DOWN THE ROAD

A Road to the Past Volume 1

The Archaeology of the A1 Road Schemes between Lisburn and Newry

Colin Dunlop

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Front Cover: Reconstruction of the Iron Age defensive earthwork known as the Dane's Cast or Black Pig's Glen, near Newry © Philip Armstrong
Page i: The Neolithic ring barrow and Bronze Age timber circle at Derrybeg (Site 12) © Tony Corey, DOE:HED
Page ii: Aerial view of the excavations at Carnmeen (Site 23) © Headland
Contents page: Reconstructed Bronze Age pottery recovered during the excavations

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Contents

Opposite: The A1 Road Scheme immediately after opening

Foreword

I am very pleased to lend my support to this publication on the archaeology of the A1 corridor.

Major developments by TransportNI have seen the A1 between Loughbrickland and the border with the Republic of Ireland upgraded to dual carriageway standard. These developments have 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 A1 during the DBFO Package 2 Contract which included the A1 Beechill to Cloghogue dual carriageway Scheme and the A1 Junction Improvements Scheme. 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 improvements to the A1 and in the preparation of this informative publication.

Pat Doherty

Director of Engineering – TransportNI

Opposite: Ring Barrows under excavation at Ballintaggart
© Tony Corey, DOE:HED

Introduction

The A1 has been improved in three distinct phases between 2003 and 2010. Lagan Construction built the dualling of the A1 from Loughbrickland to Beech Hill and SIAC Ferrovial built the Newry to Dundalk dual carriageway. The dual carriageway between Beech Hill and Cloghouge as well as four new junctions at Dromore, Hillsborough, Loughbrickland and Banbridge 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 Beech Hill to Cloghogue scheme, then Roads Minister Conor Murphy stated that '*This project is the final link on the key strategic route between Belfast and Dublin on Ireland's Eastern Seaboard and makes a substantial positive contribution to the social and economic well-being of our communities both north and south*'. Once these works were completed Amey Roads NI became responsible for operation and maintenance of the schemes 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., Headland Archaeology (UK) Ltd. and Northern Archaeological Consultancy Ltd. were employed to undertake this work.

The monitoring by archaeologists from these three companies identified a total of 30 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 present day. It is these important sites that are discussed within this book.

Gavin McKevitt

Regional Director – Lagan Construction Ltd

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

Early Neolithic: 4000 BC to 3600 BC

Middle Neolithic: 3600 BC to 3000 BC

Late Neolithic: 3000 BC to 2500 BC

Early Bronze Age: 2500 BC to 1600 BC

Middle Bronze Age: 1600 BC to 1200 BC

Late Bronze Age: 1200 BC to 700 BC

Early Iron Age: 700 BC to 400 BC

Middle Iron Age: 400 BC to BC/AD 0

Late Iron Age: BC/AD 0 to AD 400

Early medieval: AD 400 to AD 1150

Medieval: AD 1150 to AD 1550

Post-medieval: AD 1550 to AD 1914

Modern era: AD 1914 to present day

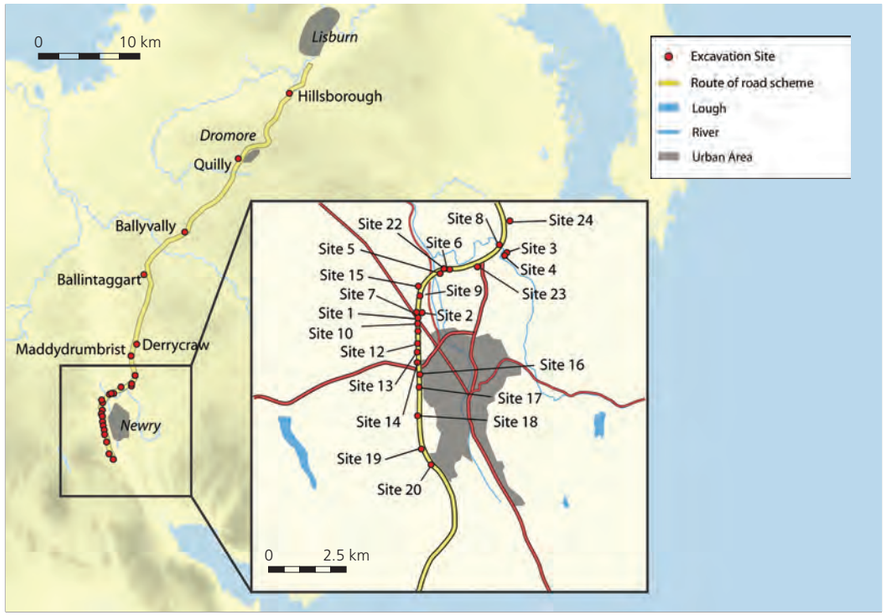
The majority of the dating evidence used within this monograph has been obtained from the radiocarbon dating of charcoal samples obtained from archaeological features found during the excavations. The results from radiocarbon dating analysis can produce a single date range, e.g. AD 300–500, or multiple 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 30 archaeological sites were excavated along the Road Scheme. In keeping with DOE:HED guidelines the sites are principally named after the townland into which they fell, then numerically if more than one archaeological site was within a given townland. For consistency within the text a small number of 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

Opposite: View from the Mourne Mountains towards Newry

Environmental History

The A1 Road Scheme runs southwest across County Down for a distance of nearly 50km from Lisburn to Newry. The terrain along this route is varied as it runs from the Lagan valley, through the rolling drumlins of much of County Down, and on to the mountains in the south and east: Slieve Gullion, the Cooley Mountains, and the Mourne Mountains. Since the icy wastes of the Ice Age Ireland has progressed over the past 12,000 from a sub-tundra environment to a richly wooded one, and over the past 5,000 years human influence has contributed to the cultural landscape we have today.

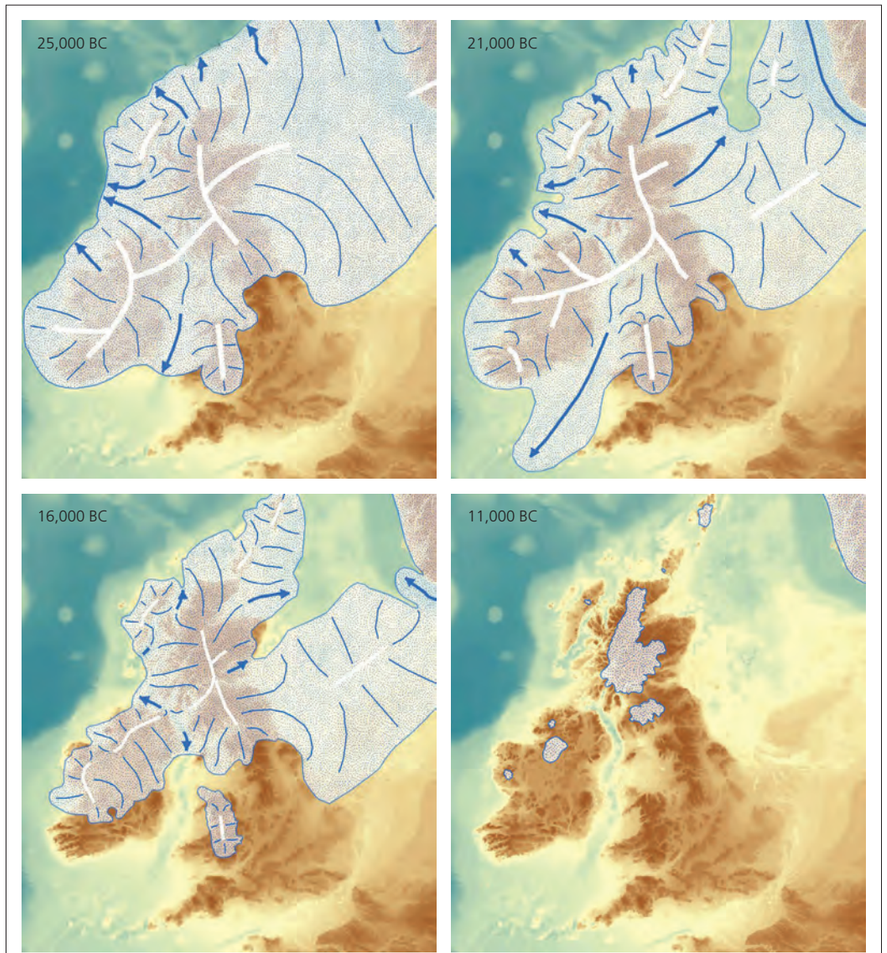
Frozen wasteland – how the Ice Age shaped County Down

The peak of the last phase of Ice Age glaciation was between 24,000 and 18,000 years ago.[1] 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.[2] 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.

The rolling landscape along the Road Scheme 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)[3] and are found from northeast County Down, southwest through County Armagh and on into Counties Monaghan and Cavan.[4] Sometimes these are referred to as 'baskets of eggs' in reference to their egg-shaped appearance when viewed from above.[5] 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.[6] Heather grew on the higher ground of Slieve Gullion, the Cooley Mountains, and the Mourne 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 first pioneers.[7]

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 is particularly notable at Ballintaggart where one of the largest archaeological sites on the Road Scheme was recorded. Today the site lies 200m from Lough Brickland; however, during the prehistoric period the settlement was located on a dry rise only 50m from the edge of the much larger lake. The dry fields which now lie around this rise would have been boggy ground, making the settlement location the most practical place to have occupied in this area. The site was so suitable that it was occupied sporadically for at least 2000 years, from the Neolithic through to the Late Bronze Age.



Ice Age limits © University of Sheffield

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, a partial antler of one such deer was recovered from a depth of around 10m in a peat bog associated with the Newry River, just to the west of Corcreeghy (Site 21). This is thought to date to the early post-glacial period around 12,000 years ago.

The improving climate was brought to an abrupt end around 12,700[8] years ago when the ice which held back a vast North American glacial lake called Lake Agassiz collapsed,[9] 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.

White Dryas © Jouko Lehmuskallio, NatureGate

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[10] 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[11] period began, this is the interglacial period in which we are currently living.

The Irish hare is one of the only survivors of the immediate post-glacial tundra and will still turn partially white in cold winters © Felicity Martin

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.[12] 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, 10 of which have become extinct over the past 10,000 years.[13] 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.[14] 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.[15] 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[16] (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.[17] 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.[18, 19] 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 affect 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.

While no pollen analysis from the prehistoric was undertaken on this Road Scheme, charcoal recovered from the archaeological sites excavated was analysed. The results from this 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 Ballyvally. 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 exposed ridge at the archaeological site of Carnmeen (Site 5). They are also an indicator species for cleared agricultural ground.

Pollen analysis from the early medieval site at Carnmeen (Site 23) was consistent with the historical record as there was evidence for a mix of grazing pastures and cereal production.

Soils and their influence on human settlement

The soils over much of the road scheme were poorly draining heavy clays (Sites 1–3, 5, 11, 14–23, Ballyvally and Hillsborough). This soil type predominated in the inter-drumlin hollows, causing these areas to become waterlogged. Peat formed in these hollows, a feature recorded at Ballyvally and Corcreeghy (Site 21). 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 remaining archaeological sites found in these areas were from short term transient occupation, with no evidence for prolonged settlement.

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 extensive burial practices was either on these ridges (Sites 8, 13, 10, Ballintaggart, Derrycraw and Quilly), or on their lower slopes where nutrient rich sandy alluvial deposits from the Newry River floodplain occurred (Sites 4, 6, 7, 9 and 12). The archaeological sites excavated within this environment and their significance within the landscape are discussed in the following chapters.

Wet woodland species would have grown beside lakes and rivers as well as the waterlogged drumlin hollows. These species were particularly noted in the deposits at the site at Ballyvally.

Opposite: Late Mesolithic rock art from Hjemmeluft, Alta Fjord, Norway, showing men in boats casting fishing nets and using bows.[1]

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.[2, 3] These first colonists were hunters, trappers, fishers, and foragers who initially settled on the coast and then accessed the interior of the island along the rivers.[4] At this time much of Strangford Lough and Carlingford Lough would have been dry land and it is in these areas that the first settlers would have lived. However, with the melting ice causing a rise in sea level of some 60m many of these sites have since been inundated, and we are only left with evidence for those which were either on the higher ground, or further inland, such as those found on this Road Scheme.

