of pits or post-holes, forming part of a palisade or pit alignment, running east–west then curving to the south, above the river. One feature of the alignment (8) was excavated. This had a fairly shallow profile (0.38 x 0.44 x 0.25 m deep) with no definite traces of a post-pipe (Fig. 4). Unfortunately no suitable dating deposits were encountered. The only find was a flint chunk found adjacent to one feature, but the alignment terminated in association with a large ditch (AH) containing Neolithic pottery, possibly suggesting that the two features may be contemporary or at least built in reference to one another.

#### DITCH AH

This ditch, extending to the edge of the terrace, was adjacent to the palisade/pit alignment. Potsherds and flint were found on the surface prior to excavation. A small sondage was cut across this ditch and revealed a steeply sloping north side with a shallower sloping profile on the east (Fig. 4). Various fills were identified, including a basal gravel fill. Nearly all the other fills comprised dark brown, almost sterile soil, apart from a few charcoal flecks concentrated in deposits 022 and 023 in what may be a recut. Sixty-three sherds of prehistoric pottery from 23–26 vessels were recovered from fills 021, 017, and the surface of 018, along with a number of unstratified finds from around this feature. This pottery has been identified as mostly belonging to the ‘modified Carinated Bowl’ tradition, of Early–Middle Neolithic date, with three sherds from the top of the fill and next to AJ probably representing Middle Neolithic Impressed Ware, and one sherd (P25) probably of Late Neolithic Grooved Ware (Johnson & Sheridan below).

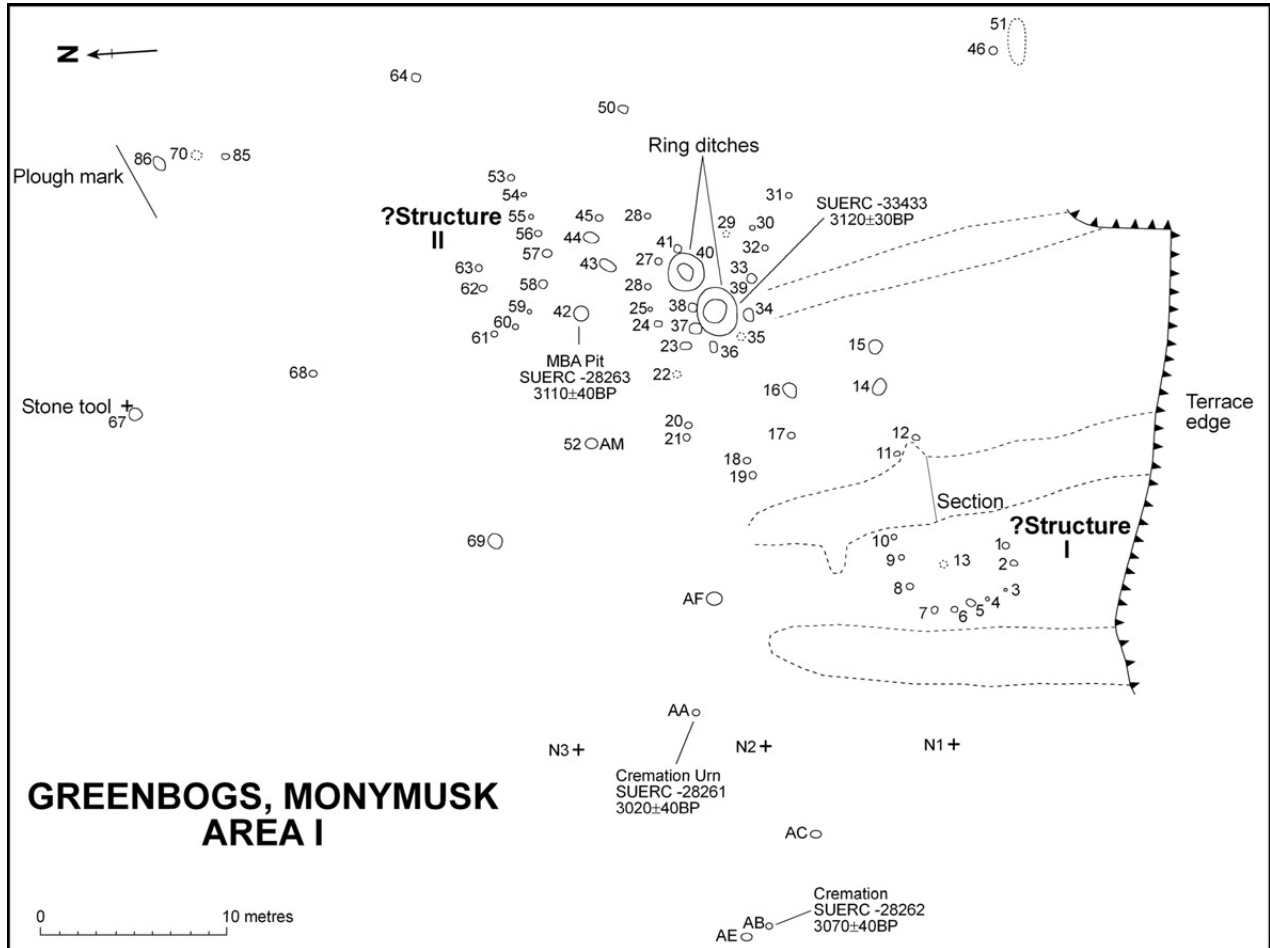


Fig. 2.  
Area I plan (drawn by Alison Sandison)

PITS

Pit AG was the largest pit in Area II. The upper fill consisted of dark soil with traces of burning and large, *in situ* burnt timbers up to 0.08 m thick near the base of the upper fill. Beneath this was a *c.* 0.05 m thick layer of dark, midden-like material (028) from which came a small flint flake. The lowest fill consisted of a grey, loose soil layer *c.* 0.1 m thick. Radiocarbon dating of lower fill 028 produced two dates in the first millennium BC (750–400 cal BC, SUERC-33431, on oak charcoal, and 380–100 cal BC, SUERC-28264, on alder charcoal; Table 1). It seems likely that the oak date suffers from an ‘old wood’ effect. Pit AJ was circular in plan, 0.97 x 1.17 m by 0.20 m deep; its upper fill consisted of greyish-black earth with small stones, and the lower fill of fairly fine black ash with charcoal fragments. Two radiocarbon dates from the second half of the 1st millennium cal BC were obtained (410–210 cal BC, SUERC-33432, and 400–200 cal

BC, SUERC-28265, both on oak charcoal; Table 1). Once more, it may be that an ‘old wood’ effect needs to be taken into consideration in relation to the dating of this feature. Pit AK was a large, undated, sub-circular pit with dark, charcoal-rich fill, 0.80 x 1.01 m across. A number of other pits (AL–AZ) were plotted in Area II, but left unexcavated. These formed no coherent pattern and included large examples (eg, AL: 2.3 x 1 m) and smaller features which may be post-holes (eg, AO, AN, AS, and AT). Full details of sizes of these features are available in the site archive.

Area III Four-post structures and oval building

The most substantial and coherent archaeological remains were recorded on the most southerly knoll (Fig. 5). The excavated evidence in Area III indicates

TABLE 1: RADIOCARBON DATES FOR GREENBOGS

Lab No	Material	Context / Sample	Radiocarbon Age (BP)	$\delta^{13}\text{C}$ relative to VPDB	Calibrated date range BC (95% confidence)
SUERC-28269	Charcoal: <i>Alnus glutinosa</i>	Four-post structure B: B4-065	4165±40	-24.1	2890–2620
SUERC-20998	Charcoal: <i>Alnus glutinosa</i>	Four-post structure A: A4-051	4100±40	-27.3	2880–2490
SUERC-33430	Charcoal: <i>Alnus glutinosa</i>	Four-post structure A: A26	4125±30	-23.6	2870–2570
SUERC-28263	Charcoal: <i>Alnus glutinosa</i>	Pit F42: 105	3110±40	-26.1	1490–1260
SUERC-33433	Charcoal: <i>Alnus glutinosa</i>	Ring-ditch F39: 100	3120±30	-27.4	1460–1310
SUERC-28262	Charcoal: <i>Alnus glutinosa</i>	Pit with cremated bone AB: 003	3070±40	-27.0	1430–1210
SUERC-28261	Charcoal: <i>Alnus glutinosa</i>	Cremation urn AA: 001	3020±40	-26.0	1400–1120
SUERC-33431	Charcoal: <i>Quercus</i> sp.	Pit AG: 028	2425±30	-26.6	750–400
SUERC-28264	Charcoal: <i>Alnus glutinosa</i>	Pit AG: 028	2175±45	-26.2	380–100
SUERC-33432	Charcoal: <i>Quercus</i> sp.	Pit AJ: 026	2285±30	-26.4	410–210
SUERC-28265	Charcoal: <i>Quercus</i> sp.	Pit AJ: 026	2245±40	-26.3	400–200

that three timber structures stood on this southern knoll, of which two (Structures A and B) were circular and the third (Structure C), oval. The radiocarbon dates for the two circular structures, all from short-lived species charcoal, indicate a date in the first half of the 3rd millennium BC (see below).

#### STRUCTURE A

This structure had an internal diameter of around 9.5 m and was defined by an outer setting of 34 post-holes, averaging 0.25–0.3 m in diameter, spaced *c.* 0.5 m apart. An entrance to the structure appeared to lie in the south-east with a small break in the outer setting just over 1 m wide. Within stood an internal setting of four large post-holes defining the corners of a square, with, on average of *c.* 3.5 m between the centres of the four posts. The fills of the large post-holes consisted of a very dark ash-like matrix in the centre with gravel around, suggesting posts that had been gravel-packed and had rotted *in situ* (Fig. 6). Post-hole A3 of the internal four-poster had a clear post-pipe in evidence, and there were possible traces of a post-pipe in A1 as well. No post-pipes were evident in the external pits, but these were very heavily truncated. In total only five of the post-holes of the structure were sampled, with charcoal from post-holes A4 and A26 dated (2880–2490 cal BC, SUERC-20998 and 2870–2570 cal BC, SUERC-33430 respectively; Table 1).

#### STRUCTURE B

This structure lay *c.* 10 m to the east of A and was slightly smaller, with an internal diameter of *c.* 7.2 m. This structure was defined by an outer setting of around 31 post-holes, averaging 0.25 m in diameter and generally spaced *c.* 0.45 m apart. An entrance gap was evident on the south-west side; *c.* 1.7 m in width (wider than the entrance to Structure A). This structure also had an internal four-post setting, in this case of slightly smaller dimensions, with, on average, *c.* 2.5 m between the centres of the four posts. One internal and five exterior posts were excavated. None of these showed evidence of post-pipes, but they had the same general profile of those in Structure A, with a much deeper and substantial profile to the internal posts, and shallow exterior post-holes. Post-hole B4 of the internal four-post setting was shown to have a diameter of 0.43 m and a depth of 0.6 m, and its stepped profile is suggestive of having held a timber that had perhaps been dug-out to remove or the post had been re-set at some point in its life-history (Fig. 7). The outer setting of posts had an average depth of 0.15 m and, in places, there appeared to be a doubling of posts, such as B12/B12a and B21/B21a, although in the latter case these could relate to Structure C. In both Structure A and B the axis of the four-post settings respects the entrance arrangements of the outer post-hole settings, suggesting that they are related building events. Charcoal from post-hole B4 was dated to 2890–2620 cal BC (SUERC-28269; Table 1).

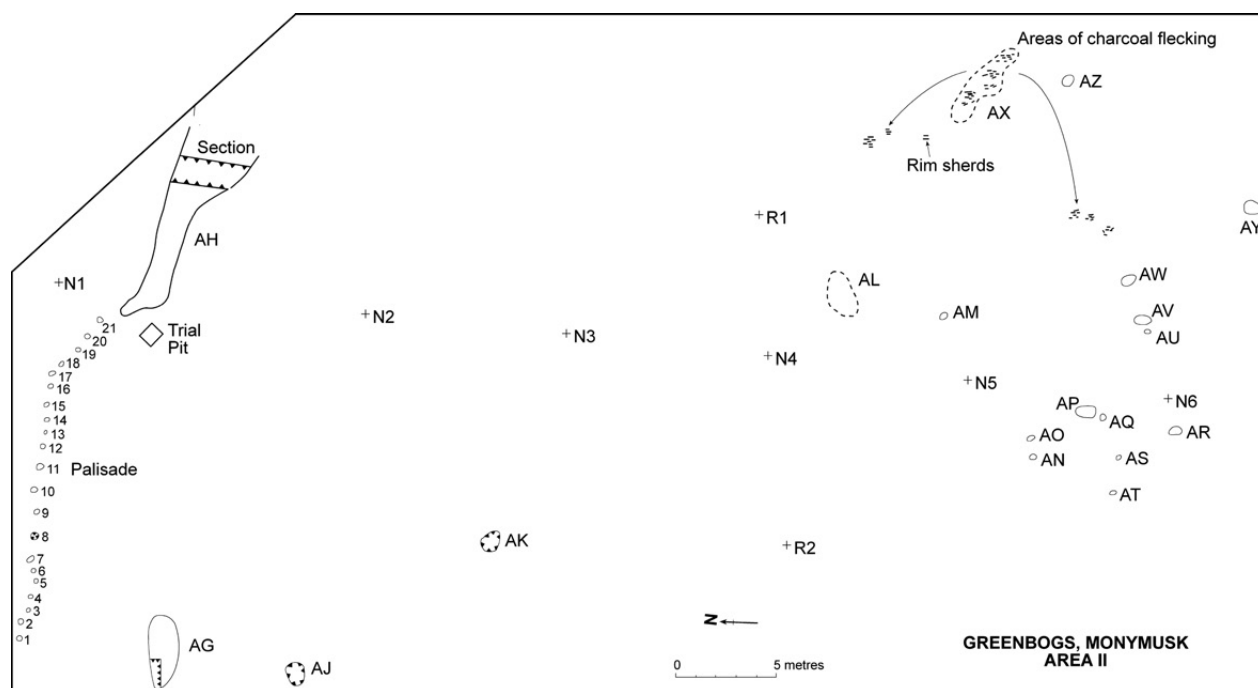


Fig. 3.  
Area II plan (drawn by Alison Sandison)

#### STRUCTURE C

This structure (post-holes C1–5 and D1–25) was much less well preserved than the other two with only faint traces of outer post-holes evident. Structure C may pre-date A and B, as it immediately adjoined and was in fact probably partly overlain by Structure B; its poorer state of preservation also suggests it was earlier. The maximum dimensions of Structure C would have been around 10 m north-east–south-west by 7 m north-west–south-east. There were possible traces of larger post-holes or features inside the structure and there may be an annexe attached to the north-east side, or a small working area (features E1–4). This area shows signs of burning and there were a number of heat-shattered stones lying on the surface.

Only one piece of pottery was found in association with these three structures. This is a rimsherd of a fine pot, found lying next to feature C2 on the eastern side of Structure C. It is probably Neolithic – quite possibly Late Neolithic – in date (Johnson & Sheridan below).

#### POTTERY

MELANIE JOHNSON WITH ALISON SHERIDAN

The pottery was presented as unwashed and dried. Sherds were dry-brushed where necessary for closer examination of the surfaces. The assemblage was

recorded in accordance with the *Guidelines for Analysis and Publication* set out by the Prehistoric Ceramics Research Group (1995). Sherds were grouped into families by form, fabric, and decoration and the minimum number of individual vessels (MNI) calculated based on these groupings. A full catalogue and more detailed description can be found in the site archive.

