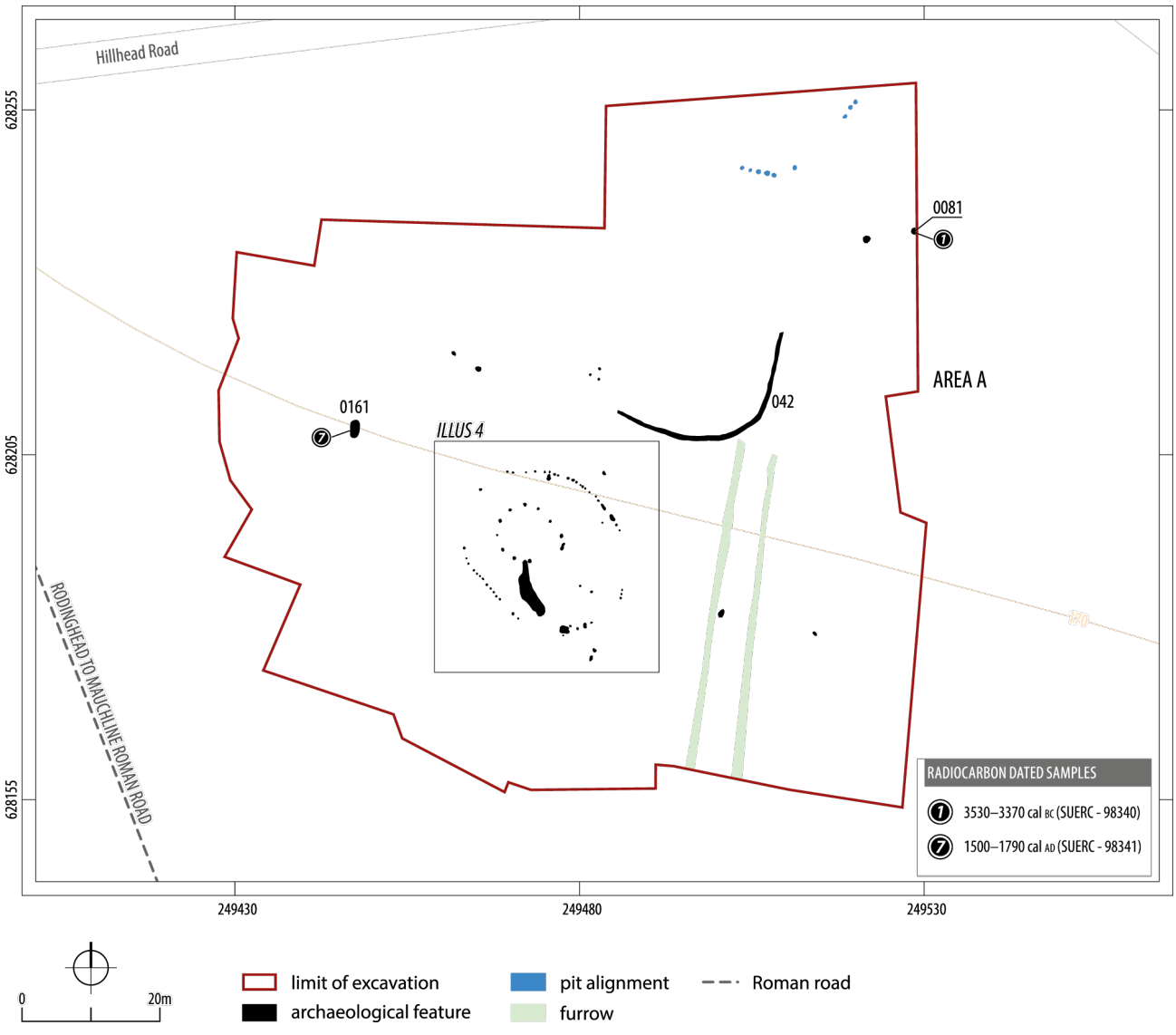
4. EXCAVATION RESULTS

The two areas subject to monitored topsoil stripping were labelled Area A and Area C by the excavation team (a planned third area, Area B, became part of Area A when the latter was expanded during the works) (Illus 1). As per the agreed excavation methodology, discrete features or those forming a structure were 100% excavated, while curvilinear features were 80% excavated (McFarlane 2020: 3). All the features excavated were located in Area A, except for one isolated pit of no obvious function in Area C (not illustrated), and so Area C is not considered in this article (Illus 3). The interpretation of the chronology of the site in this publication differs markedly from that posited in the preliminary Data Structure Report; that is due to the radiocarbon dates, which were not available to the author of the earlier text (McFarlane 2020).

4.1 Middle Neolithic activity

A shallow sub-circular pit, C0081, was recorded in the north-east part of Area A (Illus 3). The feature measured 0.6m in diameter with gently sloping sides and a flat base, was 0.07m deep, and contained two fills. The primary fill, C0082, comprised a charcoal-rich dark brownish-grey fine sandy silt and was interpreted as material raked into the pit from its western edge. This fill was notable for the high concentration of charred hazelnuts and nutshells, with smaller quantities present in



Illus 3 Plan of Area A

the upper fill C0083. Crab-apple seeds were also identified in both fills, though in lesser quantities. A fragment of hazelnut kernel recovered from the primary fill was radiocarbon dated to 3530–3370 cal BC (95.4% probability; SUERC-98340) (Illus 2). It is likely that the pit is evidence of a one-off event taking place in late summer / early autumn in the Middle Neolithic when the hazelnuts and crab apples were prepared for consumption in a hearth adjacent to the pit. Once ready, the prehistoric people scraped off the top of the hearth to access the nuts and then raked the hearth material into the pit. This is discussed further below (see 4.5 'Environmental analysis').

Ten undiagnostic sherds of pottery were recovered from both fills of the pit and are likely to be associated with the consumption and deposition events discussed above (see 4.4.1 'Prehistoric pottery' below) (Table 2).

A lithics assemblage comprising 13 small pieces of debitage was recovered from the fills of post hole C0014 (associated with the roundhouse, the fills of the souterrain) (see Illus 4), and pit C0161 (Illus 3). The lithics could not be assigned to a time period beyond a general prehistoric date, and the small quantities recovered suggest only sporadic occupation prior to the settlement phase. The assemblage is likely to be residual in nature, with the small size of the pieces making it probable that they have moved around through redeposition or bioturbation.

The evidence of the pit and the lithics assemblage is indicative of small-scale one-off activities and is typical of the traces left by early prehistoric people in the landscape.

