ROAD TO THE WEST

A Road to the Past Volume 2

The Archaeology of the A4 / A5 Road Improvements Scheme from Dungannon to Ballygawley

Colin Dunlop *and* **Jonathan Barkley**

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Foreword

I am very pleased to lend my support to this publication on the archaeology of the A4 and A5 corridors.

Major developments by TransportNI; which included the A4 Dungannon to Ballygawley Dualling Scheme, the A4 Annaghilla Scheme and the A5 Tullyvar Scheme, presented an opportunity for archaeologists to uncover and investigate many features that would have previously been hidden.

This publication focuses on archaeological features uncovered on the A4 and A5 corridors during the DBFO Package 2 Contract. It has been prepared in line with a commitment by TransportNI to work with the Department of the Environment's Historic Monuments Unit to ensure that where major schemes uncover significant archaeological remains that this information is made available to address public interest.

I take this opportunity to thank all those involved in the delivery of the A4 / A5 improvements and in the preparation of this informative publication.

Pat Doherty

Director of Engineering – TransportNI

Introduction

The construction of 20km of dual carriageway on the A4 between Dungannon and Ballygawley, the A4 Annaghilla realignment from Ballygawley towards Augher and the A5 Tullyvar realignment from Ballygawley towards Aughnacloy was undertaken between 2008 and 2010. The schemes were built by Amey Lagan Roads Ltd (now Amey Roads NI) and their contractor Lagan Ferrovial as part of the "DBFO Package 2" public private partnership contract.

At the time of opening the, then Roads Minister Conor Murphy stated that "*The new A4 scheme combined with the recently upgraded Westlink means that you can now drive uninterrupted between Belfast and Ballygawley. The scheme will reduce journey times and improve road safety for those travelling east to west improving access between Belfast and both Enniskillen and Omagh.*" Once these works were completed Amey Roads NI became responsible for operation and maintenance of the A4 Dualling Scheme for a period of 30 years.

As part of the requirements placed on the scheme by the NIEA (now DOE: HED) and DRD Roads Service NI (now TransportNI) archaeological monitoring was required in advance of construction proceeding on the scheme. Archaeological Development Services Ltd. and Headland Archaeology (UK) Ltd. were employed to undertake this work.

The monitoring by archaeologists from these two companies identified a total of 52 areas where significant archaeological remains were present. These archaeological sites were then excavated and recorded by teams of archaeologists prior to the construction of the road. The sites identified were both domestic and funerary, and ranged in date from the Mesolithic (8000–4000 BC) to the medieval period (AD 1150–AD 1550). It is these important sites that are discussed within this book.

Gavin McKevitt

Regional Director – Lagan Construction Group

Terminology and Dating

Divisions of archaeological periods are generally defined by significant changes in the material culture of the population. Radiocarbon dating and extensive research by archaeologists has allowed date ranges for these periods, and their early, middle and late sub-divisions, to be identified. These chronological periods are, however, not static, and as new evidence comes to light from ongoing excavations these dates are refined on a regular basis. There are also issues of disagreement between archaeologists, with no absolute dating agreed for any point in the spectrum of time periods. Taking into account all current research on the dating of archaeological periods in Ireland the following simplified date ranges have been used within this book:

Mesolithic: 8000 BC to 4000 BC

Middle Neolithic: 3600 BC to 3000 BC

Early Bronze Age: 2500 BC to 1600 BC

Late Bronze Age: 1200 BC to 700 BC

Middle Iron Age: 400 BC to BC/AD 0

EEarly medieval: AD 400 to AD 1150

Post-medieval: AD 1550 to AD 1914

Early Neolithic: 4000 BC to 3600 BC

Late Neolithic: 3000 BC to 2500 BC

Middle Bronze Age: 1600 BC to 1200 BC

Early Iron Age: 700 BC to 400 BC

Late Iron Age: BC/AD 0 to AD 400

Medieval: AD 1150 to AD 1550

Modern era: AD 1914 to present day

The majority of the dating evidence used within this monograph has been obtained from the radiocarbon dating of charcoal samples obtained from archaeological features found during the excavations. The results from radiocarbon dating analysis can produce a single date range, e.g. AD 300–500, or multiple possible date ranges, e.g. AD 300–420 and AD 450–500, from a single sample. All radiocarbon dates in this monograph are quoted to two sigma. This means that there is a 95.4% probability that the material dated lies within the range quoted. Where a radiocarbon date returned multiple date ranges only those over 10% (of 94.5%) have been used. This means that some dates quoted therefore have a probability of 86%. The radiocarbon laboratory reference number for each radiocarbon date is included in brackets after the date range, 'AD 300–500 (UBA-12343)'.

Radiocarbon dates may also be subject to a phenomenon known as old wood effect. Old wood effect can occur when wood from the centre of a tree which may have been laid down decades, or indeed centuries, before the tree was felled is dated, rather than the outer sapwood or twigs which were growing immediately before the tree was felled. This problem is particularly acute in funerary deposits, as to fully cremate the remains large pyres are required which burn a great quantity of wood. Inevitably a lot of this wood derives from mature trees, often oak trees, therefore skewing the dates. Where old wood affect may have occurred this has been noted within the text.

Finally a small number of clearly erroneous radiocarbon dates were returned that did not correspond with the dating evidence from associated artefacts, such as pottery and flint, or were found in a feature already conclusively radiocarbon dated to a different time period. These dates have not been included within the main body of the text but are presented in the radiocarbon date section at the end of the publication, along with full detail on the probability of each date.

The locations of the sites discussed

A total of 52 archaeological sites were excavated along the Road Scheme. In keeping with DOE: HED guidelines the sites are named after the townland into which they fell. They are also numbered from west to east to allow for ease of identification on the maps. For consistency within the text the sites have been renamed for this publication, however a full list of the original site names, site directors and archaeological licence numbers can be found at the back of this volume.
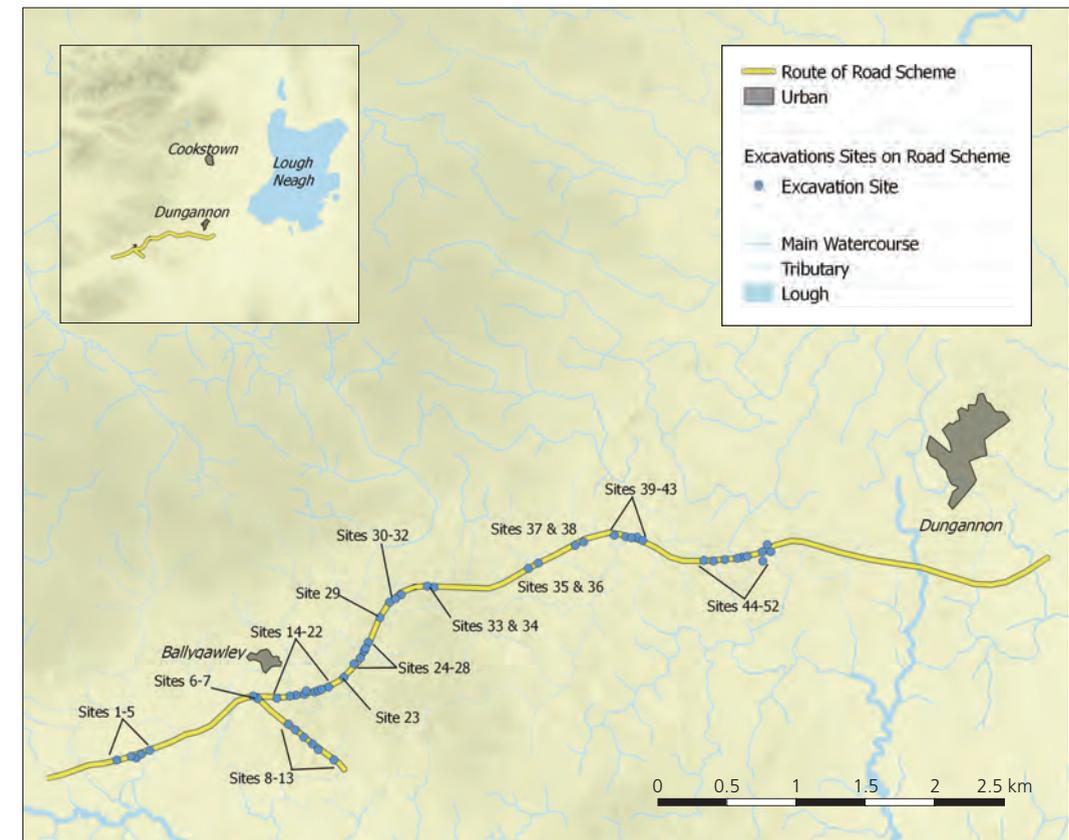
Location of the sites discussed

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Environmental History

The A4 dualling and A4 Annaghilla schemes run southwest across County Tyrone for a distance of approximately 26km from Dungannon to Ballywgawley, whilst the A5 Tullyvar scheme runs approximately 3km southeast from Ballygawley towards Aughnacloy. There is little variation in the terrain along the route as it runs through the rolling drumlins of southern County Tyrone and then enters the Clogher Valley, bounded on the north by the range of hills that span between Cappagh Mountain in the east and Slievemore in the west. Since the icy wastes of the Ice Age, Ireland has developed over the past 12,000 years from a sub-tundra environment to a richly wooded one, and due, to human influence since the farming revolution of the Neolithic, to the cultivated and cultural landscape in existence today.

Frozen wasteland – how the Ice Age shaped County Tyrone

The peak of the last phase of Ice Age glaciation was between 24,000 and 18,000 years ago.[4] The blanket of ice was upwards of 1km thick and covered all but the extreme southeast of the British Isles. As the ice retreated, the first parts of Ireland to be released from its grip were Cork, Kerry and Waterford; however, these areas remained un-inhabitable icy desert for some time.

In the final stages of the Ice Age the sea level was at least 120m lower than today due to the vast amount of water locked up in the ice sheets, and Ireland was a peninsula connected to the rest of mainland Europe. As the ice melted, sea levels slowly rose and Ireland became an island around 14,000 years ago, whereas Great Britain remained connected to the European land mass for a further 6,000 years.[5] This early separation has resulted in a much reduced range of animals and plants in Ireland, and indeed Britain, as compared to the European mainland.

To the north, the Road Scheme was bordered by a ridge of high ground between Cappagh and Slievemore Mountains. The Road Scheme itself ran along a rolling landscape that was formed near the end of the Ice Age. As the glaciers retreated they left behind mounds of sediment which had been gouged up from the underlying solid geology. These features are called drumlins (from the Irish *dromnin*; meaning littlest ridge)[6] and are found from northeast County Down, southwest through County Armagh, south Tyrone and on into Counties Monaghan and Cavan.[7] Sometimes these are referred to as 'baskets of eggs' in reference to their egg-shaped appearance when viewed from above.[8] The low-lying areas between the drumlins were often waterlogged with lakes and bogs forming in many of the hollows. The drumlins themselves were freely draining and became home to some of the first post-glacial vegetation in Ireland. These were plants which could survive in very thin soils such as grasses, dock, and daisy.[9] Heather grew on the higher ground around Cappagh and Slievemore Mountains, with sphagnum moss growing in the wetter hollows. As plants grew and decayed their remains left behind an increasingly rich soil which allowed the first trees to colonise, with dwarf willow and birch being the pioneers.[10]

Ice Age limits ©
University of Sheffield

21,000 BC   16,000 BC   13,000 BC
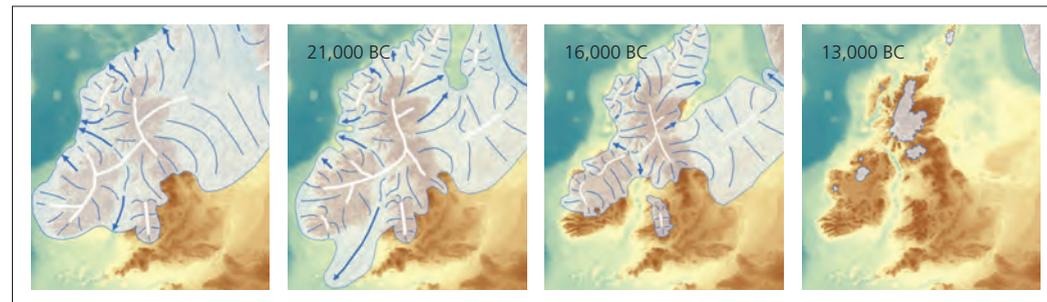
Map of Northern Ireland with the topography highlighted to show the lowest lying areas © NASA's Earth Observatory

While the general topography of the Road Scheme remains largely unchanged since the end of the Ice Age, changes in climate and recent agricultural improvements have greatly decreased the water levels present. This was particularly noticeable with the Mesolithic sites that were excavated. All of the Mesolithic sites were located on alluvium (water deposited sediment) indicating that these sites were originally positioned beside rivers or lakes. By the time of the Road Scheme these areas had dried up and the rivers and lakes had disappeared (see proceeding chapter).

Drawing of the antlers of the Giant Irish Deer (*Megaloceros giganteus*)[12]
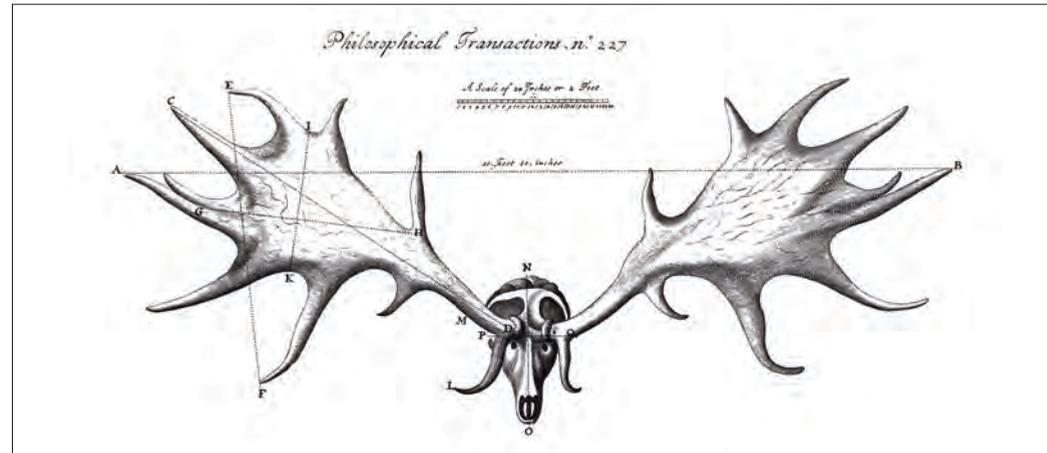
The first animals

The climate of the post-glacial grasslands was much like that of Northern Scandinavia today, with trees such as birch, willow, and juniper forming thin woodlands in sheltered areas. Evidence of animal life in the early post-glacial period is relatively rare, but the remains of the Giant Irish Deer (Megaloceros giganteus) have been uncovered in considerable numbers. Indeed, while discussing the fossilised remains of their antlers Gould records that 'Before attracting the attention of scientists, they have been used as gateposts and even as a temporary bridge to span a rivulet in County Tyrone'.[11]

The improving climate was brought to an abrupt end around 12,700 years ago[13] when the ice which held back a vast North American glacial lake called Lake Agassiz collapsed,[14] discharging the entire contents of this lake into the North Atlantic. This influx of cold fresh water changed the flow of sea currents and caused the warm surface waters of the Gulf Stream (North Atlantic Conveyer) to halt further south. In less than a generation the climate plunged back into glacial conditions, causing a shortening in the growing season and lowering annual temperatures which led to decreased vegetation cover.

The shortened growing season and competition for diminishing resources by herds of animals, such as reindeer, meant that it was no longer possible to lay down sufficient fat reserves for winter months, and so a series of extinctions followed. Among the casualties were the Giant Irish Deer[15] and the reindeer which were absent in Ireland from this time onwards. While the rest of Europe, including the south of England, has evidence for Palaeolithic (Early Stone Age) man hunting these early animals there is no evidence for man in Ireland at this time. This 1000-year period of worsening conditions is known as the Younger Dryas: named after a small hardy rose called the White Dryas which thrived in these early tundra conditions. After this, the Holocene[16] period began, this is the interglacial period in which we are currently living.

The Irish environment from the start of the Holocene

As previously mentioned, there is a much narrower range of species which is native to Ireland than exists in Britain or Continental Europe.[17] Ireland has around 850 species of plants compared with over 1000 in Britain. Ireland had three species of amphibians, one species of reptile and 24 species of terrestrial mammal, ten of which have become extinct over the past 10,000 years.[18] Species which were present in Britain but did not make it to Ireland before the Irish Sea formed include the common vole, common toads, crested newts, moles, and snakes. While Irish hare, otter, wild boar, wolf, lynx, and bear were definitely present before the arrival of humans, there is some evidence to suggest that badgers and red deer may have been deliberately introduced by humans during the Mesolithic period.[19] In the 2,000 years after the end of the Younger Dryas Ireland changed from an open, practically treeless landscape to a mostly overgrown and forested one. This is partly due to the lack of most, if not all, of the large grazers who would have kept lowland woodland clearings open.[20] The uplands and the limestone plateaus of the west may have been a more open landscape where light-loving plants and animals flourished.

Pollen analysis shows that around the time of the first settlers in the Boreal period[21] (8100–5800 BC) the landscape was dominated by hazel, elm, and oak, with localised areas of pine, which reached their peak at the expense of oak towards the end of Boreal period.[22] Alder and hazel levels began to rise towards the beginning of the Atlantic period (5800–4000 BC) and, although this has been seen as an indicator for wetter conditions, it is possible that this was caused by human interference with the natural woodland.[23,24] The Sub-Boreal period (4000–500 BC) is generally perceived as warmer and drier than the Atlantic period. It is during this time that agriculture was introduced in Ireland, and that human interaction began to have an effect on the environment. For much of Ireland, and indeed Western Europe, the pollen record shows an increase in herbs, particularly grass and plantain, and a corresponding decrease in tree pollen, thus suggesting that forests were being cleared in order to make way for the spread of agriculture.

Roughly improved grazing land in Co. Tyrone today. It is likely that the first fields created by the Neolithic farmers were similar to this

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Both pollen and charcoal analysis was undertaken across the Road Scheme in order to try and build a picture of the past environments. The results of the charcoal analysis were consistent across the Scheme's length, with a mixture of trees indicative of a dense canopy woodlands (oak and hazel), wet woodlands (alder and willow), and shrub/scrub (hazel, birch, rowan, hawthorn) present on all sites and in all time periods. This wide range of species indicates a mosaic of different woodland being present. The wet woodland species would have grown beside lakes and rivers as well as the waterlogged drumlin hollows, and these species were particularly noted in the deposits at the site at Lisbeg (Site 6). Tall stands of dense woodlands, such as oak and ash, could have grown on dryer ground and were used as a source of construction timber. Scrub trees tolerated the higher ground on the scheme and were noted as being present in larger quantities on the hill at the archaeological site of Armalughey (Site 18). They are also an indicator species for cleared agricultural ground.

The analysis of pollen, seed, and grain was also consistent across the Road Scheme. Every site produced evidence for grain; with barley and wheat the dominant species on the Bronze Age and Iron Age sites, and oats dominating the early medieval and medieval sites. The absence of oats throughout the prehistoric period, and their introduction during the early medieval period, has been recorded from previous excavations.[25] While in Ulster during the early medieval period it has been noted that oats were favoured over barley.[26] The majority of sites also produced evidence for fruits, with seeds or stones from brambles, crab apples, and sloe berries all present. The exploitation of hazel was clearly prevalent in the area, with wood, pollen, and hazelnuts also recorded from the majority of the sites. As well as plants that were cultivated or gathered, weeds were present across all excavation sites. While a large range of different species were present, the most common were woundwort, dock, redshank, ribwort, and buttercup.

Soils and their influence on human settlement

The soils varied over the Road Scheme with heavier clays and peat in the inter-drumlin hollows and glacial till on the higher drumlin ridges.

The inter-drumlin hollows were dominated by poorly draining heavy clays; the clays caused these areas to become waterlogged and in turn peat then formed in these hollows, a feature recorded at Lisbeg (Site 6). The archaeological evidence from the Road Scheme indicated that these areas were principally utilised for the construction of burnt mounds. This was not surprising as due to the need for water on burnt mound sites they are almost exclusively found within poorly draining areas.

The drumlin ridges had lighter sands and gravel-rich soils which were more suitable for growing crops. It was noticeable that all of the evidence for farming, prolonged occupation, and burial practices occurred on these ridges (Armalughey (Site 20), Tullyvar (Site 11), Mullaghbane (Site

27), Armalughey (Site 25). The archaeological sites excavated within this environment and their significance within the landscape are discussed in the following chapters.

Bramble, nettle, wild grasses and vetch growing within the hedgerows in Co. Tyrone today. Seeds from these plants were discovered at most of the excavation sites along the Road Scheme and while they would not have been actively cultivated they were foraged for food

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The First Settlers

As the ice sheets retreated north the Mesolithic hunter gatherers of Europe followed, populating these newly forested regions. Evidence indicates that the first humans crossed the Irish Sea around 8000 BC, travelling to the east coast of Ireland from western Britain or the Isle of Man. This was a time when sea levels were significantly lower, indeed much of the Irish Sea basin was dry land, and when the gap between Britain and Ireland was less than currently.[1, 2] These first colonists were hunters, trappers, fishers, and foragers who gradually moved inland along Ireland's many waterways,[3] settling along the rivers and lakes within the interior of the island. Within Tyrone the shores of Lough Neagh and the small rivers, streams and lakes which are found within the county provided an ideal habitat for the plants, wildfowl and fish that are favoured by hunter gatherer communities. The lack of substantive evidence for their presence in these areas to date may be attributed to the lightweight structures they occupied and, the later growth of peat and blanket bog covering locations which would have been ideal for the Mesolithic population.

Movement from the coast

Once settled along the coast, the Mesolithic colonists began to use the waterways of Ireland to move inland. They utilised rudimentary log-carved boats, or wooden-framed boats covered in bark or skin. These would have appeared similar in form to modern day curraghs or coracles, and would only have held two or three people at most. Prior to this Road Scheme, only one Mesolithic boat has been recovered from this area,[4] a hollowed-out log (dating to 5490–5246 BC) from the western shore of Lough Neagh, at Brookend, Co. Tyrone.[5]

Drumnafern (Site 52) was located at the edge of what proved to be a former stream or small river which ran towards Wood Lough in the east. The remains of a Late Mesolithic hollowed-out log boat dating to 4596–4446 BC (UBA-14621) were recovered. The boat was at least 6m long and 0.75m wide. It was in a bad state of decay and no tool marks could be identified; however, two transverse parallel grooves and a rounded notch were most probably manmade. The latter may have supported rudimentary paddles, while the purpose of the former may have been as a foot support.

Fragmentary and poorly preserved log boats can be difficult to identify, and it has been suggested that to qualify as such two or more conditions must be met.[6] The log boat excavated here qualifies as it meets three of the conditions: it is over 3m in length, has neither bark nor sapwood, and it was recovered from a former watercourse. This boat does not meet the other three conditions which are: recovery of associated nautical equipment, having a clear log boat shape, and being able to identify particular fittings characteristic to logboats. However, these final three conditions rarely occur. Indeed, some of the log boats recorded in Fry's[7] inventory are little more than featureless oak beams.

Remains of log boat excavated at Drumnafern (Site 52) © ADS

Edge of former stream

0   2   4m
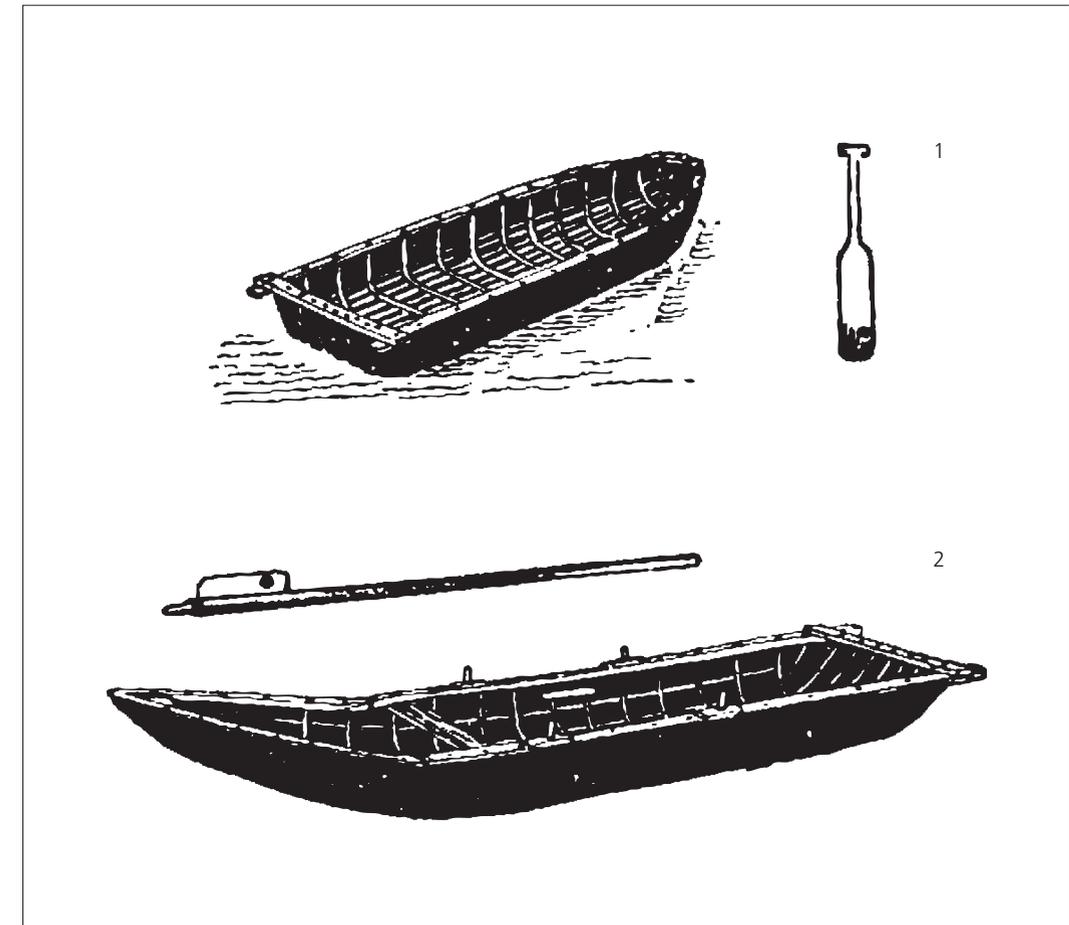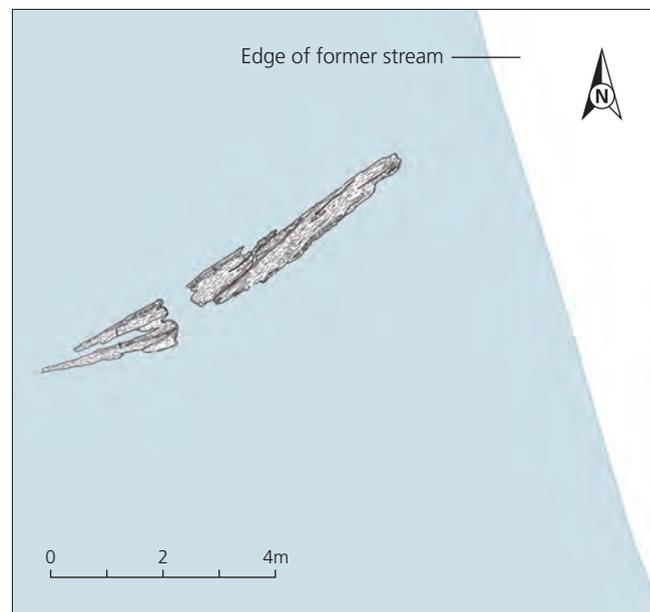
1. Paddle curragh,

2. Rowing Curragh, as drawn by Estyn Evans[8]

Seasonal camps

There are few sites in Ireland with structural evidence for Mesolithic settlement. The majority of excavated material comprises stray lithics, or the occasional archaeological feature with a Mesolithic date. Defined structures are infrequently found, and only a very small number of occupation sites such as Newferry, Co. Antrim,[9] Moynagh Lough, Co. Meath,[10] Drumakeely, Co. Antrim[11] and Mount Sandel, Co. Londonderry,[12] have produced a wealth of archaeological material.

Evidence for the Mesolithic population in Co. Tyrone has only recently been recovered in the archaeological record. It remains limited but now includes an occasional isolated worked flint artefact, the aforementioned log boat recovered at Brookend, Early Mesolithic flakes and cores and an isolated Late Mesolithic bann flake from Tullaghoge,[13] and an isolated find of a Late Mesolithic butt-trimmed flake from Shannarragh.[14] However, there is a plethora of Mesolithic sites recorded along the east and north shores of Lough Neagh and there is no reason to believe that the west shore of Lough Neagh was not also similarly populated.

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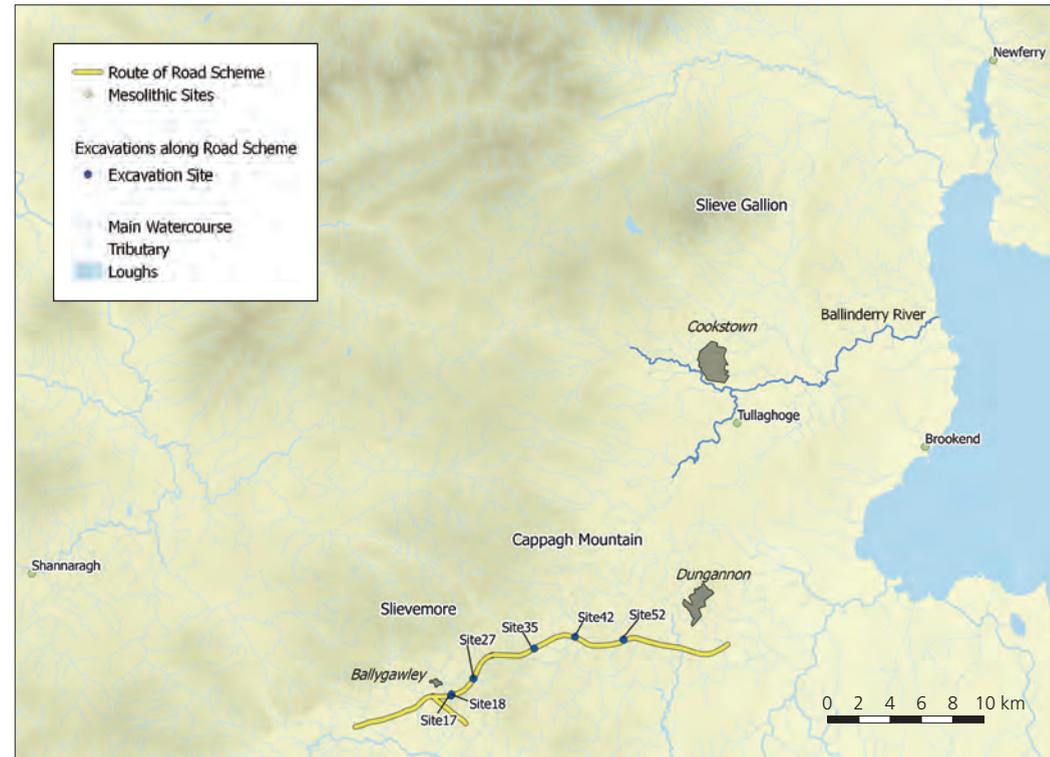
On this Road Scheme there was no evidence for any Early Mesolithic activity but a small number of Late Mesolithic occupation sites were excavated. These sites were exclusively within areas where the subsoil was composed of mud and clay deposited by rivers and lakes, termed alluvium. These sediments mark the floodplains of both current and former watercourses and indicate that the Mesolithic hunter gatherers in Tyrone were still very much tied to a riverine subsistence.

The most significant site excavated was the hut from Grange (Site 14) which was dated to 4230–3986 BC (UBA-14482). The hut was defined by ten stakeholes, a cluster of which at the southwest may have formed an entrance. Unfortunately, it was not possible to fully excavate this site as part of the hut lay beyond the edge of the Road Scheme. However, based on the area excavated the hut would have been around 4m in diameter, comparable in size with the Late Mesolithic hut excavated at Eglinton, Co. Londonderry,[15] and the probable hut platform at Clowanstown, Co. Meath.[16]

The remaining evidence for the Mesolithic came from isolated hearths and pits. These were located at Armalughey (Site 17, 5522–5364 BC, UBA-14497), Farriter (Site 35, 4683–4498 BC, UBA-14584), Farriter (Site 36, 4231–4194 BC, UBA-14587), Tullyallen (Site 42, 4561–4453 BC, UBA-14450), Armalughey (Site 18, 4241–4041 BC, GU-17384) and Mullaghbane (Site 27). Of these sites only Mullaghbane (Site 27) produced artefacts to corroborate the radiocarbon dates. This is not unsurprising as the flint from which Mesolithic people made their tools is not readily available in

Tyrone. Flint-bearing chalk outcrops are only present along the Ballinderry River valley, some 20km north of the Road Scheme. It can therefore be assumed that the population living here was mainly using wood and/or bone tools: materials which rarely survive in the archaeological record.

Similar sites consisting of isolated pits and hearths from this period have been excavated across Ireland. At Ferriter's Cove, Co. Kerry,[17] it has been shown that many of these short-lived camps were the result of seasonal patterns of movement. Occupation was dependant on the availability of game, fish, or wild fruit and plants at particular times of the year.

Ireland was heavily forested at this time, and the resources within and along the edges of waterways provided both food and shelter. While none of the sites along the Road Scheme provided direct evidence for the diet of the local population, the presence of hazel in the hearths indicates that hazelnuts were present, and these would have provided a seasonal food source. The Road Scheme excavations revealed no evidence for the types of protein that may have been consumed in the Mesolithic; however, other excavations have revealed that fish, such as salmon, eel, and trout, were caught in inland locations, and that wild boar was also hunted.
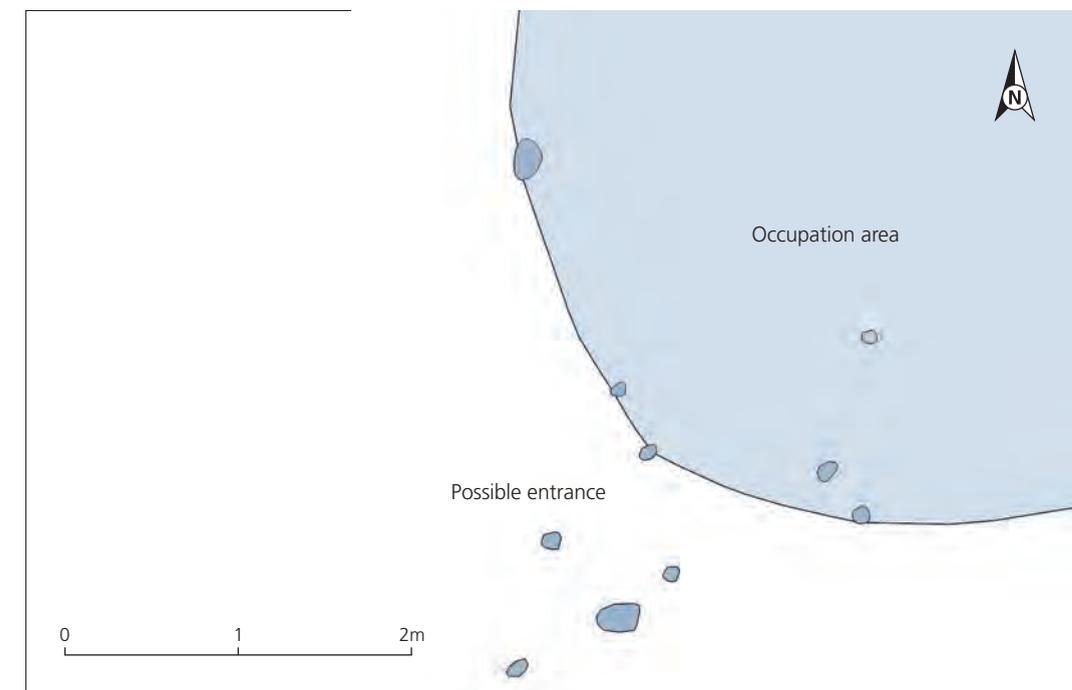
Plan of hut from Grange (Site 14) © ADS
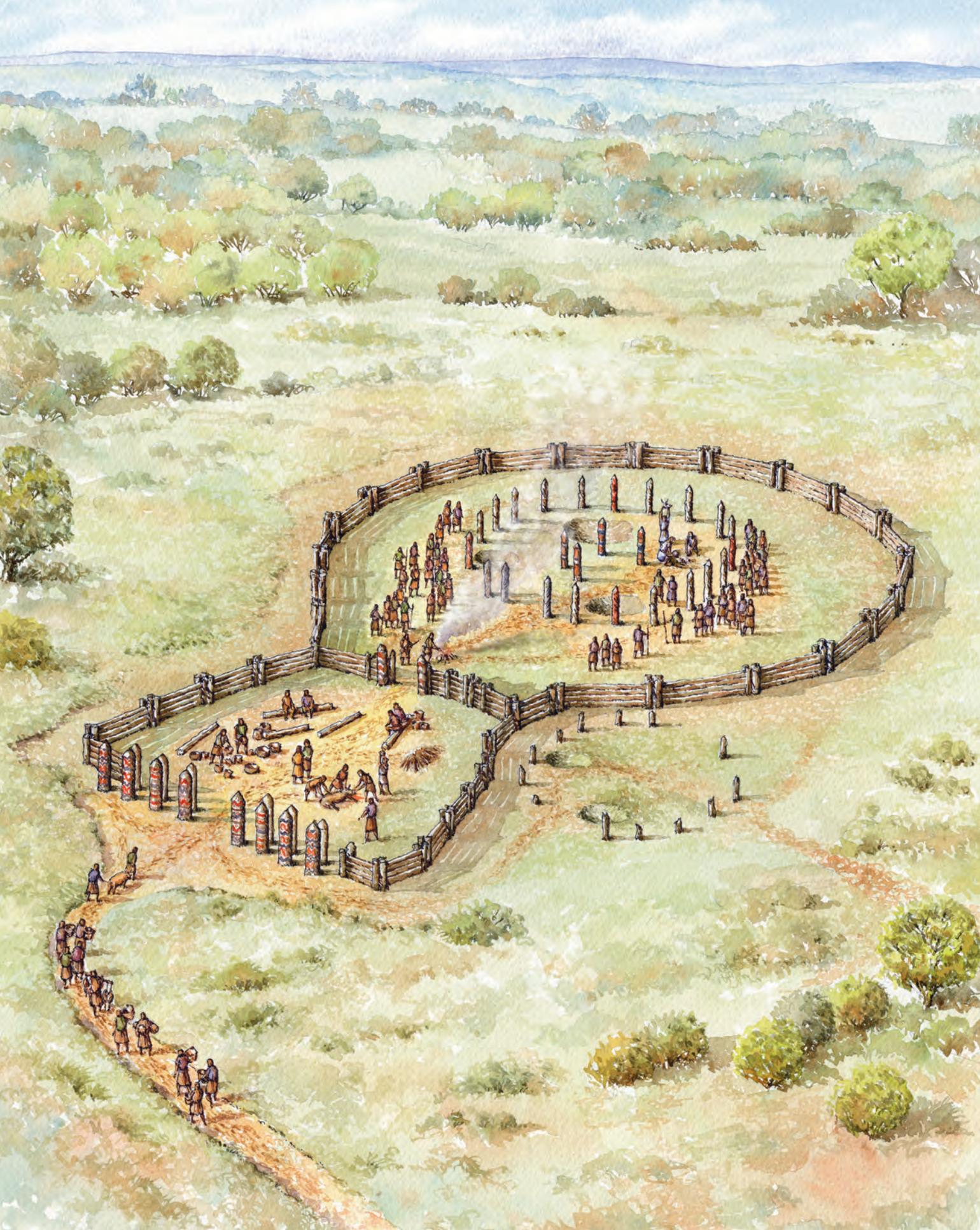
The Neolithic

Many facets of life changed in Ireland during the Neolithic period. The previous nomadic and hunter-gatherer way of life was transformed by the introduction of farming, leading to the establishment of small permanent settlements. Vegetation was cleared to create fields for growing crops and to feed livestock, and new technology was introduced in the form of pottery, quern stones for grinding grain, and advanced stone tools such as axes for clearing trees. While population estimates vary, the archaeological record does indicate that this more settled style of living led to a dramatic increase in the number of inhabitants who lived in Ireland during this prehistoric period.

During the Neolithic, large stone-built burial monuments, known as megaliths, were introduced, and these are still easily identifiable across the country. These monuments show that in the Neolithic complex burial rites and religious beliefs were very different to those of the Mesolithic period. Indeed, these burial monuments show a concerted effort by various groups of people, probably ranging from single families up to large communities, working together, emphasising that the way society was structured had also transformed.

Growing crops, foraging, and hunting

While temperature and precipitation varied throughout the Neolithic period, the winters in Ireland were generally a little colder than today and the summers, on average, were a few degrees warmer.[1] This combination of favourable summer temperatures and reliable rainfall would have allowed the new farmers to grow cereal crops. However, only the excavation at Armalughey (Site 20) provided evidence for cereal production, with a few grains of hulled barley recovered. Secondary evidence for cereal processing was also missing from the excavations along this Road Scheme. There were no quern stones, or rubbing stones, from flour production recovered from any of the Neolithic sites.

Evidence for foraging and in particular the collection of hazelnuts was identified on the majority of the Neolithic sites on the Road Scheme. Crab apple was recovered from Armalughey (Sites 18 and 20), while vetch seeds were recovered from Ballylagan (Site 2). Hazelnut shells are a ubiquitous find at excavations across all locations and time periods in Ireland. They were one of the most commonly collected foods in prehistory, and indeed are still collected today; they are high in energy and contain a large quantity of fats, proteins, vitamins, and minerals. Hazelnuts are also easily stored for up to six months if kept in a cool dry place. It is believed that they were therefore a vital part of the winter diet[2] and may have held off starvation in such lean times.

Crab apples are bitter fruits that would have required processing in order to be edible. They would have been baked or roasted before being eaten. Crab apples will also survive in storage for several months, if collected without bruises that would otherwise cause them to rot. While the main body of a vetch plant is slightly toxic, vetch shoot tips can be eaten, as can the seeds when they mature in the autumn.[3] One other plant, which may have been gathered for food is sheep's sorrel, which was identified at Ballylagan (Site 2). Sorrel leaves can be used raw as a salad, or cooked as fresh greens.[4]

Evidence from other Neolithic excavations in Ireland indicates that protein was obtained from wild game and fish, as well as domesticated animals, including cattle, sheep, goats, and pigs.[5] The only site along the route of the excavated road which contained identifiable animal remains was the Late Neolithic settlement site at Armalughey (Site 20). Excavations here recovered a small number of bones belonging to domesticated pigs, as well as a few unidentifiable bird bones.

While the domesticated pigs would have been kept in pens and would have provided readily available protein, the birds may have been domesticated, or may have been wild and would have been either trapped, or hunted, prior to eating. While there was no evidence for hunting or trapping materials at this site, the nearby excavation at Annaghilla (Site 4) provided two Neolithic arrowheads. These would have been hafted to a shaft with cord and resin.[6] No resin was attached to these arrowheads; however, throughout prehistory there seems to have been a preference for birch bark tar over the generally more readily accessible pine resin.[7] Indeed, across the Road Scheme charcoal analysis showed little, and in most areas no, pine within the taxa identified, and it is therefore most likely that birch tar was used here.

Arrowheads from Annaghilla (Site 4) © Headland
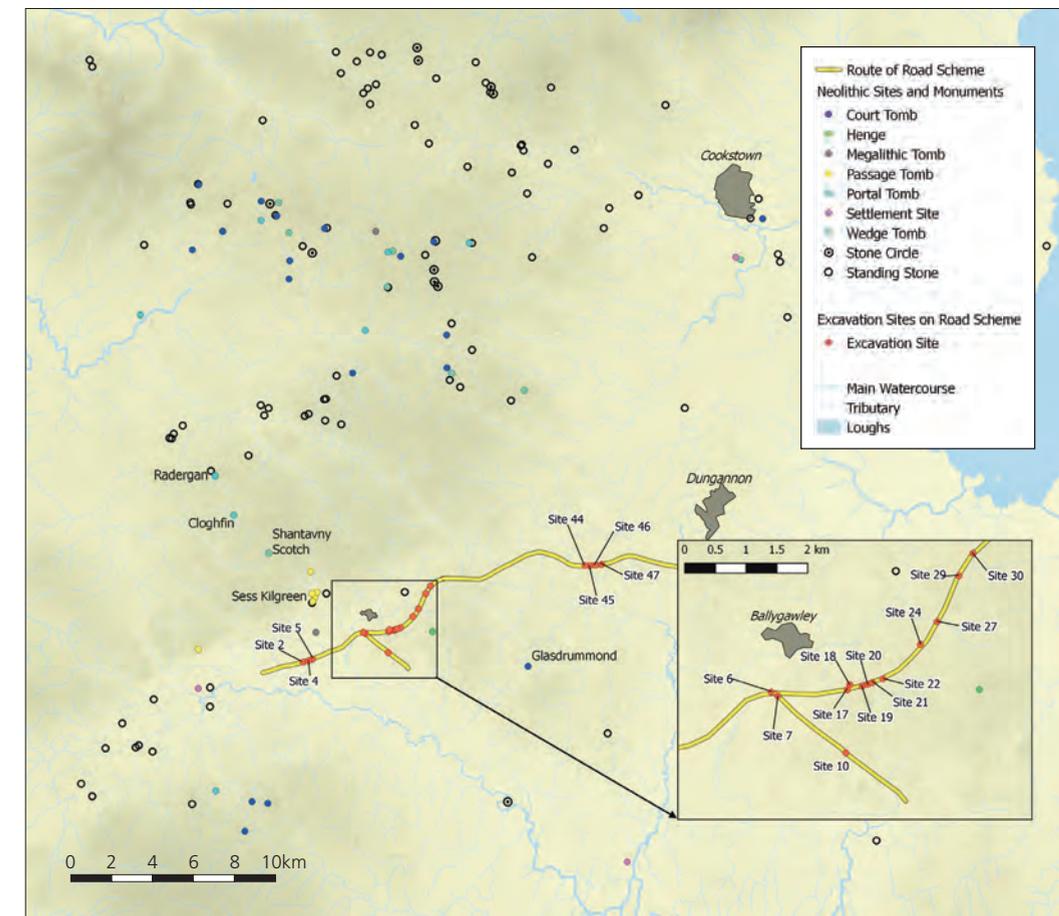
Location map showing Neolithic site locations along Road Scheme, and Neolithic sites in the general area which are noted in the DOE: HED Sites and Monument Record

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Settling down

Early Neolithic evidence – focus on Annaghilla (Site 4)

In mainland Europe, the Neolithic population tended to live in small villages of up to 20 houses. They were often occupied over long periods — in some cases centuries — with older buildings being replaced by new ones. However, the trend in Britain and Ireland was towards isolated houses, or smaller groups of buildings. In many ways, the landscape of County Tyrone in the Neolithic would have looked very similar to rural Ireland at the turn of the 19th century: isolated farms interspersed with occasional small settlements or hamlets, where two or three families would work surrounding fields sharing workloads and tools.

Rectangular houses characterise the Early Neolithic settlement pattern. These were most often built using split timbers which were placed upright in deep foundation slots dug into the ground, and with a roof supported on two or more central posts. However, there is no standard structural design and various combinations of posts, planks, and wattle walling have been identified.[8]
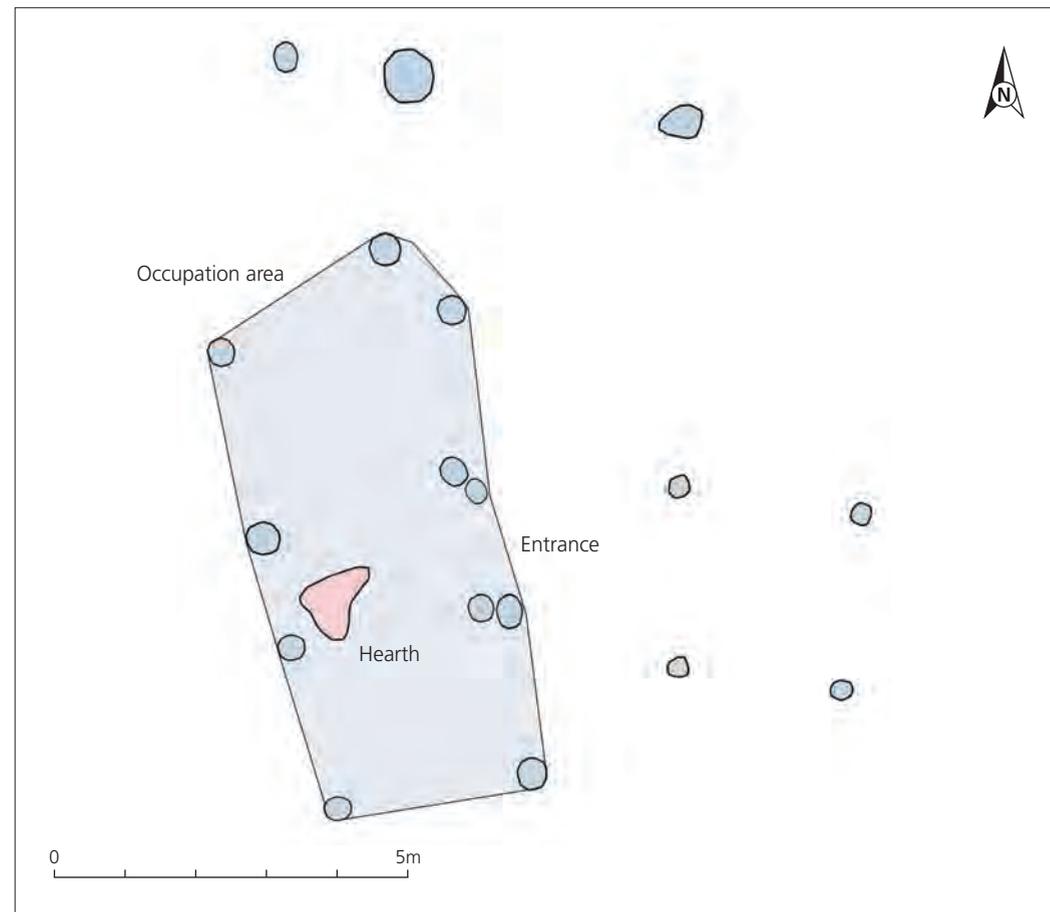
At Annaghilla (Site 4) sherds of Western Neolithic Carinated Bowl (c.4000–3650 BC)[9] were found within postholes of a rectangular house. The building was located on the north-facing slope of a small hill, the crest of which was occupied by an early medieval rath. Evidence for Later Neolithic, Bronze Age, and Iron Age activity was also noted on this hilltop.

The house was orientated roughly north to south, and measured 7.5m by 4m. This places the structure within the most commonly occurring cluster of Early Neolithic house sizes: those which are 6–8m long and 4–7m wide.[10] The absence of wall slots is unusual, but not unknown, with sites at Kilmainham 1a[11] and 1c, Co. Meath,[12] Townparks 5, Co. Meath,[13] and Gardenrath, Co. Meath,[14] and Monanny, Co. Monaghan,[15] also lacking substantive wall slots. The entrance was located on the east side of the structure where a set of double postholes defined the doorway. It is unlikely that there were windows, so positioning the doorway on this side allowed the maximum amount of light to enter the house during the day.

There was a shallow hearth located towards the southern end of the structure. Sherds of Carinated Bowl, flint flakes and blades, including one scraper, were recovered from the postholes and the hearth of the house. There was little evidence that the posts had burnt or rotted in-situ and the structure appears to have been dismantled. The occupational material is therefore likely to derive from debris that accumulated after the removal of the structural timbers.

A pair of posts was located 2m and 4.5m east of the doorway. It was not clear whether these defined a walled passage, or fence leading from the entrance. Three pits located to the north of the house were also dated to the Early Neolithic and are likely to be contemporary with the house, as were the Carinated Bowl and Early Neolithic scrapers recovered from Bronze and Iron Age features immediately to the west of the house. An isolated pit some 80m south of the houses contained sherds of Carinated Bowls as well as two small leaf-shaped arrowheads. This feature may also be contemporary with the house.

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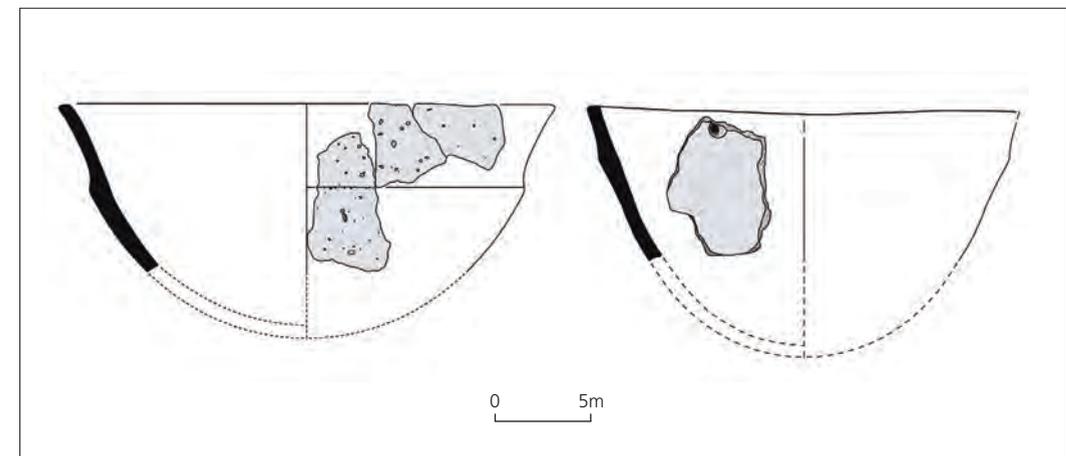
Neolithic Carinated Bowls from Annaghilla (Site 4) © Headland

0   5m

Evidence for Early Neolithic activity on the Road Scheme was also found on a few other sites. Lisbeg (Site 7), Armalughey (Site 17) and Mullaghbane (Site 44) contained single isolated pits which returned radiocarbon dates of 3942–3705 BC (UBA-14481), 3639–3515 BC (UBA-14499), 3698 BC–3536 BC (UBA-14465), respectively. An occupation layer at Armalughey (Site 19) was dated to 4001–3940 BC (UBA-14505). This layer was full of charcoal and may have been deposited from a fireplace. At Armalughey (Site 24) there were two stakeholes which dated to 3639–3518 BC (UBA-14517). No Early Neolithic artefacts were recovered from any of these sites and while they are likely to represent the remains of small temporary campsites there was not enough evidence to confirm this possibility.

At Grange (Site 14) two large pits (one of which dated to 3715–3637 BC (UBA-14483)) contained hazelnut shells, a plano-convex flint knife, a retouched blade, and four flint flakes. Thirty sherds of Western Neolithic pottery (c.4000–3500 BC)[16] were also recovered. These were found to be from more than one vessel. Western Neolithic pottery was also recovered from several pits at Armalughey (Site 22) a site which was then utilised in the Late Neolithic for the construction of a ring barrow.

At Ballylagan (Site 2) eleven pits and six occupation deposits were spread over an area some 75m long and 20m wide. No clear structure was apparent, and the radiocarbon dates suggested activity in both the Early Neolithic (Pit 1: 3965–3744 BC, UBA-14598) and the Middle Neolithic (Pit 2: 3364–3108 BC, UBA-14599). No diagnostic artefacts were recovered from the pits; however, two convex flint scrapers were retrieved during topsoil stripping in this area. These could have dated to either the Neolithic or the Bronze Age.

Flint from Grange (Site 14), 1. Retouched blade, 2. Plano-convex knife © ADS
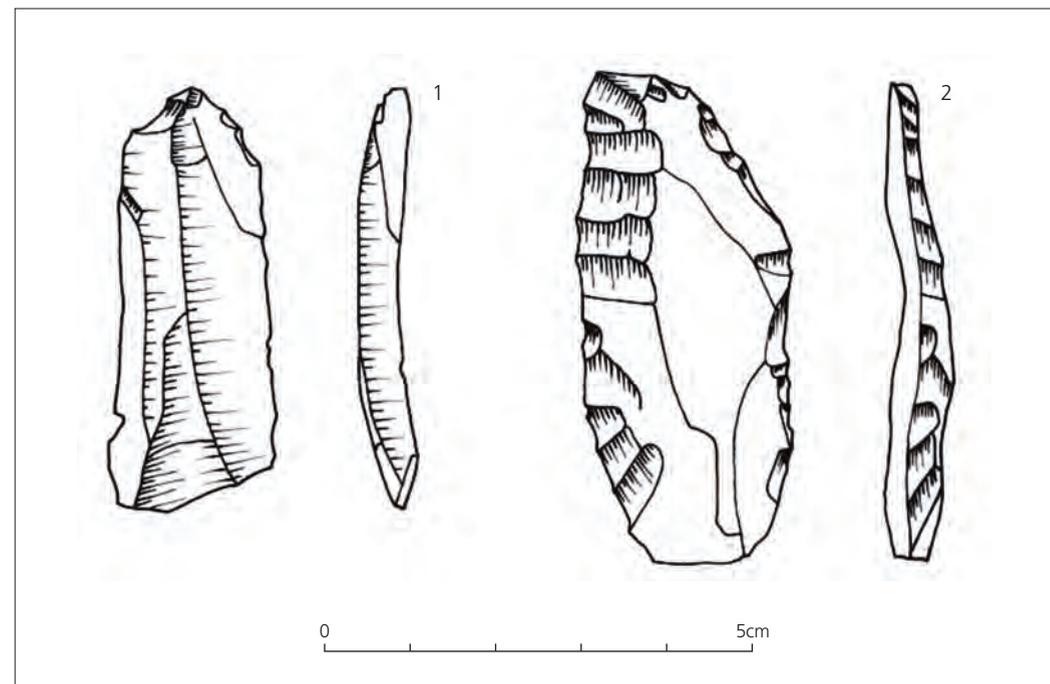
Middle Neolithic evidence

At the beginning of the Middle Neolithic, around 3600 BC, there was a shift from substantially constructed rectangular buildings[17] to less well-built round, or partially rounded, houses. The roundhouses were not built using large split timbers but with walls made from wattle – a lattice of thin, woven branches – resting in narrow slots and supported by upright posts. Throughout this period, and indeed throughout most of prehistory, the walls of the houses are most likely to have been covered in daub: wet clay mixed with straw or hair, which forms a solid and weather-proof barrier when dry. The roofs would have been thatched using material from whichever plant was most readily available, commonly reeds, dried grass, or the waste from cereal cultivation. Although there would have been no chimney in these buildings, the smoke from fires would have been able to filter naturally through the thatch. Internally, the houses often have a confusing array of internal posts, suggesting that the house had internal divisions, like rooms. While it is not clear what led to the change in house building during the Middle Neolithic, the internal dimensions of houses remained almost the same, suggesting that the newer structures fulfilled the same social requirements as the older rectangular houses.

Evidence for the Middle Neolithic on this Road Scheme was limited to transient occupation, with no significant structures recorded. At Armalughey (Site 22) two distinct periods of Middle Neolithic occupation were noted. The first period of occupation came from an isolated pit containing a broken axe head and Carrowkeel Ware type pottery (c.3200–3000 BC).[18] Carrowkeel Ware pottery is normally recovered from ritual contexts, such as Neolithic tombs,[19, 20, 21] and as such it is likely that the pit served a ritual, rather than domestic function. Single (or sometimes pairs of) originally intact bowls of this type have been found on a number of occasions, for instance at Monknewtown,[22] Co. Meath, Burial II, Tara, Co. Meath,[23] Ballynahatty, Co. Down,[24] Donegore Moat, Co. Antrim, Millin Bay, Co. Down, Bracklin, Co. Westmeath, and Lisalea, Co. Monaghan.[25] Although the Armalaughey bowl was incomplete (the feature was truncated), it seems likely that this pit contained a single vessel and not a mixed fill of refuse. The second phase of Middle Neolithic activity in this area came from a cluster of six pits, one of which dated to 3091–2923 BC (UBA-14521).

Broken axe head from Armalughey (Site 22)
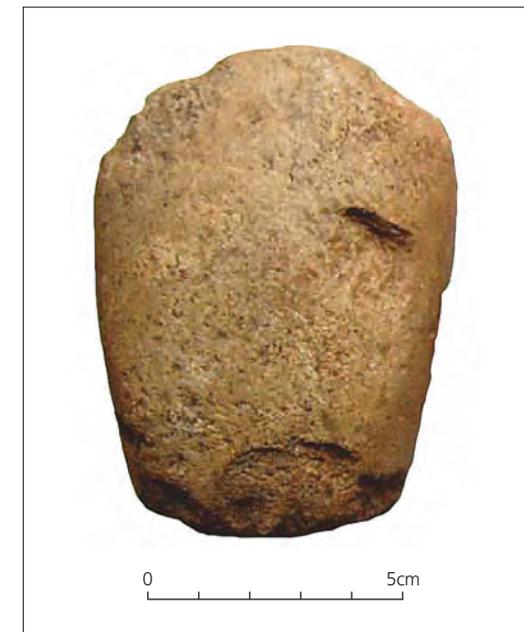
At Annaghilla (Site 5) a large pit was dated to 3522–3338 BC (UBA-14606). The pit was 1.6m long, 0.9m wide and 0.3m deep, and had a stakehole on both its south and east sides. The high concentration of charcoal, and the presence of some burnt rocks within the pit, suggests that it was a large hearth, probably used for cooking. The stakeholes may have held supports for a structure which sat over the fire. One of the pits at Tullyvar (Site 10) provided a radiocarbon date of 3498–3333BC (UBA-14475). However, as this pit was part of a Bronze Age structure it can be assumed that the material dated was from earlier, transient Middle Neolithic activity in this area.