One hundred and one sherds in total, weighing 576 g and representing a minimum of 40 vessels were recovered along with an intact pot (P1) used as a cinerary urn. The assemblage is discussed by area and feature.

#### Area I

##### PIT AA

Pit AA contained a whole vessel (P1), weighing 1644 g (Fig. 8), placed upright and containing a fill (002) comprising charcoal and cremated bone. The vessel is a small barrel-shaped pot, slightly lopsided, being more globular on one side with a more pronounced footed base, as if the vessel had slumped slightly while wet. The rim is rounded to flattened, with a slight internal bevel and has been pinched in places to form a small neck/groove below it. The base is thick and slightly raised on the interior. The fabric is very sandy, medium-coarse, and the surfaces are brown. Blackish

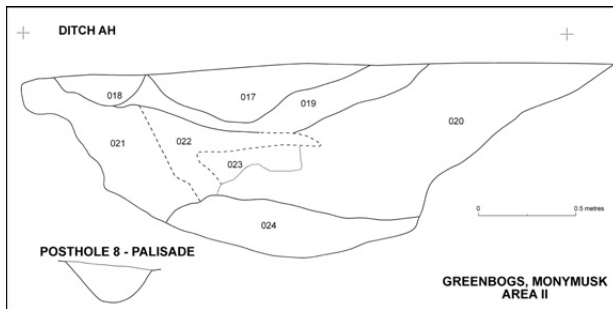


Fig. 4.  
Area II, ditch AH & palisade post sections  
(drawn by Alison Sandison)

organic residues are present across the interior with the exterior being mostly clean, with some slight sooting in places. The surfaces have been fairly roughly finished, with finger-marking visible and some protruding inclusions. The vessel has some cracks and has undergone some minor conservation but otherwise is in very good condition. At its maximum, it is 150 mm high, with a rim diameter of 130 mm and a base diameter of 105 mm and fitted very snugly into the pit.

The fill of the pit (001) has a radiocarbon date of 1400–1120 cal BC (SUERC-28261; Table 1), placing it in the Middle Bronze Age. It seems highly likely that this date corresponds to the date of manufacture and deposition of the vessel which belongs to a tradition of undecorated Middle–Late Bronze Age pottery found in both funerary and non-funerary contexts, described as ‘flat-rimmed ware’ (and, in a funerary context, as ‘bucket urns’; see Sheridan 2007 for a discussion of the latter). Comparanda from Aberdeenshire include domestic pots from Forest Road, Kintore (MacSween 2008, 189) and pots used as cinerary urns from Loanhead of Daviot, Garrol Wood, Gownie, Old Keig, and Foularton (Sheridan 2007a; the latter appear to be slightly later than the Greenbogs pot).

#### PIT AF

A further 16 sherds weighing 102 g, were recovered from AF (context 007), a pit containing heat-shattered stones. These represent at least four different vessels and all but two sherds are undecorated, featureless body sherds belonging to three vessels with two fabric types recorded. A small group, belonging to pot 4 (P4), is in a fine, micaceous, thin fabric (5 mm thick), dark greyish-brown, with smoothed surfaces. The second fabric (P3, P5) is medium-coarse and very sandy, with finger-marked, dark orange-brown surfaces, similar to urn P1; the main difference being the presence of grass marks on the sherd exteriors. These marks are not filler but are probably the result of laying the wet vessel on an organic surface to dry. Two conjoining rimsherds belong to a large, decorated vessel (P2, Fig. 9), which seems to be of a different character to the other pots. Its rim diameter will have

exceeded 300 mm and it has broken along an angular ring joint, showing that the top of the rim had been added separately. Immediately below the rim is a band of diagonal incised lines. The rim may have flared slightly. The surface had been wet-smoothed or slipped and the fabric is a light pinkish-yellow-brown. While there are some examples of Neolithic pottery that have this kind of decoration (eg, some Early–Middle Neolithic bowls from Culduthel, Highland: Sheridan forthcoming a), this decorative scheme is also found on pottery dating to the early to mid-2nd millennium BC, for example at Howmuir Farm, East Lothian (Innes 2007, fig. 6.3) and Green Knowe, Borders (Jobey 1980; see Burgess 1995 for a discussion). Therefore, it is quite possible that pit AF is of Bronze Age date, albeit probably earlier than the pits with the cremated bone.

#### Area II

Most of the pottery from this area (63 sherds from 23–26 vessels) came from ditch AH to the east of the post alignment. Pottery was recovered from its upper fills (017 and 018), and from fill 021 (Figs 4 & 10–12). Twenty-one further sherds were found unstratified around the area of the ditch. The assemblage from the ditch consists of small portions of a number of vessels; the sherds are generally small (average sherd weight 5.5 g) and show a moderate degree of edge abrasion, suggesting that they had lain around for some time before being incorporated in the ditch fills. The sherds are mostly undecorated, although one (Fig. 10, P11) has hints of shallow vertical incised decoration. Both uncarinated pots (one sherd from Fig. 10, P20a) and carinated vessels (eg, Fig. 10, P19–20a, P7, P22) are represented. The sherds range from being thin, fine, and virtually inclusion-free (as in the case of P11: 6.7 mm thick, with small and sparse inclusions) to thicker and coarser-textured, with fairly abundant lithic inclusions (eg, P7: 14.5 mm thick; P20b, angular fragments of white stone up to 7 x 7 mm). Mica platelets were noted among the inclusions in several sherds (including P19, P22 and P35). The carinations range from being gentle (P7) to cordon-like (eg, P22), and the rims are rounded (Fig. 10, P31) to flattish-rounded (P19). One pot (P31) has a short, upright neck, its lower edge defined by a cordon-like feature. One pot (P7) had been burnt, and several sherds (P7, P14, P22) have blackish organic encrustation on their exterior, suggesting that they had been used as cooking pots. Other sherds similar to the material in the ditch were found among the unstratified material (eg, Fig. 10, P35 and P40 (not illustrated), with cordon-like carinations).

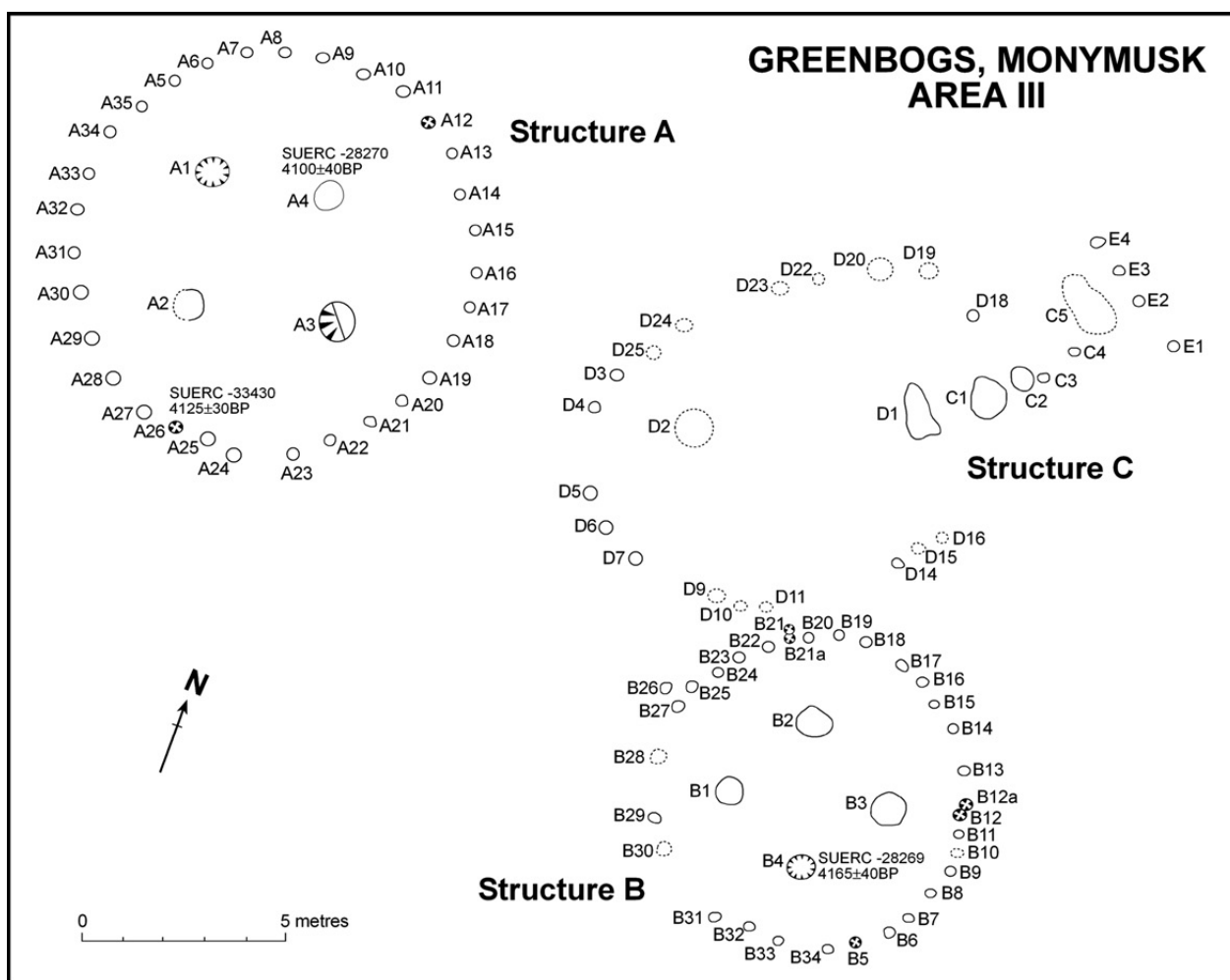


Fig. 5.  
Area III plan (drawn by Alison Sandison)

Although the number of diagnostic sherds is relatively small, the indications are that this pottery belongs to the 'modified Carinated Bowl' tradition (Sheridan 2007b), with comparanda including material from Balfarg Riding School, Fife (Cowie 1993a), Dubton Farm, Brechin (MacSween 2002) and Newton Road, Carnoustie (Johnson 2009; see also Cowie 1993b for a general survey of this kind of pottery from east-central Scotland). The small sherd with possible vertical line decoration (P11) may be comparable with the bipartite, long-necked, and shallow-bellied decorated bowls recently found at Culduthel, on the southern edge of Inverness (Sheridan forthcoming a). These belong to the 'North-

Eastern' style of modified Carinated Bowl pottery, and one example from Culduthel is associated with a date of 3640–3520 cal BC at  $2\sigma$  (SUERC-17222, 4780±30 BP). However, the small size of the Greenbogs P11 sherd means that this identification can only be regarded as provisional and a date in the centuries around 3500 cal BC seems plausible.

The pottery from within and around the ditch included four sherds that cannot be ascribed to this tradition. Three: P13, P14 and P33 (Fig. 11), have impressed decoration, and it is quite possible that P13 and P14 (which were found at the top of the ditch fill) belong to the same pot. Their decoration was jabbed with a fairly sharp but broad-ended tool; that of P33



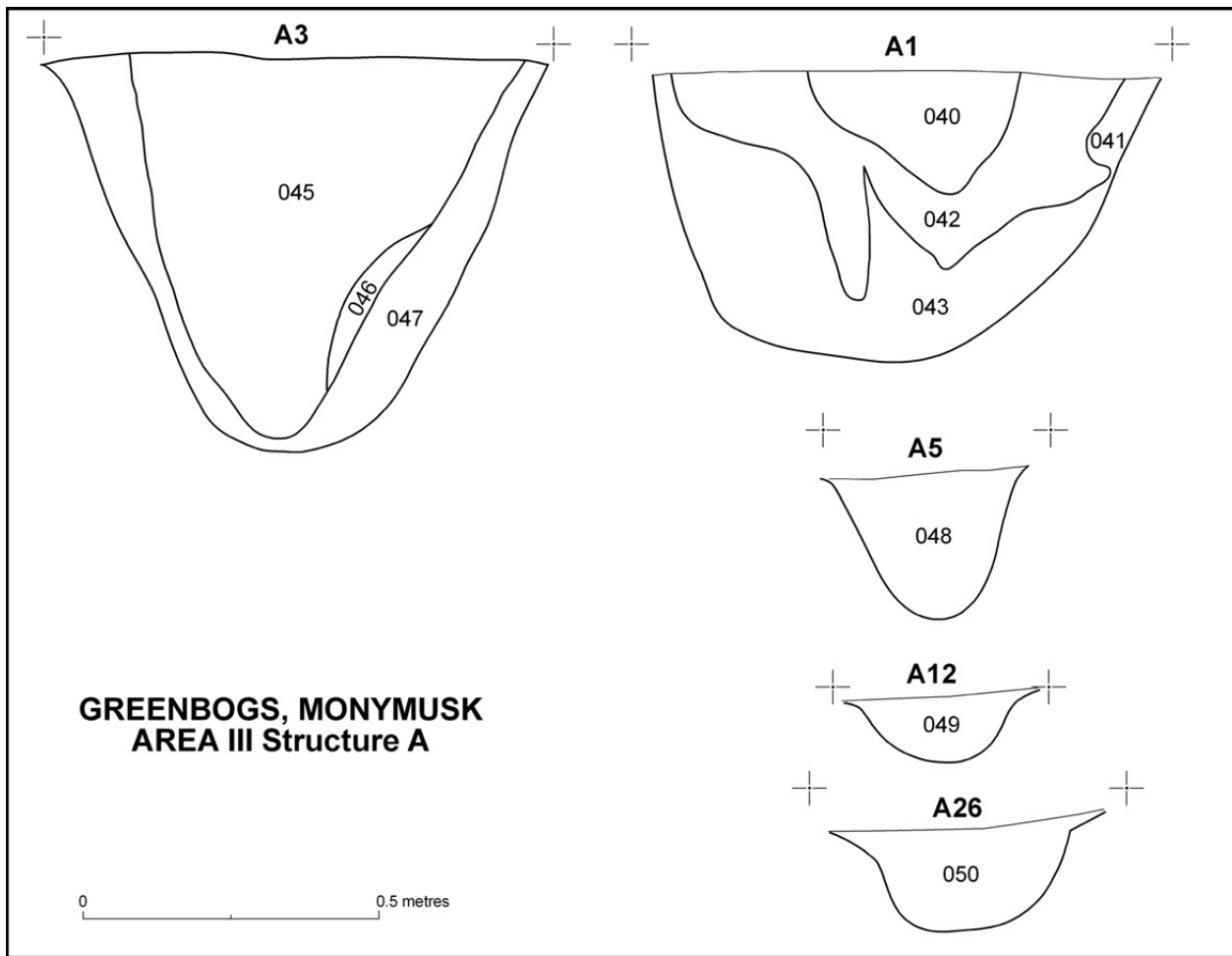


Fig. 6. Sections of features in Area III – Structure A (drawn by Alison Sandison)

(which was found beside AJ) may well have been made by inserting and dragging a thumbnail. P14 is a rimsherd, with a gently sloping internal bevel. The closest comparanda are to be found among Middle Neolithic Impressed Ware pottery, a large assemblage of which was found at Meadowend Farm, Clackmannanshire, and dated to *c.* 3300–2900 BC (Sheridan forthcoming b).

The fourth sherd, P25 (Fig. 12), is a rimsherd from a small, thin, fine vessel with internal horizontal grooves immediately below the rim; the estimated rim diameter is *c.* 150 mm. This was found in context 17, the uppermost fill of the ditch, and its closest parallels are with Grooved Ware (eg. at Forest Road, Kintore: MacSween 2008, fig. 143, V64 regarding the interior

grooving). This sherd could be contemporary with the four-poster structures in Area III.