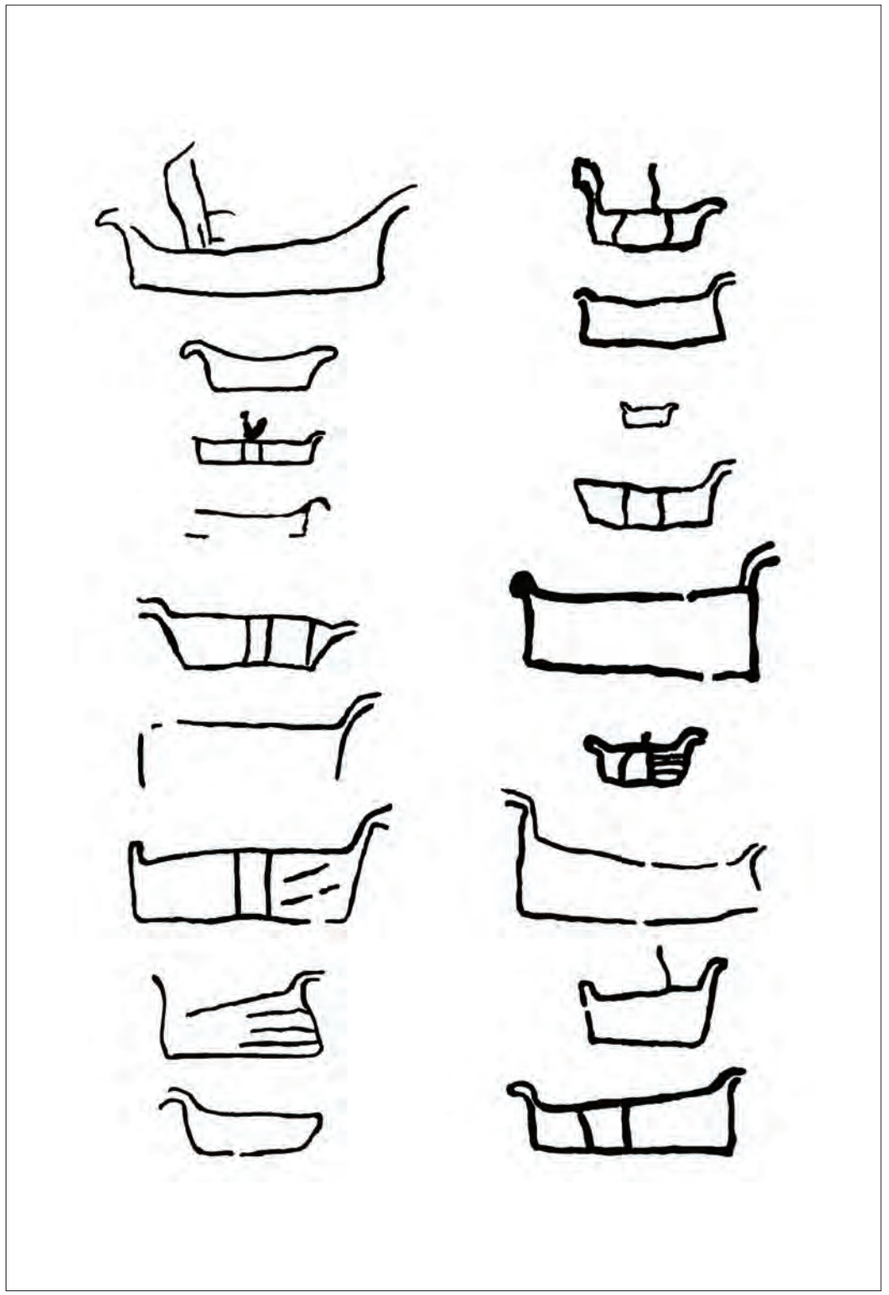
Arrival

Crossing the Irish Sea in a small boat would have been less perilous during the Mesolithic than today. Lower sea levels and subsequent less treacherous currents, combined with a shorter crossing distance, meant that in calm conditions even a small boat could have made this crossing in only a few hours.[5] No Mesolithic boats have been found in County Down; however, a later Mesolithic canoe formed from a hollowed-out log (dating to 5490–5246 BC) was uncovered on the western shore of Lough Neagh, at Brookend, County Tyrone.[6] As well as dug-out logs, it is likely that wooden-framed boats covered in bark or skin would have been constructed. These would have appeared similar in form to modern day curraghs or coracles, and would only have held two or three people at most.

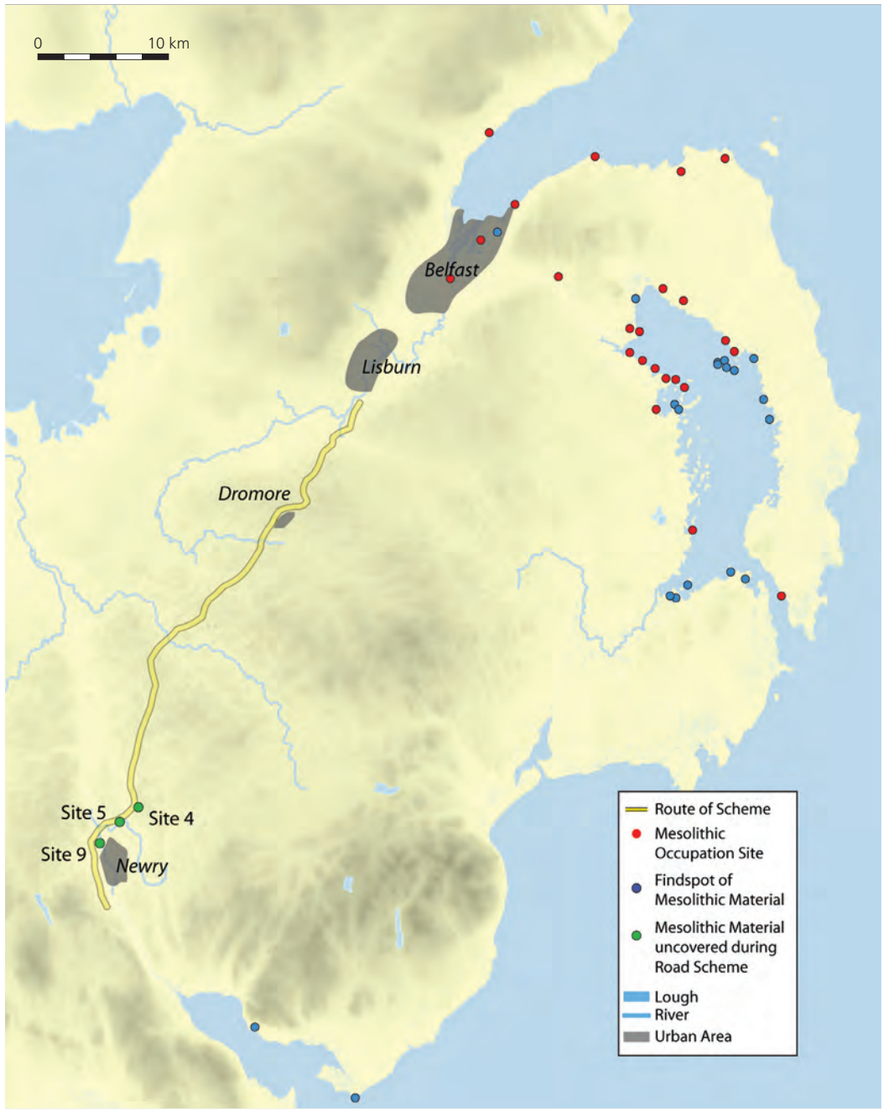
Seasonal camps

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,[8] Moynagh Lough, Co. Meath,[9] and Mount Sandel, Co. Londonderry[10], have produced a wealth of archaeological material.

Painting of a Curragh in use by Richard Lovett, 1888[7]



Rock carvings of Mesolithic boats from Norway.[11] Similar images are found carved into rocks along the northern Scandinavian and Russian coasts. The majority of the carvings are of log boats. This may indicate a preference for wooden boats over skin boats providing suitable materials were available.[12]



Location map showing previously known Mesolithic sites in County Down, and those found on the Road Scheme

Within County Down the evidence for the Mesolithic population has until now been limited to the shores of the Ards Peninsula, Carlingford Lough, and Strangford Lough. However, three sites, all dating to the Late Mesolithic, were discovered during the Road Scheme excavations and represent transient settlement sites located away from this coastal range.

At Carnbane (Site 9) two pits were located 120m from each other. Their associated radiocarbon dates, 4957–4792 BC (UBA-14832) and 4339–4232 BC (UBA-14834), indicated two different phases of Mesolithic activity in the area. Mesolithic radiocarbon dates were also returned for isolated pits at Carnmeen (Site 4) and Carnmeen (Site 5), dated to 4502–4353 BC (UBA-12839) and 5807–5671 BC (UBA-12840) respectively. At Carnmeen (Site 3) a piece of burnt hazel from an early medieval ditch was dated to 4617–4458 BC (UBA-14199). It is not possible to determine if this hazel represents archaeological activity: it may have derived from a Mesolithic campsite which was built over during this later period, or it may simply have been a piece of wood burned in a forest fire during the Mesolithic period.

Normally archaeologists can corroborate the radiocarbon dating evidence by comparing this with associated chronologically diagnostic artefacts. The Mesolithic period pre-dates pottery manufacture, and therefore much of the diagnostic artefact range of the Mesolithic is confined to flint tools. Unfortunately, none of the pits at Carnbane (Site 9) or Carnmeen (Sites 4 or 5) contained any flint. The lack of stone tools could be accounted for by the absence of a readily accessible flint resource in this area. As such, any population living here is likely to have used wooden, rather than stone artefacts, and these have not survived in the archaeological record.

Similar sites from this period have been excavated across Ireland. At Ferriter's Cove, Co. Kerry,[13] 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. Some of these sites were also used for flint knapping; however, this was not the case for the sites on the Road Scheme as no flint occurs naturally in this area. By using the sea and the large network of rivers in Ireland it was relatively easy for the population to move between these smaller seasonal camps and the larger more permanent homes, such as that recorded at Mount Sandel.[14] This is a trend which has been identified across the European archaeological record.[15]

Foraging and hunting

As mentioned above, Ireland was heavily forested at this time, and access to resources and communications was easiest via rivers and lakes. The resources within and along the edges of these waterways provided both food and shelter. At Carnbane (Site 9) a pit contained an interesting range of wild plant foods, including blackberries, sloe and fat hen (a common weed which can be cooked and eaten much like spinach[16]) which had been deposited here from a small camp fire. These remains most likely represent part of the meal eaten by the occupants. At Carnmeen (Site 4) the presence of fruit tree wood and hazelnut shell also shows that the Mesolithic diet included crab apples and hazelnuts.

The Road Scheme excavations revealed no evidence for the types of protein that may have been consumed in the Mesolithic. We know from other excavations that fish, such as salmon, eel, and trout, were caught in inland locations, and that wild boar was also hunted. It is highly likely that the three major rivers crossed by the road: the Newry, the Bann and the Lagan, as well as Loughbrickland lake which lies along its edge, were actively fished throughout this period.

The importance of fish to the Mesolithic diet is well attested, with fish bones recovered from sites such as Ferriter's Cove,[17] Mount Sandel,[18] and Lough Boora, Co. Offaly.[19] Evidence for Mesolithic fishing equipment is largely confined to spears, although several fish traps have also been excavated elsewhere in Ireland. During the Early Mesolithic, the spears may have been composite weapons, utilising a number of small pieces of flint known as microliths,[20] while the later Mesolithic hunters may have used single large flint flakes.[21] The use of organic material (wood, bone, horn, etc.) to create hunting or fishing weapons was also likely.[22] Unfortunately, these would only survive in exceptional circumstances, and to date no organic-based fishing or hunting weapon has been found in Ireland. There are, however, a few recorded examples of Mesolithic wooden fish traps[23] with Spencer Dock, Co. Dublin, and Clowanstown, Co. Meath,[24] being two examples. These traps were constructed from a weave of slender tree shoots and took the form of a basket which tapered to a narrow point. The size of these traps varied, indicating that they may have been designed with particular types of fish in mind.