At Annaghilla (Site 4) a small number of pits contained artefacts dating to the Middle Neolithic. These included modified Carinated Bowls, Carrowkeel Ware, an arrowhead, and a small collection of burnt animal bones (discussed above). Some of these pits produced debitage which indicates that flint tool manufacture took place on the site. These pits were overlain with later archaeological features, thereby obscuring their precise function.

The final evidence for the Middle Neolithic was at Lisbeg (Site 6) where two hearths were located near to the edge of a former stream. The hearths dated to 3339–2913 BC (SUERC-20420, SUERC-20424). No artefacts were recovered and these features would appear to represent temporary campsites beside a waterway.

Late Neolithic evidence – focus on Armalughey (Site 18) and Annaghilla (Site 4)

Very few Late Neolithic houses have been identified in Ireland, and those that have are almost universally round and post built. The houses from this period are also much smaller than their predecessors, suggesting that the inhabitant families were composed of fewer permanently resident members.

Two Late Neolithic structures were identified at Armalughey (Site 18) and two at Annaghilla (Site 4). The structures at Armalughey (Site 18) were located near to the summit of a hill, at a location which was re-used during the Iron Age and the early medieval periods. A modern hedge had also badly truncated both structures.

Structure 1 could only be partially excavated as the northern half of this structure lay outside the Road Scheme area. The structure was post built, c.5.5m diameter, and was most probably circular in shape. An entrance was identified to the south of the structure. The entrance was 0.8m wide and had a distinct layer of occupation material both outside and inside the building. This material would appear to have been deposited by the trampling of feet through the entrance over a prolonged period of time. Several further postholes arched south and west from the west side of the entrance and may have defined the entrance. A modern hedge obscured the east side of the entrance. Radiocarbon dates

from the postholes dated the structure to 2886–2487 BC (SUERC-20649, SUERC-20654, SUEC-20760). Beaker pottery was found within the upper sedimentation layers which formed within the postholes. It was not contemporary with the building; however, its presence does indicate that the postholes were still partially visible at the time when the beaker pottery was deposited. As the process of sedimentation of the postholes would have been relatively rapid, it seems likely that Structure 1 dates to end of the Late Neolithic period, which is immediately prior to the introduction of beaker pottery.

Structure 2 was less well defined than Structure 1, with much of the south and west of this structure truncated by both a modern hedge and two Iron Age ditches. This structure was not defined by postholes but by pits and was c.5.5m diameter. The pits were not as deep as the postholes in Structure 1 and were shallow sided, which made interpretation of this feature as a structure problematic. However, as the structure had an entrance it must be assumed that the area was enclosed, though it may not have been roofed. A hearth was located centrally within this area, and both this feature and the remaining pits contained fragments of burnt bone (including pig, sheep or goat and large mammal, cattle, horse, or deer), hazelnut shell, burnt and unburnt flint, and sherds of Grooved Ware pottery (c.3100–2500 BC).[26, 27] The entrance was in the southeast corner of the structure and was defined by two arcs of postholes set 1.3m apart from each other. The central hearth of this structure was date to 2861–2559 BC (SUERC-12118), while one of the outer postholes was dated to 2582–2470 BC (SUERC-12016), indicating that this structure was also Late Neolithic in date. The presence of an array of artefacts and the large amount of burnt bone suggests that this was the working and cooking area for the occupants of Structure 1.

Armalughey (Site 18)
Structure 1 © Headland

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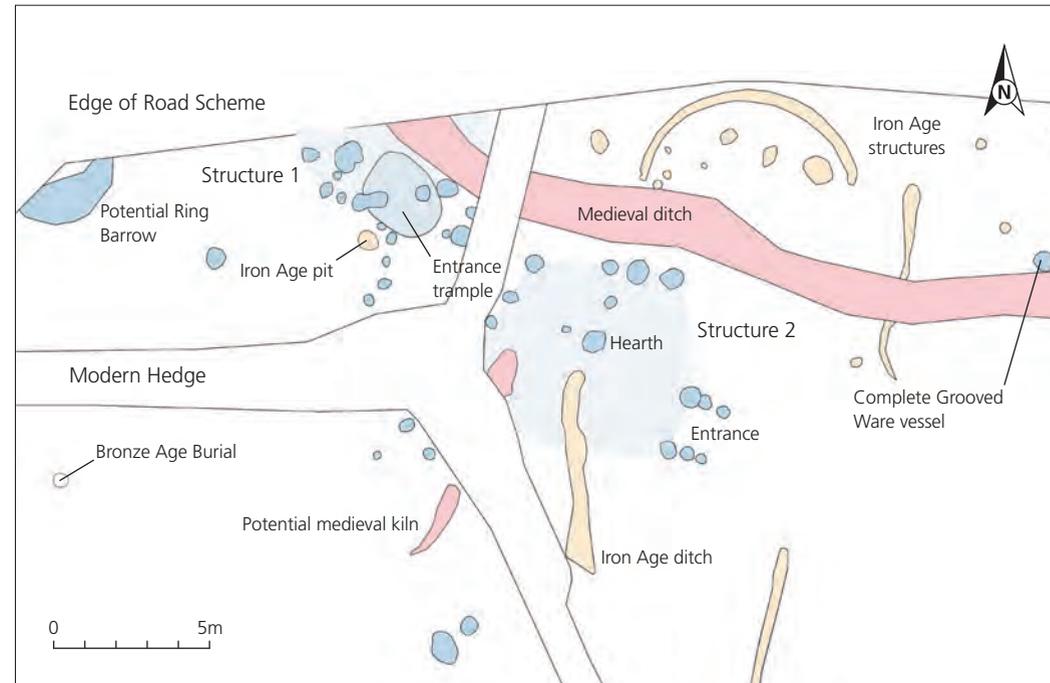
A stone-lined pit located 15m east of Structure 2 contained a complete Grooved Ware vessel and had been capped with a large stone. Any deposit within the pit had been washed out due to erosion. It is possible that a cremation had been present, and that this pit represents a funerary monument. However, examples of similarly deposited Grooved Ware vessels are also known from non-funerary contexts, including Pool, Orkney Islands.[28] Further funerary evidence was noted at the site in the form of a probable ring barrow partially excavated immediately to the west of Structure 1 (see below).

As at Armalughey (Site 18), the structures at Annaghilla (Site 4) were located towards the centre of a hilltop. Both structures were oval, 5m long and 4.5m wide, and defined by a series of postholes. The northernmost house, Structure 1, was defined by 21 postholes. The entrance was not apparent as there was a possible entrance gap in its northern circumference, along with a pair of posts on its southern side. Structure 2 was defined by seven postholes, and appeared to have been truncated by ploughing; no evidence for the entrance was apparent.

No pottery, and only one worked flint (a scraper), was recovered from the two houses. The presence of a large quantity of flint flakes and debitage does, however, indicate that flint working had taken place within the structures. Three of the postholes from Structure 1 dated to 2863–2474 BC (SUERC-21655, SUERC-21642, SUERC-21331), while a date of 2576–2467 BC (SUERC-21320) was returned from a posthole in Structure 2. A Bronze Age date (1301–1118 BC, SUERC-21319) was also returned for Structure 2. However, this would appear to be erroneous as no other Bronze Age material was found within this structure.
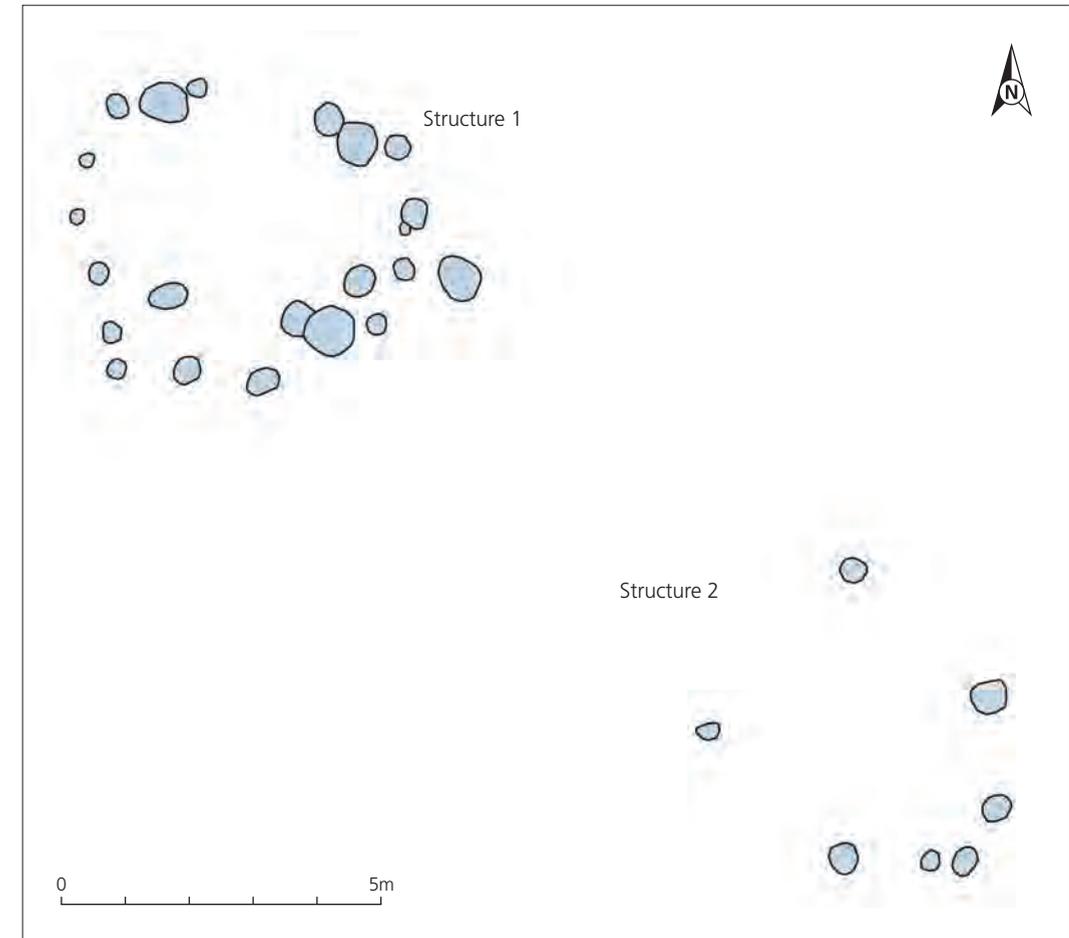
There was also a scatter of other Late Neolithic features found across Annaghilla (Site 4). The most significant concentration was a cluster of postholes and pits 20m west of the houses, one of which was dated to 2872–2617 BC (SUERC-21317). No structure could be defined but, as with the houses, the presence of flint debitage indicates flint tool manufacture in this area. These features may be broadly contemporary with Structures 1 and 2.

At Inishmagh (Site 30) and Drumnafern (Site 47) isolated pits were dated to 2856–2568 BC (UBA-14541) and 2863–2576 BC (UBA-14456), respectively. No artefacts were found within these pits and their function was unclear.

At Armalughey (Site 19) a cluster of five pits was dated to 2581–2469 BC (UBA-14501, UBA-14503). These pits contained small fragments of Early Bronze Age Food Vessel-type pottery as well as a large number of worked flint artefacts; including, two blades and three convex scrapers. The pits also contained unworked flint flakes and debitage which indicates that flint tool manufacture was being undertaken at this site.

At Cullenfad (Site 45) a sherd of Grooved Ware (c.3100–2500 BC),[29] a sherd of Carinated Bowl (c.3650–2900 BC),[30] and several Late Neolithic concave and end scrapers were recovered from within the Bronze Age ring barrows. A radiocarbon date of 2867–2581 BC (SUERC-21132) was also returned from a pit underneath one of the ring barrows. These artefacts and the radiocarbon date indicate that pre-Bronze Age activity occurred sporadically in this area.

Flint artefacts from Armalughey (Site 19) © ADS
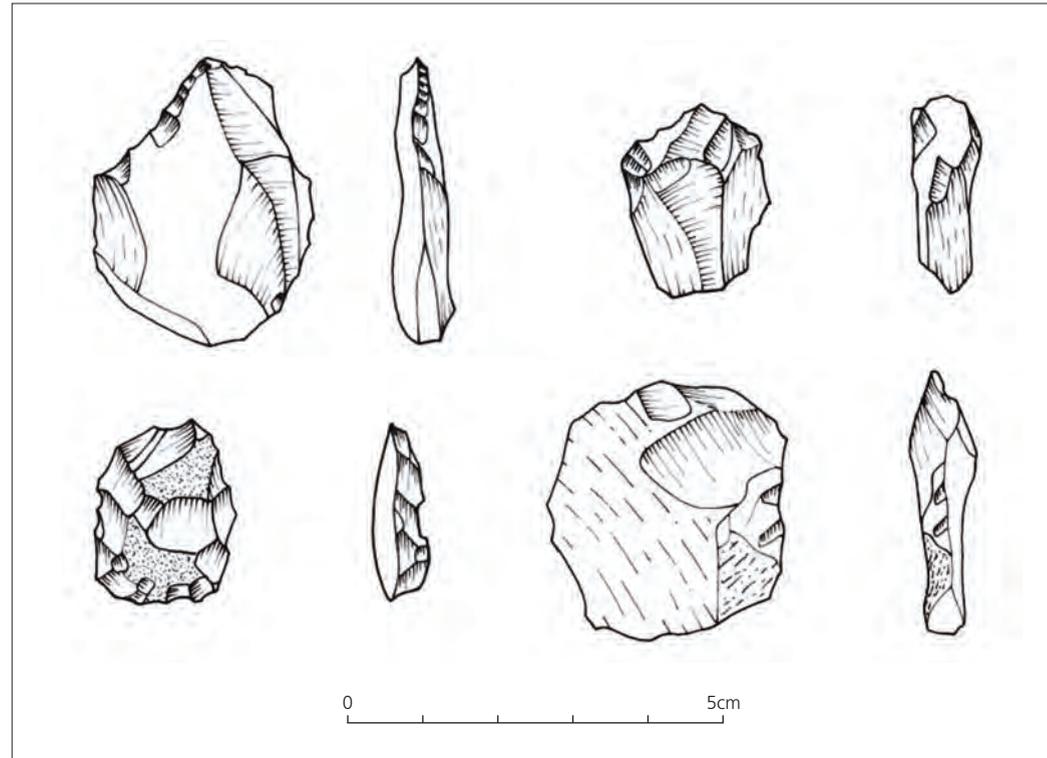
Cullenfad (Site 45) flint artefacts, left: concave scraper; right: retouched end scraper © Headland
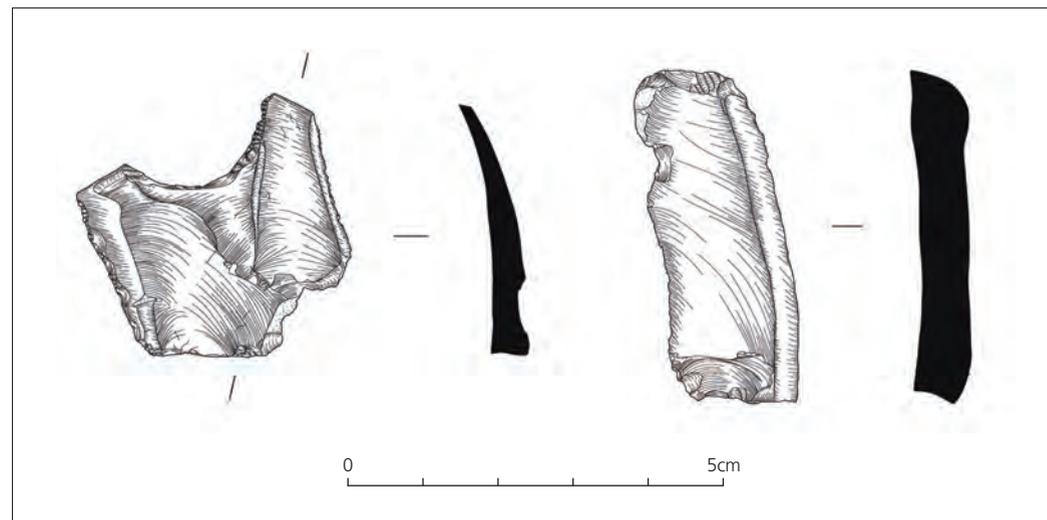
Death, Burial and Ritual

A monumental landscape

County Tyrone contains a wide array of upstanding Neolithic and Bronze Age monuments. These include standing stones, stone circles, and megaliths (from the Greek, meaning 'large stone'). Megaliths were used to mark the burial sites of prominent members of their society. Stone circles served a ritual function, possibly related to the significance of particular solar, or lunar alignments. Standing stones may have been territory or route markers and while most cannot be directly associated with burial rites, a few have been found with deposits of human remains. While the dating sequence for the various types of megalithic monuments is reasonably well attested, only a small number of Irish stone circles, and even fewer standing stones, has been dated and as such many of these sites which lie within close proximity to the Road Scheme may be either Neolithic or Bronze Age in date.

During the Early Neolithic period two main types of funerary monuments were built: portal tombs (sometimes called dolmens) and court tombs. In the later Neolithic these were superseded by passage and then wedge tombs.

Portal tombs typically have a single chamber formed from two tall stones, with side stones set wider at the front than the back, all of which support a capstone, which lies flat on top. The tomb would then have been covered with an earthen mound, which allowed access from one side or occasionally from both sides. Two examples of this type of megalith are located just south of Beragh: at Cloghfin[31] and Radergan.[32]

The majority of court tombs are found in the north and west of Ireland. Normally they consist of a trapezoidal cairn, which is made by heaping small rocks on top of one another. They are generally open at one end to allow access to a central court and stone burial chambers within which were roofed with corbeled stone arches.[33] A particularly fine example of a court tomb stands in Glassdrummond.[34]

Passage tombs consist of a narrow passage which has one or more burial chambers leading off it. Larger passage tombs can have multiple smaller chambers leading off the main chamber or chambers. Passage tombs were then covered with a mound of earth and were accessed through an opening at the external end of the passage. Passage tombs are often found clustered in cemeteries. One such cemetery is located close to the Road Scheme at Sess Kilgreen.[35]

Wedge tombs began to be constructed in the very Late Neolithic, with most dating to the Early Bronze Age. They are generally formed by a single chamber which narrows, in both height and width, at its terminal end, thus giving the burial monument a wedge shape. The tomb was then covered in a mound. The nearest wedge tomb to the Road Scheme is at Shantavny Scotch.[36]

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Early Neolithic

Only Mullaghbane (Site 27) had evidence for burial during this period. The excavation here was located on a hilltop which had extensive views over the surrounding area. The location was utilised again in the Late Neolithic and the Bronze Age for ring barrow burials, and then again in the early medieval period for the construction of a rath.

The Early Neolithic burial was a cremation within a small pit on the west side of the hilltop. The cremation had been disturbed shortly after deposition, with the upper part of the burial pit being cut by a second pit. The cremation was dated to 3705–3631 BC (SUERC-21743), with the second pit dating to 3655–3526 BC (SUERC-21746). The remains were identified as human; unfortunately, later disturbance had removed most of the human bone making further morphological assessment impossible. A flint blade deposited with the cremation was in an unburnt state, and therefore must have been placed with the remains after they had been cremated, most probably as a grave good.

Middle Neolithic

There was no evidence for Middle Neolithic burial or ritual practices on the Road Scheme; however, a number of the already noted megaliths in this area may have continued to be in use during this period.

Knockmany Passage Tomb. Also known as Annia's Cove this cairn lies on the summit of Knockmany hill in the forest park. Several of the stones forming the chamber are decorated with Neolithic art including circles, spirals and zigzags. The cairn which now covers the tomb is modern, and was constructed in 1959 to protect the stones. Visitors wishing to examine the rock art should contact DOE: HED to arrange for the gate to be opened. This image was taken c.1910 by Robert Welch © NMNI Welch Collection

Late Neolithic – focus on Armalughey (Site 22) and Mullaghbane (Site 27)

While ring barrows predominantly date to the Bronze Age,[37, 38] there is evidence to suggest that their construction begins to occur at the start of the Middle Neolithic period. These very early barrows tended to be much larger than those of the Bronze Age and stopped being constructed around 2900 BC[39] when smaller ring barrows begin to appear.

The excavations on this Road Scheme provided evidence for two of these smaller Late Neolithic ring barrows: these were at Armalughey (Site 22) and Mullaghbane (Site 27). Parallels for this type of Early Neolithic ring barrows can be tentatively drawn in Linkardstown-type burials, particularly an example at Fourknocks, Co. Meath. Fourknocks II (Phase 1) was approximately 8m across and consisted of an encircling ditch with an off-centre pit filled with charcoal and a small amount of cremated human bone, over which a cairn was constructed.[40]

The ring barrow at Armalughey (Site 22) had a 7.5m internal diameter and the ditch was 0.6m wide and 0.15–0.2m deep. A pit in the centre of this ring barrow was dated to the Middle Neolithic (3636–3381 BC; UBA-14528); however, this date was at least 500 years earlier than all of the other ring barrow-related features in this area. As previously mentioned it is probable that this date was caused by the old wood effect, or by the presence of residual Early Neolithic material related to the Early Neolithic occupation in this area. This pit contained fragments of human bone from one adult and would appear to have held a large wooden post. This post was later removed, the pit backfilled and then replaced by a smaller pit. Replacement of large pits or postholes with ring barrows has previously been noted at other archaeological sites, including Derrycraw and Ballintaggart, Co. Down.[41]

Ring barrow at Armalughey (Site 22) © ADS

Cremation

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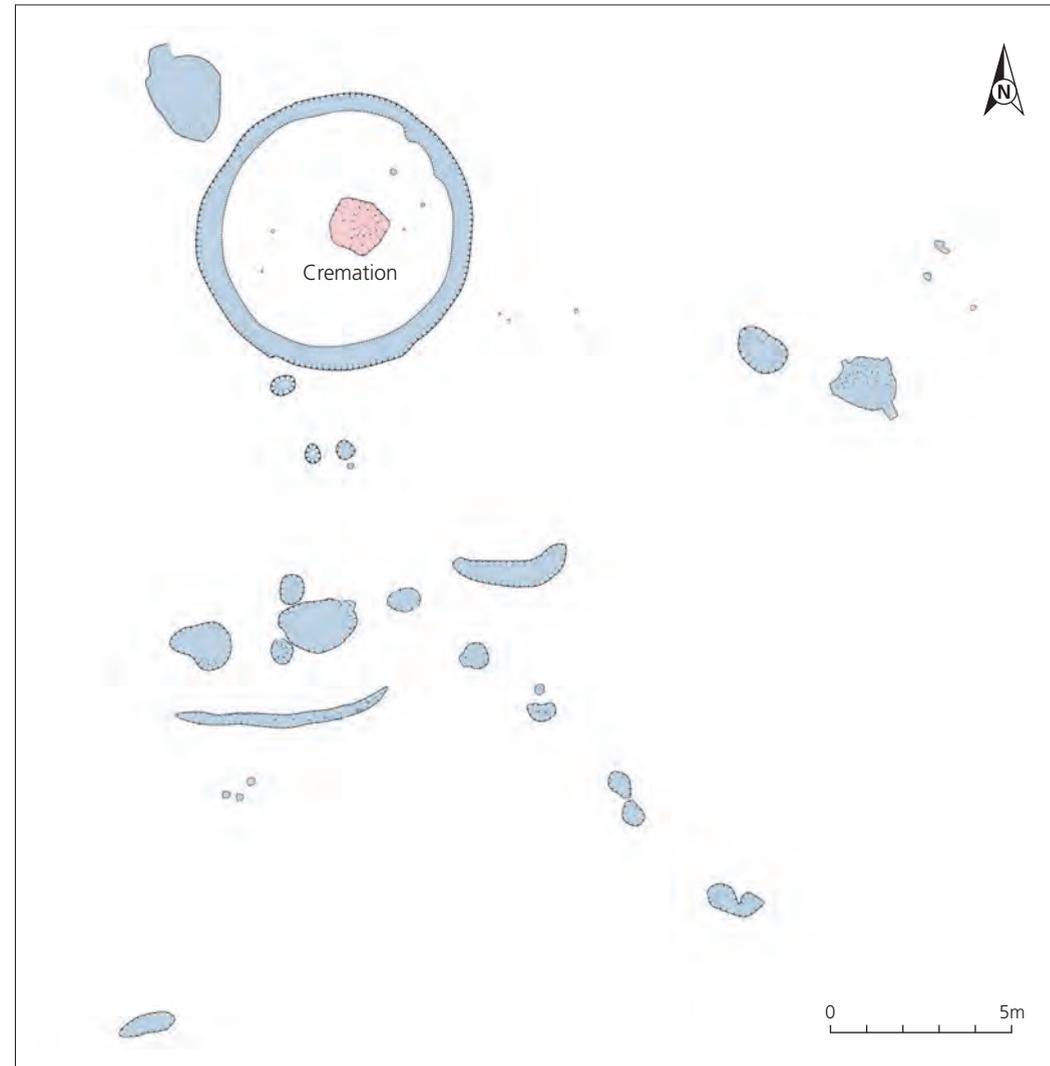
The second pit was dated to 2680–2488 BC (UBA-14529). It also contained fragments of cremated bone, including parts of a human mandible. It was not clear whether this was a second cremation, or derived from the cremation in the first pit. Located 5m south of the ring barrow were six pits one of which contained both sherds of Western Neolithic pottery (c.4000–3500 BC)[42] and sherds of Grooved Ware pottery (c.3100–2500 BC).[43, 44] The precise function and dates of these pits remains unclear.

The area also contained a large number of pits of varying sizes; the majority of these contained sherds of Grooved Ware pottery and worked flint artefacts. Three of the pits dated to 2872–2488 BC (UBA-14526, UBA-14527, UBA-14530) and as such appeared to be contemporary to the second pit within the ring barrow. The most significant deposit was within a pit immediately south of the ring

barrow. It contained the remains of at least four shattered Grooved Ware vessels. These appeared to have been deliberately broken and deposited in this pit, presumably as a ritualistic offering. A similar deposit was excavated at Lowpark, Co. Mayo.[45]

No material suitable for radiocarbon dating was obtained from the ring barrow, and no chronologically diagnostic artefacts were recovered; therefore its precise date remains unknown. However, it is highly likely that the ring barrow was contemporary with at least some of the other funerary activity from the site and therefore broadly dates to the Middle Neolithic.

A cluster of 11 pits was found 40m southeast of the ring barrow, one of which contained a cremated human adult. Grooved Ware pottery and c.100 worked flint artefacts (principally flakes, scrapers, and blades) were recovered from these pits. The pits dated to 2871–2486 BC (UBA-14519, UBA-14522 and UBA-14524).

A second cluster of activity: seven pits and a postholes, was located 30m northeast of the ring barrow. One of these contained the cremated remains of an adult, the bones of which were mixed with animal bone. The cremation had been badly disturbed but would appear to have been buried within an inverted Grooved Ware Vessel. The cremation dated to 2854–2571 BC (UBA-14523); one of the other pits dated to 2850–2492 BC (UBA-14525).

Grooved Ware in-situ at Armalughey (Site 22) © ADS

Mullaghbane (Site 27)
Late Neolithic ring
barrow and nearby
archaeological features
© Headland (amended
NAC)
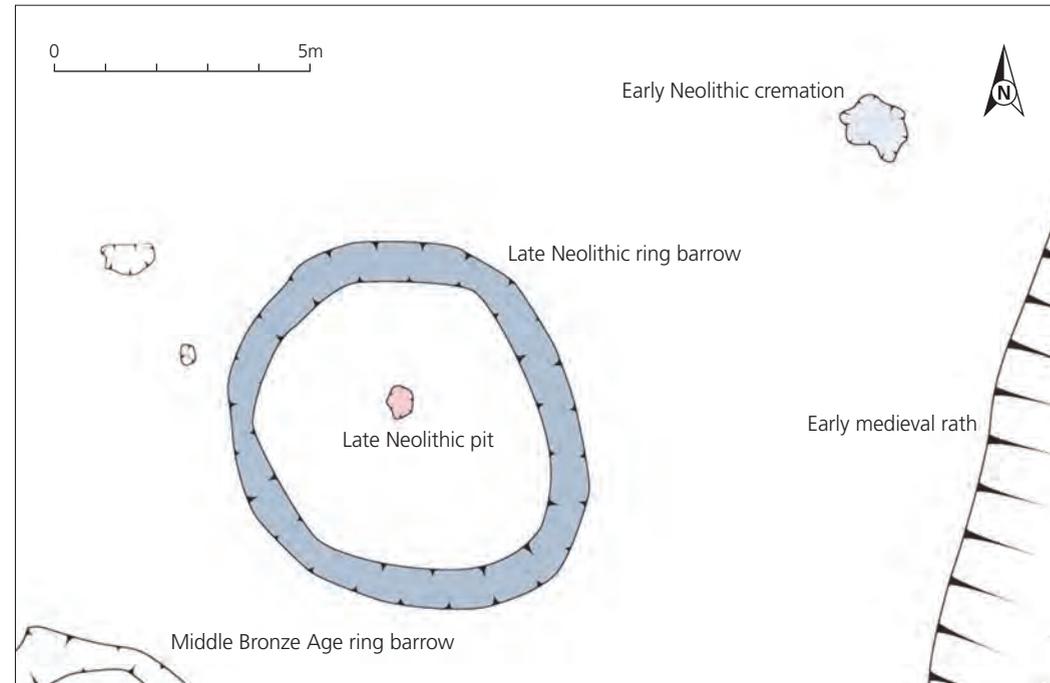
At Mullaghbane (Site 27) the central pit of a ring barrow was dated to 2897–2679 BC (SUERC-21735). No bone was recovered from the pit; however, is probable that there had been a central cremation which had been removed through later ploughing. The ring barrow had a 5.5m internal diameter, and its ditch was 0.8m wide and 0.3m deep. The ring barrow was not dated, but it may be broadly contemporary with the central pit. The ring barrow was near the summit of a low natural rise, flanked to the north and south by later, Bronze Age ring barrow features. An Early Neolithic cremation was located immediately northeast of this barrow. In the early medieval period a rath was constructed to the east of this barrow.

Late Neolithic timber circle - focus on Armalughey (Site 20)

At Armalughey (Site 20) a keyhole-shaped timber structure was excavated. The structure was formed from two concentric rings of timber posts, with an elaborate entrance to the southeast. This structure fits well within the body of Late Neolithic circular monuments built of timber or stone. In form it is most similar to the Late Neolithic timber structure at Ballynahatty, Co. Down,[46] which also has a central four post structure. Ballynhatty does however lack the elaborate entrance features which were present here. Grooved Ware was recovered from the postholes. This has been noted at the other 15 timber circles thus far identified in Ireland. Beaker pottery was also recovered which indicates continuity of activity at the site into the early Bronze Age. Beaker pottery has not been noted previously at timber circles in Ireland, however it has been found deliberately deposited within
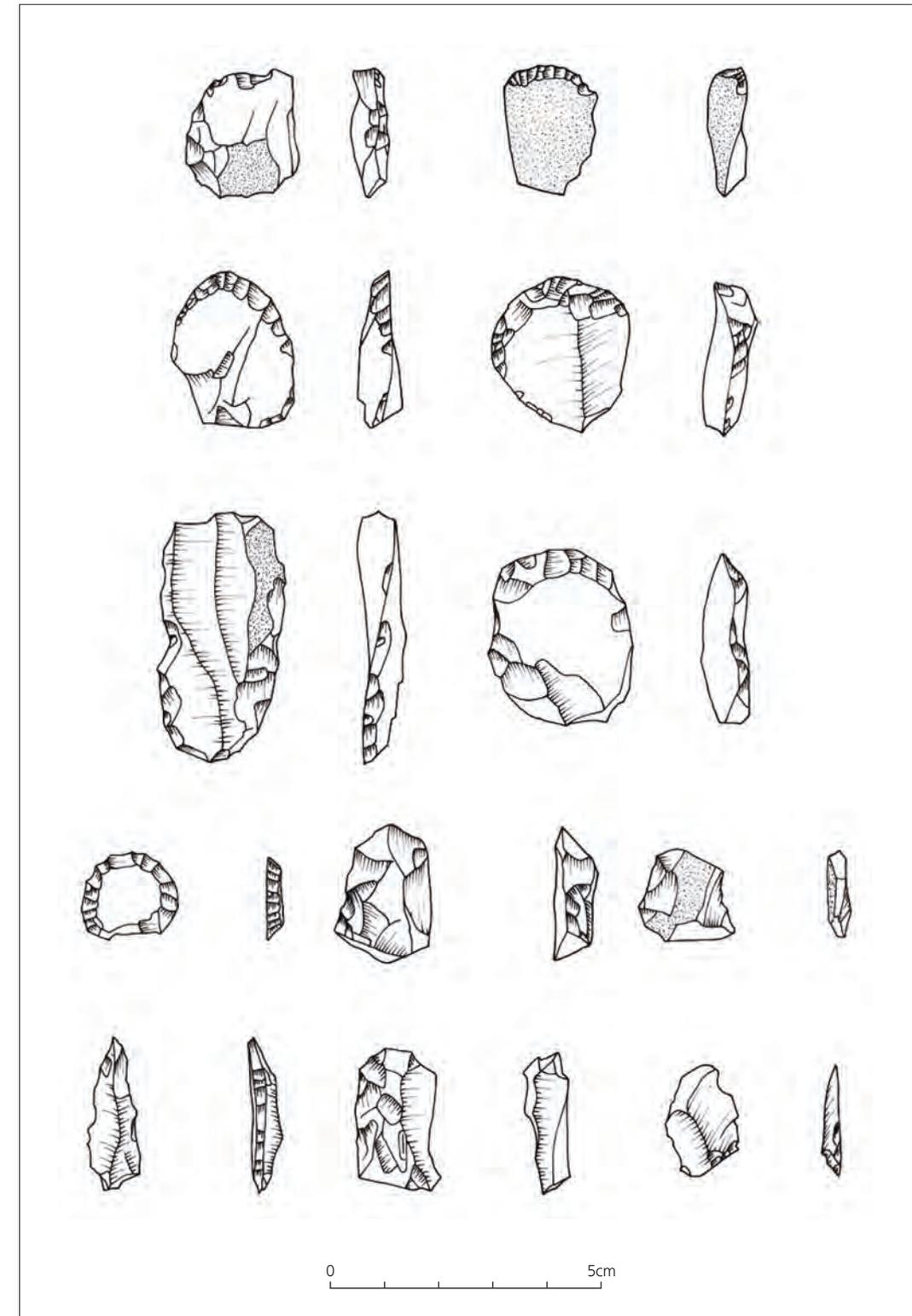
a large number of other Late Neolithic monuments, therefore its presence here is not unsurprising.

The site was located on a small hilltop, within a landscape of gently rolling hills and drumlins. It was inter-visible with Armalughey (Site 18) where two broadly contemporary dating Late Neolithic structures, most probably houses, were located. The site itself was relatively flat, although the timber structure sat on a low rise or knoll within this. The initial phase of activity at the site (Phase 1) saw the excavation of four postholes and two pits. These formed a square four post structure with a pit defined entrance and was dated to 3014–2888 BC (SUERC-20787, SUERC-20788). The second phase (Phase 2) saw the construction of the circle itself and also a small structure (Circle D) which may have been a hut used by the builders during its construction. The date of the timber circle is discussed in more detail below; however, when dates where old wood effect is a possibility have been removed, a date of c.2600–2450 BC for its construction is probable. The final phase of activity on the site includes the insertion of beaker pottery (c.2500–1900 BC)[47, 48] into some of the pits in the centre of the circle. This appears to have been undertaken sometime after the circle was constructed and indicates continuity of ritual and use of the site well into the Bronze Age.

Key:
- Phase 1 features
- Phase 2 features
- Pits recut during po...
- Later features cutting ...

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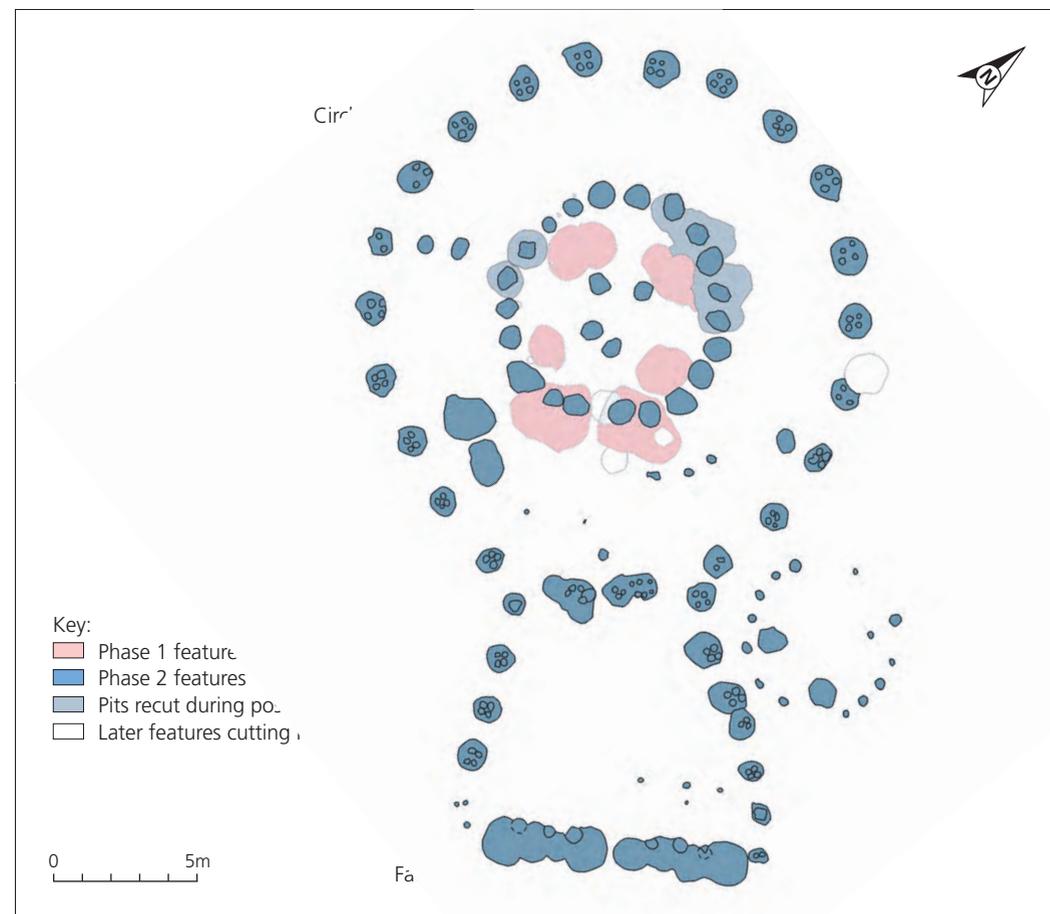
Immediately east of the timber circle, at Armalughey (Site 21), six postholes and seven pits were spread out over a large area. These features could not be resolved into specific structures. However, one pit was dated to 2620–2473 BC (UBA-14445), a date consistent with the flint artefacts recovered, and as such is likely to represent contemporary activity to the timber circle.

Phase 1

The earliest dated features on the site were four large postholes. These formed a four post structure whose entrance was defined by two pits. The pits and postholes contained small amounts of charcoal and some sherds of Carrowkeel Ware pottery (c.3200–3000 BC).[49] As previously discussed, Carrowkeel Ware pottery is normally recovered from ritual contexts,[50, 51, 52] and, as such, it is likely that these features represent the first esoteric activities on this site. They were dated to 3014–2888 BC (SUERC-20787, SUERC-20788), which is broadly in line with the known end date for Carrowkeel Ware. These features signify the importance of this location, and show ritualistic activity being undertaken here prior to the timber circle being constructed.

While the two pits closest to the entrance were completely backfilled during the construction of the timber circle (Circle B) the four large postholes within this circle appear to have remained at least partially open, as the upper silting layers of the pits contained both Late Neolithic Grooved Ware (radiocarbon dated to 2635–2475 BC; SUERC-20796) and Beaker pottery (radiocarbon dated to 2231–2038 BC; SUERC-20768).

Phase 2

Following the excavation of the large pits and their subsequent silting up, the radiocarbon dating evidence would suggest that between 100 and 300 years passed before the timber circle was constructed. The timber structure comprised two roughly concentric rings of posts (Circles A and B), with an elaborate entrance structure to the southeast (Structure E), made up of a façade and lines of posts radiating out from the rings (Facade F). Within the interior of the concentric rings were four smaller posts, unusually asymmetrical in layout (Structure C). There were also features in the strip between the two rings which have been placed in this phase by association. These were undated and their function in relation to the timber circle is unclear. To the east of the structure lay a much smaller ring of stakeholes, which may have been a shelter, or small hut for the builders of the timber circle (Circle D). A scattering of pits and postholes to the east of the timber circle was also dated to this phase (SUERC-20775 and SUERC-20776); however, no further structures could be identified.

A small number of pits and postholes lay between Circles A and B. While the concentric and complex nature of the structure might suggest a multi-phase construction, dating of the individual elements of the structure showed this was not the case. The structure seems to have been conceived of and constructed as a whole.

Outer ring (Circle A) - dated to 2872–2491 BC (SUERC-20770, SUERC-20777, SUERC-20778)

Circle A was a ring of 22 four-post pits, spaced c.2.5m apart and measuring 17.5m in diameter. The form of these pits was consistent throughout almost every example. In each case, a large relatively shallow pit contained the post pipes of four individual posts. The large pits were roughly 1m in diameter, and were usually between 0.3m and 0.5m in depth. Within each large pit there were four individual posts, with an average diameter of around 0.2m.

Overlying three of the southern pits (Circle A: pit 19, 20 and 21) were charcoal-rich deposits and layers of silt. These appeared to have accumulated in the hollows left once the backfill of the pits had settled. The material had spread beyond the limits of the postholes. The charcoal was spread over only three of the pits and is therefore more likely to represent deliberate placement (activity seen elsewhere within the structure) than the result of the outer post ring burning down.

The relatively unusual arrangement of these four-post pits helps to indicate their function and appearance. All the posts were inserted at the same time and must have been in use concurrently. The uniformity of size of each post also indicates that they all had the same function within the pit. In each case, the layout of the four posts is such that a pair of posts in one pit is directly opposite a pair of posts in the next one. Each pair of posts would have supported horizontal timbers or
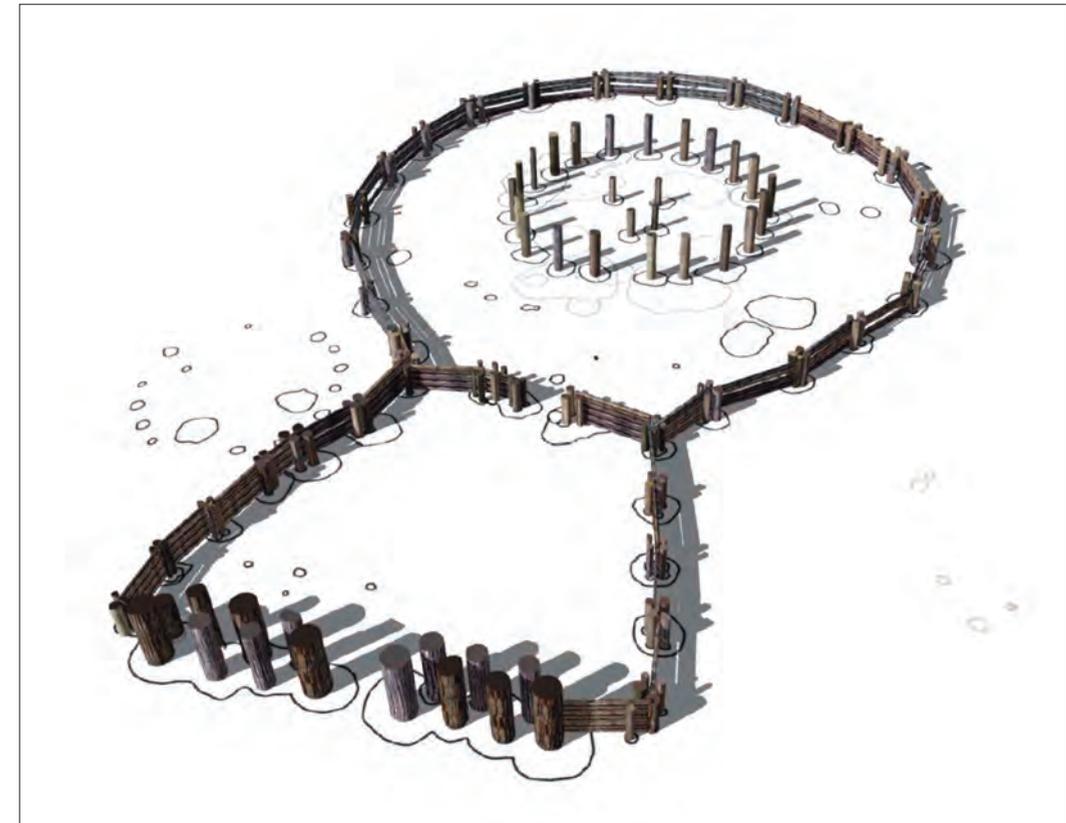
Layout of Phase 2 posts at the timber circle © Headland.

Excavations underway at Armalughey (Site 20) © Headland

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planking, creating a solid wall around the structure. The presence of such high concentrations of charcoal around three of the southern pits also helps to suggest the presence of further wooden superstructures attached to the posts. This would be an effective and relatively easy way to wall a large circle, perhaps in a situation where large timbers were difficult to find (or were being reserved for use as upright posts).

Two of these pits bordered the entrance to the timber structure (Circle A: Pits 1 and 22) and are slightly different from those forming the rest of the ring. They were larger than the other examples, being just under 2m long and almost 1m wide. These appear to have held at least two lines of four or five posts, although more posts may have been present.

Despite the basic similarity in form between the pits of the outer circle and these two at the entrance, there must have been a different function for them. The arrangement of four seems specifically designed to hold long horizontal planks, but more uprights than would be structurally necessary were present. It is difficult to see what structural purpose the extra postholes could serve and, unless they represent several phases at the entrance, it should be assumed they are for some other purpose or more elaborate structure.

Reconstruction drawing of a range of Grooved Ware pottery from Balfarg, Scotland. The larger Urns are similar to those recovered at Armalughey (Site 20) © Alan Braby

Radial arms – dated to 2678–2471 BC (SUERC-20786, SUERC-20790)

Two radial 'arms' extended out from the southeast side of Circle A, to join up with the postholes of the façade. Together these formed an entrance structure or large porch attached to the timber circle. As with Circle A, each large pit contained four individual posts.

Façade – dated to 2857–2565 BC (SUERC-10789, SUERC-20794)

A line of eight large postholes, split into two groups of four, completed the entrance structure on its southeast side. A secondary line of postholes intercut these on their northwest edge. The postholes were between 1m and 1.5m in diameter, up to 0.8m in depth, and each group followed the sequence of two larger postholes on the outer edges and smaller ones on the inside. The deposits identified within the postholes seem to indicate the posts were deliberately removed and the postholes gradually silted up.

The gap between the two groups of postholes was an important one, as it represents the only entrance into the structure. Taking the centre point of each post, and their presumed size, the gap between them would have been considerably less than 1m. This narrow gap would have emphasised the monumental nature of the façade, and from most angles of approach it would not even have been visible. It would also physically restrict access to some degree, in that only one person could enter at a time.

The secondary line of postholes in each group lay to the northwest of the main line and these postholes considerably smaller: roughly 0.4m across and only 0.5m in depth. Although they intercut the larger postholes, the fills of both were similar and no evidence of phasing between them could be seen. A possible explanation for their presence could again be to do with the visual impact of the façade, created by the combination of enormous timbers and a narrow gap between two groups of very large postholes. The additional line of posts would fill the gaps between the main structural posts.

Inner Ring (Circle B) – dated to Circle B can be dated to 2865–2473 BC (SUERC-20784, SUERC-20785, SUERC-20779)

Beyond the entrance structure and within Circle A there was a second ring of posts (Circle B). The ring measured c.8.5m in diameter and was made up of 21 postholes. The size of the postholes varied from about 0.6m in diameter to 1.1m. The majority were between 0.6m and 0.75m in depth. There was some evidence for a number of these posts having been intentionally removed, others had rotted in-situ.

The postholes were spaced c.0.5m apart, with an average spacing of c.1.15m from centre to centre. This spacing was only broken by the gap at the entrance to the ring on the southeast side, where a gap of 1.6m was present between Circle B postholes 1 and 21. At the north of the ring, some of the postholes (Circle B: postholes 6–10) were surrounded by larger pits which may have been excavated for the replacement of the original posts.

It is possible that this was in fact a small building with the circle of posts supporting a roof, and that the narrow gaps between the posts having been filled with wattle and daub walling. The only view into this building would have then been via the narrow entrance.

Structure C – dated to 2864–2475 BC (SUERC-20774, SUERC-20780)

Within Circle B were four smaller postholes, labelled Structure C. These were 0.65m in diameter and 0.3m to 0.4m in depth. This was considerably smaller than those of Circle B and indicates that smaller posts were used. A similar feature was recorded at the contemporarily dated (c.3080–2490 BC) timber circle at Ballynahatty, Co. Down,[53] and was identified as an excarnation platform. This is a timber structure where a corpse was defleshed by the elements and carrion birds. If Circle B was un-roofed then this could be a possibility here; however, if it was roofed then such a function is unlikely. Regardless of its exact function it is likely that this structure served a significant ritual purpose. It would also have been the only structure visible to anyone viewing the interior of the timber circle from the entrance façade.

Small hut (Circle D) – dated to 2865–2575 BC (SUERC-20795)

Immediately to the east of the timber structure there was a ring of stakeholes, measuring c.5.5m in diameter. The stakeholes were generally between 0.05m and 0.15m in depth and were angled inwards. This indicates that the structure had a curved roof, most probably tied together in the middle.

Radiocarbon dated material from one of the stakeholes was broadly the same as the date of the main structure and as such it is most probably contemporary. The irregularity of the line of the northern radial arm of the timber circle would suggest that this structure was in place before this part of the timber circle was erected. Indeed, it is possible that this was a shelter, or small hut utilised by the builders of the timber circle during its construction.

Summary Discussion (A full discussion by Dr. Neil Carlin is included as an Appendix to this Volume)

Timber circles are known throughout Ireland and Britain, although their numbers in Ireland are small. In basic terms, a timber circle comprises an arrangement of cut features, normally postholes, which may have been designed to hold timber uprights. The numbers of timbers present can range from only a few to many tens of posts. The simplest examples may only have a single circle of posts, but there are also examples such at Mount Pleasant in Dorset which has five concentric circles and radiating lines of posts.[54] These structures appear to have been erected from around 3000 BC through to 900 BC;[55] however, most dated examples (including the one excavated on this Road Scheme) are focused in the third millennium BC.

Most timber circles in Ireland consist of only a single ring. In Britain, double circles are known from sites such as Machrie Moor, Isle of Arran[56] and the Northern Circle at Durrington Walls, Wiltshire,[57] both of which comprised an outer and inner ring that encircled a central arrangement of four large posts in a square. Multiple circles have also been excavated, these include Balfarg, Fife,[58] Woodhenge, Wiltshire[59] and the Southern Circle at Durrington Walls, Wiltshire. The occurrence of a double ring is only paralleled in Ireland by the Grooved Ware associated timber circle located at Ballynahatty, Co. Down[60] in the Lagan Valley 78km to the east. Although, at Newgrange, Co. Meath, a large circle immediately southeast of the main passage tomb comprising multiple rings of pits and postholes (70m in diameter) was partially excavated.[61, 62]
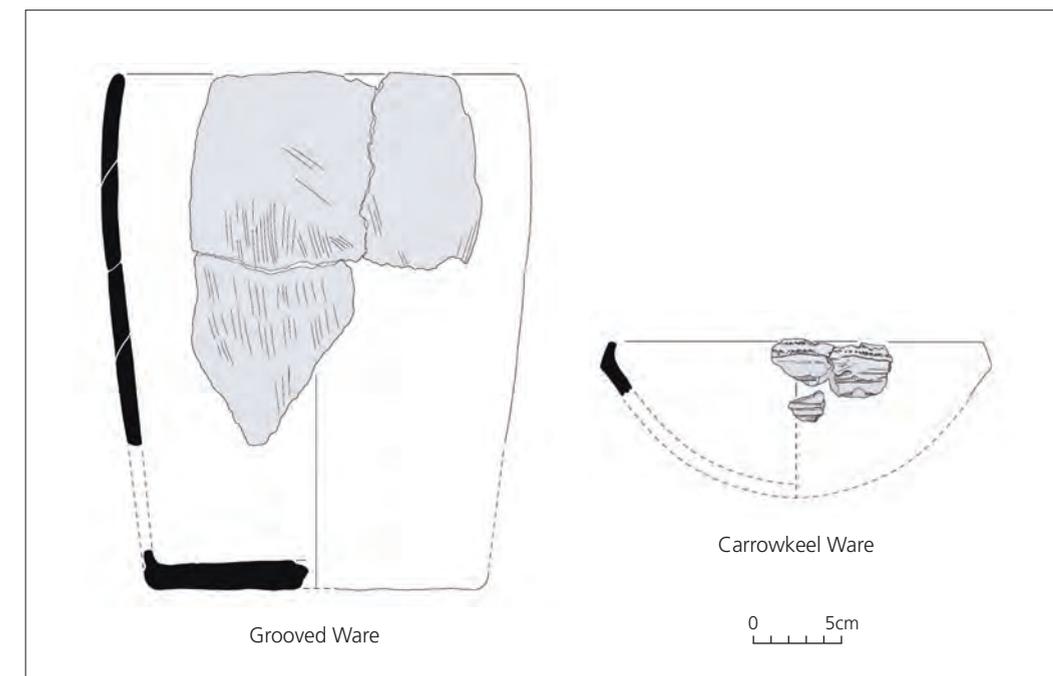
Reconstruction of Grooved Ware and Carrowkeel Ware recovered from Armalughey (Site 20) © Headland

Carrowkeel Ware

Grooved Ware

0   5cm

The four postholes and pits belonging to the earlier previous phase of activity comprise an earlier monument consisting of a four-post structure with a pit-defined entrance way. Such a ground plan would closely resemble the main surviving elements of Grooved Ware associated timber structures at Balgatheran, Co. Louth[63] and Kilmainham 3, Co. Meath,[64] as well as Durrington 68[65] and Durrington 70[66] in Wiltshire. Simple 'four post in circle' settings commonly found in Ireland may represent an early phase, in a sequence that is possibly associated with a pre-enclosure phase at many monument complexes.[67]

The entrance façade has no direct parallels in Ireland and provides an interesting interpretative challenge. While comparisons can be drawn with the entrances to the circular enclosures at Ballynahatty, Co. Down[68] and Newgrange, Co. Meath[69] the funnel-shape entrance at Armalughey (Site 20) is of a much grander scale. The entrance area certainly bears similarities to megalithic court tombs. At these tombs an enclosed 'court' is entered through a narrow entrance gap. Another narrow opening is generally opposite the entrance, and this leads into the burial chamber, or chambers beyond. However, there was no evidence that this site was used for burial and therefore while the overall form of the entrance structure can be compared to court tombs, its overall function was not the same.

While being much larger, the timbers placed within the outer circle at Armalughey (Site 20) form a double ring of posts that greatly resembles the large double post structure enclosing the timber circle at Ballynahatty, Co. Down.[70] Certainly the structures at both these places share many aspects of the same architectural tradition. Indeed, many of the more recently excavated timber circles in Ireland suggest that a shared architectural vocabulary was in existence in the Late Neolithic with various interchangeable components that could be arranged and re-arranged. Ongoing studies are revealing evidence for multi-phase buildings with long histories of building activity occasionally lasting over three centuries and involving the repeated re-cutting or replacement of postholes as well as the remodelling of other components at timber circles in Britain such as Dunragit, Dumfries and Galloway,[71] the Southern circle at Durrington Walls, Wiltshire[72] and Woodhenge, Wilstshire.[73, 74]

The function of timber circles remains the subject of much debate. Many different interpretations have been suggested, but in broad terms, all can be said to relate to 'ritual activities'. The most common themes tend to be around the concepts of burial, division of space, procession, and astronomical awareness. There is evidence for all of these things at many different sites, and it may well be that while there was a common background to the circles, individual examples had different focuses and purposes.

The importance of the position and movement of both sun and moon is well attested in the archaeological record, from the Neolithic through to the later Bronze Age. Alignments with the winter solstice sunrise have been identified right across northwest Europe, with sites such as Newgrange, Co.

Meath,[75] Woodtemple[76] and Durrington Walls, Wiltshire,[77] and Zwoll, Netherlands,[78] providing clear evidence for the significance of this astronomical event. It has been suggested that sunrise alignments are associated with 'new beginnings, life, light, fertility, feasting, water, and the earth'.[79]

The entrance to the timber circle here was orientated to the southeast. While it was not directly aligned with the midwinter sunrise, the morning sun would have shone through the entrance during the winter months. The lunar alignment is more closely matched to a known astrological point, the southern minor limit of the moon. To accurately pinpoint and record this position would require a long period of study of the movement of the moon across the night sky, potentially several generations' worth. If the structure was indeed aligned on this, then it indicates a high level of recording skill, of community co-operation and of organisation over a lengthy block of time, but there is no real supporting evidence that this is the case. Perhaps the mostly likely interpretation is that the structure faced towards the setting sun on the day that its construction commenced.
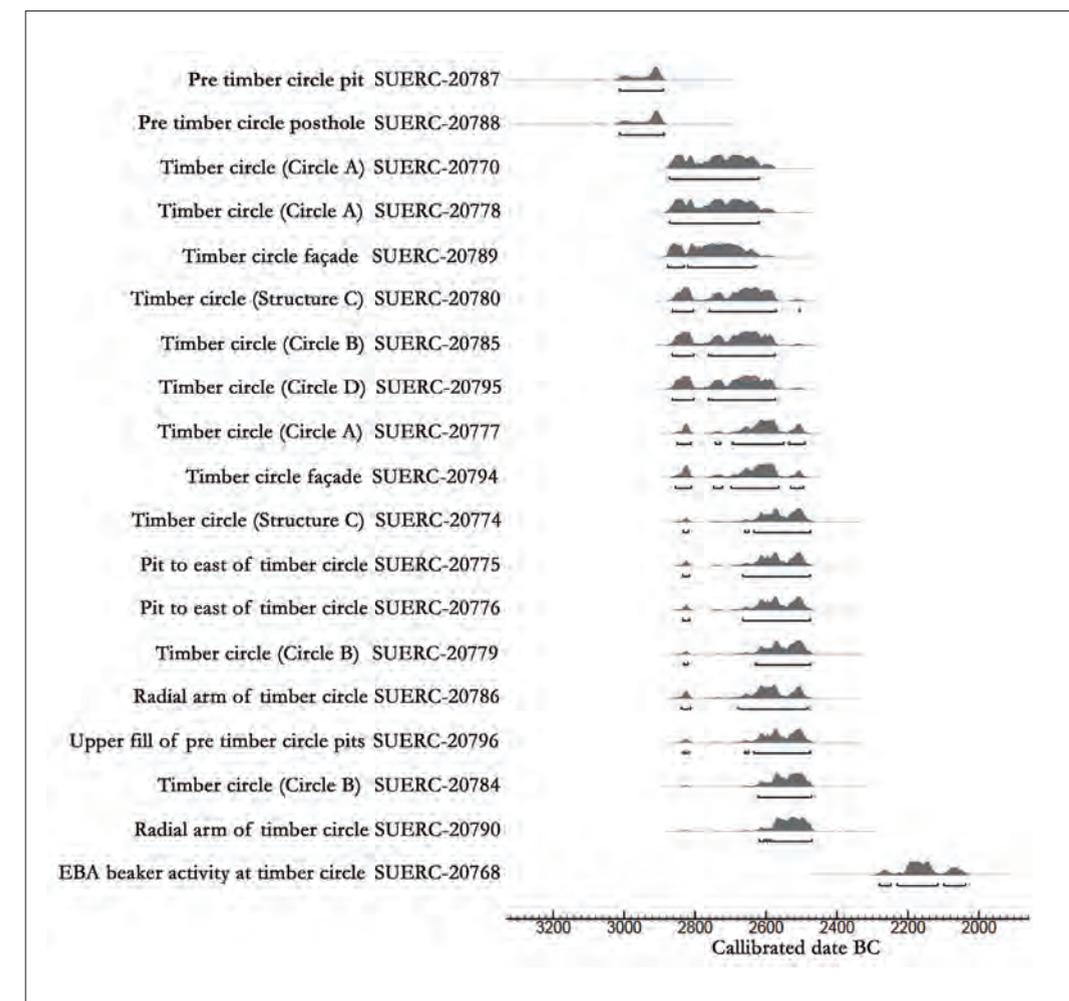
Table of radiocarbon date ranges from the timber circle at Armalughey (Site 20)

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The Bronze Age

At the end of the Neolithic period the temperature in Ireland was warmer than at present. However, throughout the Bronze Age average temperatures decreased,[1] and by the end of the Bronze Age Ireland was at least one degree colder than today.[2] Prolonged periods of increased rainfall have also been noted. These were at 2100 BC, 1500 BC, 1240 BC, and 750 BC.[3] The impact of these wet events on the Irish population is unknown, but there may be some correlation between climatic shifts and cultural transitions.