As for the chronological relationship between the digging of the ditch and the deposition of the pottery, unless all the pottery was residual, it is likely that the ditch pre-dates the deposition of the Middle Neolithic Impressed Ware pottery and the Late Neolithic Grooved Ware, and possible that it was contemporary with the use of the modified Carinated Bowl.

#### Area III

A single sherd (P6; 7 g; Fig. 12) came from Structure C, beside post-hole C2, and so is essentially unstratified, although likely to have been ploughed

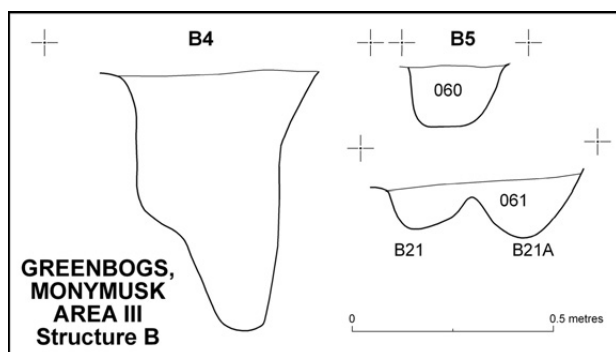


Fig. 7.  
Sections of features in Area III – Structure B  
(drawn by Alison Sandison)

out of the fill of pit C2 or one of the other features in this area. It is a gently rounded, upright rimsherd from a small pot, of estimated rim diameter *c.* 170 mm. The fabric is fine, micaceous, and dark grey. Much of the outer surface has spalled off. The surfaces are undecorated and carefully smoothed. An Early Neolithic date cannot be ruled out but it is quite possible that this is from a small, fine, undecorated Grooved Ware pot; completely plain Grooved Ware is known to have been used in north-east Scotland (eg, a large vessel from Culduthel; Sheridan forthcoming a).

#### LITHICS ANN CLARKE

Just eight flaked lithics came from Area II (Table 2). Three undiagnostic flints were found (1, 2 & 10): a chunk from beside a palisade post-hole; a small inner flake from feature AG; and an irregular flake that was unstratified. All are products of flint knapping but none can be attributed to any specific period. The remainder of the lithics were associated with feature AH and include a thick secondary flake of quartz (3) that appears to have been detached from a large quartz crystal as it has remnant crystal facets. There are also three large flakes of quartzite which appear so similar in material that they were most likely detached from the same cobble. Two of these are quite chunky (6 & 7) and the other (5) is a broad blade-like flake. These four lithics were found in context 17 (upper ditch fill) together with a small irregular pebble of

quartz/agate (4) which could be a natural inclusion. The three quartzite flakes appear to have been knapped from the same cobble and this indicates that the context from which they are from was relatively undisturbed, perhaps some kind of occupation layer. Unstratified, but on top of feature AH was a utilised flint blade (8) and a probable heat spall from a quartzite cobble (9).

Typologically the flaked lithics associated with feature AH would date anywhere between the Mesolithic and Late Bronze Age. The selection of stone materials other than flint (flaked quartz and quartzite) most likely points to a date in the Late Neolithic–Early Bronze Age. The use of a large quartz crystal as a core may have been an entirely practical choice since rock crystals are visible in the local geology and fine specimens of rock crystal have been noted in the nearby parish of Keig (Lewis 1846). However, a survey of standing stones in the region observed that they often have distinctive crystal veins and that at Backhill of Drachlaw, Aberdeenshire, the whinstone boulders have seams of pebbles and white quartz, a band of which encircles the whinstone ‘like a rope of crystal’ (Coles 1903, 120). Perhaps the use of quartz in the Late Neolithic–Early Bronze Age had a role beyond the strictly utilitarian.

#### COPPER ALLOY

DAWN McCLAREN, WITH SCIENTIFIC ANALYSIS BY  
SUSANNA KIRK & ADDITIONAL COMMENTS BY  
ALISON SHERIDAN

Three non-joining fragments of a highly corroded, curved, thin rectangular bar, 20 mm in length, 2.5–2.7 mm in width, and 1 mm in thickness, broken at both ends, was recovered from the centre of the fill of pit AB in Area 1 (Fig. 8). The curvature is asymmetric but due to its fragile condition it is unclear whether this reflects the original shape or is the result of post-depositional distortion. Not enough of the object remains to confirm the original form but it may a fragment from a looped fitting or ring. Non-destructive X-ray fluorescence (XRF) analysis confirms the composition as a high-copper alloy with only minor contributions from alloying elements such as tin and lead. The results are from surface analysis only, and thus are affected by corrosion. Pit AB has been dated to 1430–1210 cal BC (see Table 1). The object shows no signs of having passed through the pyre.

TABLE 2: LITHICS CATALOGUE

No	Area	Feature	Context	Catalogue	Description	Max L (mm)	Max W (mm)	Max thickness (mm)
1	II	Beside palisade PH 8			Irregular secondary chunk, toffee coloured flint	26	20	12
2	II	AG	031	AUAM 50602	Small inner flake, red flint	15	7	2
3	II	AH	17	AUAM 50607/50608	Thick secondary flake, quartz, flaked from large crystal	42	48	18
4	II	AH	17	AUAM 50597	Natural pebble, quartz/agate	40	25	16
5	II	AH	17	AUAM 50597	Large inner bladeflake, quartzite with narrow platform	65	34	38
6	II	AH	17	AUAM 50597	Large secondary chunk, quartzite, smooth pebble cortex	71	32	22
7	II	On top of AH	17	AUAM 50597	Thick inner flake, quartzite	43	29	14
8	II	On top of AH		AUAM 50603	Secondary blade, light grey flint. Both straight edges damaged with light flaking & denticulation, most prob. use-wear	37	15	5
9	II	On top of AH		AUAM 50604	Primary spall from cobble quartzite, most likely detached through heating	95	72	22
10	II	Unstratified		AUAM 50599	Irregular inner flake, toffee coloured flint	23	19	6
11	II	AG	030	AOC 30527	Natural sandstone chip			

The fragmentary object is not instantly recognisable as a Middle Bronze Age ornament, although the number of ornaments (other than gold torcs) that are datable to this period in Scotland is very small. Furthermore, the fact that it was found in the fill of the pit raises the question of whether or how it was associated with the cremated deposits; it may be intrusive although it was found far enough down in the pit fill for this to be unlikely. If the object is genuinely contemporary with the grave, then the only broadly contemporary parallels that spring to mind are the three small gold rings found with a pair of penannular gold bracelets in an inverted pot of 'flat-rimmed ware' at Duff House, Banff in the early 19th century (Anderson 1883, fig. 3). While two of these appear to be ribbed or made of soldered gold wire, the third is a solid penannular band, circular in section. The estimated date of this material is *c.* 12th century BC and

thus slightly later than the Greenbogs find. It is unclear whether the Duff House find had been associated with any human remains, or had been a hoard.

CREMATED BONE FROM GRAVES AND BURNT BONE  
FROM OTHER FEATURES

SUE ANDERSON

Cremated and burnt bone was collected from five features, four in Area I (AA, AB, AF, and F42) and one in Area II (AJ). Radiocarbon dates from charcoal in three of the four features in Area 1 indicate a Middle Bronze Age date, whilst the Area II feature was Iron Age in date.

The burnt bone was collected as bulk samples and sieved. The bone from each context was sorted into

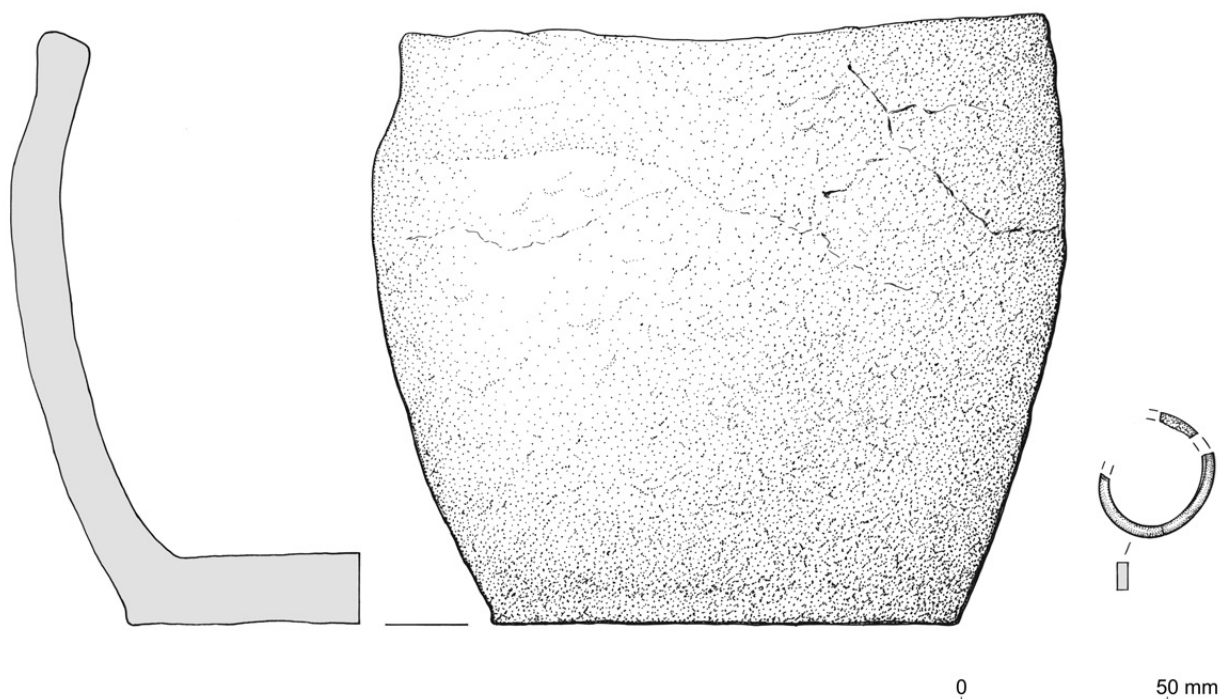


Fig. 8.  
Middle Bronze Age cinerary urn and metal object (drawn by Marion O'Neil)

six categories: skull, axial, upper limb, lower limb, unidentified long bone, and unidentified. All fragments in the first five categories were counted and weighed to the nearest tenth of a gram, those in the sixth were weighed only. This allowed an average fragment weight to be calculated. Measurements of maximum skull and long bone fragment sizes were also recorded. These data are listed in the site archive. Observations were made, where possible, concerning bone colour, age, sex, dental remains, and pathology. Identifiable fragments were noted. Methods used follow the Workshop of European Anthropologists (WEA 1980) and McKinley (1994; 2004). A catalogue of burials is included in the site archive.

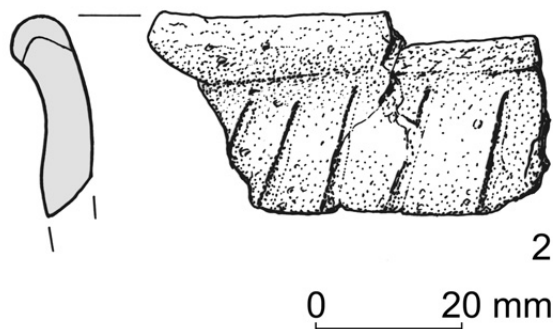


Fig. 9.  
P2 from pit AF, Area I (drawn by Marion O'Neil)

*Quantification, identification, collection and survival*  
Table 3 shows the bone weights, percentages of identified bone from each burial, and the proportions of bone identified from the four areas of the skeleton. Skull fragments are over-represented amongst the identifiable material and other areas are under-represented. It has been suggested that 'it should be possible to recognise any bias in the collection of

certain areas of the body after cremation' (McKinley 1994, 6), but in this case the groups are too small to identify any significant patterns. Mays (1998, table 11.2) notes that the combusted weight of an adult skeleton has a mean of around 1500 g for females and 2300 g for males. The largest quantity of bone in this assemblage came from cremation burial AB, but it represents only a very small proportion of the combusted weight of an average adult skeleton. The

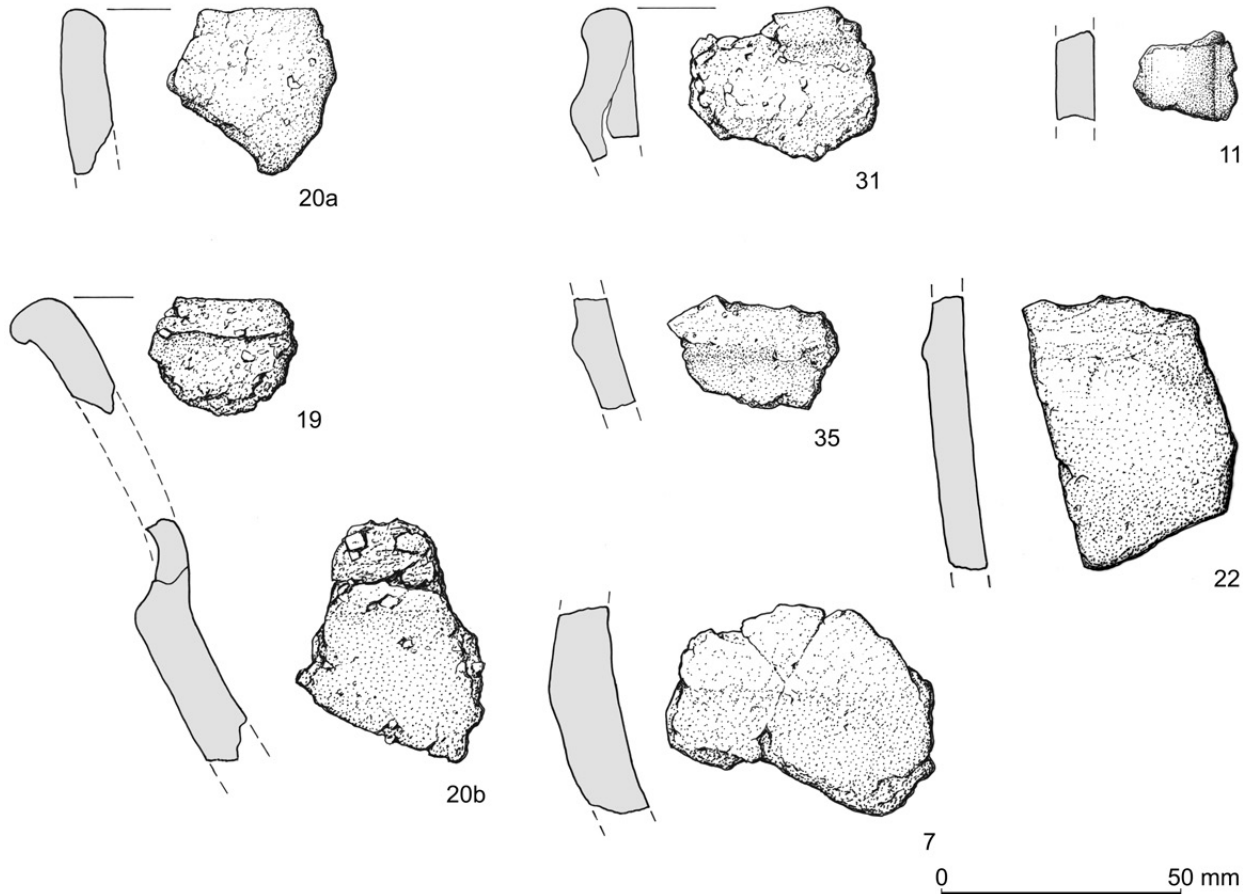


Fig. 10.  
Modified Carinated Bowl pottery from Area II (drawn by Marion O'Neil)

degree of fragmentation, based on average fragment weight, was very high. The average weight of identifiable material varied from 0.07 g (AA skull) to 0.65 g (AB lower limb). The largest fragment (also AB lower limb) was only 36 mm long. A few fragments from all the groups had a chalky texture and showed signs of abrasion. The majority of bone in this assemblage was fully oxidised and cream to white, although some internal areas were grey-blue. The presence of a high proportion of white bone indicates firing temperatures in excess of *c.* 600°C (McKinley 2004, 11).