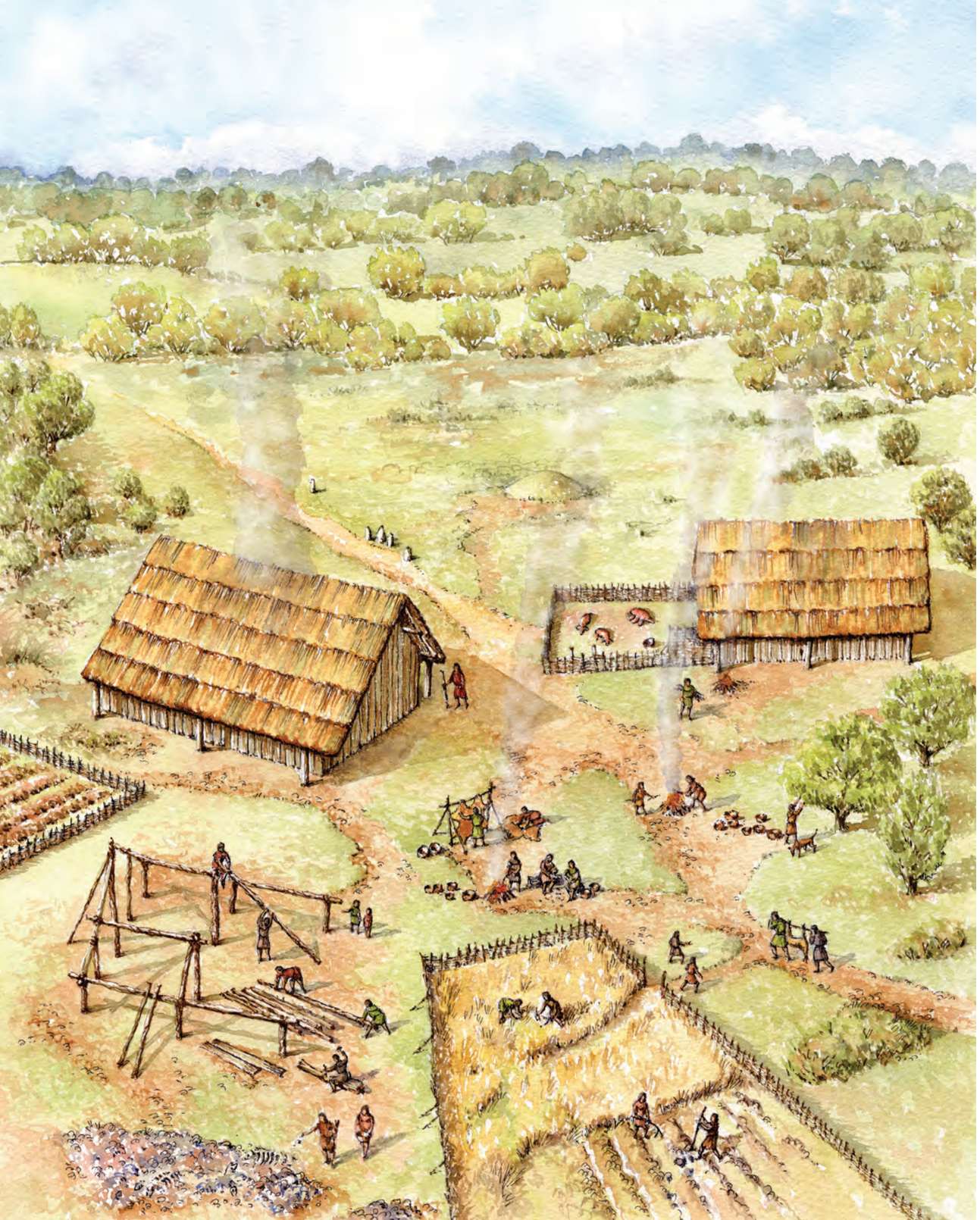
While there is no direct evidence for Mesolithic archery in the British Isles it is likely that bows and arrows were used. In a wider European context there are rock carvings from both Norway and Spain which show the use of bows. Also, and most remarkably, a pair of 9000-year-old elm longbows were recovered from Holmegaard in Denmark.[25]

Population

It is very difficult to extrapolate a population size for Ireland during any prehistoric period. However, it has been estimated that with the limited post-glacial resources available and on-going winter food shortages due to poor climatic conditions[26] the population in Ireland may never have been more than 8000.[27] This equates to a population density of only 0.1 persons per km^2. Due to the small population, the lightly built nature of the campsites they constructed, and a general tendency for the population to live on either coastal, riverside or lakeside locations it is not surprising that there is little evidence for inland Mesolithic settlement in Ireland. Those sites which are found tend to be similar to the examples on this Road Scheme, and are represented by isolated pits or hearths from small campsites.

Clowanstown Fish trap © National Roads Authority[28]

A modern-day fish trap in use in Vietnam © Ruzicka\UNESCO,[29] the Mesolithic fish traps were almost identical in design to these and would have been placed at narrow points along the rivers and streams which are now crossed by the Road Scheme.



Opposite: The Neolithic settlement excavated at Ballintaggart. Reconstruction by Philip Armstrong

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 clay 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 and foraging

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 allowed the new farmers to grow cereal crops. During the excavations along the Road Scheme, the archaeologists recovered grains of oats, barley, and wheat from Ballintaggart, Carnmeen (Site 2) and Glassdrummond (Site 7). At Derrybeg over 2000 charred barley grains were found; these had been sorted and were ready for processing. At Carnmeen (Site 2) grains of wild grass were also found, suggesting that the farmers here were bulking out the domesticated cereals with edible, but less nutritious, wild grass seeds.

Most of the harvested grain would have been ground into flour using a quern-stone, and the resulting flour used to make either bread or a thick gruel. A quern stone is a type of small, hand-operated mill for use in the home. The earliest type is known as a saddle quern. This was a flat, or shallow, bowl-shaped rock (the quern) upon which grain was ground using a smaller stone (the hand stone) that was held in the hand. Over time the quern was worn away into a shape similar to a saddle, which gave it its name. Two rubbing stones were found within the topsoil at Glasdrummond (Site 7) and may have been hand stones for using with a quern. No quern stones were found during the Neolithic excavations here, but they have been found on similar sites, such as those at Ballygally, Co. Antrim,[2] Ballyharry, Co. Antrim, Corbally, Co. Kildare, and Thornhill, Co. Londonderry.[3] It is possible that the querns were of such value that they were carried away with Neolithic families when they moved. Alternatively, it is possible that they were lost by later ploughing of the fields.

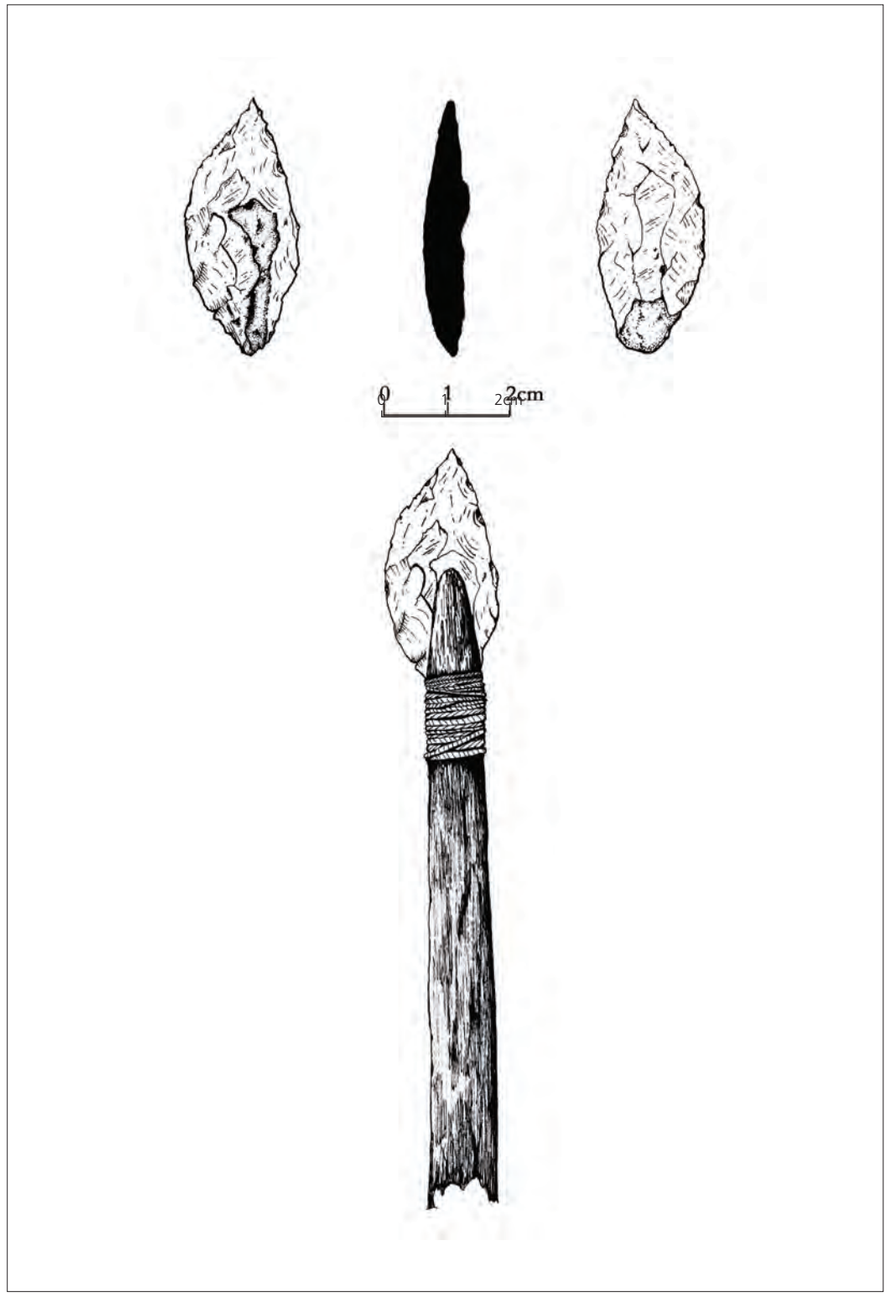
Pottery from Ballintaggart with the impression of a sloe seed, left, and a crab apple pip, right, in the fired clay

The environmental specialist[4] identified a charred garden pea seed at Glasdrummond (Site 7) from a pit dated to 3955–3782 BC (UBA-14207). The pea is not a wild species, and it was therefore being intentionally cultivated. Peas are an excellent source of nutritious food in their own right, and they are often grown in tandem with wheat and barley as their roots enrich the soil by fixing nitrogen into it, improving the conditions for cereal production. Peas are also used in crop rotation, as they enrich the soil in between seasons. Glasdrummond (Site 7) is one of only five Early Neolithic[5] sites in the British Isles where pea has been identified. The association between the charred pea seed and the radiocarbon dated material from the pit at this site is not clear. However, if the pea seed did come from a secure context, and the radiocarbon date can be associated, then this is a significant find as it represents the first occurrence of domestic pea in Ireland.[6]

Neolithic farmers continued to gather readily available wild fruits, nuts, and berries. Sloe kernels and crab apple pips were found at Ballintaggart, and blackberry seeds and crab apple pips at Glassdrummond (Site 7). Blackberries would have been eaten as they ripened: the edges of the fields and forest edges providing an autumnal feast. Sloes and crab apples would have matured at the same time of year but are both such bitter fruits that they would have required processing in order to be edible. Experimental archaeologists have shown that mashing sloes into a pulp removes the bitter taste and the resulting mass can be eaten in large quantities. It is also possible to store sloes whole in cool dry conditions, or to cook and mash them together as a flat leathery cake.[7] Crab apples, while being considerably sweeter than sloes, are still very bitter and would have been baked or roasted before being eaten. Like sloes, crab apples will also survive in storage for several months, if collected without bruises that would otherwise cause them to rot.

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[8] and may have held off starvation in such lean times. Nuts can also be roasted to aid longevity of storage, and it is possible that the pit found at Glasdrummond (Site 7) which had a heavily scorched base, as well as others across the Scheme, may have been used to roast, and/or store food over winter.

Other plants, which may have been gathered for food, include water-pepper and goosegrass, both of which were recovered at Derrybeg (Site 13). While it is possible that these were simply weeds, the seeds of which found their way into archaeological deposits, both can also be made fit for limited human consumption. Water-pepper seeds can be made into a tasteless and nutritionally poor flour,[9] while goosegrass tips, although bland, can be eaten raw or steamed.[10]

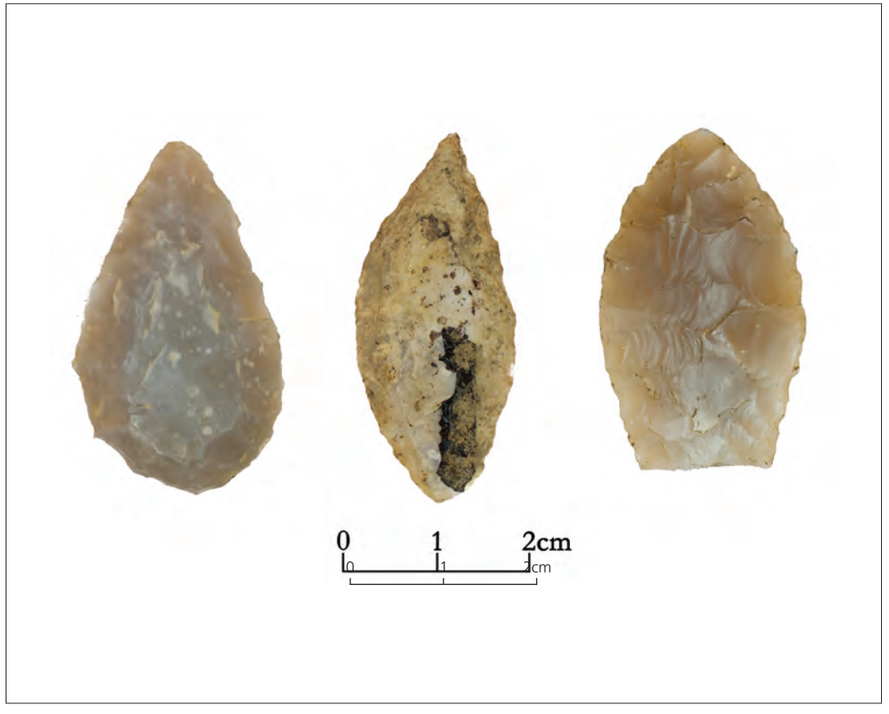


Reconstruction by Stephanie Godden showing the method of hafting the arrowhead to the shaft with cord and birch resin[11]. Birch bark would have been abundant in the marginal land around Loughbrickland. By heating the bark to over 300 degrees (in the absence of oxygen) a large quantity of tar is produced. This would have been applied while still hot and then as it cooled it hardened to form a durable adhesive. There seems to have been a preference for birch bark tar over the more readily available and easily harvested pine resin throughout prehistory[12]. While no comparative hafting studies have been undertaken it is clear that birch tar must have worked much better as a hafting material as the process to create the tar is much more involved and time consuming than collecting pine resin.