Table 2 Overview of pottery per context

Feature type	Parent context	Context	No. of pieces	Weight (g)	Thickness (mm)	Diameter (mm)
Post holes roundhouse	0026	0027	6	36.6	13.4	–
	0028	0030	4	58.5	11.9, 12.6	–
	0034	0035	5	8.6	n/m	–
Neolithic pit	0081	0082	2	1.7	n/m	–
		0083	8	25.0	10.0	–
Ditch	0114	0115	2	5.5	8.4	–
Souterrain	0145	0155	6	6.3	n/m	–
		0157	2	6.6	n/m	–
		0158	1	0.2	n/m	–
		0159	4	3.6	n/m	–
	0166	0167	9	84.0	13.0, 10.6, 9.8	–
		0171	1	7.9	11.9	–
	0174	0177	2	6.0	n/m	–
	0178	0204	1	1.1	n/m	–
		0211	4	111.5	11.7	–
		0212	6	133.6	11.7, 12.0	*c* 210mm with *c* 25% surviving (all rims)
		0278	30	150.0	9.8, 10.5, 12.8	–
Post holes enclosure fence	0233	0234	1	23.3	n/m	–
	0263	0264	1	60.3	14.1	–

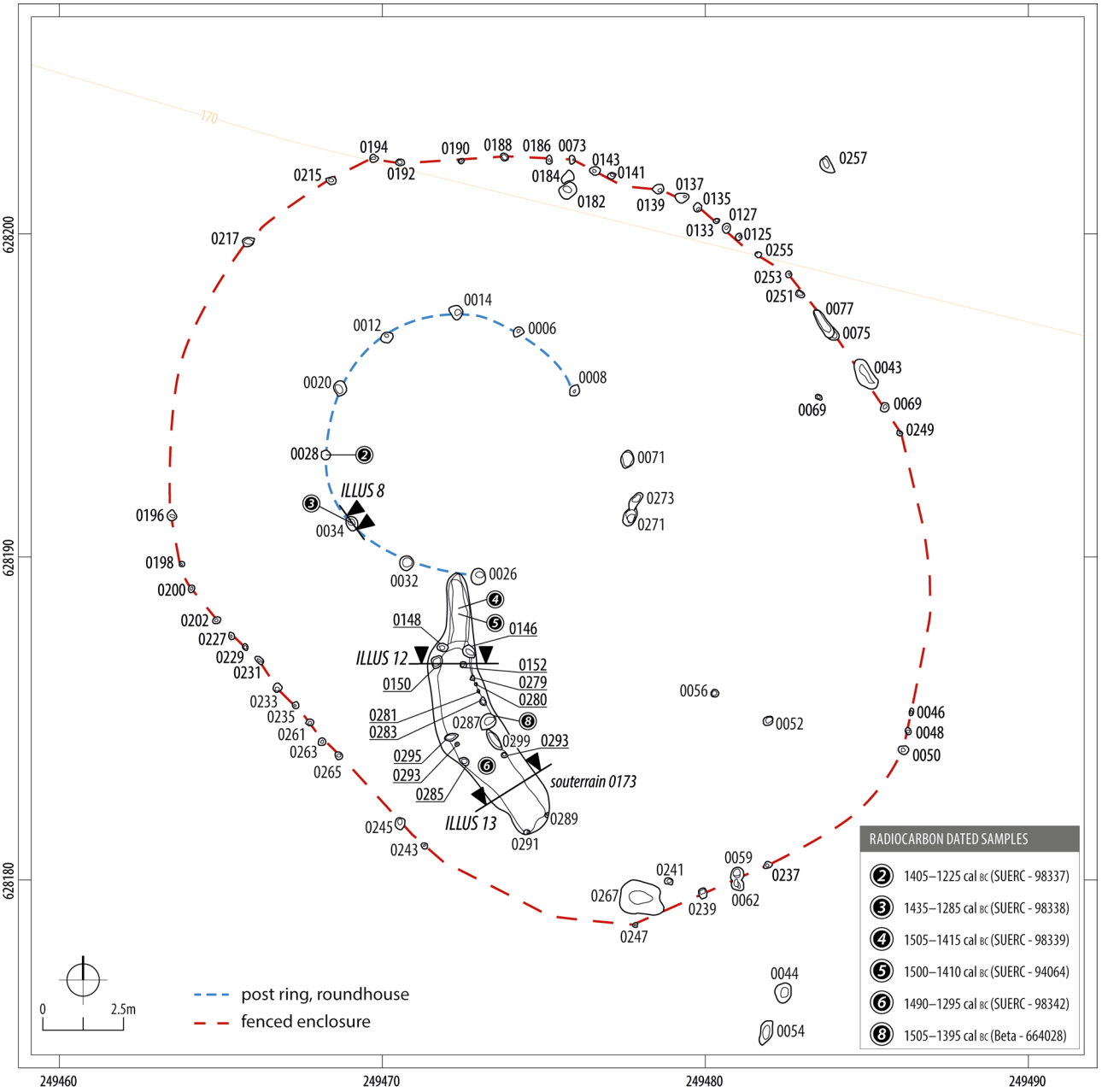
4.2 The later prehistoric settlement

Evidence of a later prehistoric, Middle Bronze Age, settlement comprising a roundhouse, souterrain and fenced enclosure was excavated and recorded in the southern part of Area A (Illus 4).

4.2.1 Enclosure

A fenced enclosure comprising 42 post holes demarcated the core area of the Middle Bronze Age settlement (Illus 1, 3 & 4). The boundary formed an incomplete oval shape in plan and enclosed an area of approximately 1,500m^2. Four gaps, measuring between 11 and 18m wide, were observed in the projected fence line, situated in the north-west, south and south-east of the oval. It is likely that one of these gaps represents an entrance while others may be the result of medieval or later ploughing activity.

The 42 post holes which demarcate the fence line measured between 0.2 and 0.4m in diameter and were between 0.1 and 0.2m deep with vertical or steep sides and curved bases. They were spaced between 0.5 and 1.5m apart. The fills ranged between friable mid-greyish-brown sandy silt and



Illus 4 Plan of core area of late prehistoric settlement

Illus 5 View towards the south-east showing the north-eastern arc of the fenced enclosure

loose dark greyish-brown silty sand. One sherd of pottery each was discovered in two of the post holes, namely in C0233 (Illus 5) and C0263 in the south-western quadrant of the fence line (Table 2).

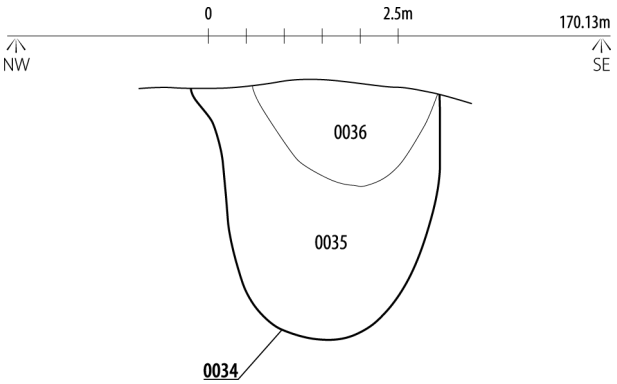
4.2.2 The roundhouse

The roundhouse was situated in the northern half of the enclosure and comprised a post ring measuring 7.5m in diameter (Illus 4). Just to the east of the post ring was a group of three pits C0071, C0273 and C0271, although their relationship to the roundhouse is uncertain. The post ring was formed of nine post holes spaced approximately 2m apart. A 6m-wide gap in the south-east of the post ring was observed between post hole C0008 and C0026 and may be representative of an entrance.