*The cremated bones from features AA and AB*

Only two of the five groups, AA and AB, could be identified as human with any certainty. The other three groups were small and heavily fragmented and

there was no diagnostic anatomical evidence to indicate species.

Feature AA, which included material from within and around the urn, contained a small quantity of very fragmented remains including several pieces of skull; the size of these suggests that the individual may have been a juvenile.

Bone from AB consists of fragments of skull and long bones of a young adult or older sub-adult, possibly male. A few tooth root fragments are present including pieces of molar and premolar, all of which were fully formed at the time of death; these tooth roots are usually complete by the age of 15 years. There are two fragments of unfused diaphyseal bone, probably from the legs, but the actual bone and joint could not be identified. Epiphyseal fusion in the lower limbs usually takes place between the ages of 16–20.

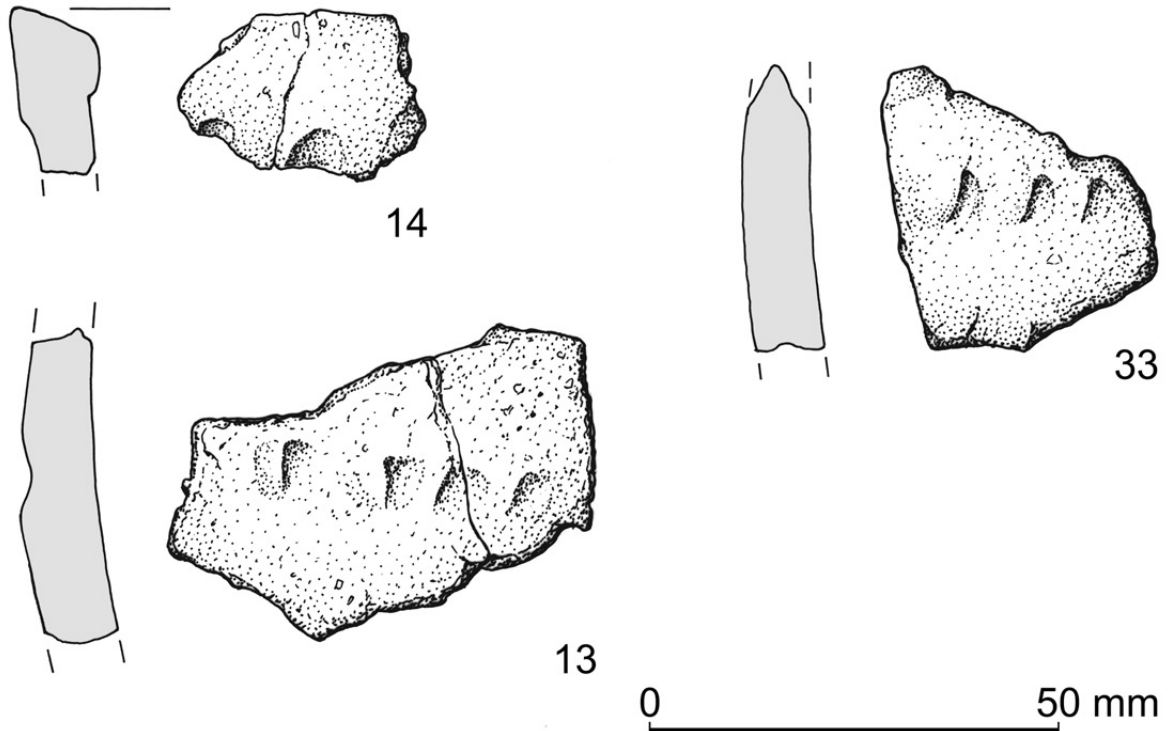


Fig. 11.  
Impressed Ware from ditch AH, Area II (drawn by Marion O'Neil)

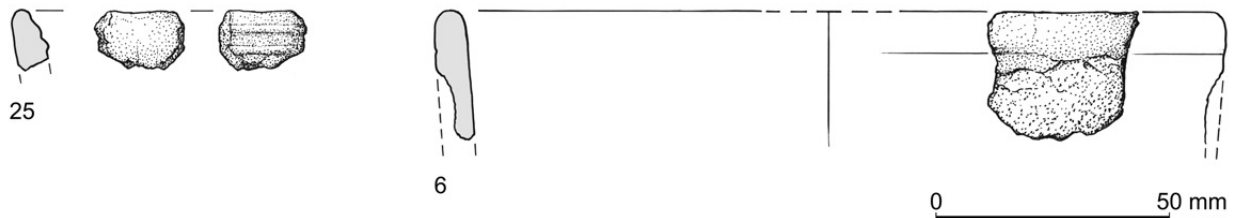


Fig. 12.  
Grooved Ware from ditch AH, Area II & Structure C, Area III (drawn by Marion O'Neil)

Fragments of distal finger phalanges are fully fused, however, and the proximal epiphyses of these would normally be fused by the age of 15–16 years in a male (Scheuer & Black 2004, 311). The cranial sutures are unfused, also indicating a young individual. The bones generally appear to be consistent with an adult, and it is possible that the individual was around 18–20 years old (or possibly slightly younger). Sex was

determined based on the relatively robust occipital crest, but no other sexing evidence is available.

A few fragments of skull from AB are relatively thin in comparison with the rest of the skull. While they may be from the lower parts of the vault, which can be thinner, there are no diagnostic markings and it is possible that they represent a second individual, a younger juvenile. If so, there did not appear to be

TABLE 3: PERCENTAGES OF IDENTIFIED FRAGMENTS OUT OF TOTAL IDENTIFIED TO AREA OF SKELETON

Con- text	Total wt/g	% ident.	% Skull	% Axial	%U limb	%L limb
<i>Expected*</i>			18.2	20.6	23.1	38.1
AA	11.6	50.9	100.0	–	–	–
AB	226.6	55.6	47.4	9.5	12.5	30.6
AF	3.7	0.0	–	–	–	–
F42	3.1	19.4	100.0	–	–	–
AJ	0.5	0.0	–	–	–	–

\*expected proportions (from McKinley 1994, 6)

any other bone from this individual in the feature and it is possible that the fragments were incorporated into the burial accidentally (perhaps during collection of the remains if the pyre were on the same site as an earlier burning), rather than representing an intentional double burial.

#### *Summary and discussion*

The four groups of bone from Area I represent a minimum of one adult and possibly one juvenile, with further small quantities of bone which are possibly of adult human origin in two other features. The bone fragments from the Iron Age feature AJ in Area II are too small for identification. None of the contexts represented complete cremated bodies, the weight of even the largest being considerably below the expected quantity for an adult male. Of the two features which appear most likely to be cremation burials, the urned burial in AA contained the least bone. Usually urned burials would be expected to contain more, and better preserved, fragments than unurned ones. This may be due to incomplete collection from the pyre, but appears more likely to be due to truncation at some point after burial. The very small quantities recovered from the other features are more suggestive of accidental incorporation into pit fills, rather than deliberate burial, although ‘token’ burial is also a possibility. The assemblage is too small and fragmented to allow further interpretation or comparison with other assemblages.

#### DISCUSSION

##### *The Neolithic features*

The Neolithic features at Greenbogs were concentrated in Areas II and III. In Area II there was

a substantial ditch (AH) which, as noted above, contained pottery that may range in date from the Early–Middle Neolithic to the Late Neolithic, and may have possibly been dug in the centuries around 3500 cal BC. This ditch appeared to be associated with a palisade or pit alignment that extended westwards from the ditch terminal. Unfortunately, no direct or indirect dating was obtained for either the ditch or the palisade but both are perhaps best interpreted as some sort of land division dating to the 4th millennium BC. The presence of the pottery in the ditch fill, with some of it showing signs of having been used for cooking, suggests that there may have been some form of settlement or activity near to the ditched and palisaded boundaries. Alternatively, both features could form small elements of monuments; however, only a short stretch of the palisade and ditch was evident in the trench and nothing has appeared in subsequent aerial reconnaissance of the site to demonstrate whether these features were more extensive in the past. The ditch terminates at the edge of the gravel terrace upon which the site is situated.

The most significant Neolithic finds were the two timber structures with central four-post settings (Structures A and B), radiocarbon dated to the first half of the 3rd millennium BC, and the oval structure that lay between them, on the southernmost gravel knoll (Area III: Figs 5 & 13). Despite their heavily truncated nature, and the near-absence of artefactual finds, Structures A and B are important to our understanding of the Late Neolithic, not only in north-east Scotland but also elsewhere in Britain and Ireland, because they represent a widespread architectural form normally associated with Grooved Ware pottery (Cleal & MacSween 1999). The Grooved Ware associations of the structures at Greenbogs may be represented by the single sherd of small, fine, undecorated pot that may be Grooved Ware from Structure C and the nearby find of P25, a rimsherd from a small, thin, fine vessel with internal horizontal grooves from an upper fill of ditch AH in Area II.

Architectural parallels for the four-post structures at Greenbogs site include two recently excavated structures, found in 2006 in the interior of the major Late Neolithic ceremonial monument at Durrington Walls, Wiltshire, in particular a building found in Trench 14 surrounded by a henge, *c.* 35 m in diameter (Fig. 14). The examples at Durrington have been interpreted as specialised structures possibly associated with veneration of the dead (Thomas 2010).



Fig. 13.  
Structure A during excavation

The Greenbogs structures can also be compared to a slowly growing body of Late Neolithic structures that have been interpreted as settlement structures. For example, they have close parallels in two buildings, interpreted as houses, found at Wyke Down in Dorset (Green 2000). At Wyke Down fragments of daub were found in the post-holes of both structures, the decoration of which has been compared to Late Neolithic Grooved Ware pottery (Green 2000, 73–6; Thomas 2010, 5). Further structures with interior four-post settings interpreted as houses include Structure F at Redgate Hill, Hunstanton in Norfolk (Healy & Kinnes 1993, 18–22, fig. 21), Structure D at Willington, Derbyshire (Darvill 1996, 102, 106) and parallels may also be present in Ireland, for instance at Balgatheran, Slieve Breagh 1, Bettystown, and Whitewell (Bradley 2007, fig. 3.16; Smyth 2010, 20–6, fig. 5).

The survival of most of these structures as plough-truncated post-settings makes their interpretation

uncertain. In terms of size and morphology they can, nonetheless, be compared to the small body of Late Neolithic settlement structures without four-post settings such as the structures at Upper Ninepence and Trelystan in Wales (Britnell 1982; Gibson 1999), and the recently discovered houses found outside the entrance of Durrington Walls (Parker Pearson 2007).

In Scotland, specifically, there are fewer excavated sites of similar size and character to Greenbogs (eg, Barclay 1996; 2003; Brophy in press) (larger timber circle sites generally interpreted as monuments are outlined below). Potential parallels include four-post structures with Grooved Ware associations found at Beckton Farm, Dumfries & Galloway (Pollard 1997) (Fig. 15) where two four-post structures were located in association with a range of other structures including clusters of stake-holes, hearths, and silty clay spreads interpreted as the remains of small, relatively ephemeral dwellings (Carter 1997; Pollard 1997: 115, 118<sup>2</sup>). Elsewhere in lowland Scotland,



there are no direct parallels for the Greenbogs structures. However, while the excavated parallels for the Greenbogs site in lowland Scotland are at present few in number, there is evidence to suggest that many other structures of a similar form may be present in the archaeological record, but have yet to be recognised. For example, a number of parallels can be identified from the aerial reconnaissance programme of the Royal Commission for Ancient and Historical Monuments of Scotland (RCAHMS). The most striking parallel is a site at Chapelton in Angus (NMRS NO64NW 105), where aerial photography has documented the presence of a cluster of at least eight structures, seven comprising circles of close-set posts or stake-holes surrounding an internal setting of four large post-holes and one surviving simply as a four-post setting<sup>3</sup> (Fig. 16). The cropmarks indicate phasing with overlapping structures and the structures themselves range in diameter from approximately 11 m to 16 m, and the internal four-post settings around 4–8 m across. The site therefore includes structures of comparable size to those at Greenbogs, but also larger structures. Elsewhere, many cropmark sites comprising close-set arrangements of four posts can be recognised but few have outer settings of the exact form found at Greenbogs. Two additional sites are Balcathie in Angus and Green of Invermay in Perth & Kinross. The site at Balcathie includes a four-post setting, measuring *c.* 4 m across, faintly surrounded by close-set post-holes or palisade *c.* 10 m in diameter (Fig. 17). The site is close to the cropmarks of a possible Neolithic timber hall of Late Neolithic type (Millican 2009, 72)<sup>4</sup>. A further parallel at Green of Invermay (Fig. 18) is very clearly surrounded by either posts or a ring-ditch, though the poor definition of the cropmarks means that it is not possible to discern whether the outer boundary is formed by individual post-pits or a palisade ditch<sup>5</sup>. A further example may be Thorn in Perth & Kinross where there is a suggestion of an outer setting of posts around a four-post setting.

Although sites such as Chapelton have previously been interpreted as part of settlements of later prehistoric date (eg, RCAHMS 2007), the structures recorded do not fit comfortably within the known morphology of later prehistoric settlement in Scotland (eg, Hingley 1992; RCAHMS 1994). Settings of four posts without encircling palisades or post-settings are generally thought to date to the later Bronze Age or Iron Age, although the evidence at Beckton may

suggest that this is not always the case. As cropmarks, four-post settings without external post- or palisade settings may represent later prehistoric structures or could also represent the former location of four-poster stone circles – a type of monument apparently of 2nd millennium BC date, and unrelated to the Late Neolithic timber structures that form the focus of interest here (eg, RCAHMS 1994, 29; Burl 1988). Only further dating will differentiate these traditions of four-post construction. Isolated four-post settings do, however, occupy interesting positions in relation to some known Late Neolithic monuments. A four-post structure within the cropmark of a Late Neolithic palisaded enclosure at Leadketty, Perth & Kinross, for example may be contemporary with the palisaded monument (Fig. 19) and, a little more tentatively, four-post structures at Whiteloch and Ardmuir, in Perth & Kinross, also appear good candidates to be of Neolithic date for, in all both cases, they are found in close proximity to potential Neolithic monuments including a probable henge at Whiteloch. However, without further investigation, more definite interpretations of the dating and form of these four-post structures are not possible.

#### *Interpreting the four-posters: roofed buildings?*

The level of truncation at Greenbogs, as with most lowland structures made of timber, alongside the limited excavation of the Greenbogs site itself, means that it is uncertain whether these were roofed buildings and whether ground level features, such as hearths and floor levels, were present. Indeed, in these Late Neolithic sites, intact floor levels have generally been absent – with one important exception. At Durrington Walls, Wiltshire, some additional elements of the four-post structures were preserved (Thomas 2007, 156; 2010). In particular, the sites at Durrington Walls 14 and 15 both consisted of four-post settings occupying preserved floor hollows, *c.* 4 x 4 m in extent. A line of stake-holes found close to the edge of the floor hollow in both cases indicated the position of a wall-line of the structure. Around a metre outside of this stake-line was a post-circle. In these cases at least, these outer post-settings may represent exterior palisades or post-settings or could conceivably be outer facings for turf-built walls (cf. Loveday 2006). With the exception of the floor hollows and stake-lines, the Durrington Walls structures provide close parallels for the much less well preserved Greenbogs structures.