During the Bronze Age the landscape seems to have been managed or controlled to a much greater degree than in the Neolithic.[4] Extensive areas were deforested for farming, and hamlets and field systems appear in the archaeological record.[5] The importance of the individual was accentuated and some interpretations suggest that society may have become much more stratified and less egalitarian. It is during the Bronze Age that conspicuous displays of wealth appear, and bronze tools and weapons — as well as gold and other exotic jewellery such as amber and jet — are found in the archaeological record.

During the Early and Middle Bronze Age a variety of pottery styles and techniques were in use, including Food Vessels, Encrusted Urns, Irish Bowls, Collared Urns, and Cordoned Urns. These eventually were superseded in the Late Bronze Age by a variety of undecorated vases or barrel-shaped flat-bottomed undecorated pottery. Flint continued to be used in tool construction, alongside copper and then bronze. Bronze tools included socketed spearheads, axes and sickles, woodworking tools, and a plethora of sword designs ranging from long, thin rapiers with riveted handles to locally produced copies of European style swords.[6]

In general, burial in the Early Bronze Age primarily involved individual crouched inhumations, with the percentage of cremations increasing with time. By the Middle and Late Bronze Age cremation seems to have become the almost exclusive rite. Towards the end of the Bronze Age, these cremations involved just a portion of the cremated remains, and are known as token cremations. A variety of burial monuments were used, including wedge tombs, cist burials, and mounds; however, ring barrows were the primary funerary monument from the 2nd millennium BC to the early centuries AD.

Evidence for farming and foraging

While it is known that cattle, sheep, and pigs were farmed during the prehistoric period,[7] and a large number of wild species were hunted, the only animal remains which were identifiable by species on this Road Scheme were cattle molars from the Late Bronze Age site at Armalughey (Site 17).

However, there was substantial evidence for the arable economy. Barley was recovered from Golan (Site 28), Ballyward (Site 46), Armalugey (Site 18), and Lisbeg (Site 16). The samples from Golan (Site 28) also contained grains of both emmer and spelt wheat. Large quantities of wild grass seeds were mixed in with the cereal grains at Golan (Site 28) and Ballyward (Site 46). The grass seeds and wild oat may have been used to bulk out the wheat and barley flour. While requiring more effort to harvest, all grass seeds are essentially edible and highly nutritious and can be ground down to form a crude flour.[8] Redshank seeds recovered from Golan (Site 28) and water pepper from Ballyward (Site 46) may also have been ground up and added to flour,[9] but it is also possible that these were simply weeds growing within the arable ground.

Barley was one of the main cereals cultivated in prehistoric Ireland, as demonstrated at the sites of Cashlandoo, Co. Londonderry,[10] Lough Gur, Co. Limerick,[11] Tankardstown, Co. Limerick, and Curraghatoor, Co. Tipperary.[12] Wheat appears less frequently in the archaeological record; however, emmer wheat was grown in Ireland from the Neolithic, with hardier spelt wheat introduced into Ireland during the Bronze Age. Spelt wheat is likely to have had a number of uses in the past, including its incorporation into food products, such as bread, as well as in brewing and perhaps as animal fodder.[13]

Corn spurrey, identified at Golan (Site 28), provides oil rich and nutritious seeds. Large concentrations of these seeds have been found on prehistoric archaeological sites across Europe. It has been suggested that intentional cultivation of this species may have begun around 800 BC;[14] however, their prolific seed production makes it likely that they were an addition to the diet prior to this. The quantities returned from Golan (Site 28) do not suggest any form of deliberate cultivation and, as they are found as weeds among cereal crops, it is likely that they entered the seed assemblage with the grain from this site.

Nuts and berries included hazelnuts which were found on nearly all of the Bronze Age sites, blackberry from Cavankilgreen (Site 13), and raspberry from Ballyward (Site 46) and Lisbeg (Site 16). Sloe berries and elder recovered at Cavankilgreen (Site 13) could not have been eaten raw but would have been cooked and turned into nutritious flat pancakes.[15]

Bronze Age sites on the A4 Road Scheme
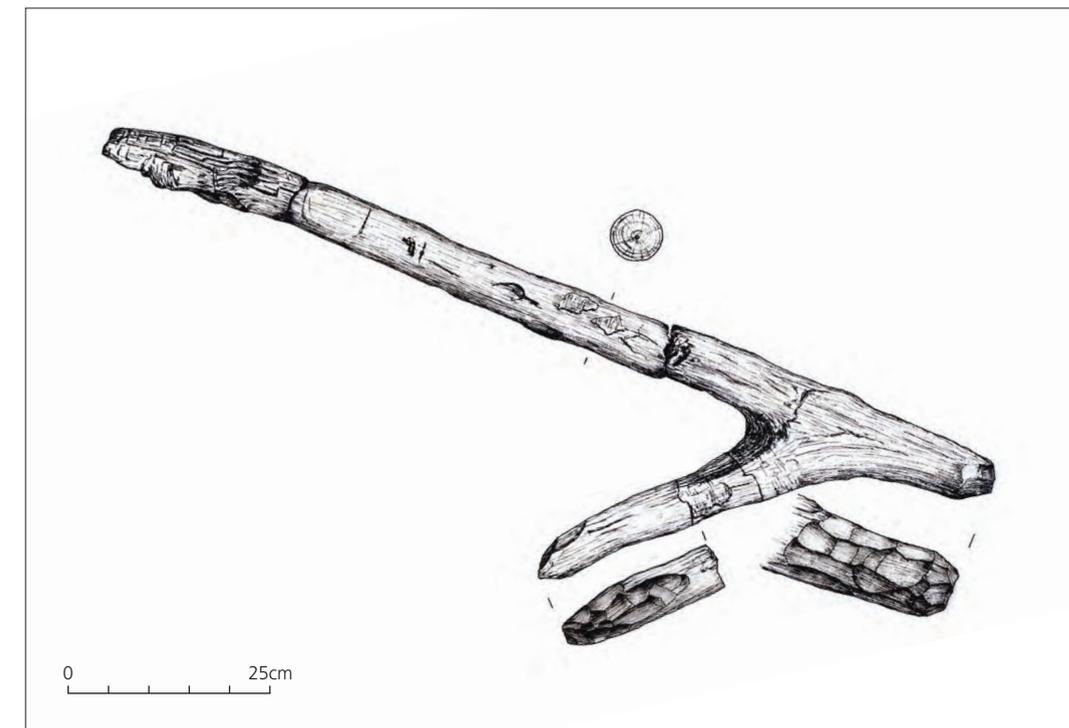
Crook-ard plough from Armalughey (Site 25) © ADS

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A small number of other species which would have grown wild around the occupation sites may also have been used as food. Sheep's sorrel[16,17] and chickweed[18,19] recovered from Golan (Site 28) could have been used as a salad, or, as with the nettle recovered from Golan (Site 28) and Cavankilgreen (Site 13), could have been cooked to form a soup.[20,21]

A very rare find of a wooden farming implement was recovered from the backfill of a Late Bronze Age burnt mound trough at Armalughey (Site 25). The artefact was a crook-ard. It would have been used for ploughing, with the worked ends hoeing into the ground. This small example was most probably used manually, though larger, more complex examples would have been dragged by cows. It was formed from a forked hazel branch, c.1.3m in length and c.0.8m in diameter, with a natural branch, c.0.8m in length, extended at an approximate 45° angle from the main body of this timber at one end. The end of this branch, and those on the main timber, were all found to be worked into points. The cut ends were in a condition suggesting that the ard had never been used, and its deposition within the trough would therefore appear to have been a ritual act.

There is little evidence for the use of the plough in Europe before the start of the Early Bronze Age.[22] While few examples have been recovered in the British Isles, a large number have been found in Scandinavian bogs. Two of these, recovered at Sejback and Hvorslev, North Jutland, Denmark,[23] were of almost identical design to that recovered here. These were dated to the Early Iron Age, which shows that the technology remained unchanged across Europe for much of the prehistoric period.

Further evidence for Bronze Age agriculture was encountered at Farriter (Site 36). In the Early Bronze Age field clearance was identified, with a large number of burnt root systems and evidence for deliberately removed tree roots found. The depressions left by the removal of the roots had been infilled and levelled with ash from the burning. The basal fill within the void left by the removal of the roots dated to 2346–2192 BC (UBA-14586).

A second phase of activity at Farriter (Site 36) was identified and charcoal from one of the postholes dated to the Middle Bronze Age (1693–1535 BC: UBA-14589). During this phase a rectangular post-built structure, measuring 8.4m by 4.8m, consisting of 34 posts set in four parallel rows was erected. This structure was located on relatively flat ground not far below the crest of a ridge. The precise form and function of this structure remains unknown. The postholes were all of a similar depth, and it is unclear if any supported a roof. Similar structures have been found on Iron Age sites in north-west Europe where they have been interpreted as the remains of covered platforms or granaries where grain, hay, or other produce could have been stored.[24] It is possible that the structure at Farriter (Site 36) had a similar function, with the postholes supporting a raised wooden floor.

Storing grain on a raised platform would have reduced the likelihood of it becoming damp, or eaten by rodents. Such raised platform granaries are known in the Irish archaeological record and

continued in use until fairly recently.[25] While no direct parallel for such a large granary structure can be found, similar, smaller, Bronze Age rectangular granaries have been uncovered at many sites, including Stamullin, Co. Meath[26] and at Camlin, Co. Tipperary.[27] At Camlin a second structure was identified c.30m from the granary, and both structures were located just outside of an enclosed contemporary settlement.[28]

A second structure at Farriter (Site 36) was located in this area which, while undated, could have been related to the granary, and may have formed part of some sort of small stock enclosure or shelter. It is likely a contemporary settlement was located in the area, although no evidence was identified within the Road Scheme.
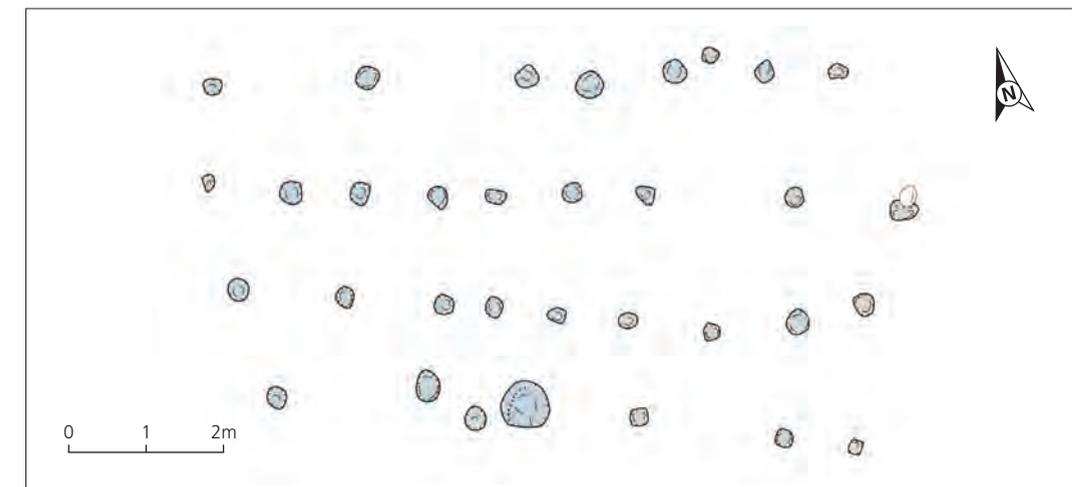
Plan of possible granary at Farriter (Site 36) © ADS

Photograph of possible granary at Farriter (Site 36) © ADS

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Settlement

Early Bronze Age

The first part of the Early Bronze Age is known as the Beaker period, after a fine, European-wide pottery style which reached Ireland around 4,500 years ago.[29] Beakers were often associated with a package comprising barbed and tanged arrowheads, stone bracers to protect the wrist from the bite of the bow string, small copper knives, and simple Bronze weapons, such as flat axes, and gold jewellery.[30] Although no Beaker period houses were found, Beaker pottery was recovered from Tullyvar (Site 12), Armalughey (Site 22), and Annaghilla (Site 3).

Around 2160 BC there was a transition from Beaker to Food Vessel type pottery. It is known in two forms: Bowl and Vase, both of which appear to have developed from the earlier Beaker vessels. Bowls can be dated between c.2160–1920 BC, and Vases slightly later at c.2000–1740 BC. From 2000 BC burials began to be placed in Urns. These were generally slightly larger than Food Vessel types and took four forms: Encrusted Urns (c.2000–1740 BC), Vase Urns (c.2000–1740 BC), Collared Urns (c.1850–1700 BC), and Cordoned Urns (c.1730–1500 BC).[31] The earliest of these pottery types would appear to have been only for burial practices; the latter two types have also been found with occupation material. It should also be noted that there is a distinct concentration of Cordoned Urns in the north of Ireland, particularly in Counties Antrim, Londonderry, Down, Louth, and Tyrone.[32] Miniature vessels are also known from the Early–Middle Bronze Age (c.1900–1500 BC). These are very small pots which are distinguished primarily by their diminutive size, most being less than 5cm in height.[33] They have been found in both domestic and funerary contexts and in a wide range of styles and shapes.

The majority of the Early Bronze Age evidence along the Road Scheme came from either burnt mounds; Annaghilla (Site 3), Lisbeg (Site 6), Tullyvar (Site 12), Lisbeg (Site 16), Armalughey (Site 25), Mullaghbane (Site 29), Inishmagh (Site 30), Mulnahunch (Site 38) and Drumnafern (Site 48) (see end of chapter for full discussion on burnt mounds), or funerary features, the ring barrow at Tullyallen (Site 40) and an isolated cremation in an urn at Armalughey (Site 18) (see below).

Evidence for Early Bronze Age settlement activity was limited; being present on only two sites and taking the form of several pits and postholes where no specific structure could be defined.

The first of these sites was Armalughey (Site 22) where several pits and postholes were located. Decorated Early Bronze Age pottery, a sherd of probable Beaker pottery and a convex scraper were recovered. The pit which contained the beaker pottery sherd was dated to 2465–2203 BC (UBA-14520). At Tullyvar (Site 10) a series of overlapping gullies, postholes, and stakeholes produced dates ranging from the Early Bronze Age (1976–1875 BC, UBA-14473) to the Middle Bronze Age (1434–1283 BC; UBA-14472, UBA-14476) and Iron Age (401–233 BC; UBA-14474). It was not possible to

Cordoned Urn recovered from Ballygawley townland, Co. Tyrone (BELUM.A246.1928 © NMNI Collection Ulster museum)

identify which of the undated features related to which phase of occupation at this site and no clear structures could be interpreted from the myriad of features.

A small wattle constructed shelter or windbreak, c.4m in diameter, was recorded at Mullaghbane (Site 29). It was dated to 1879–1692 BC (UBA-14580). Sherds from a Cordoned Urn (c.1750–1500 BC) were recovered from a depression within the shelter and would indicate that occupation during the latter part of the radiocarbon date range is more likely. The final site containing Early Bronze Age occupation evidence was at Inishmagh (Site 30), where an isolated hearth was dated to 2351–2204 BC (UBA-14537).

Middle and Late Bronze Age

Where the Early Bronze Age is principally defined by its pottery, the Middle Bronze Age is assessed by its change in metalwork with simple flat axes, plain daggers, and spearheads developing into flanged axes/palstaves, dirks/rapiers, and looped spearheads.[34] Pottery vessels developed from the more ornate Cordoned Urn style of the Early Bronze Age, to simple, flat-based, bucket-type vessels; with little difference between those found in funerary and domestic contexts. This development continued through to the end of the Bronze Age, with pottery becoming less decorated and less well made.

Around 1200 BC a new industrial and technological stage of the Bronze Age emerged, with some of the finest metalwork in Europe being created in Ireland. One of the principal factors in this shift in metalworking was the replacement of the stone moulds of the earlier Bronze Age with composite, clay moulds.[35] These clay moulds allowed a greater delicacy of metalwork, thereby facilitating the manufacture of highly ornate bronze and gold artefacts. While there is speculation regarding the potential ceremonial nature of the often lightweight daggers and rapiers of the earlier Bronze Age, the Late Bronze Age sees the development of swords, shields with metal bosses, and other forms of weaponry which were certainly utilised in battle.[36] From the 10th century onwards, European influences can be identified with some artefacts, such as bronze pendants and swords, showing a continuity in style across much of Western Europe. There is increased evidence for European trade links with objects of potential Irish origin being found in northern Spain and France as well as Britain, and beads made from Scandinavian amber have also been recovered in Irish contexts.[37] These connections were most likely in the form of trade and exchange between neighbouring coastal villages, rather than a direct long distance link between Ireland and the villages along the northern edges of Europe.

While many of the Bronze Age houses hitherto found in Ireland were isolated, development-led excavations since the 2000's have identified increasing numbers of house clusters which contain two or more dwellings.[38] These clusters are often associated with external features such as animal enclosures, large pits and fences, as was found at Lisbeg (Site 15). There are also a number of sites where prolonged occupation over a period of time is noted, as at Lough Gur for example.[39] In some cases, it is not clear if this represents generational occupation by a single family or tribal unit, and on other sites this appears to represent re-use of a suitable location by completely different sets of people with potentially decades or centuries of abandonment in between.
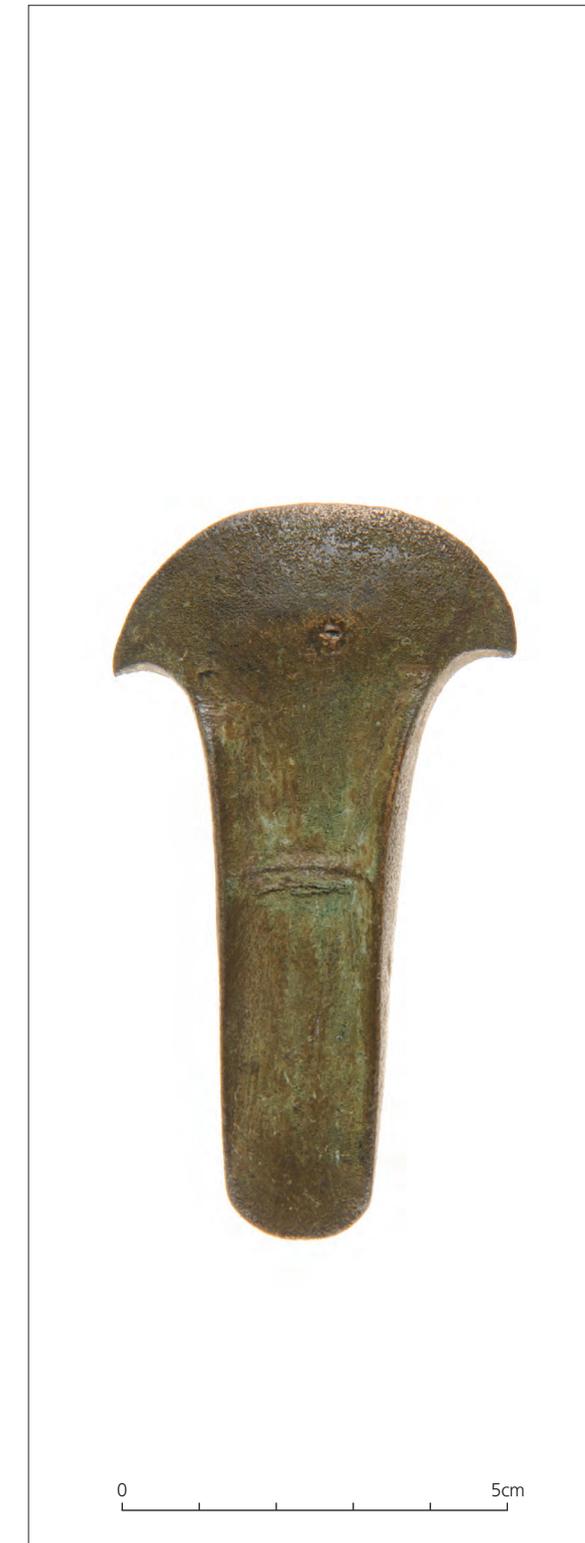
Left: Late Bronze Age sword from Donaghmore, Co. Tyrone (ARMCM.24.1942 © NMNI Collection Armagh museum)

Right: Middle Bronze Age flanged axe from Dungannon, Co. Tyrone (BELUM.A175.B.1913 © NMNI Collection Ulster museum)

Middle Bronze Age occupation - Focus on Golan (Site 28) and Cravenny Scotch (Site 23)

The principal Middle Bronze Age occupation evidence recorded on the Road Scheme comprised a post- and stake-built roundhouse at Golan (Site 28) and a similarly constructed, though unenclosed, roundhouse at Cravenny Scotch (Site 23).

The Middle Bronze Age settlement at Golan (Site 28) was located on a gentle slope, just off the top of a small ridge. It comprised a small enclosure, defined by an outer palisade, which encircled a double walled roundhouse. The site was occupied around the middle of the 2nd millennium BC. The palisade enclosed an area 23m long and 15m wide. The slot-trench for the palisade was 0.3–0.5m wide and 0.2–05m deep with a single 0.4m wide entrance at the southeast. This would have been very narrow, making access for animals into the site difficult. The southern side of the palisade slot was widened at some point after the palisade had been constructed. This widening took the form of a pit 2.8m long, 1.2m wide and 0.7m deep which had almost vertical faces. The purpose of this widening may have been to create a new, larger, entrance. The pit could then have acted as something akin to a modern day 'cattle grid', keeping animals either within or outside the enclosure as was required. The remainder of the time the gap was narrow enough to have been covered with split planks to allow both animals and people to cross.

Although it was not possible to determine the materials used to construct the palisade, the depth and width of the slot would suggest that split timbers were more likely to have been used rather than wattle. A small number of undiagnostic worked flint artefacts and sherds of plain Bronze Age pottery were recovered. Charcoal from the slot was dated to 1624–1497 BC (UBA-14581) while the widened entrance was dated to 1632–1505 BC (UBA-14580).

The roundhouse was in the northern half of the enclosure, lying approximately 2m to 2.5m from the palisade at this end and leaving a large open area to the south. The roundhouse was 11m long and 9.5m wide, with a 2.5m wide entrance gap at the south. The entrance was defined by a gap in the wall slots, which all turned slightly inwards at this point. A large posthole within the inner wall slot at the eastern side of the door, and a smaller posthole at the west side of the door are likely to have supported a door lintel. The western side of the structure was severely truncated, most likely by ploughing which would had levelled the top of the slope the settlement was built upon.

The roundhouse was a double walled construction consisting of five surviving segments of earth cut slots, most likely sections of what where originally two concentric slots, with a gap of approximately 0.3m between the inner and outer wall. These were not deep and would have acted as foundation trenches for wattle walling, the gap between the two walls would have been filled with insulating material, such as moss, or packed earth, to form a stable, secure wall, strong enough to help support

Enclosed roundhouse settlement at Golan (Site 28) © ADS

the roof. The outer and inner faces of this wall would have been lined with daub, which would have also helped to insulate, and protect the timber elements from the weather. Charcoal from the fills of the walls slots was dated to 1562–1405 BC (UBA-14578, UBA-14579).

Within the structure there was a curving setting of five postholes, this ring of posts would originally have supported the roof. Six large lozenge-shaped pits lay along the inner edge of the interior wall. They contained unidentified animal burnt bone fragments, pot sherds, and flint and may have been used for storage. The pits were dated to 1777–1434 BC (UBA-14575, UBA-14576). There was also a total of 80 stakeholes found within the interior of the roundhouse, mostly concentrated to the east. A setting of 51 stakeholes, within an area measuring 5m north to south by 0.7m wide, formed a rough arc to the east, running parallel to the outer wall. These may have formed internal divisions or screens, although the high number would suggest that these may have been replaced several times. The same is probably true for the other internal stakeholes, most of which may have functioned as part of an internal system of divisions, which separated the roundhouse into different compartments. Lines of stakeholes to the east and south of the roundhouse indicate that there were fences within and outside the enclosure. One of the stakeholes in the fence which lay between the house and the enclosure at the northeast was dated to 1429–1301 BC (UBA-14577). This date range is at the end of the sequence of dates obtained from the main structure and may indicate that this fence is from a slightly later phase of activity.

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Bronze Age enclosure at Golan (Site 28) © ADS

Internal ring beam support

House Entrance

Enclosing palisade

Entrance

Widened palisade slot

0 — 5m

Outer palisade slot at Golan (Site 28) © ADS
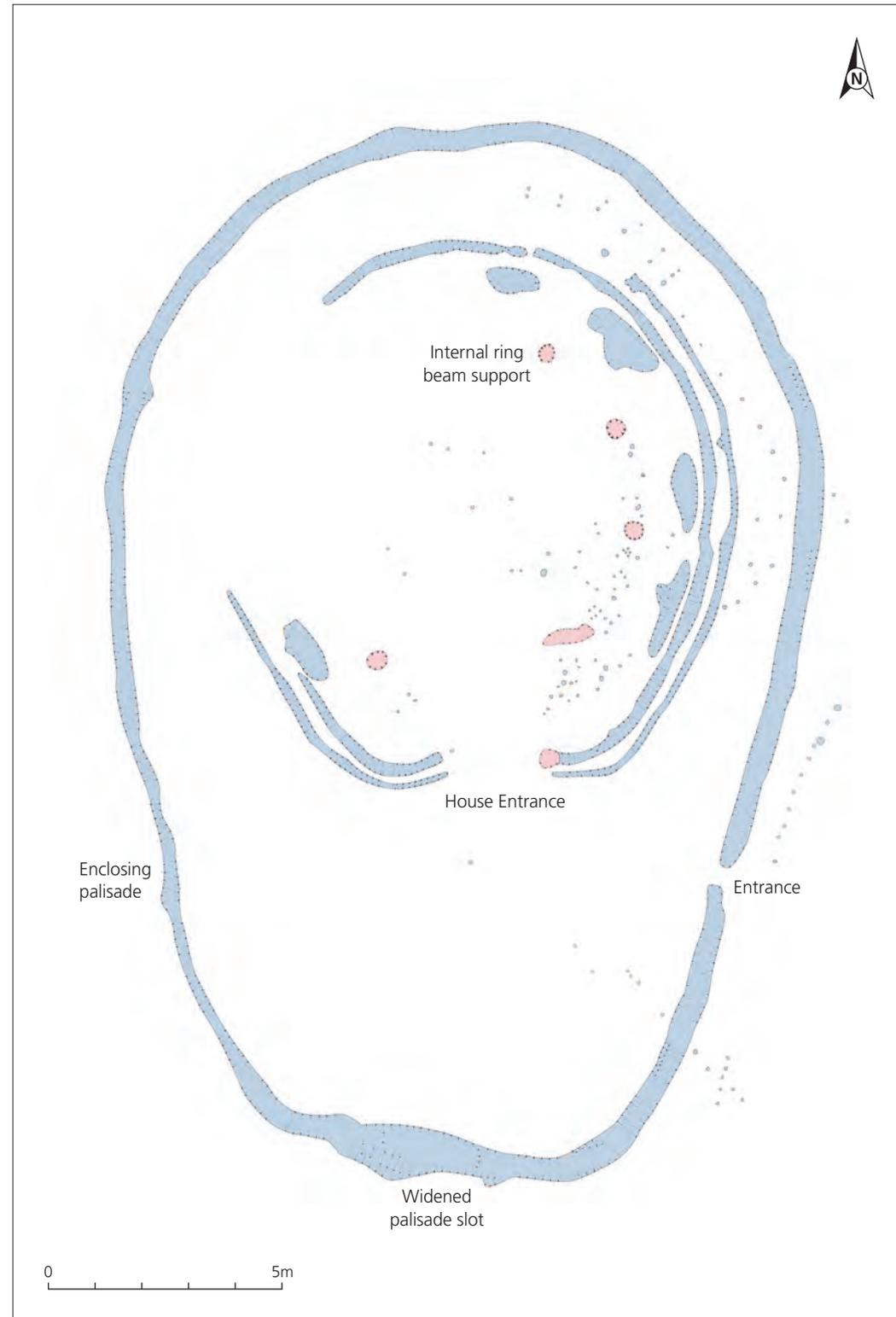
Overall the radiocarbon dates indicated that the settlement was occupied between 1777–1301 BC; however, the presence of small quantities of Cordoned Urn pottery (c.1750–1500 BC) suggests that the settlement's main phase of occupation may have been at the earlier end of this date range. Cordoned Urn has been found at other contemporarily dated domestic sites, such as Knockhouse, Co. Waterford.[40] The flint tools recovered were for the most part crude scrapers and flakes, which were not diagnostically dateable, but were consistent with a domestic function for this occupation site. While it was not possible to identify the species of the animal remains recovered the nature of the enclosure indicates probable animal husbandry taking place at this site. Evidence for cereal production came from hulled barley and wheat recovered from one of the postholes, and naked barley from one of the pits.

Enclosed Bronze Age settlements begin to appear in Ireland after 1750 BC, and could have been a statement of status by the inhabitants.[41] A similar double walled roundhouse, within a palisaded enclosure was uncovered at Raffin, Co Meath;[42,43] while enclosed settlements with multiple structures have been found at Killoran 8, Co. Tipperary,[44] Curraghatoor, Co. Tipperary[45] and Ballybrowney, Co. Cork,[46] where three enclosures were uncovered, at least one of which contained the remains of a circular house.

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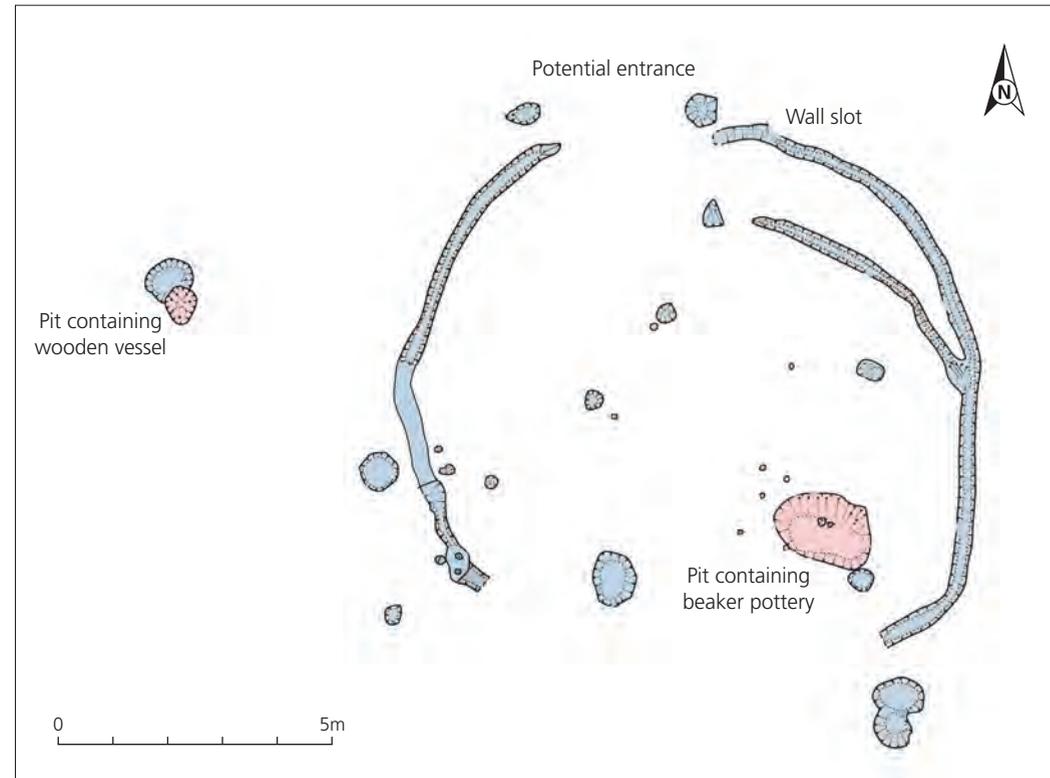
A similarly constructed, c.10m diameter roundhouse was excavated at Cravenny Scotch (Site 23). The house was constructed in an area which previously had at least two periods of occupation. Two Neolithic plano-convex knives were recovered from the wall slot of the house, and a pit into which postholes of the house had been inserted, contained Beaker pottery (2450–1900 BC).[47] These factors help to explain the disparity in radiocarbon dates obtained for the house with the wall slot dated to 1741–1618 BC (UBA-14515), and a posthole and pit within the house dated to 1454–1260 BC (UBA-14514, UBA-14516). It is probable that residual material mixed with the residues dated from the wall slot, thus providing an earlier date and that the later date is more likely to be the true date for this house.

The house was defined by a vertical-sided wall slot 0.24m wide and 0.11m deep. The wall slot was incomplete with gaps to the south and north. The gap to the north would appear to have been the entrance, with postholes either side of this gap marking a doorway. Modern disturbance at the southern edge of the house structure accounted for the gap on this side. The walls of the house may have been constructed with either split timbers or wattle. A second short stretch of wall slot ran towards the entrance from the east side of the main wall slot. This slot may have marked a sub-division within the house, possibly a separate space for animals to be stabled. A similar interpretation has been suggested for the roundhouse at High Knowes in Northumberland[48,49] and at Skilbanagan.[50]

The structure of the roof support was unclear as, while there were seven postholes within the interior of the house, these were placed irregularly and varied in size from 0.3m diameter by 0.25m deep to 0.8m diameter by 0.55m deep. There was no direct evidence for a hearth; however, burnt (unidentifiable), animal bone fragments and charcoal found throughout the interior suggests that cooking had taken place within the house.

Several pits were located to the west and south of the house, one of which contained the charred remains of a wooden vessel. The vessel was made out of alder and appeared to have been burnt in-situ. The vessel may have been a small bucket but due to the poor state of preservation it was not possible to provide further identification.

Other Middle Bronze Age occupation

Other Middle Bronze Age houses recorded along the Road Scheme include post- and pit-constructed roundhouses at Armalughey (Site 18) and Lisbeg (Site 15), a rectangular post-built house at Cullenfad (Site 45) and small huts, or windbreaks, at Tullyvar (Site 9), Lisbeg (Site 16), and Tullyallen (Site 43).

An occupation site enclosed within a small palisade was recorded at Lisbeg (Site 15). Only a small portion of the entire complex could be excavated as it continued beyond the limits of the Road Scheme to the north, while at the south the construction of a pre-existing farm access lane had removed any further traces of the archaeological deposits
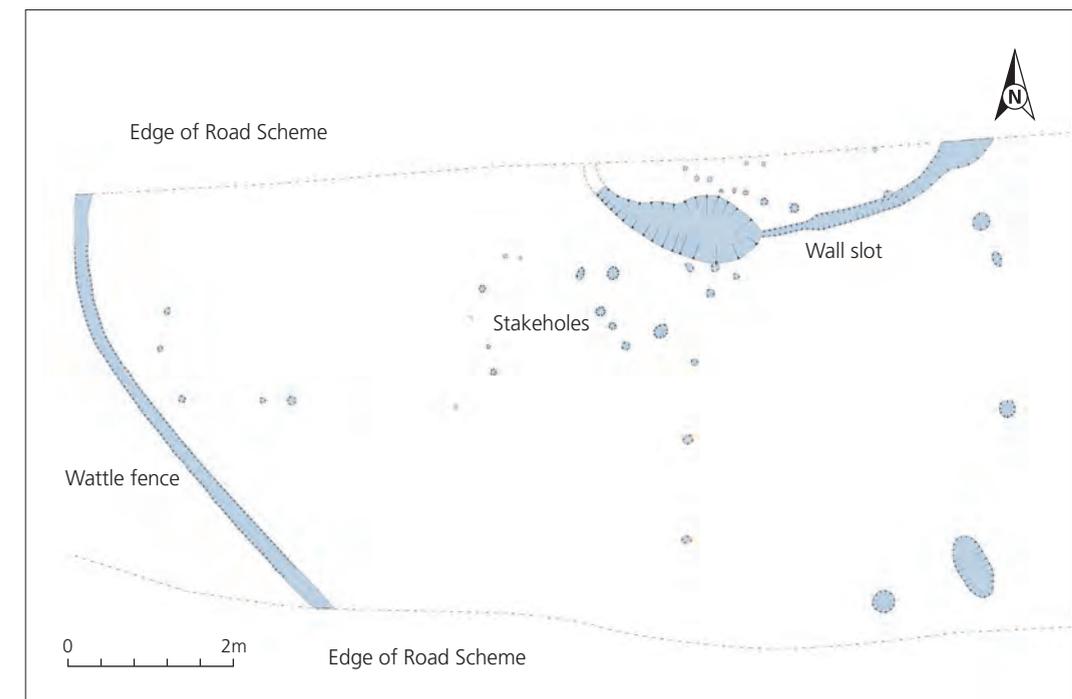
House at Armalughey (Site 18), medieval ditch to the rear of the photo © Headland

The outer edge of a house at Armalughey (Site 18) was formed by a curvilinear gully which was surrounded by a line of 15 postholes. The full extent of the structure was not excavated as it extended beyond the limit of the road take to the north. Although only partially excavated, it was possible to estimate an internal width for the house of c.5m. A medieval ditch had removed evidence for much of the east side of the structure.

The steep-sided profile of the gully, along with the presence of probable packing stones at its eastern terminal, suggests that it held a fence or wall. The gully appeared to continue on the northeast side of the house, with a south-eastern gap representing the entrance. A series of very shallow postholes mirrored the line of the gully to its exterior. While the postholes cannot be linked to the gully stratigraphically, the extent to which they replicate its line makes it more than likely they are all elements of the same structure. Charcoal from the gully of the structure was dated to 1633–1501 BC (SUERC-20766). The only artefact recovered from the structure was a fragment of possible Grooved Ware pottery. The hearth in the centre of the house was dated to the early medieval period (SUERC-20765) and, although appearing to be within the house, probably formed part of the early medieval occupation of the site.

The palisade slot was located in the west of the excavated area. It was 0.18m wide and 0.12m deep. Fragments of wattle recovered from the base of this slot indicated that it held a fence. A curving ditch on the north edge of the excavated area was probably the wall slot for a small house. While no wood was recovered from this feature it is likely that, as with the fence, its walls were constructed using

wattle. The stakeholes present within the area defined by this curving slot may have held internal wall supports, the function of the postholes and stakeholes outside of this house was unclear. While it is not possible to define the full extent of the fence, extrapolating the curve of the house slot would indicate that it was likely to have been c.6m in diameter. The house structure was dated to 1688–1450 BC (UBA-14485, UBA-14486, UBA-14487, UBA-14488), while a posthole south of the house structure was dated to 1634–1499 BC (UBA-14484). A sherd of Cordoned Urn (c.1730–1500 BC) was recovered from deposits within the house; no flint was recovered.
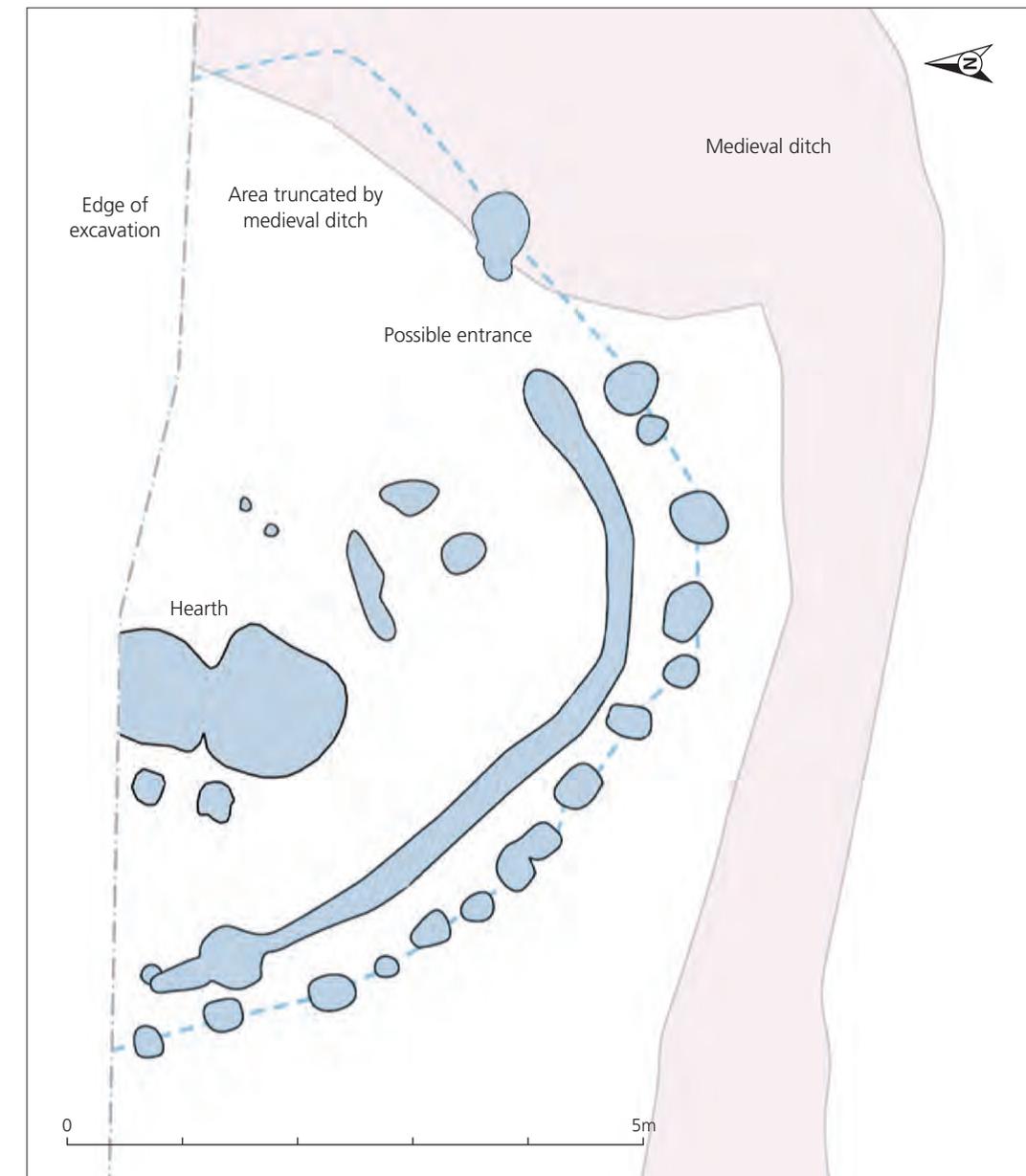
Plan of house at Armalughey (Site 18) © Headland

At Cullenfad (Site 45) two distinct clusters of stakeholes and postholes were identified. One of the clusters included paired postholes and may represent the remains of a structure, the precise layout of which is unclear. The second cluster may represent a working area. Middle–Late Bronze Age pottery sherds were recovered from this area, but no radiocarbon dates were obtained. This site also contained evidence for funerary and burnt mound activity, which could have been broadly contemporary.

The remaining Middle Bronze Age occupation evidence was limited to a 1m-diameter pit and several stakeholes at Lisbeg (Site 7) (1517–1306 BC: UBA-14479, UBA-14480); two isolated pits at Tullyvar (Site 9) (1395–1226 BC:UBA-14477); a curving ditch at Lisbeg (Site 16) (1393–1192 BC: UBA-14489, UBA-14490); three small pits at Tullyallen (Site 41) (1391–1218 BC: UBA-14449); and four stakeholes and a posthole at Tullyallen (Site 43) (1666–1527 BC: UBA-14451).

Plan of house and working area at Cullenfad (Site 45) © Headland

Key:
Postholes
Stakeholes

Working area

House structure

0   5m
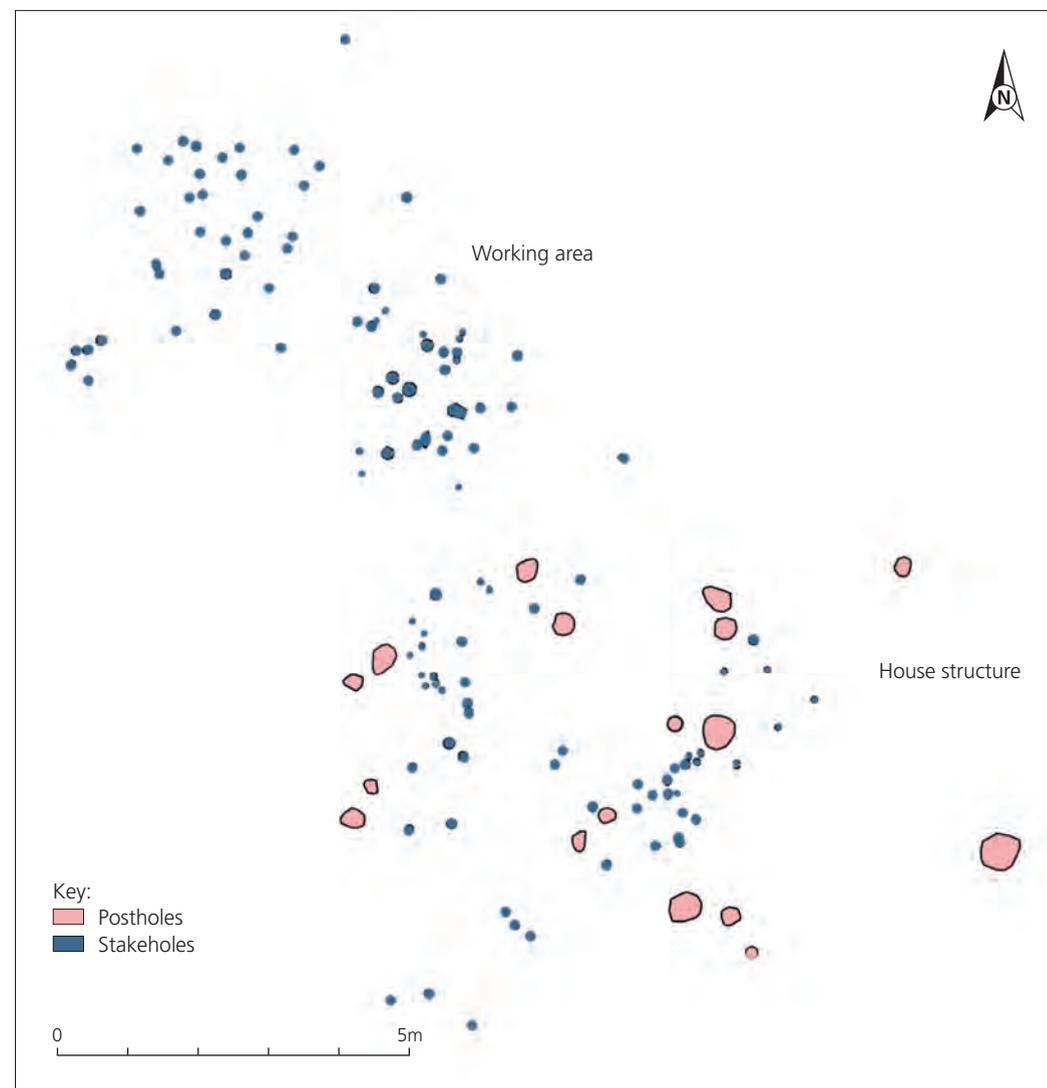
Late Bronze Age occupation - Focus on Golan (Site 28) and Aghnahoe (Site 32)

Two substantial stake- and post-built roundhouses were recorded at Golan (Site 28) and Aghnahoe (Site 32); two less well-preserved examples were also recorded at Armalughey (Site 17) and Annaghilla (Site 4). Armalughey (Site 19), Ballyward (Site 46), and Armalughey (Site 18) provided evidence for small campsites.

The Late Bronze Age roundhouse at Golan (Site 28) lay on the same ridge as the enclosed Middle Bronze Age house discussed above. The house was occupied at the end of the 2nd millennium BC and several phases of construction/re-building were recorded. The house had a series of internal pits, postholes, and a large number of stakeholes. While these internal features most likely represent internal divisions and roof supports, some could date to earlier phases of activity at this location as Early Bronze Age pottery sherds were encountered in several of the later dated features. A posthole on the western side of the roundhouse, which clearly formed part of the Late Bronze Age phase of construction, returned an Early Bronze Age date (1971–1771 BC; UBA-14570)from its fill. However, this date must be from residual deposits of charcoal originating from the same occupation phase as the pottery.

Plan of Late Bronze Age roundhouse at Golan (Site 28) © ADS

Modern ditch

Edge of excavation

Modern ditch

Hearth

0   5m
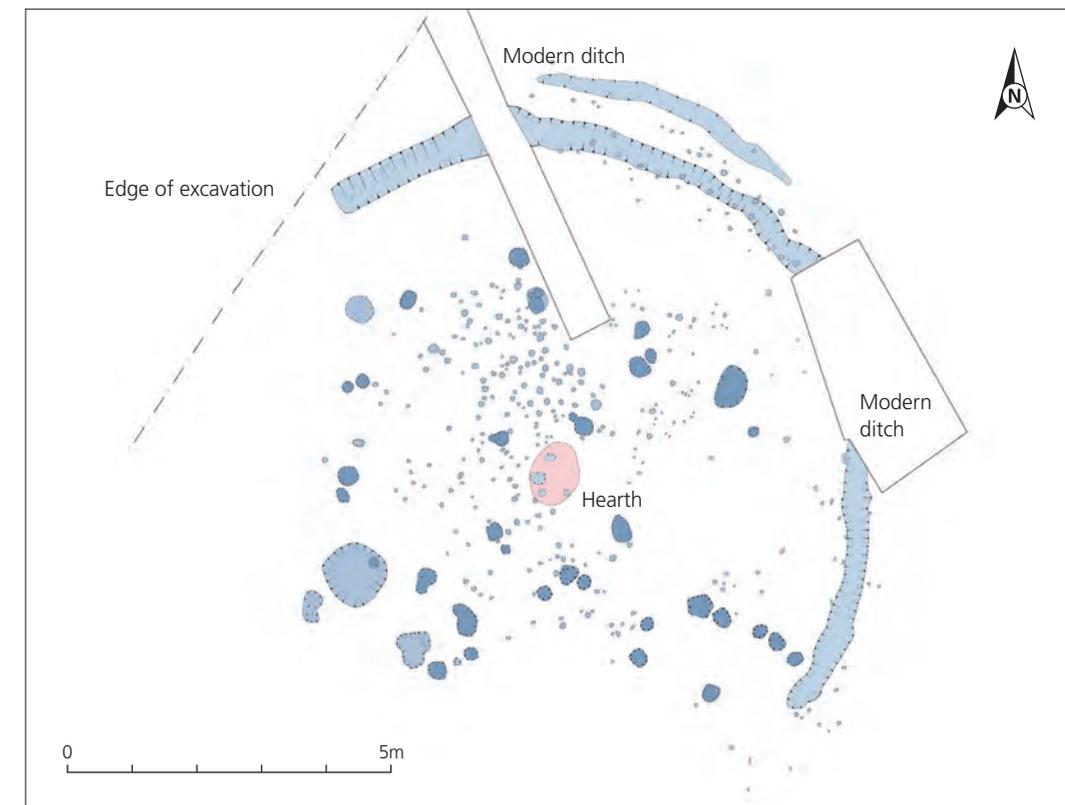
House site at Golan (Site 28) with road being constructed to back of photo © ADS

The north and east side of the structure was defined by a curving wall slot; no traces of the slot were found to the south and west, where later agricultural activity had truncated the area. To the east and north modern ditches cut through the edges of the roundhouse. The wall slot, if it originally formed a complete circuit, would have enclosed an area measuring c.10 m in diameter. The presence of a large number of stakeholes along the gully indicates that the outer wall was of wattle and daub construction, as wattle requires vertical stakes as support. At the northeast of the house there was evidence of repair/rebuild of the outer wall, as at least three different stakehole lines suggest attempts were made to reinforce or replace the wall at this point. At the northwest side of the house there was evidence for a re-cut to the wall slot. This need for repair demonstrates that the structure was in use for an extended period. The wall slot was dated to 1119–1004 BC (UBA-14563).

Due to truncation it was not possible to define the location of the entrance. However, a line of four postholes which ran towards the wall slot from the inside of the house at the southeast may mark the entrance. These posts were dated to 1447–926 BC (UBA-14564, UBA-14566, UBA-14568, and UBA-14569). Entrances in the southeast would be normal for this period[51] as this side faces the sun for most of the day. Traces of a drip gully imply that the structure had a pitched roof, with water run-off from this roof creating the outer gully. The roof was most likely thatched with reeds or straw.

Within the area defined by the slot there was a large number of features, including five pits, 39 postholes, and 178 stakeholes. A ring of postholes c.6m diameter were located around a central

hearth. One of these postholes was dated to 1004–903 BC (UBA-14567). Seven postholes lay directly around the hearth, in a setting measuring c.2m in diameter. Some of these postholes may have been replacements; one was dated to 1011–915 BC (UBA-14574). The hearth itself was 1m long and 0.8m wide.

The two rings of postholes would have held roof supports. The numerous internal stakeholes did not have any clear alignments although this is more likely a result of their large number, extent, and general concentration making it impossible to define any alignments with clarity. Most of these stakeholes would have acted as internal divisions, probably supporting wattle screening, which would have segregated the structure into various sections, possibly for sleeping, working, cooking, etc. The vast majority of the stakeholes were located within the area of the central post setting, suggesting that the area between the central posts and wall slot was left clear, possibly for storage or sleeping. These internal walls were made of wattle as excavations revealed linear impressions of the wattle on the ground surface where one of these screens must have collapsed. The pits found within the roundhouse were most likely used for storage, they dated to 1304–916 BC (UBA-14565, UBA-14572, UBA-14573), and one of the stakeholes dated to 1051–916 BC (UBA-14571).

Radiocarbon dating suggests that the structure was built and occupied between the 14th and 10th centuries BC. During its occupation there were various alterations and re-building of partial elements within the structure. The sheer mass of internal features, especially stakeholes, and the intercutting nature of a number of the features indicates that there are several different phases to the structure; though it is likely the structure was occupied continuously for its entire lifetime. This would explain the apparent repairs to the outer wall, the intercutting features, and heavy concentration of stakeholes, all reflecting alterations to the structure overtime. Some of these alterations may have been necessary as certain elements slowly rotted, while other may have been deliberate, perhaps representing slight changes to the internal layout or changes in the function of certain internal areas.

The inhabitants of the roundhouse would have been farmers and while no evidence for animal husbandry was encountered evidence for farming, in the form of wheat and barley grains, was uncovered during the excavation. As no diagnostic sherds of pottery or flint artefacts were recovered it is not possible to refine the occupation period of this house more closely than the date range 1447–903 BC provided by radiocarbon dating. However, even with repair, a wattle and daub constructed house was unlikely to have survived for more than a few generations, giving an occupation period of a forty or fifty years at best.

Though relatively large, the roundhouse falls within the limits for such sites.[52] Bronze Age roundhouses with outer wall slots and internal roof supports and features, have been excavated across Ireland, including two at Townparks, Antrim Town, Co. Antrim,[53] two at Ballynamona, Co. Cork,[54] Boyerstown, Co. Meath,[55] Coolfin, Co Meath,[56] and at least four along the route of the gas pipeline

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to the west, one each in Counties Dublin, Limerick, Meath, and Westmeath.[57] The presence of these structures, found right across Ireland, express the widespread and extensive nature of settlement at this time, which is reflected on a smaller scale by the excavations on the Road Scheme.

A very similar roundhouse to that excavated at Golan (Site 28) was excavated at Aghnahoe (Site 32). The house here was defined by a c.9m-diameter outer wall, consisting of a double arc of stakes, and an inner post-ring with a c.5m diameter. Within the interior were stake built divisions and a central hearth. Immediately north of the roundhouse was a smaller structure, which may have been used for smoking meat, or drying grain. The structures were contemporary and dated to the end of the second millennium BC.

Outer wall of house

Possible entrance position

External structure

Hearth

Hearth

Inner roof supports

0   5m
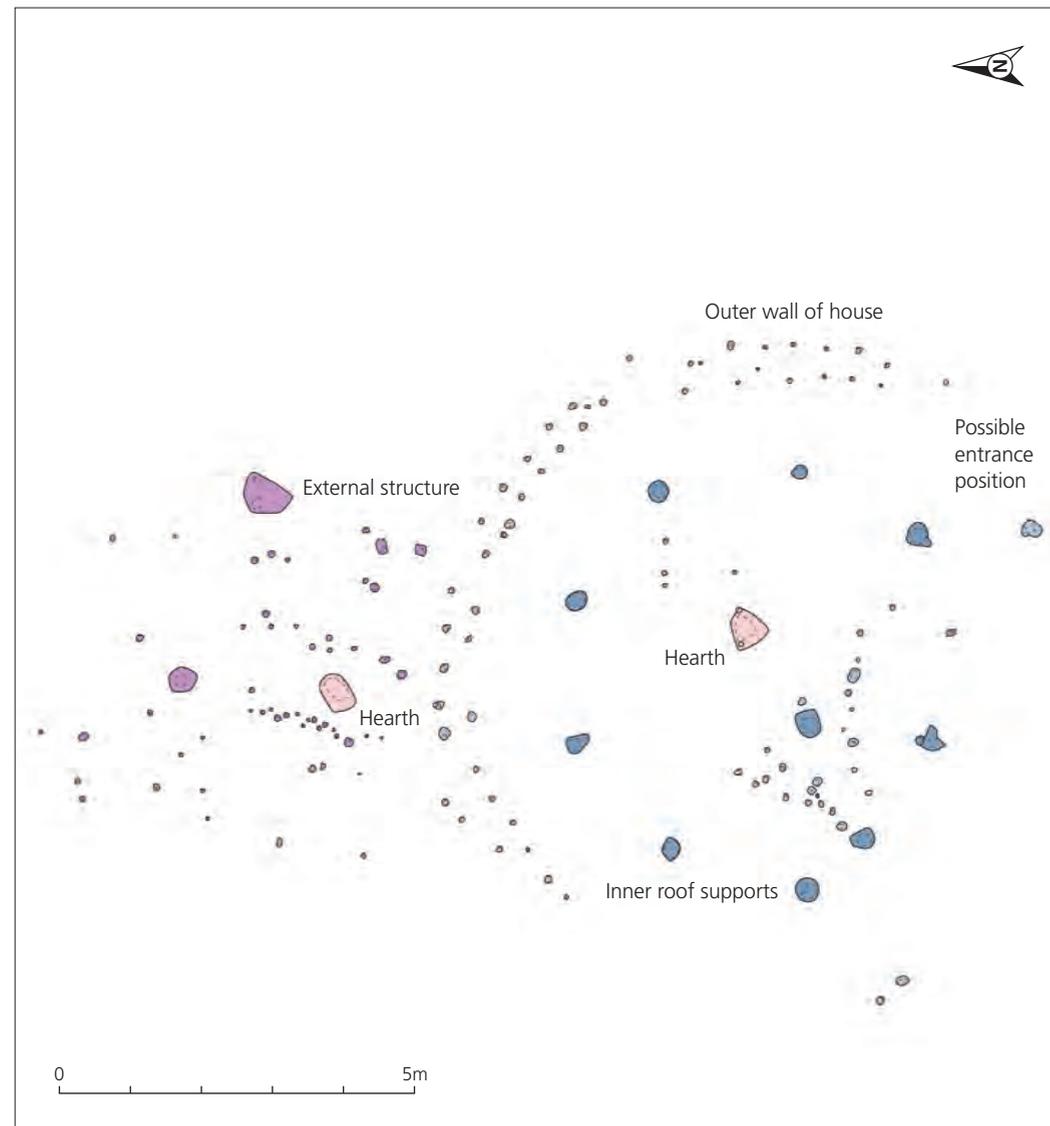
The outer wall of the roundhouse was formed by a double arc of 49 stakeholes, with substantial root growth in the southern half of the structure destroying any stakeholes in this area. It is likely that the outer double arc of stakeholes originally formed a continuous circuit. A large posthole at the southeast of the expected circumference may have marked the entrance position.

This setting of stakes would have encircled an area with an internal diameter of c.9m. The outer wall probably consisted of two individual sections of wattle and daub, each represented by one of the curving arcs. Between this wattle and daub there was a 0.3m-wide cavity, which could have been filled with packed earth or some form of insulating material. The resulting wall was probably fairly low in height, perhaps around a metre high, and probably provided a degree of support to the roof.

A circular setting of postholes surrounding a hearth in the centre of the roundhouse was set at a diameter of c.5m. These are likely to have supported a ring-beam, which would have in turn supported a conical, pitched roof, alleviating weight from the outer wall. Two stakeholes, which were located near to the eastern and western edges of the hearth, may be contemporary with the hearth and could have been supports used in cooking. Evidence for the use of the hearth for cooking comes from the presence of burnt, though unidentifiable, animal bone and abundant grains of barley and wheat. The hearth was dated to 1439–1261 BC (UBA-14545, UBA-14546). Two arcs of stakeholes to the southwest of the hearth would have partitioned the interior of the roundhouse. The absence of many stakeholes in the northeast of the interior suggests that this side was open.

Immediately to the north of the roundhouse was a second smaller sub-rectangular structure. The structure was c.5m square and defined by a single line of stakeholes. Within the interior of this structure were two parallel lines of stakeholes, which ran either side of a hearth. These may have held stakes supporting smoking racks for meat, or grain drying racks. The relative lack of oxidation below and around the hearth indicates a low temperature of burning within it, consistent with the requirements of both smoking and drying racks. The presence of grains of charred barley within the fill of the hearth may indicate that cereal drying was at least one of the functions of this structure. The outer stakes of this structure would not have been sufficient to support a substantial roof and as there was no evidence for internal roof supports it must be assumed that this structure was only lightly roofed, if at all. A pit within this structure was dated to 1425–1121 BC (UBA-14543, UBA-14544).