Raising livestock, hunting, and fishing

Evidence for the Neolithic diet in Ireland indicates that wild game and fish, as well as domesticated animals, including cattle, sheep, goats, pigs, and dogs, were eaten.[13] The only site along the route of the excavated road which contained identifiable animal remains was the Early Neolithic settlement site at Ballintaggart. Excavations of the houses there recovered a small number of bones belonging to either wild boar or domesticated pigs. It is estimated that at the beginning of the Neolithic there were around 800,000 wild boar on the island of Ireland[14] and these would have provided an ample resource to exploit. It has been argued that in the later Neolithic wild boar become extinct through a combination of hunting and habitat loss, as well as clearance of trees and scrub for farming.[15] It is impossible to know if the remains at Ballintaggart are from wild boar; however, three arrowheads were also recovered from the site, indicating that the inhabitants were actively hunting something. One of these arrowheads had birch resin surviving on its base from when it was mounted in its shaft.

Animal bones found at the later Neolithic sites at Carnmeen (Site 2), Carnbane (Site 9), Derrybeg (Site 13), and Glassdrummond (Site 7) were very fragmented and could not be identified to species; however, it is likely that they would have been from domesticated stock.



Arrowheads from Ballintaggart

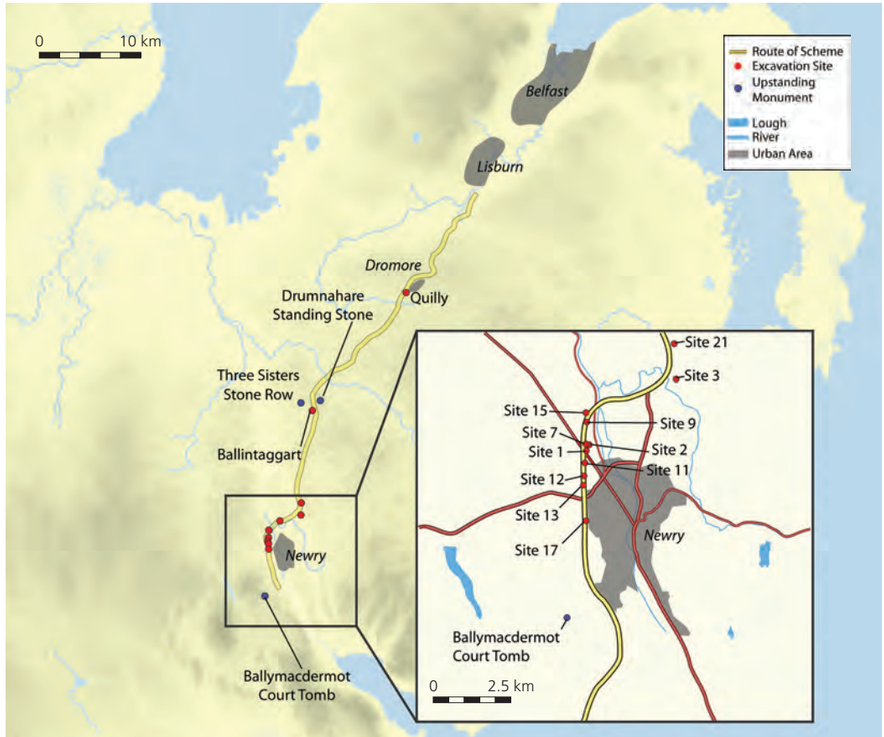
Abandoned 19th Century Vernacular house in the Mourne Mountains, near Hilltown. Like farming techniques, the style of houses also changed over time. At the start of the Neolithic period the houses were rectangular and would have looked very similar to 18th- and 19th-century single-story farm houses; some even had separate rooms to one side which may have been for housing animals.[16]

Settling down

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. A good example of this is Ovcharovo, a village in modern Bulgaria, which was occupied for around 500 years.[17] However, the trend in Britain and Ireland was towards isolated houses, or smaller groups of buildings, such as those that have been found during excavations at Ballygally,[18] and Corbally.[19] In many ways, the landscape of County Down 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.

The rectangular houses that characterise the Neolithic were built using split timbers which were placed upright in deep foundation slots dug into the ground, and they generally had a roof supported on two or more central posts. However, at the beginning of the Middle Neolithic, around 3600 BC, there was a shift from substantially constructed rectangular buildings[20] to less well-built round, or partially rounded houses. The reason for this shift is not clear, but it has been suggested that with an increased population and pressure on resources, conflicts began to arise and the population moved to enclosed settlements[21] and structures which were easier and quicker to build.

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. By the last part of the Neolithic, very few houses have been identified, and those that have are almost universally post built and round. However, the houses from this period are also much smaller, suggesting that the inhabitant families were composed of fewer permanently resident members.



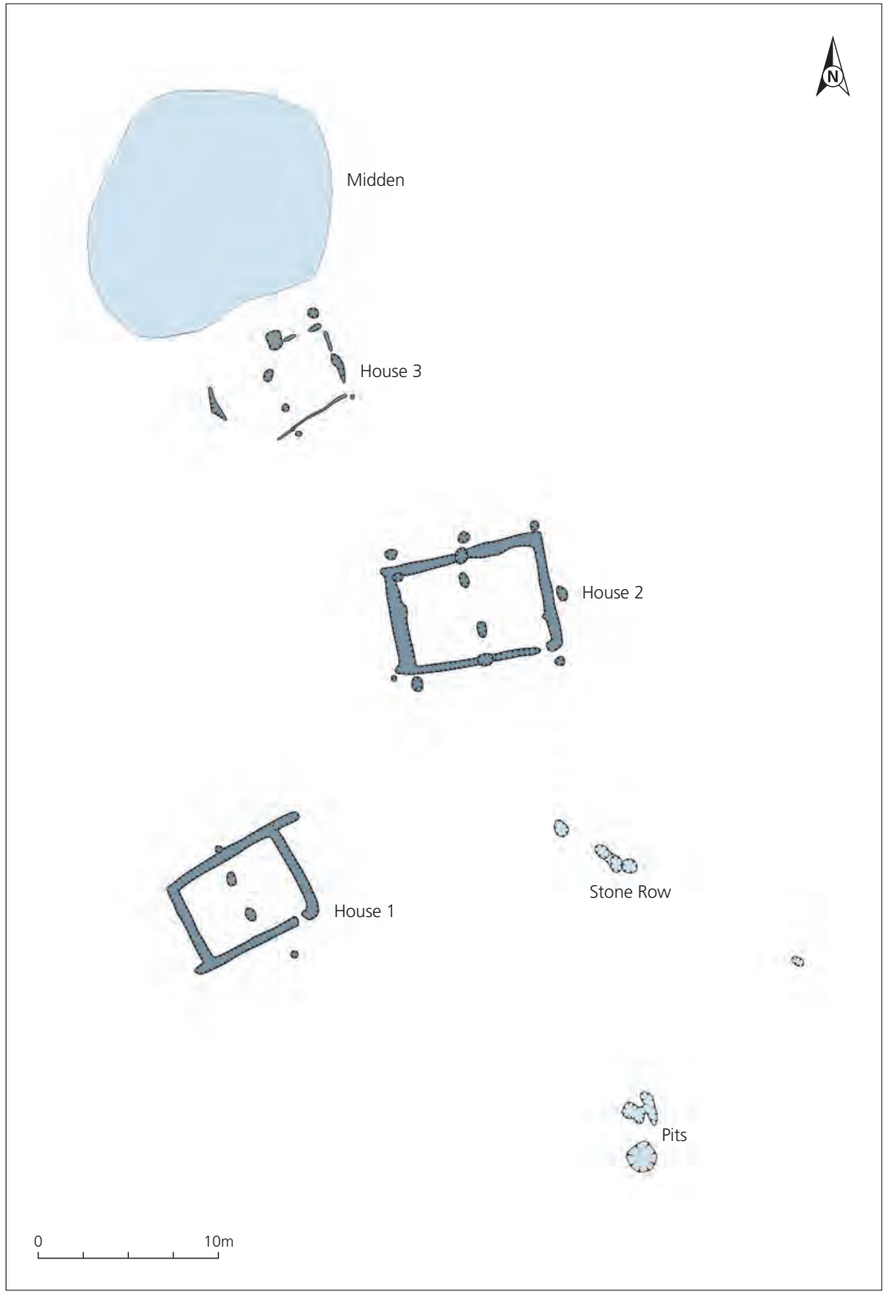
Location map showing Neolithic site locations along Road Scheme

Early Neolithic settlement - focus on Ballintaggart

The settlement at Ballintaggart comprised three houses, which lay on a south-facing slope, on a slight rise above the surrounding boggy areas to the west and south. It was sheltered by the hills to the northwest and overlooked Loughbrickland to the northeast. This location followed a trend of settlement near water during this period, with other sites, such as Ballynagilly, Co. Tyrone, and Lough Gur, Co. Limerick, located beside lakes, and Knowth, Co. Meath, Newgrange, Co. Meath, Tankardstown, Co. Meath, and Townleyhall, Co. Louth, all located beside rivers.[22]

The houses here can be dated to the start of the Neolithic period; radiocarbon dates for these structures provide a likely period of occupation between 3715 and 3507 BC (House 1: Beta-213591; House 2: Beta-213590). The three houses respected each other, and an extended family group would probably have occupied all at the same time. A large midden containing broken pottery and damaged flint artefacts was found just north of House 3. Its size, relative to the buildings, indicates that the occupants could have lived here over a prolonged period. Potential evidence for the ritual practices of the people living here was also found: a row of standing stones was constructed immediately to the east of the houses and a series of pits containing deliberately deposited goods lay just south of this (see below).

Early Neolithic rectangular house at Ballintaggart under excavation © Tony Corey, DOE:HED



Plan of the Early Neolithic settlement at Ballintaggart

Broken end of a polished stone axe from the foundation of House 1, Ballintaggart. This axe is made from porcellanite, a rock which is only found at Tievebulliagh, near Cushendall, Co. Antrim, and Brockley, Rathlin Island. The majority of polished stone axes recovered in the north of Ireland are made from this particular stone. While the quantity of porcellanite axes does decrease with distance from this source, they are found across Ireland and the British Isles: from the Shetland Isles in the north to the south coast of England. This distribution indicates that axes were also important trade items. Most polished stone axes are of a size comparable with our modern axes. They would have been inserted into a wooden handle and could have been used for chopping down trees. A small number of both very small (less than 10cm long) and very large (more than 20cm long) axes have been found. These were more likely to have had a symbolic, rather than a practical function: expressing wealth or power and possibly used in religious ceremonies.[28]

The houses were constructed in a similar way, and although varying slightly in size, were all around 8.5m long and 4.5m wide, which conforms roughly to the footprint of a modern terraced house. All three of the houses had a gap in their wall slot at the southeast corner, probably the doorway into the house. 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. The door would have been supported by timbers within the wall slots on either side of this gap. Inside the building there were further posts to support the roof. All three houses also had a pair of central postholes, which would have held additional posts to support the roof and may also have divided the house in two, with the posts supporting a partition wall. The largest house, House 2, also had external posts which may have supported the eaves of the roof and would have provided shelter for any animals which had been tethered to the back of the house. House 1 had extensions on its two longest sides and it is possible that these were the remains of lean-to sheds or windbreaks for animals; similar extensions were noted at Ballygally.[23] A structural footprint identical to this was found at Tankardstown,[24] with similar footprints on a number of other sites including Ballyglass, Co. Mayo,[25] Newtown, Co. Meath,[26] and Drummenny Lower, Co. Donegal.[27]

It would appear that Houses 1 and 2 were repaired at some point during their use; there was evidence to suggest that further posts were inserted into the walls after they had been built. These were presumably used to brace the wall and roof when it began to decay and sag. It is also a further indication that the occupants lived here over a prolonged period of time, as repairs would not be needed within the first few years of a wooden building's life. There was no evidence for hearths in any of the dwellings; however, this is not unusual as hearths were either located externally, or, if located internally, would have been ploughed out.

Burnt structural timbers were recovered from the wall slots of House 1 which show that it was destroyed in a fire. There was no evidence for the site being attacked, and while it has been suggested that some Neolithic houses destroyed by fire were part of a deliberate ritual[29] the absence of deliberately deposited artefacts within the houses found here make this unlikely. The fire was therefore most likely the result of an accident.