The post holes measured between 0.35 and 0.5m in diameter and were between 0.12 and 0.38m deep. The variations in the depth of the post holes is likely indicative of later truncation by medieval and post-medieval agricultural activities, as shown through the incidence of furrows across the excavation area. A modern land drain also bisected the centre of the roundhouse (Illus 7). The post holes were mostly circular in plan with steep or vertical sides and rounded or flat bases (Illus 6). Five of the post holes – C008, C0014, C0020, C0028 and C0034 – contained post pipes (Illus 8). The post pipes generally comprised dark brownish-grey loose sandy silts and clayey sands and contained fragments of oak and alder charcoal up to 20mm in size. These fragments represent either the remnants of a charred post end or material from the use of the roundhouse that filled the post-pipe cavity. Packing fills used to secure the posts in place were present in the post holes that had post pipes and ranged from firm light orangey-brown clayey sand to loose dark brown silty sand. Two fragments of alder charcoal from the post pipes of post hole C0034 and C0028 were radiocarbon dated to 1435–1285 cal BC (95.4% probability; SUERC-98338) and 1405–1225 cal BC (95.4% probability; SUERC-98337) respectively, placing the roundhouse in the Middle Bronze Age.

Illus 6 South-west-facing section of post hole C0233

Illus 7 North-east-facing view of the roundhouse and modern land drains



Illus 8 South-west-facing section drawing of post hole C0034 showing the post pipe

The fills of the remaining post holes were composed of loose silty sands ranging in colour from mottled grey-brown to dark brownish black. No post pipes were present in these post holes, suggesting that the posts were removed before being backfilled through natural processes. No evidence of post replacement or modification was observed in any of the post holes. Six, four and five fragments of pottery were recovered from the fills of post hole C0026, C0028 and C0034 respectively (Table 2). The pottery was of a similar thickness and coarseness as the sherds discovered in the fenced enclosure and are probably contemporaneous. The significant thickness of the sherds suggests they were used as cooking vessels (see 4.4.1 'Prehistoric pottery' below).

4.2.3 The souterrain

The souterrain, C0173, was located immediately to the south of the post ring of the roundhouse (Illus 4). It had an irregular arch shape in plan and measured 8.3m long, a maximum of 2m wide, and a maximum of 1.3m deep (Illus 9). The top fill of the feature was truncated by a modern land drain over a substantial stretch of its total length.

The entrance to the souterrain comprised a narrow, steep-sided passage, C0166, which was located between two post holes that were part of the roundhouse, namely C0026 and C0032 (Illus 4 & 9). The passage sloped gently down to a step, measuring 0.4m in depth, leading into the main

Illus 9 South-east-facing view of souterrain prior to excavation

Illus 10 Photogrammetric model of the souterrain viewed south

chamber of the souterrain. The main chamber was approximately 6m long with a flat base and vertical sides. It measured up to 1.3m in depth before shallowing slightly to approximately 1.2m close to the south-eastern terminus (Illus 10 & 11).

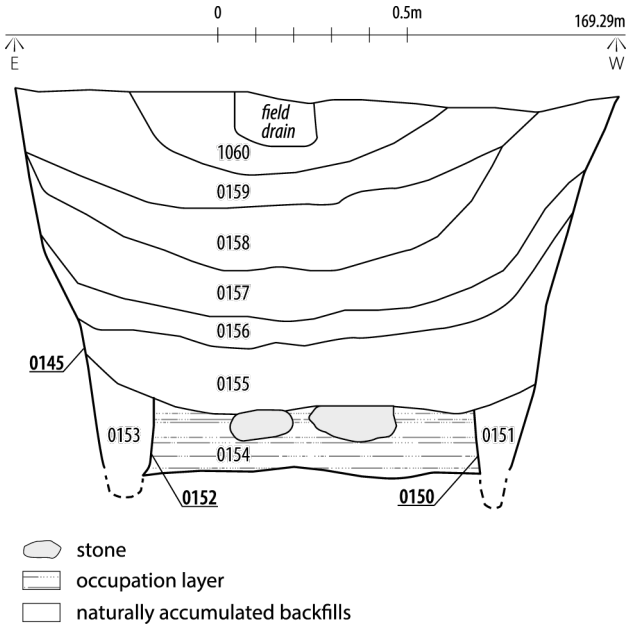
Within the main chamber of the souterrain 15 post holes and a pit were cut into the base. They were generally sub-circular in plan with steep or vertical sides and rounded or flat bases, measured between 0.1 and 0.5m in diameter and were between 0.1 and 0.4m in depth. The fills of the post holes ranged between mid-grey clayey silt to mottled brownish-orange sandy silt. The lack of post pipes in the post holes suggests that the posts were removed when the souterrain fell out of use. However, one post hole, C0287, contained a waterlogged in situ timber. The timber was identified as oak and was radiocarbon dated to 1505–1395 cal BC (95.4% probability; Beta-664028) – an analysis of the wood is included in the environmental report below (4.6 'Waterlogged wood analysis'). It is possible that its waterlogged nature led to it being left in situ, although whether the waterlogging was a factor in the abandonment of the souterrain is not known.

The largest post holes were located in two pairs either side of the step down into the main chamber, with another three large post holes (two forming a pair) located in the central area. Pit C0295, located on the western side beside the three large post holes in the central area, was sub-oval in plan with steep sides and a flat base. It measured 0.75m in length, 0.3m in width and 0.15m in depth. The nature of the cut indicates that it may have been a beam slot. These larger posts and the pit cut for a beam slot may have formed the supporting frame for a wooden roof or plank structure which would have sealed the souterrain.

A line of smaller post holes was identified along the eastern edge of the base of the souterrain between the central posts and the entrance posts. These post holes may have supported a wattle or roundwood lining for the souterrain.

Within the chamber and passage of the souterrain a sequence of fills was identified, relating to the use and disuse of the feature (Illus 12, Table 3). Contexts 0154 and 0278 represented the occupation or usage layer of the chamber, while fill C0167 played a similar role within the entrance passage. The usage layer of the entrance passage contained nine sherds of thick and coarse pottery that was similar to that found in relation to the roundhouse and the fenced enclosure. These fills also contained a possible whetstone which showed evidence of use

Illus 11 Working shot of the south-eastern terminus of the souterrain



Illus 12 North-facing section drawing of souterrain chamber showing post holes C0150 and C0152 and the sequence of deposits

wear (see '4.4.3 Coarse stone' below). Two fragments of alder charcoal recovered from fill C0167 (not in section) were radiocarbon dated; one to 1505–1415 cal BC (95.4% probability; SUERC-98339) (Table 1, no. 2), the other to 1500–1410 cal BC (95.4% probability; SUERC-94064) (Table 1, no. 3).