Other Late Bronze Age occupation

Two less well preserved roundhouses were excavated at Armalughey (Site 17) and Annaghilla (Site 4). The roundhouse at Armalughey (Site 17) was 9m in diameter and had been constructed over an earlier ditch and wall slot. These were not radiocarbon dated; however, as the house's foundation had been dug through the backfills of the ditch and the earlier wall slot it was clear that they pre-dated the Late Bronze Age house construction. While the function of the ditch was not clear, the earlier wall slot was likely to represent an earlier house at this location. It is therefore probable that some of the internal features may actually belong to the earlier house and not to the later one.

The Late Bronze Age house was defined by a wall slot around its northeast side, the southwest side had been truncated by later agricultural works. The wall slot was up to 0.3m deep and could have supported a split timber wall or a wattle fence; there was no indication for postholes within the wall slot. Six large postholes (averaging 0.45m in diameter and 0.35m deep) were located in the centre of the structure. These may have supported a ring beam which would have held up the roof. Several other postholes and stakeholes lay within the structure. The majority of these lay along the central axis of the structure and as such they may have formed a partition wall. While no hearth was identified, the presence of a large quantity of burnt animal bone, wheat/barley grains, and hazelnut shells within the postholes and the surrounding wall slot indicates cooking within the structure. Most of the animal bone was too small to be identified; however, cattle molars were present which shows that this was at least one of the protein sources utilised. Sherds of a large flat based urn were recovered from within the wall slot. This vessel was quite large, having had a diameter of 320mm, and a depth of at least 240mm. The vessel was of a late Middle Bronze Age, or early Late Bronze Age date.[58]

External pit

Extent of house

Earlier phase ditch

Main phase wall slot

0   5m

Earlier phase slot
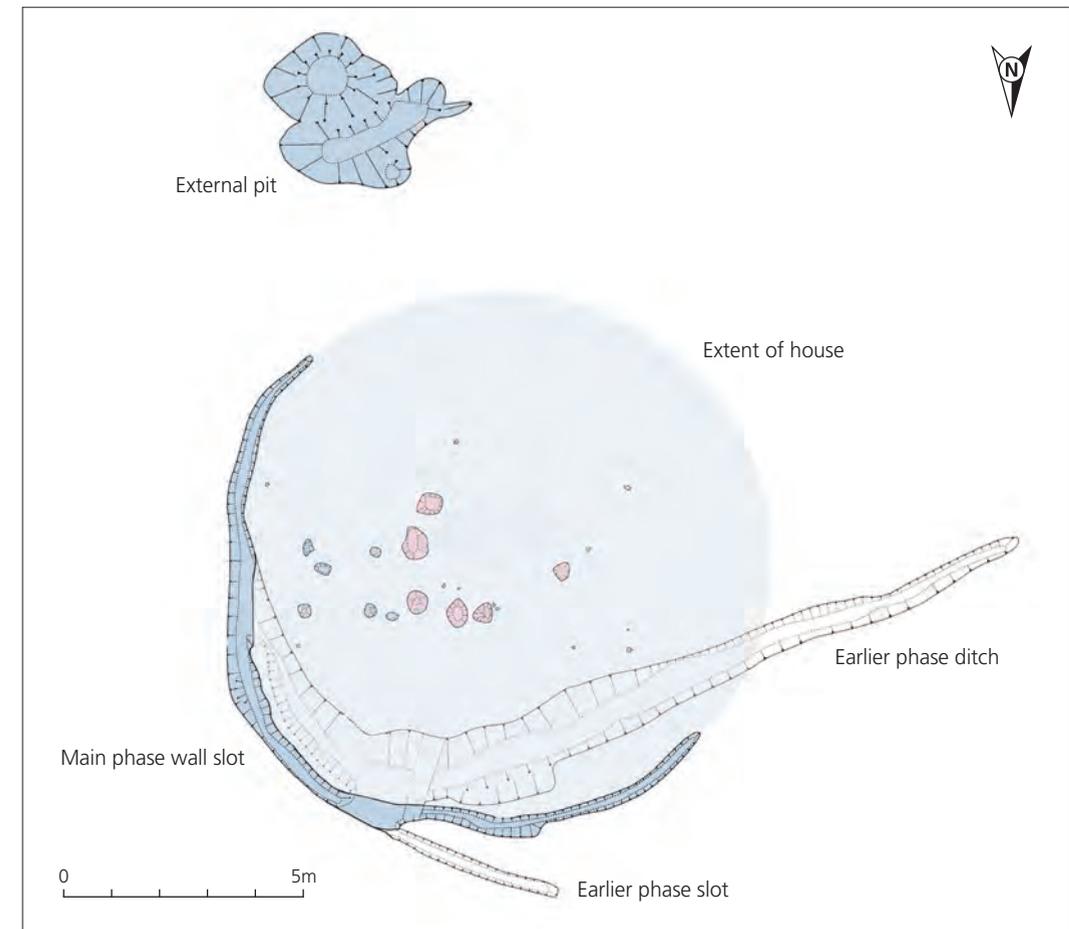
The later phase wall slot was dated to 1086–915 BC (UBA-14500), the central postholes of the structure were dated to 1207–896 BC (UBA-14493, UBA-14498) and a posthole and a stakehole within the structure were dated to 1218–925 BC (UBA-14494, UBA-14496). This corresponds with the dating evidence from the pottery recovered.

A large irregular pit, c.2.5m diameter and 0.8m deep, with a small posthole in its base, lay 3m south of the house structure. The function of this pit was not clear; however, as the posthole was deliberately sealed by a saddle quern, and an unused convex scraper had been deliberately deposited within the pit, it would appear to have served a ritual function. Charcoal from the fill at the base of this pit was radiocarbon dated to 1022–894 BC (UBA-14495), contemporary to the main phase of the house.

The roundhouse partially excavated at Annaghilla (Site 4) was slightly smaller than that at Armalughey (Site 17), having a diameter of c.8m. The structure was defined by a series of pits and postholes, some of which contained packing stones. The site was located immediately west of a Neolithic rectangular house and was only partially excavated as it lay on the edge of the road take. The house was dated to 1055–899 BC (SUERC-21296), which corresponds with the Late Bronze Age coarseware pottery recovered from several of the pits. An Iron Age date, 751–406 BC (SUERC-21295), returned from one of the other pits may indicate a second phase of activity at this location.

Further settlement evidence was found at Armalughey (Site 19), Ballyward (Site 46), and Armalughey (Site 18). At Armalughey (Site 19) two large pits and a cluster of stakeholes were identified. The pits contained at least four flat-based Late Bronze Age vessels. Charcoal from the fill of the pits was dated to 1305–938 BC (UBA-14507, UBA-14509 and UBA-14510). The stakeholes were not radiocarbon dated but as they contained similar sherds of pottery to the pits they are likely to be contemporary. The stakeholes were in a cluster and may have represented a small temporary shelter.

Plan of Annaghilla (Site 4) Late Bronze Age house © Headland
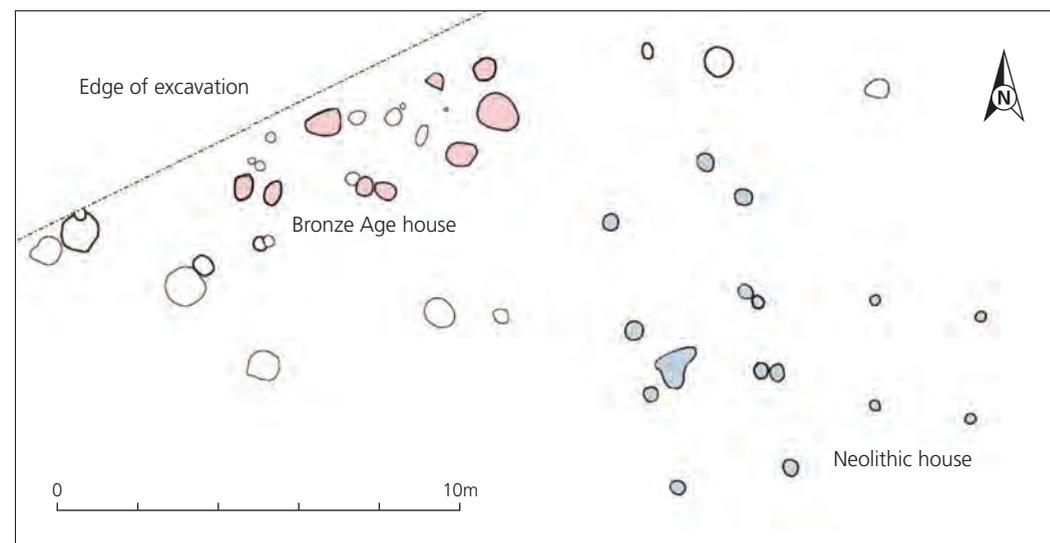
A small hut, 3m long and 2m wide and defined by a ring of 12 stakeholes was recorded at Ballyward (Site 46). The interior of the hut was covered in a layer of occupation material 60mm thick which contained grains of barley as well as grass, water pepper, and raspberry seeds. Water pepper and grass seeds can be used to create a dry, and rather tasteless flour;[59] it is likely that they were used in this case to bulk up the barley flour. The hut is too small to have been a permanent house site; however, the depth of the occupation spread suggests either it was occupied for a prolonged period of time or a short period of time during which intense activity took place. The raspberry seeds may indicate a late summer/autumn occupation period. The hut was dated to 1131–1011 BC (UBA-14464).

At Armalughey (Site 18) an isolated refuse pit, containing fragments of animal bone (not identifiable to species), charred hazelnut shell, and single grains of wild oat and barley, was dated to 1046–894 BC (SUERC-20645). Also located at Armalughey (Site 18), and on the flat top of a hill, was a four-post structure c.2.5m square. The function of this structure was not clear. Similar features have been found in association with Middle to Late Bronze Age burial sites, for example Ballintaggart, Co. Down.[60] This location did not however provide any evidence for ritual activity at this time, and as such may have been a small industrial or agricultural structure, possibly a cereal-drying platform. The four-post structure was dated to 874–429 BC (SUERC-20647, SUERC-20759).

Burial

Around 2,500 BC the round barrow emerged as the major burial monument in the British Isles.[61] While there is evidence for their construction from at least the Late Neolithic (see previous chapter for examples from this Road Scheme), their main period of construction was during the Bronze Age.[62,63] Iron Age examples also occur but these tend to be much smaller (two Iron Age barrows from Annaghilla (Site 4) are discussed in the proceeding chapter). The deposition of individual burials, both cremated and inhumed, in round barrows appears to signal a departure from the Neolithic custom of depositing the remains of the dead en masse in earthen long barrows or megalithic tombs and a move to a more individualised practice, possibly suggesting the emergence of a more stratified society.[64]

Ring barrows are roughly circular ditches with a mound of earth in the centre. The barrow may also have had a 'kerb' of stones to define and retain the central mound, and occasionally a bank on the outside of the ditch. They are termed annular if the ditch is unbroken, or penannular if there is a gap in the ditch. Irish ring barrows varied in size. A few were very large, exceeding 30m diameter, but most were less than 30m. The majority of upstanding barrows have external diameters of between 15m and 25m;[65] however, recent excavations have identified a plethora of smaller barrows, the upstanding remains of which had been destroyed by later agricultural activities. The Bronze Age barrows found across this Road Scheme ranged from 4m to 18m external diameter, with the majority between 10m

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and 15m diameter.

While they are considered to be burial monuments, not all are directly associated with human remains. Where human remains are present they are generally cremated, with inhumations in barrows a rarity. Cremations could be complete, or partial token deposits of bone, buried within a pit dug in the central mound or placed within its ditch.

Early Bronze Age burial

The only Early Bronze Age ring barrow recorded was at Tullyallen (Site 40). It had a c.5m internal diameter with a c.1m wide and c.1m deep ditch. Charcoal from the fill of the ring barrow was dated to 2145–2016 BC (UBA-14448). There were no cremation deposits directly associated with the ring barrow, nor were any artefacts of an Early Bronze Age date recovered. The site was re-used in the Late Bronze Age when a small number of pits were excavated in this area, two of which had been excavated through surface of the silted-up ring barrow. These pits were dated to 1056–919 BC (UBA-14447).

Urns were also used to hold cremations. During burial a pit would have been dug and the urn then placed within; either upright, usually with a stone capping the urn, or inverted, with the urn placed over the cremation. When buried within ring barrows urns were generally located within the mound, rather than in the ditch. Urns could also be used for isolated, unenclosed, burials, such as the Early Bronze Age burial found at Armalughey (Site 18). Here an isolated cremation of a juvenile (aged between 8 and 16) was located on the crest of a hill. The cremation was within a Collared Urn and was dated to 1907–1737 BC (SUERC-20643). A flint knife found within the urn appeared to have been deliberately cremated with the individual and then placed as a ritual deposit with the remains.

Tullyallen (Site 40) ring barrow © ADS

Middle Bronze Age Burial - focus on Cullenfad (Site 45), Mullaghbane (Site 27), and Lisbeg (Site 6)

Two ring barrow cemeteries were excavated at Cullenfad (Site 45) and Mullaghbane (Site 27). An inhumation burial was exhumed at Lisbeg (Site 6).

The cemetery at Cullenfad (Site 45) contained three large ring barrows and one small ring barrow. The ring barrows were dated to the period 1689–1008 BC. Stone within the fills of the ditches of the three larger barrows indicated that they were originally capped by stone cairns. None of the barrows had associated burial remains. A possible house structure and working area (see above), and a burnt mound at to the east (see below), may have been contemporary features.

A series of Iron Age dates were also returned from this area, which indicates at least one later phase of settlement at this location (see proceeding chapter). A number of pits and postholes within the ring barrows are likely to relate to this later period occupation.

Ring Barrow 1 had an internal diameter of c.7m. The ditch averaged 4m wide and was 1.1m deep; it was dated to 1689–1528 BC (SUERC-21134). Ring Barrow 2 had an internal diameter of c.9m. The ditch averaged 2.8m wide and was 0.8m deep. A cluster of 13 worked flint tools, four flint cores, and a large quantity of debitage (waste chips from flint knapping) appears to have been deliberately deposited within the ditch of this barrow. The barrow was dated to 1458–1025 BC (SUERC-21137, SUERC-21143). Ring Barrow 3 was pennanular, with a 0.8m-wide opening on its southeast side. It had an internal diameter of c.11m. The ditch averaged 3.4m wide and was 1m deep. It was dated to 1207–1008 BC (SUERC-21135). Ring Barrow 4 was much smaller than the other three ring barrows. It had an internal diameter of c.2m. The ditch averaged 0.8m wide and was 0.15m deep. This small barrow was undated but as there is a clear trend for barrow size to decrease towards the end of their construction period, it is possible that this barrow post-dates the three larger barrows.

Pottery sherds were recovered from the bases of the ditches of Ring Barrows 1–3 and identified as belonging to plain, flat-based, bucket-shaped vessels of Middle to Late Bronze Age date. The largest concentrations were recovered from either side of the entrance of Ring Barrow 3. Focus of ritual deposition at the entrances of pennanular barrows has been noted before, for example at Ardsallagh, Co. Tipperary.[66] Some near-complete vessels were recovered, one of which had perforations around its rim. String would have been inserted into these holes to support the vessel over a fire. Similar Irish examples of this type of pottery assemblage were found at Rathgall, Co. Wicklow[67] and Freestone Hill, Co. Kilkenny.[68] At both these sites a large assemblage of bucket-shaped, Middle to Late Bronze Age vessels, with and without perforations, was recovered.

Ring barrows 1–3 at Cullenfad (Site 45) © Headland
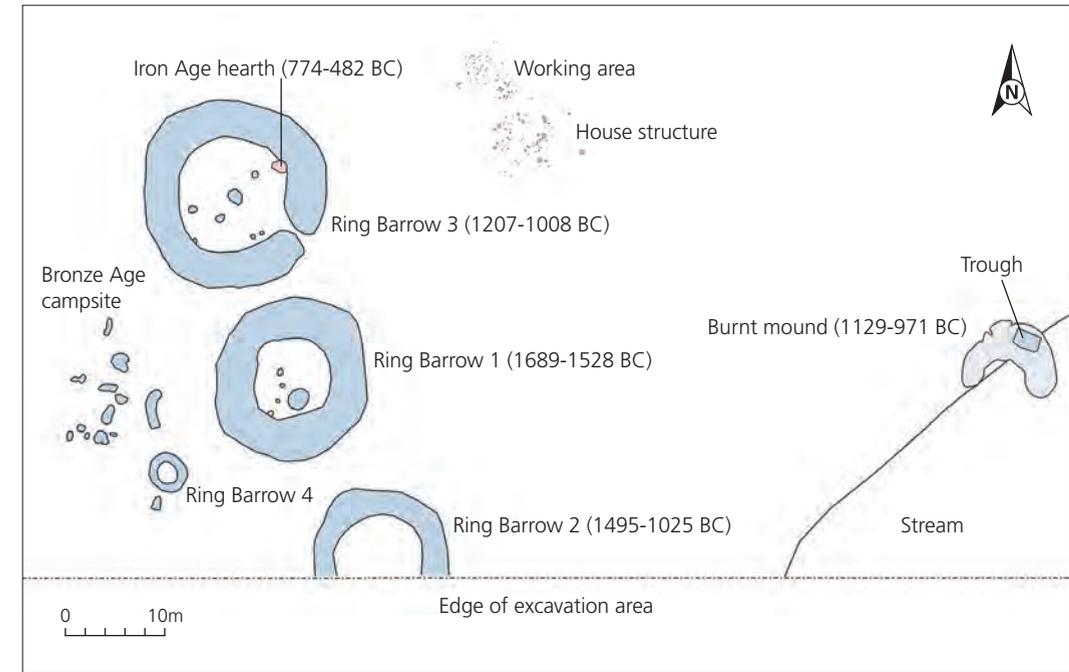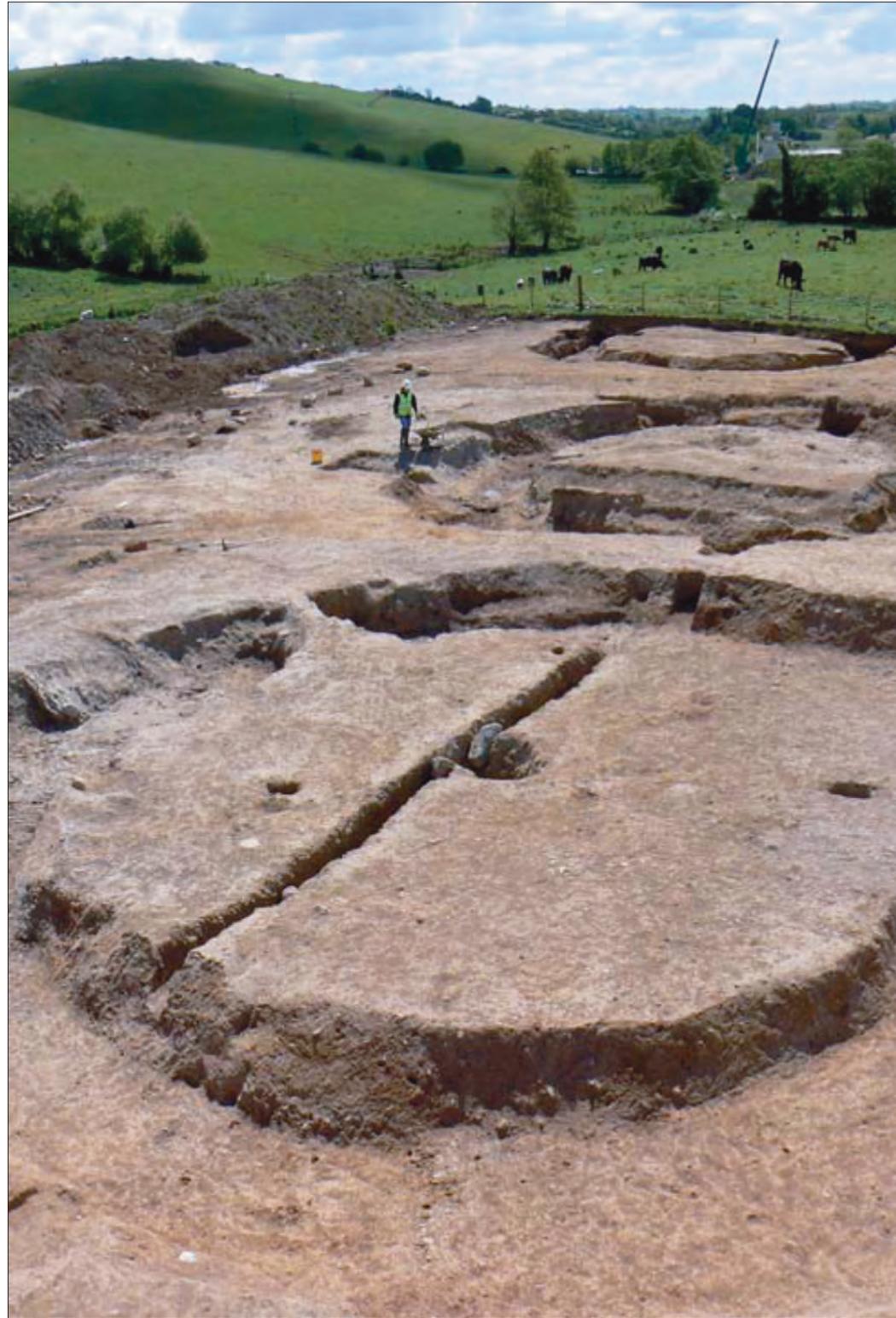
Plan of Bronze Age features at Cullenfad (Site 45) © Headland

Iron Age hearth (774-482 BC)

Working area

House structure

Ring Barrow 3 (1207-1008 BC)

Bronze Age campsite

Trough

Burnt mound (1129-971 BC)

Ring Barrow 1 (1689-1528 BC)

Ring Barrow 4

Ring Barrow 2 (1495-1025 BC)

Stream

Edge of excavation area

0   10m
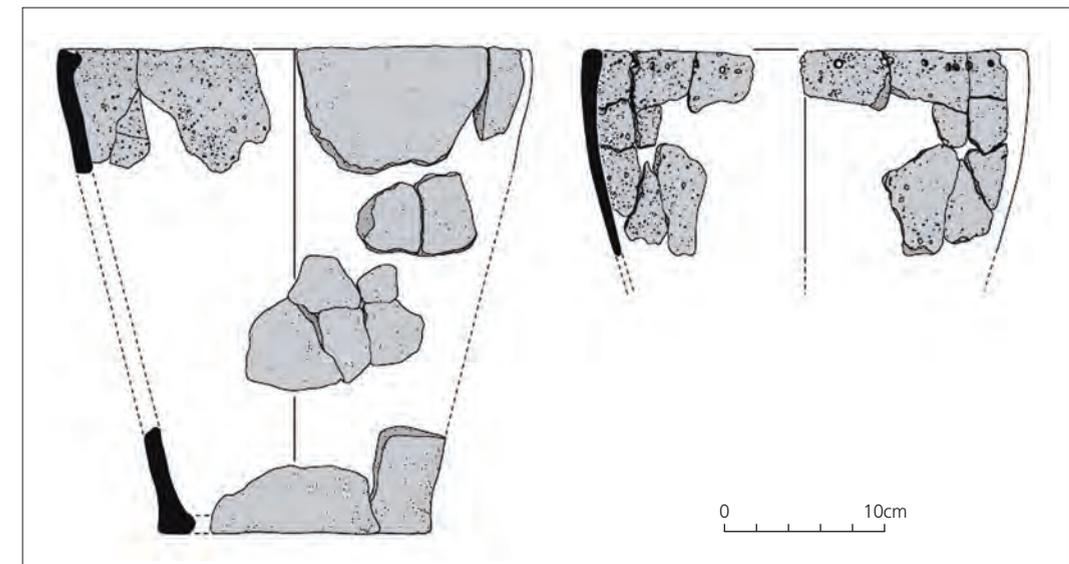
Plain flat-based, bucket-shaped vessels of a Middle to Late Bronze Age date from Cullenfad (Site 45), note perforations around rim of vessel on right. © Headland

0   10cm

The second ring barrow cemetery, at Mullaghbane (Site 27), contained four ring barrows and four cremation pits. Ring Barrow 1 had a central cremation which dated to the Neolithic (2897–2679 BC: SUERC-21735) and is therefore discussed in the preceding chapter. Ring Barrows 2–4 dated to 1497–1226 BC, and the cremations to 1401–1076 BC. Four large pits immediately east of the ring barrows may also have been of contemporary construction as they dated to an overlapping period: 1451–1291 BC (SUERC-21717).

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Ring Barrow 2 had an internal diameter of c.5m. The ditch averaged 0.5m wide and was 0.2m deep. A perforated Middle Bronze Age vessel, similar to that recovered from the ring barrow at Cullenfad (Site 45), was found in the base of the ditch. It was probably placed intact into the ditch as a ritual offering. This barrow was dated to 1497–1297 BC (SUERC-17593, SUERC-17596). Ring Barrow 3 had an internal diameter of c.5m. The ditch averaged 1m wide and was 0.5m deep. No artefacts were recovered from this barrow; it was dated to 1437–1288 BC (SUERC-21736). Ring Barrow 4 was truncated by an early medieval rath ditch, and only its eastern edge survived. If complete the barrow would have had an internal diameter of c.3m; the ditch averaged 0.4m wide and 0.2m deep. No artefacts were recovered; it was dated to 1437–1288 BC (SUERC-21736).

Plan of Mullaghbane (Site 27) © Headland
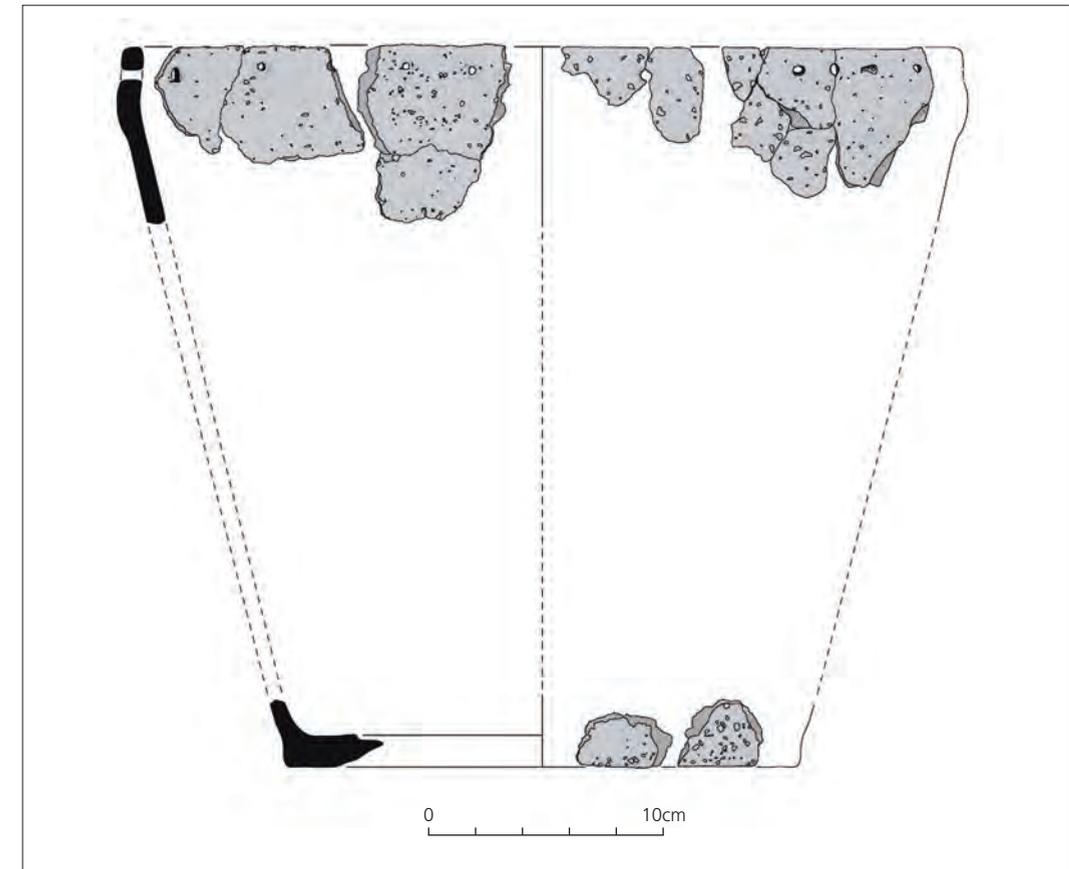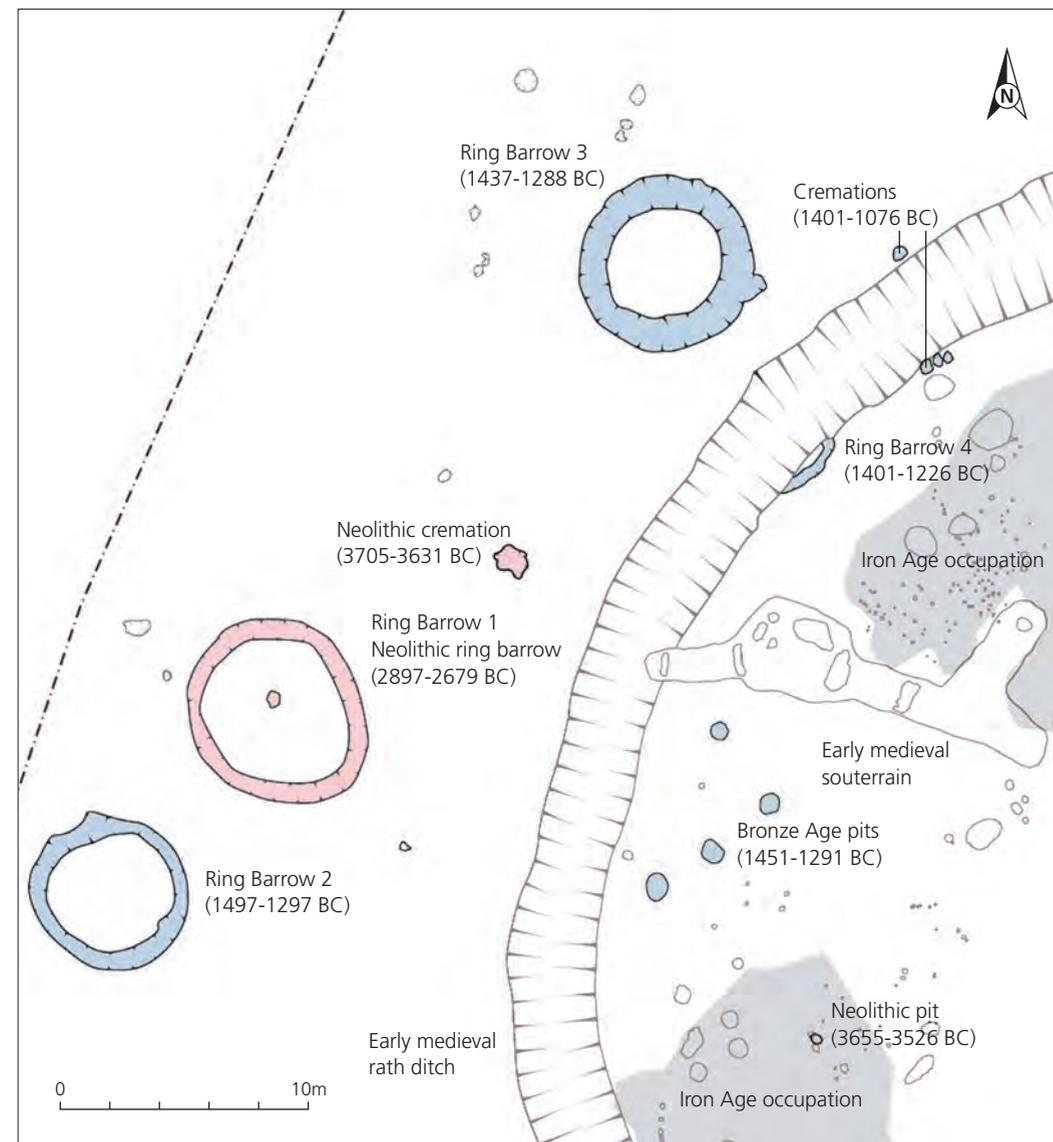
Perforated Middle Bronze Age pot from Mullaghbane (Site 27) © Headland

The cremations lay to the east of Ring Barrow 3 and were deposited in small pits averaging 0.6m diameter and 0.2m deep. As the early medieval rath ditch lay between these cremations it is probable that further cremation deposits had been in this area but had been destroyed during the rath construction. Only one cremation had identifiable human remains and these were of a teenager, no more than 16 years old.

A single Middle Bronze Age inhumation was recovered from Lisbeg (Site 6), and dated to 1543–1411 BC (SUERC-20636). This burial may have been associated with several burnt mounds which lay to the west. The burial was at an approximate depth of 1m, within peaty clay. The remains were poorly preserved and consisted of the left and right forearms, femurs, fibula, and tibia. Analysis suggests that they belonged to either an older adolescent or young adult. There was some indication of erosion of the bones by water. It is likely that only the limbs were deposited on site and that the remainder of the body was deposited elsewhere. 'Sextant beetle' (*necrophorus* sp.) was found in samples taken from around the remains. As the sextant beetle traditionally only buries small mammals[69,70,71] it is possible that as the limbs were detached from the remainder of the body, the beetles might have been attempting to bury them.[72]

If this is a deliberate burial in a wetland context it would suggest that the practice of depositing human remains in wetland contexts was exercised earlier than the Late Bronze Age period with which it has been traditionally associated.[73] Human remains have been identified from a number of burnt mound sites in Ireland: for example, Cragbrien, Co. Clare; Inchagreenoge, Co. Limerick[74] and Busherstown E2584, Co. Carlow.[75] This evidence casts further light on the special nature of activity at some burnt mound sites. Fragmented human skulls were deposited at Cragbrien and Inchagreenoge. At Cragbrien the mound was dated to c.1372–1100 BC and a human skull fragment and part of a facial bone from an adult male were deposited within the mound in its last phase of use. Also in the final phase of the Inchagreenoge burnt mound, the skull of a young adult male was deposited in a spring and sealed by a stone capping: this was radiocarbon dated to 1260–1010 BC.[76] Finally, one badly preserved piece of human femur shaft was recovered from the spread of the burnt mound at Busherstown which was radiocarbon dated to 1384–406 BC.[77]

It appears that the human remains from all of these sites represent deliberate, symbolic deposits and are important contributions to a wider body of Bronze Age evidence for this type of votive offering of human bone associated with burnt mounds. It seems appropriate, therefore, to suggest that at least some burnt mounds, perhaps owing to their close association with the populations who used them, became sufficiently important to be perceived as appropriate places for sacred activity such as human offerings.

Late Bronze Age burial

Ring barrows and urn burials show a degree of continuity in burial practices from the Early through the Middle Bronze Age; however, there is a marked decrease in their numbers towards the end of the 11th century BC.[78] This decrease corresponds with an increase in the deposition of hoards, and while only some of the hoards are within burial sites it does indicate a change in ritual practices. Traditionally, these hoards have been interpreted as ostentatious displays of wealth suggesting that society had moved towards a class system, led by a wealthy aristocratic, warrior elite. This system is similar to that which appears in the Ulster Cycle of heroic tales, and while there is no contemporary written record of the society at this time, these tales are believed by some to have their roots in the latter part of the Bronze Age.

The only evidence for burial during the Late Bronze Age came from Cravenny Scotch (Site 23), where an isolated cremation burial was recorded. The cremation was of a single adult and was within a shallow rectangular pit 0.31m long, 0.27m wide and 0.1m deep. The cremation was dated to 1277–1116 BC (UBA-14511).

Bronze Age Burnt mounds

Burnt mounds, also known as *fulachta fiadh*, are found with notable frequency in Ireland, with over 7,000[79] so far recorded. They range in date from the Late Neolithic through to the early medieval period. A large number of burnt mound sites were excavated along this Road Scheme and spanning across all of the noted time periods. The most significant of these was Lisbeg (Site 6) which provided evidence for burnt mounds dating from the late Neolithic/Early Bronze Age, through to the medieval period.

Within the last 10 years, as more burnt mounds have been excavated, it has become clear that although many of the sites appear to use a similar technology, the differences between them hint at a variety of uses. With further experimentation and modern scientific techniques, this idea has gathered credibility. Fundamentally, however, burnt mounds represent the remains of heated stone technology, which includes the heating of water with immersion of hot rocks and the utilisation of steam.

Burnt mounds are characterised by a layer or mound of dark brown or black charcoal-rich soil which contains burnt and fire-cracked stones. These stones are heated in a fire and then placed within a trough of water. The rapid heating and cooling cracks the stones, and they are then discarded with the waste from the fire, creating the layer of burnt material. The layers of burnt material are often, but not always, associated with other features. These include the troughs which are generally circular or rectangular in shape and which would have held water; hearths on which the stones were heated; and other smaller pits. A limited number of burnt mounds also has evidence for small structures surrounding, or located beside, the troughs, and occasionally even for a house.

Due to the need for water on burnt mound sites they are almost exclusively found within flood plains, or next to river banks, with a few found on higher ground next to a natural spring. These sites were frequently re-used multiple times, with river silts deposited from flooding often found between the layers of charcoal and cracked stones. These flooding events have also suggested that some of the activities at burnt mounds were seasonal, with higher water tables during the winter cutting off access to the area.

What were they used for?

The earliest historical record for burnt mound sites in Ireland calls them *fulachta fiadh*, which translates as a 'cooking pit for wild animals'.[80] In order to better understand this interpretation, archaeological experiments were undertaken which looked at the potential for cooking. These have shown that when the fire-heated stones were placed within a trough the water could be brought to boiling point within 35 minutes. Larger animals would have been butchered, and the meat wrapped

in reeds or grass before being placed into the pit. Pottery or leather vessels could also have been put into the trough to cook broths or stews. Evidence for cooking has been found at some sites with pieces of burnt bone and pottery recovered from the burnt mounds.

However, for sites where evidence for cooking was not present, the wide range of activities which could have been undertaken makes it very difficult to identify the specific function of an individual burnt mound. These activities could have included: extraction of grease or tallow, brewing beer,[81] dying cloth,[82] fulling wool,[83] working leather,[84] building boats,[85] bathing, and even possibly spiritual experiences.[86]

While the spread of burnt material is often the first evidence archaeologists find for burnt mounds, it is in fact the troughs which lie below this spread which provide evidence for the function of these sites. The spread of burnt material is simply waste from the site's use. There are two main differences in the troughs used on burnt mound sites: the shape, and the presence or absence of a lining. The troughs range in shape from circular to rectangular, with the circular troughs often being deeper than the rectangular ones. It has previously been thought that there was a trend for circular troughs to be earlier than rectangular ones.[87] This seems to be borne out by the excavations here, as both Neolithic burnt mound sites had circular troughs. However, with the excavation of more examples there is growing evidence for a large number of circular troughs of a later date. The lining of troughs also occurs throughout all periods, and includes clay, wood in the form of planking, wattle, dug-out tree trunks, and stone in the form of dry stone walling or large slabs.[88] The lining of a trough appears to be associated with the duration of site use, rather than representing a variation in function, as it would have made cleaning and re-use easier if the trough was being used over a considerable length of time.[89] This is borne out by the size of the burnt mound spreads associated with lined troughs, as they tend to be larger than their unlined counterparts.

A multi-period burnt mound location – Focus on Lisbeg (Site 6)

A total of 23 phases of burnt mound activity were identified at Lisbeg (Site 6). Burnt Mound 1 was radiocarbon dated to the end of the Neolithic; Burnt Mounds 2–8 and 10 were Early Bronze Age; Burnt Mound 9 provided a range of dates which spanned the latter part of the Early Bronze Age and into the Middle Bronze Age; Burnt Mounds 11–13 were dated to the end of the Middle Bronze Age, beginning of the Late Bronze Age; Burnt Mounds 14 and 15 were Late Bronze Age in date; Burnt Mounds 16–18 were Late Bronze Age to early Iron Age; Burnt Mound 19 was Middle Iron Age; and the remaining burnt mounds (Burnt Mounds 19–23) were early medieval in date. Fifteen of the burnt mounds had troughs or pits, of which seven were lined with planks. Burnt Mound 2 had a trough partially lined with wicker, and Burnt Mound 19 had a trough fully lined with wicker.
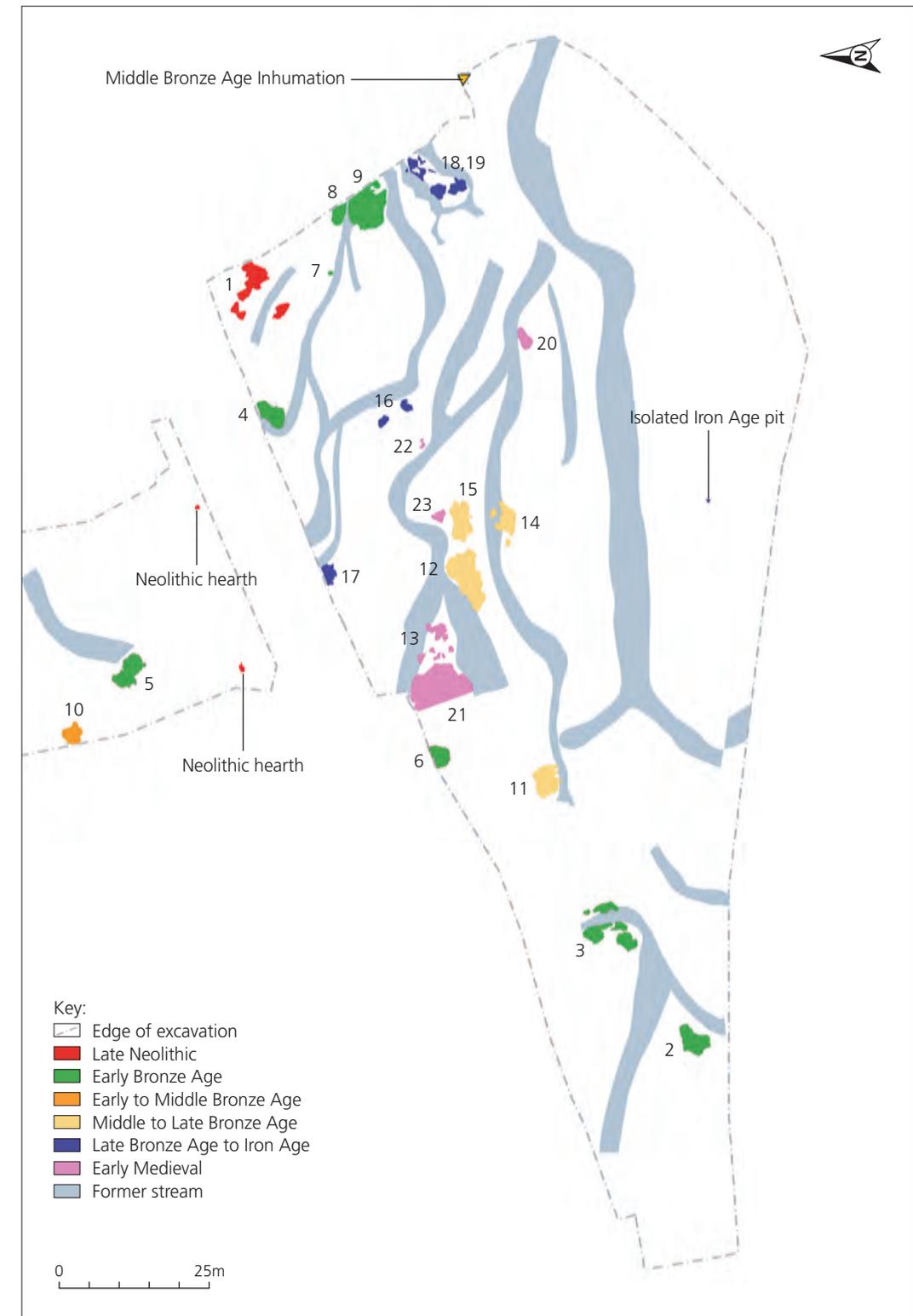
Burnt mounds at Lisbeg (Site 6), after © Headland

Burnt Mound 2 (2577-2205 BC)

Burnt Mound 3 (2493-2410 BC)

Burnt Mound 9 (1776-1420 BC)

Burnt Mound 14 (1128-923 BC)

Hearth

Extent of burnt mound

Extent of burnt mound

Hearth

Trough 2

Former stream

Trough 1

Extent of burnt mound

0   2m
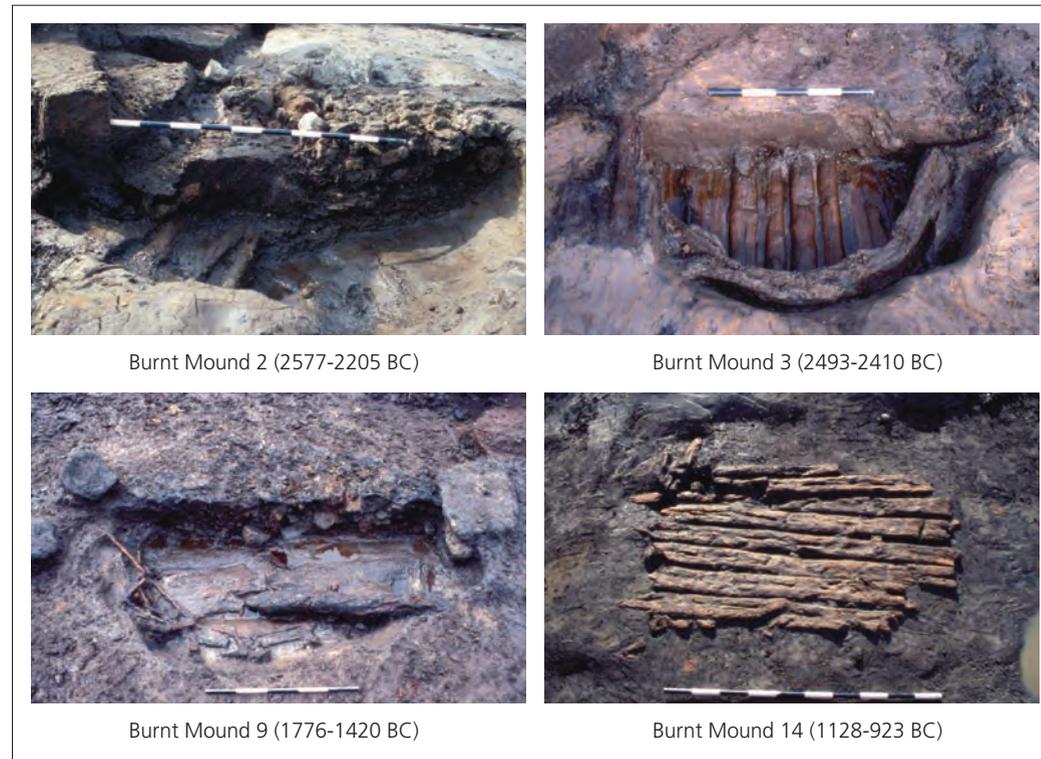
Burnt Mound 1 had two oval troughs and two hearths. The burnt mound and troughs were dated to 2897–2462 BC (SUERC-20419, SUERC-20431, SUERC-20599, SUERC-20603, and SUERC-20605). A birch sample from a layer of natural peat which had filled the burnt mound troughs was dated to 2471–2281 BC (SUERC-20604). Trough 1 was 1.7m long, 1.3m wide, and 0.3m deep; Trough 2 was 1m long, 0.9m wide, and 0.35m deep. Neither of these troughs provided evidence for being lined. A former stream was identified between the two troughs and would have provided a readily available source of water for use in the troughs.

Burnt Mounds 2–8 and 10 were Early Bronze Age. Burnt Mound 2 had an unlined oval trough c.1.9m long, 1.6m wide, and 0.35m, which was later replaced with a smaller partially wicker lined trough 1m long, 1.05m wide, and 02m deep. The troughs were covered with a kidney-shaped spread 5m long, 4m wide, and 0.2m thick. The spread was dated to 2577–2432 BC (SUERC-20633) and the wicker lined trough to 2457–2205 BC (SUERC-23227).

Burnt Mound 3 was located on the west and east sides of a stream. A burnt spread 8m long, 4m wide, and 0.2m think on the west side of the stream, and 4m long, 1m wide, and 0.2m thick on the east side of the stream partially covered two wood plank-lined troughs. The larger trough was oval, 1.6m long, 1.2m wide, and 0.1m deep; the second smaller trough was 4m north of the first; it was also oval, 1.4m long, 1.2m wide, and 0.3m deep. The spread was dated to 2549–2140 BC (SUERC-
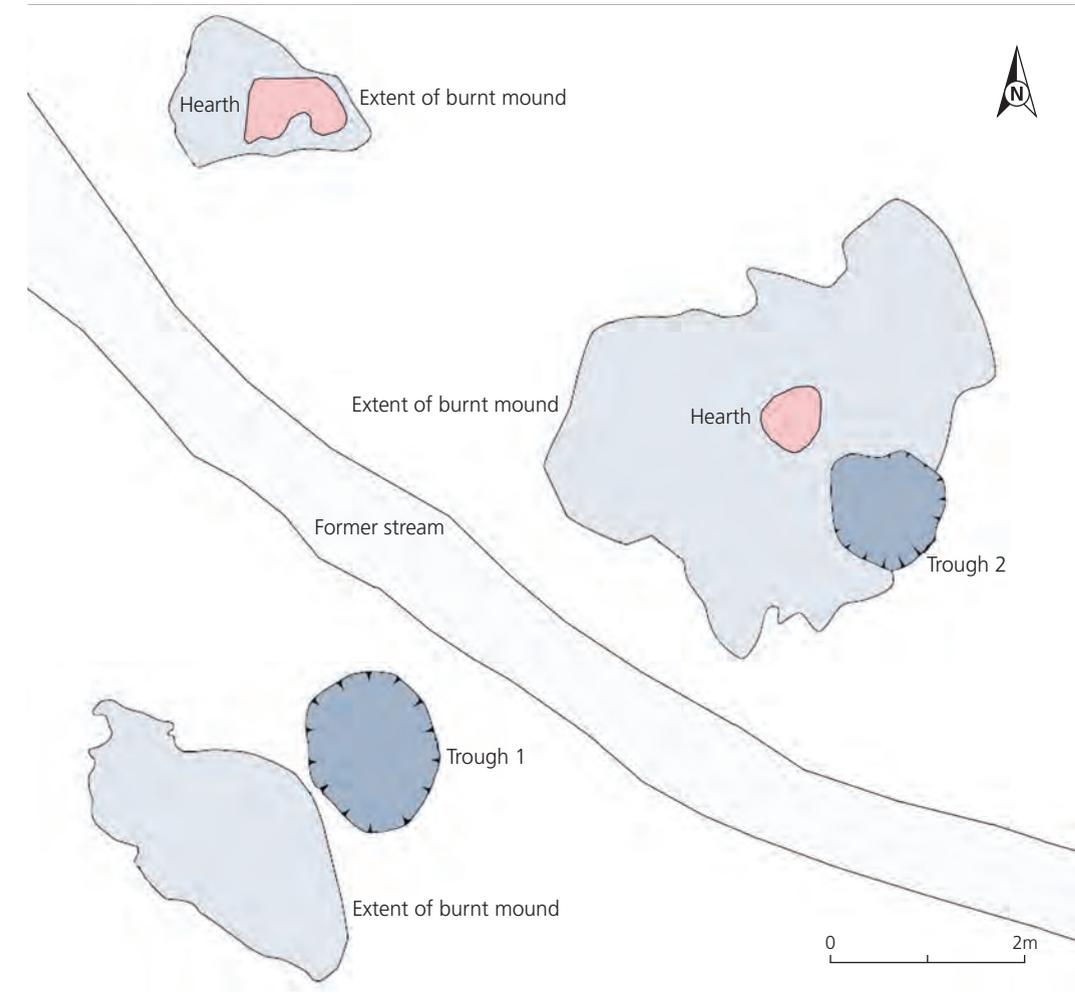
20634, SUERC-20635, SUERC-20628, SUERC-20629), the larger trough was dated to 2493–2278 BC (SUERC-23228, SUERC-23226), and the smaller to 2351–2196 BC (SUERC-23225).

Burnt Mounds 4 and 6 were on the edge of the excavation area. They were shallow spreads of burnt mound material. Burnt Mound 4 was dated to 2473–2299 BC (SUERC-20429), and Burnt Mound 6 dated to 2465–2209 BC (SUERC-20433). Burnt Mound 5 had a shallow unlined oval trough, 1.52m long, 1.15m wide, and 0.16m deep. A burnt mound spread 5.9m long, 3.25m wide, and 0.12m thick was adjacent to the trough. The spread was dated to 2467–2286 BC (SUERC-20428). Burnt Mound 7 was a small pit containing burnt cracked stones, the pit was 0.93m long, 0.78m wide, and 0.08m deep. No spread was associated with this pit, it was dated to 1965–1754 BC (SUERC-17352). Burnt Mound 8 was a spread located at the edge of the excavation area. It was 2.4m long, 2.2m wide, and 0.9m thick and was dated to 1888–1693 BC (SUERC-23216, SUERC-20595). No troughs or pits were associated with this burnt mound. However, the extensive depth of material present indicates that

substantial troughs or pits associated with this burnt mound must lie within the adjacent area, which was not excavated during the Road Scheme. Burnt Mound 10 had two troughs: both unlined and oval, one was 1.2m long, 0.79m wide, and 0.5m deep, the other 1.1m long, 0.57m wide, and 0.11m deep. The troughs were covered by a spread 3.1m diameter and 0.3m thick. The spread was dated to 1746–1603 BC (SUERC-17363).

Burnt Mound 9 provided a range of dates which spanned the latter part of the Early Bronze Age and into the Middle Bronze Age. The burnt mound had an oval trough measuring 1.65m long, 1.18m wide, and 0.25m deep. It was wood lined, with a plank base and wattle sides. The trough was covered with a spread 7.8m long, 6.2m wide, and 0.23m thick. The burnt mound spread was dated to 1776–1420 BC (SUERC-20418, SUERC-20434, SUERC-20608, SUERC-23217), the trough was dated to 1745–1451 BC (SUERC-23214, SUERC-23215).

Burnt Mounds 11–13 were dated to the end of the Middle Bronze Age, beginning of the Late Bronze Age. Burnt Mound 11 was a spread 4m long, 3m wide, and 0.25m thick which covered two small postholes; no troughs were present. The spread was dated to 1396–1054 BC (SUERC-20596, SUERC-20430). Burnt Mound 12 had three small irregular pits covered by a burnt mound spread 5.5m long, 2.2m wide, and 0.1m thick. The spread was dated to 1386–1118 BC (SUERC-20626, SUERC-20627). Burnt Mound 13 contained a very large rectangular trough 3.6m long, 1.2m wide, and 0.27m deep, with a single split oak plank lining the base. The oak plank was dated to 1236–1051 BC (SUERC-23223). Overlying the trough was a spread of burnt mound material 6.55m long, 5.4m wide, and 0.3m thick. The spread was dated to 1214–979 BC (SUERC-20614, SUERC-20619).

Lisbeg (Site 6) Burnt mound Trough 1 filled with water (back left) and Trough 2 (centre foreground); note burnt cracked stones surrounding the trough and the waterlogged nature of the site location © Headland

Lisbeg (Site 6) Burnt Mound 11, mid excavation, note stream to back of photo © Headland

Burnt Mounds 14 and 15 were Late Bronze Age in date. Burnt Mound 14 had two burnt mound spreads: the first was 6m long, 1.5m wide, and 0.1m thick, the second 4.4m long, 2.6m wide, and 0.15m thick. It appeared that these spreads had been partially eroded away by flooding events and may have originally been one large spread. The spread covered a rectangular trough 1.7m long, 1.1m wide, and 0.15m deep which had a wooden plank base. The wood in the base of the trough was dated to 1111–927 BC (SUERC-23224), and the spread to 1128–923 BC (SUERC-20624). Burnt Mound 15 had two shallow burnt mound deposits which were dated to 1089–896 BC (SUERC_20615, SUERC-20616). No troughs or pits were associated with this burnt mound.

Burnt Mounds 16–18 were Late Bronze Age to Early Iron Age in date. Burnt Mound 16 contained a hearth, with a burnt mound spread located 4m to the southeast. The hearth was 2.35m diameter and 0.05m deep, and was found to contain 600 fragments of burnt bone, some of which were identified as either sheep or goat. It was dated to 801–549 BC (SUERC-20609). The spread was c.2.1m long, 1.2m wide, and 0.14m thick and dated to 756–413 BC (SUERC-20617). Burnt Mound 17 was an isolated spread 3.4m long, 2.3m wide, and 0.11m thick, it was dated to 756–413 BC (SUERC-20423). Burnt Mound 18 was also an isolated spread. It was 1.55m long, 0.95m wide, and 0.05m thick and was dated to 758–429 BC (SUERC-17373).

Burnt Mounds 19–23 were dated to later periods and as such are discussed in detail in the proceeding sections.

Early Bronze Age burnt mound sites

As well as Lisbeg (Site 6), many other sites on the Road Scheme contained evidence for Early Bronze Age burnt mounds. These included Mullaghbane (Site 29), Tullyvar (Site 12), Lisbeg (Site 16), Armalughey (Site 25), Annaghilla (Site 3), Mullaghbane (Site 29), Inishmagh (Site 30), Mulnahunch (Site 38), and Drumnafern (Site 48). The earliest possible Bronze Age burnt mound recorded during the excavations was at Mullaghbane (Site 29), where six pits and a spread of burnt material were excavated. Two of the pits were radiocarbon dated to the Late Neolithic/Early Bronze Age: 2861–2464 BC (Pit 2: UBA-14535 and Pit 3: UBA-14533), while one of the other pits was dated to the Middle/Late Neolithic 3323–2924 BC (Pit 1: UBA-14532). This burnt mound was in use at the very end of the Neolithic and into the Early Bronze Age.

Plan of burnt mound and pits at Mullaghbane (Site 29) © ADS
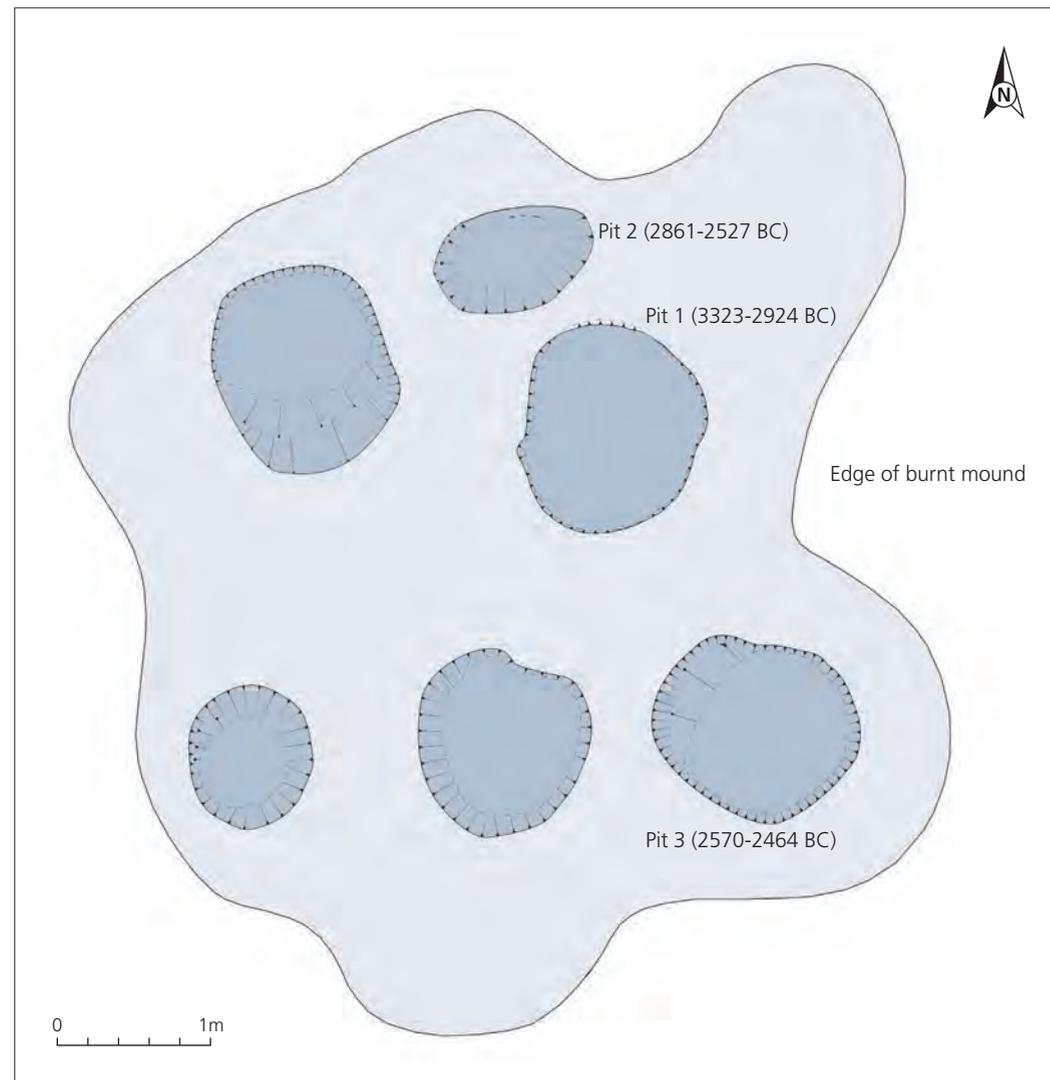
At Tullyvar (Site 12) a large spread of burnt cracked stones 13m long, 11m wide, and 0.3m thick overlay a rectangular trough and a circular pit. The trough was 2m long, 1.5m wide, and 0.25m deep and did not appear to have been lined. The pit was 0.9m diameter and 0.2m deep. The sides of this pit were heavily oxidised which indicates intense burning within this feature, most probably this was the hearth in which the rocks were heated prior to deposition within the burnt mound trough. Two sherds of Beaker pottery were recovered from the fill of the pit. The pit was dated to 2346–2190 BC (UBA-14468), which corresponds with the known date range of Beaker pottery (2450–1900 BC).[90]

The burnt mound at Lisbeg (Site 16) was located on both sides of a stream. The spread of burnt cracked stones was 8m long and 6m wide to the east of the stream, 10m long and 4m wide to the west of the stream, and was a maximum of 0.25m thick. This spread covered five irregular rounded pits and one large trough. The trough was located on the west side of the stream; it had steep sides and was 1.85m long, 1.45m wide, and 0.37m deep. The pits were all less than 0.2m deep and had irregular shallow sloping sides. There was no evidence for wood lining in any of the pits, or the trough. The burnt mound spread was dated to 2136–1945 BC (UBA-14492), a date corroborated by the presence of Early Bronze Age convex scrapers within the trough and one of the pits to the east.