Pieces of worked flint, broken pieces of polished porcellanite axes, and potsherds from at least 120 different vessels were recovered from the houses and the midden, and they represent the debris of years of occupation on the site. These pots are from the Western Neolithic tradition, and denote a type of pottery found throughout much of Western Europe.[30] The type excavated here was primarily in the form of round-bottomed carinated bowls, the earliest type of pottery found in Ireland.[31]

Reconstruction drawing of Neolithic carinated bowl from Ballintaggart: note the impressions made by the fingers of the maker on the clay as it was smoothed before firing. Used for storage of food and water, as well as for cooking, the Early Neolithic carinated bowl is an incredibly well-made vessel, with walls that were so thin and smoothly finished, that they could look like tanned leather. The pots have a rounded base above which there is a distinct shoulder or carination, an open lip around the mouth, and some examples have holes for the attachment of leather or woven plant fibre cords to allow them to be hung.[32, 33, 34] In the later Neolithic as the manufacture of these pots evolved, their plain features came to be replaced with unique designs and decorations, which were often specific to their particular region. This pottery has been found at a wide variety of other Neolithic domestic sites, as well as court tombs. Carinated bowls are well dated from a variety of sites to the period 3900–3600 BC. Illustration by the author.

Possible Neolithic Stone Row

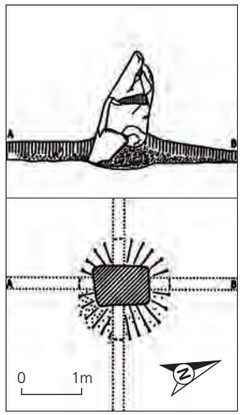
A line of five pits was located to the east of the houses. The central pit of the alignment contained 35 sherds of Neolithic pottery from at least three plain and two carinated bowls. No large stones were recovered from the fills of the pits but the presence of a large pointed depression in the base of one indicates that a large stone was perhaps deposited vertically here. It is therefore possible that the other pits also contained upright stones. Interestingly, later occupation at Ballintaggart – a ring-ditch cemetery – respected this pit alignment. This means that the stones they held must have been still visible and upstanding at this time.

Through comparison with similar, upstanding stone monuments in the vicinity, such as The Three Sisters at Greenan and Drumnahare Standing Stone (both in County Down), it can be assumed that the stones within the row were likely to have been between 0.50m and 1.50m in height.

It has been a broadly held belief that standing stones were erected in the Bronze Age. However, this view is based on the dating of a small number of burials found at the base of the monuments rather than dating evidence from the stone's placement.[35] These burials may have in fact been placed at the location of much earlier standing stones as they were considered to be ancient sacred sites.[36] Single standing stones have been found within the Neolithic passage tombs at Lough Crew, Co. Meath[37] and Carrowkeel, Co. Sligo,[38] while short rows have been identified in front of the court cairns at Annaghmore, Co. Armagh[39] and Cohaw, Co. Cavan.[40]

Stone rows were a common feature of the prehistoric landscape and indeed a large number of stone rows remains in place. They range in length from paired stones, up to very long extended rows, the longest being the Stall Moor row in Dartmoor which is 3.32km long.[41] The longer rows are most often directly associated with other monuments, such as the avenue at Ballynahatty, Co. Down,[42] and the stone rows at Beaghmore, Co. Tyrone.[43] Shorter rows are, however, frequently monuments in their own right.[44] A number of short stone rows, similar to the one excavated here, has been recorded in Northern Ireland, with the closest being The Three Sisters.[45]

A number of these rows appear to have been oriented towards the point of rising or setting of conspicuous astronomical features, namely the sun, the moon, or a particularly bright star.[46] Examples of this include Killadangan, Co. Mayo,[47] aligned with the setting sun at the summer solstice; Ballochroy, Argyll,[48] aligned with the setting sun at the winter solstice; and the main row at Callanish, in the Outer Hebrides, which is aligned with the star, Capella.[49] However, the alignment of most stone rows has no known astronomical association. To this end, they may have formed avenues or processional ways to the monuments to which they were related, or perhaps they were aligned to surrounding geographical features. Alternatively, they may not have aligned to any specific feature at all.[50]



Left: Drumnahare Standing Stone © Collins.[51]

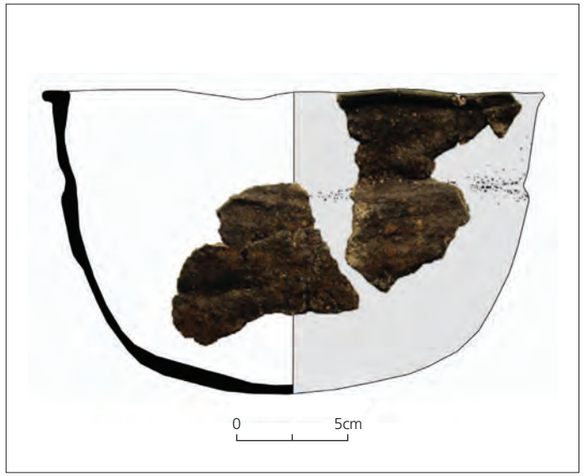
Right: Drumnahare Standing Stone, looking south over Lough Brickland towards the Neolithic site at Ballintaggart © Tony Corey, DOE:HED. The tree-covered island in the lake is a man-made island known as a crannog and is discussed in the medieval section of this book.

In the case of the stone row excavated at Ballintaggart, the alignment was northwest to southeast, at an angle of 299° which, like so many other alignments, does not correspond to any specific astronomical feature, nor any surrounding geographical feature. The northwest to southeast alignment is however, almost identical to the nearest stone row, The Three Sisters, which is less than 1km away, indicating that this alignment may have had some significance to the local population.

Just south of the standing stones there was a small cluster of larger pits which contained fragments of unidentifiable burnt bone; 146 Neolithic pottery sherds from at least 13 plain bowls and 13 carinated bowls; and a small number of flint artefacts, including two intact and unused arrowheads. The largest of these pits was dated 3814–3627 BC (Beta-216905) and as such it may have been contemporary with the occupation of the rectangular houses. The presence of the unused arrowheads means that it is unlikely that these deposits were from rubbish disposal and were probably a form of ritual deposit. Indeed, it has been suggested that arrowheads were not only used for hunting but also had a significant symbolic function.[52, 53] The presence of deposits like these in close proximity to house structures has been noted before at other Neolithic settlement sites; including Thornhill[54] and Drummenny.[55]

Left: Tiny polished Mudstone axe from Carnbane (Site 9). Such axes were clearly too small for practical use and are therefore interpreted as representing ritual artefacts.

Right: Reconstruction of Neolithic pot from Carnbane (Site 15) © ADS



Other Early Neolithic evidence

Evidence for further Early Neolithic activity on the Road Scheme was found on a few other sites. At Glasdrummond (Site 7) two small spreads of charcoal (one of which dated to 3798–3655 BC; UBA-14218) and an isolated pit (3939–3701 BC; UBA-14204) were found. Several sherds of Western Neolithic pottery and six partially worked flints were recovered. At Carnbane (Site 9) three large pits (one of which dated to 3706–3638 BC; UBA-14835) were identified as being used for quarrying clay to make pottery. Also recovered at Carnbane (Site 9) was a tiny polished mudstone axe which has been identified as Neolithic in character. Such axes were clearly too small for practical use and are therefore interpreted as representing ritual artefacts.

At Carnmeen (Sites 2, 3 and 6) several postholes and pits were excavated which contained a small quantity of Western Neolithic pottery and flint. Early Neolithic dates were returned from Carnmeen (Site 2) (3804–3692 BC; UBA-13501) and from Carnmeen (Site 3) (3646–3523 BC; UBA-14185), no date was returned for Carnmeen (Site 6). At Carnbane (Site 15) a large number of pits and postholes was scattered across a hillside. A total of 73 sherds of Western Neolithic pottery was recovered, the majority of which were from a single rounded vessel 20cm diameter and 15cm high. One of these pits dated to the Early Neolithic (3766–3650; UBA-13466). At Derrybeg (Site 13) a single sherd of Western Neolithic pottery was recovered from a pit in a cluster of four, one of which also contained Bronze Age pottery.

Ballymacdermott Court Cairn © Tony Corey, DOE:HED

There is also a small number of Early Neolithic megaliths located within close proximity to the Road Scheme. From the Greek, meaning 'large stone', these megalithic structures were used to mark the burial sites of prominent members of their society. During this period two main types of funerary monuments were built: portal tombs (sometimes called dolmens) and court 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. One of the closest examples of this type of megalith is at Kilfeaghan, Co. Down.[56] 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.[57] A particularly fine example of a court tomb stands in Ballymacdermott, Co. Armagh, near Newry.[58]

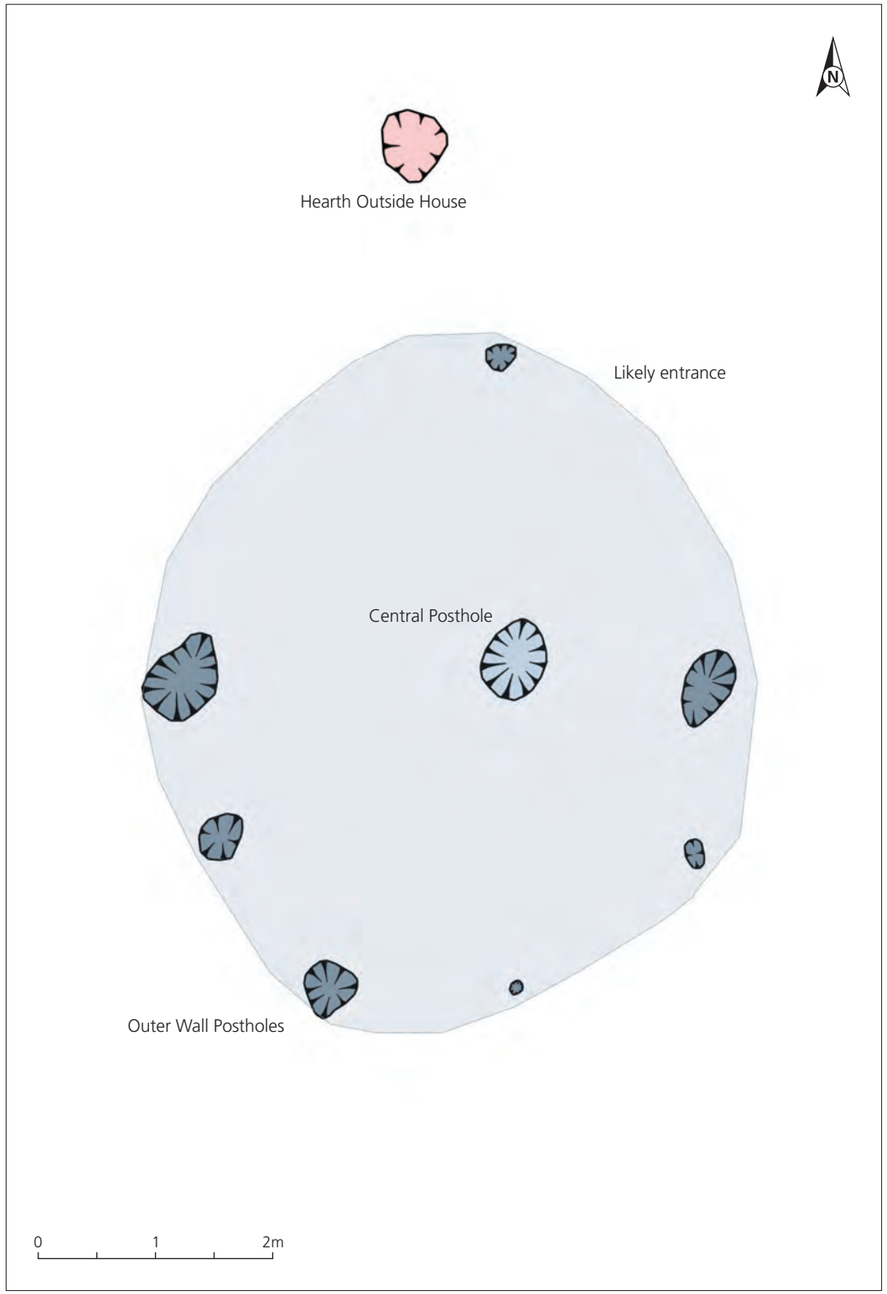
Middle Neolithic settlement - focus on Glassdrummond (Site 1) and Derrybeg (Site 12)

As mentioned above, at the end of the Early Neolithic, there is a marked shift from solidly constructed rectangular houses, such as those at Ballintaggart, to less well-built circular houses. The reason for this change in construction may be linked to a downturn in the climate, with average temperatures after 3670 BC dropping, and prolonged periods of heavy rainfall occurring between 3600 BC and 3460 BC.[59] Such worsening conditions would have caused crops to fail and it is likely that there were periods of starvation that lead to a decrease in the population. There was also a significant move away from upland to lowland locations for both agriculture and the placement of ritual structures,[60] further indication that the changing conditions rendered traditional areas and practices no longer suitable. With pressure on resources it has also been suggested that conflict ensued, leading to the construction of settlements enclosed by defensive structures such as palisade walls or in naturally protected locations, such as river or lake edges.[61]

Farmers at this time also moved from cereal production to keeping increased numbers of livestock, perhaps on the grounds that animals do not fall so easily victim to climate change.[62] If this were the case then the farmers would have required greater mobility to herd their animals effectively over larger areas of ground. As a result of this, there would have been be less need for a permanent dwelling and smaller, lighter structures would have been adequate for their needs. This difference can be seen in the archaeological record, as the latter type of building is often only identifiable from scatters of postholes and occasional hearths. Interestingly, however, this did not correspond with a downturn in the size and scale of burial monuments. Indeed, the continued importance of ritual acts and religious beliefs indicates that there was continuity from the Early Neolithic culture. The earlier portal and court tombs, however, were gradually replaced with a variety of monuments including passage tombs, ring cairns, barrows, henges, and wood or stone circles.