The usage layer in the entrance passage as well as in the chamber was overlain by a series of naturally accumulated deposits which varied in colour and texture (Table 3). Fifty-five sherds of pottery, again thick and coarse, were found among the lowest fills of the chamber (Table 2). One sherd from secondary fill C0212 contained carbonised internal residue, which was radiocarbon dated to 1490–1295 cal BC (95.4% probability; SUERC-98342).

After the initial abandonment of the souterrain, it appears to have gradually filled in over time through natural infilling, with a range of deposits washed into it. The deposits ranged between C0157 plastic mid-greyish-brown sandy silt to C0205 firm light brownish-orange silty clay and represent continued natural siltation of the souterrain following its abandonment. There was evidence of deliberate

Table 3 Overview of deposits observed within the souterrain

	Usage layer	Primary fill	Secondary fill	Tertiary fill	Quaternary fill	Quinary fill	Senary fill	Septenary fill	Octonary fill
Construction cut 0174		0181	0180	0179	0177				
				Tertiary fill	Quaternary fill				
		Compact mid-greyish-brown clayey fine sand	Compact mid-greyish-brown clayey fine sand	Compact mid-orangish-brown clayey coarse sand	Compact mid-greyish-brown clayey fine sand				
Cut of entrance 0166	0167	0168	0169	0170	0171	0172			
	Usage layer	Primary fill	Secondary fill	Tertiary fill	Quaternary fill	Quinary fill			
	Friable mid-blueish-grey coarse sandy silt	Firm mid-brownish-orange coarse sandy clay	Plastic mid-greyish-brown coarse sandy silt	Firm mid-reddish-orange silty clay	Plastic mid-greyish-brown coarse sandy silt	Friable dark greyish black fine sandy silt			
Cut of chamber (north-west) 0145	0154	0155	0156	0157	0158	0159	0160		
	Usage layer	Primary fill	Secondary fill	Tertiary fill	Quaternary fill	Quinary fill	Senary fill		
	Firm mid-reddish-orange silty clay	Friable mid-blueish-grey coarse sandy silt	Friable mid-brownish-grey silty clay	Plastic mid-greyish-brown coarse sandy silt	Firm mid-reddish-orange silty clay	Plastic mid-greyish-brown coarse silt	Friable dark greyish black fine sandy silt		
Cut of chamber (south-east) 0178	0278	0211	0212	0205	0206	0208	0209	0214	0204
	Usage layer	Primary fill	Secondary fill	Tertiary fill	Quaternary fill	Quinary fill	Senary fill	Septenary fill	Octonary fill
	Firm mid-brownish-red silty clay	Firm mottled grey silty clay	Friable mid-brownish-grey silty clay	Firm light brownish-orange silty clay	Plastic mid-greyish-orange silty clay	Firm light orangish-grey fine sandy clay	Firm mid-greyish brown silty fine sand	Loose light brownish-grey fine sandy clay	Friable dark greyish-brown silty loam

Illus 13 North-west-facing section of souterrain showing concentration of stones near the south-eastern terminus of the chamber

backfilling with dumps of stones at the southern extent of the souterrain seen in C0177 and C0214 (Illus 13). It is possible that the souterrain was used as a convenient place to deposit stones removed during later field clearance activities in the area.

The upper fills of the souterrain were characterised by dark greyish-brown silty loam similar in composition to the topsoil. These fills are interpreted as ploughsoil resulting from agricultural practices and represent the final infilling of the souterrain (as the fills of the souterrain subsided over time). A possible pot lid was recovered from one of these upper fills, C0204, and is interpreted as a residual find.

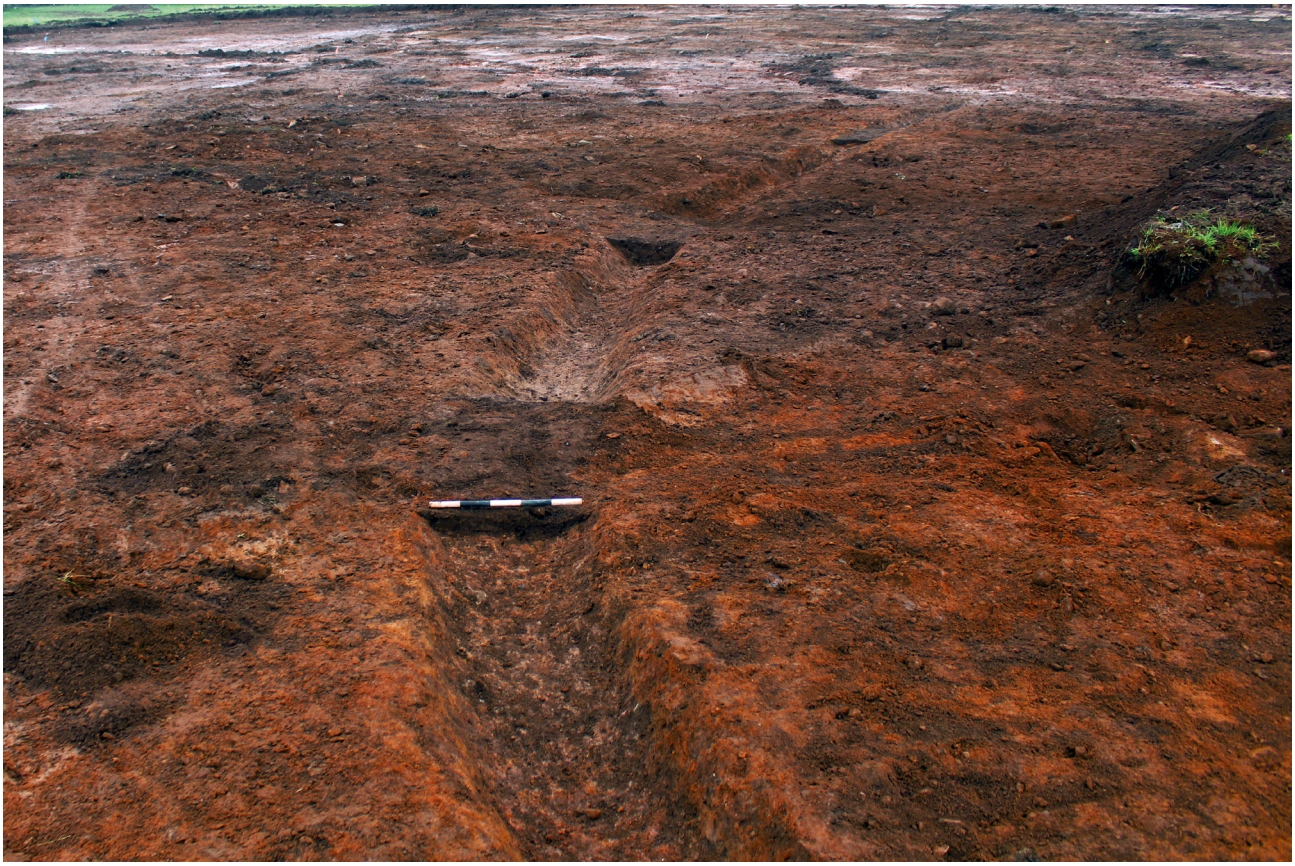
4.2.4 Curvilinear ditch

Approximately 17m to the north-east of the roundhouse was a curvilinear ditch C0042 (Illus 3). The ditch measured approximately 25m in length and up to 0.7m in width and formed a 90-degree arc in plan.