Plan of burnt mounds at Lisbeg (Site 16) © ADS
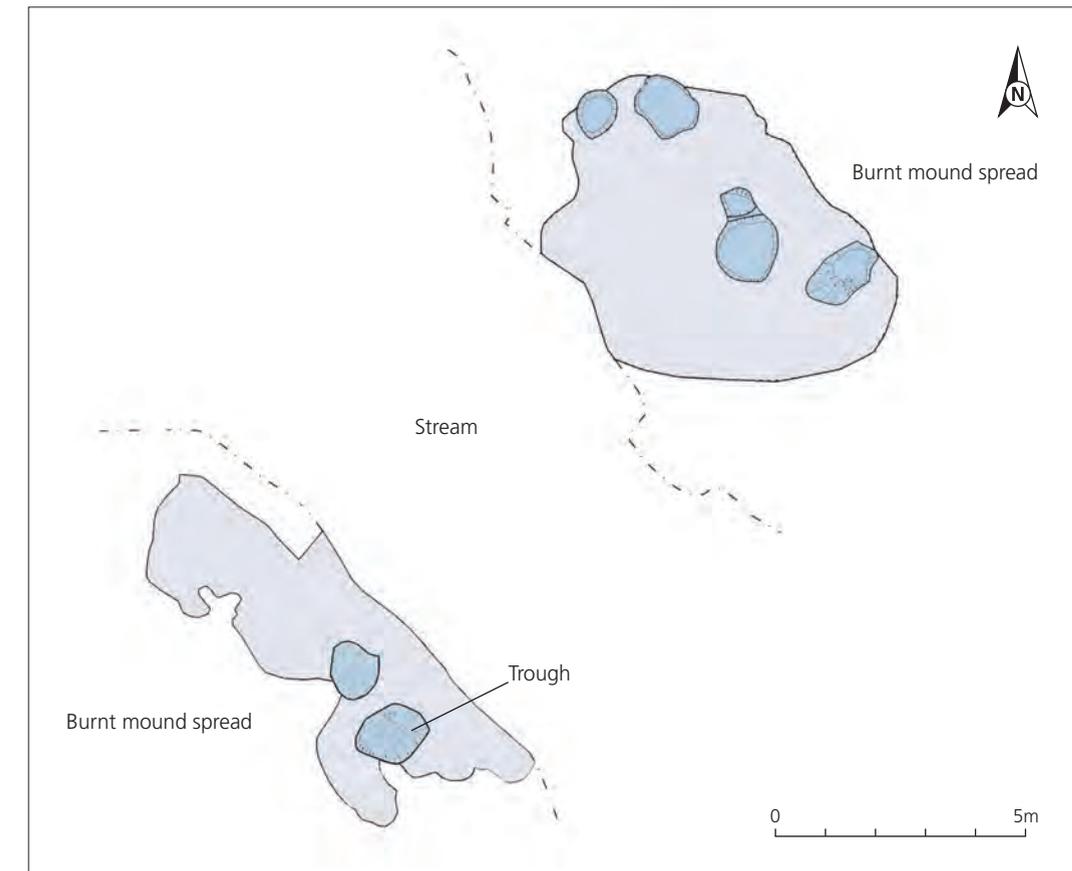
Burnt mounds at Lisbeg (Site 16), note stream between excavation areas © ADS

Early Bronze Age convex scrapers found within the trough and one of the pits at Lisbeg (Site 16) © ADS

0   5cm
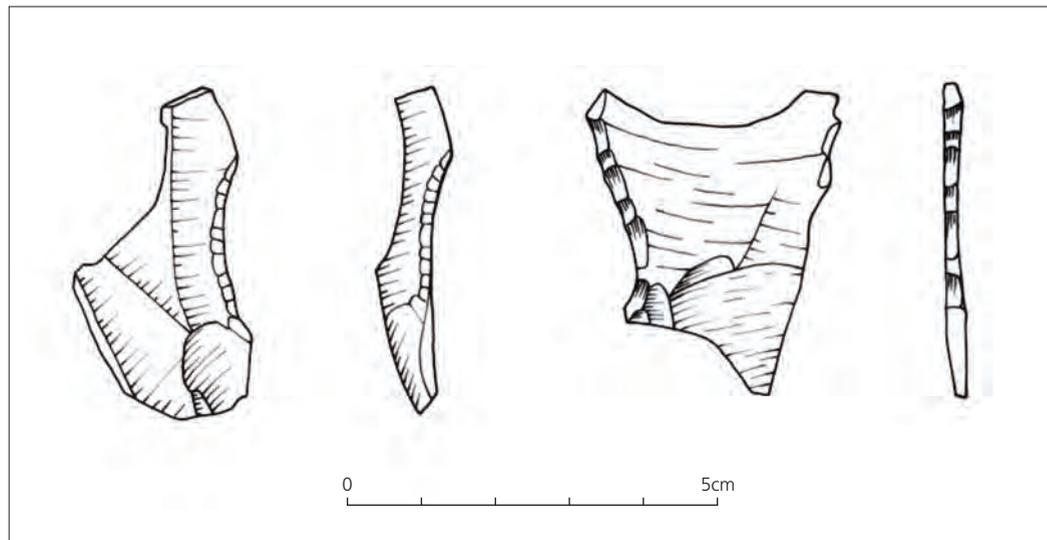
Three Bronze Age burnt mounds were excavated along a stream at Armalughey (Site 25). The first of these dated to the start of the Bronze Age, 2463–2028 BC (UBA-14549, UBA-14550, UBA-14552, UBA-14553) and the second to the end of the Early Bronze Age, 1741–1446 BC (UBA-14551, UBA-14554, UBA-14555, UBA-14557, UBA-14556). The third burnt mound was not radiocarbon dated and may have been Late Neolithic or Early Bronze Age in date.

Burnt mound trough from Armalughey (Site 25) © ADS

The earliest of the dated sites at Armalughey (Site 25) had a burnt mound spread 15m long, 7m wide, and 0.2m thick. The spread covered two troughs, one of which was oval: 1.8m long, 1m wide, and 0.28m deep, and the other rectangular: 1.5m long, 0.7m wide, and 0.22m deep. The rectangular trough had been lined with horizontal alder and hazel timbers held in place by an upright post hammered into the base of the trough. The later burnt mound had a spread 10m long, 4.5m wide, and 0.05m thick. This spread covered two stakeholes, with no evidence for a trough being present. Five shallow pits and two postholes were located immediately east of this spread of material. Their function was unclear.

The final burnt mound had been badly disturbed by later drainage activity. The spread here was 16.5m long, 13m, and up to 0.5m thick. It covered two small pits, each of which was c.0.7m diameter and c.0.12m deep.

Annaghilla (Site 3) had three phases of Early Bronze Age burnt mound activity, all of which were located on the west side of a small stream. The first phase had four large irregularly shaped unlined pits, each of which contained burnt cracked stones. There was no covering burnt mound spread at this site, and only small patches of burnt cracked stones beside the pits remained. The quantity of material deposited suggests that this site was only used once. A few sherds of beaker pottery were recovered and two of the pits were dated to 2465–2286 BC (UBA-14600, UBA-14602).

The second phase of activity was located 5m to the north of the first. The second phase had one oval

trough, three large irregular pits, and three smaller pits. The trough was 1.8m long, 1.5m wide, and 0.4 m deep with a step at its east side. The step clearly indicates that this trough was intended for human access. Eighty six stakeholes immediately east of this step appear to have been part of a small structure related to the trough's use. The dense concentration suggests either ongoing replacement of a small hut at this location, or potentially these were supports for a small wooden platform at the entry/exit point of the trough. One of the stakeholes was dated to 1907–1745 BC (UBA-14603).

The final phase of activity was 50m further north. Here the badly truncated remains of a rectangular trough 1.6m long, 1m wide, and 0.4m deep was excavated. The trough was covered with a burnt mound spread 6.5m long and 3.5m wide; however, this was not the full extent as it continued beyond the edge of the Road Scheme. The trough was dated to 1611–1502 BC (UBA-14601).

Phases at Annaghilla (Site 3) © ADS
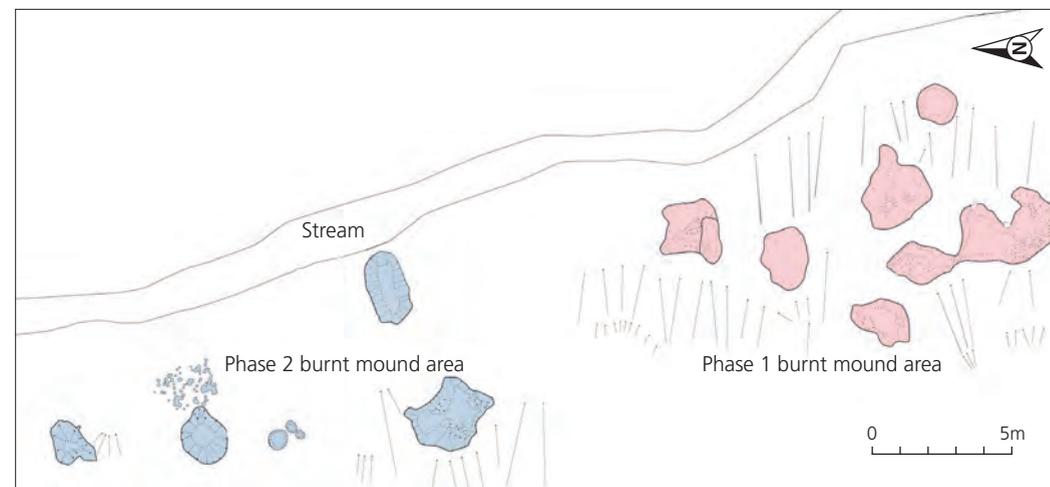
Close up plan of trough and stakeholes at Annaghilla (Site 3) © ADS
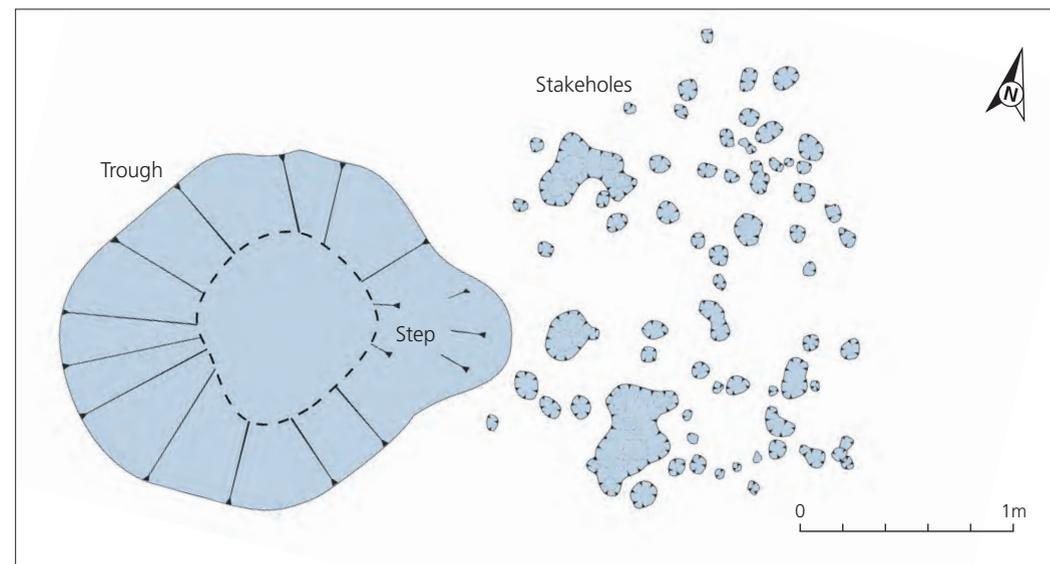
The burnt mound spread at Mullaghbane (Site 29) was 15m long, 5.25m wide, and 0.1m thick. An unlined oval trough 1.3m long, 0.7m wide, and 0.65m deep was positioned beside the spread. Three shallow pits were also located in this area. The burnt mound was dated to 1744–1616 BC (UBA-14534).

Two burnt mounds were excavated at Inishmagh (Site 30). The first had a burnt mound spread 10m long, 6m wide, and 0.2m thick which covered a rectangular trough measuring 1.7m long, 1.25m wide, and 0.5m deep. Willow fragments found within the trough may have been part of a wooden lining. This trough was dated to 1948–1771 BC (UBA-14538). The second burnt mound was located 20m northwest of the first. It was 7.7m long, 5.4m wide, and 0.15m thick and also covered a rectangular trough. This trough was 1.6m long, 1.1m wide, and 0.35m deep; no evidence for a lining was present. This burnt mound was not dated and it is possible that it was not contemporary with the first burnt mound in this area.

The remains of a burnt mound spread, c.5m diameter and 0.1m thick, and four shallow pits were excavated at Mulnahunch (Site 38). The spread was dated to 2408–2205 BC (UBA-14595). A trough measuring 1.4m long, 1.3m wide, and 0.3m deep contained burnt mound material at Roughan (Site 1). The trough was dated to 2286–2133 BC (UBA-14596). The shallowness of the trough and the lack of overlying burnt mound spread suggest that this site was truncated by later agricultural improvements.

A burnt mound trough and thick layer of burnt mound spread were recorded in the first phase of activity at Drumnafern (Site 48). The trough was 1.9m long, 0.65m wide, and 0.3m deep, and was lined with clay. The trough was dated to 2348–2134 BC (UBA-14617). The site was then abandoned and a layer of hill wash covered it prior to its reuse in the Middle Bronze Age (See below).

Middle Bronze Age burnt mound sites

As well as at Lisbeg (Site 6), Middle Bronze Age burnt mound evidence was recorded at Drumnafern (Sites 48 and 49), Annaghilla (Site 4), and Cullenfad (Site 45). At Drumnafern (Site 49) an unlined oval trough (1.95m long, 1.25m wide, and 0.68m deep), a large pit (1.7m long and 0.95m wide) and three pits which had been truncated by later drains were recorded. The truncated pits were covered by the western extent of a large burnt mound spread. This spread also covered a series of pits dated to the Late Bronze Age. It is likely that the spread is the combined material from both phases of activity. The trough was dated to 1689–1516 (UBA-14610), and the pit to 1644–1450 BC (UBA-14612).

A large trough, 2.4m long, 1m wide, and 0.5m deep, was excavated at Drumnafern (Site 48). It was within a burnt mound spread measuring c.6m diameter and 0.33m thick. It was located 7m northeast of the Early Bronze Age burnt mound in this area (see above). The trough had wooden planks lining

Drumnafern (Site 49) site plan showing phases of use © ADS
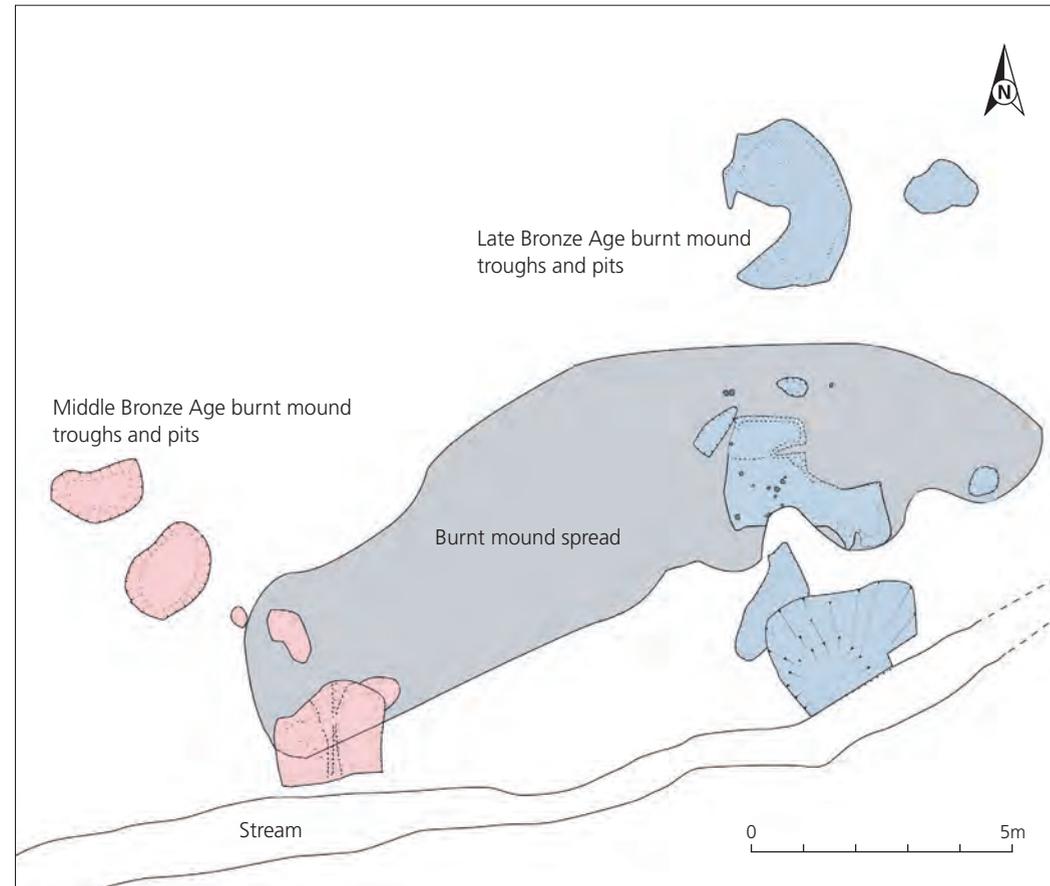
its base. Posts which were placed at each corner probably held planks to line the walls of the trough. Burnt organic material, either moss or wattle, was found along the edge of the trough which indicates that packing material had been inserted behind the wooden plank wall lining. The trough was dated to 1611–1431 BC (UBA-14618).

A spread of burnt cracked stones and charcoal c.5m in diameter was uncovered at Annaghilla (Site 4) and was dated to 1411–1257 BC (SUERC-21327). No trough or pits were present at this location; however, as the burnt spread was located at the very edge of the excavation area it is possible that associated features lay beyond the road take to the east.

A burnt mound spread c.8m long, c.7m wide, and 0.1m thick covered a trough at Cullenfad (Site 45). The trough was rectangular, measuring 2.55m long, 1.6m wide, and 0.2m deep. Its base was lined with wooden planks which were dated to 1129–971 BC (SUERC-23233).

Late Bronze Age burnt mound sites

As well as Lisbeg (Site 6), Late Bronze Age burnt mound evidence was recorded at Cavankilgreen (Site 13), Annaghilla (Site 5), Drumnafern (Site 49), Drumnafern (Site 48), Drumnafern (Site 52), and Armalughey (Site 18). At Cavankilgreen (Site 13) a large burnt mound trough measuring 2m long, 1.5m wide, and 0.5m deep was recorded. The base was covered with timber planks and the sides had been lined with split logs. The basal fill of the trough was dated to 802–750 BC (UBA-14467).

An oval burnt mound trough 1.4m long, 1m wide, and 0.6m deep was excavated at Annaghilla (Site 5). It was covered by a small spread of burnt cracked stones 4.2m long, 1.8m wide, and 0.23m thick. The trough was dated to 1056–906 BC (UBA-14607).

Several burnt mound spreads were found overlying peat deposits at Gorey (Site 39). No associated pits or troughs were found and the burnt mound spreads were dated to 1009–894 BC (UBA-14609).

The second phase at Drumnafern (Site 49) was dated to 896–774 BC (UBA-14613). The burnt mound spread (which also covered some of the first phase burnt mound pits) overlay 11 pits, one posthole, and three stakeholes. The largest of the pits was 2.7m long, 1m wide, and 0.7m deep. The stakeholes and posthole formed no distinct pattern to indicate a specific structure. There was no evidence for lining in any of the pits.

The second and third phases at Drumnafern (Site 48) were associated with a burnt mound spread 11m long, 7m wide, and 0.34m thick. This spread covered an unlined trough c.0.8m diameter and 0.25m deep, the fill of which was dated to 1028–835 BC (UBA-14616). The trough was then enlarged to 2.1m long, 1.05m wide, and 0.35m deep. The base of the trough was lined with oak planks; a stakehole found at one corner may also suggest that the walls were originally lined. The fill of the widened trough was dated to 748–402 BC (UBA-14615). It is clear that the widening was intentional and as such the two troughs must have been broadly contemporary in date. A shallow pit under the burnt mound spread returned a date of 2409–2194 BC (UBA-14619). Stratigraphically it was contemporary with the trough, and therefore the earlier date was most likely due to residual material from the first phase of activity finding its way into this pit.

A very large burnt mound trough c.2m in diameter and 1.55m deep was recorded at Drumnafern (Site 52). It lay at the north side of a c.15.5m-diameter and 0.12m-thick burnt mound spread. The spread was dated to 1211–1006 BC (UBA-14622) and the trough to 1112–895 BC (UBA-14623). Twenty-eight stakeholes located to the west of the trough were likely to have supported a small windbreak.

Alder vessel at Drumnafern (Site 52) in-situ © ADS

Collapsed roof timbers in trough at Drumnafern (Site 52) © ADS

A cylindrical, bottomless vessel formed from the hollowed-out trunk of an alder tree had been inserted into the subsoil on the west side of the burnt mound spread. It had been manufactured using metal tools,[91] and measured 490mm diameter internally and 48mm high. The vessel had been secured in place with four wooden pegs and had filled with organic peaty material which contained some whole hazelnuts, a range of marginal land plant seeds, and aquatic insect remains. The insect remains show that the vessel was at least partially submerged, while the plant seeds are indicative of the surrounding environment. It is unclear what the function of this vessel was, as while hazelnuts were found within it, they will rapidly rot in waterlogged conditions and as such it is unlikely this vessel was used for their storage. The vessel was dated to 1210–840 BC (UBA-14625, UBA-14626 and UBA-14627) and as such was contemporary with the burnt mound. Also in this area was a second oval trough 3m long, 2m wide, and 0.8m deep. The trough was partially lined with stones. Timber found within the pit appeared to have collapsed into it from above, which may indicate that the pit had been roofed. The trough was dated to 903–806 BC (UBA-14624).

The final Bronze Age burnt mound site recorded was at Tullyvar (Site 11) where a thin burnt mound spread c.6m long and c.2.5m wide covered a sub-rectangular trough 1.8m long, 1.2m wide, and 0.3m deep. The trough had small postholes in each corner and was dated to 1111–914 BC (SUERC-20644).

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The Iron Age

From around 700 BC to 400 BC[3] there was a transition from the Bronze Age to the Iron Age with the gradual introduction of new technologies: bronze was superseded by iron, stone implements fell out of use, and ceramic pottery appears to have been mostly replaced with vessels made from leather or wood. Decorative metal artefacts, glass, and amber jewellery, as well as new weapon types were created. These artefacts all fall within the 'Celtic' tradition which is found across much of Europe at this time.

The continuation and proliferation of heavily fortified settlements and defensive earthworks, combined with the increase in weapon types, indicates that this was a turbulent time in Ireland. This is reflected in the mythology surrounding the Irish Iron Age, as depicted in the Ulster Cycle of tales involving Cu Chulainn, 'The Hound of Ulster', the Red Branch Knights, and the infamous Cattle Raid of Cooley. Indeed, the seat of the High Kings of Ulster recorded in these myths is at Emain Macha, now known as Navan Fort, a few kilometres southeast of the road from Dungannon to Ballygawley, where extensive Iron Age activity has been recorded[4].

Historical evidence

At the beginning of the fifth century the area of the Road Scheme lay within the territory of *Airgialla*, or 'hostage givers'[5]. Initially the territory was controlled by seven different tribes, with the road scheme lying between the lands of the *Airthir*, *Ui Thuirtri*, *Ui Chremthainn* and *Ui Nadsluaig* tribes[6,7]. By the 11th century the territory of *Airgialla* had been subsumed by the *Ui Neill* tribe, whose territory originally covered modern Donegal and parts of Co. Londonderry and Fermanagh[8]. The *Ui Neill*, or O'Neill, continued to control Tyrone for the next 600 years (see proceeding chapters).

Iron Age settlement sites - Focus on Annaghilla (Site 4)

A number of sites along the Road Scheme uncovered evidence for Iron Age settlement, either in the form of structures or longer and phased occupation of an area. This continuation of occupation was most noticeable at Annaghilla (Site 4). Here it appears that the early medieval enclosure was an enlargement/replacement for an earlier Iron Age enclosure.

15th-century reproduction of Ptolemy's map of Ireland
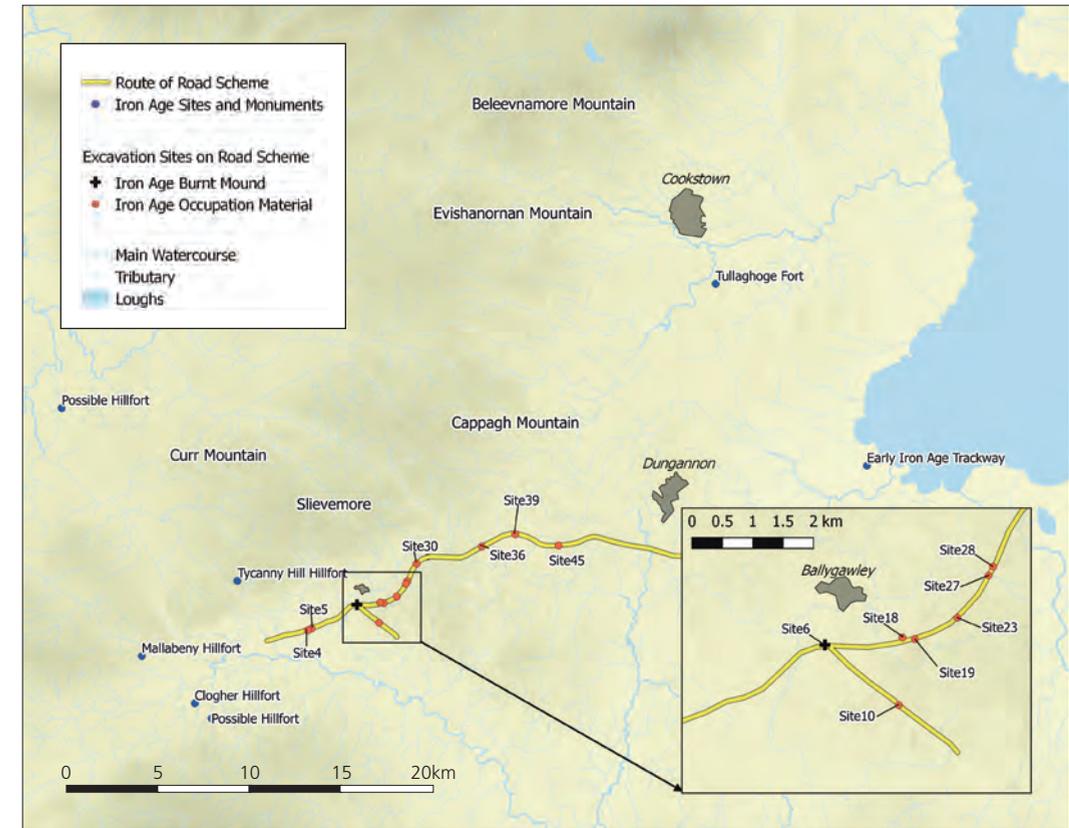
Location of Iron Age sites on Road Scheme, and nearby archaeological sites which are listed as having Iron Age occupation periods within the DOE: HED Sites and monuments record

Three phases of activity were present at Annaghilla (Site 4), spanning the Middle and Late Iron Age. The earliest phase of Iron Age activity at Annaghilla (Site 4) was represented by three postholes. Charcoal and burnt bone from these postholes provided radiocarbon dates of 393–186 BC (SUERC-21329, SUERC-21633, SUERC 21326). The postholes were in an area that had been disturbed by later, early medieval graves. It is possible that these postholes originally formed part of a structure, but all evidence has been lost due to the later activity (the second phase comprised burial activity, and is discussed below).

The third and final phase of Iron Age activity on the site ran from the Late Iron Age into the start of the early medieval period. Two sections of curving gully, postholes, and pits all partially followed the inner edge of the early medieval enclosure ditch. These features were present at the north-eastern side of the site, but had been destroyed by the enclosure ditch to the north, south, and west. Charcoal from two postholes at the entrance through the gullies and from one of the pits provided radiocarbon dates of AD 338–577 (SUERC-21643, SUERC-21656, and SUERC-21660). Given the location and alignment of the features they would appear to represent an enclosure which immediately preceded, and was then replaced by, the later early medieval enclosure. When the larger enclosure ditch was dug any bank would then have covered these earlier features.
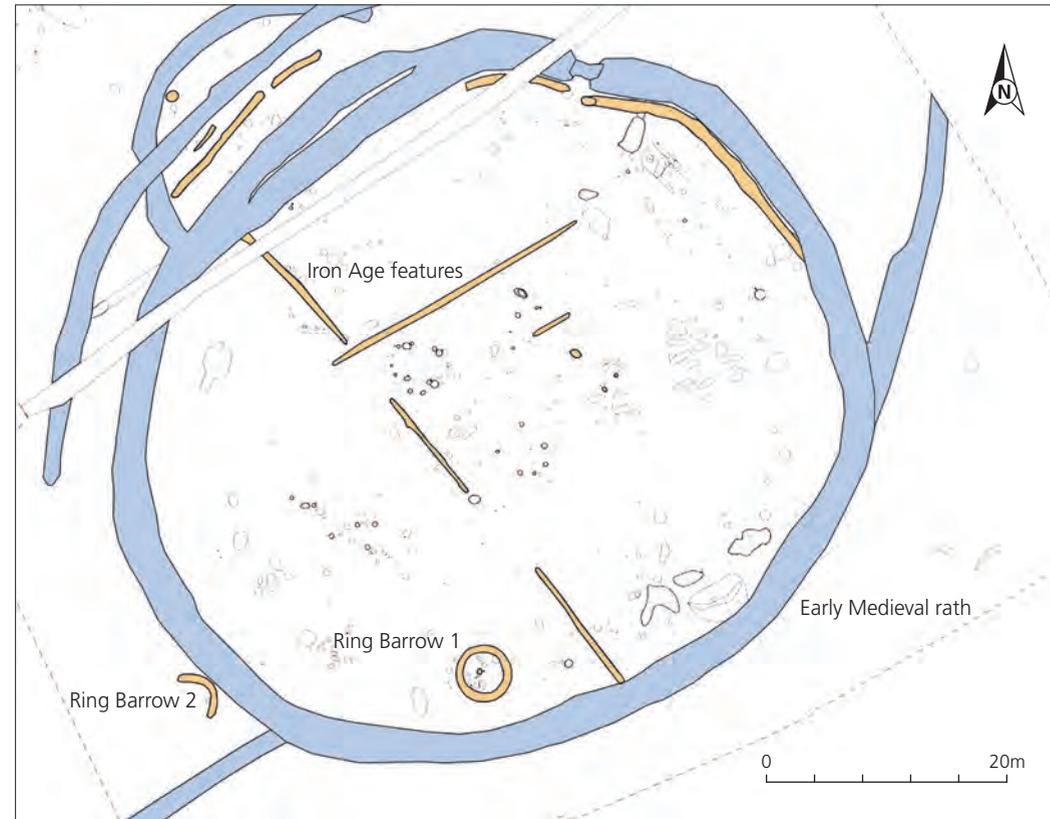
As well as the Earlier and Later Iron Age settlement at Annaghilla (Site 4) the Middle Iron Age sees a period where the land was divided up and burial took place. Gullies, hearths, and the remains of at least two ring barrows and a cremation burial were all present during this second phase of the site.

A series of segmented gullies ran southeast to northwest across the site with perpendicular gullies, orientated northeast to southwest, joining them. Although these gullies were present inside the early medieval enclosure they were cut by the ditches and radiocarbon dates from two of the gullies show that they date to 211–41 BC (SUERC-21654, SUERC-21321).

Two isolated hearths also dated to this phase of the Iron Age. Burnt animal bone from one of the hearths produced a radiocarbon date of 209–37 BC (SUERC-21632) and alder charcoal from the second hearth radiocarbon date of 165 BC–AD 54 (SUERC-21651). The second hearth also contained a small blue glass bead.

Cremation had been the dominant funeral rite during the Bronze Age and the practice continued during the Iron Age[9] alongside the emergence of inhumation. A variety of practices has been observed, but the most commonly identified Iron Age burials found in Ireland are located within barrows[10]. Iron Age barrows have a tendency to be smaller than their earlier Bronze Age counterparts.

The two ring barrows at Annaghilla (Site 4) were located in the south-western part of the site and to the west of the gullies. The complete ring barrow was 5m in diameter and the ditch was 0.30m deep; it was located just inside the early medieval enclosure, but pre-dated it and would have been covered by the bank. A pit had been cut into the centre of the ring barrow and the cremated remains of a female adult were then deposited. Bone from the cremation produced a radiocarbon date of 195–42 BC (SUERC-21308).

A second, badly disturbed, ring barrow lay to the west of the burial. Although there was no dating evidence from this example its association with the complete ring barrow would suggest that the two were contemporary. The association between the gullies and the barrows is not clear, but perhaps the gullies were designed to divide the land between that used for funerary purposes, and that used for settlement.

Like Annaghilla (Site 4) the excavation at Mullaghbane (Site 27) uncovered the remains of an early medieval enclosure (discussed in proceeding chapter) that was predated by Neolithic, Bronze Age and Iron Age activity. The Iron Age activity was less substantive than at Annaghilla (Site 4), comprising two pits, an occupation spread and a linear slot.

The two pits, of unknown function, dated to 360–45 BC (UBA-14560, SUERC-14562). One contained a small bone bead. Three features dated to the Late Iron Age: charcoal from a pit and a spread of occupation material returned radiocarbon dates of AD 332–534 (SUERC-21731, SUERC-21715). A

linear slot, possibly a wall slot from a building, returned a radiocarbon date of AD 328–431 (SUERC-21732). The fill of this slot also produced evidence for iron working in the form of hammerscale: small fragments of iron thrown up during the smithing process[11]. If this slot did not form part of a blacksmithing building then iron working was clearly taking part within the near vicinity. Other features internal to the rath may also have dated to the Iron Age and been associated with this activity.

Bronze Age ring barrow

Iron Age occupation spread

Rath ditch

Early Medieval souterrain

Iron Age slot

Edge of excavation

Iron Age occupation spread

Undated slot

Iron Age pits

0   20m
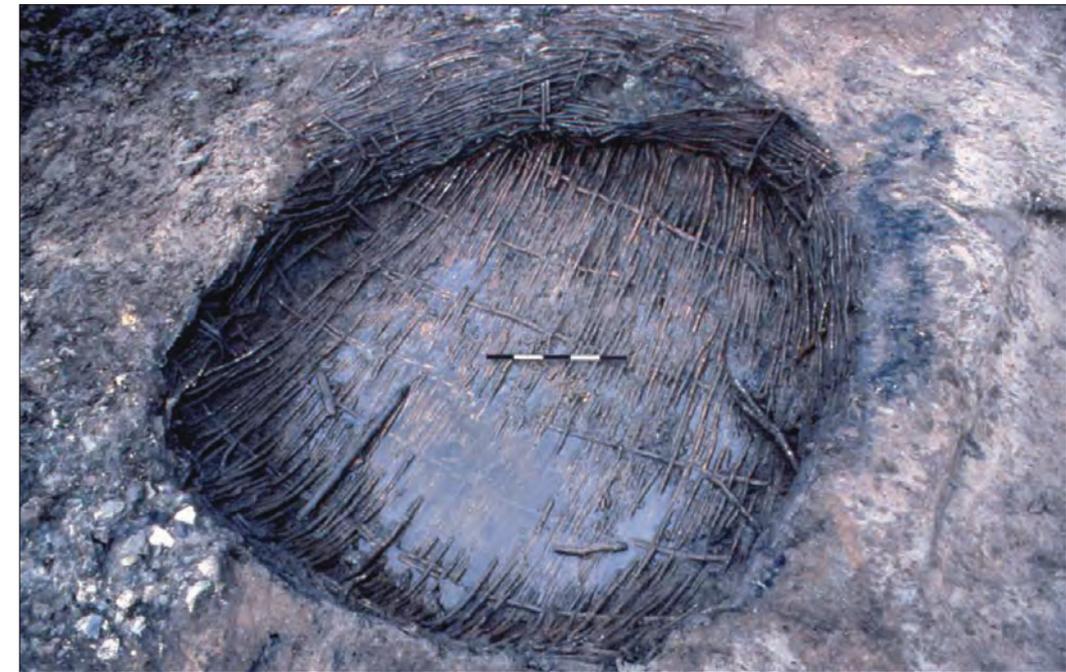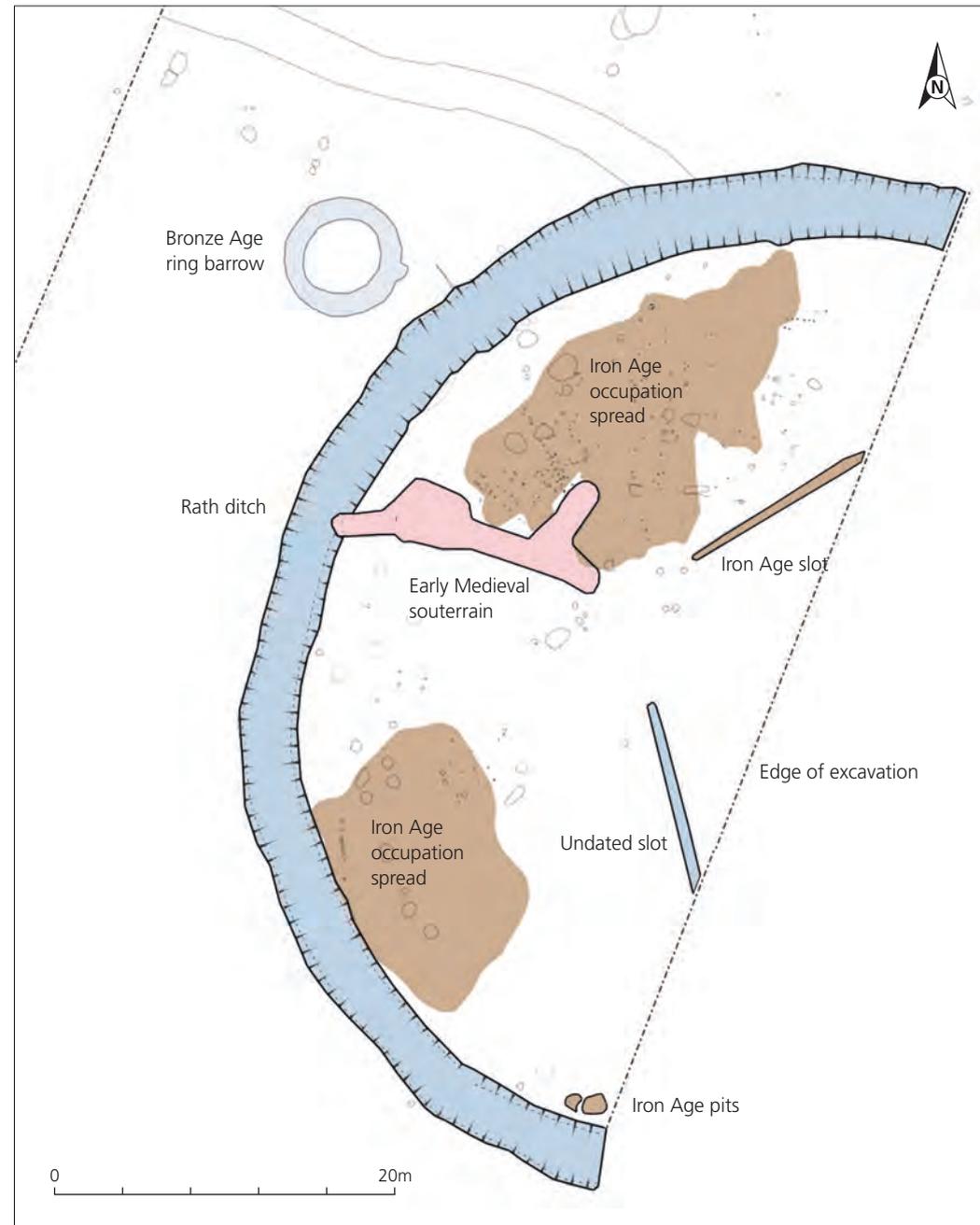
Wicker lined trough at Lisbeg (Site 6)

Burnt mounds – Focus on Lisbeg (Site 6)

While burnt mounds are predominantly Bronze Age in date, there are an increasing number of examples dated to the Early and Middle Iron Age with numbers then decreasing until the latter early medieval period when there is a renaissance in their use[12]. On this Road scheme only Lisbeg (Site 6) contained an Iron Age burnt mound. At this site a plethora of burnt mounds were excavated and recorded. These dated from the Neolithic, through to the latter part of the early medieval period, Burnt Mound 19 was however dated to the Middle Iron Age.

This burnt mound had a large oval trough, 2.5m long, 1.9m wide and 0.5m deep. The trough had been lined with brushwood and moss on top of which a hazel wicker base and sides was constructed. Collapsed wicker from around the sides of the trough indicates that it once stood nearly 0.5m higher than excavated. The sides were probably supported by the surrounding peat into which the trough had been excavated, rather than standing proud of the ground surface. The moss lining would have acted as a filter for water seeping into the trough. This indicates that clean water was required for the activities associated with this trough and therefore 'dirty' processes such as extracting grease or tallow, dying cloth, fulling wool and working leather were unlikely; while brewing beer, cooking or bathing are possible. It was also of note that the function may have been different to the simpler troughs which both pre and post-date this burnt mound. Patches of burnt mound spread were located around the trough. These were up to 0.3m thick, suggesting an extensive period of use for the trough.

Located immediately south of the burnt mound was a hearth which measured 1.1m long, 0.65m wide and 0.13m deep. Three stakeholes beside the trough and the hearth may indicate that there was a light structure associated with the burnt mound during its use. Wattle within the trough was dated to 384–204 BC (SUERC-23208), one of the stakeholes was dated to 380–203 BC (SUERC-23213). A small isolated pit 50m south of Burnt Mound 19 was dated to 396–208 BC (SUERC-20606), and as such may have been a contemporary period of activity with the burnt mound. The pit contained burnt bone and may have been a small hearth.

Other Iron Age evidence

A number of other sites along the Road Scheme produced evidence for Iron Age activity. All of this evidence is based on radiocarbon dates that were produced from single features, such as isolated pits and postholes.

At Cravenny Scotch (Site 23) the remains of a sub-circular hut, 6.40m long and 5.55m wide, were present within the northern pit group. The hut was defined by a series of pits and postholes and a gap in the southeast marked the entrance. The hut was dated to 204–49 BC (UBA-14512). The shape and size of the hut would indicate that this was a temporary structure[13], probably the result of people camping as they moved through the area.

Flint projectile from Armalughey (Site 18) © Headland
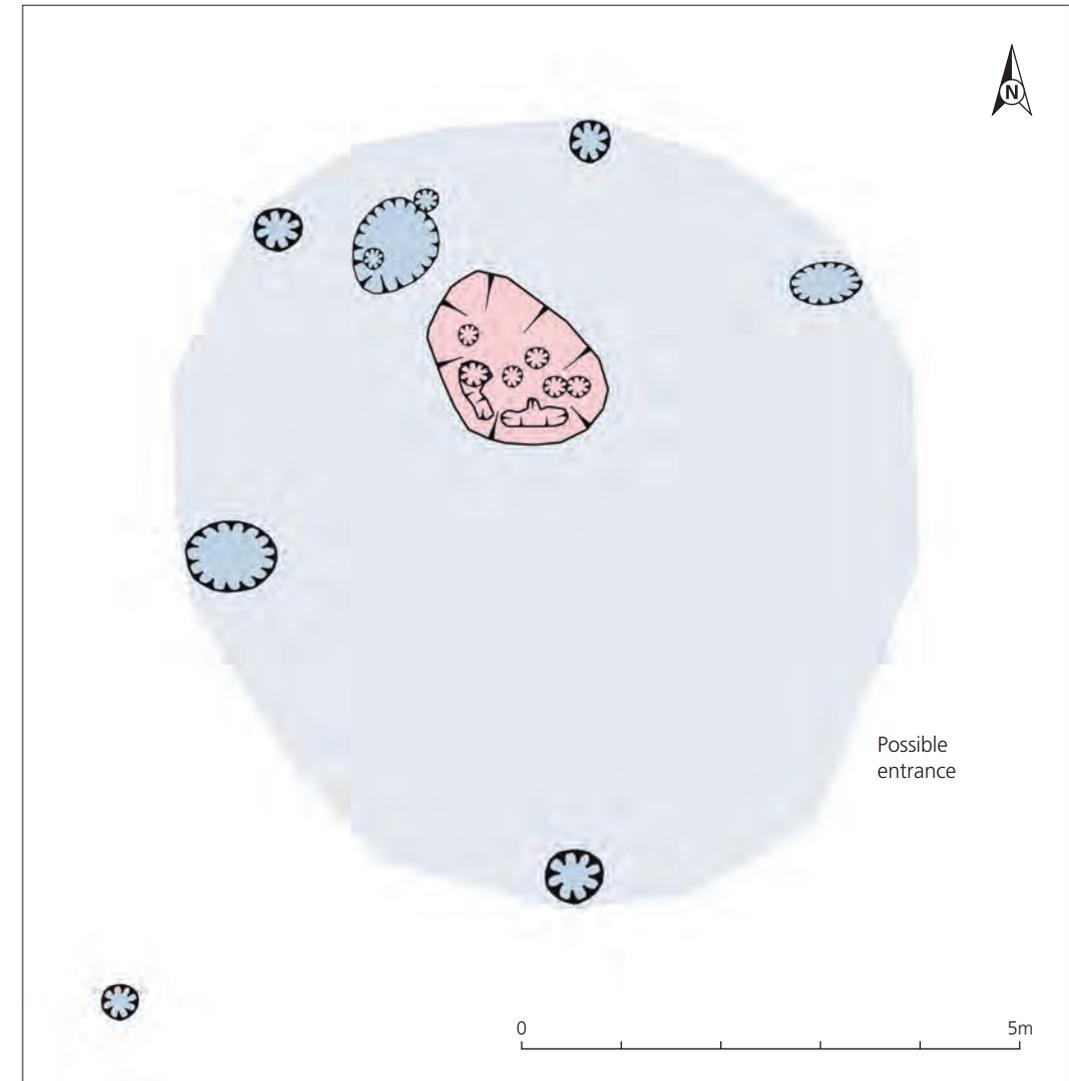
Cravenny Scotch (Site 23) site plan of Iron Age hut © ADS

Possible entrance

An area of over 5000m² was excavated at Armalughey (Site 18), with features ranging in date from the Late Mesolithic though to the medieval period. The Iron Age was represented by the partial remains of a circular structure, several boundary ditches, and a number of pits.

The structure was approximately 7m in diameter and defined by a curving gully. Less than half of it survived, the remainder having been destroyed by a medieval ditch. A number of pits were present within the interior of the structure. The largest of these pits contained a blue glass bead and a large piece of a flint projectile; charcoal from this feature dated to AD 137–355 (SUERC-20758). Several sections of linear gully were also present within this area and, while none of them were dated, they did appear to be related to the structure. These seem to form a Late Iron Age settlement, with a roundhouse and areas of associated features.

Also at Armalughey (Site 18) a single pit dating to the Middle Iron Age (210–46 BC; SUERC-20653) had been cut through the area of the Neolithic house (Structure 1; see Neolithic Chapter). A single grain of wheat recovered from a layer of occupation material at the entrance into the Neolithic house returned a date of 205–49 BC (SUERC-20764). As the stratigraphy clearly showed that this spread must be associated with the Neolithic house the grain is assumed to be an intrusion from the pit, which lay just to the southwest.

The Bronze Age ring barrow cemetery at Cullenfad (Site 45) appeared to show evidence for destruction during the Iron Age. Radiocarbon dates from all of the ring barrows showed deliberate infilling of the ditches during the Early Iron Age period (768–476 BC; SUERC-21136, 754–411 BC; SUERC-21144 and 399–209 BC; SUERC-21145) followed by a period of abandonment when the remainder of the ditches silted up (384–204 BC; SUERC-21142 and 182–52 BC; SUERC-21141).

A single hearth was excavated on the edge of one of the Bronze Age ring barrows. Oak charcoal from the hearth produced a date of 774–482 BC (SUERC-21133) suggesting the hearth was being used around the same period as the infilling of the ditches was taking place. A number of pits and postholes were also excavated inside and in close proximity to the ring barrows. Given the continued occupation of the site from the Neolithic through to the Iron Age it is not possible to definitely associate these features with the ring barrows.

Excavations at Tullyvar (Site 10) uncovered a series of pits, postholes, and wall slots, all of which had been badly damaged by modern farming. While most of these features were associated with Neolithic activity (see Neolithic Chapter) one of the postholes was dated to 401–233 BC (UBA-14474) indicating some form of occupation during the Middle Iron Age.

Inishmagh (Site 30) was a small area, measuring 2.8m north to south by 2.5m east to west. The only feature was an Iron Age, keyhole-shaped, cereal-drying kiln. It worked by lighting a fire at one end and hot air being blown down a short flue to dry the damp cereal grains which were deposited at the far end. Charcoal produced a Late Iron Age radiocarbon date of AD 138–330 (UBA-14536).

In the north-eastern corner of Gorey (Site 39) a series of five pits had been cut into an area of higher, dry ground overlooking Bronze Age burnt mounds and a bog. The pits did not form a structure and their purpose is unknown, but one of the pits was dated to 251–210 BC (UBA-14608).

A series of isolated pits with no clear function was also uncovered at Annaghilla (Site 5) (776–481 BC; UBA-14605), Armalughey (Site 19) (197–55 BC; UBA-14508) and Farriter (Site 36) (AD 135–330; UBA-14588).
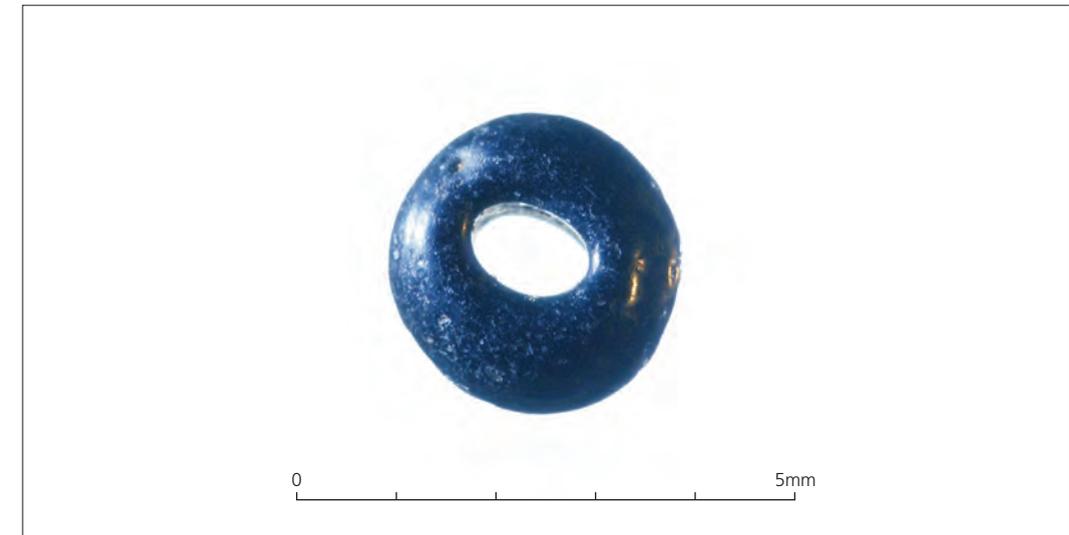
Blue glass bead from Armalughey (Site 18)
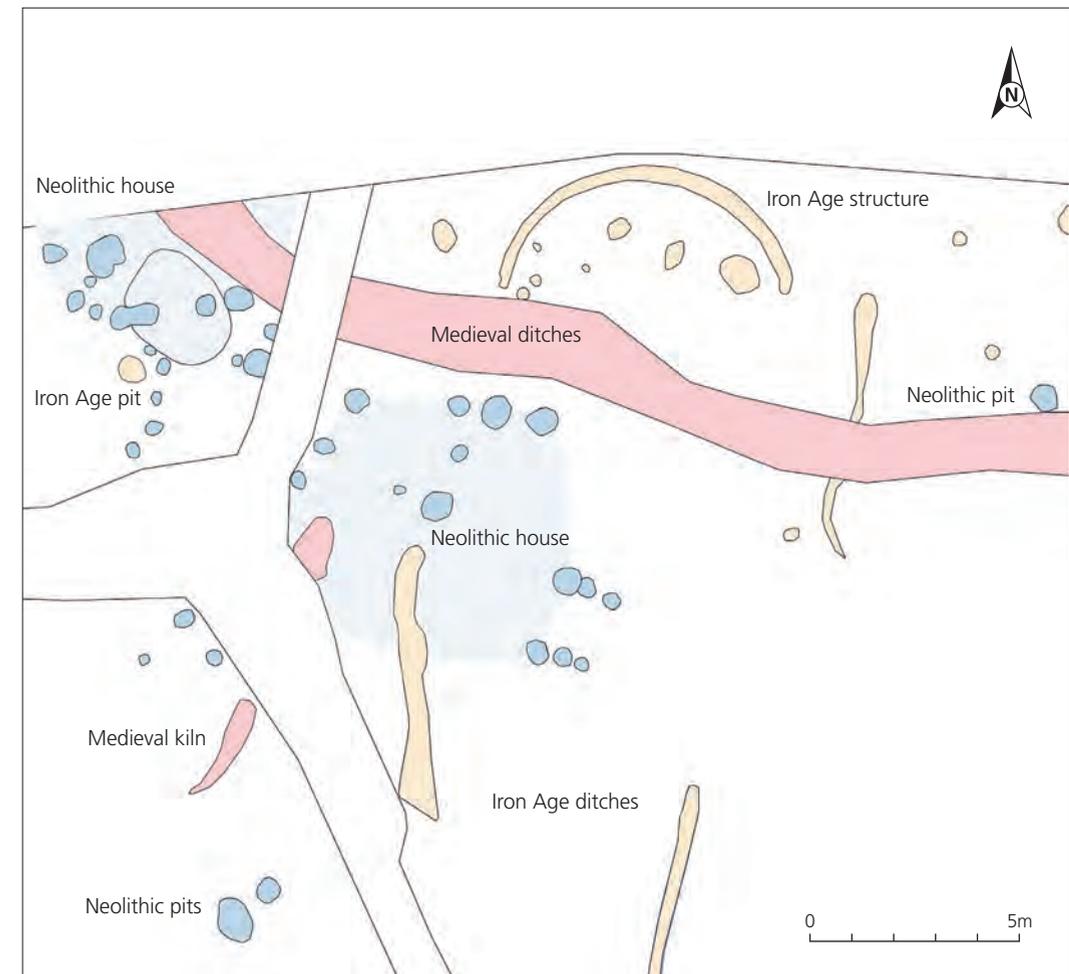
Plan of Armalughey (Site 18) showing Iron Age features in yellow © Headland

Neolithic house

Iron Age structure

Medieval ditches

Iron Age pit

Neolithic pit

Neolithic house

Medieval kiln

Iron Age ditches

Neolithic pits

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Early Medieval Period

The early medieval period begins with the arrival of Christianity to Ireland and ends with the arrival of the Anglo-Normans. While St Patrick is often attributed as being wholly responsible for bringing Christianity to Ireland it is clear that he was but one of a wave of missionaries who brought Christian teachings from the Roman world at this time.[1] With Christianity also came literacy, as the priests who brought the message of God did so through the written word. This marks the change from the prehistoric period, when all records were passed on orally from generation to generation, to the historic period, when the first native written records of the people who lived in Ireland began to be produced.[2]

The majority of the population lived in dispersed farming settlements called raths. These were defensive enclosures containing one or two dwellings as well as other farming structures such as animal pens. Occasional unenclosed houses have also been found but these remain a rarity, and there is little evidence for clusters of houses until at least the late ninth and early 10th centuries AD.[3]

The Tribes of Tyrone

The Road Scheme passed through the territory of the Airgialla, a federation of different people and tribes[4] and an under-kingdom of the Northern Ui Neill centred on modern day Armagh, Fermanagh, Tyrone and Monaghan.[5] The area of the southern Airgialla, and laterally the Road Scheme, was dominated by the Uí Chremthainn,[6] a kingdom whose capital was located at Clogher in Co. Tyrone.[7,8] Lying just to the north of the Road Scheme was the territory of the Uí Thuirtri, whose capital was located at Tullaghoge.[9] By the 11th century the area had come under the full control of the Uí Neill (O'Neills)[10] with Tullaghoge as their dynastic centre and inauguration site.[11]

Map of Co. Tyrone showing the kingdoms, tribes, and their centres of power within the area during the early medieval period
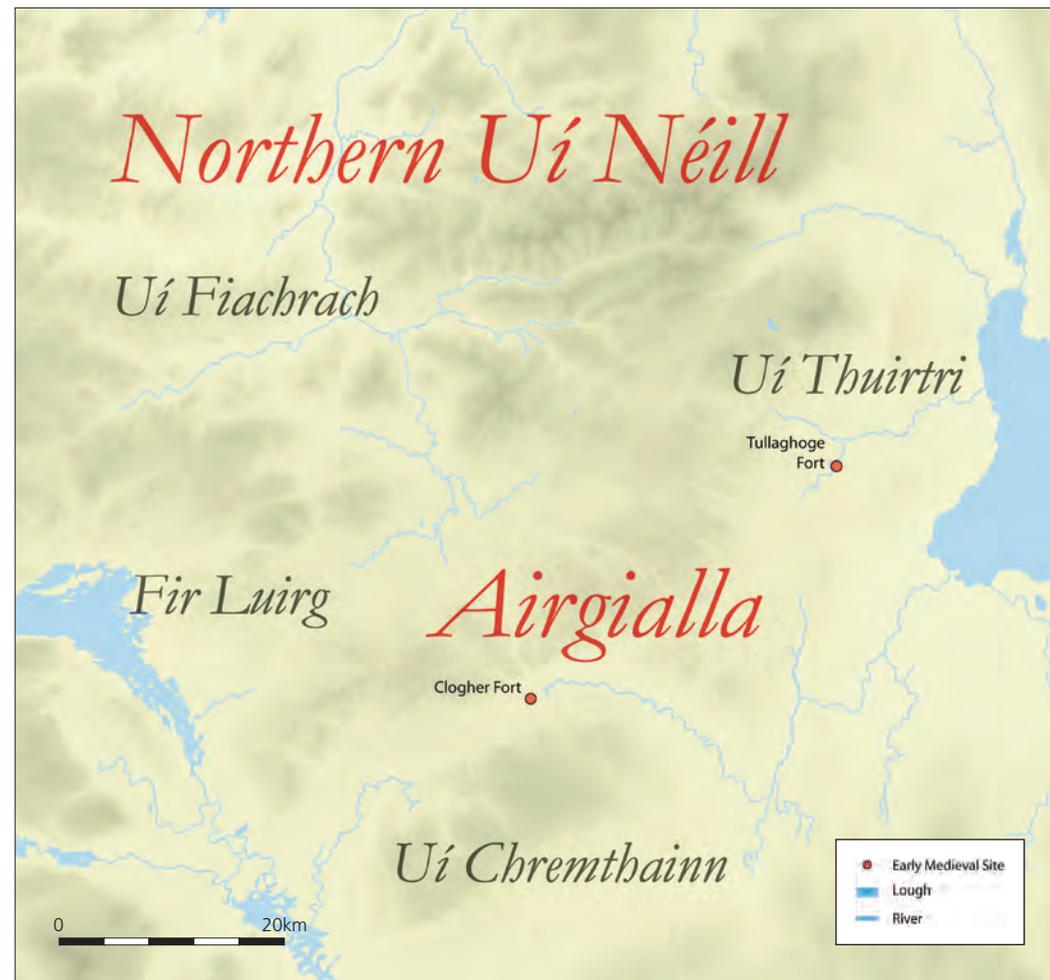
This ornate bull headed iron object was recovered from the early medieval deposits at Clogher hillfort.[12] It is probably part of a 'standard', or perhaps 'lamp-holder', similar to that found at the seventh century AD ship burial at Sutton Hoo.[13] Clogher was notable for its cattle in the seventh century and it may have been made in one of the iron workshops on site, though it is also possible that it was imported from Saxon England. It appeared to have been thrown into the ditch as rubbish, or fell in from a position on the bank (appropriate for a standard or lamp). Two other, similar, objects were also found within the ditch.[14] (BELUM. ACL.304 © NMNI Collection Ulster museum)

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Christianity

One of the key defining factors of the early medieval period in Ireland is the arrival of Christianity and the establishment of the church.