There were only four sites on the Road Scheme which provided evidence for the Middle Neolithic. At Glassdrummond (Sites 1 and 7) and Carnagat (Site 17) there was evidence for occupation, while at Derrybeg (Site 12) two ring barrows were excavated.

Glassdrummond (Site 1) lay on a shallow plateau on a north-facing slope beside a small stream. A large number of postholes, stakeholes and pits was discovered over an area approximately 20m^2. The majority of these did not appear to have been structural and must have been related to the industrial or farming activities which the people living here were undertaking. The house was at the south of the area and would have lain above the maximum water level of a nearby stream; all evidence for activity was found between these two points. The house measured 4.5m in diameter, had a central supporting post and a ring of outer posts, which would have been tied into the central post.



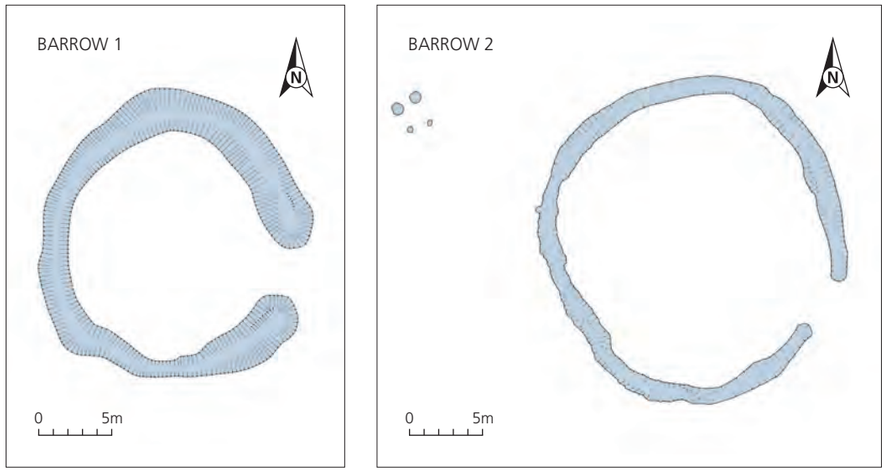
Plan of the roundhouse at Glassdrummond (Site 1). To gain maximum light most prehistoric houses would have had entrances in the south or southeast; however, this house had an entrance at the northeast, allowing it direct access to the stream and the area in which the inhabitants were working. A hearth was located not inside the house, but outside this entrance.

Reconstruction of a similar Neolithic round house from Newgrange, this hut can be visited at the Newgrange Visitors centre.

The ground plan for this house is similar to that identified at Newgrange,[63] and it is likely that it was constructed in the same way. To gain maximum light most prehistoric houses would have had entrances in the south or southeast; however, this house had an entrance at the northeast, allowing it direct access to the stream and the area in which the inhabitants were working. A hearth was located not inside the house, but outside this entrance. A radiocarbon date obtained from an external stakehole dated to 3499–3349 BC (UBA-12836). Glassdrummond (Site 7) contained an isolated pit dated to 3649–3522 BC (UBA-14229). At Carnagat (Site 17) eight pits that might constitute the remains of a small temporary campsite were recorded. One of these pits dated to 3513–3354 BC (UBA-13469).

Derrybeg (Site 12) was located on gentle sloping ground, and overlooked the Bessbrook River, running 250m to the north. On a clear day the site would have been visible from as much as 20km away with the Mourne Mountains, Cooley Mountains and Carlingford Lough inter-visible with the site. Such prominence is in keeping with its significance throughout the prehistoric period, as the location was also used for ritual purposes in the Middle Bronze Age (see next section).

The Neolithic activity began with the construction of two barrows. Barrows consist of oval- or circular-shaped ring-ditches. The upcast from the construction of these ditches is used to form associated banks. Some examples have no discernible entrances, while others have one or more. The examples excavated at Derrybeg (Site 12) were located 70m apart, with Barrow 2 positioned south and slightly east of Barrow 1. Both were oval shaped and had openings which faced east-southeast, potentially to align with the sunrise at winter solstice.



Plans of Ring Barrows 1 and 2 at Derrybeg (Site 12), Scale is 5m.

Ring Barrow 2 at Derrybeg (Site 12) © Tony Corey, DOE:HED

Ring Barrow 1 had internal dimensions of c.13.5m east–west and c.15m north–south with external dimensions of c.18.5m east–west and c.19.5m north–south. Its ditch was between 1m and 3m wide and up to 0.9m deep. During excavation it was noted that the majority of the material which had backfilled the ditch had come from the inside of the barrow, this indicates that the barrow had an internal bank. A residual Mesolithic date (5618–5486 BC; UBA-14862) came from the basal fill of the ditch; however, sherds of at least three Early Neolithic carinated bowls (dating to the period 3900–3600 BC) were also recovered from this fill, more accurately dating the ring barrow to this period.

Ring Barrow 2 had internal dimensions of c.17.5m east–west and c.20m north–south with external dimensions of c.20.5m east–west and c.22m north–south. Its ditch was between 1m and 1.5m wide and had a maximum depth of 0.57m. Barrow 2 was located on an area of raised bedrock, which resulted in a shallower ditch. As with Barrow 1, this barrow also had an internal bank. The bottom fill of the ditch dated to the 3959–3761 BC (UBA-14855), material slumped from the internal bank was dated to 3514–3102 BC (UBA-14854) while a pit dug into the slump dated to 3521–3348 BC (UBA-14853). Two postholes and two pits formed a square feature which was located to the rear of the barrow, directly in line with the entrance. The function of this feature was unclear.

A total of 132 sherds of Middle Neolithic impressed ware pottery was recovered from the ditch fills of Barrow 1, and 151 sherds from Barrow 2. They were found in a number of different deposits within the fill of the ditch and as such may indicate a prolonged period of use. Impressed ware pottery is generally represented by deep hemispherical bowls with a broad flat, or gently curved rim and a short, frequently constricted, neck.[64, 65] The rim top often has a short, pronounced outward projection and a wider inward projection. Decoration is common on the rim top but less so on the remainder of the pot, with twisted and whipped cord impressions on those examples found at Derrybeg (Site 12). While they have generally been found on domestic sites there are also well-dated examples from funerary contexts such as the Linkardstown tombs and other court and portal tombs.[66] The emergence of this decorated tradition occurs around 3600 BC, with the pottery found at Derrybeg likely to be from the period 3600 BC to 3400 BC. A small number of worked pieces of flint were recovered from both barrows; unfortunately, these were not chronologically diagnostic.

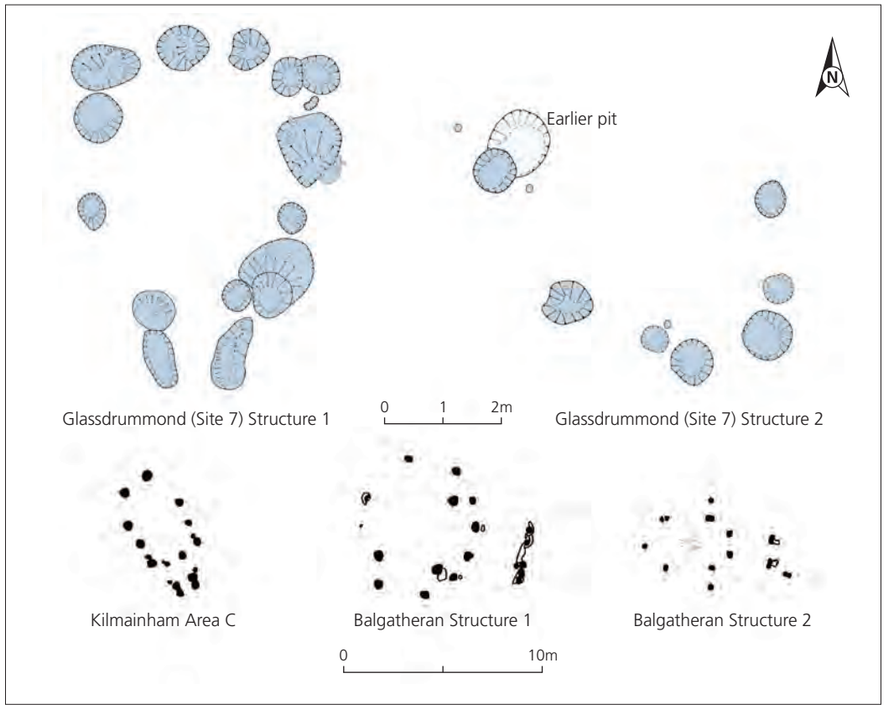
There is a growing body of evidence to suggest that simple barrows with only a single or a small number of entrances began to be constructed 3600 BC, and stopped being constructed around 2900 BC.[67] When the pottery is taken into account it is likely that both Derrybeg (Site 12) barrows were constructed and in use closer to the start of this period, most likely between 3600 BC and 3400 BC. The final silting layer within Barrow 1 was dated to 2583–2432 BC (UBA-14861), the Late Neolithic / Early Bronze Age period. No date was returned from Barrow 2; however, it can be assumed that the same natural processes occurred and as such its ditch would have been mostly filled by the same time.

Late Neolithic settlement - focus on Glassdrummond (Site 7)

Glassdrummond (Site 7) was located on a shallow plateau, on a ridge overlooking the Clanrye River, which runs through modern day Newry to the east. It had open views for several kilometers in all directions. Two house structures were found at this location.

Structure 1 was substantially built and constructed from posts. It was oval in plan with an opening to the south, defined by a porch. The interior measured c.5m by c.3m, and the porch extended for c.1.5m, with a doorway 0.75m wide. It was probably built with wattle walls between the supporting posts of the house. A posthole in the southeast of the structure was dated to 2851–2566 BC (UBA-14224). Its shape was almost identical to a house excavated at Kilmainham, Co. Meath, which dated to 2580–2460 BC, and also to two of the Late Neolithic houses excavated at Balgatheran, Co. Louth.[68] Twelve flint scrapers, eight blades, 74 flakes, and a retouched flake, as well as a hammer stone, 14 flint cores, and a small quantity of debitage (the worked stone nucleus from which tools are made and the waste flakes produced from this process) were recovered from Glasdrummond (Site 7). These latter artefacts indicate that flint knapping taking place within the house. This knapping was of a small, domestic scale. A few broken sherds of pottery were also recovered; these have not been identified to any period. Twenty meters to the east of the house there was a cluster of four irregular pits which may have been contemporary with the house. Two of the pits provided radiocarbon dates of 2873–2620 BC (UBA-14212) and 2680–2486 BC (UBA-14213); while the spread that covered them was dated to 2854–2571 BC (UBA-14217).