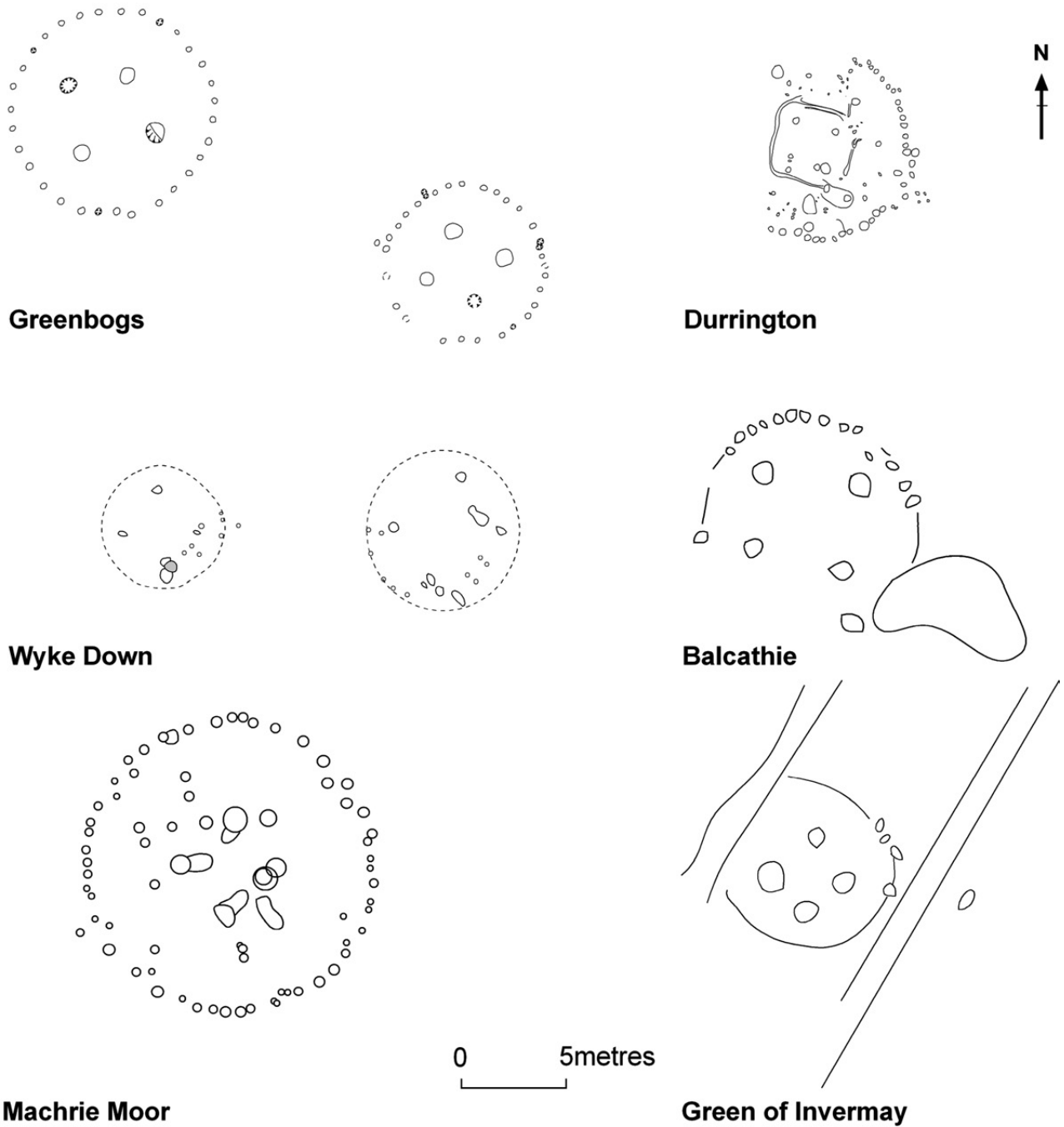


Fig. 14.  
Comparative site plans: a selection of four-post structures of Scotland, compared with those found at Durrington (structure 14) & Wyke Down (drawn by Jenny Johnston)

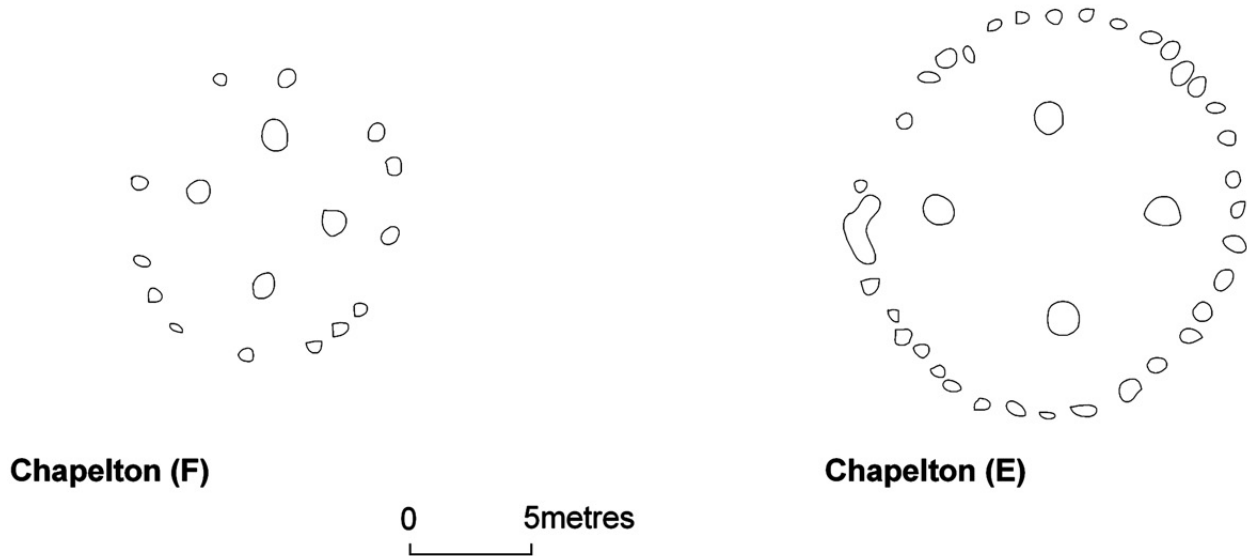


Fig. 14.  
Comparative site plans: a selection of four-post structures of Scotland, compared with those found at Durrington Walls (structure 14) & Wyke Down (drawn by Jenny Johnston)

More limited evidence from Wyke Down, Dorset, may also suggest that the four-post elements of structures of this type formed the main structural components of these buildings with the outer post-settings again acting as external palisades or an external wall face. At Wyke Down there were no preserved floor surfaces or inner stake-line, but the decorated daub was found exclusively within the post-holes of the internal four-post settings, suggesting that wattle walls and perhaps floor surfaces were again focused towards the central four-post setting<sup>6</sup>. At Beckton Farm, silty clay spreads, similar to those found in association with other structures on site, were found extending from the southern four-post setting and between the two four-post structures, but here outer settings of posts were not present (Fig. 5)<sup>7</sup>. The evidence is limited, but suggests that if these four-post structures were roofed buildings then the internal structure may have been based around the four-post settings with an external palisade or wall facing present in some (but not all) cases.

Post-Neolithic round-houses with four-post settings are rare, but are not unknown in Britain. Structures so interpreted are known from later Bronze Age contexts at sites such as Rams Hill, Berkshire (Bradley & Ellison 1975, 55, fig. 2.23) and, in an Iron Age

context, the best known example is Little Woodbury, Wiltshire (Bersu 1940)<sup>8</sup>. At Rams Hill the four-post setting of the Late Bronze Age example is the reverse of the Neolithic examples discussed here, the posts being of slighter proportions than the exterior settings. Little Woodbury is a close parallel for the Neolithic structures. The four-post setting at Little Woodbury is at the smaller end of the scale (less than 3 m across), with the outer setting around 13 m in diameter (and therefore of slightly different proportions to most of the dated Neolithic examples). Gerhard Bersu presented various possible reconstructions of the Little Woodbury house (Bersu 1940, 88–9, 91) and suggested that round-houses with four-post settings were a structural form that evolved from rectangular architecture – an observation pertinent to the Neolithic context, where in Scotland at least, the later 4th millennium BC architectural forms tend to be rectangular (eg, Balfarg, Carsie Mains, and Littleour) with the emergence of circular architecture in mainland Scotland in the early 3rd millennium BC (eg, Barclay & Brophy 2004; Barclay & Russell-White 1993; Brophy 2007).

In the later prehistoric cases of Rams Hill and Little Woodbury the four-post settings have been interpreted as forming a square structure that supported the roof

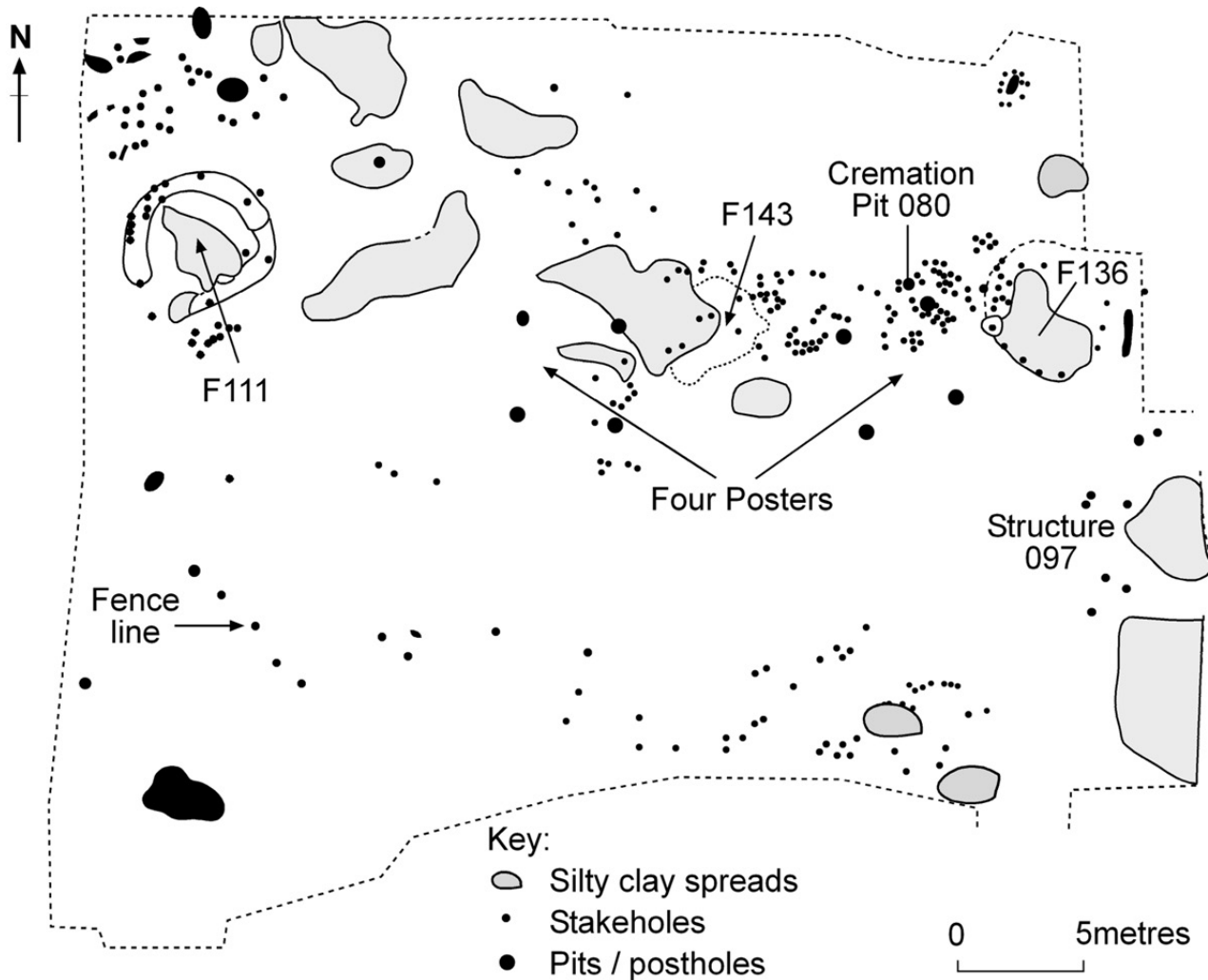


Fig. 15.  
Redrawn plan of Beckton Farm (after Pollard 1997) showing four-posters, circular stake-structures,  
& possible floor deposits (drawn by Jenny Johnston)

(Bradley & Ellison 1975, 55; Bersu 1940). That this is structurally possible is shown by the reconstruction that was carried out for Greenbogs Structure A. During the 1990s, prior to obtaining radiocarbon dates, Greenbogs Structure A formed the basis of a reconstruction of an 'Iron Age' round-house at Archaeolink Prehistory Park in Aberdeenshire (Fig. 20). The four-post setting acted as the main roof support with four additional large roof beams acting as ground to roof supports extending from the four apexes of the four-post setting. In this reconstruction

the four-post setting provides the framework for very useable and functional floor space in the eaves of the house<sup>9</sup> (Fig. 21). In this context, the outer post-setting was reconstructed as the outer wall of a roofed building. The reconstruction was based on the larger 9 m diameter Greenbogs A structure, which demonstrates that it is more than possible to roof a circular dwelling of this size on the basis of an internal four-post setting. Clearly, given the Archaeolink evidence, there is no structural impediment to a square four-post structure forming the support for a



Fig. 16.

The cluster of structures recorded as cropmarks at Chapelton, Angus. Each individual structure is labelled from A to H (Photograph ©Crown Copyright: RCAHMS C46973CN, transcription K. Millican)

roofed circular or sub-circular structure. It should also be remembered that the Late Neolithic dwellings of Orkney essentially follow the design logic of a square within a circle (Bradley 2007, 120). Indeed, the potential floor area of the four-post structures outlined here and their overall sizes tallies well with the range of sizes known from the Late Neolithic stone-built settlement sites in Orkney (Table 4) (Parker Pearson 2007, 142).