Few early churches are recorded in close proximity to the road scheme, though this may be due in part to the road scheme being located away from major settlements. The only recorded example is a church which is believed to have been located within Grange townland,[15] just south of the town of Ballygawley and on the northern edge of the road scheme. The full title of the church was the Cell Mor Magh Enir ('the big church or monastery on the plain of Enir'), latterly anglicised to the Grange of Moyenner. This early church is mentioned several times in Annals of Ulster,[16] both in reference to abbots that served the church[17] and to it being raided by Vikings in AD 873.[18] Although little else is known about the church the fact that abbots are mentioned indicates that it was probably a monastic settlement, an abbot being the head of a monastery. By 1819, in his Parochial Survey of Ireland, William Shaw Mason notes that although the area was known as a church no remains were visible.[19]

It is probable that other early medieval churches were present but that they were not large or important enough to warrant mention in the Annals and their remains have not yet been identified. It is known that small, early churches were located within circular enclosures very similar to raths.[20] As there are a number of raths in close proximity to the road scheme it is possible that some of these are, as yet, undiscovered church sites.

Some evidence for Christian practices was uncovered during the excavation of the settlement-cemetery at Annaghilla (Site 4). Although no church was uncovered, a series of burials were present within an early medieval enclosure (see below). These burials, while having been interred in what is considered to be a secular site, were buried in west to east orientated graves, with no evidence for grave goods. This type of burial is a Christian tradition and differs from the earlier Iron Age and Bronze Age types, where barrows were utilised and remains were often cremated.

Raths: early medieval defended sites – focus on Tullyvar (Site 11), Mullaghbane (Site 27) and Armalughey (Site 25)

By far the largest number of early medieval sites found in Ireland are raths or ringforts. These are roughly circular enclosures measuring 20m to 40m across, surrounded by one or more ditches and with the earth thrown up from the ditches forming an internal bank. Sometimes the interior is raised with a build-up of soil and the site is then known as a raised rath. The majority of early medieval enclosures are roughly circular in shape, though recent excavations have uncovered D-shaped, heart-shaped and plectrum-shaped enclosures.[21] These non-circular enclosures, in general, have similar chronologies and apparently similar functions to the more common, circular, raths.[22]

Killyliss Rath[23,24] is located 4km west of Dungannon and lies on the north side of the A4 road. The rath is bivallate, with a very substantial outer bank and ditch enclosing a smaller shallow inner bank and low ditch. The enclosure is c.50m in diameter with the inner occupation area c.22m in diameter. Small scale excavations in 1965 uncovered evidence for occupation in the form of hearths. Souterrain ware pottery and lignite bracelets and a ring-headed pin were recovered. © DOE: HED

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Within the enclosure there would generally be one or two small houses and sometimes an underground passage capped with stone or wood, known as a souterrain. The houses tended to be round at the start of the period and rectangular towards the end.[25] In both types the walls were built of post-and-wattle and the roofs were thatched.[26] These wicker houses had a relatively short lifespan, 10–20 years, and at a number of sites there is evidence for rebuilding of houses over the footprint of collapsed earlier structures.[27] There is some evidence for deliberate floor covering, with gravels, clay and brushwood surviving in the archaeological record. It is also likely that straw, reeds and other more bio-degradable plant material was used for flooring.[28]

Souterrains in Ireland are generally considered to be early medieval in date, with most dating to the period after AD 700,[29] but their function is a matter of debate. The most frequent explanations are that they were used either for food storage or for refuge.[30] In an era of pre-refrigeration, low constant temperatures would be maintained underground, and it is possible that souterrains acted as a larder for perishables — milk or butter — that would quickly spoil above ground in the heat. Souterrains also appear to have been used in times of danger to keep people and personal possessions safe, and there are references to raiders going into souterrains for loot.[31]

Tullyvar (Site 11) was located on the southeast-facing slope of a drumlin. The excavation exposed a two-phased early medieval enclosure. The Phase 1 enclosure comprised a sub-circular area measuring approximately 24.5m northwest to southeast by 21m internally, with a 2.5m wide entrance on its east side. It varied in both width and depth, being a maximum of 2.6m wide by 1m deep at the northeast, beside the entrance, although this was reduced on the northwest and west where it was an average of 1.5m wide and 0.7m deep. It is likely that the enclosure had an inner bank running concentrically with the ditch; however, no evidence for this feature survived. The Phase 2 ditch was larger, having at least a c.30m diameter. The Phase 1 ditch dated to AD 569–649 (UBA-14470) and the Phase 2 ditch to AD 576–654 (UBA-14469). A similar arrangement of ditches was seen at Twomileborris, Co. Tipperary, where a rath was enlarged by the addition of a larger ditch creating a separate area.[32] This area was used for industrial purposes, moving the industry out of the original rath site.[33] While the rath at Twomileborris provided evidence for several houses there were no definite structures found within the enclosure at Tullyvar (Site 11). However, the generally shallow nature of the evidence for structures from this period can result in a lack of preservation.[34]

Map of early medieval sites excavated on this Road Scheme and nearby sites listed on the DOE: HED Sites and monument record
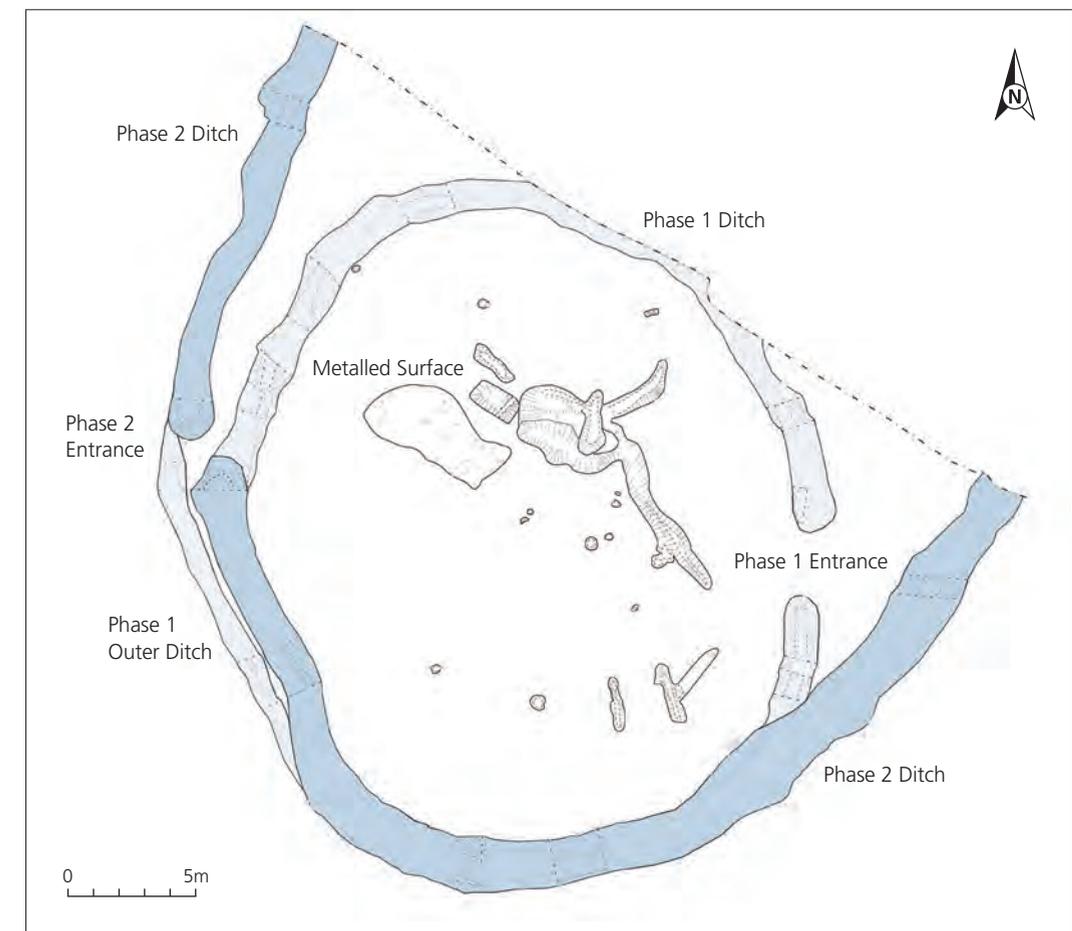
Tullyvar (Site 11) Site plan showing the early medieval Phase 1 (light grey) and Phase 2 (light blue) enclosures © Headland

Unidentified fragments of un-burnt animal bone, burnt animal bone, and charcoal were recovered from the ditches at Tullyvar (Site 11), with the highest concentration noted at the entrances. This material was most probably deposited through intentional use of the ditch as a refuse dump. The material was deposited at the terminals, as the surrounding internal bank would have prevented easy access to the remainder of the ditch. Analysis of the archaeo-botanical material showed that the ditches also contained frequent blackberry and raspberry seeds, along with common nettle seeds. Charred barley and fragments of cattle and pig bone and teeth were found within features belonging to both phases of the site. There was also evidence for small-scale ironworking, with metal slag, a hearth base, and a tuyère fragment recovered. The most significant artefact recovered was a bronze spiral-ringed, loop-headed pin found within one of the pits. Rings of this type date from the early fifth to the ninth century AD.

Ring pin from Tullyvar (Site 11)
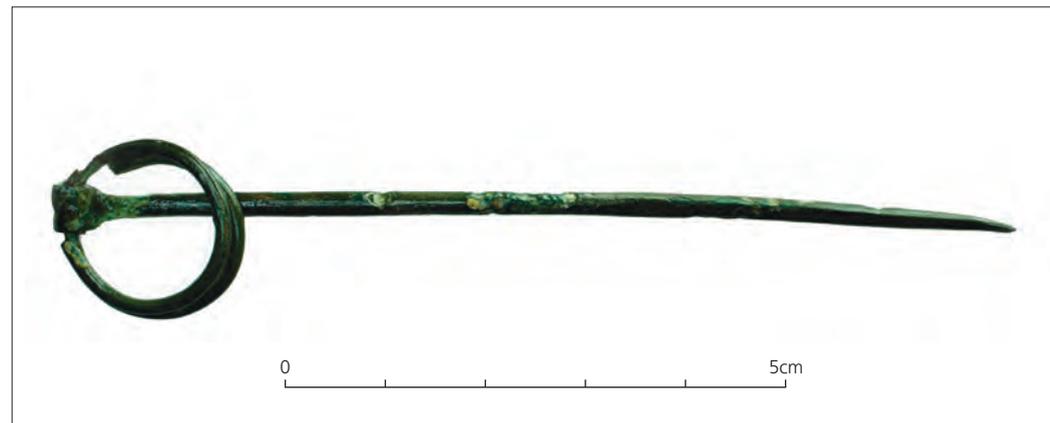
Tuyère from Tullyvar (Site 11)

Top   Bottom
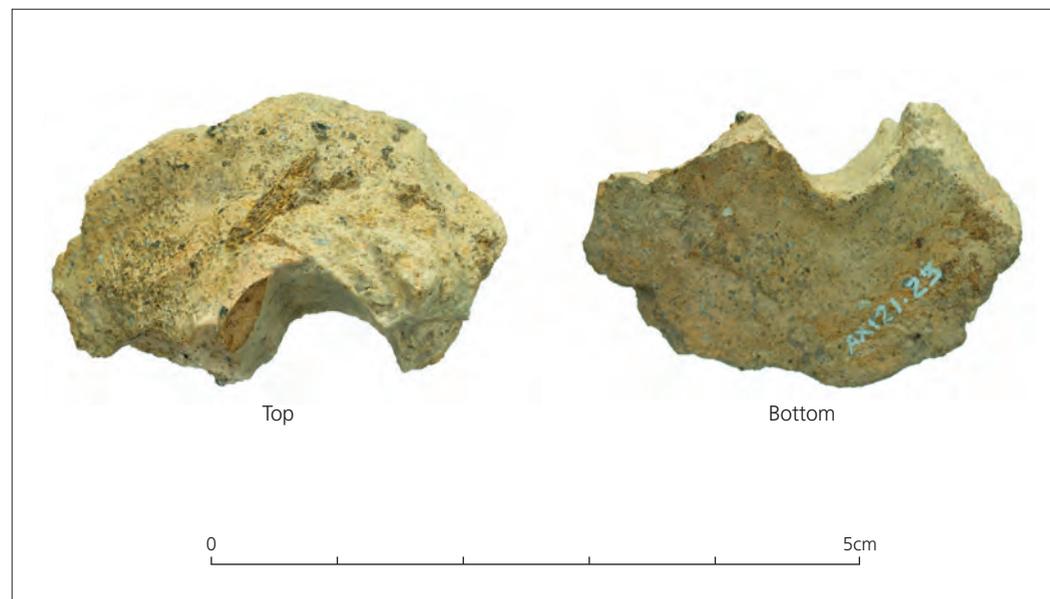
The rath provided evidence for smithing, with iron slag, a hearth base and a tuyère recovered. A tuyère is a piece of moulded clay, formed around the nozzle of a bellows and used to protect the bellows from the heat of the furnace. It also acted as a channel through which air from the bellows was blasted into the furnace.[35,36] It could have been employed during a number of different stages in the metalworking process: including smelting, bloom-smithing, and forging. While the tuyère itself cannot be used to determine which of these processes occurred at Tullyvar (Site 11), the presence of both smithing slag and the smithing hearth bottom means it is likely that the tuyère was utilised during the smithing process, the point when artefacts would have been forged. While these metalworking remains are undated, they were found on an early medieval rath, dated to the sixth–seventh centuries AD and would be consistent with this period.

Ironworking requires several different processes. Firstly the ore has to be mined and roasted. The roasted ore is then smelted in order to extract the iron. The extracted iron then undergoes bloom-smithing, a process which removes impurities and refines the iron. Finally the iron is forged into the required item.[37] There are no known sources of iron ore located near to the site, although bog ore may have been exploited,[38] as was the case at Mullaghbane, Co. Tyrone.[39] Once smelted and the bloom iron was collected, it would have required further reheating and refining to produce the finished artefact.[40] These processes were likely to have been undertaken by specialised skilled craftsmen[41] although the extent of small-scale ironworking evidence found on raths indicates that there was widespread knowledge and skills sufficient enough to allow for small-scale ironworking or repairs to be undertaken by the general population.[42, 43]

Considering that the ironworking evidence at Tullyvar (Site 11) consists of probable smithing remains, it is this process which appears to have occurred on the site. The relative small amount of smithing evidence does suggest that the ironworking was of a low level, and probably consisted of the site occupants producing or repairing a small number of iron tools for themselves. Similar evidence for ironworking was also uncovered at another rath site excavated on the Road Scheme, Annaghilla (Site 4).

Mullaghbane (Site 27) archaeologists providing scale for the rath and the souterrain © Headland

Mullaghbane (Site 27)
Aerial photograph of
the rath and souterrain,
the earlier Bronze Age
barrows can be seen
to the left of the rath ©
Headland

Mullaghbane (Site 27) and Armalughey (Site 25) were two adjacent sites which had been the location of settlement and burial from the Mesolithic period onwards. This settlement continued into the early medieval period when a rath and souterrain were constructed on the site. Dating of the ditch and a number of the internal features has shown that the occupation of the rath was at its peak during the eighth and ninth centuries before going into decline. There is some evidence that the ditch was re-cut during the medieval period, but this appears to have been a small-scale re-use of the site. Due to the limits of the Road Scheme area only the western half of the rath was excavated, the remainder being preserved in situ.

The rath was approximately 32m in diameter and the ditch was 4.30m wide and varied between 1.30m and 1.50m deep. Radiocarbon dates from the fills of the ditch revealed that the ditch had infilled quite significantly by AD 661–777 (SUERC-21751) but then had been recut and reused during the eighth or ninth centuries before silting up again between AD 894–1016 (SUERC-21752). Finally, a slot or furrow, dating to AD 1022–1155 (SUERC-21744) cut across the upper fill of the ditch indicating that the ditch was completely infilled by this date.

Within the area of the rath were the remains of a Y-shaped, earth-cut souterrain. The souterrain was approximately 8m long and would have been entered through a pit-drop style entrance.[44] A small chamber lay on the northern side of the souterrain and a larger chamber lay at the western end of the passage. A separate passage allowed access/escape from the chamber into the ditch of the rath. There was no indication that the souterrain had ever been stone or wood lined. Several postholes were present and their positioning suggests that they were used to support the roof and possibly to create gates to allow the passage to be blocked if required. It appeared that the souterrain had been deliberately backfilled, probably using material from the interior of the rath. This resulted in the fills containing cremated human bone, a fragment of a lignite bracelet, a saddle-quern, a smith's hammer, and a perforated whetstone and hammerscale from the smithing process. Two radiocarbon dates were returned from the souterrain and indicate that it was infilled between AD 662–899 (SUERC-21751, SUERC-21712).

A number of pits, postholes, and stakeholes were present within the interior of the rath. A number of the smaller stakeholes did form lines, marking places where fences or hurdles had once been used to divide up the interior, but the larger features did not seem to form a cohesive structure. Radiocarbon dating has shown that the features within the interior did not all belong to the early medieval phase, as some of the pits and postholes belonged to the earlier Iron Age phase of occupation. Five pits or postholes returned dates ranging from AD 650 to AD 891 (SUERC-21725, SUERC-21733, SUERC-21711, SUERC-21727, and SUERC-21741).

Mullaghbane (Site 27) Showing the souterrain exiting into the ditch of the rath © Headland

Mullaghbane (Site 27) Site plan of souterrain showing the postholes which would have supported the roof © Headland

Iron Age occupation spread

Chamber

Exit   Chamber

N

0   5m

Rath Ditch

Possible entrance
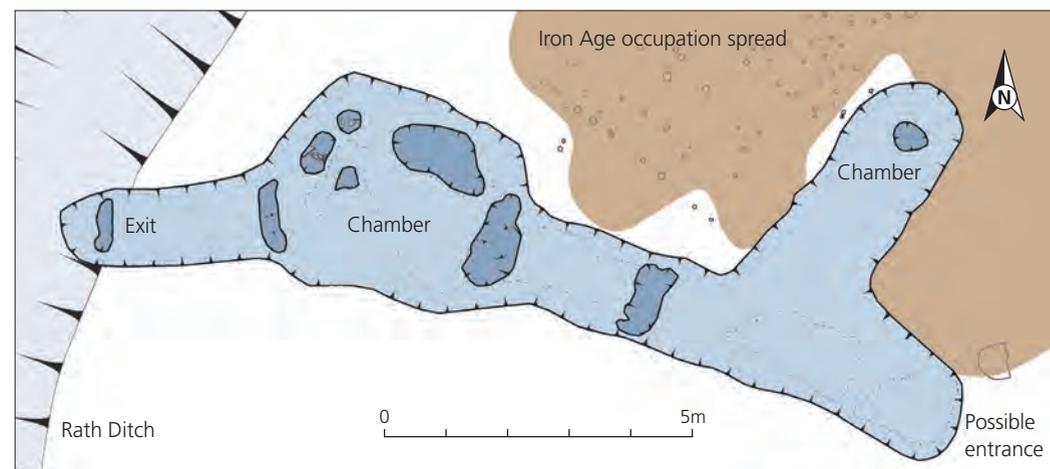
At Armalughey (Site 25) a two-phase, early medieval, cereal-drying kiln, while appearing isolated, probably formed part of the settlement associated with the rath at Mullaghbane (Site 27), around 50m away. The kiln was keyhole shaped and consisted of a large pit with adjoining flue. The cereal grains would have been placed within the larger pit, probably on top of a stone, and a fire set at the opposite end of the flue. The heat from the fire then travelled down the flue drying out the grain. The fill at the base of the Phase 1 kiln was heavily burnt, suggesting that the kiln had caught fire. This charcoal from this episode of burning was dated to AD 648–766 (UBA-14558), the same period as the occupation of the rath at Mullaghbane (Site 27). A cereal drying kiln was still required and although the central pit was reused the original flue was closed and a new one created on the opposite side.

The cereal-drying kiln at Armalughey (Site 25) is a good example of why such kilns were positioned away from the main settlement. Although the fire and the grains that were being dried were separated during the process it was not uncommon for cereal kilns to catch fire. If the kiln was located within the settlement, which consisted of wooden buildings, such an event could be catastrophic.

Early medieval kiln at Armalughey (Site 25), note the layer of charcoal at the base which indicates that the kiln had caught fire © ADS

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Settlement-Cemetery – Focus on Annaghilla (Site 4)

Annaghilla (Site 4) occupied a small hill with the first settlement occurring during the Neolithic and continuing through the Bronze Age, and Iron Age. During the Iron Age phase of occupation an enclosure had been constructed on the top of the hill. During the early medieval period this enclosure was subsequently enlarged and a cemetery created within the interior. This later enclosure measured 60m northeast to southwest by 50m northwest to southeast. The shape and size of this site would indicate that this was not a rath, but rather a recently recognised group of sites which have been classified as 'cemetery settlements',[45] or 'settlement-cemetery'.[46, 47] These are enclosures which are usually sub-circular in shape[48] and larger than raths, usually over 50m in diameter.[49]

Annaghilla (Site 4) Site plan showing early medieval settlement (blue), Iron Age settlement (yellow) and Neolithic settlement (pink) © Headland
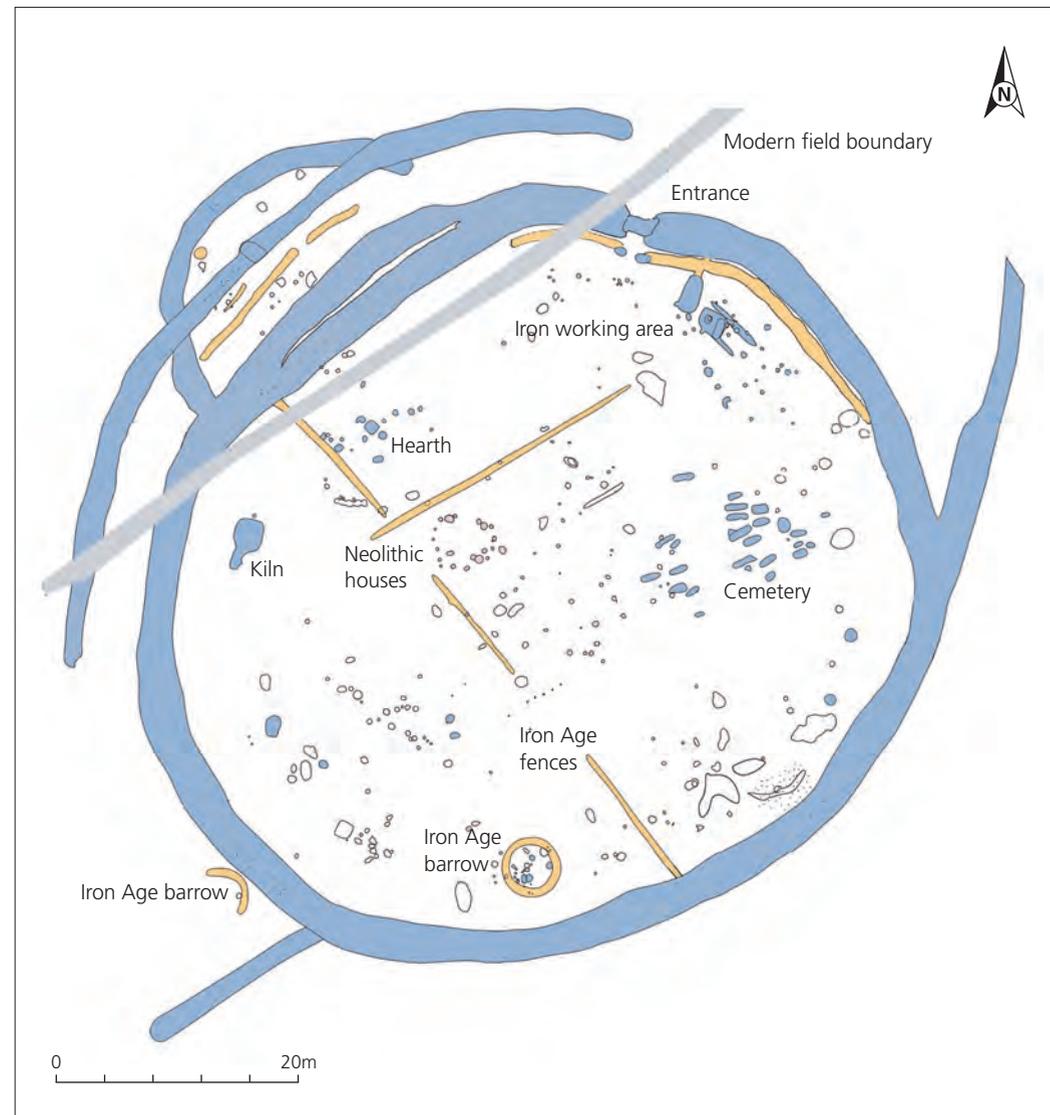
Dozens of features were present within the interior of the enclosure and they dated to all periods of the site's occupation. Fifteen of these features, all pits, postholes or hearths, could be shown to date to the early medieval phase of occupation (SUERC-21645, SUERC-21640, SUERC-21305, SUERC-21315, SUERC-21325, SUERC-21297, SUERC-21311, SUERC-21306, SUERC-21310, SUERC-21650, SUERC-21646, SUERC-21309, SUERC-21631, SUERC-21644 and SUERC-21298). Despite the quantity of these, and other associated, features no definite house structure was identifiable. Despite the lack of an obvious house the features do indicate continued settlement and activity and it is likely that the structures did not leave any trace.

Annaghilla (Site 4) Aerial photograph © Headland

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There was no clear evidence for occupation of the site beyond the ninth century. Hazel charcoal from one of the fills of the ditch produced a date of AD 868–1023. As this charcoal came from approximately half way down the ditch section it shows that the ditch had already been partially infilled at some point between the late ninth and early 11th centuries.

A small cemetery, comprising 23 graves, was located on the eastern side of the enclosure. As far as could be ascertained, all of the burials were inhumations and the grave cuts were orientated west to east. Due to the acidic nature of the soil the remains had been all but destroyed, with only the harder enamel from a small number of teeth in some of the graves survived. On the basis of the size of the grave cuts there was a mixture of both adult and child burials. The only artefact that was uncovered was a small blue glass bead from one of the adult graves. No radiocarbon dates were obtained; however, the position of the graves within the enclosure and the presence of a blue glass bead would indicate that the graves were early medieval in date.

The first phase of the early medieval occupation occurred during the fifth to seventh centuries AD. This phase of the settlement was identified by a number of radiocarbon dates (SUERC-21300, SUERC-21307, SUERC-21301, SUERC-21299, SUERC-21328, and SUERC-21316) and was limited to a number of individual pits and postholes which did not form a single, cohesive feature, for example a house. This phase appears to be a continuation of the earlier Iron Age settlement and probably took place within the confines of the Iron Age enclosure.

Annaghilla (Site 4) Ironworking furnace with stone base in situ © Headland

The second, and most substantive, period of settlement was during Phase 2 of the early medieval occupation between the seventh and ninth centuries AD. During this phase, the large enclosing ditch was excavated and the burials were interred. The ditch appears to have followed the line of the original Iron Age enclosure, apart from a small section at the entrance where the Iron Age enclosure ran just inside the early medieval one. The early medieval ditch was 4m wide and 1.30m deep and an entrance causeway 1.60m wide was left at the northeast side of the site. Sections excavated through the ditch do not appear to show any evidence for a bank, either internal or external, and the presence of early medieval features in close proximity to the edge of the ditch would also attest to this. Radiocarbon dates from the ditch show that it silted up in the period AD 615–881 (SUERC-21661, SUERC-21318, and SUERC-21636). On the northwest side of the enclosure a much smaller D-shaped enclosure had been added to the side of the main enclosure. The purpose of this additional enclosure is unclear, but oat grain from the fill of this ditch dated it to AD 648–775 (SUERC-21653), indicating that this annex was probably constructed at the same time as the main ditch.

On the western side of the enclosure were the remains of a squared, keyhole-shaped kiln. The main body of the kiln consisted of a bowl 2.4m wide and 1.30m deep, with a shallower gully running into the southern side of the bowl creating the keyhole shape. A series of large stones had been placed on the base of the bowl to act as a floor and large stones within the fill were probably the remains of the collapsed structure. The charcoal-rich fill of the kiln was dated to AD 660–770 (SUERC-21335). As this kiln was located away from the metal working area it probably served a different function, for example it may have been a cereal drying kiln.

Recording the ditch at Annaghilla (Site 4) © Headland

On the eastern side of the enclosure, just to the southeast of the entrance and north of the cemetery, were a series of pits, hearth, and a furnace all associated with ironworking. The pits and the hearths produced iron waste, slag, and hammerscale, all of which are the by-products of the smelting and smithing of iron. Charcoal and barley grain from these pits showed that they dated to AD 637–869 (SUERC-21330, SUERC-21336, and SUERC-21634). Although iron was clearly being worked within the enclosure no complete iron artefacts were uncovered during the excavation. This may indicate that items were being manufactured here and then taken away to be sold or traded. To the south of this main concentration of ironworking features, another furnace was also excavated. This furnace consisted of a large flat stone which acted as the base of the furnace, with the remainder of the structure being built out of clay. This furnace although it was not dated, is assumed to have been contemporary with the features which lay to the north.

While there seems to be lot of variation amongst the other settlement-cemetery sites that have so far been excavated in Ireland[50] there are some consistencies. Although they are classified as settlements there are very few contemporary structures known in relation to the enclosures and burials,[51] yet it seems to be quite common to find clear evidence for industry taking place.[52, 53] This was clearly the case at Annaghilla (Site 4) where extensive iron processing and working appears to have been carried out in relatively close proximity to the cemetery. In regards to the cemetery itself, excavation of similar sites has shown that the number of burials can vary greatly from as few as 12, as at Castlefarm[54] to 1365 at Mount Offaly.[55]

Annaghilla (Site 4) Seven of the graves that were present within the settlement © Headland

With 23 grave cuts Annaghilla (Site 4) is clearly at the smaller end of the scale for these sites; though it has been noted[56] that due to poor survival of remains on a number of other sites the number of actual burials could be higher, with more than one individual per grave cut. Another key feature of the cemetery is its position within the enclosure. In the majority of the sites, Annaghilla (Site 4) included, the cemetery was located on the eastern side of the enclosure.[57] It has been theorised that this was a mirroring of ecclesiastical settlements (where the cemetery is most commonly found on the eastern side of the site).[58] Finally, it is of note that the site at Annaghilla (Site 4) had seen continuing occupation from prehistory. Again, it has been noted that most 'settlement cemetery' sites show a continuation of settlement from the Iron Age into the early medieval period.[59] As well as settlement the sites also show a continuation of burial tradition, with earlier Iron Age barrows being succeeded by early medieval flat burials.[60]
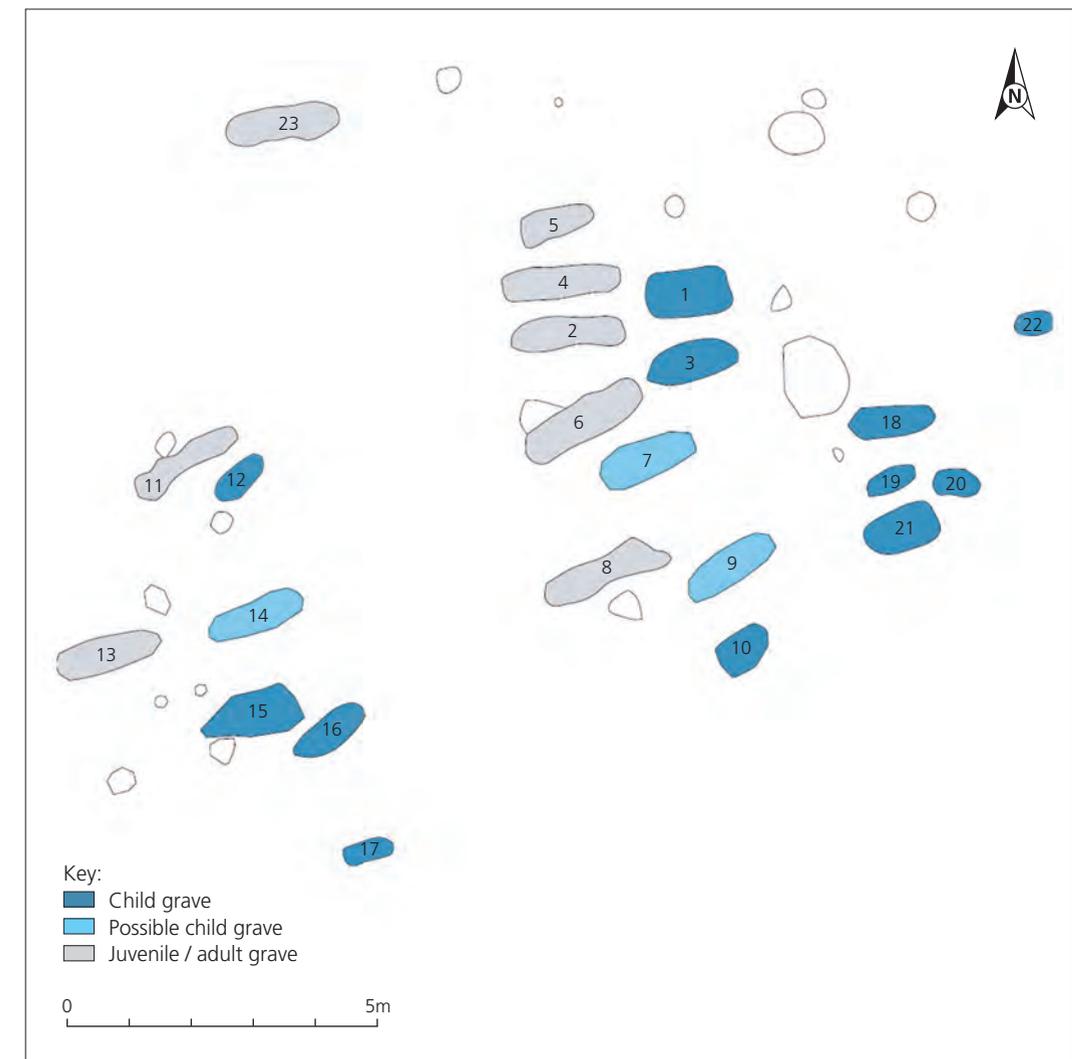
Annaghilla (Site 4) Site plan of the cemetery showing child and adult graves © Headland

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Animal enclosure – focus on Ballyward (Site 46)

Ballyward (Site 46) was located on a steep, north-facing slope of a drumlin. It comprised a sub-rectangular enclosure, which measured 13.20m east to west and 12.90m north to south, and four outlying hearths. The enclosure ditch was, on average, 0.95m wide and 0.49m deep. There was no evidence for any internal features, though a modern field boundary cut through the middle of the enclosure and would have destroyed any central features if they had been present. The radiocarbon dates appear to show that the ditch silted up in two phases, the lower fills dated to AD 878–987 (UBA-14460; UBA-14462) and the upper fill to AD 986–1040 (UBA-14463). The four hearths lay outside of the enclosure, with one to the north and the remaining three to the southeast. Dating of the hearths has shown that the group to the southeast dated to AD 893–988 (UBA-14461) while the hearth to the north dated to AD 1027–1158 (UBA-14458).

The function of this enclosure is unclear. As there is no evidence for any structural supports or a hearth it is highly unlikely that the enclosure was a settlement site. Instead it is probable that the enclosure was used as a pen or paddock for animals while the hearths were utilised by the shepherds or cowherds who were tending the animals. Although in close proximity to larger early medieval enclosures similar pen or paddock style enclosures have been noted at the rath sites of Roestown[61] and Colp West,[62] both in Co. Meath, and the plectrum-shaped enclosure at Bushford, Co. Antrim.[63] As this enclosure appears to be located away from a larger settlement enclosure it may have been used to corral animals, possibly during the night or for shearing or milking. While the ditch and bank may not have been substantial enough to protect from wild animal attacks it should have been enough to stop the animals from straying.

Animal enclosure at Ballyward (Site 46) © ADS
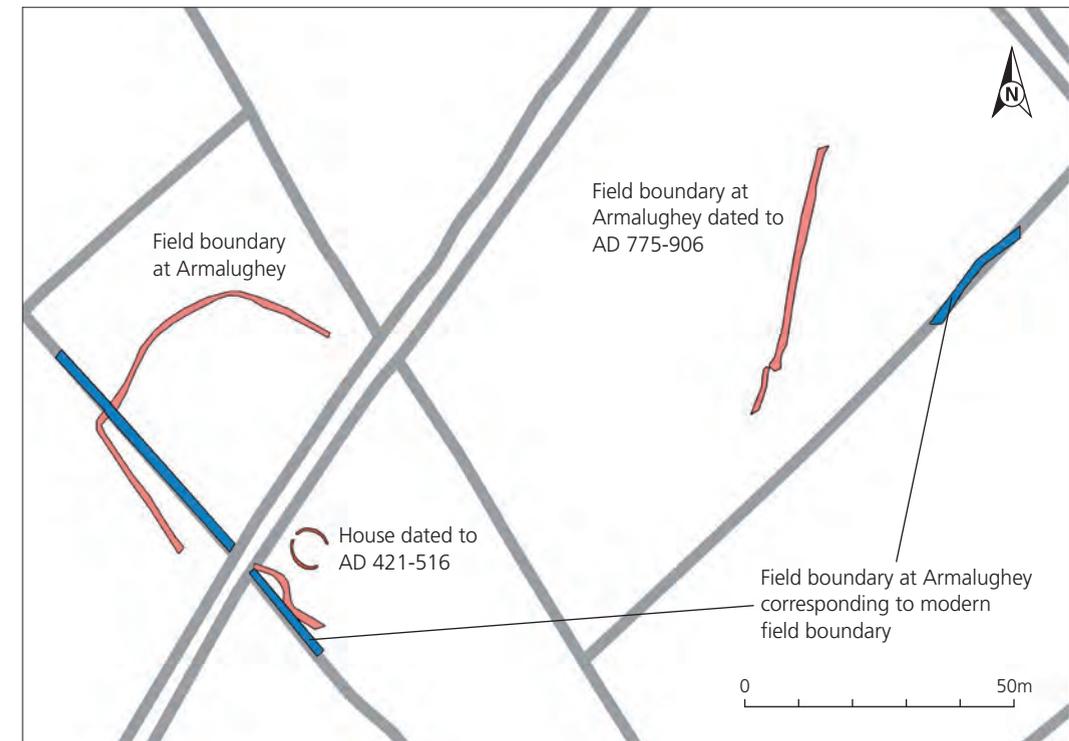
Armalughey (Sites 19 and 20) early medieval roundhouse and field boundaries and excavated post-medieval field boundaries overlaid on digitally redrawn Second Edition (1857-59) Ordnance Survey map of the area © LPS

Field boundary at Armalughey

Field boundary at Armalughey dated to AD 775-906

House dated to AD 421-516

Field boundary at Armalughey corresponding to modern field boundary

0   50m

Unenclosed settlement and fields – focus on Armalughey (Site 19 and Site 20)

The study of early medieval archaeology in Ireland places a lot of emphasis on settlement enclosures. This is due, in a large part, to raths which are prevalent across the whole of Ireland. While raths were undoubtedly a common site type throughout the early medieval period their current visibility within the landscape allows them to be readily identified and studied. One settlement type of the period which is not as well understood is unenclosed settlement. Unlike raths, unenclosed settlements leave no upstanding remains and are usually only encountered during projects, such as road schemes, where large areas of ground are being stripped of topsoil.

As its name suggests, an unenclosed settlement is simply a house that has no surrounding enclosure. As to why some houses did not require an enclosure is not entirely clear and may have been dependent on the sitting of the settlement and its uses. It has been suggested that some of the unenclosed houses were the dwellings of the poor,[64] some, for example Ballyutoag, Co. Antrim,[65] were for seasonal use when animals were taken up onto the higher pasture[66] and in some cases, such as at Ballywee[67] or Drumadoon[68] both in County Antrim, the siting of the house simply meant that an enclosure was unnecessary.

Stakeholes

Round house (AD 421-561)

Probable early medieval field boundary

0   5m

As with unenclosed settlement, early medieval field boundaries are another form of feature which is recorded within contemporary sources,[69] but are difficult to identify within the archaeological record. The laws describe four different styles of boundary ranging from a simple ditch and bank to an oak fence.[70] When field boundaries are encountered they usually take the form of ditches, some examples of which were uncovered along this Road Scheme.

The early medieval settlement at Armalughey (Site 19) consisted of a circular house and surrounding field systems. The house measured 7m in diameter and was defined by two curving sections of wall slot; which would have supported a wattle-built wall. A gap present on the southeast side of the house marked where the door would have been present. Within the interior of the house three large postholes were present. These postholes would have held the posts which supported the roof. Stakeholes within the interior mark the lines of internal, dividing walls. Despite the lack of evidence for a pit which contained the hearth within the interior of the house one would still have been required to provide both heat and light. It is likely that the hearth was originally placed on the ground and its remains have been destroyed by modern farming activity. One of the wall slots of the house was dated to AD 421–561 (UBA-14504), the start of the early medieval period.

Within the vicinity of the early medieval house at Armalughey (Site 19) and to the east at Armalughey (Site 20) were a series of long linear and curving ditches, one of which was dated to AD 775–969 (SUERC-20769). Similar ditches have been excavated at Kiltrough, Co. Meath[71] and Raystown, Co. Meath,[72] and have been interpreted as possible field boundaries.

Armalughey (Site 19) early medieval roundhouse © ADS

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Burnt Mounds – focus on Lisbeg (Site 6), Inishmagh (Site 30) Cabragh (Site 37) and Cullenfad (Site 45)

Lisbeg (Site 6) contained burnt mounds dating from the end of the Neolithic through to the latter part of the early medieval period. Four of these were early medieval in date (Burnt Mounds 20–23). Burnt Mound 20 had an unlined circular trough 1.15m diameter and 0.46m deep. It was dated to AD 663–778 (SUERC-20597). Partially overlying the trough were two burnt mound spreads, the first was 3.5m long, 1.8m wide and 0.07m thick, the second was 3.9m long, 2.6m wide and 0.1m thick. One of the spreads was dated to AD 767–900 (SUERC-20598).

Burnt Mound 21 had a plank-lined trough measuring 2m long, 1.8m wide, and 0.35m deep, and two large unlined pits. One of the pits was 0.85m diameter and 0.4m deep; the other was 1.55m long, 1.23m wide and 0.36m deep. A channel had been excavated from the former stream to the trough to allow water to flow in. Beside the trough was a large hearth, c.1.5m diameter, and a small hearth, 0.91m long and 0.76m wide. The hearths must have been burning intensively as the subsoil below them was heat affected to a depth of 0.1m. The pits, trough, and hearths were covered in a burnt mound spread measuring 10m long, 6m wide, and 0.15m thick. The trough was dated to AD 1020–1155 (SUERC-23212), the larger pit to AD 1033–1190 (SUERC-20613), the larger hearth to AD 1025–1157 (SUERC-20432), and the spread to AD 1041–1264 (SUERC-20623, SUERC-20625).

Burnt Mound 22 contained an oval trough, 1.3m long, 1m wide, and 0.22m deep. It was lined on the base with five planks of alder; the sides were lined with alder and hazel stakes. Two very small deposits of burnt mound spread were located beside the trough; this would indicate a limited period of use for this burnt mound. The trough was dated to AD 1022–155 (SUERC-23218).

Burnt Mound 23 contained a rectangular trough 2m long, 1.8m wide, and 0.35m deep. The sides and base were lined with alder and willow planks. A burnt mound spread 2m diameter and 0.7m thick partially overlay the trough. The trough was dated to AD 1033–1190 (SUERC-23222).
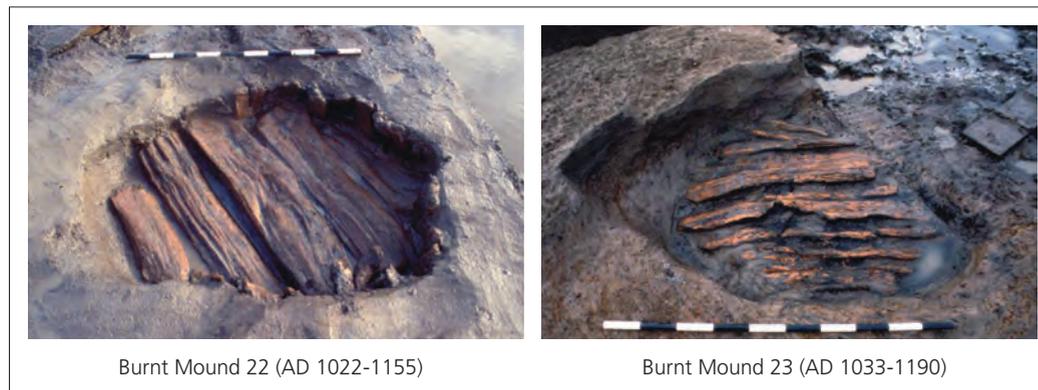
As well as the previously discussed burnt mounds at Lisbeg (Site 6), further early medieval burnt mounds were uncovered at three different excavation sites across the Road Scheme. For a long time it had been considered that burnt mounds were a purely Bronze Age monument type.[73] A more recent reappraisal of radiocarbon dates has shown that in Ireland there are actually two main periods of use;[74] the first ranging from the Neolithic through to the Late Bronze Age and the second starting during the early medieval period and continuing into the medieval.[75] The dates from the following three sites all reflect this second period of burnt mound creation.

At Inishmagh (Site 30) a, two phase, burnt mound trough was constructed within an area that had contained settlement since the Neolithic. The first phase involved the digging of the trough, its use, and the subsequent creation of the burnt mound. This first phase of use dated to AD 988–1125 (UBA-14539). During the second phase of use a new trough was constructed. This second trough was dug in the same approximate position as the infilled first phase trough.

A single trough and burnt mound were uncovered at Cabragh (Site 37). They were located in a hollow at the base of a slope and adjacent to an old stream. The trough measured 1.50m in diameter and was 0.15m deep while the burnt mound measured 2.6m east to west and 1.20m north to south, and was 0.13m deep. The burnt mound material had spread, covering the trough. The upper fill of the trough, the basal fill of the burnt mound, dated the site to AD 1043–1218 (UBA-14594).

At Cullenfad (Site 45) an early medieval burnt mound overlay the site of an earlier Bronze Age burnt mound. The original Bronze Age burnt mound and trough were covered by layers of prehistoric topsoil and hill wash prior to the construction of the early medieval trough. This trough was irregular in shape and measured 1.60m long, 1.06m wide, and was 0.65m deep. It had been covered by the burnt mound spread which measured 9m long, 3.50m wide, and 0.10m deep. The fill of the trough dated to AD 770–963 (SUERC-21146).

Other Settlement Evidence

Across the Road Scheme a further five sites produced evidence for early medieval settlement. These were isolated pits or spreads, which were unconnected to any substantive settlement but which produced early medieval radiocarbon dates. The sites were Tullyvar (Site 10) (AD 986–1125; UBA-14471), Tullywhinny (Site 8) (AD 1030–1155; UBA-14478), Drumnafern (Site 51) (AD 776–967; UBA-14454), Drumnafern (Site 47) (AD 977–1035; UBA-14457), and Mullaghbane (Site 26) (AD 656–888; UBA-14583).

Burnt mound troughs at Lisbeg (Site 6) © Headland

Burnt Mound 22 (AD 1022-1155)

Burnt Mound 23 (AD 1033-1190)

Medieval Period

The medieval period in Ireland begins around the middle of the 12th century AD, when settlement patterns alter and larger villages and towns are constructed.[1] The start of the medieval period is also marked by the Anglo-Norman invasion of Ireland which began in 1169.[2,3] This invasion and settlement was concentrated along the north and east coasts of Ireland[4] and did not extend as far west as Co. Tyrone. This area was still held by the native Irish, principally under the control of the O'Neills.[5]

Even before the Anglo-Norman invasion people had begun to abandon the raths that had dominated the countryside previously. A large number of towns and villages was also founded during this period, including Dungannon. A transition in the pottery styles and manufacture is also apparent: finer, well-fired, glazed pots and jugs were introduced and the coarse, unglazed wares of the previous 5,000 years began to disappear.[6]

During the medieval period the vast majority of Irish settlements, fortifications, and ecclesiastical sites were recorded in contemporary documents and maps. Through the work of historians and archaeologists in the intervening years their locations have, for the most part, been geographically pinpointed. Careful planning by Transport NI with consultation from the DOE: HED means that roads are, where possible, now designed to avoid these important historical sites. Due to this fact few medieval sites are excavated along road schemes and this proved to be the case here.

Medieval Dungannon

It is not known exactly when the town of Dungannon was established, but it is first recorded in a letter sent in 1329 from Donald O'Neill to Pope John XXII. While the town itself is not discussed, the letter records that the author was in Dungannon.[7] The next mention of Dungannon is in the Annals of the Four Masters where it is recorded that in 1498 the Earl of Kildare took control of the castle from the O'Neills.[8] While nothing of the medieval settlement of Dungannon has survived, and little is known about the town, it was during the post-medieval period that the town flourished with the growth of industry in the surrounding areas.

Medieval decorated quern stone from Dungannon (ARMCM.105.1955 ©NMNI Collection Armagh Museum)

The O'Neills and Tullaghoge

The area around Dungannon is closely connected with the O'Neills and the royal site of Tullaghoge.[9] The O'Neills (originally Ui Neill) were descendants of Niall of the Nine Hostages[10] and originally held territories in Donegal.[11] By the 11th century they had spread into what is now Co. Tyrone (from Tir Eoghan or 'Land of Eoghan')[12] establishing their kingdom. The invasion of Tyrone by the High King Rory O'Connor in the 12th century saw the kingdom split with the land in the north granted to the McLoughlin clan and the land in the south to the O'Neill's.[13] This split did not last long and the kingdom was reunited by the end of the 12th century.[14]

By the middle of the 16th century Tyrone was the largest Gaelic lordship in Ireland with Hugh O'Neill at its head.[15] Hugh O'Neill was created the second of Earl Tyrone in 1585[16] and for a period continued to support the English crown. Dissatisfied with further English advances into Ireland, O'Neill, along with O'Donnell of Tyrconnell,[17] fought back, and so in 1594 the Nine Years War began.[18] O'Neill and O'Donnell enjoyed some early success with victories at the Battle of Clontibret[19] and the Battle of Yellow Ford[20] but eventually the tide began to turn. In 1602, with the crown forces approaching, O'Neill destroyed his own capital at Dungannon.[21] Although the rest of the Irish lords had surrendered in 1602[22] O'Neill held out until 30 March 1603 when he surrendered to Mountjoy and signed the Treaty of Mellifont.[23] Although peace held, the Crown once again began to encroach on the lands of the Gaelic lords.[24] With no available support from the Spanish[25] the lords believed that their only

Excavations carried out close to Tullaghoge fort in 2015 discovered the remains of three buildings. The largest building measured 14m long and 8m wide and was defined by a shallow drip trench. A large amount of grain was found in association with this building and may indicate that it was used as a store © DOE: HED

option was to flee. Thus on the 14 September 1607 Hugh O'Neill, Rory O'Donnell and a number of followers left Ireland in an event which has become known as the Flight of the Earls.[26] When they departed so did both the O'Neill lordship of Tyrone and what remained of the old Gaelic order.[27]

Tullaghoge Fort is located about 11 kilometres north of Dungannon and was the inauguration site of the O'Neills.[28, 29] Little is known about the origins of Tullaghoge, but it is likely that it pre-dates the 11th century when it was first recognised as a dynastic centre.[30] The shape of the site makes it look like a large bivallate rath, but the lack of an outer ditch and the large distance between the inner and outer bank indicate that this is not the case.[31] The O'Neills were crowned whilst sitting on a large stone chair or throne; this chair sat not inside Tullaghoge Fort but rather on the slope of the hill outside.[32] The chair was destroyed by Mountjoy in 1602 ending the kingship of the O'Neill's.[33] Excavations carried out close to the fort in 2015 discovered the remains of three buildings. The largest building measured 14m long and 8m wide and was defined by a shallow drip trench. A second, smaller building lay to the north-west. A large amount of grain was found in association with this building and may indicate that it was used as a store. These buildings were radiocarbon dated to the 11th – 13th centuries AD (Sloan and Logue, pers. Comm.)

Medieval archaeology on the Road Scheme - focus on Armalughey (Site 18) and Mullaghbane (Site 27)

At Armalughey (Site 18) two shallow ditches and the remains of a kiln returned radiocarbon dates which indicated a medieval period of creation and use. These features were present within a landscape which had already produced a number of different archaeological features and radiocarbon dates, spanning from the Neolithic through to the Iron Age.

Two different sections of ditch returned dates of AD 1169–1270 (SUERC-20648) and AD 1150–1256 (SUERC-20767). These ditches were relatively shallow and would not have been able to serve a defensive purpose, unlike the rath ditches of the early medieval period (see previous chapter). Instead these are probably the remains of field boundaries, used to divide the land either between owners or for different uses. The northern ditch was found to be waterlogged at its eastern end and organic material had survived. This organic material included fodder, which was used for feeding animals, and a range of beetle remains which indicate the area was rough, open pasture. The presence of both fodder and pasture clearly indicates that the area was being used to keep animals.

The cereal kiln had been practically destroyed by a modern field boundary. It existed as a shallow linear slot, which contained a large quantity of heavily charred oat grains, as well as grains of wheat and barley. The main section of the kiln had probably been constructed above ground and has been completely destroyed by modern deep ploughing. Oat grains returned radiocarbon dates of AD

1165–1391 (SUERC-20756, SUERC-20655). The presence of greater amounts of oats compared to wheat and barley is unsurprising as oats are seen as one of the staple foods in Ireland from the early medieval period.[34]

The rath at Mullaghbane (Site 27) entered a period of abandonment towards the end of the early medieval period but was re-occupied again during the 12th–14th centuries. The ditch of the rath was partially re-cut, though not to its original depth. A lot of material was dumped into the ditch during this phase, and flint, grain, nutshell, and Everted Rim Ware pottery were all recovered from the fills of the ditch. Two radiocarbon dates from carbonised oats from the ditch returned dates of AD 1415–1479 (SUERC-21713) and AD 1421–1499 (SUERC-21714). A pit inside the rath also produced sherds of Everted Rim Ware pottery and a grain of carbonised hulled barley produced a radiocarbon date of AD 1318–1439 (SUERC-21716). The reoccupation of raths during the medieval period is known from a number of different sites. For example, at Charlesland, Co. Wicklow an early medieval rath was re-cut and extended three times during the medieval period[35] and the ditch of a rath at Ballynakelly, Co. Dublin was also re-cut when the site was occupied during the medieval period.[36]
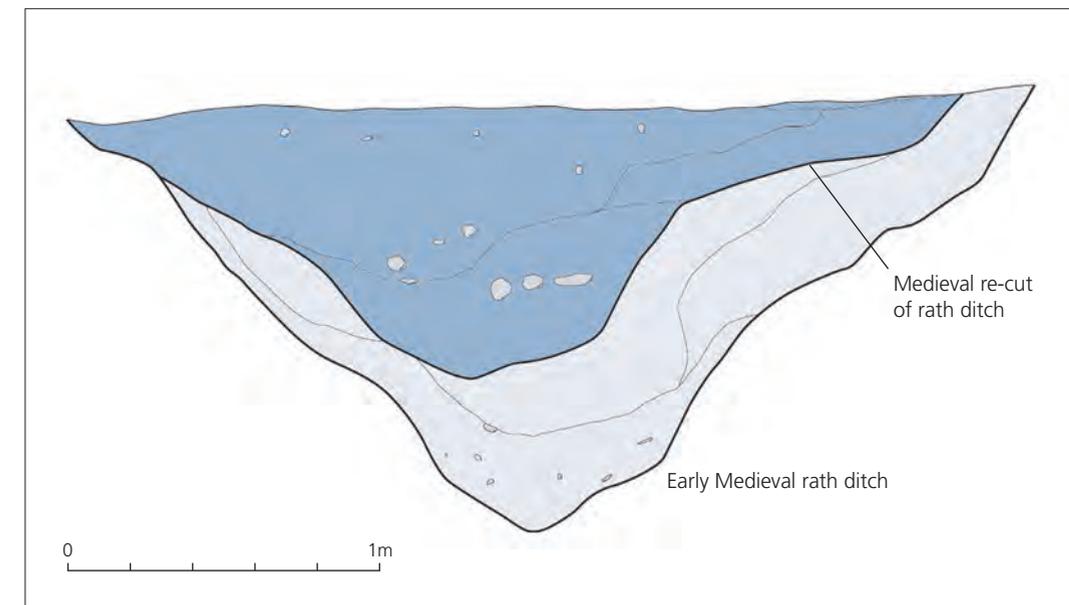
Section of rath ditch at Mullaghbane (Site 27) showing the medieval recut of the ditch © Headland

Medieval re-cut of rath ditch

Early Medieval rath ditch

0   1m

Epilogue

Beginning in the middle of the 16th century, with the start of the plantations, and ending in 1914 with the outbreak of the First World War the post-medieval period saw many changes in Ireland. The country became mechanized, industry grew and with it the towns and villages.

One of the greatest changes that took place during the post-medieval period was the growth of industry and the Industrial Revolution. Taking place between 1750 and 1850[1] the Industrial Revolution was a period of rapid industrial growth which saw the creation of many factories and mills. During this period Ireland became a vitally important producer and manufacturer of goods for the British Empire, with Irish linen in particularly high demand. It was also during this period that many of the towns in Ireland began to grow and expand. With the rise of industry, and the need for a workforce, people began to move away from the countryside and into the towns. As the population began to grow, peaking at 8 million in the early 1840's,[2] more land was required to grow food. With the need for more produce, and aided by mechanization, fields became larger and fences and walls were erected to enclose the land.

As large road schemes tend to be carried out in open country the post-medieval archaeology uncovered tends to be very limited. Where post-medieval sites, such as mills, are present these are generally known about and the road is designed to avoid them. This was the case on this Road Scheme where the only post-medieval archaeology encountered was evidence for farming and agricultural activity.

Towns and villages

Although Ballygawley[3] was originally a Gaelic settlement the current town was established during the Plantation of Ulster in 1609[4]. The land was originally granted to a William Turvin, but following his failure to actually settle any British tenants the area was then granted to Sir Gerard Lowther who, by 1614, had erected a castle on the banks of the river.[5] This castle, and probably a small associated settlement, was destroyed in 1642 during the Rebellion.[6] Despite two of the towers and part of the walls surviving[7] the castle was never rebuilt.[8] By the 18th century the centre of the village had moved up the hill, away from the river.[9] By the 19th century, the village was well established and known for the quality of the gloves that were produced there, as well as for the large brewery and distillery.[10]

The village of Castlecaulfield was established by Sir Toby Caulfield in 1614.[11] Sir Toby Caulfield began by constructing the castle, after which the village takes its name,[12, 13] and then settled the area, with 20 houses having been erected by 1622.[14] The site of the mansion house was believed to have originally been the location of an earlier fort which had been constructed by the O'Donnellys,[15] but excavation carried out in 2011 found no evidence of this.[16] The mansion house was burned down during the 1641 Rebellion[17] but was rebuilt and the Caulfield family were once again in residence by the 1660's.[18] By the 19th century the village had grown and had increased in size from 20 houses to 50.[19]

Parkanaur House[25, 26] © Tony Corey, DOE: HED

Castle Caulfield[27] after which the village takes its name, was established by Sir Toby Caulfield in 1614

To the south of the village of Castlecaulfield lies the house and estate of Parkanaur.[20] The house was designed in the Tudor Revival[21] style by Thomas Duff, an architect from Newry who trained at the Royal School of Architectural Drawing, Dublin.[22] Originally a small cottage the building was enlarged and extended during the 19th century, with the architecture reflecting the building styles of Elizabethan England.[23, 24]

Although modern Dungannon[28] was established during the medieval period, it remained an important Gaelic town throughout the 16th century and into the 17th century, and played a central role in the various uprisings and wars between the O'Neill's and the English Crown.[29] On several different occasions throughout this period the town and the castle were attacked and destroyed. Following the Flight of the Earls in 1607 the O'Neill castle and lands were granted to Sir Arthur Chichester who constructed a large bawn and several stone houses.[30] The town was once again attacked during the Rebellion of 1641 and was occupied by the Jacobite forces during the Williamite Wars at the end of the 17th century.[31] From the 18th century, and a period of relative peace, the town of Dungannon and its surrounding area began to flourish and grow as various industries were established. The local countryside was involved in the growing of flax and mills were established to turn the flax into linen.[32] As well as Linen production potteries[33] and glass houses[34] were also established in the area. A lot of this industry was fuelled by coal, brought from the coalfields which surrounded the nearby town of Coalisland.[35] The coal fields were so extensive that the Coalisland Canal was established, linking the town with Lough Neagh and the Newry Canal and allowing the coal to be quickly and cheaply transported to Dublin.[36]

Mills and industry

Some of the most visible traces that are left behind from the post-medieval period are the mills that were once common place across the country. Most of these mills, and their ancillary buildings, were involved in the various stages of the production of linen. Indeed, by the end of the Victorian era the north of Ireland was home to the largest linen industry in the world.[37]

A number of mills associated with linen production were located close to the Road Scheme. These include spinning mills,[38] where the yarn was spun into cloth,[39] and beetling mills,[40] where the finished cloth was pounded using beech mallets or beetles, in order to give the surface of the cloth a sheen.[41]

As well as linen mills, corn mills,[42] saw mills,[43] windmills[44] and a brewery[45] are also recorded in close vicinity to the Road Scheme.

Agriculture

Evidence for post-medieval agriculture is abundant in a country as rural as Ireland. It can be observed in the shape and layout of the fields, many of which are hundreds of years old,[46] as well as the farmhouses and barns that are dotted round the landscape.