Structure 1 at Glassdrummond (Site 7), ranging rods are 1m long © ADS



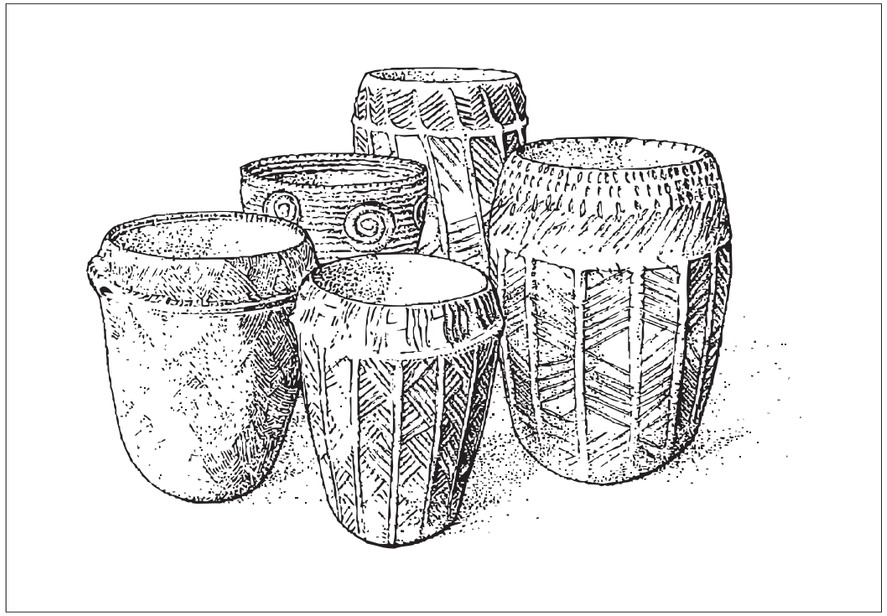
Plan of Glassdrumond (Site 7) and its similarities to the sites excavated at Kilmainham and Balgatheran © Smyth [69]

Structure 2, while heavily truncated to the north, would appear to have been of a similar construction and shape to Structure 1, with an entrance in the southeast. The postholes in north side of the house in this area did not survive, however, as the interior measured c.3m wide it is likely that, as with Structure 1, this structure would also have had an internal length of c.5m. There was no distinct porch within this structure with the entrance defined by a matching pair of large and small postholes, the doorway was 0.6m wide. Two of the postholes at the entrance to the structure dated to 2864–2578 BC (UBA-14226) and 2880–2633 BC (UBA-14227). A pit at the northwest side of the house was also radiocarbon dated (3332–2928 BC; UBA-14228); however, this pit was cut by one of the postholes of the house and as such is not contemporary to its construction. One flint core, one blade and five flakes, as well as a small number of broken sherds of pottery, were recovered. Several pits of varying sizes were located 5m to the east of Structure 2. Two of these were radiocarbon dated to 2570–2468 BC (Pit 1; UBA-14230) and 2866–2572 BC (Pit 2; UBA-14232). The latter of these two features was 2.5m long, 1.3m wide and 0.35m deep with a rounded northern terminal. This pit had evidence for *in situ* burning, and prehistoric pottery sherds were found within it. An isolated pit some 40m southeast of the house had a broadly contemporary radiocarbon date of 2578–2467 BC (UBA-14231).

Other Late Neolithic evidence

The remaining evidence for later Neolithic settlement on the Road Scheme was less substantial. It consisted of scattered pits and postholes associated with habitation spreads, possibly representing the remains of structures which have otherwise decayed without trace in the surface of the ground.[70] This is consistent with much of the evidence for settlement at this time.

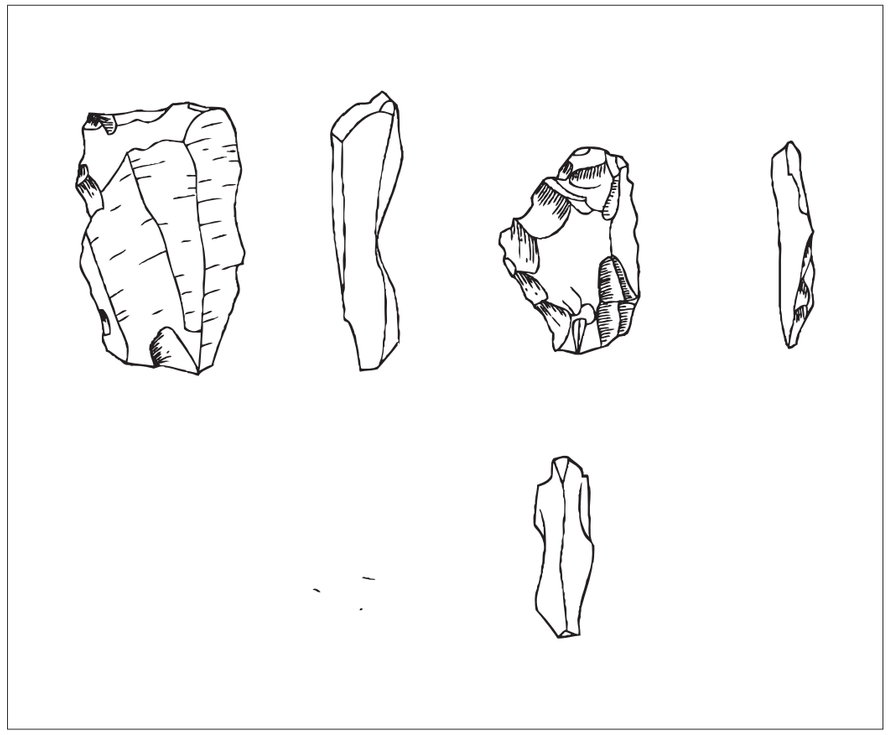
At Corcreeghy (Site 21), a small number of pits was excavated along with a single posthole and a hearth. A total of 132 sherds of pottery was recovered from the hearth; they were from a single large vessel of style known as Grooved Ware. These are flat-based vessels with straight or slightly curved sides and thin bases which have been found in a variety of sizes. They are well made with smooth walls and rounded or pinched rims. They are commonly decorated with horizontal grooved or incised lines which can appear on all, or only part, of the vessel. Occasionally they have handles in the form of small lugs. This type of pottery was used for food, as opposed to funerary purposes, and appears in the archaeological record during the Late Neolithic, around 3000 BC, and remained in use until the Early Bronze Age.[71,72] A pit in this area was dated to 3026 BC and 2906 BC (UBA-13504).



Reconstructions of a range of Late Neolithic Grooved Ware pottery similar to that found along the road scheme © Parker Pearson[73]

Derrybeg (Site 11) had an isolated pit dated to 2680–2487 BC (UBA-12848). At Derrybeg (Site 13) there was a small number of pits, postholes and stakeholes, some of which contained burnt animal bone and, as with Corcreeghy (Site 21), Grooved Ware pottery. Five radiocarbon dates from the pits in this area gave a range of dates between 2880 BC and 2476 BC (UBA-14868; UBA-14869; UBA-14871; UBA-14872; UBA-14875). At Carnbane (Site 9) a slightly curving ditch, which ran partially around a drumlin, was dated to 2899–2693 BC (UBA-14837).

Evidence for Late Neolithic burial practices was limited to two cremation deposits found in a large pit at Quilly. The pit was partially encircled on the south side by four postholes, the north side of the pit unfortunately lay outside the Road Scheme. Cremation Deposits 1 and 2 returned similar Late Neolithic dates of 2852–2491 BC (Deposit 1; UBA-12646) and 2878–2632 BC (Deposit 2; UBA-12647). The cremations were identified as being human, one of the individuals being an infant. Pottery recovered from the cremation deposits was from at least three flat-based, vertical-sided vessels, one of which was 30cm in diameter. The number of vessels identified suggests that more than two individuals were interred in this pit. Cremation Deposit 1 was the first burial as it had been disturbed by the insertion of Cremation Deposit 2.



Illustrations of crudely retouched Late Neolithic flint tools from Corcreeghy (Site 21). Illustration by Johnny Ryan © ADS

A potential gaming piece

Approximately 50m south of the Early Neolithic settlement in Ballintaggart, were four small pits which were dated to the Early Neolithic by the presence of carinated pottery sherds within their fills. One of these pits also contained a small, almost circular, slate disk. The disk measured 25mm long, 23.5mm wide and 6.5mm thick; it was roughly shaped, ground down, and smoothed on its face and edges. The slate used was from a local source, so it is likely that it was crafted on the site. Parallels, or similar rough-outs, are known from other Neolithic sites such as Ballygalley,[74] and from Donegore Hill, also in Antrim. Those pieces were, however, larger, and less well finished than this artefact. The only directly comparable example of such a piece in Ireland is a small sandstone disc found in a court cairn in Ballynamona, Co. Waterford.[75] In Britain, however, several other examples have been found. These include five small slate plaques from the Neolithic house site at Ronaldsway, Malew,[76] two circular slate discs from the Pant y Saer passage grave in Anglesey,[77] and a single stone disc from the chambered cairn at Quoyness, Sanday.[78] Outside of the British Isles, similar disks were recovered from two megalithic tombs in Brittany, Champ Grosset and Keriaval, and from the domestic site, Castro of Pavia in Portugal,[79] and these provide evidence for European-wide creation of these unusual little objects.

While these artefacts may have been tools used in a specific industrial or domestic activity, their rarity within the archaeological record and their presence within burial sites suggests that they may have been used for a more esoteric purpose. It has also been suggested that these disks and decorated stone balls, which are principally found in sites across the east coast of Scotland and less commonly throughout the remainder of the British Isles, may have been gaming pieces.[80]

Potential gaming piece from Ballintaggart

Opposite: The ceremonial burials at Ballintaggart, Water Hill Fort visible on the hill behind. Reconstruction by Philip Armstrong.

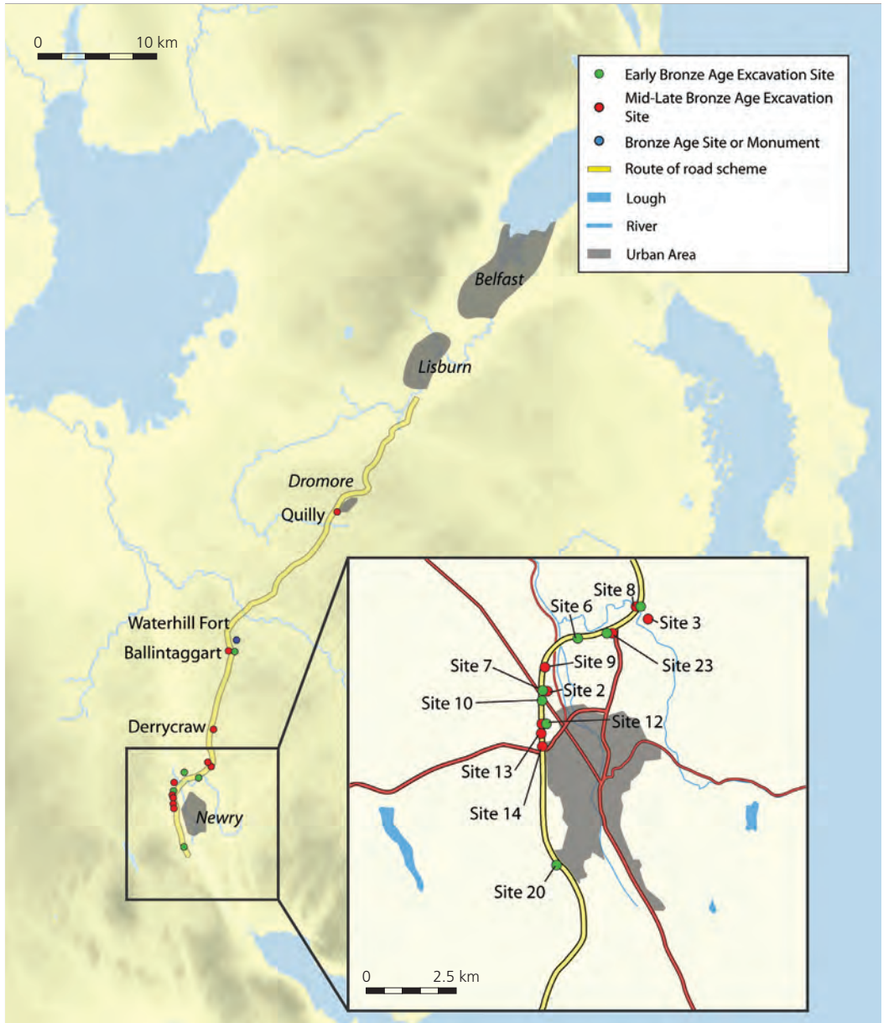
The Bronze Age

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 society became 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 by a variety of undecorated vases or barrel-shaped flat-bottomed undecorated pottery in the Late Bronze Age. 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.



Bronze Age sites on the A1 Road Scheme

Evidence for agriculture and hunting

No animal bone was recovered from any of the sites on the Road Scheme and therefore, there is no evidence to indicate the nature of livestock farming. A barbed and tanged arrowhead from Ballintaggart indicates that hunting was taking place.

Barbed and tanged arrowhead from Ballintaggart

There was substantial evidence for the arable economy. Hulled barley was recovered from Quilly, Ballyvalley, Carnmeen (Site 6), and Carnbane (Site 9). Barley was one of the main cereals cultivated in prehistoric Ireland, as demonstrated at the sites of Cashlandoo, Co. Londonderry,[7] Lough Gur, Co. Limerick,[8] Tankardstown, Co. Limerick, and Curraghatoor, Co. Tipperary.[9] At Ballintaggart the dominant species was oats followed by very small amounts of bread wheat, naked barley, and hulled barley[10].
Wild oats have occasionally been found in archaeological samples from the Neolithic onwards. There is no evidence to suggest that domesticated oats were cultivated in Ireland before the early medieval period.[11]

In terms of foraged foods, hazelnuts were found at nearly all of the Bronze Age sites on the Scheme. Sloe berries were recovered at Quilly, Ballyvalley, and at Corcreeghy (Site 8); blackberry at Carnmeen (Site 3) and Corcreeghy (Site 8); and water-pepper seeds from Corcreeghy (Site 8). These foodstuffs were also identified in the Neolithic assemblages recovered and their presence shows the continued importance of locally gathered, readily available seasonal food.