In terms of internal features other than floor levels, none of excavated Scottish examples of four-posters contains definite internal features. (The cropmarks at Chapelton do, however, suggest that internal features may be present here). Hearth pits were present in the centre of both Durrington Walls 14 and 15 and have also been identified at Wyke Down. In the Irish

examples, hearths have been found in some of the four-post structures, such as Slieve Breagh 1 (one of the smaller Irish examples), but are absent in others (Smyth 2010, 22). In some of the Scottish examples hearths or cooking pits may have been sited outside of the structures; at Beckton Farm, for example, hearths, fire-pits, and other features were found around and away from circular stake-built dwellings and four-post structures, perhaps in external working areas. A possible external working area was also found at Greenbogs and there were clearly other features and structures present here including the oval building, Structure C. Many four-post structures in both Scotland and England were associated with pits, in the majority of cases, pits filled with Grooved Ware (Table 4). Sites such as Beckton Farm and Wyke

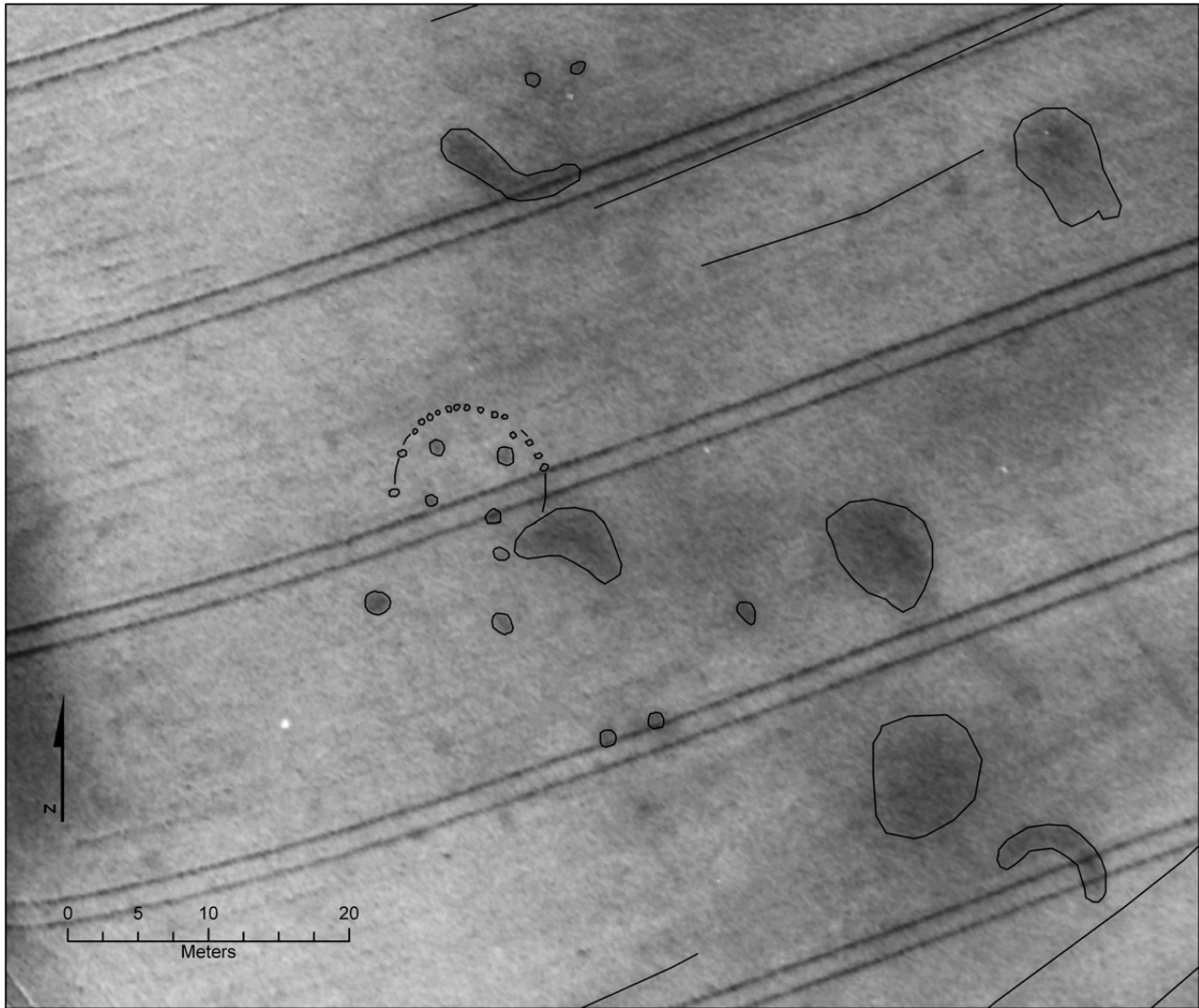


Fig. 17.

Interpretation of the cropmarks recorded at Balcathie, Perth & Kinross. The probable Neolithic four-post structure lies in the centre of the image, the darker 'blobs' represent the remains of later prehistoric settlement  
 (Photograph ©Crown Copyright: RCAHMS C27327, transcription K. Millican)

Down were also associated with linear alignments of posts (Table 4). These fence lines are suggestive of some form of land division or further architectural elaborations in the vicinity of these structures (Pope 2007, 221), and it may be that wider Late Neolithic landscapes may be recovered at these sites through further excavation.

All in all, the exact interpretation and reconstruction of all of these structures is by no means clear-cut: the truncated nature of the remains of nearly

all of these structures does not allow us to say definitively one way or the other as to what they were used for or what they looked like. Indeed, the roofing of structures such as these and larger examples of four-poster structures (outlined) below forms one of a long-running topic of debate in British and Irish archaeology. However, the picture that can be gleaned from a variety of these structures includes the occasional preservation of floor levels, hearths and possible wall lines that indicates that some of these

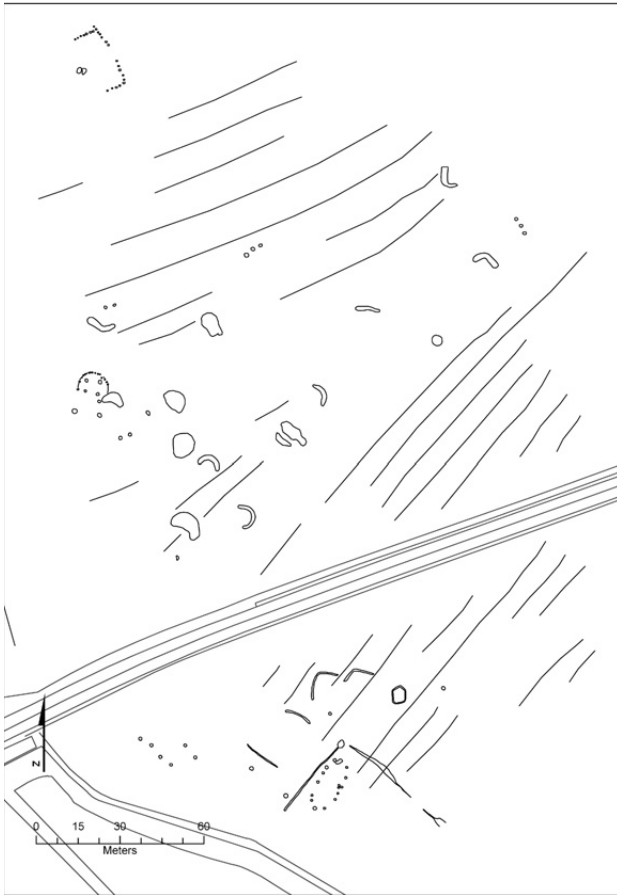


Fig. 18. The context of the cropmarks at Balcathie, Perth and Kinross (Map ©Crown Copyright/database right 2010. An Ordnance Survey/EDINA supplied service, transcription K. Millican)

structures at least are likely to have been roofed buildings and may well be associated with domestic life of some form<sup>10</sup>.

#### *'Monumental' four-posters*

In interpreting the Greenbogs structures, parallels should also be drawn with structures more commonly identified as monuments, for example, the southern and northern circles at Durrington Walls, and a similar structure found nearby at Durrington 68 (Darvill 2006, 114–5; Thomas 2010); and in Scotland the timber circle at Machrie Moor on the island of Arran (Haggarty 1991). These generally larger post-settings share the same spatial layouts, but can be more elaborate in form with multiple post-rings in some

cases and a more obvious relationship with monuments in some cases. Parallels can also be sought in Ireland with the four-post timber settings at Knowth and Ballynahatty, for example (Eogan & Roche 1997; Hartwell 2002; Smyth 2010). These later Neolithic structures in Britain and Ireland consist of four-post settings surrounded by outer post-settings. They can occur on a scale larger than that found at Greenbogs but are generally of a size smaller than the larger examples of timber circles or other known Late Neolithic timber monument types which tend to lack internal features of any form (eg, Gibson 2005; Millican 2007). Previous work has highlighted the parallels between these 'monumental' four-post structures and the four-post structures highlighted above, however these structures have largely been interpreted as monuments rather than dwellings (eg, Bradley 2007, 120; Pollard & Robinson 2007, 166–7; Thomas 2010). Indeed, most authors in recent years have interpreted these sites as open, unroofed monuments, although others have occasionally argued otherwise (eg, Bradley 2007, 120–4; Darvill 2006, 114–5; Bourke 1997; Gibson 2005, 132–5; Parker Pearson 2007; Thomas 2007; Wainwright & Longworth 1971). Thomas (2010), for example, has suggested that the larger sites were free-standing versions of a house modelled on the 'skeletal' form of a house in disrepair and may have been used as places of veneration. Similarly, Bradley has suggested that the larger structures may have been 'Big Houses' that formed a more public role (Bradley 2001; 2005; 2007).

Undoubtedly some of these structures have been found in more specialised contexts. The Ballynahatty structure for example, was found in association with a series of elaborate timber settings. However, in terms of size there is little clear distinction between the type of four-post structure found at Greenbogs, the parallels interpreted as houses, and those interpreted as monuments (Table 4), albeit that some of these monuments can have exterior spaces and dimensions emphasised by further external post-settings, porches, or avenue-like settings (eg, Ballynahatty, Hartwell 2002). Clearly there was a continuum of square-in-circle structures built in the Late Neolithic. For example, the size of the four-post settings interpreted as monuments, such as Durrington Walls, Knowth, and Machrie Moor, overlap with those such as Wyke Down interpreted as settlements (especially if cropmark sites such as Chapelton<sup>11</sup>, where there is no clear monumental context for the four-posters, are

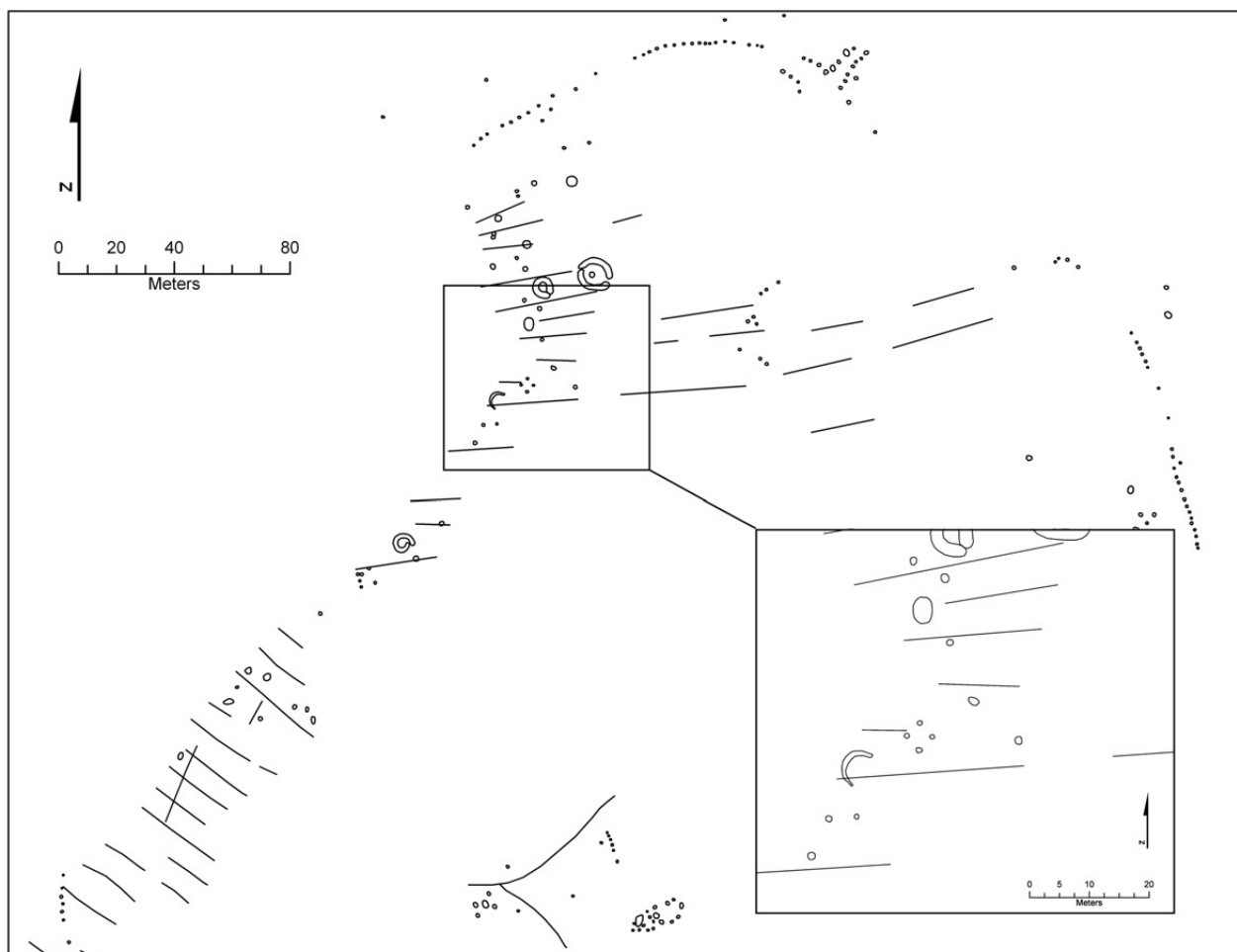


Fig. 19.

The four-post structure within the palisaded enclosure at Leadketty Farm, Perth & Kinross (transcription K. Millican)

included) (Table 4). In terms of roofing, the size of even the most ‘monumental’ of these four-post structures (min. 6 m–max. 16 m diameter of outer post-settings) are well within the range of Iron Age round-houses and, given structures up to 9 m in diameter can be roofed without internal supports (Pope 2007, 220), the substantial nature of both the inner and outer settings at these structures means that roofing would not be out of the question. Of course this does not prove that any of these structures *were* roofed structures or indeed dwellings, but it is certainly the case that these were *roofable* structures that again did not exceed the floor area or maximum dimensions of structures known in the context of the settlement record of the Orcadian Neolithic,

particularly if internal areas were based around the four-post settings<sup>12</sup> (cf. Parker Pearson 2007, 142)<sup>13</sup> (Table 4). The excavated and cropmark evidence from sites such as Greenbogs, Wyke Down and Chapelton also suggests a whole range of sizes of four-post structures could be present on a single site, with no clear distinction between ‘small’ and ‘large’.