The ditch ranged in depth between 0.15m in its central area and only 0.03m at its northern and western extents, where it was presumably truncated by later ploughing. In the well-preserved central area, its profile was steep sided with a flat base (Illus 14). The ditch contained a sandy silt fill ranging in colour from mid-reddish-brown to mid-greyish-brown. A sherd of undiagnostic prehistoric pottery was recovered from the western end of the ditch.

4.2.5 Pit alignments

Approximately 20m north of curvilinear ditch C0042 were two pit alignments forming a possible enclosure (Illus 1 & 15; Table 4). The northern alignment measured 4m long and comprised four pits aligned roughly north-east/south-west; it potentially continued beyond the northern limit of excavation. The southern alignment measured 6m long and comprised five pits aligned roughly east/west (Illus 15). The pits were sub-circular in plan with steep sides and flat or rounded bases measuring between 0.35m and 0.65m in diameter and up to 0.3m in depth. The fills ranged between loose mid-reddish-brown silty sand and loose mid-



Illus 14 South-west-facing view of curvilinear ditch

Illus 15 West-facing view of the pit alignment forming the north-east/south-west orientated stretch

Table 4 Details of the individual features forming the pit alignments

Pit	Length (m)	Width (m)	Depth (m)	Plan/Profile	Fill
North-east/south-west alignment					
0106	0.67	0.50	0.23	Sub-circular plan. Curved base and sides	0107 Friable mid-greyish-brown coarse sandy silt
0108	0.65	0.38	0.30	Sub-circular plan. Curved base and sides	0109 Friable mid-greyish-brown fine sandy silt
0110	0.68	0.63	0.30	Circular plan. Curved base and sides	0111 Friable mid-greyish-brown fine sandy silt with rare charcoal
0104	0.60	0.46	0.32	Sub-circular plan. Curved base and sides	0105 Loose mid-greyish-brown clayey fine sand
North-west/south-east alignment					
0102	0.48	0.48	0.30	Circular plan. Flat base and vertical side	0103 Compact mid-reddish-brown silty coarse sand with rare charcoal
0100	0.62	0.50	0.29	Circular plan. Curved base and sides	0101 Loose mid-reddish-brown silty coarse sand with rare charcoal
0098	0.65	0.61	0.23	Circular plan. Curved base and sides	0099 Loose mid-reddish-brown silty coarse sand
0096	0.39	0.39	0.13	Circular plan. Curved base and sides	0097 Compact mid-reddish-brown silty coarse sand with rare charcoal
0094	0.43	0.43	0.09	Circular plan. Flat base and steeply sloping sides	0095 Compact mid-brown silty coarse sand

greyish-brown clayey sand. No dating evidence was recovered from the fills of the pits.

4.2.6 Other features

Eight undated pits and four isolated post holes were also identified in Area A. No evidence of date or function for these features was recovered.

4.3 Post-medieval activity

Activity on site during the medieval or post-medieval period was evidenced by traces of ridge and furrow ploughing as well as by the presence of pit C0161. Evidence of medieval or later agricultural activity was formed by two NNE/SSW aligned furrows in the south-eastern corner of Area A (Illus 1 & 3). To the east of these were a series of north/south field drains, which cut elements of the roundhouse, the fenced enclosure and the souterrain (Illus 7).

Pit C0161, located at the north-west of Area A (Illus 3), was sub-oval in plan with gently sloping sides and a flat base. It measured 2.4m in length, 1.4m in width and 0.6m in depth. The pit was notable for its large size compared to those recorded elsewhere on site and for the large number of medium–large sub-angular and sub-rounded stones (Illus 16) which were present in its basal fill, C0162. A fragment of charcoal from this fill returned a radiocarbon date of cal AD 1500–1790 (95.4% probability; SUERC-98341). The upper fills of the pit (C0163 and C0164) also had evidence of burnt material which had been redeposited into the pit, with environmental evidence indicating the presence of burnt turves. No other pit recorded on site had comparable depositional patterns and it is possible that the pit was used to deposit stones following field clearance activities.

Two furrows were noted in the south-eastern part of Area A (Illus 1& 3). They are evidence of rig and furrow agricultural systems and could date to the medieval or post-medieval periods. Their orientation corresponds with the orientation of the rig and furrow indicated in roughly the location of the excavation area on Roy's survey of the Lowlands (Roy 1747–1755).

Illus 16 West-facing section of pit C0161

4.4 Finds

This section discusses the prehistoric pottery, and stone finds and associated materials. A small assemblage of modern pottery, glass and ceramic building material (CBM) was also recovered. These include a small fragment of modern whiteware pottery, from post hole C0202, part of the fenced enclosure, as well as a fragment of undiagnostic colourless glass from post hole C0020, which is part of the roundhouse structure. Found also in relationship to the roundhouse, in post hole C0014, were 11 small flakes of brick or tile with a modern date. These finds likely derive from modern disturbance, perhaps associated with the installation of the field drains. These finds are not discussed further in the following section, but detailed reports are available in the archive report (McFarlane 2020). Most of the assemblage was associated with the roundhouse structure, its surrounding fence and the adjacent souterrain.

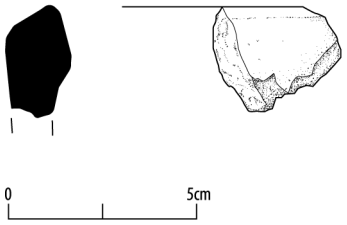
4.4.1 Prehistoric pottery

Beverley Ballin Smith

A total of 95 sherds (732g) of prehistoric pottery was retrieved from 11 features. The majority of the sherds (66, 69.5% by count; 512g, 69.9% by weight) were found in features associated with the souterrain. All the pottery from the site was examined using a 6X hand lens and weighed. Where both surfaces of sherds were present, the sherd thickness was measured. The diameters of rim sherds from a single vessel from the souterrain have been amalgamated to determine its approximate diameter and its percentage survival (see Table 2).

The general conclusion concerning this pottery is that visually it all looks very similar, and it is difficult to distinguish separate wares from the inclusions in the clay because of the almost consistent use of similar rock/minerals and vegetable temper.