Some of the most ubiquitous evidence for post-medieval activity that archaeologists find are sherds of pottery. A lot of this pottery originates from the practice of manuring the fields; when the rubbish and waste from homes, towns and villages was gathered and spread the fields as a form of fertiliser.[47] It was because of this practice that it is common to find broken pieces of pottery, glass and clay pipe in freshly ploughed fields.

When the archaeologically monitored topsoil stripping was carried out in advance of the Road Scheme evidence of the impact of farming could be seen in the form of plough marks. Plough marks are long lines that are created when the plough cuts deeper than the topsoil and cuts into the underlying clay. The darker topsoil then falls back into the cut leaving a darker line visible against the, usually, orange clay.

As well as the evidence for the manuring and ploughing of the land one of the most commonly identified post-medieval features are drains. Field drains play an important role in farming by simply removing superfluous water from the land. While drains come in many different styles the most commonly encountered in fields is a type known as the 'French drain'.[48] Named for the author Henry French, who wrote a treatise on drains in 1860,[49] the basic form of the French drain is a long narrow trench filled with stones. According to Frenchs' book larger stones should be placed at the bottom of the drain with smaller stones at the top.[50]

Windmill, Windmill Park, Dungannon[51] Most of these mills, and their ancillary buildings, were involved in the various stages of the production of linen. Indeed, by the end of the Victorian era the north of Ireland was home to the largest linen industry in the world

Conclusions

The archaeological investigations along the Road Scheme provided evidence for occupation from the Late Mesolithic (c.5500BC) through to the end of the post medieval period (c.AD 1914). Settlement and occupation was focused on the higher drumlin ridges, as their freely draining soils are much more suitable for growing crops. These areas remained attractive for settlement through the prehistoric and historic periods and many of the sites had multiple phases of occupation. The hollows between these ridges were much wetter, in some cases waterlogged. Although they held little attraction for the construction of settlements these areas were the ideal setting for the use of hot stone technologies. This use of hot stone left behind burnt mounds; with evidence uncovered for the use of burnt mounds across all periods, from the Neolithic to the medieval period. They were most prolific at Lisbeg (Site 6) where 23 burnt mounds were uncovered with their use spanning all periods.

The importance of agriculture, and in particular cereal production, was identified; with oats, barley and wheat being present on the majority of occupation sites. As well as the grain artefacts and features associated with its storing and processing were also identified. Cereal drying kilns were excavated at Aghnahoe (Site 32) (Bronze Age), Inishmagh (Site 30) (Iron Age), Armalughey (Site 25) (early medieval) and Annaghilla (site 4) (early medieval). A probable Bronze Age granary for the storing of grain was recorded at Farriter (Site 36) and quern stones for the grinding of grain into flour were excavated at Annaghilla (Site 4) (Bronze Age) and Mullaghbane (Site 27) (early medieval). One of the scarcest finds in relation to agriculture was a Bronze Age wooden ard that was excavated at Armalughey (Site 25). The ard would have been used to break the ground to allow the planting of crops. As well as growing grain the majority of the occupation sites also provided evidence for the utilisation of locally growing fruit and nuts. Seeds or stones from brambles, crab apples, and sloe berries were all present on a number of sites, as were the shells of hazelnuts

While a large amount of evidence for short-term, transient settlement was encountered, for example isolated hearths and pits, there was also a number of sites which displayed prolonged, permanent settlement. Early to Late Neolithic houses were excavated at Annaghilla (Site 4) and at Golan (Site 28) settlement continued through the Middle and Late Bronze Age. The majority of the early medieval settlement took the form of enclosures; with an enclosed/defended settlement at Tullyvar (Site 11) and the remains of a rath excavated at Mullaghbane (Site 27). At Annaghilla (Site 4), the site of Early to Late Neolithic settlement, further occupation took place during the Iron Age. This too was superseded by the creation of a large settlement cemetery enclosure during the early medieval period. Evidence for unenclosed settlement during the early medieval period was also uncovered at Armalughey (Sites 19 and 20). These roundhouses were present in a landscape dominated by contemporary field boundaries and without the large enclosures seen at the other early medieval settlement sites. These sites all provided a valuable insight into the changes in dwelling styles and construction over several thousand years.

As well as settlement evidence for burial practices from the prehistoric and into the early medieval period were also uncovered. Evidence for burial was uncovered on a number of sites along the Road Scheme, with some of the sites containing different burial practices spanning various periods. At Mullaghbane (Site 27) the earliest burial to have taken place was an Early Neolithic cremation which had been placed into a pit. Burial continued at the site through the Late Neolithic and into the Bronze Age, with ring barrows being created. At Annaghilla (Site 4) the first evidence for burial was two ring barrows which were created during the Iron Age. The site was once again used for burial during the early medieval period, when a cemetery containing 23 graves was created. Not all of the burials that were excavated came from cemetery sites. A single Bronze Age ring barrow was excavated at Tullyallen (Site 40) and a Late Bronze Age cremation was present at Cravenny Scotch (Site 23).

Probably the most unusual burial along the Road Scheme were the remains of an inhumation at Lisbeg (Site 6). Uncovered within a wetland context, and in association with burnt mounds, it is possible that this burial was a form of symbolic offering.

Evidence for ritual activity was present at Armalughey (Site 20), where a large timber circle with an elaborate entrance structure was excavated. Dating to the Late Neolithic the timber circle at Armalughey (Site 20) bears a number of similarities with the Late Neolithic ritual site at Ballynahatty, Co. Down.

Industrial activity, in the form of metal working, was identified at two of the early medieval settlement sites. At the rath at Mullaghbane (Site 27) a smiths hammer, whetstone and hammerscale were all recovered from the fill of the souterrain within the rath. These items are all associated with smithing and the finishing of iron objects. The settlement cemetery at Annaghilla (Site 4) produced kilns, hearths, slag and hammerscale. All of which indicate that the whole process from roasting and smelting the ore to extract the iron, to creating finished objects was taking place on the site.

To conclude, the excavations that took place across the Road Scheme shed light on the lives of the people who inhabited this part of Ireland. It has shown the nature of the dwellings that people lived in, the food that they ate, and how it was produced, and how people were treated after they had died. This volume encompasses the findings of the archaeologists that worked on the various excavations along the Road Scheme.

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41   Rynne 2006, pp. 219–220
42   DOE:HED Industrial Heritage Record numbers
      05279:000:00, 05283:000:00, 05287:000:00
      and 05494:000:00
43   DOE:HED Industrial Heritage Record number
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Radiocarbon Dates

All calibrated to:
BC/AD 95.4% C.I. @ 2 Sigma Calibration
Calibrations performed using OxCal 4.2 and IntCal13 (Bronk Ramsey, C 2009 'Bayesian analysis of radiocarbon dates' Radiocarbon, 51(1), pp. 337-360)

Lab codes:
UBA = 14Chrono Queens University
SUERC = Scottish Universities Environmental Research Centre Radiocarbon Dating Laboratory

Environmental

Context Description	Lab ID	Date BP	SD	δ^{13}C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
Lisbeg (Site 6)						*Lower*	*Upper*	
Monolith 1 – 63-34cm depth	GU-15846	2635	35		Peat-Humic Acid	894 BC 849 BC	872 BC 773 BC	0.041 0.913
Monolith 1 – 149-150cm depth	GU-15848	3995	35		Hazelnut Shell	2619 BC 2599 BC 2586 BC	2607 BC 2594 BC 2459 BC	0.012 0.004 0.938
Monolith 728 – 91-92cm depth	GU-15849	3850	35		Peat-Humic Acid	2459 BC	2206 BC	0.954
Monolith 728 – 100-101cm depth	GU-15851	3865	35		Alder Charcoal	2465 BC 2256 BC	2274 BC 2209 BC	0.842 0.112

The First Settlers

Context Description	Lab ID	Date BP	SD	δ^{13}C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
Roughan (Site 1)						*Lower*	*Upper*	
Erroneous date from a Burnt Mound	*UBA-14597*	*5561*	*39*	*-30.5*	*Willow Charcoal*	*4461 BC*	*4340 BC*	*0.954*
Grange (Site 14)						*Lower*	*Upper*	
Very Late Mesolithic stakehole structure	UBA-14482	5264	32	-29.4	Oak Charcoal	4230 BC 4174 BC	4197 BC 3986 BC	0.140 0.814
Armalughey (Site 17)						*Lower*	*Upper*	
Isolated pit	UBA-14497	6484	40	-26.8	Oak Charcoal	5522 BC	5364 BC	0.954
Armalughey (Site 18)						*Lower*	*Upper*	
Isolated hearth	SUERC-20637	5305	35	-25.7	Oak Charcoal	4241 BC 4012 BC	4041 BC 4005 BC	0.946 0.008
Mullaghbane (Site 27)						*Lower*	*Upper*	
Mesolithic pit, Mesolithic flint found during excavations but not in this pit	SUERC-21723	5280	30	-25.3	Oak Charcoal	4232 BC 4181 BC 4021 BC	4189 BC 4037 BC 3996 BC	0.190 0.697 0.067
Aghnahoe (Site 33)						*Lower*	*Upper*	
Mesolithic date from ground clearance, unlikely to be archaeology	*UBA-14547*	*5658*	*25*	*-26.8*	*Yew Charcoal*	*4546 BC*	*4449 BC*	*0.954*

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Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
						Lower	Upper	
Farriter (Site 35)						*Lower*	*Upper*	
Hearth	UBA-14584	5732	28	-26.0	Yew Charcoal	4683 BC 4623 BC	4632 BC 4498 BC	0.166 0.788
Farriter (Site 36)						*Lower*	*Upper*	
Small pit	UBA-14587	5274	28	-27.1	Oak Charcoal	4231 BC 4176 BC 4024 BC	4194 BC 4036 BC 3993 BC	0.172 0.683 0.099
Tullyallen (Site 42)						*Lower*	*Upper*	
Isolated pit	UBA-14450	5677	27	-31.1	Hazel Charcoal	4579 BC 4561 BC	4571 BC 4453 BC	0.009 0.945
Drumnafern (Site 52)						*Lower*	*Upper*	
Potential Mesolithic log boat beneath a burnt mound	UBA-14621	5667	34	-26.2	Hazel Charcoal	4593 BC 4420 BC	4446 BC 4399 BC	0.930 0.024

The Neolithic

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
						Lower	Upper	
Ballylagan (Site 2)						*Lower*	*Upper*	
Pit in cluster of pits, no clear structure	UBA-14598	5069	41	-28.8	Hazel Charcoal	3965 BC	3774 BC	0.954
Pit 2 in cluster of pits, no clear structure	UBA-14599	4539	21	-30.9	Hazel Charcoal	3364 BC 3293 BC 3274 BC 3238 BC	3316 BC 3289 BC 3267 BC 3108 BC	0.288 0.005 0.010 0.650
Annaghilla (Site 4)						*Lower*	*Upper*	
Pit to west of House 1	SUERC-21317	4130	30	-27.7	Oak Charcoal	2872 BC 2794 BC 2781 BC 2610 BC	2799 BC 2786 BC 2617 BC 2583 BC	0.270 0.011 0.629 0.045
House 1 posthole	SUERC-21655	4080	40	-26.5	Oak Charcoal	2863 BC 2759 BC 2708 BC 2540 BC	2807 BC 2717 BC 2547 BC 2489 BC	0.166 0.072 0.603 0.113
House 1 posthole	SUERC-21642	4055	40	-28.5	Hazel Charcoal	2851 BC 2743 BC 2695 BC	2812 BC 2729 BC 2474 BC	0.089 0.014 0.851
House 1 posthole	SUERC-21331	4060	30	-25	Oak Charcoal	2840 BC 2678 BC	2813 BC 2483 BC	0.077 0.877
House 2 posthole	SUERC-21320	3995	30	-25.3	Alder Charcoal	2576 BC	2467 BC	0.954
House 2 erroneous Bronze Age date	*SUERC-21319*	*2990*	*30*	*-29.2*	*Oak Charcoal*	*1374 BC* *1301 BC*	*1356 BC* *1118 BC*	*0.026* *0.928*
Erroneous date from pit with Neolithic flint artefacts	*SUERC-21635*	*3930*	*40*	*-25.1*	*Cremated Human Bone*	*2565 BC* *2496 BC*	*2532 BC* *2294 BC*	*0.066* *0.888*
Annaghilla (Site 5)						*Lower*	*Upper*	
Large isolated pit associated with two stakeholes, possibly a cooking hearth	UBA-14606	4627	42	-27.2	Oak Charcoal	3621 BC 3522 BC 3205 BC 3147 BC	3609 BC 3338 BC 3195 BC 3144 BC	0.009 0.934 0.008 0.002

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
						Lower	Upper	
Lisbeg (Site 6)						*Lower*	*Upper*	
Hearth beside stream	SUERC-20424	4470	30	-28.6	Alder Charcoal	3339 BC 3196 BC 3069 BC	3206 BC 3081 BC 3026 BC	0.524 0.333 0.097
Hearth beside stream	SUERC-20420	4380	30	-27.6	Hazel Charcoal	3090 BC 3036 BC	3045 BC 2913 BC	0.151 0.803
Lisbeg (Site 7)						*Lower*	*Upper*	
Isolated pit	UBA-14481	5009	32	-26.4	Oak Charcoal	3942 BC 3822 BC	3857 BC 3705 BC	0.337 0.617
Tullyvar (Site 10)						*Lower*	*Upper*	
Posthole in an otherwise Bronze Age area	*UBA-14475*	*4590*	*26*	*-26.2*	*Pomaceous fruitwood Charcoal*	*3498 BC* *3378 BC* *3213 BC* *3155 BC*	*3457 BC* *3333 BC* *3189 BC* *3132 BC*	*0.265* *0.595* *0.053* *0.040*
Grange (Site 14)						*Lower*	*Upper*	
Date from one of two pits which contained Western Neolithic pottery and flint	UBA-14483	4896	32	-30.6	Alder Charcoal	3761 BC 3731 BC 3715 BC	3742 BC 3726 BC 3637 BC	0.031 0.007 0.916
Armalughey (Site 17)						*Lower*	*Upper*	
Isolated pit	UBA-14499	4760	28	-26.7	Alder Charcoal	3639 BC 3410 BC 3399 BC	3515 BC 3405 BC 3384 BC	0.913 0.008 0.033
Armalughey (Site 18)						*Lower*	*Upper*	
Structure 1 posthole	SUERC-20654	4100	35	-26.2	Oak Charcoal	2866 BC 2763 BC 2516 BC	2804 BC 2568 BC 2500 BC	0.219 0.714 0.021
Structure 2 hearth	SUERC-20646	4080	35	-28.4	Cremated Human Bone	2861 BC 2756 BC 2704 BC 2536 BC	2808 BC 2719 BC 2559 BC 2491 BC	0.165 0.058 0.632 0.099
Structure 1 posthole	SUERC-20760	4080	30	-24.6	Oak Charcoal	2857 BC 2748 BC 2699 BC 2532 BC	2811 BC 2724 BC 2565 BC 2496 BC	0.159 0.037 0.680 0.078
Structure 1 posthole	SUERC-20649	4065	35	-26.1	Cremated Human Bone	2853 BC 2744 BC 2696 BC	2812 BC 2726 BC 2487 BC	0.110 0.002 0.824
Structure 2 pit	SUERC-20639	4015	30	-26.7	Oak Charcoal	2618 BC 2582 BC	2610 BC 2470 BC	0.015 0.939
Armalughey (Site 19)						*Lower*	*Upper*	
Pit in cluster of pits	UBA-14501	4021	26	-24.5	Hazel Charcoal	2618 BC 2581 BC	2610 BC 2472 BC	0.016 0.938
Second pit in cluster of pits	UBA-14503	3999	29	-26.8	Hazel Charcoal	2575 BC	2469 BC	0.954
Spread, no artefacts recovered	UBA-14505	5155	28	-26.4	Pomaceous fruitwood Charcoal	4040 BC 4001 BC 3857 BC	4014 BC 3940 BC 3818 BC	0.099 0.790 0.064
Armalughey (Site 20)						*Lower*	*Upper*	
Pre Timber circle pits	SUERC-20787	4320	30	-25.3	Oak Charcoal	3014 BC	2891 BC	0.954

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Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
Armalughey (Site 20)						*Lower*	*Upper*	
Pre Timber circle pits	SUERC-20788	4315	30	-24.9	Oak Charcoal	3013 BC	2888 BC	0.954
Timber circle (Circle A)	SUERC-20770	4135	30	-26.2	Willow Charcoal	2872 BC	2620 BC	0.954
Timber circle (Circle A)	SUERC-20778	4135	30	-26	Oak Charcoal	2872 BC	2620 BC	0.954
Timber circle façade	SUERC-20789	4155	30	-25.8	Oak Charcoal	2878 BC 2821 BC	2831 BC 2631 BC	0.188 0.766
Timber circle (Structure C)	SUERC-20780	4105	30	-25.8	Cremated Human Bone	2864 BC 2760 BC 2508 BC	2806 BC 2572 BC 2506 BC	0.231 0.721 0.002
Timber circle (Circle B)	SUERC-20785	4110	30	-27.2	Oak Charcoal	2865 BC 2762 BC	2804 BC 2575 BC	0.241 0.713
Timber circle (Circle D)	SUERC-20795	4110	30	-24.1	Alder Charcoal	2865 BC 2762 BC	2804 BC 2575 BC	0.241 0.713
Timber circle (Circle A)	SUERC-20777	4070	30	-26.1	Willow Charcoal0	2851 BC 2743 BC 2695 BC 2537 BC	2812 BC 2729 BC 2551 BC 2491 BC	0.119 0.015 0.669 0.152
Timber circle façade	SUERC-20794	4080	30	-26.5	Oak Charcoal	2857 BC 2748 BC 2699 BC 2532 BC	2811 BC 2742 BC 2565 BC 2496 BC	0.159 0.037 0.680 0.078
Timber circle (Structure C)	SUERC-20774	4045	30	-22	Charred Hazelnut Shell	2834 BC 2660 BC 2635 BC	2819 BC 2649 BC 2475 BC	0.032 0.016 0.906
Pit to east of timber circle	SUERC-20775	4050	30	-25.4	Charred Hazelnut Shell	2835 BC 2666 BC	2817 BC 2476 BC	0.045 0.909
Pit to east of timber circle	SUERC-20776	4050	30	-23.5	Charred Hazelnut Shell	2835 BC 2666 BC	2817 BC 2476 BC	0.045 0.909
Timber circle (Circle B)	SUERC-20779	4040	30	-21.3	Charred Hazelnut Shell	2832 BC 2631 BC	2821 BC 2474 BC	0.020 0.934
Radial arm of timber circle	SUERC-20786	4060	30	-23.6	Willow Charcoal	2840 BC 2678 BC	2813 BC 2483 BC	0.077 0.877
Upper fill of pre timber circle pits	SUERC-20796	4045	30	-25	Unidentified Burnt Bone	2834 BC 2660 BC 2635 BC	2819 BC 2649 BC 2475 BC	0.032 0.016 0.906
Timber circle (Circle B)	SUERC-20784	4030	30	-23.6	Oak Charcoal	2623 BC	2473 BC	0.954
Radial arm of timber circle	SUERC-20790	4020	30	-26.3	Alder Charcoal	2620 BC 2600 BC 2588 BC	2606 BC 2593 BC 2471 BC	0.003 0.013 0.910
Early Bronze Age Beaker activity at timber circle	SUERC-20768	3750	30	-23.9	Oak Charcoal	2281 BC 2231 BC 2100 BC	2249 BC 2116 BC 2038 BC	0.078 0.667 0.209
Armalughey (Site 21)						*Lower*	*Upper*	
Pit from area containing a small number of pits spread over large area	UBA-14445	4025	28	-27.0	Alder Charcoal	2620 BC	2473 BC	0.954

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
Armalughey (Site 22)						*Lower*	*Upper*	
Pit beside Cremation Pit 1 (contains at least four grooved ware vessels)	UBA-14519	4047	25	-25.5	Oak Charcoal	2832 BC 2632 BC	2821 BC 2486 BC	0.022 0.932
Pre ring barrow activity	UBA-14521	4397	24	-25.1	Oak Charcoal	3091 BC	2923 BC	0.954
Cremation Pit 1	UBA-14522	4021	34	-20.2	Wild/Bird Cherry Charcoal	2622 BC	2470 BC	0.954
Cremation Pit 2	UBA-14523	4088	24	-23.7	Oak Charcoal	2854 BC 2746 BC 2697 BC 2514 BC	2812 BC 2726 BC 2571 BC 2503 BC	0.179 0.032 0.724 0.019
Pit beside Cremation Pit 1	UBA-14524	4133	26	-24.7	Oak Charcoal	2871 BC 2780 BC 2606 BC	2801 BC 2619 BC 2601 BC	0.281 0.665 0.008
Pit beside Cremation Pit 2	UBA-14525	4072	26	-26.9	Birch Charcoal	2850 BC 2742 BC 2694 BC 2681 BC 2535 BC	2812 BC 2731 BC 2686 BC 2562 BC 2492 BC	0.118 0.009 0.007 0.696 0.124
Pit immediately south of ring barrow	UBA-14526	4059	27	-26.2	Oak Charcoal	2836 BC 2671 BC	2815 BC 2488 BC	0.064 0.890
Pit immediately south of ring barrow	UBA-14527	4137	25	-21.9	Pomaceous fruitwood Charcoal	2872 BC	2621 BC	0.954
Pre ring barrow pit	UBA-14528	4744	28	-23.9	Oak Charcoal	3636 BC 3427 BC	3507 BC 3381 BC	0.795 0.159
Cremation pit in ring barrow	UBA-14529	4065	29	-23.7	Willow Charcoal	2849 BC 2739 BC 2693 BC 2680 BC	2813 BC 2734 BC 2688 BC 2488 BC	0.098 0.004 0.004 0.849
Pit immediately south of ring barrow	UBA-14530	4093	25	-30.1	Hazel Charcoal	2857 BC 2748 BC 2699 BC 2511 BC	2811 BC 2724 BC 2572 BC 2505 BC	0.199 0.050 0.696 0.008
Armalughey (Site 24)						*Lower*	*Upper*	
Two isolated stakeholes, not associated with any further structures	UBA-14517	4768	26	-26.9	Hazel Charcoal	3639 BC	3518 BC	0.954
Mullaghbane (Site 27)						*Lower*	*Upper*	
Cremation Pit	SUERC-21743	4855	30	-25.2	Oak Charcoal	3705 BC 3562 BC	3631 BC 3537 BC	0.858 0.096
Pit cut through Cremation Pit	SUERC-21746	4815	30	-26.6	Oak Charcoal	3655 BC 3598 BC	3626 BC 3526 BC	0.300 0.654
Pit in centre of ring barrow	SUERC-21735	4205	30	-24.3	Oak Charcoal	2897 BC 2814 BC	2848 BC 2679 BC	0.296 0.658
Mullaghbane (Site 29)						*Lower*	*Upper*	
Pit 1 Erroneous dates from cluster of pits which provided two later overlapping dates	UBA-14532	4426	29	-28.1	*Hazel Charcoal*	*3323 BC 3172 BC 3117 BC*	*3234 BC 3162 BC 2924 BC*	*0.161 0.001 0.783*

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Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
Mullaghbane (Site 29)						*Lower*	*Upper*	
Pit 3 in pit cluster, may be burnt mound	UBA-14533	3978	23	-25.4	Hazel Charcoal	2570 BC 2501 BC	2516 BC 2464 BC	0.513 0.441
Pit 2 in pit cluster, may be burnt mound	UBA-14535	4107	26	-25.8	Hazel Charcoal	2861 BC 2758 BC 2706 BC	2807 BC 2718 BC 2527 BC	0.238 0.110 0.606
Inishmagh (Site 30)						*Lower*	*Upper*	
Isolated pit	UBA-14541	4086	27	-30.6	Hazel Charcoal	2856 BC 2748 BC 2698 BC 2517 BC	2811 BC 2724 BC 2568 BC 2500 BC	0.176 0.004 0.703 0.035
Mullaghbane (Site 44)						*Lower*	*Upper*	
Isolated pit	UBA-14465	4847	29	-29.0	Hazel Charcoal	3698 BC 3578 BC 3566 BC	3631 BC 3573 BC 3536 BC	0.778 0.009 0.166
Cullenfad (Site 45)						*Lower*	*Upper*	
Isolated pit beneath Bronze Age barrow	SUERC-21132	4125	30	-27	Alder Charcoal	2867 BC 2777 BC	2803 BC 2581 BC	0.258 0.696
Drumnafern (Site 47)						*Lower*	*Upper*	
Isolated pit	UBA-14456	4109	27	-23.4	Hazel Charcoal	2863 BC 2760 BC 2709 BC	2806 BC 2717 BC 2576 BC	0.241 0.122 0.591

Bronze Age

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
Roughan (Site 1)						*Lower*	*Upper*	
Burnt mound trough	UBA-14596	3768	24	-28.3	Alder Charcoal	2286 BC 2080 BC	2133 BC 2061 BC	0.924 0.030
Annaghilla (Site 3)						*Lower*	*Upper*	
Phase 2 burnt mound stakeholes	UBA-14603	3502	29	-22.0	Birch Charcoal	1907 BC	1745 BC	0.954
Phase 3 burnt mound	UBA-14601	3269	20	-30.6	Hazel Charcoal	1611 BC	1502 BC	0.954
Phase 1 burnt mound pit 1	UBA-14600	3882	20	-29.8	Alder Charcoal	2461 BC	2297 BC	0.954
Phase 1 burnt mound pit 2	UBA-14602	3875	24	-25.5	Wild/Bird Cherry Charcoal	2465 BC	2286 BC	0.954
Annaghilla (Site 4)						*Lower*	*Upper*	
Burnt mound	SUERC-21327	3060	30	-27.8	Oak Charcoal	1411 BC 1251 BC	1257 BC 1231 BC	0.911 0.043
Bronze Age roundhouse	SUERC-21296	2820	30	-24.8	Carbonised Barley Grain	1055 BC	899 BC	0.954
Iron Age date from bronze age roundhouse	SUERC- 21295	2435	30	-26.7	Alder Charcoal	751 BC 669 BC 625 BC 592 BC	683 BC 637 BC 615 BC 406 BC	0.215 0.077 0.010 0.651

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
Annaghilla (Site 5)						*Lower*	*Upper*	
Burnt mound trough	UBA-14607	2830	28	-31.1	Birch Charcoal	1071 BC 1056 BC	1066 BC 906 BC	0.004 0.950
Lisbeg (Site 6)						*Lower*	*Upper*	
Hearth within Burnt Mound 1	SUERC-20605	4200	35	-27.1	Alder Charcoal	2897 BC 2816 BC	2636 BC 2671 BC	0.276 0.678
Burnt Mound 1 spread	SUERC-20419	4125	30	-26.2	Oak Charcoal	2867 BC 2777 BC	2803 BC 2581 BC	0.258 0.696
Burnt Mound 1 spread	SUERC-20431	4045	30	-23.9	Alder Charcoal	2834 BC 2660 BC 2635 BC	2819 BC 2649 BC 2475 BC	0.032 0.016 0.906
Burnt Mound 1 spread	SUERC-20603	4040	30	-27.3	Hazel Charcoal	2832 BC 2631 BC	2821 BC 2474 BC	0.002 0.934
Burnt Mound 1 spread	SUERC-20599	4000	30	-27.6	Alder Charcoal	2619 BC 2599 BC 2587 BC	2607 BC 2593 BC 2462 BC	0.015 0.006 0.933
Burnt Mound 1 spread	SUERC-20633	3970	35	-24	Willow Charcoal	2577 BC 2424 BC 2381 BC	2432 BC 2401 BC 2348 BC	0.863 0.037 0.054
Wood from birch within peat which had grown over Burnt Mound 1	SUERC-20604	3885	35	-29.5	Birch Wood	2471 BC 2250 BC 2218 BC	2281 BC 2232 BC 2214 BC	0.924 0.025 0.005
Burnt Mound 2 spread	SUERC-20633	3970	35	-24	Willow Charcoal	2577 BC 2424 BC 2381 BC	2432 BC 2401 BC 2348 BC	0.863 0.037 0.054
Burnt Mound 2 trough	SUERC-23227	3845	30	-28.4	Willow Wicker	2457 BC 2409 BC	2417 BC 2205 BC	0.103 0.851
Burnt Mound 3 trough 1	SUERC-23228	3935	30	-27.5	Alder Wood	2563 BC 2493 BC 2322 BC	2534 BC 2337 BC 2308 BC	0.055 0.878 0.020
Burnt Mound 3 trough 1	SUERC-23226	3865	30	-28.9	Alder Wood	2463 BC 2252 BC 2221 BC	2278 BC 2229 BC 2211 BC	0.876 0.057 0.021
Burnt Mound 3 spread	SUERC-20634	3850	35	-25.4	Alder Charcoal	2549 BC	2206 BC	0.954
Burnt Mound 3 spread	SUERC-20635	3840	30	-26	Alder Charcoal	2457 BC 2409 BC	2417 BC 2202 BC	0.084 0.870
Burnt Mound 3 trough 2	SUERC-23225	3825	30	-28.6	Alder Wood	2455 BC 2406 BC 2351 BC 2171 BC	2419 BC 2376 BC 2196 BC 2147 BC	0.038 0.047 0.834 0.034
Burnt Mound 3 spread	SUERC-20628	3815	35	-26.6	Alder Charcoal	2452 BC 2406 BC 2350 BC	2420 BC 2377 BC 2140 BC	0.031 0.038 0.885
Burnt Mound 3 spread	SUERC-20629	3805	30	-28.7	Alder Charcoal	2343 BC	2140 BC	0.954
Burnt Mound 4 spread	SUERC-20429	3910	30	-25.3	Alder Charcoal	2473 BC	2299BC	0.954

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Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.* Lower	Upper	Probability
Lisbeg (Site 6)						*Lower*	*Upper*	
Burnt Mound 5 spread	SUERC-20428	3880	30	-27.4	Alder Charcoal	2467 BC / 2247 BC	2286 BC / 2236 BC	0.942 / 0.012
Burnt Mound 6 spread	SUERC-20433	3865	35	-25.9	Hazel Charcoal	2465 BC / 2256 BC	2274 BC / 2209 BC	0.842 / 0.112
Burnt Mound 7 pit	SUERC-20593	3540	35	-26.8	Alder Charcoal	1965 BC	1754 BC	0.954
Burnt Mound 8 spread - Date 1	SUERC-23216	3480	30	-30.1	Hazel Wood	1888 BC / 1715 BC	1737 BC / 1697 BC	0.909 / 0.045
Burnt Mound 8 spread - Date 2	SUERC-20595	3465	30	-25.5	Alder Charcoal	1883 BC / 1720 BC	1732 BC / 1693 BC	0.844 / 0.110
Burnt Mound 9 channel filled with burnt mound spread	SUERC-20418	3405	35	-23.6	Prunus Charcoal (Includes: plum, cherry apricot)	1870 BC / 1776 BC	1846 BC / 1619 BC	0.034 / 0.920
Burnt Mound 9 trough	SUERC-23214	3370	30	-26.2	Oak Wood	1745 BC / 1572 BC	1611 BC / 1566 BC	0.948 / 0.060
Burnt Mound 9 spread	SUERC-20434	3330	30	-27.2	Alder Charcoal	1689 BC	1528 BC	0.954
Burnt Mound 9 trough	SUERC-23215	3250	30	-28.5	Alder Wattle	1613 BC / 1485 BC	1491 BC / 1451 BC	0.805 / 0.149
Burnt Mound 9 spread	SUERC-20608	3215	35	-24	Carbonised Barley Grain	1607 BC / 1560 BC / 1547 BC	1583 BC / 1553 BC / 1417 BC	0.048 / 0.009 / 0.897
Burnt Mound 9 spread	SUERC-23217	3215	30	-26.4	Hazel Wood	1600 BC / 1535 BC	1586 BC / 1420 BC	0.024 / 0.930
Burnt Mound 10 spread	SUERC-20607	3365	35	-29.6	Alder Charcoal	1746 BC / 1585 BC / 1538 BC	1603 BC / 1544 BC / 1535 BC	0.884 / 0.067 / 0.040
Human inhumation burial	SUERC-20636	3205	35	-22.8	Cremated Human Bone	1601 BC / 1543 BC	1585 BC / 1411 BC	0.023 / 0.931
Burnt Mound 11 channel filled with burnt mound spread	SUERC-20596	3025	35	-25.6	Alder Charcoal	1396 BC / 1177 BC / 1144 BC	1191 BC / 1163 BC / 1131 BC	0.918 / 0.016 / 0.020
Burnt Mound 11 spread	SUERC-20430	2970	35	-24.4	Charred Hazelnut Shell	1286 BC	1054 BC	0.954
Burnt Mound 12 spread	SUERC-20627	3010	30	-27.4	Alder Charcoal	1386 BC / 1310 BC / 1147 BC	1340 BC / 1157 BC / 1128 BC	0.122 / 0.789 / 0.044
Burnt Mound 12 spread	SUERC-20626	2990	30	-28.1	Alder Charcoal	1374 BC / 1301 BC	1356 BC / 1118 BC	0.026 / 0.928
Burnt Mound 13 trough, oak plank base	SUERC-23223	2950	30	-26.9	Oak Wood	1260 BC / 1236 BC	1241 BC / 1051 BC	0.032 / 0.922
Burnt Mound 13 spread	SUERC-20619	2910	35	-26.8	Alder Charcoal	1214 BC	1006 BC	0.954
Burnt Mound 13 spread	SUERC-20614	2895	35	-27.2	Alder Charcoal	1209 BC	979 BC	0.954

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.* Lower	Upper	Probability
Lisbeg (Site 6)						*Lower*	*Upper*	
Burnt Mound 14 spread	SUERC-20624	2865	35	-27.2	Alder Charcoal	1188 BC / 1156 BC / 1128 BC	1181 BC / 1148 BC / 923 BC	0.007 / 0.008 / 0.939
Burnt Mound 14 trough, poplar plank base	SUERC-23224	2850	30	-28.9	Poplar Wood	1111 BC	927 BC	0.954
Burnt Mound 15 spread 1	SUERC-20616	2830	30	-25.8	Willow Charcoal	1083 BC / 1058 BC	1065 BC / 906 BC	0.018 / 0.936
Burnt Mound 15 spread 2	SUERC-20615	2820	35	-24.1	Hazel Charcoal	1108 BC / 1089 BC	1100 BC / 896 BC	0.006 / 0.948
Burnt Mound 16 hearth	SUERC-20609	2545	30	-26.7	Alder Charcoal	801 BC / 688 BC / 646 BC	739 BC / 664 BC / 549 BC	0.494 / 0.111 / 0.349
Burnt Mound 16 spread	SUERC-20617	2455	35	-25.8	Birch Charcoal	756 BC / 671 BC	679 BC / 413 BC	0.265 / 0.689
Burnt Mound 17 spread	SUERC-20423	2480	30	-25.8	Alder Charcoal	774 BC / 441 BC	482 BC / 434 BC	0.949 / 0.005
Burnt Mound 18 spread	SUERC-20594	2460	30	-26	Prunus Charcoal (Includes: plum, cherry apricot)	758 BC / 672 BC	678 BC / 429 BC	0.295 / 0.659
Lisbeg (Site 7)						*Lower*	*Upper*	
Pit beside some associated stakeholes, no definite structure apparent	UBA-14479	3208	23	-26.8		1517 BC	1429 BC	0.954
Stakehole in cluster beside pit, no definite structure apparent	UBA-14480	3146	33	-29.6		1500 BC / 1344 BC	1378 BC / 1306 BC	0.829 / 0.125
Tullyvar (Site 9)						*Lower*	*Upper*	
Pit 1 of two isolated pits	UBA-14477	3047	24	-25.5	Ash Charcoal	1395 BC / 1327 BC	1333 BC / 1226 BC	0.391 / 0.563
Tullyvar (Site 10)						*Lower*	*Upper*	
Stakehole in cluster of features dating from EBA to Iron Age	UBA-14472	3093	27	-31.1	Oak Charcoal	1425 BC	1283 BC	0.954
Gully in cluster of features dating from EBA to Iron Age	UBA-14473	3560	24	-26.5	Hazel Charcoal	2009 BC / 1976 BC / 1844 BC / 1799 BC	2001 BC / 1875 BC / 1817 BC / 1780 BC	0.010 / 0.851 / 0.058 / 0.035
Gully in cluster of features dating from EBA to Iron Age	UBA-14476	3109	24	-30.0	Pomaceous fruitwood Charcoal	1434 BC / 1361 BC	1369 BC / 1298 BC	0.526 / 0.428
Cavankilgreen (Site 12)						*Lower*	*Upper*	
Burnt mound	UBA-14468	3810	29	-24.9	Hazel Charcoal	2397 BC / 2346 BC / 2181 BC	2385 BC / 2190 BC / 2141 BC	0.008 / 0.851 / 0.095

Cavankilgreen / Lisbeg / Armalughey (left)

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.* Lower	Upper	Probability
Cavankilgreen (Site 13)						*Lower*	*Upper*	
Burnt mound	UBA-14467	2556	22	-30.9	Water Elder Charcoal	802 BC	750 BC	0.814
						684 BC	667 BC	0.053
						637 BC	621 BC	0.002
						616 BC	590 BC	0.062
						576 BC	571 BC	0.005
Lisbeg (Site 15)						*Lower*	*Upper*	
Posthole outside house structure	UBA-14484	3286	31	-24.6	Hazel Charcoal	1634 BC	1499 BC	0.954
Pit within curving wall slot of house structure	UBA-14485	3297	31	-26.9	Hazel Charcoal	1644 BC	1502 BC	0.954
Large spread within curving wall slot of house structure	UBA-14486	3276	29	-25.7	Willow Charcoal	1626 BC	1497 BC	0.950
						1469 BC	1466 BC	0.004
Wall slot of house structure	UBA-14487	3255	33	-28.3	Hazel Charcoal	1616 BC	1450 BC	0.954
Stakehole within house structure	UBA-14488	3325	31	-28.3	Willow Charcoal	1688 BC	1521 BC	0.954
Lisbeg (Site 16)						*Lower*	*Upper*	
Windbreak	UBA-14489	3042	26	-25.1	Willow Charcoal	1391 BC	1337 BC	0.204
						1321 BC	1195 BC	0.745
						1139 BC	1135 BC	0.005
Windbreak	UBA-14490	3022	29	-27.1	Willow Charcoal	1393 BC	1336 BC	0.201
						1323 BC	1192 BC	0.732
						1173 BC	1167 BC	0.005
						1143 BC	1132 BC	0.016
Burnt mound	UBA-14491	3657	32	-27.2	Birch Charcoal	2136 BC	1945 BC	0.954
Armalughey (Site 17)						*Lower*	*Upper*	
Central posthole 1 of roundhouse	UBA-14493	2805	28	-30.4	Hazel Charcoal	1043 BC	896 BC	0.954
Posthole within roundhouse	UBA-14494	2932	25	-29.1	Oak Charcoal	1218 BC	1047 BC	0.954
Large ritual pit beside round house	UBA-14495	2802	26	-27.4	Pomaceous fruitwood Charcoal	1022 BC	894 BC	0.948
						864 BC	857 BC	0.006
Stakehole within roundhouse	UBA-14496	2847	27	-32.2	Ash Charcoal	1108 BC	1099 BC	0.019
						1090 BC	925 BC	0.935
Central posthole 2 of roundhouse	UBA-14498	2902	30	-24.1	Oak Charcoal	1207 BC	1141 BC	0.179
						1134 BC	1006 BC	0.775
Wall slot of roundhouse	UBA-14500	2838	28	-24.8	Hazel Charcoal	1086 BC	915 BC	0.954
Armalughey (Site 18)						*Lower*	*Upper*	
Isolated cremation of a juvenile within Collared Urn	SUERC-20643	3490	35	-25	Cremated Human Bone	1907 BC	1737 BC	0.915
						1716 BC	1696 BC	0.039

Armalughey / Cravenny Scotch (right)

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.* Lower	Upper	Probability
Armalughey (Site 18)						*Lower*	*Upper*	
MBA House structure defined by gully and postholes	SUERC-20766	3290	30	-26.6	Oak Charcoal	1633 BC	1501 BC	0.954
Burnt mound trough	SUERC-20644	2840	35	-24	Oak Charcoal	1111 BC	914 BC	0.954
Isolated refuse pit	SUERC-20645	2805	30	-25	Oak Charcoal	1046 BC	894 BC	0.942
						866 BC	855 BC	0.012
Four Post Structure - Date 2	SUERC-20759	2645	30	-24.7	Oak Charcoal	894 BC	873 BC	0.039
						874 BC	788 BC	0.915
Erroneous date from base of medieval ditch	*SUERC-20755*	*2570*	*30*	*-26.5*	*Alder Charcoal*	*809 BC*	*748 BC*	*0.775*
						685 BC	*667 BC*	*0.052*
						641 BC	*588 BC*	*0.102*
						580 BC	*559 BC*	*0.025*
Four Post Structure - Date 1	SUERC-20647	2460	30	-26.3	Oak Charcoal	758 BC	678 BC	0.295
						672 BC	429 BC	0.659
Erroneous hearth date from MBA house structure	*SUERC-20765*	*1030*	*30*	*-28.6*	*Hazel Charcoal*	*AD 901*	*AD 920*	*0.028*
						AD 962	*AD 1041*	*0.919*
						AD 1109	*AD 1116*	*0.007*
Armalughey (Site 19)						*Lower*	*Upper*	
Pit 2	UBA-14507	2861	23	-23.7	Pomaceous fruitwood Charcoal	1114 BC	972 BC	0.895
						959 BC	938 BC	0.059
Pit 1 - Date 1	UBA-14509	2928	23	-28.9	Ash Charcoal	1214 BC	1047 BC	0.954
Pit 1 - Date 2	UBA-14510	3007	26	-24.6	Birch Charcoal	1379 BC	1345 BC	0.080
						1305 BC	1188 BC	0.796
						1181 BC	1159 BC	0.038
						1145 BC	1129 BC	0.040
Armalughey (Site 22)						*Lower*	*Upper*	
Pit containing Beaker pottery	UBA-14520	3855	44	-29.6	Hazel Charcoal	2465 BC	2203 BC	0.954
Cravenny Scotch (Site 23)						*Lower*	*Upper*	
Cremation of a single adult	UBA-14511	2975	26	-28.7	Hazel Charcoal	1277 BC	1116 BC	0.954
Wall slot of roundhouse	UBA-14515	3375	24	-29.5	Hazel Charcoal	1741 BC	1711 BC	0.156
						1699 BC	1618 BC	0.798
Post within roundhouse	UBA-14514	3133	24	-28.6	Hazel Charcoal	1492 BC	1482 BC	0.017
						1454 BC	1376 BC	0.762
						1345 BC	1305 BC	0.175
Pit immediately south of roundhouse	UBA-14516	3057	23	-29.1	Alder Charcoal	1402 BC	1260 BC	0.944
						1241 BC	1236 BC	0.010
Erroneous Iron Age date from roundhouse	*UBA-14513*	*2161*	*25*	*-29.4*	*Hazel Charcoal*	*357 BC*	*283 BC*	*0.432*
						257 BC	*247 BC*	*0.010*
						235 BC	*149 BC*	*0.468*
						140 BC	*113 BC*	*0.044*
Armalughey (Site 25)						*Lower*	*Upper*	
Burnt Mound 1 spread	UBA-14549	3884	24	-30.8		2463 BC	2296 BC	0.954

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Context Description	Lab ID	Date BP	SD	δ13C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
Armalughey (Site 25)						*Lower*	*Upper*	
Burnt Mound 1 upper fill	UBA-14550	3704	22	-31.5		2195 BC 2145 BC	2174 BC 2028 BC	0.055 0.899
Burnt Mound 2 spread	UBA-14551	3290	24	-30.0	Alder Charcoal	1621 BC	1508 BC	0.954
Burnt Mound 1 trough	UBA-14552	3822	27	-30.5		2433 BC 2404 BC 2350 BC 2172 BC	2422 BC 2380 BC 2196 BC 2147 BC	0.009 0.029 0.883 0.033
Burnt Mound 1 trough middle fill	UBA-14553	3790	27	-29.5		2297 BC	2137 BC	0.954
Burnt Mound 2 spread	UBA-14554	3378	25	-27.4	Alder Charcoal	1741 BC 1699 BC	1711 BC 1621 BC	0.182 0.772
Pit to east of Burnt Mound 2	UBA-14555	3242	25	-18.7	Wild/Bird Cherry Charcoal	1609 BC 1564 BC	1579 BC 1446 BC	0.133 0.821
Posthole 2 to east of Burnt Mound 2	UBA-14556	3325	28	-32.1	Alder Charcoal	1684 BC	1528 BC	0.954
Posthole 1 to east of Burnt Mound 2	UBA-14557	3281	27	-27.0	Willow Charcoal	1622 BC	1502 BC	0.954
Mullaghbane (Site 27)						*Lower*	*Upper*	
Ring Barrow 2 – Date 1	SUERC-21745	3140	30	-25.4	Oak Charcoal	1497 BC 1345 BC	1377 BC 1305 BC	0.802 0.152
Ring barrow 2 – Date 2	SUERC-21742	3125	30	-26.2	Oak Charcoal	1492 BC 1454 BC	1481 BC 1297 BC	0.016 0.938
Pits and postholes, L-shape structure. Within and destroyed by EM rath ditch	SUERC-21717	3120	30	-26.8	Alder Charcoal	1451 BC	1291 BC	0.954
Cremation 1	SUERC-21726	3065	30	-24.2	Cremated Human Bone	1412 BC 1244 BC	1258 BC 1234 BC	0.934 0.002
Ring Barrow 4	SUERC-21734	3050	30	-25.4	Oak Charcoal	1401 BC	1226 BC	0.954
Cremation 2	SUERC-21721	3015	30	-24	Burnt Bone: Human	1387 BC 1316 BC 1178 BC 1144 BC	1339 BC 1190 BC 1161 BC 1131 BC	0.153 0.747 0.025 0.028
Cremation 3	SUERC-21724	2970	30	-26	Alder Charcoal	1281 BC 1065 BC	1076 BC 1058 BC	0.948 0.006
Ring Barrow 3	SUERC-21736	3110	30	-27.2	Alder Charcoal	1437 BC	1288 BC	0.954
Golan (Site 28)						*Lower*	*Upper*	
Wall slot of LBA roundhouse	UBA-14563	2882	18	-26.8	Birch Charcoal	1119 BC	1004 BC	0.954
Pit 1 within LBA roundhouse	UBA-14565	3017	18	-22.2	Hazel Charcoal	1377 BC 1304 BC	1349 BC 1209 BC	0.088 0.866
LBA roundhouse entrance post 3	UBA-14564	2861	21	-27.3	Willow Charcoal	1112 BC 957 BC	974 BC 942 BC	0.912 0.042

Context Description	Lab ID	Date BP	SD	δ13C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
Golan (Site 28)						*Lower*	*Upper*	
LBA roundhouse entrance post 4	UBA-14566	2924	20	-28.7	Oak Charcoal	1210 BC	1047 BC	0.954
Outer post ring of roundhouse	UBA-14567	2796	19	-25.5	Hazel Charcoal	1004 BC	903 BC	0.954
LBA roundhouse entrance post 1	UBA-14568	2834	19	-31.0	Oak Charcoal	1046 BC	926 BC	0.954
LBA roundhouse entrance post 2	UBA-14569	3127	22	-30.7	Hazel Charcoal	1447 BC 1345 BC	1376 BC 1305 BC	0.735 0.219
Residual date from LBA house	*UBA-14570*	*3547*	*30*	*-30.4*	*Hazel Charcoal*	*1971 BC*	*1771 BC*	*0.954*
Internal stakehole from LBA roundhouse	UBA-14571	2832	24	-27.8	Ash Charcoal	1051 BC	916 BC	0.954
Pit 2 within LBA roundhouse	UBA-14572	2825	23	-24.6	Holly Charcoal	1043 BC	916 BC	0.954
Pit 3 within LBA roundhouse	UBA-14573	2939	23	-28.0	Oak Charcoal	1216 BC	1054 BC	0.954
Inner post ring from LBA roundhouse	UBA-14574	2815	18	-26.4	Hazel Charcoal	1011 BC	915 BC	0.954
Storage pit 1 within MBA roundhouse	UBA-14575	3403	38	-30.1	Alder Charcoal	1871 BC 1812 BC 1777 BC	1845 BC 1803 BC 1615 BC	0.039 0.009 0.906
Storage pit 2 within MBA roundhouse	UBA-14576	3215	20	-30.3	Alder Charcoal	1518 BC	1434 BC	0.954
Stakehole in fence between MBA roundhouse and enclosure at NW of enclosure	UBA-14577	3104	20	-29.1	Hazel Charcoal	1429 BC 1359 BC	1371 BC 1301 BC	0.495 0.459
Outer wall slot of MBA roundhouse	UBA-14578	3235	27	-27.7	Hazel Charcoal	1608 BC 1562 BC	1582 BC 1437 BC	0.093 0.861
Inner wall slot of MBA roundhouse	UBA-14579	3169	27	-25.5	Hazel Charcoal	1501 BC	1405 BC	0.954
Widened entrance at south of palisade, MBA roundhouse	UBA-14580	3296	28	-27.0	Alder Charcoal	1632 BC	1505 BC	0.954
Palisade enclosure, MBA roundhouse	UBA-14581	3274	28	-26.1	Alder Charcoal	1624 BC	1497 BC	0.954
Mullaghbane (Site 29)						*Lower*	*Upper*	
Burnt mound trough	UBA-14534	3377	27	-25.7	Hazel Charcoal	1744 BC 1701 BC	1708 BC 1616 BC	0.190 0.764
Hollow within stake built shelter	UBA-14531	3455	24	-30.3	Hazel Charcoal	1879 BC 1830 BC	1838 BC 1692 BC	0.230 0.724
Inishmagh (Site 30)						*Lower*	*Upper*	
Erroneous date from post medieval feature	*UBA-14540*	*3470*	*24*	*-28.0*	*Hazel Charcoal*	*1881 BC* *1714 BC*	*1739 BC* *1698 BC*	*0.896* *0.058*

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
						Lower	Upper	
Inishmagh (Site 30)						*Lower*	*Upper*	
Isolated hearth	UBA-14537	3843	25	-31.0	Alder Charcoal	2456 BC	2418 BC	0.077
						2407 BC	2375 BC	0.093
						2367 BC	2362 BC	0.008
						2351 BC	2204 BC	0.776
Burnt mound	UBA-14538	3538	27	-29.2	Hazel Charcoal	1948 BC	1771 BC	0.954
Aghnahoe (Site 32)						*Lower*	*Upper*	
Pit within structure to north of round house - Date 1	UBA-14543	3096	25	-29.9	Hazel Charcoal	1425 BC	1289 BC	0.954
Pit within structure to north of round house - Date 2	UBA-14544	2986	25	-28.6	Willow Charcoal	1285 BC	1121 BC	0.954
Hearth of round house - Date 1	UBA-14545	3113	28	-32.8	Hazel Charcoal	1439 BC	1294 BC	0.954
Hearth of round house - Date 2	UBA-14546	3064	25	-27.1	Willow Charcoal	1410 BC	1261 BC	0.954
Aghnahoe (Site 34)						*Lower*	*Upper*	
EBA field clearance	UBA-14548	3666	25	-29.0	Oak Charcoal	2136 BC	1961 BC	0.954
Farriter (Site 36)						*Lower*	*Upper*	
Field clearance	UBA-14586	3812	28	-30.7	Hazel Charcoal	2397 BC	2385 BC	0.008
						2346 BC	2192 BC	0.867
						2179 BC	2143 BC	0.079
Posthole in granary store	UBA-14589	3347	26	-28.4	Oak Charcoal	1733 BC	1733 BC	0.026
						1693 BC	1602 BC	0.811
						1585 BC	1535 BC	0.117
Mulnahunch (Site 38)						*Lower*	*Upper*	
Burnt mound spread	UBA-14595	3845	28	-29.8	Hazel Charcoal	2456 BC	2418 BC	0.096
						2408 BC	2375 BC	0.107
						2368 BC	2205 BC	0.751
Gorey (Site 39)						*Lower*	*Upper*	
Burnt mound spread, no troughs/pits present	UBA-14609	2792	23	-24.4	Willow Charcoal	1009 BC	894 BC	0.938
						866 BC	855 BC	0.016
Tullyallen (Site 40)						*Lower*	*Upper*	
LBA pits over EBA ring barrow	UBA-14447	2840	22	-26.3	Hazel Charcoal	1071 BC	1066 BC	0.004
						1056 BC	919 BC	0.950
EBA ring barrow	UBA-14448	3692	26	-29.7	Hazel Charcoal	2194 BC	2177 BC	0.032
						2145 BC	2016 BC	0.894
						1996 BC	1980 BC	0.029
Tullyallen (Site 41)						*Lower*	*Upper*	
MBA scattered pits	UBA-14449	3036	24	-25.2	Willow Charcoal	1391 BC	1337 BC	0.297
						1322 BC	1218 BC	0.657
Tullyallen (Site 43)						*Lower*	*Upper*	
Stakehole in small shelter/structure	UBA-14451	3321	25	-25.2	Alder Charcoal	1682 BC	1675 BC	0.010
						1666 BC	1527 BC	0.944

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
						Lower	Upper	
Cullenfad (Site 45)						*Lower*	*Upper*	
Ring Barrow 1	SUERC-21134	3330	30	-24.7	Oak Charcoal	1689 BC	1528 BC	0.954
Ring Barrow 2	SUERC-21143	3130	30	-26.2	Alder Charcoal	1495 BC	1477 BC	0.033
						1458 BC	1371 BC	0.663
						1395 BC	1300 BC	0.258
Ring Barrow 3	SUERC-21135	2905	30	-27.8	Alder Charcoal	1207 BC	1141 BC	0.202
						1135 BC	1008 BC	0.752
Burnt mound	SUERC-23233	2875	30	-27.1	Alder Charcoal	1189 BC	1180 BC	0.011
						1157 BC	1146 BC	0.012
						1129 BC	971 BC	0.892
						961 BC	936 BC	0.039
Ring Barrow 2 – Date 2	SUERC-21137	2930	30	-26.0	Ash charcoal	1220 BC	1025 BC	0.954
Ballyward (Site 46)						*Lower*	*Upper*	
Stakeholes from small hut	UBA-14464	2902	22	-26.7	Hazel Charcoal	1193 BC	1172 BC	0.048
						1164 BC	1144 BC	0.050
						1131 BC	1011 BC	0.856
Drumnafern (Site 48)						*Lower*	*Upper*	
Burnt Mound 2 trough	UBA-14618	3232	39	-25.0	Hazel Charcoal	1611 BC	1431 BC	0.954
Burnt Mound 1 - Phase 1 trough	UBA-14617	3798	35	-22.4	Hazel Charcoal	2401 BC	2383 BC	0.012
						2348 BC	2134 BC	0.934
						2077 BC	2063 BC	0.008
Burnt Mound 1 - Phase 2 trough	UBA-14616	2789	39	-24.9	Pomaceous fruitwood Charcoal	1028 BC	835 BC	0.954
Burnt Mound 1 - Phase 3 trough	UBA-14615	2421	31	-27.8	Hazel Charcoal	748 BC	685 BC	0.163
						667 BC	641 BC	0.051
						588 BC	580 BC	0.007
						560 BC	402 BC	0.734
Burnt Mound 1 - Phase 3 pit (erroneous Phase 1 dating)	*UBA-14619*	*3824*	*39*	*-28.5*	*Alder Charcoal*	*2457 BC*	*2417 BC*	*0.065*
						2409 BC	*2194 BC*	*0.828*
						2176 BC	*2144 BC*	*0.061*
Drumnafern (Site 49)						*Lower*	*Upper*	
MBA burnt mound trough	UBA-14610	3325	34	-26.0	Hazel Charcoal	1689 BC	1516 BC	0.954
LBA burnt mound trough	UBA-14613	2683	42	-27.2	Hazel Charcoal	896 BC	774 BC	0.954
MBA burnt mound pit	UBA-14612	3277	41	-31.2	Hazel Charcoal	1644 BC	1450 BC	0.954
Drumnafern (Site 51)						*Lower*	*Upper*	
Two isolated pits	UBA-14455	3708	25	-28.6	Hazel Charcoal	2197 BC	2168 BC	0.098
						2148 BC	2029 BC	0.856
Drumnafern (Site 52)						*Lower*	*Upper*	
Burnt mound spread	UBA-14622	2907	34	-29.2	Alder Charcoal	1211 BC	1006 BC	0.954
Large burnt mound trough	UBA-14623	2822	39	-26.7	Alder Charcoal	1112 BC	895 BC	0.954

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
Drumnafern (Site 52)						*Lower*	*Upper*	
Alder vessel	UBA-14626	2764	19	-27.6	Hazel stake	974 BC 942 BC	956 BC 840 BC	0.078 0.876
Stake holding alder vessel down	UBA-14627	2922	20	-33.0	Alder vessel	1210 BC	1044 BC	0.954
Fil of alder vessel	UBA-14625	2870	19	-31.7	Alder within c67	1116 BC	978 BC	0.954
Pit which may post date the burnt mound	UBA-14624	2697	30	-24.0	Alder Charcoal	903	806 BC	0.954

Iron Age

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
Annaghilla (Site 4)						*Lower*	*Upper*	
Isolated Posthole	SUERC-21329	2245	30	-25.4	Oak Charcoal	393 BC 321 BC	346 BC 206 BC	0.279 0.675
Isolated Posthole	SUERC-21633	2215	40	-27.7	Cremated Human Bone	386 BC	186 BC	0.954
Isolated Posthole	SUERC-21326	2225	30	-26.9	Oak Charcoal	380 BC	203 BC	0.954
Gully	SUERC-21654	2115	40	-26.1	Cremated Human Bone	352 BC 228 BC 211 BC	298 BC 222 BC 41 BC	0.085 0.005 0.864
Hearth	SUERC-21632	2105	40	-27	Cremated Human Bone	350 BC 209 BC 30 BC 11 BC	311 BC 37 BC 21 BC 2 BC	0.047 0.893 0.006 0.007
Gully	SUERC-21321	2110	30	-25.7	Cremated Human Bone	204 BC	46 BC	0.954
Ring Barrow	SUREC-21308	2090	30	-28.2	Cremated Human Bone	195 BC	42 BC	0.954
Hearth	SUERC-21651	2035	40	-24.8	Alder Charcoal	165 BC	AD 54	0.954
Posthole at gully terminus	SUREC-21643	1630	40	-26	Oak Charcoal	AD 338	AD 539	0.954
Pit	SUERC-21656	1620	40	-26.1	Oak Charcoal	AD 345	AD 541	0.954
Posthole at gully terminus	SUERC-21660	1565	40	-27.9	Oak Charcoal	AD 405	AD 577	0.954
Annaghilla (Site 5)						*Lower*	*Upper*	
Pit	UBA-14605	2468	23	-25.8	Hazel Charcoal	776 BC 442 BC	481 BC 434 BC	0.946 0.080
Lisbeg (Site 6)						*Lower*	*Upper*	
Isolated pit	SUERC-20606	2255	30	-26	Alder Charcoal	396 BC 316 BC	348 BC 208 BC	0.351 0.603
Burnt Mound 19 wattle in trough	SUERC-23208	2230	30	-28.9	Hazel Wicker	384 BC 328 BC	339 BC 204 BC	0.208 0.746

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
Lisbeg (Site 6)								
Burnt Mound 19 stakehole under spread	SUERC-23213	2225	30	-27.9	Willow Wood	380 BC	203 BC	0.954
Tullyvar (Site 10)						*Lower*	*Upper*	
Pit within cluster of features which also dated to Early and Middle Bronze Age	UBA-14474	2282	24	-27.6	Ash Charcoal	401 BC 228 BC	356 BC 233 BC	0.724 0.230
Armalughey (Site 18)						*Lower*	*Upper*	
Spread	SUERC-20764	2115	30	-23.7	Carbonised Wheat Grain	341 BC 205 BC	328 BC 49 BC	0.019 0.935
Pit	SUERC-20653	2105	30	-25.5	Cremated Human Bone	210 BC	46 BC	0.954
Pit	SUERC-20758	1780	30	-25.7	Cremated Human Bone	AD 137	AD 335	0.954
Armalughey (Site 19)						*Lower*	*Upper*	
Erroneous from Neolithic cluster of pits	*UBA-14502*	*2187*	*23*	*-25.0*	*Ash Charcoal*	*359 BC 261 BC*	*274 BC 181 BC*	*0.585 0.369*
Erroneous from Bronze Age cluster of features	*UBA-14506*	*2280*	*24*	*-29.2*	*Alder Charcoal*	*401 BC 290 BC*	*354 BC 232 BC*	*0.700 0.254*
Isolated Pit	UBA-14508	2110	24	-27.7	Hazel Charcoal	197 BC	55 BC	0.954
Cravenny Scotch (Site 23)						*Lower*	*Upper*	
Pit – Part of Iron Age hut structure	UBA014512	2114	29	-30.0	Alder Charcoal	335 BC 204 BC	330 BC 49 BC	0.007 0.947
Mullaghbane (Site 27)						*Lower*	*Upper*	
Pit	UBA-14560	2185	27	-28.1	Hazel Charcoal	360 BC 263 BC	272 BC 175 BC	0.559 0.395
Pit	UBA-14562	2076	18	-29.0	Alder Charcoal	165 BC	45 BC	0.954
Possible wall slot inside rath	SUERC-21732	1655	30	-27.5	Oak Charcoal	AD 262 AD 328 AD 492	AD 277 AD 431 AD 530	0.020 0.879 0.056
Layer of grey occupation material	SUERC-21715	1645	30	-28.1	Burnt Bone: Human	AD 332 AD 452 AD 487	AD 435 AD 471 AD 534	0.813 0.021 0.120
Pit	SUERC-21731	1645	30	-25.4	Hazel Charcoal	AD 332 AD 452 AD 487	AD 435 AD 471 AD 534	0.813 0.021 0.120
Erroneous date from Iron Age occupation material	*SUERC-21722*	*2895*	*30*	*-25.9*	*Oak Charcoal*	*1207 BC 1135 BC*	*1141 BC 998 BC*	*0.135 0.819*
Inishmagh (Site 30)						*Lower*	*Upper*	
Cereal Drying Kiln	UBA-14536	1785	22	-31.1	Ash Charcoal	AD 138 AD 275	AD 263 AD 330	0.624 0.330
Farriter (Site 36)						*Lower*	*Upper*	
Isolated Hearth	UBA-14588	1786	28	-27.8	Oak Charcoal	AD 135 AD 274	AD 264 AD 330	0.641 0.313