#### *Dating the four-poster tradition*

The dating for the tradition of four-post structures in Britain and Ireland is, at present, limited, although a number of new dates have added precision to the chronology of this tradition. The three new dates from Greenbogs are a welcome addition to the corpus and,





Fig. 20.  
The reconstructed 'Iron Age' round-house at Archaeolink, based on Greenbogs A

in a Scottish context, represent the most reliable determinations for the four-poster tradition. As outlined above Greenbogs A dates broadly to the period 2880–2490 cal BC and Greenbogs B to 2890–2620 cal BC (Table 1). Elsewhere in Scotland, there are five dates from Beckton Farm that can be loosely associated with the Grooved Ware activity on site. The dates from Beckton, however, are also all on mixed species charcoal and none comes directly from the four-post structures (Table 5). The dates fall broadly within the first half of the 3rd millennium BC but are excluded from further analysis due to uncertainty over the provenance and context of the bulked material (Ashmore 1999). There are three dates associated with the 'monumental' four-post

setting at Machrie Moor, but again the sample sources are far from ideal, being either from mixed samples or from oak charcoal. One early date from Machrie Moor suggests activity in the late 4th millennium BC (GU-2316). However, this date is a significant outlier from the other two dates including one (GU-2325) from the same timber setting as GU-2316 (Table 5). These two other dates from Machrie Moor are in broad correlation suggesting construction in the 3rd millennium BC, but neither date is satisfactory with wide error margins in both cases. Outwith Scotland, there are only a handful of sites with radiocarbon dates in association with four-post structures. The dates from Wyke Down suggest broadly contemporary activity with Greenbogs in the period *c.* 2900–2600

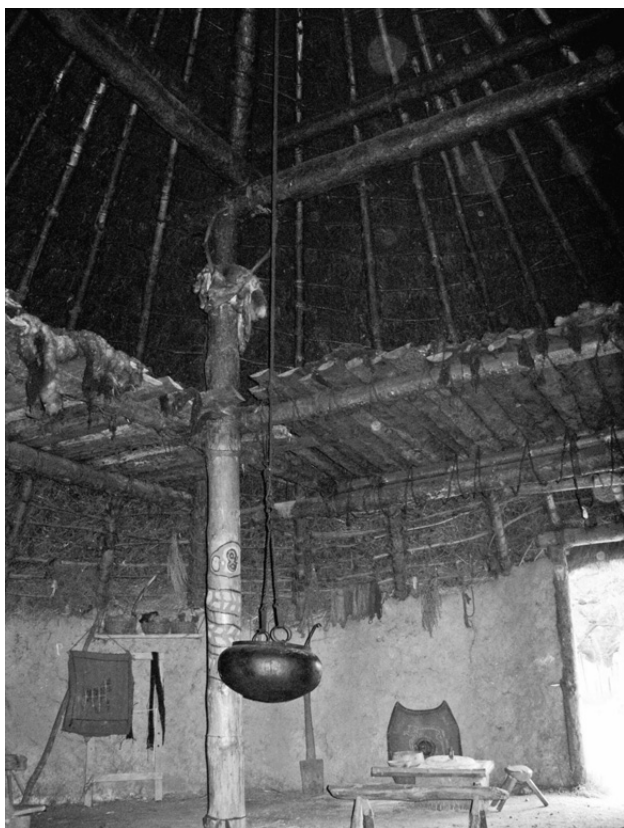


Fig. 21.  
The interior of the reconstructed round-house at  
Archaeolink showing the internal four-post setting & the  
upper storey created by this arrangement

cal BC. Additional radiocarbon dates have recently been obtained for the four-poster at Knowth. Here, the dates obtained on pottery residues and one hazelnut shell (UBA-14781) are argued to be the most accurate suggesting a construction date for the site around the mid-3rd millennium BC (Rick Schulting pers. comm.; Schulting & McClatchie in Eogan & Cleary forthcoming). Recent dating of Durrington Walls adds some precision – an antler pick from a post-hole of the four-poster phase (post-hole 187) of the Southern Circle's Phase 1 has been dated to 2630–2460 cal BC at 94.1% probability (Table 5) the modelled date for this being 2490–2455 cal BC (information from P. Marshall, M. Parker Pearson, C. Richards, J. Pollard & J. Thomas) (Parker Pearson *et al.* forthcoming). The earlier dates from Durrington Walls have wide error margins and are of questionable value (Table 5).

Overall, removing the more questionable dates and considering those only in direct association with four-posters and associated timber settings, the dating for four-posters can be shown to be a closely related tradition, architecturally and chronologically, dating to the first half of the 3rd millennium BC (Fig. 22). The date range broadly correlates with the earlier dates for the timber circle tradition (Gibson 2005; Millican 2007) and with Late Neolithic palisaded enclosures (Noble & Brophy 2011), along with the *floruit* of the Grooved Ware tradition in mainland Britain (Cleal & MacSween 1999). Much more tentatively, it can be suggested (albeit based on very limited data) that the smaller structures such as Greenbogs and Wyke Down may prove to be earlier than the more monumental series of four-posters (Table 5). Only more dates and perhaps some modelling of existing datasets will allow more precision.

#### *Settlement and ritual in the Late Neolithic*

The new or reinterpreted sites outlined in this article, including Greenbogs and aerial evidence such as Chapelton, suggest that Late Neolithic four-post or square-within-circle structures were more common than previously suspected, and form a shared style of architecture that extended across large areas of Britain and Ireland in the first half of the 3rd millennium BC. These structures were a building type found in a variety of contexts from the mundane to the highly ritualised. A much clearer continuum of structures can now also be identified between the smaller structures interpreted as dwellings such as Wyke Down and the larger settings such as Machrie Moor (Table 4).

One distinction that could mark out individual examples of these structures is the context in which they are found, with some clearly associated with monumental landscapes and others not. However, in terms of location we can see from Table 4 that at many sites listed, there is a spatial relationship with a monument of some kind. This is not the case in all examples – in Ireland for example four-post structures are increasingly found isolated from any monumental context (Smyth 2010, 20). Where there is an association with monuments, this extends from sites which scholars have been much happier to accept as domestic, eg, Wyke Down where the 'houses' were located near to two small henge monuments, to those that have been interpreted as more specialised buildings, for example those found at Durrington

TABLE 4: SELECTED CHARACTERISTICS OF A) FOUR-POSTERS FROM SCOTLAND B) LATE NEOLITHIC COMPARISONS FROM BRITAIN INCLUDING NON FOUR-POSTER SITES (C) FOUR-POST STRUCTURES INTERPRETED AS MONUMENTS AND (D) ORCADIAN LATE NEOLITHIC SETTLEMENTS

Site	4-post setting	Dimensions	4-post area (max)	Outer post-setting	Dimensions	Overall area m <sup>2</sup> (max)	Floor levels	Floor area (m <sup>2</sup> )	Hearths	Gr.Ware	Burial/cremations	Grooved Ware pits	Fence line	Associated monuments
<b>a) Scotland</b>														
Balclathie	✓	4 x 4	16	✓	10	79								Timber Hall and ?cursus
Beckton A	✓	3.5 x 3.5	12.25	x	x	x	?	x	✓	✓	✓	✓	✓	None
Beckton B	✓	3.5 x 3.5	12.25	x	x	x	?	x	✓	✓	✓	✓	✓	None
Chapelton A	✓	4.5 x 4.5	16	✓	?10	79								None
Chapelton B	?	?		✓	?11	95	✓	?36						None
Chapelton C	✓	5 x 5	24	✓	?12	113			?					None
Chapelton D	✓	6 x 6	36	✓	14	154			?					None
Chapelton E	✓	7 x 7	64	✓	16	201								None
Chapelton F	✓	4.5 x 4.5	24	✓	11	95								None
Chapelton G	✓	7 x 7	49	x	x	x			?					None
Chapelton H	✓	7.5 x 7.5	56	✓	16	201								None
Greenbogs A	✓	3.5 x 3.5	12.25	✓	9.5	71	x	x	x	✓	x	x	x	?Palisade
Greenbogs B	✓	2.5 x 2.5	6.25	✓	7.2	41	x	x	x	✓	x	x	x	?Palisade
Green of Invermay	✓	3 x 3	9	✓	8	50								Forteviot palisaded enclosure 300m SSW
Leadketty	✓	3 x 3	9	x	x	x								Within Leadketty palisaded enclosure
Average areas			24.71			107.18								

TABLE 4: SELECTED CHARACTERISTICS OF A) FOUR-POSTERS FROM SCOTLAND B) LATE NEOLITHIC COMPARISONS FROM BRITAIN INCLUDING NON FOUR-POSTER SITES (C) FOUR-POST STRUCTURES INTERPRETED AS MONUMENTS AND (D) ORCADIAN LATE NEOLITHIC SETTLEMENTS

Site	4-post setting	Dimensions	4-post area (max)	Outer post-setting	Dimensions	Overall area m <sup>2</sup> (max)	Floor levels	Floor area (m <sup>2</sup> )	Hearths	Gr.Ware	Burial/cremations	Grooved Ware pits	Fence line	Associated monuments
<b>b) selected comparisons</b>														
Durrington 14	✓	2 x 2	4	✓	10	79	✓	16	✓	x	x	✓	?	Henges, timber circles
Durrington 15	✓	22 x 2	4	✓	c. 10	79	✓	16	✓	x	x	✓	?	Henges, timber circles
Wkye Down 1	✓	4 x 4	16	✓	8	50	?	x	✓	✓	x	✓	✓	Henges
Wkye Down 2	✓	3 x 3	9	✓	6	28	?	x	✓	✓	x	✓	✓	Henges
Raigmore	x	x	x	✓	10 x 5	50	x	x	✓	✓	✓	x	✓	Kerb ?cairn
Trelystan	x	x	x	✓	x	x	?	x	✓	✓	✓	✓	✓	Barrow
Upper Ninepence 1	x	x	x	✓	6	28	x	x	✓	✓	x	✓	?	Barrow
Upper Ninepence 2	x	x	x	✓	8	50	x	x	✓	✓	x	✓	?	Barrow
Upper Ninepence 3	x	x	x	✓	12	113	✓	c.8	✓	✓	x	✓	?	Barrow
Average areas			12.5			53.8								
<b>c) monuments</b>														
Ballynahatty	✓	6 x 6	36	✓	11/16	95/201	x	x	x	✓	✓	x	✓	Henges, timber settings
Durrington 68	✓	6 x 6	36	✓	14 x ?12	168	x	x	x	✓	✓	x	x	Henges, timber circles
Knowth	✓	4 x 4	16	✓	8 x 9	72	✓	?	x	✓	x	✓	x	Passage graves, palisaded enclosure

TABLE 4: SELECTED CHARACTERISTICS OF A) FOUR-POSTERS FROM SCOTLAND B) LATE NEOLITHIC COMPARISONS FROM BRITAIN INCLUDING NON FOUR-POSTER SITES (C) FOUR-POST STRUCTURES INTERPRETED AS MONUMENTS AND (D) ORCADIAN LATE NEOLITHIC SETTLEMENTS

Site	4-post setting	Internal Dimensions	Area (max)	Outer post-setting	External Dimensions	Area m <sup>2</sup> (max)	Floor levels	Floor area (m <sup>2</sup> )	Hearths	Gr.Ware	Burial/cremations	Grooved Ware pits	Fence line	Associated monuments
Machrie Moor	✓	4 x 4	16	✓	14.5	165	x	x	x	✓	?	✓	✓	Stone circles, timber circle
Average areas			25.8			139.75								
<b>d) Orcadian settlements</b>														
Skara Brae House 7	x	5 x 5	27.5		8 x 8	64	✓	27.5	✓	✓	✓	✓	✓	
Skara Brae Hut 1	x	6.5 x 6.5	42		10 x 11	110	✓	42	✓	✓	x	✓	✓	
Barnhouse House 2	x	10 x 7	70		12 x 14	168	✓	70	✓	✓	?	✓	x	Stones of Stenness
Barnhouse Structure 8	x	8 x 8	64		13 x 14	182	✓	64	✓	✓	x	✓	x	Stones of Stenness
Average areas			50.87			131								
			5											

This table shows that both overall areas enclosed by four-post settings of a variety of forms is comparable with the internal floor area and overall areas of Orcadian Late Neolithic settlement structures. It also records presence/absence of a number of features including floor levels, hearths, Grooved Ware, burials, and fence-lines

TABLE 5: RADIOCARBON DATES FROM FOUR-POSTERS

Lab no.	Material	Context/Sample	Radiocarbon Age (BP)	Calibrated date range BC (95.4% confidence)
SUERC-28269	Charcoal: <i>Alnus glutinosa</i>	Greenbogs B	4165±40	2890–2620
SUERC-20998	Charcoal: <i>Alnus glutinosa</i>	Greenbogs A	4100±40	2880–2490
SUERC-33430	Charcoal: <i>Alnus glutinosa</i>	Greenbogs A	4125±30	2870–2570
GU-3533	Charcoal: mixed species	Beckton Grooved Ware pit	4360±60	3330–2880
GU-3534	Charcoal: mixed species	Beckton Grooved Ware pit	4220±60	2930–2620
AA-12587	Charcoal: mixed species	Beckton Grooved Ware pit	4150±95	2910–2460
GU-3538	Charcoal: mixed species	Beckton fire-pit	4070±90	2890–2350
GU-3535	Charcoal: mixed species	Beckton fire-pit	3960±60	2830–2230
WK-118751	Charcoal	Wyke Down post-hole	4203±33	2900–2670
WK-118752	Charcoal	Wyke Down post-hole	4117±40	2880–2570
GU-2316	Charcoal: mixed species	Machrie Moor main ring	4470±50	3360–2940
GU-2325	Charcoal: <i>Quercus</i> sp.	Machrie Moor main ring	3980±180	2930–1960
GU-2324	Charcoal: mixed species	Machrie Moor outer ring	4080±90	2900–2350
UBA-14782	Hazelnut shell: <i>Corylus avellana</i>	Knowth post-pit fill, K91:38:26	4560±29	3490–3100
GrA-445	Charred residue pottery	Knowth post-hole 16	4130±35	2880–2580
GrA-448	Charred residue pottery	Knowth post-hole 7	3985±35	2620–2350
UBA-14781	Hazelnut shell: <i>Corylus avellana</i>	Knowth post-pit fill, K91:31:24	3987±27	2580–2460
NPL-240	Antler	Durrington Walls North Circle post-hole 42	3905±110	2850–2030
SUERC-30992	Antler pick	Durrington Walls N Circle	4025±35	2840–2460
NPL-239	Antler	Durrington Walls S Circle	3760±148	2580–1750
BM-396	Charcoal: <i>Quercus</i> sp.	Durrington Walls S Circle	3950±90	2860–2150
BM-395	Antler	Durrington Walls S Circle	3900±90	2830–2050
BM-397	Bone	Durrington Walls S Circle	3850±90	2570–2030

Note the Beckton dates come from associated features, not directly from the four-posters; (calibrated by OxCal v.4.1.7)

Walls (Thomas 2010). It is also the case that at each individual site, again whether interpreted as domestic dwelling or monument, there are hints of ritualised actions such as the placing of the dead. Deposits of cremated bone for example, have been found at ‘monumental’ sites such as Ballynahatty (Hartwell 2002), and at sites such as Beckton Farm<sup>14</sup>. In Ireland, ritualised acts such as the dismantling and/or burning of timbers and deposition within post pits occurs in examples interpreted in both domestic and monumental contexts (Smyth 2010, 20). Therefore, the presence of more unusual practices such as burial or deposition should not be seen as a definitive indicator of the role of a particular structure.