The majority of the assemblage comprises body sherds, as expected, with only six rim sherds, fragments less than 10 × 10mm, and no base sherds. There are general observations: the mineral temper added to the clay is very similar across all sherds, indicating the use of easily exploitable, nearby volcanic rocks such as those forming the bedrock in the vicinity of the site and the town of

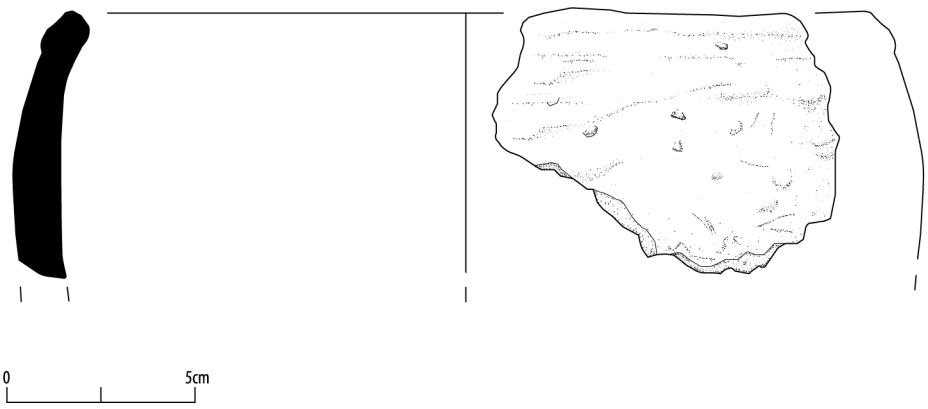


Illus 17 Pottery vessel rim from fill C0027 of post hole C0026 related to the roundhouse

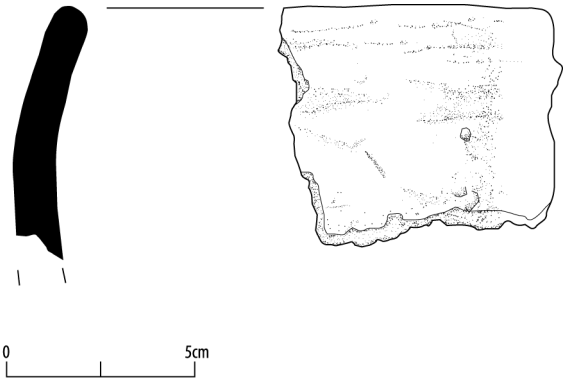
Mauchline (NERC 2024). A few sherds also include quartz sand, with some coal and mica, suggesting the exploitation of superficial deposits forming the subsoil, possibly exposed in the sides or bed of a stream. The subsoil would also have provided clay for the manufacture of the pottery. Organic temper, from straw or dried grasses, is identified in most sherds and is responsible for the occasional surviving grass marks on the pottery.

The use of the same or similar resources over time for the manufacture of this assemblage of pottery indicates that there is very little distinction between temper in sherds found in the different features. However, it must be noted that the body sherds recovered from the fills C0082 and C0083 of pit C0081 in the northern part of Area A contain predominantly quartz rock and quartz sand, as opposed to igneous rocks. A Middle Neolithic radiocarbon date range of 3530–3370 cal BC (95.4% probability; SUERC 98340) was returned from one of a number of hazelnut shells found within the pit fill. It suggests that the body sherds from it are likely to be of the same date – the earliest of the site.

Another noticeable characteristic of the pottery is the poor moulding and finishing of the vessels. Finger indentations are noted on many of the sherds which, given the coarse to very coarse grains of rock temper, were not smoothed completely away. In most sherds, rock temper shows through the surface of the sherds, and this might be deliberate, or simply a product of wear and abrasion of the clay around the harder grits. Rim sherds appear to be badly moulded, and their profiles are variable. The finishing of many of the external surfaces of sherds has largely been lost, in some cases by severe abrasion and burning causing it to flake off. However, where exterior surfaces survived in reasonable condition, it was noted that attempts



Illus 18 Pottery vessel rim from fill C0212 of souterrain chamber slot C0178



Illus 19 Pottery vessel rim from fill C0278 of souterrain chamber slot C0178

were made to smooth the vessels. Due to the size of rock temper most of the sherd thicknesses are in excess of 10mm, suggesting the vessels were heavy and robust, and probably intended as cooking vessels. Carbonised food remains and sooting are common on surfaces and reinforce that view.

The rim from fill C0027 of post hole C0026, is an unusual form (Illus 17). It is triangular in shape with a chamfer to the interior and one to the exterior. The latter ends at a slightly bulbous portion of the rim, from which there is a short but slight concavity for the neck of the vessel. The largest body sherd was smoothed out with surviving finger moulding marks; sooting or carbonised food deposits are present; and the sherd is burnt.

A radiocarbon sample from post hole C0028, one of the posts that formed the ring of structural timbers forming the main structure of the roundhouse, provided a Middle Bronze Age date range of 1405–1225 cal BC (95.4% probability; SUERC 98337). The post hole contained a single plain and undistinguished body sherd that is also likely to be Bronze Age in date.

The pottery from the souterrain fills (Illus 18 & 19) and from a post hole at its base is very similar and suggests one or more broken vessels became mixed in with the backfilling material, or possibly the use of the feature. The (non-joining) misshapen rim sherds of the only vessel identified (from fills C0212, C0278 and C0177) are poorly moulded. The rim is heavily worn on its top, but a bulge is present on its interior surface. A finger depression below the rim externally also created an uneven bulge of clay. This is not a cordon, but the product of poor moulding, which is also noted on the vessel body, where finger depressions and grass marks are clearly seen. The indication of the vessel diameter of *c* 210mm with *c* 25% of it surviving is only a guide, as the rim sherds are too irregular for an exact measurement. One of the sherds from secondary fill C0212 (not illustrated), the natural infilling of the souterrain, provided sufficient internal carbonised food residues to yield a Middle Bronze Age radiocarbon date range of 1490–1295 cal BC (95.4% probability; SUERC 98342). This date partly overlaps with another Middle Bronze Age radiocarbon date range of 1505–1415 cal BC (95.4% probability; SUERC 98339) from another sample S157 of natural infill within the souterrain, which also contained two pieces of pottery and one fragment of clay or daub.

Neolithic pits are often found on sites with later occupation, indicating the reuse of specific

landscapes over time, such as that at Hillhouse, South Ayrshire (Green et al 2021). The occurrence of a roundhouse of Middle Bronze Age date with associated pottery in East Ayrshire is mirrored in adjoining areas, such as that at Colinhill, South Lanarkshire (Spence 2019), and these buildings are increasingly commonly found due to the impact of modern developments. There is also the tendency to find pottery (often rims) and lithics ('special' artefacts) in selected post holes of roundhouses, including those forming the entrance or the porch. There is growing evidence to suggest deliberate or structured deposition, such as at Colinhill (ibid: 37).

4.4.2 Lithics

Julie Lochrie

The lithic assemblage comprises 13 pieces and was retrieved from post hole C0014, associated with roundhouse C0031, cuts C0145, C0174 and C0178 located within souterrain C0173, and pit C0161.

The lithics are made from small pieces of chert, flint or chalcedony/agate, which suggests a lack of flint resources nearby and more convenient access to chert. All the lithics are small pieces of debitage, meaning they have been struck from the stone and not worked any further. There is no indication of what may have been made or what their dating is, although they are certainly prehistoric.