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Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
Gorey (Site 39)						*Lower*	*Upper*	
Pit	UBA-14608	2256	22	-26.5	Hazel Charcoal	395 BC 301 BC	351 BC 210 BC	0.408 0.546
Cullenfad (Site 45)						*Lower*	*Upper*	
Hearth within BA Ring Barrow 3	SUERC-21133	2480	30	-26.2	Oak Charcoal	774 BC 441 BC	482 BC 434 BC	0.949 0.005
BA Ring Barrow 1 initial silting	SUERC-21136	2470	30	-26.9	Alder Charcoal	768 BC 464 BC 445 BC	476 BC 453 BC 431 BC	0.924 0.012 0.018
BA Ring Barrow 2 final silting up	SUERC-21141	2100	20	-26	Charred Hazelnut Shell	182 BC	52 BC	0.954
BA Ring Barrow 3 final silting up	SUERC-21142	2230	30	-26.7	Hazel Charcoal	384 BC 328 BC	339 BC 204 BC	0.208 0.746
BA Ring Barrow 3 initial silting	SUERC-21144	2450	30	-26.2	Oak Charcoal	754 BC 670 BC 595 BC	681 BC 609 BC 411 BC	0.267 0.155 0.532
BA Ring Barrow 2 backfill date	SUARC-21145	2265	30	-27.9	Oak Charcoal	399 BC 306 BC	350 BC 209 BC	0.444 0.510

Early Medieval

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
Annaghilla (Site 4)						*Lower*	*Upper*	
Pit within ring barrow	SUERC-21300	1570	30	-28.3	Cremated Human Bone	AD 416	AD 557	0.954
Pit	SUERC-21307	1460	30	-26.5	Oak Charcoal	AD 553	AD 648	0.954
Pit within ring barrow	SUERC-21301	1445	30	-26.9	Cremated Human Bone	AD 564	AD 653	0.954
Pit	SUERC-21299	1425	30	-26.8	Cremated Human Bone	AD 576	AD 659	0.954
Pit	SUERC-21328	1420	30	-26.9	Oak Charcoal	AD 582	AD 661	0.954
Stakehole	SUERC-21316	1380	30	-24.2	Charred Hazelnut Shell	AD 606	AD 680	0.954
Enclosure ditch	SUERC-21661	1350	40	-26.6	Alder Charcoal	AD 615 AD 740	AD 723 AD 768	0.829 0.125
Furnace	SUERC-21330	1350	30	-25.6	Oak Charcoal	AD 637 AD 744	AD 714 AD 765	0.885 0.069
Pit	SUREC-21645	1340	40	-26.9	Cremated Human Bone	AD 631	AD 770	0.954
Secondary enclosure ditch	SUERC-21653	1305	40	-24.7	Carbonised Oat Grain	AD 648	AD 775	0.954
Hearth	SUERC-21640	1330	40	-26.9	Alder Charcoal	AD 643	AD 770	0.954

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
Annaghilla (Site 4)						*Lower*	*Upper*	
Pit within ring barrow	SUERC-21305	1305	30	-26.6	Cremated Human Bone	AD 658 AD 736	AD 729 AD 769	0.660 0.294
Posthole	SUERC-21315	1325	30	-25	Carbonised Barley Grain	AD 650 AD 740	AD 722 AD 768	0.754 0.200
Enclosure ditch	SUERC-21318	1310	30	-25.6	Alder Charcoal	AD 656 AD 737	AD 727 AD 769	0.680 0.274
Posthole	SUERC-21325	1280	35	-27.1	Alder Charcoal	AD 657 AD 792 AD 817 AD 842	AD 778 AD 804 AD 822 AD 860	0.921 0.012 0.004 0.017
Pit within iron working area	SUERC-21336	1305	30	-28.4	Alder Charcoal	AD 658 AD 736	AD 729 AD 769	0.660 0.294
Secondary enclosure ditch	SUERC-21641	1285	40	-26.3	Carbonised Oat Grain	AD 655 AD 791 AD 812 AD 840	AD 778 AD 805 AD 826 AD 863	0.899 0.017 0.013 0.024
Hearth	SUERC-21297	1265	30	-24.7	Carbonised Barley Grain	AD 666 AD 791 AD 812 AD 840	AD 779 AD 805 AD 826 AD 863	0.891 0.019 0.015 0.028
Posthole	SUERC-21311	1275	30	-26.5	Cremated Human Bone	AD 661 AD 793	AD 777 AD 800	0.948 0.006
Pit	SUERC-21306	1285	30	-26.4	Cremated Human Bone	AD 666	AD 771	0.954
Pit	SUERC-21310	1280	30	-27.3	Cremated Human Bone	AD 662	AD 774	0.954
Iron ore roasting pit	SUERC-21634	1265	40	-24.2	Carbonised Barley Grain	AD 665 AD 790	AD 779 AD 869	0.784 0.170
Kiln	SUERC-21335	1300	30	-25.8	Oak Charcoal	AD 660 AD 736	AD 731 AD 770	0.644 0.310
Pit	SUERC-21650	1270	40	-27	Cremated Human Bone	AD 662 AD 790	AD 779 AD 868	0.817 0.137
Pit	SUERC-21646	1265	40	-26.7	Cremated Human Bone	AD 665 AD 790	AD 779 AD 869	0.784 0.170
Pit	SUERC-21309	1255	30	-26	Charred Hazelnut Shell	AD 672 AD 790	AD 779 AD 868	0.803 0.151
Posthole	SUERC-21631	1240	40	-27.9	Cremated Human Bone	AD 680	AD 881	0.954
Enclosure ditch	SUERC-21636	1240	40	-26.1	Oak Charcoal	AD 680	AD 881	0.954
Pit	SUERC-21644	1235	40	-26.7	Cremated Human Bone	AD 680	AD 885	0.954

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.* Lower	Upper	Probability
Annaghilla (Site 4)						*Lower*	*Upper*	
Hearth	SUERC-21298	1215	30	-23.2	Carbonised Barley Grain	AD 694 AD 763	AD 746 AD 889	0.160 0.794
Enclosure ditch	SUERC-21652	1095	40	-26.7	Hazel Charcoal	AD 779 AD 868	AD 789 AD 1023	0.011 0.943
Lisbeg (Site 6)						*Lower*	*Upper*	
Burnt Mound 20 trough	SUERC-20597	1270	30	-28.4	*Prunus* Charcoal (Includes: plum, cherry apricot)	AD 663 AD 792 AD 819 AD 842	AD 778 AD 804 AD 821 AD 859	0.923 0.013 0.002 0.016
Burnt Mound 20 spread	SUERC-20598	1185	30	-26.6	Alder Charcoal	AD 725 AD 767 AD 922	AD 739 AD 900 AD 949	0.018 0.883 0.053
Burnt Mound 21 trough	SUERC-23212	960	30	-28.2	Alder Wood	AD 1020	AD 1155	0.954
Burnt Mound 21 hearth	SUERC-20432	945	30	-24.8	Charred Hazelnut Shell	AD 1025	AD 1157	0.954
Burnt Mound 21 spread	SUERC-20625	885	30	-25.9	Oak Charcoal	AD 1041 AD 1116	AD 1108 AD 1220	0.316 0.638
Burnt Mound 21 pit	SUERC-20613	910	30	-27	Birch Charcoal	AD 1033 AD 1198	AD 1190 AD 1204	0.940 0.014
Burnt Mound 21 spread over hearth	SUERC-20623	840	30	-26.6	Carbonised Oat Grain	AD 1059 AD 1154	AD 1063 AD 1264	0.004 0.950
Burnt Mound 22 trough	SUERC-23218	955	30	-27.3	Alder Wood	AD 1022	AD 1155	0.954
Burnt Mound 23 trough	SUERC-23222	910	30	-27.8	Willow Wood	AD 1033 AD 1198	AD 1190 AD 1204	0.940 0.014
Tullywhinny (Site 8)						*Lower*	*Upper*	
Pit	UBA-14478	939	24	-27.4	Hazel Charcoal	AD 1030	AD 1155	0.954
Tullyvar (Site 10)						*Lower*	*Upper*	
Pit	UBA-14471	1000	26	-30.3	Hazel Charcoal	AD 986 AD 1085 AD 1136	AD 1050 AD 1125 AD 1150	0.767 0.150 0.037
Tullyvar (Site 11)						*Lower*	*Upper*	
Phase 2 Rath ditch	UBA-14469	1435	26	-24.9	Hazel Charcoal	AD 576	AD 654	0.954
Phase 1 Rath ditch	UBA-14470	1448	24	-30.3	Hazel Charcoal	AD 569	AD 649	0.954
Armalughey (Site 18)						*Lower*	*Upper*	
Erroneous date from Bronze Age burnt mound	*SUERC-20638*	*1095*	*30*	*-24.6*	*Oak Charcoal*	*AD 890*	*AD 1013*	*0.954*
Armalughey (Site 19)						*Lower*	*Upper*	
Wall slot	UBA-14504	1561	28	-24.5	Birch Charcoal	AD 421	AD 561	0.954
Armalughey (Site 20)						*Lower*	*Upper*	
Field boundary	SUERC-20769	1155	30	-25.3	Willow Charcoal	AD 775	AD 969	0.954

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.* Lower	Upper	Probability
Armalughey (Site 25)						*Lower*	*Upper*	
Cereal Drying Kiln	UBA-14558	1333	28	-28.0	Hazel Charcoal	AD 648 AD 743	AD 715 AD 766	0.816 0.138
Mullaghbane (Site 26)						*Lower*	*Upper*	
Pit	UBA-14582	1315	24	-33.5	Hazel Charcoal	AD 656 AD 741	AD 720 AD 768	0.725 0.229
Pit	UBA-14583	1216	25	-26.5	Hazel Charcoal	AD 696 AD 710 AD 764	AD 700 AD 745 AD 888	0.006 0.127 0.822
Mullaghbane (Site 27)						*Lower*	*Upper*	
Erroneous date from Iron Age slot	*UBA-14560*	*1556*	*19*	*-29.5*	*Willow Charcoal*	*AD 427*	*AD 550*	*0.954*
Posthole	SUERC-21725	1315	30	-26.4	Hazel Charcoal	AD 655 AD 739	AD 724 AD 768	0.704 0.250
Posthole	SUERC-21733	1325	30	-25.9	Oak Charcoal	AD 650 AD 740	AD 722 AD 768	0.754 0.200
Pit	SUERC-21711	1260	30	-26.7	Burnt Bone	AD 669 AD 791 AD 838	AD 779 AD 829 AD 865	0.853 0.059 0.042
Rath ditch	SUERC-21751	1275	30	-29.2	Alder Charcoal	AD 661 AD 793	AD 777 AD 800	0.948 0.006
Fill of souterrain	SUERC-21737	1280	30	-27.3	Burnt Bone: Human	AD 662	AD 774	0.954
Pit	SUERC-21727	1235	30	-27	Burnt Bone: Human	AD 686	AD 880	0.954
Posthole	SUERC-21741	1210	30	-27.1	Hazel Charcoal	AD 695 AD 710 AD 764	AD 700 AD 745 AD 891	0.006 0.108 0.839
Fill of souterrain	SUERC-21712	1190	30	-28.2	Burnt Bone: Human	AD 722 AD 766 AD 924	AD 740 AD 899 AD 945	0.029 0.890 0.035
Re-cut of rath ditch	SUERC-21752	1085	30	-25.3	Hazel Charcoal	AD 894 AD 937	AD 932 AD 1016	0.305 0.64.9
Slot cutting upper layers of rath ditch	SUERC-21744	955	30	-28	Burnt Bone: Human	AD 1022	AD 1155	0.954
Erroneous date from base of rath ditch	*SUERC-21747*	*2935*	*30*	*-25*	*Blackthorn Charcoal*	*1225 BC*	*1028 BC*	*0.954*
Inishmagh (Site 30)						*Lower*	*Upper*	
Former stream	UBA-14542	917	24	-30.7	Pomaceous fruitwood Charcoal	AD 1031	AD 1169	0.954
Basal fill of trough	UBA-14539	995	25	-28.9	Ash Charcoal	AD 988 AD 1085 AD 1136	AD 1050 AD 1125 AD 1150	0.716 0.190 0.047
Cabragh (Site 37)						*Lower*	*Upper*	
Upper fill of trough	UBA-14594	888	27	-25.9	Oak Charcoal	AD 1043 AD 1118	AD 1104 AD 1218	0.331 0.623
Cullenfad (Site 45)						*Lower*	*Upper*	
Burnt mound	SUERC-21146	1175	30	-27	Alder Charcoal	AD 770 AD 919	AD 902 AD 963	0.844 0.110

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
						Lower	Upper	
Ballyward (Site 46)								
Hearth	UBA-14458	940	29	-22.3	Hazel Charcoal	AD 1027	AD 1158	0.954
Enclosure Ditch	UBA-14460	1127	21	-26.0	Hazel Charcoal	AD 879	AD 984	0.954
Enclosure Ditch	UBA-14462	1125	23	-25.0	Alder Charcoal	AD 878	AD 987	0.954
Hearth	UBA-14461	1103	20	-26.1	Hazel Charcoal	AD 893	AD 988	0.954
Enclosure Ditch	UBA-14463	1010	20	-29.9	Hazel Charcoal	AD 986	AD 1040	0.954
Drumnafern (Site 47)						Lower	Upper	
Pit	UBA-14457	1022	24	-25.0	Hazel Charcoal	AD 977	AD 1035	0.954
Drumnafern (Site 51)						Lower	Upper	
Spread	UBA-14454	1155	21	-25.3	Hazel Charcoal	AD 776 / AD 916	AD 905 / AD 967	0.654 / 0.300

Medieval dates

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
						Lower	Upper	
Armalughey (Site 18)						Lower	Upper	
Boundary Ditch	SUERC-20767	860	30	-24	Oat Grain	AD 1049 / AD 1125 / AD 1150	AD 1084 / AD 1136 / AD 1256	0.099 / 0.020 / 0.835
Cereal Kiln	SUERC-20644	820	30	-27	Oat Grain	AD 1165	AD 1265	0.954
Boundary Ditch	SUERC-20648	810	30	-23.5	Carbonised Barley Grain	AD 1169	AD 1270	0.954
Cereal Kiln	SUERC-20655	670	30	-24.5	Carbonised Oat Grain	AD 1274 / AD 1351	AD 1320 / AD 1391	0.531 / 0.423
Mullaghbane (Site 27)						Lower	Upper	
Pit	SUERC-21716	535	30	-23.3	Carbonised Hulled Barley Grain	AD 1318 / AD 1390	AD 1353 / AD 1439	0.247 / 0.707
Upper fill of rath ditch	UBA-14561	466	30	-27.2	Hazel Charcoal	AD 1410	AD 1463	0.954
Upper fill of rath ditch	SUERC-21713	450	30	24.5	Carbonised Oat Grain	AD 1415	AD 1479	0.954
Upper fill of rath ditch	SUERC-21714	430	30	23.4	Carbonised Oat Grain	AD 1421 / AD 1507 / AD 1601	AD 1499 / AD 1511 / AD 1616	0.907 / 0.006 / 0.041
Aghnahoe (Site 31)						Lower	Upper	
Erroneous from Bronze Age pit cluster	UBA-14446	407	26	-26.3	Hazel Charcoal	*AD 1436 / AD 1596*	*AD 1516 / AD 1619*	*0.851 / 0.103*
Drumnafern (Site 48)						Lower	Upper	
Pit associated with burnt mound	UBA-14614	786	29	-28.8	Alder Charcoal	AD 1194 / AD 1205	AD 1197 / AD 1280	0.006 / 0.948

Context Description	Lab ID	Date BP	SD	δ¹³C	Material	Calibrated Sample date BC/AD 95% C.I.*		Probability
						Lower	Upper	
Drumnafern (Site 48)						Lower	Upper	
Modern fire pit	UBA-14620	182	41	-29.2	Oak Charcoal	AD 1647 / AD 1719 / AD 1832 / AD 1914	AD 1707 / AD 1820 / AD 1883 / AD 1950	0.206 / 0.469 / 0.093 / 0.186
Drumnafern (Site 49)						Lower	Upper	
Curving Pit	UBA-14611	857	28	-26.3	Oak Charcoal	AD 1051 / AD 1151	AD 1082 / AD 1257	0.069 / 0.885
Drumnafern (Site 50)						Lower	Upper	
Spread of charcoal rich material	UBA-14453	739	26	-29.9	Hazel Charcoal	AD 1225 / AD 1243	AD 1233 / AD 1291	0.027 / 0.927
Drumnafern (Site 53)						Lower	Upper	
Pit	UBA-14452	840	24	-27.1	Alder Charcoal	AD 1161	AD 1265	0.954

List of Archaeological Excavation Sites

Archaeological companies
ADS – Archaeological Development Services Ltd.
Headland – Headland Archaeology (UK) Ltd.

Site name in text (Townland/ Site Name)	Data Structure report (DSR) title	Irish Grid Ref.	Archaeological Licence	Licence Holder	Company
Roughan (Site 1)	Final Excavation Report A4/A5 Scheme 3 Areas 41-45 (Area 41)	259483E 355187N	AE/08/104	Frank Mallon	ADS
Ballylagan (Site 2)	Final Excavation Report A4/A5 Scheme 3 Areas 41-45 (Area 42)	259829E 355275N	AE/08/104	Frank Mallon	ADS
Annaghilla (Site 3)	Final Excavation Report A4/A5 Scheme 3 Areas 41-45 (Area 43)	259956E 355241N	AE/08/104	Frank Mallon	ADS
Annaghilla (Site 4)	DBFO Package 2, A4/A5 Corridor Improvements, Phase 3 Report, Site 25	259586E 355439N	AE/07/63	Michael Kimber	Headland
Annaghilla (Site 5)	Final Excavation Report A4/A5 Scheme 3 Areas 41-45 (Area 45)	260277E 355422N	AE/08/104	Frank Mallon	ADS
Lisbeg (Site 6)	DBFO Package 2, A4/A5 Corridor Improvements, Phase 3 Report, Site 1	262078E 356704N	AE/06/224 or AE/06/105	Paul Masser	Headland
Lisbeg (Site 7)	Final Excavation Report A4/A5 Scheme 3 Areas 1-7 (Area 7)	262878E 356666N	AE/08/61	Kara Ward	ADS
Tullywhinny (Site 8)	Final Excavation Report A4/A5 Scheme 3 Areas 1-7 (Area 6)	263762E 356134N	AE/08/61	Kara Ward	ADS
Tullyvar (Site 9)	Final Excavation Report A4/A5 Scheme 3 Areas 1-7 (Area 5)	263787E 355912N	AE/08/61	Kara Ward	ADS
Tullyvar (Site 10)	Final Excavation Report A4/A5 Scheme 3 Areas 1-7 (Area 4)	263175E 355365N	AE/08/61	Kara Ward	ADS
Tullyvar (Site 11)	Final Excavation Report A4/A5 Scheme 3 Areas 1-7 (Area 3)	264443E 355497N	AE/08/61	Kara Ward	ADS
Tullyvar (Site 12)	Final Excavation Report A4/A5 Scheme 3 Areas 1-7 (Area 2)	264336E 355437N	AE/08/61	Kara Ward	ADS
Cavankilgreen (Site 13)	Final Excavation Report A4/A5 Scheme 3 Areas 1-7 (Area 1)	264717E 355191N	AE/08/61	Kara Ward	ADS

Site name in text (Townland/ Site Name)	Data Structure report (DSR) title	Irish Grid Ref.	Archaeological Licence	Licence Holder	Company
Lisbeg (Site 15)	Final Excavation Report A4/A5 Scheme 3 Areas 8-15 (Area 9)	263655E 356725N	AE/08/62	James McKee	ADS
Lisbeg (Site 16)	Final Excavation Report A4/A5 Scheme 3 Areas 8-15 (Area 10)	263798E 356744N	AE/08/62	James McKee	ADS
Armalughey (Site 17)	Final Excavation Report A4/A5 Scheme 3 Areas 8-15 (Area 12)	264009E 356763N	AE/08/62	James McKee	ADS
Armalughey (Site 18)	DBFO Package 2, A4/A5 Corridor Improvements, Phase 3 Report, Site 3	264050E 356850N	AE/06/278	Kirsty Dingwall	Headland
Armalughey (Site 19)	Final Excavation Report A4/A5 Scheme 3 Areas 8-15 (Area 15)	264628E 356722N	AE/08/62	James McKee	ADS
Armalughey (Site 20)	DBFO Package 2, A4/A5 Corridor Improvements, Phase 3 Report, Site 4	263992E 357092N	AE/06/276	Kirsty Dingwall	Headland
Armalughey (Site 21)	Final Excavation Report A4/A5 Scheme 3 Areas 16,17,24,28,30,37,38,47-52,54,55&58-61 (Area 17)	264416E 356883N	AE/07/213	Frank Mallon	ADS
Armalughey (Site 22)	Final Excavation Report A4/A5 Scheme 3 Area 18	264587E 356943N	AE/08/78	Frank Mallon	ADS
Cravenny Scotch (Site 23)	Final Excavation Report A4/A5 Scheme 3 Areas 19 & 20 (Area 19)	264955E 357175N	AE/08/77	Frank Mallon	ADS
Armalughey (Site 24)	Final Excavation Report A4/A5 Scheme 3 Areas 19 & 20 (Area 20)	265200E 357500N	AE/08/77	Frank Mallon	ADS
Armalughey (Site 25)	Final Excavation Report A4/A5 Scheme 3 Areas 21-23 & 62 (Area 21)	265811E 357203N	AE/08/101	Frank Mallon	ADS
Mullaghbane (Site 26)	Final Excavation Report A4/A5 Scheme 3 Areas 21-23 & 62 (Area 62)	264486E 357845N	AE/09/64	Frank Mallon	ADS
Mullaghbane (Site 27)	DBFO Package 2, A4/A5 Corridor Improvements, Phase 3 Report, Site 28	265500E 355900N	AE/07/64	Kirsty Dingwall	Headland
Golan (Site 28)	Final Excavation Report A4/A5 Scheme 3 Areas 21-23 & 62 (Area 23)	265543E 358013N	AE/08/101	Frank Mallon	ADS
Mullaghbane (Site 29)	Final Excavation Report A4/A5 Scheme 3 Area 26	265826E 358613N	AE/08/90	Kara Ward	ADS
Inishmagh (Site 30)	Final Excavation Report A4/A5 Scheme 3 Area 29	265330E 359194N	AE/08/91	Matt Mossop	ADS

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Site name in text (Townland/ Site Name)	Data Structure report (DSR) title	Irish Grid Ref.	Archaeological Licence	Licence Holder	Company
Aghnahoe (Site 31)	Final Excavation Report A4/A5 Scheme 3 Areas 16,17,24,28,30,37,38,47-52,54,55&58-61 (Area 30)	266199E 359064N	AE/07/213	Frank Mallon	ADS
Aghnahoe (Site 32)	Final Excavation Report A4/A5 Scheme 3 Area 31	266335E 359160N	AE/08/92	Matt Mossop	ADS
Aghnahoe (Site 33)	Final Excavation Report A4/A5 Scheme 3 Areas 32 & 33 (Area 32)	266966E 359366N	AE/08/93	Kara Ward	ADS
Aghnahoe (Site 34)	Final Excavation Report A4/A5 Scheme 3 Areas 32 & 33 (Area 33)	267130E 359340N	AE/08/93	Kara Ward	ADS
Farriter (Site 35)	Final Excavation Report A4/A5 Scheme 3 Areas 34-36 (Area 34)	269402E 359793N	AE/08/102	Matt Mossop	ADS
Farriter (Site 36)	Final Excavation Report A4/A5 Scheme 3 Areas 34-36 (Area 35)	269639E 359921N	AE/08/102	Matt Mossop	ADS
Cabragh (Site 37)	Final Excavation Report A4/A5 Scheme 3 Areas 39-40 (Area 39)	270588E 360084N	AE/08/103	Kara Ward	ADS
Mulnahunch (Site 38)	Final Excavation Report A4/A5 Scheme 3 Areas 39-40 (Area 40)	270729E 360429N	AE/08/103	Kara Ward	ADS
Gorey (Site 39)	Final Excavation Report A4/A5 Scheme 3 Area 46	271473E 360592N	AE/08/105	Frank Mallon	ADS
Tullyallen (Site 40)	Final Excavation Report A4/A5 Scheme 3 Areas 16,17,24,28,30,37,38,47-52,54,55&58-61 (Area 47)	271743E 360555N	AE/07/213	Frank Mallon	ADS
Tullyallen (Site 41)	Final Excavation Report A4/A5 Scheme 3 Areas 16,17,24,28,30,37,38,47-52,54,55&58-61 (Area 48)	271887E 360529N	AE/07/213	Frank Mallon	ADS
Tullyallen (Site 42)	Final Excavation Report A4/A5 Scheme 3 Areas 16,17,24,28,30,37,38,47-52,54,55&58-61 (Area 49)	272022E 360544N	AE/07/213	Frank Mallon	ADS
Tullyallen (Site 43)	Final Excavation Report A4/A5 Scheme 3 Areas 16,17,24,28,30,37,38,47-52,54,55&58-61 (Area 51)	272155E 360461N	AE/07/213	Frank Mallon	ADS
Mullaghbane (Site 44)	Final Excavation Report A4/A5 Scheme 3 Areas 16,17,24,28,30,37,38,47-52,54,55&58-61 (Area 60)	273628E 359986N	AE/07/213	Frank Mallon	ADS
Cullenfad (Site 45)	DBFO Package 2, A4/A5 Corridor Improvements, Phase 3 Report, Site 17	272946E 360413N	AE/06/275	Michael Kimber	Headland
Ballyward (Site 46)	Final Excavation Report A4/A5 Scheme 3 Areas 16,17,24,28,30,37,38,47-52,54,55&58-61 (Area 59)	273825E 359290N	AE/07/213	Frank Mallon	ADS

Site name in text (Townland/ Site Name)	Data Structure report (DSR) title	Irish Grid Ref.	Archaeological Licence	Licence Holder	Company
Drumnafern (Site 47)	Final Excavation Report A4/A5 Scheme 3 Areas 16,17,24,28,30,37,38,47-52,54,55&58-61 (Area 58)	273828E 360751N	AE/07/213	Frank Mallon	ADS
Drumnafern (Site 48)	Final Excavation Report A4/A5 Scheme 3 Areas 56&57 (Area 57)	274546E 360059N	AE/08/170	Frank Mallon	ADS
Drumnafern (Site 49)	Final Excavation Report A4/A5 Scheme 3 Areas 56&57 (Area 56)	274672E 360085N	AE/08/170	Frank Mallon	ADS
Drumnafern (Site 50)	Final Excavation Report A4/A5 Scheme 3 Areas 16,17,24,28,30,37,38,47-52,54,55&58-61 (Area 54)	275048E 359967N	AE/07/213	Frank Mallon	ADS
Drumnafern (Site 51)	Final Excavation Report A4/A5 Scheme 3 Areas 16,17,24,28,30,37,38,47-52,54,55&58-61 (Area 55)	275240E 359669N	AE/07/213	Frank Mallon	ADS
Drumnafern (Site 52)	Final Excavation Report A4/A5 Scheme 3 Area 53	275156E 360364N	AE/08/171	Frank Mallon	ADS

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Appendix

Discussion of the Timber circle at Armalughey (Sites 18 and 20) with a focus on the Grooved Ware and Beaker discoveries at these sites
By Neil Carlin for Headland Archaeology (UK) Ltd.

Introduction

Both Grooved Ware and Beaker associated features were discovered at Armalughey (Sites 18 and 20), near Ballygawley, Co. Tyrone during excavations directed by Kirsty Dingwall (forthcoming). Late Neolithic/Early Bronze Age features at Armalughey (Site 18) comprised a cluster of Grooved Ware and Beaker associated pits and postholes, currently interpreted by the excavator as a possible sub-circular structure. The Beaker and Grooved Ware ceramics appear to display distinct spatial distributions, perhaps suggesting two separate clusters of features representing two successive phases of activity. An isolated stone-lined pit containing Grooved Ware was also excavated. At Armalughey (Site 20), both Grooved Ware and Beakers were found within the fills of pits and postholes forming a timber circle radiocarbon dated to between 2800-2500 BC. A small amount of Middle Neolithic Carrowkeel Ware was also associated with an early phase of this monument.

The Physical landscape

Armalughey Sites 18 and 20 were situated in mid Tyrone, on well-drained gravel ridges that were adjacent to lower-lying wetter areas beside the Ballygawley Water on the eastern fringes of the Clogher Valley - a broad natural east- west corridor of gently rolling lowland, that links Lough Neagh to Lough Erne. The Ballygawley Water is a tributary of the River Blackwater which flows from its source in the hills north of Fivemiletown through this natural corridor into the southwestern corner of Lough Neagh. A ribbon of uplands demarcate the northern side of the valley extending from Cappagh Mountain (to the northeast of Ballygawley) through to Slievemore, Shantavny Scotch, Tycany Hill, Ballyness, Brougher Mountain, Co. Tyrone and Topped Mountain, Co. Fermanagh. Its southern limits are defined to the west by the uplands of Slieve Beagh and to the east by Burnt Hill. The valley comprises an assortment of undulating sand and gravel eskers and boulder clay drumlins interspersed with boglands and wet meadows. In prehistory this region would have consisted of a complex patchwork of areas of well-drained soil amenable to early agricultural use interspersed with stretches of bogland and extensive tracts of poorly draining gleys prone to winter water logging or flooding.

The Prehistoric Archaeological landscape

Although aspects of the Mid-Ulster's archaeological record have been included in wider studies (e.g court tombs – Herity. 1987), the region has received little scholarly attention. With the exception of Claire Foley's (2000) short overview of the prehistory of Co. Tyrone, little or no general synthesis has been conducted and overall understanding remains poor. The early prehistory of this county is dominated by its 130 megalithic monuments including court tombs, portal tombs, passage tombs and wedge tombs (Foley 2000) which indicate that a significant level of Neolithic activity was focused in the uplands. Although these monuments are fairly evenly distributed throughout Tyrone, they are more prevalent in the northern extent of the county and there is a distinct scarcity of prehistoric sites in the southeast of the county. A long tradition of human settlement in the Clogher Valley from at least c.3800 BC onwards is indicated by the occurrence of a small concentration of Early Neolithic monuments in the hills south of Augher, such as Ballywholan court tomb (15km southeast of Ballygawley). Early Neolithic Carinated Bowls and associated lithics were found in associated with a contemporary hearth during excavations at Clogher hillfort (Warner 1972, 1973). A dense grouping of five Middle Neolithic passage tombs are situated (just 4km northeast of Armalughey Sites 18 & 20) on the foot of Slievemore Hill at Shantavny, Glenchuil and Sess Kilgreen and slightly further west at Knockmany (Collins & Waterman 1952). Megalithic art comprising pecked motifs similar to those found in the Boyne Valley occurs within the tombs at Knockmany and Sess Kilgreen (O'Sullivan 1995). The monumental evidence suggests that the eastern extent of the Clogher Valley was an important place with its own ritual centres during the Middle Neolithic. Local communities were participating in the wide spheres of interaction associated with the construction and use of passage tombs.

Recent large-scale development-led archaeological projects have resulted in numerous important subsurface discoveries within more low-lying terrain, which now form the main component of the archaeological record in Ireland. These excavations indicate a much greater distribution and range of activities across the landscape than hitherto suspected. However, only 45 prehistoric excavations had been conducted in Co, Tyrone, by the year 2000 (Foley 2000, 4), almost all of these were focused on megaliths in upland locations and were undertaken over fifty years ago. A cursory glance over the excavation bulletins (www.excavations.ie) reveals that this trend has not changed in the succeeding years. Thus, the recent discoveries at Armalughey of lowland non-megalithic features add considerably to the prehistoric record of Co, Tyrone. The lack of archaeological investigations in less elevated terrain within the County would appear to explain the paucity of contemporary non-monumental sites in the areas surrounding Armalughey.

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The Place of Grooved Ware and Beaker pottery in the Irish Late Neolithic/ Early Bronze Age

Although the occasional presence of Grooved Ware has long been recognised in Ireland (eg O Ríordáin 1951; Liversage 1968), only recently has this ceramic begun to be widely identified (Cleary 1983; Roche 1995; Sheridan 1995; Brindley 1999). In the past 10 years, development-led excavation in Ireland has revealed a far greater range and distribution of Grooved Ware sites than previously known (Carlin *et al* forthcoming). Although at least 50 Grooved Ware sites have now been excavated, it is still not plentiful and the new discoveries have confirmed the existence of a clear concentration of Grooved Ware sites in east Ulster/north Leinster, particularly in Co. Meath. Previously, Grooved Ware was only thought to occur at prominent places displaying evidence for long sequences of activity and intense interaction with other more distant places as exemplified by Brú na Bóinne, Co. Meath (e.g Eogan & Roche 1999). It has been noted that Grooved Ware displays a particularly strong association with passage tombs (Roche 1995; Cooney 2000, 168), but recent excavations are revealing a more localised use of Grooved Ware that is not exclusively tied to the large ceremonial centres of the Middle Neolithic (Carlin *et al* forthcoming).

Grooved Ware occurs in a wide variety of contexts, it is mainly found in pit groups, but is still frequently found in direct association with timber circles and, to a much lesser extent, pit circles and it has been recorded in the ditch of one large earthen enclosure (Carlin *et al* forthcoming). Circular wooden structures at Slieve Breagh (de Paor and Ó h-Eochaidhe 1956; Grogan 2004, 111) and Balgatheran Co. Meath (Ó Drisceoil forthcoming) have been interpreted as houses, but there are very few if any examples of domestic sites or buildings associated with Grooved Ware. It is extremely difficult to identify distinct domestic and ritual spheres during the Late Neolithic and any attempt to distinguish houses from ceremonial structures remains problematic (Brück 1999). Approximately 15 Grooved Ware timber circles have been identified to date in Ireland, in plan most closely resembling the Northern circle and Phase 1 of the Southern circle at Durrington Walls (Carlin *et al* forthcoming; Thomas 2007). The nature of the link between Grooved Ware and embanked circular enclosures – the possible Irish version of British henge monuments – remains unclear. Very few have been investigated and radiocarbon dating where carried out has not been conclusive (Stout 1991; Cooney and Grogan 1994, 87–91; Condit and Simpson 1998).

In Ireland, Grooved Ware is found in association with lithics, particularly steeply retouched end-scrapers made from long blades, discoidal knives and oblique arrowheads (Petit tranchet derivatives), and artefacts of baked clay of unknown function (Roche and Eogan 2001, 127; Sheridan 2004, 27). The flint artefacts often appear to be produced using chalk flint from the northeast of Ireland. The dating of the Grooved Ware complex in Ireland remains problematic, due to the very small dataset of radiocarbon determinations and the existence of several plateaux in the relevant part of the

calibration curve about 4400, 4200 and 4000 BP. Despite these difficulties, both Sheridan (2004, 31) and Brindley (1999a; 1999b) have argued that the Irish Grooved Ware complex lasted from 3000– 2500/2400 BC. The results of recent excavations confirm that this was a short lived phenomenon in Ireland i.e. c.2900–2500 BC that started later and finished earlier than in Britain (Carlin *et al*. Forthcoming, Garwood 1999).

A significant amount of new archaeological data concerning Beaker-related activities in Ireland has been generated by the increase in development-led excavations and Beaker pottery now occurs extensively across the whole island with many newly discovered concentrations of sites arising in places such as south Munster and south Leinster (Carlin 2005). Despite this, the dating of this phenomenon in Ireland remains very poorly understood and Beaker pottery was probably in use from 2500/ 2400 to 1900 BC (Brindley 2005, 335 & 2007, 321). Beakers are associated with archery equipment and early metalwork and a combination of classic constituents of the "Beaker package" along with some more distinctively Irish objects appeared at this time. These include polypod bowls, wrist-bracers, V-perforated buttons, basket-shaped earrings, early gold discs, lunulae, copper daggers, small disc beads, small convex scrapers, barbed and tanged arrowheads of Conygar Hill, Green Low and Sutton type (Woodman *et al* 2006, 138; Green 1980; O'Hare 2005) and hollow-based arrowheads (Green 1980, 141–2; Woodman *et al* 2006, 134; O'Hare 2005). Beaker pottery occurs in a range of contexts in Ireland including megalithic tombs but predominantly in pits. In contrast, many of the non-ceramic artefacts are found in natural places, particularly bogs, and almost never in association with Beaker pottery (Carlin forthcoming). Despite the paucity of Beaker associated houses, the proliferation of these pits generally containing occupational debris (ibid) in Ireland has resulted in the Irish Late Neolithic is viewed as being rich in settlement evidence with a much smaller funerary component. The classic Beaker burial appears to be completely absent, however, crouched inhumations, , do appear in graves with Food Vessels and a range of other objects after 2200 BC (See Carlin & Brück forthcoming). Beaker associated mortuary practice consists primarily of collective burials - both cremation and inhumation - in primary and secondary contexts in megalithic tombs but also in cists and pits. Although older megaliths were being re-used, a new form of monument comprising chambers of wedge-shape or trapezoidal plan known as wedge tombs began to be built and used from 2400–2100 BC (Brindley and Lanting 1991/92, 25, Walsh 1995), Beaker sherds have been found in association with cremated and un-burnt human bone in apparently primary positions in up to nine wedge tombs and these monuments are almost certainly of Late Neolithic–Early Bronze Age construction (O'Brien 1999, Carlin & Brück forthcoming).

Importantly, the excavation of so many new Grooved Ware and Beaker sites in Ireland has cast doubt on traditional interpretations of changes in the material culture of the third millennium BC in relation to powerful elites pursuing new ritual mechanisms and participating in prestige goods

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economy in an attempt to preserve their dominance (e.g Thorpe & Richards 1984, Clarke *et al* 1985). The ubiquity of both Grooved Ware and Beaker pottery outside of ceremonial and mortuary contexts suggests that these were not restricted to an elite group, even from the earliest appearance of these pottery types. Developments in social practices during the Irish Late and Late Neolithic including the appearance of these new ceramics may represent the emergence of local communities who began to develop their own unique identities by interacting with other local groups across the Irish Sea, adopting and adapting new ideas which they employed in idiosyncratic ways that allowed them to underpin their local identity in the context of wider inter-regional links (Carlin & Brück forthcoming, Carlin *et al.* forthcoming).

The local and regional context for the Armalughey Grooved Ware and Beaker discoveries

In Ulster, there only a small number of sites beyond the main concentration of Grooved Ware discoveries in Counties Antrim and Down (Brindley 1999; Eogan & Roche 1999), most notable among which is the Ballynahatty timber circle and palisaded enclosure (Hartwell 1998). In Co. Tyrone, the only previous find of Grooved Ware was in a pit excavated during Arthur Apsimon's excavations at Ballynagilly, northeast of Cookstown (Arthur Apsimon pers. comm). Further west, at Kiltierney, Co. Fermanagh, a small amount of Grooved Ware was found in a possible cremation pit (Daniels & Williams 1977). Although, the Clogher Valley was previously lacking in evidence for Late Neolithic activity, the establishment of a major Grooved Ware associated ceremonial centre at Ballygawley would appear to be directly linked to the nearby passage tomb cemetery. An embanked enclosure whose construction may have been contemporary with the this timber circle is located 2km east, however the dating of these remains controversial and very few have been excavated (see Carlin *et al.* forthcoming). The Armalughey discoveries demonstrate the continuing importance of this area in the Late Neolithic and represent a significant addition to the distribution of Grooved Ware sites, particularly in Ulster, but also in Ireland.

Beaker pottery is quite unevenly distributed throughout Ulster with most sites occurring along the north-eastern coastline or within the significant clusters along the lower slopes of the Binevenagh Mountain flanking the Roe River in Co. Derry and to a lesser extent around Lough Erne, in Co. Fermanagh and Cavan. Only seven sites with Beaker have been identified in Co. Tyrone and the Armalughey material represents the first discovery of the ceramic in the eastern Clogher Valley. There are no other Beaker assemblages known from the immediate area and these excavations represent is a very significant addition to our understanding of the patterning of Beakers in the South Ulster Region. The nearest discoveries of Beaker pottery were made over 30km away - to the northeast at Tullywiggan, Co. Tyrone in the Ballinderry River Valley near Cookstown (Steven Briggs

pers. comm.) and to the west at Ballyreagh court tomb, Co. Fermanagh (Davies 1942). This megalith is situated on the slopes of Brougher Mountain at the fringes of the Clogher Valley. Further to the north of Cookstown, excavations have also revealed Beakers within pits at Ballynagilly (Apsimon 1969, 35 & 1976) and Cluntyganny, Co. Tyrone (Brennan *et al.* 1978). At Ballybriest on the slopes of Slieve Gallion, along the southeastern edge of the Sperrin Mountains in South Co. Derry, the excavations of both a wedge tomb (Hurl 2001) and a nearby court tomb (Evans 1939) produced Beakers. These form part of a loose cluster of megalithic tombs containing this material that are distributed throughout the Sperrins. These include the wedge tombs in the northern foothills at Cashelbane (Davies and Mullin 1940) and Loughash, Co. Tyrone (Davies 1939), as well as Barnes Lower court tomb (Collins 1966) on the south side of the Glenelly valley and Legland court tomb (Davies 1940) situated to the south west of Bessybell Mountain. The identification of Beaker pottery at Armalughey represents the latest addition to the growing number of Beaker sites Ireland and adds considerably to the distribution of Beakers in Northern Ireland where only four new Beaker sites have been excavated since 1997.

Although the Armalughey Beakers appear as quite isolated discoveries, the known distribution of other broadly contemporary sites and artefacts indicate a wider swathe and greater level of activity in this area c.2500- 2000 BC. Pre-existing monuments would have continued to play a strong role in the cultural landscape, but new forms of monument such as wedge tombs and possibly also embanked enclosures began to be constructed. In Co. Tyrone, 22 wedge tombs are known and concentrations of these occur near Dromore overlooking the Clogher Valley (15km west of Ballygawley) or Loughmacrory (20km north of Ballygawley). One such megalith was constructed at Shantavny Scotch c.2400 BC just 6km to the northeast of Armalughey. A probable wristbracer was discovered within Ballywholan court tomb (Kelly 1985), just south of Augher, Co. Tyrone. A Type Carn copper halberd in the British Museum came from Ballygawley (Harbison 1969, 145) – these represent the earliest form of copper halberds dating to sometime around 2300 BC (Schuhmacher 2002, 280, Needham 1996, 126). A tanged copper dagger was found (20km east in Blacklands Bog, near Fivemiletown, Tyrone (Harbison 1978, 333-335). It is of Knocknagur Type which represent the earliest form of copper dagger in Ireland and Britain dating from c.2400-1900 BC (Needham 1996 & 1998, 187). Lunulae have been found at Carrickmore (15km north of Ballygawley), Tullynafoile, near Clogher (11km east) and Trillick which is located (30km west of Ballygawley) on the northern foot of Brougher Mountain (Eogan 1994, 123.). Only 20 tanged copper daggers and 26 halberds are known in Ireland (Harbison 1969, Sheridan & Northover 1993) – the discovery of one of each of the earliest types in such proximity to the Armalughey sites suggests that this area was perceived as an important place in the past. The occurrence of Grooved Ware, Beaker pottery, a timber circle and wedge tombs, as well as early copper and gold objects in the Clogher Valley suggests that this micro region continued to develop as a significant node in the Late Neolithic/Early Bronze Age. Communities living here

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were abreast of international transformations in social practices and were eager to participate in the wider interaction networks that were developing at this time (see Carlin & Brück forthcoming) with clear links to the wider world. It is probable that the Clogher Valley functioned as a major routeway, with the River Blackwater and its tributaries including the Ballygawley Water acting as a conduit for the movement of people, ideas and objects from east to west Ulster.

The Armalughey Grooved Ware & Beaker discoveries in context

The occurrence of Grooved Ware in a cluster of pits and postholes at Armalughey (Site 18) is entirely typical as it represents the context in which this ceramic mainly occurs in Ireland (Carlin *et al.* forthcoming). These pits occur in clusters often with associated postholes or as single examples in apparent isolation in the landscape. These generally contain occupational debris - consisting of charcoal, pottery lithics and occasionally animal bone and cereals - ranging in quantity from a few pieces to much larger assemblages. For example, a pit at Lowpark, Co. Mayo, contained chert and flint artefacts, a miniature polished stone axehead, frequent small fragments of burnt bone and 1600 potsherds that were derived from a minimum of 15 Grooved Ware vessels (Gillespie 2007). Whether any of these pits can be interpreted as 'domestic' is a problematic issue, not least because of the inherent difficulties in attempting to distinguish between domestic and ritual activities in past societies (Brück 1999, Bradley 2005)

A cluster of pits and postholes also produced Beaker pottery and as is the case for Grooved Ware, this discovery is stereotypical of Irish Beaker sites. In fact these pit sites share many similarities with their Late Neolithic counterparts. Most commonly, these pits represent the only features containing Beaker pottery on site, they occur alone or in clusters, sometimes accompanied by other features such as postholes or spreads. Along with Beakers, these pits contain artefacts such as lithics, burnt and unburnt animal bone, the charred remains of cereals and fruits. Occasionally polished stone axes, both complete and fragmentary, are also found. For example, at Cloghers, County Kerry, one of the pits produced Beaker pottery along with a kit for the production of stone axes comprising a complete polished sandstone axe, a hammer stone and a grinding stone (Kiely and Dunne 2005). There is much variety in the nature of Beaker pits. These range from examples displaying the 'formalised' or structured deposition of large numbers of artefacts to those containing only a few sherds of ceramics, while others contained human bone (See Carlin forthcoming). In every case, the contents of these pits represented partial depositions, usually consisting of a few sherds from each of a number of pots and never consisting of complete vessels. Burnt and unburnt as well as abraded and unabraded sherds and lithics often occur in pits that display no evidence for *in situ* burning. Often these sherds have originated from the same pot and some are conjoining. This suggests that most of these pits contain fills consisting of derived materials (Garrow 2006) taken from larger aggregations of occupational

debris such as middens (Pollard 2000, 365; Case 1995, 10–11). The presence of human bone, as well as special objects such as polished stone axes and arrowheads makes it difficult to distinguish a purely 'domestic' component and it would seem that some of these were not simply rubbish or storage pits. Recent interpretations of these pits deposits as ideologically significant acts that were possibly associated with the commemoration of the end of an occupation (for example, Thomas 1996, 197; 1999; Pollard 1999), as well as beliefs about fertility, renewal, regeneration (Case 1973; Pollard 2000; Cooney 2005) and transformation (Brück 1995), have now superseded such traditional functionalist interpretations. Nevertheless, it seems likely that some pit groups represent the only surviving element of what must have been long term or repeated occupation (Carlin forthcoming).

The Grooved Ware and Beaker associated timber circle at Armalughey (Site 20) is quite unique and although many aspects of this structure are readily paralleled by the 15 other Irish Late Neolithic timber circles, the Armalughey structure displays evidence for a much more complex architecture and history of use. Typical timber circles in Ireland are symmetrical structures comprising a ring or more of postholes that enclose an internal square or rectangular setting of four large postholes and a well-defined south/southeast facing entrance that is often flanked by an additional screen or façade of posts (Carlin *et al* forthcoming). These vary in size from five to 16m in diameter. The size of the postholes in these structures range from large examples such as the entrance postholes at Knowth (1.32m in diameter and 1.3m deep, Eogan & Roche 1997) to the more diminutive scale of the Kilbride circle of postholes which were generally 0.50m in diameter and c.0.50m deep (Cotter 2006). Much of the depositional activity at timber circles also seems to have a deliberate spatial element. Concentrations of sherds were especially prominent within the postholes that formed the entrance at many timber circles such as Bettystown, Whitewell, Kilbride and Scart (J. Eogan 1999, Grogan *et al.* 2007, Cotter 2006, Johnie Monteith pers. com). The importance of the entrance in this monument type is further indicated by the evidence from Wyke Down Henge (Cleal in Barrett *et al.* 1991, 141–2) and from Durrington Walls (Wainwright and Longworth 1971, 195). Examination of the distribution of artefacts within the Knowth timber circle revealed that deposition focused on the central postholes, the entrance area and the corresponding back posts (Roche & Eogan 2001, 127– see Eogan & Roche 1997, 220–221). The latter pattern was also detected at the Southern Circle at Durrington Walls, where a posthole at the rear of the building and directly opposite the entrance and it produced a large number of antler picks (Thomas 2007, 151).

Like most timber circles, the Armalughey timber structure was located in a locally elevated position on the summit of a ridge overlooking the surrounding area. It comprises two concentric post circles: an inner ring (8.5m in diameter) of 21 evenly spaced large postholes and an outer ring (with a diameter of 15m) of 24 large shallow pits – each of which contained the post-pipes of four circular posts (Dingwall forthcoming). Attached to the outermost circle is an elaborate southeastern entrance

defined by two radiating lines of similar postpits that are joined at their termini by a line of large intercutting postholes forming an outer façade The inner ring of posts encircle an internal square setting of four very large and deep pits that display evidence for a complex sequence of backfilling and recutting representing several phases of activity.

Grooved Ware occurs in the inner and outer ring as well as the façade of the timber circle while Beaker pottery seems to be restricted to re-cuts within the large pits forming the internal square arrangement. These four pits may well represent the most enduring aspect of a multi-phased structure. The rearmost pair of this four post setting was cut into shallow pits on their north and east (inside) edges, respectively. These two shallow scoop-like features clearly pre-date the large fourpost structure and at least one of these contained Middle Neolithic Carrowkeel Ware. These two features may represent the earliest phase of the timber circle, for they strongly resemble the features curiously labelled as 'annexes' located in the exact same positions within the timber circle at Knowth, Co. Meath which seemed to represent earlier pits that were deliberately recut in order to become post-pits (although this is not how they were interpreted at the time, see Post-pit 1 & 4 in Eogan & Roche 1997, 116, fig. 25). Barrie Hartwell (2002, 526) identified Carrowkeel Ware at Ballynahatty which he considered to represent a possible early stage of the timber structure..

The inner circle of posts cut through a pair of large sub-rectangular pits belonging a previous phase of activity. However, the axial symmetry displayed by these two pits in conjunction with the four large pits forming an internal square suggests that these may these six features may represent different parts of a composite monument consisting of a four-post structure with a pit-defined entrance way. Such a ground plan would closely resemble the main surviving elements of Grooved Ware associated timber structures at Balgatheran, Co. Louth (Ó Drisceoil forthcoming) and Kilmainham 3, Co. Meath (Whitty 2007) or Durrington 68 (Pollard 1995) and Durrington 70 in Wiltshire (Pollard *et al* 2007). These examples comprise four central pits with an entrance defined by a large pair of pits, some of which are encircled by a ring of much slighter posts. As highlighted by Martin Green (1997), were it not for the fortuitous survival of the slighter postholes at these sites, the only surviving element would have been the six large pits. This suggests that the six pits at Armalughey may represent the only surviving features from an earlier form of timber monument and although the original entrance was transformed by the subsequent creation of the inner ring of the later timber circle, the occurrence of Beaker pottery within the fills of the four-poster element suggests that it remained an active part of all the succeeding phases.

The exact chronological sequence of activity at Armalughey is still being developed and it remains to be concluded whether or not the two concentric rings of posts were contemporary. Nonetheless, this structure is quite unusual as most timber circles in Ireland consist of only a single ring. In Britain, double circles are known from sites such as Machrie Moor (Haggarty 1991), and the Northern Circle

at Durrington Walls (Wainwright & Longworth 1971), both of which which comprised an outer and inner ring that encircled a central arrangement of four large posts in a square. Multiple circles have also been excavated, these include Balfarg in Fife (Mercer 1981), Woodhenge (Cunnington 1929) and the Southern Circle at Durrington Walls (Wainwright & Longworth 1971), Wiltshire. The occurrence of a double ring is only paralleled in Ireland by the Grooved Ware associated timber circle located at Ballynahatty in the Lagan Valley 78km to the east (Hartwell 1998). Although, at Newgrange, Co. Meath, a large circle immediately southeast of the main passage tomb comprising multiple rings of pits and postholes (70m in diameter) was partially excavated (O'Kelly 1983, 16-21; Sweetman 1985). Material from these including burnt animal bone, particularly pig, produced 13 radiocarbon dates ranging from 2865–2145 BC (Grogan 1991, 131) and Grooved Ware was found in at least three of the pits (O'Kelly 1983, 18, 21), as well as within the interior of the circle in stakeholes and spreads of habitation debris (Roche and Eogan 2001, 129). Magnetic gradiometry and susceptibility surveys have revealed what appears to be the full extent of this pit circle as well as a number of distinct elements composed of regularly spaced, double and single rows of pits – some of which appear to form an elaborate entrance feature similar to that which leads from the wooden enclosure into the timber circle at Ballynahatty (Barton *et al*. in prep.). The Ballynahatty timber circle has been interpreted as a multi-phase monument that began as a single ring of posts (11m in diameter) enclosing a square setting of four posts and displaying an external entrance façade which would have greatly resembled the more typical ground plan of these structures exemplified by the building at Knowth (Hartwell 1998, 39). Subsequently, all of these postholes including the internal four-poster were re-cut to hold larger posts and a second ring of posts (16m in diameter) was erected around the first circle. This timber circle was then encircled by a large enclosure (BNH5) consisting of a double ring of postpits with a post-built corridor leading out from this enclosure to an entrance within an elaborate annex (Hartwell 2002, 529). Similarly, if the inner ring at Armalughey was constructed prior to the outer one then there would have been a time when this timber circle would also have greatly resembled that at Knowth.

The funnel-shaped entrance feature leading into the timber circle at Armalughey is without any parallels in Ireland other than the two entrances to the circular enclosures at Ballynahatty and Newgrange. In Britain, the avenue of posts leading from a façade into the Northern Circle at Durrington also provides a good comparison and this may be significant given the strong similarities in the architecture shared by these two timber circles. In comparison to Armalughey, the clearly defined entrances typically displayed by Irish timber circles - many of which include associated porch-like features - represent comparatively simple constructions. Similarly, the large shallow pits containing four equally spaced post-pipes that form the outer ring of the Armalughey structure are lacking Ireland direct parallels in an Irish and Britain context. However, the actual timbers placed within this outer circle form a double ring of posts that greatly resembles the large double post structure (BNH5)

enclosing the timber circle at Ballynahatty, even if the scale is very different. Certainly the structures at both these places share many aspects of the same architectural tradition. Indeed, many of the more recently excavated timber circles in Ireland suggest that a shared architectural vocabulary was in existence in the Late Neolithic with various interchangeable components that could be arranged and re-arranged and there may even have been a prescribed sequence to the addition of these different elements (see Carlin *et al*. forthcoming). Ongoing studies are revealing evidence for multi-phase buildings with a long histories of building activity occasionally lasting over three centuries and involving the repeated recutting or replacement of postholes as well as the remodelling of other components at timber circles in Britain such as Dunragit in Scotland (Thomas 2004), the Southern circle at Durrington Walls (Thomas 2007) and Woodhenge (Pollard *et al* 2007, Parker Pearson 2006, 235). Based on the sequence at the Southern circle and possibly also at Woodhenge (whereby later monuments developed out of what were originally timber circles with a four post inner setting) that the simpler 'four post in circle' settings commonly found in Ireland may represent an early phase in a sequence that is possibly associated with a pre-enclosure phase at many monument complexes (Pollard *et al* 2007). The excavation of the Armalughey structure contributes greatly to the growing body of evidence that many timber circles may have a more complex sequence of development than hitherto considered.

Grooved Ware and Beaker pottery have only been found on the same sites on eleven occasions (16% of all Grooved Ware sites) in Ireland. The discovery of both ceramics in similar types of contexts at Armalughey - e.g pits at Site 18 and large post-pits forming a timber circle at Site 20 – makes a very significant contribution to our understanding of the interaction between the Grooved Ware and Beaker cultural packages and of the transformations in social practices that may have occurred in conjunction with these changes in contemporary material culture. These two ceramics have never been found in contextual association and there is almost no evidence to indicate an overlap in their usage. In fact, the overwhelming impression is that the production of Grooved Ware ceased very suddenly c.2450 BC as it was rapidly replaced by Beakers and there is nothing to suggest that its use continued as late as it is claimed in southern Britain (Garwood 1999, Needham 2005). Despite the occurrence of this sudden change in the material culture of the time, there is strong evidence for continuity in the depositional practices associated with Grooved Ware and Beaker pottery and this national pattern is certainly borne out by the excavations at Armalughey. These two types of ceramic occur in quite similar contexts – both are mainly found in pit clusters filled with occupational debris, both were deposited (albeit to a much lesser extent in the case of Beaker) as part of more formal ceremonial activity at timber and pit circles and both are rarely associated with funerary activity. In many ways, Beaker pottery appears to have fulfilled many of the roles previously associated with Grooved Ware.

The discovery of Beaker pottery in association with a timber circle at Armalughey represents an important development in our understanding of the use of this ceramic in Ireland. Beakers have been retrieved from at least 15 timber circles in Britain (see Gibson 2005, 670), such as North Mains in Perthshire (Barclay 1983), Balfarg in Fife (Mercer 1981) and the Durrington Walls Northern and Southern Circles (Wainwright with Longworth 1971, 71-3; Parker Pearson 2007, 631), many of which have also produced Grooved Ware. However, the discovery of Beaker pottery in association with a timber circle at Armalughey represents only the third such example of this in Ireland and the first such monument where Grooved Ware was also recovered. At Newgrange in Co. Meath, 30m west of the main mound (Sweetman 1987), Beaker pottery and other finds including convex scrapers, a portion of a decorated stone bowl and cremated cow and pig bone were found in a primary position within six of the many pits that formed part of two almost parallel arcs which are thought to form a pit / timber circle approximately 20m in diameter. Charcoal from these pits have returned radiocarbon dates of 3930±35 BP, 2650-2465 cal BC (GrN-12829) and 4000±30 BP, 2565–2320 cal BC (GrN-12828). Recent excavations at Paulstown, Co. Kilkenny uncovered three timber structures which produced only Beaker ceramics (Elliott 2009) that were very similar in shape and size of to typical Grooved Ware timber circles such as Knowth (Eogan and Roche 1997, fig. 21), Kilbride, Co. Mayo (Cotter 2006) or Whitewell, Co. Westmeath (Phelan 2004, Grogan *et al* 2007). The Beakers at Paulstown were deposited in pits cut into the top of the original structural postholes as part of ritualised acts of abandonment or commemoration. These depositional acts clearly post-date the original use of the buildings which were probably constructed sometime before the appearance of Beakers in Ireland. Part of a Beaker pot was recovered during excavations of the timber circle complex at Ballynahatty, but its exact context remains uncertain (Hartwell 2002, 526). The Armalughey excavation is of national significance because of the extent to which it contributes towards our understanding of ceremonial practices in the third millennium BC.

The context of much of the Grooved Ware and Beaker pottery at the Armalughey timber circle appears to be in secondary rather than primary contexts suggesting that its deposition may be largely connected to activities post-dating the main phases of use of the respective parts of the monument. This is consistent with practices at other timber circles associated with Grooved Ware where depositional activity occurs after the construction of these monuments and generally after the posts have rotted or been removed. This generally comprises the deliberate deposition of artefacts into eroding post-pipes or into pits cut into the top of the original postholes or the (see Gibson 2005, 66, 75 & 158; Parker Pearson *et al* 2007, 631, Thomas 2007, Pollard & Robinson 2007). For example at Bettystown, it seems that the posts were first removed and the voids then packed with charcoal- and artefact-rich soils (James Eogan, pers comm.). At Balgatheran, most of the posts had been removed and some posts had rotted *in situ*, before the post-pit voids were deliberately infilled with pottery and lithics (Ó Drisceoil forthcoming). In many cases, this appears to represent the deliberate deposition

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of materials derived from the collective waste generated by previous ceremonial or feasting activity in association with the use of the monument before its destruction. The placement of these deposits can be seen as ritualised acts of abandonment and/or commemoration of its past history. In this regard, it is interesting to note that the square arrangement of four large posts at the centre of the Armalughey timber circle which may have been its oldest element appear to have been the main focus of the Beaker associated depositional activity, while the outer ring appears to have been left untouched to rot in-situ. Similar occurrences have been noticed at other sites such as Ballynahatty and Dunragit. At the former timber circle, outer ring of posts were left to decay, while the inner ring and the central four-posts were burnt down, dug up and then backfilled before being marked by low cairns of stones (Hartwell 1998, 41 & 2002, 529).

The occurrence of two major, but perhaps separate phases of activity at Armalughey highlights the site as a significant place in both a local and wider regional sense. Although this element of continuity is widely repeated in Ireland and is best known at locations such as Newgrange and Knowth, the excavations at Ballygawley have revealed the previously unsuspected importance of this area during the Neolithic. These discoveries represent a very significant contribution to our understanding of the Late Neolithic in Ireland and Britain

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