The landscape location and the nature of activities at these sites, like the size range of these structures, suggests shared associations and uses between the smaller and larger examples – again a continuum rather than clear-cut categories. All of these four-post structures were clearly important to Neolithic life in one way or another – some perhaps used in an

everyday context, others in more ritualised settings, some perhaps even fulfilling a domestic role in their first incarnation before becoming the focus of ritualised activities through a process of monumentalising the house (cf. Thomas 2010; Bradley 2007, 120). In this respect, we should also perhaps interpret a continuum of use between houses and monuments – both being deeply implicated in important lifecycle events in Neolithic communities. In Late Neolithic Orkney the house (or more accurately the end of a household cycle) has been argued to have been the catalysis for monument creation at Maes Howe and Howe in Orkney where structures interpreted as houses have been suggested to underlie these monuments (Richards 1993, 2005<sup>15</sup>). In Orkney too we should not forget the intimate connections outlined by Richards (2005) between the settlement at Barnhouse and the monuments at the Stones of Stenness and Maes Howe, outlining the extent to which there was no clear division between domestic and monumental in Late

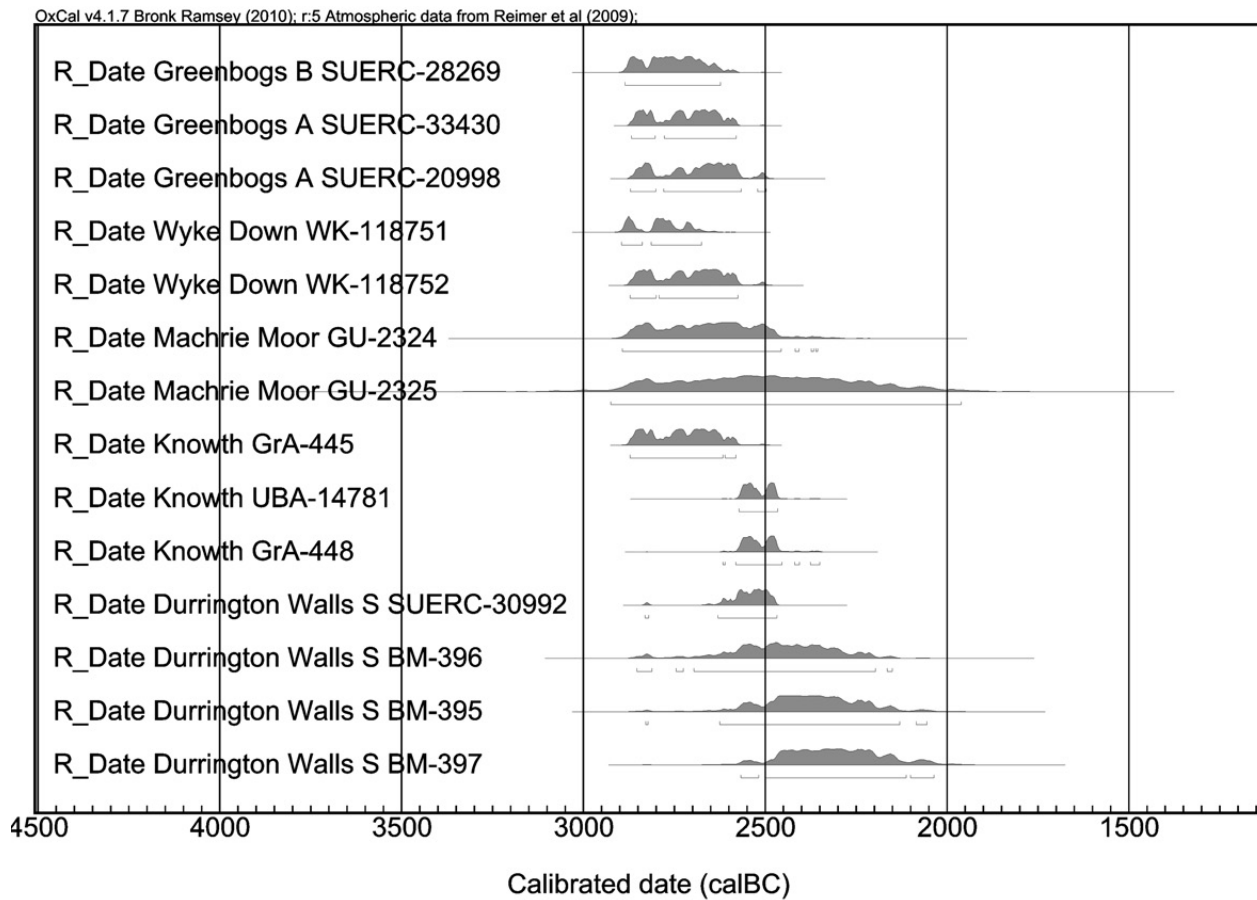


Fig. 22.  
Radiocarbon dates for four-posters and parallels (calibrated using Oxcal c.4.1.7)

Neolithic contexts. Parker Pearson *et al.* (2009, 33) have also recently suggested that a house floor may have been an early element of the site that became Stonehenge. In all of these cases, the lifecycle of the house and its position in the landscape was an adjunct and perhaps spark to the creation of a monumental landscape. All of this suggests that we should perhaps accept greater fluidity between the categories of house and monument in Late Neolithic contexts<sup>16</sup>.

Indeed, as a number of authors have stressed in recent years, it is from the everyday that ritual emerges (Bradley 2005; Brück 1999), and the household is known as the locus of many important ceremonial gatherings and ceremonies in ethnographic contexts, such as potlatch ceremonies on the north-west coast of Canada or house post-planting ceremonies in northern Thailand (Trieu 2006, 57; Waterson 1997, 123). Indeed, on the north-west coast

of Canada all spiritual beings were envisioned as living in houses in Native belief systems (Trieu 2006, 57). Moreover, in ceremonies outside of the house on the north-west coast the negotiation of household histories, rights, and property were a major feature of ceremony, again underlining the problematic and futile nature of separating domestic and ritual practice (*ibid.*). Houses themselves can also fulfil the role of ceremonial meeting place, temple and fortification, all aspects that have been most commonly associated with monuments in a Neolithic context; therefore the question of whether all four-post structures were houses or monuments may be not be a question that Late Neolithic people would have understood.

Instead we may have to accept that difficulties in separating monument from house are likely to remain and may not be a distinction that is resolvable, especially given the plough-truncated nature of the

evidence. Indeed, 'household' archaeology in other parts of the world show the difficulty in separating the categories of 'monument' and 'house'. In a north-west coast of Canada context, for example, it can be seen that more substantial timbers, beyond functional necessity, can be a marker of status in settlement architecture (Samuels 2006) and that a lack of finds is not a clear-cut indicator of the non-domestic role of a structure as variation in house-cleaning practices between elite and commoner dwellings can account for this, with elite dwellings often kept clean of debris, due to the fact that these dwellings were more likely to host public events such as feasts and dances and were kept clear of rubbish for such reasons (eg, Samuels 2006). This demonstrates the potential pitfalls in interpreting a structure on categories such as overall size, the size of structural timbers, or associated finds: common ways of differentiating function in Late Neolithic studies in Britain and Ireland. Again our cues can perhaps be taken from Orkney where differentiation between structures was emphasised though size, the quality of construction, and through the spatial layout of certain buildings<sup>17</sup> and the functions of all of these structures blurring the distinctions between ritual and domestic (Richards 2005, 129; see also Trieu *et al.* 2006 for similar demonstrations in ethnographic contexts). These differences in size and quality of construction also seem to characterise the diversity of four-poster structures identified here, but no definitive patterns can be identified, again suggesting that there was a clear continuum of structures from small to large, simple to elaborate, and, perhaps, all similarly broaching the divide between 'domestic' and 'monumental'.

In conclusion, given the partial excavation at Greenbogs and the truncation that characterises most lowland sites in Britain it is difficult to pin down the function of the four-post structures. Clearly at Greenbogs there was a wider landscape of Neolithic activity and future excavations here may reveal more detail about Late Neolithic landscapes in lowland Scotland. Likewise the further characterisation of the cropmark evidence from Scotland and beyond may well reveal many more Late Neolithic timber structures of this form. It will also be useful in future years to explore the longevity of this structural form, the Greenbogs four-post structures, for example, have parallels with late 3rd–early 2nd millennium BC four-post stone circles that are particularly abundant

in the Aberdeenshire region and the oval structure C at Greenbogs also has wider parallels in both timber and stone (Burl 1988; Darvill & Wainwright 2003). The links between the timber sites and the later monumental and probably funerary four-post stone circle sites will be an important avenue of future research.

#### *The later prehistoric features at Greenbogs*

The later prehistoric features at Greenbogs are perhaps less spectacular than the Neolithic timber structures found in the same locale. However, the limited deposits of cremated remains and other features add important regional evidence for Middle Bronze Age cremation practice and 1st millennium BC pit digging and activity zones in north-east Scotland. The small cremation urn, pit AB, and possibly pit 42 suggests there was a small Middle Bronze Age cemetery in Area I. Its discovery adds to the growing number of Middle and Late Bronze Age graves containing deposits of cremated bone in north-east Scotland, as attested, for example, among recently-dated examples from re-used recumbent stone circles in Aberdeenshire (Bradley & Sheridan 2005; Sheridan 2007a). Pottery of this tradition is also now well-known from settlement contexts in the region. The limited evidence points to the importance of this knoll in Middle Bronze Age funerary practice in the area. The ring-ditches could also be associated with the cemetery: one example, ring-ditch 39, has a radiocarbon date that overlaps with the cremation deposits. These ring-ditches may indeed be the remains of small ploughed-out barrows, but excavation was particularly limited in this area and no funerary associations were demonstrated. Without dating or further fieldwork the discussion of the other features in this area is limited. Likewise not much can be said at present regarding the isolated Iron Age pits found in Area II, but these can be placed alongside the increasing Iron Age settlement evidence known from Aberdeenshire (eg, Cook & Dunbar 2008).

#### CONCLUSIONS

Subsequent to the excavations, the Greenbogs site has since been flown over by Aberdeenshire Archaeology Service during aerial reconnaissance on a number of occasions with nothing appearing on the ground, a salutary reminder of the vicissitudes of the



archaeological record and its identification and survival. In a regional context the Greenbogs structures are important finds for north-east Scotland, where the nature of Late Neolithic activity has often been suggested to be different or unusual in terms of activities elsewhere (eg, Barclay 2005). The discovery of the Greenbogs four-poster structures – along with increasing numbers of finds of Grooved Ware pottery in Aberdeenshire (eg, at Kintore: MacSween 2008) suggests that north-east Scotland was very much part of the social networks that characterised early 3rd millennium BC Neolithic society. In a wider context, the four-post structures found in Area III are of wider significance as representing a widespread architectural tradition in Late Neolithic Britain and Ireland.

The evidence outlined here underlines that there was a clear continuum of square-within-circle structures in the Late Neolithic from those interpreted as dwellings to those interpreted as monuments. What Greenbogs and the other sites identified here indicate is that a shared style of architecture extended across large areas of Britain and Ireland and formed a building type – perhaps an archetype – that was found in a variety of contexts, some mundane, others highly ritualised, and that the creation and use of this building form may have been an important framework for social reproduction in 3rd millennium BC society

The identification of sites such as Chapelton, Balcathie and the Green of Invermay also suggests that many other sites exist ‘out there’ and in a similar way that the aerial record and developer funded archaeology has revolutionised our understandings of other aspects of the Neolithic, the discoveries at Greenbogs, and the aerial evidence suggests that a similar ‘fleshing out’ of the Late Neolithic settlement and/or monumental record and attendant revisions of our models of Late Neolithic social organisation could be due to take place. However, the nature of the evidence: plough truncation and the use of timber, earth and other organic materials in the lowlands always results in a number of interpretive and taphonomic issues concerning the way in which we understand the remains left to us from this period, meaning that it is difficult to tease apart the full significance of structures left to us only as stains in the subsoil. It is perhaps only in the coming years with greater excavation and a greater awareness of the four-post structure as an important architectural element of Late Neolithic archaeology that a fuller picture will be obtained.

#### Endnotes

- 1 The pot is held in Marischal College Museum, Aberdeen (ABDUA 50588).
- 2 See also Cormack 1963a and 1963b for further remains in the vicinity of Beckton.
- 3 The full extent of this site may not have been established as on the date of photography, the field to the north of the recorded cropmarks was under oilseed rape, a crop not sensitive to buried features.
- 4 The structure at Balcathie lies within an area showing evidence of considerable prehistoric activity. In particular, it is closely surrounded by the cropmarks of a later prehistoric unenclosed settlement. It appears, however, that the four-post structure is partially overlain by the remains of one of the round-houses of this date.
- 5 In a similar manner to that at Balcathie, the structure at Green of Invermay has also been recorded in close proximity to the cropmark remains of additional prehistoric activity, including a palisaded enclosure of probable later prehistoric date. The site, is however, also near a possible pit defined circle that lies around 40 m to the south-south-east and the site itself is only some 300 m south-south-west of the major Late Neolithic monument complex at Forteviot (Driscoll *et al.* 2010; Noble & Brophy 2011).
- 6 In further support of this it should also be noted that the possible porch settings at Wyke Down lie within the line of the projected outer setting further suggesting that the building was contained within an external palisade and that some form of inner wall, that did not survive (perhaps of turf), functioned as the main supporting wall for a roofed structure.
- 7 The cropmark site of Chapelton is at present an unexcavated cropmark, but the evidence here suggests that at least one structure (B) also survives with a floor level intact, and again the cropmark evidence suggests that this was made in relation to the four-post setting and that the external setting of posts was an independent structure or part of a substantial outer wall.
- 8 Other Iron Age examples include Holme House, Yorkshire; Winterton, Lincolnshire, and Bozeat, Northamptonshire (Harding 2004, fig. 6.4), however, these three examples are stone-built round-houses. All of the Iron Age examples are at the larger end of the scale in relation to the Neolithic structures.
- 9 This may explain why some of the four-post post-holes at sites of this type are much larger and sunk deeper than those found in the external palisades due to their load-bearing capacity and due to the presence of an upper storey.
- 10 Note while we may interpret these structures as ‘domestic’, the meaning of this is debatable – at Durrington Walls for example, Parker Pearson (2007) has interpreted the ‘houses’ as a seasonal settlement associated with monument building and ceremony.
- 11 Of course Chapelton is unexcavated and the size of some of the structures here could mean that

Chapelton represents a series of monuments rather than a settlement, but such a grouping of timber circles has no clear parallel in the excavation or cropmark record in Scotland and four-post arrangements with the exception of Machrie Moor are not a common element of the timber circle repertoire here. Moreover, the sizes of timber circle monuments tends to be larger than the structures at Chapelton and there is no parallel for floor levels or internal hearths at these sites as suggested by the cropmark evidence at Chapelton (Millican 2007).

- <sup>12</sup> The structure at Knowth is unusual in that there appears not to be an 'outer' setting of posts (this may instead have been symbolically represented by an outer setting of stones (Eogan & Roche 1997, 103), instead the post-setting tightly clustered around the four-post setting. Here the favoured reconstruction strongly suggests a roofed building (Bourke 1997). There are also possible traces of a floor level at Knowth, a huge finds assemblage and Grooved Ware with traces of cooking residues (Eogan & Roche 1997, 103, 215). There was also a midden deposit, two hearths, and a series of pits associated with Grooved Ware found elsewhere on site in an 'area of domestic activity' (*ibid.*, 197). A midden deposit was also located near to the Southern Circle at Durrington Walls (Wainwright & Longworth 1971, 38).
- <sup>13</sup> In this respect it should be noted that Durrington 68 does not have a circular outer setting, but appears to have a more ephemeral square or sub-rectangular post- or stake-setting and two larger posts that may define a south-easterly doorway, more akin to the inner settings of Durrington 14, but on a larger scale (Darvill 2006, 115, fig. 39). It also shares characteristics with the setting at Knowth (see above).
- <sup>14</sup> One of the circular dwellings F111, shares sherds of pottery with a pit found elsewhere on the site that also contained fragments of a cremation of a person and a sheep (Pollard 1997, 79).
- <sup>15</sup> Richards has also noted that a four-stone setting may have been the initial act of construction for Maes Howe passage grave (Richards 2005, chap. 9). However, it is also important to note that the original report suggests that the structure at Howe was a stalled cairn (Ballin-Smith 1994, 13–14).
- <sup>16</sup> In this respect, the cropmarks of a four-post structure at the centre of the palisaded enclosure at Leadketty and in close proximity to Forteviot at Green of Invermay, may be other intriguing examples of the monumentalisation of the house as a context or spark for the creation of ceremonial architecture in Late Neolithic contexts.
- <sup>17</sup> In the context of the north-west coast of Canada, the most visible marker of status in native communities was the size of a dwelling, with the most powerful individuals able to control the labour requirements needed to build a large timber building (Trieu 2006, 74).

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