The low level of lithics retrieved might suggest a very small amount of sporadic lithic production. The small size of the pieces makes it probable they have moved around through redeposition or bioturbation, and may therefore be residual.

4.4.3 Coarse stone

Fiona McGibbon & Julie Franklin

Two stone finds, a cobble tool and a possible pot lid, were found associated with the souterrain. The tool, from the usage layer C0167 within the souterrain, was an elongated greywacke water-worn cobble, rhomboid in cross-section, most likely sourced from local drift deposits. The shape is natural but has perhaps been intentionally selected for its utility as a whetstone or rubber. One of the two opposing flat surfaces has a waxy dark brown surface deposit, perhaps from use as a burnisher of some sort. One of the broader orthogonal sides has abundant scratches, mainly parallel to the long direction of the specimen, but there are also some diagonal scratches across the face, and a few that nick the top edge are cross cutting. The abundance of scratches on this surface and near absence on the opposite side suggest this is not natural abrasion but use wear.

The possible pot lid, from fill C0204, the final fill of the souterrain, is a flat piece of arkosic sandstone, again probably sourced from local drift. It is 18mm thick, chipped into a disc 116mm in diameter. It utilises the natural bedding of the lithology, with the two faces appearing natural, and has been minimally modified to achieve the rough circular shape. Adhering to one surface are some pieces of iron corrosion, which were at first thought to represent an iron object which may have corroded in proximity to the stone. However, microscopic examination showed these to be metalliferous globules, a spatter of spheres, one of which contains vesicles (gas bubbles). These are not an original feature of the lithology and look like spattering of molten metal or slag, potentially spat out from a metalworking hearth. These metallic deposits are not abundant, but they suggest that the object was present in the vicinity of metalworking activity and may have been used in the workshop. Given the limited evidence for metalworking on site, it is unclear whether this activity was taking place within any of the excavated features (see 4.4.5 'Industrial waste' below).

4.4.4 Fired clay

Julie Franklin

A total of 43 sherds (104g) of fired clay were retrieved from post holes C0008, C0020, C0026 and C0034, associated with the roundhouse, cuts C0166 and C0178 located within the souterrain, and pit C0161. The fragments are generally small and formless, with a few having a burnt surface. Their original function is unclear, and they may derive from a hearth, oven, pit lining, or wattle and fired clay structure.

4.4.5 Industrial waste

Julie Franklin

Slag and magnetic residues totalling 6g were retrieved from 11 features, including those associated with the roundhouse, the enclosure and the souterrain.

The slag is typically lightweight and vitrified and is characteristic of fuel ash slag. Fuel ash slags are created by burning in the presence of siliceous material and can be created in domestic hearths or ovens or can occur naturally. The magnetic residues comprise mostly magnetised gravels, which again are indicative only of burning and can occur naturally. A single possible slag sphere was retrieved from deposit C0154 in souterrain C0173. Slag spheres are created during iron smithing or smelting, though when found singly, as here, are not indicative of metalworking in the immediate vicinity. These accompany the traces of metalworking residues on the stone disc found in the final fill of the souterrain (see 4.4.3 'Coarse stone' above).

4.5 Environmental analysis

Laura Bailey

Analysis of the environmental assemblage, consisting of 79 bulk samples, revealed few findings of note. Charred cereal grains were present in small amounts in 21 deposits and were generally abraded and poorly preserved. Identifiable grains included barley (*Hordeum* sp), hulled barley (*Hordeum vulgare*), bread/club wheat (*Triticum aestivum* subsp *Compactum*) and emmer wheat (*Triticum dicoccum*). The largest number of grains, between 8 and 25 and between 6 and 15 respectively, were present in samples <133> and <157>. Both samples were taken from the usage layer of the souterrain's entrance passage, fill C0167. Among the cereals in these samples were barley, hulled barley, club/bread wheat and indeterminate grains. Emmer wheat was most abundant in the fill of post hole C0032, which was related to the roundhouse structure. Sample <110> from this fill contained between 6 and 15 grains (Bailey 2020).

Of particular note was an assemblage of wholehazelnuts and kernels, preserved by charring, and charred remains of crab apples were recovered. Whole hazelnuts (*Corylus avellana*) and charred crab-apple (*Malus sylvestris*) pericarp (the fruit components of crab apple), endocarp (core) and seeds were recovered from the fills of a pit C0081. Radiocarbon dating of whole hazelnuts from this feature returned a Neolithic date of 3530–3370 cal BC (95.4% probability; SUERC-98340). Charred hazel kernels and crab-apple pericarp are extremely rare in the archaeological record (Bishop et al 2014: 55; Bishop 2019), as both are generally consumed without the need to come into contact with fire. The recovery of these, together in the same feature, provides an interesting insight into the Neolithic economy.

Hazelnut shell is one of the most frequent wild food remains recovered from sites of prehistoric date in Europe (Bishop 2019: 1). Hazelnuts are rich in fat, protein (Dickson & Dickson 2000: 257) and other essential vitamins and nutrients and would have formed an important source of nutrition in prehistory. Hazelnut shell is the unwanted waste product after the nut is consumed, so it is likely to have been deliberately discarded onto domestic fires, or used as kindling (Bishop et al 2009: 79). The quantity of hazelnuts recovered and the presence of wholenuts and kernels at Mauchline suggest that the nuts have been the product of roasting, for storage perhaps, or accidental charring during crop processing rather than from the disposal of the shells onto a fire. In order to understand the conditions and circumstances that led to the preservation of this material at Mauchline, the hazelnut and kernel remains were compared with the results of modern charring experiments on hazelnuts (Bishop 2019) and experimental hazelnut roasting (Mithen 2001; Mithen & Score 2000).

The fragmentation of the hazelnuts and nutshell were quantified using the methodology detailed in Bishop (2019: 10) and compared to the results of recent experimentation. Five fragment size categories were used to represent the nut proportions present; 100% represents a complete nut, 50% is equal to 50–99% of a wholenut, 25% equates to 25–49% of a wholenut, 12.5 % equals 12.5–24% of a complete nut, and the remaining smaller fragments were recorded in the <12.5% category. The weight of each size class was also recorded (Table 5).

Together, the fills of pit C0081 contained 118 whole hazelnuts (50.4g) and multiple hazelnut fragments. Many of the hazelnuts were in excellent condition with the exterior shell surface intact and unworn. Although many of the shells were broken, all were relatively unabraded. Charring was visible on both the exterior and interior surfaces of the fragmented nutshells.

Fourteen charred hazelnut kernels were also recovered from fill C0082 (Table 6), the uppermost

fill of pit C0081; the number of kernels present was comparatively small given the large number of nutshells recovered. The survival of kernels in the archaeological record is extremely rare (Bishop 2019: 14). Kernels are edible components and would therefore only have been charred accidentally. It is thought that hazelnuts may have been roasted prior to consumption (Bishop et al 2014), in order to preserve them for storage, facilitate processing, aid digestion and for portability (Mithen 2001). Hazelnuts may have been roasted in shallow pits (Holst 2010), depressions or hollows, covered with sediment, with a fire lit on top (Mears & Hillman 2007: 26) and left to burn out (McClatchie 2018: 194). Recent experimentation has shown that roasting hazelnuts in this way transforms the kernels into a potato-like food that preserves well (Mears & Hillman 2007: 27).

Experimentation has shown that kernels char and remain whole only under an extremely limited range of conditions: in reducing conditions and when charred at low temperatures for short periods of time (Bishop 2019: 16). Experimental roasting of hazelnuts has shown that when whole nuts are charred the kernel tends to be of no value and becomes charred (Bishop 2019) or disintegrates into a greasy pulp when the nut is open (Mithen & Score 2000). Therefore, it is unlikely that the charred wholenuts at Mauchline were cracked open to recover the kernels for consumption (Bishop 2019: 14), which explains the presence of whole, uncracked nuts and charred kernels.

Fragments of crab apples (*Malus sylvestris*) were also present, represented by 18 apple pips and 39 fragments of endocarp and pericarp (1.5g). Crab apples contain several nutritionally valuable compounds, including pectin, malic and citric acids, and minerals including potassium, magnesium, phosphorous, calcium and iron (Mears & Hillman 2007: 222). Crab apples are bitter and are best roasted (Mabey 1996: 201), baked (Mears & Hillman 2007: 222) or dried (Dickson & Dickson 2000: 201) prior to consumption.

Charred crab-apple remains have been recovered at a few Scottish Neolithic sites. By 2009 crab apple had been recorded at only five Scottish Neolithic sites (Bishop et al 2009: 89). Crab-apple pericarp fragments and pips were recovered from the Neolithic timber hall at Balbridie (Fairweather & Ralston 1993: 321). Whole hazelnuts and a large number of carbonised crab-apple pericarp and pips were recovered together at Dubton Farm in Angus (Cameron et al 2002), a site containing Neolithic pits and souterrains dating to the Iron Age. The remains of these wild foods were found with cereal chaff and a large concentration of weed seeds, and together has been interpreted as evidence for a specialised plant-processing site (Church 2002: 52), with the crab apple and hazelnuts becoming incidentally charred during drying for storage (Bishop et al 2009: 84). Similarly, hazelnut and numerous fragments of crab-apple endocarp and seeds were recovered from the Mesolithic site

Table 5 Summary of hazelnut and nutshell from samples 120 and 119

Context	Sample	100%	50% (50–99%)	25% (25–49%)	12.5% (12.5–24%)	<12.5%	Total
0083	120	23 (8.7g)	19 (3.7g)	45 (5.3g)	151 (9.7g)	240 (10.2g)	478 (37.6g)
0082	119	95 (41.7g)	87 (17.8g)	382 (35.2g)	554 (27g)	31 (1.8g)	799 (123.5g)
Total		118 (50.4g)	106 (21.5g)	427 (40.5g)	705 (36.7g)	271 (12g)	1277 (161.1g)

Table 6 Summary of hazelnut kernels from fill C0082

Context	Sample	100%	50% (50–99%)	25% (25–49%)
0082	119	5 (0.2g)	7 (0.3g)	2 (<0.1g)

of Staosnaig on the isle of Colonsay (Mithen 2001).

The archaeobotanical assemblage from Mauchline provides valuable information on the Neolithic economy, both locally and regionally, with only a few comparable assemblages being found in Scotland. The presence of crab apples, together with hazelnuts, would imply late-summer to autumn gathering of wild foods and activity on the site. It is possible the crab apples and hazelnuts may have been collected during the autumn, and roasted or dried for storage (Renfrew 1973: 139; Bishop et al 2009: 83), and become accidentally charred during this process. During excavation no evidence of in situ burning or heat-affected soil was apparent within the pit from which the material was recovered. However, several small to medium (up to 25mm in diameter), unabraded, non-oak roundwood branches and twigs were recovered from the deposit. This suggests either that the charcoal may have been incorporated into the deposit from a fire lit on top of the pit, or that the material was processed nearby, accidentally burnt and the burnt residue from roasting was dumped into the pit together with the fuel wood. A similar situation was recorded at Derragh (Bunce 2018: 203), where the features were not identified as hazelnut roasting pits during excavation, but ash deposits were recorded throughout the site, which would be consistent with removal of the hearth atop the pit prior to unearthing the roasted nuts. In the case of the complete nut kernels and whole hazelnuts at Mauchline, it is likely that, based on analogy with modern experiments, the material was burned, perhaps beneath the ashes of a fire, at a moderate temperature (below 500°C) for a short period of time, which suggests that it was accidentally charred during roasting.

4.6 Waterlogged wood analysis

Michael Bamforth

4.6.1 Introduction

A wooden post SF176 was recovered from the fill of post hole C0287 which was situated within the souterrain. The wood was situated in waterlogged deposits which created the anaerobic conditions necessary for organic preservation.

4.6.2 Methodology

The system of categorisation and interrogation developed by Taylor (1998) and the condition scale developed by the Humber Wetlands project (Van de Noort et al 1995: table 15.1) have been adopted throughout. The item has been identified as oak (*Quercus* sp) based on characteristics visible with a ×10 magnification hand lens.

4.6.3 Results

The wooden post was recovered from one of the larger post holes and was one of a pair forming part of the timber lining or roof support of the souterrain.

The post is formed of a single piece of oak measuring 180 × 98 × 65mm. The top has degraded away, and the object is in poor condition, the outer surfaces being markedly soft and degraded with frequent radial cracks. The condition is below the threshold for confident analysis of woodworking technology.

The post currently appears as a modified radial quarter conversion. It is unclear if this represents the full original extent of the post or if other sections have degraded or broken away. The angular surface at the base suggests the end has been trimmed to length from one direction with an edged tool, probably an axe.

The post is formed of slow-grown, straight-grained oak heartwood and is derived from a parent timber with a diameter in excess of 130mm. Where visible the growth rings measure *c* 1.5–2mm with an estimated 35 annual rings present (too few to be a suitable candidate for dendrochronology). The slow growth rate and straight grain suggest the wood may be derived from a tree growing in relatively dense woodland.

4.6.4 Discussion of waterlogged wood analysis

Oak is a common tree that grows in stands and mixed woodland and will also tolerate damp soils. It is an easily worked and hard-wearing wood that splits readily in both planes (Wilson & White 1986). Oak occurs ubiquitously throughout the prehistoric and historic period as an excellent structural timber, including use in wet settings such as well linings and revetments (Gale & Cutler 2000).

This post presents as radial quarter split oak, trimmed to length at the base with an axe. The form, taxon and woodworking can all be considered typical of the Iron Age date normally attributed to souterrains, but in this case has a Bronze Age date. The post is of sufficient size to have supported the hypothesised timber lining and roof of the souterrain.