The excavations at Carnbane (Site 9) provided the greatest evidence for agricultural practices with a large number of features spread out across the hillside. These included two areas associated with cereal processing and a number of post and stake alignments which may represent drying racks for harvested crops. There was no evidence for larger scale structures to indicate the presence of houses.

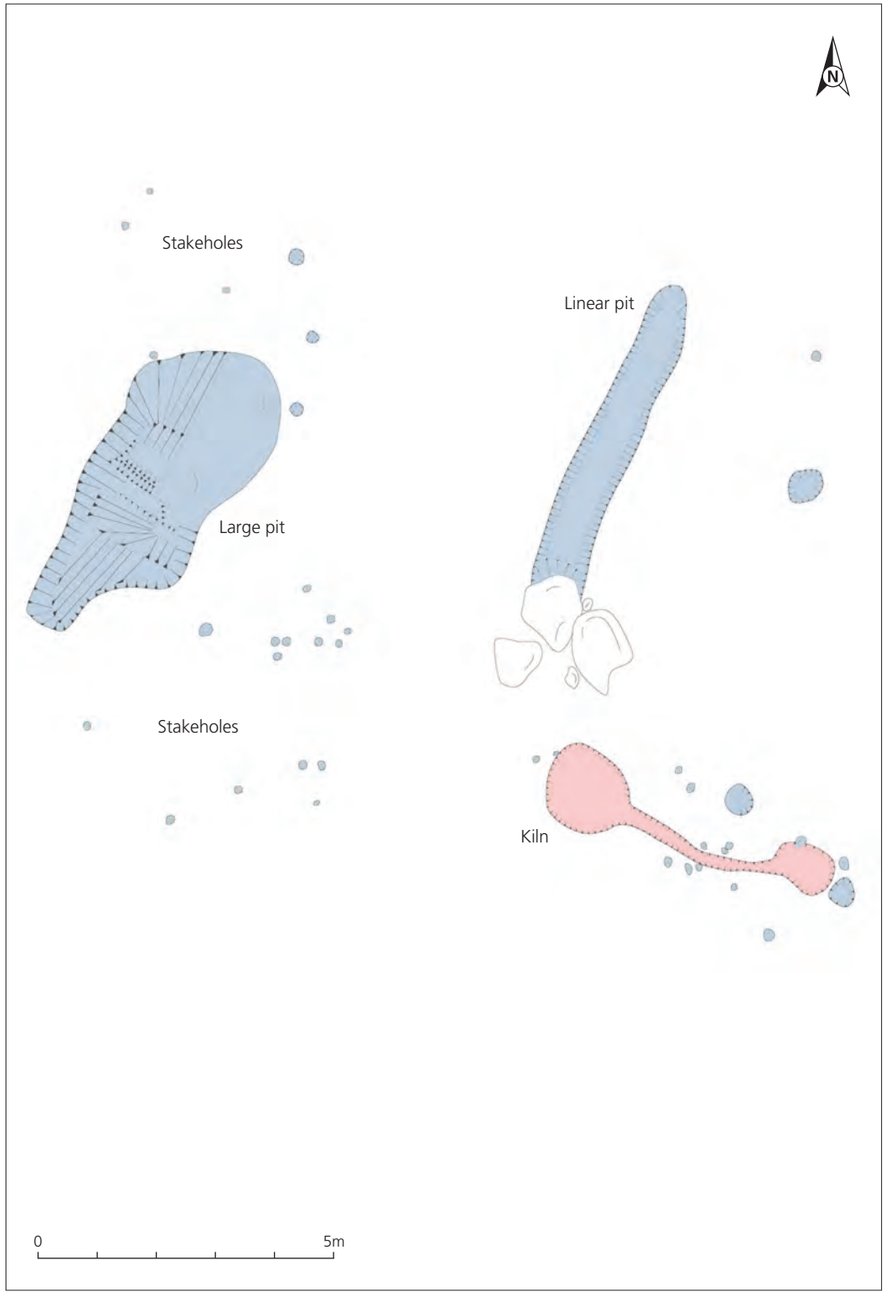
The first of the areas contained a substantial elongated dumbbell-shaped kiln, dating to 2034–1907 BC (UBA-14836). It comprised a large drying chamber and a flue with a fairly substantial firing bowl located at the end of the flue. The drying chamber of the kiln measured 1.3m in diameter, the flue 2.2m in length and 0.3m in width, and the firing bowl at the end of the flue measured 1m by 0.8m.

The level of the flue was higher near the drying chamber than the firing bowl, which would have helped to enhance the airflow through the flue. There was evidence for internal structures within the chamber with burnt branches and burnt sandy clay found which may have been a collapsed wattle and daub structure, possible shelving or drying racks of the cereal, or even a removable lid for the roof. The radiocarbon date was derived from alder associated with this layer. Experimental work[12] has demonstrated that a removable roof not only allowed the drying process to continue during light rain, but also allowed the grain to be turned with hand shovels during the drying process in order to facilitate even dryness and prevent moisture being reabsorbed.

Rows of stakeholes on either side of the flue and the drying chamber would suggest that the above-ground structure of the kiln may have been constructed, at least partially, of wood. It is likely that such a wooden construction, particularly in the case of the flue, would have been at least partially covered with turf and earth in order to prevent heat from escaping before it reached the drying chambers.

In addition, stakeholes in the vicinity of the firing bowl can be best interpreted as evidence for possible screens or a windbreak. Such screens were often necessary and directed the wind in a more favourable direction towards the flue, thereby ensuring sufficient flow of hot air through to the drying chamber.[13] Clusters of stake and postholes were observed to the west and northwest of the kiln, and appear to have been from small structures, perhaps for temporary storage of grain waiting to be dried. The functions of the large pit to the west and the linear pit to the north were unclear. A short curving gully and two pits were located 25m to the south of the kiln. One of the pits was 0.92m deep and had a posthole in its base. The precise function of these features is unclear. One of the pits was dated to 2199–2032 BC (UBA-14833).

A further 100m south of the kiln, a hearth was excavated which had evidence for *in situ* burning and which contained more than 13,000 naked barley seeds. These seeds were cleaned, and had been separated from weeds and chaff. Some small weed seeds, including grass and water pepper, were present in low quantities, a sign that the majority of the weed seeds had been removed during crop processing.[14, 15, 16] This concentration of cereal grains was most likely an accumulation from either a cooking or grain-drying accident. The stakeholes and postholes found around the hearth indicate that a small structure was partially constructed over it. With the large numbers of cereal grains being present this structure is most likely to have been a cereal-drying platform, although it may also have represented a rack for smoking and drying meat and fish. None of the grains were dated; however, the primary fill of the hearth was dated to 1746–1625 BC (UBA-14829), a posthole beside the hearth was dated to 1747–1607 BC (UBA-14831), and one of the stakeholes returned a date of 2289–2134 BC (UBA-14830). The majority of the features in this area were therefore in use in the Middle Bronze Age.



Plan of Carnbane (Site 9) Cereal-drying area

Beaker pot from Co. Antrim. This fine vessel is 60cm high and one of the largest intact beaker vessels recovered in Ireland. It is on display in the Ulster Museum, Belfast. (BELUMa26453) © NMNI Collection Ulster museum

Early Bronze Age settlement

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 4500 years ago. 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.[17] Beaker pottery was recovered from Ballintaggart, Carnmeen (Site 6), and Glasdrummond (Site 7).

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).[18] 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.[19] 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.[20] They have been found in both domestic and funerary contexts and in a wide range of styles and shapes. A simple miniature vessel, 4cm in diameter and 2cm tall, was recovered from the topsoil at Ballintaggart. It was constructed from a pinched ball of clay and was of such simple construction that it may have been created by a child.

Flat Axe recovered at Creeve, Co. Down (BELUM.A200.1937) © NMNI Collection Ulster museum

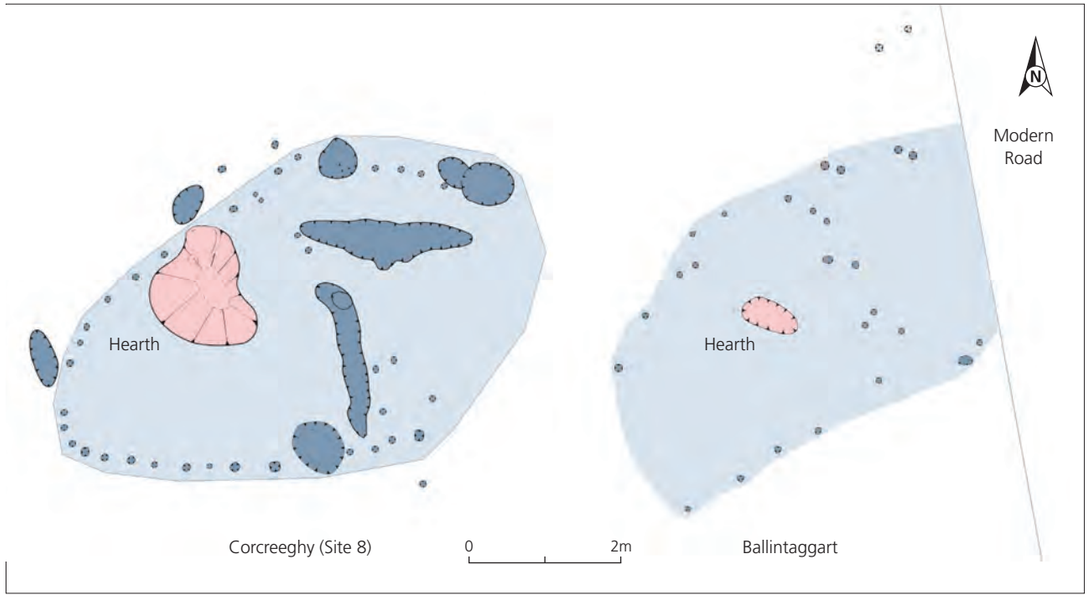
Early Bronze Age occupation - focus on Ballintaggart and Corcreeghy (Site 8)

Two Early Bronze age houses were identified on the Scheme: one at Ballintaggart, and the other at Corcreeghy (Site 8). At Ballintaggart only the western side of the house survived; the eastern edge was destroyed by a modern road. The surviving portion contained paired stakeholes which defined a 3m wide structure. An annex, defined by two lines of stakeholes, adjoined the west side of the structure. An entrance gap between the house and the annex was defined by a pair of larger stakeholes; there was also a gap in the western end of the annex. The rectangular annex was 4m long and 2m wide at its narrowest point, and it contained the remains of a hearth. A further line of stakeholes was located to the north of the annex, and probably constituted a fence associated with the house.

A thin layer of debris from the occupation of the house had been deposited. This layer contained 19 roughly worked flint artefacts (undiagnostic) and 47 sherds of Food Vessel type pottery. Food Vessels have also been recorded in occupation contexts at Lough Gur, Co. Limerick,[21] where they were associated with a rectangular house which measured 8.2m x 6.4m, and at Coney Island, Co. Antrim,[22] where there were two small rectangular houses measuring 6.1m x 2.71m and 3.35m x 2.75m.

The house at Corcreeghy (Site 8) was defined by 39 stakeholes and eight pits. The structure was 6m long and 3m wide, with an entrance on its east side where there was a 2m wide gap. A hearth lay within the centre of the house; it is unknown if it is contemporary. A stakehole from the house was dated to 2308–2194 BC (UBA-14237), a date which corresponds with the Late Neolithic/Early Bronze Age characteristics of the flint assemblage recovered from the features in this area. A pit which had been excavated through the stakeholes in the south of the house returned a date of 1390–1208 BC (UBA-14238). This indicates that some of the pits were not contemporary with the house.

Bronze Age roundhouses were constructed in various forms and styles. In the Early Bronze Age, houses are generally defined by stake or small postholes, such as the examples at Ballintaggart and Corcreeghy (Site 8). Early Bronze Age houses are generally smaller than their later counterparts. As well as the houses that were uncovered during excavations on the A1 Road Scheme other examples are recorded from around Ireland. At Clonfinlough, Co. Offaly,[23] a number of Bronze Age huts were excavated. One of these, Hut 3, measured c.5m in diameter and was constructed using small posts to form the outer wall. A similar, small hut was uncovered in Benedin townland, Co. Tipperary,[24] where a hut measuring 3.80m in diameter was excavated. The remains of a relatively well-preserved roundhouse were excavated in 1956 on the shores of Cullyhanna Lough, County Armagh.[25, 26] Following a drainage scheme along the Cullyhanna River a ring of timbers was exposed. These timbers were found to form a hut c.6m in diameter and dated by dendrochronology to the Early



Early Bronze Age houses at Corcreeghy (Site 8) and Ballintaggart

Bronze Age. Although the houses were much larger than that at Ballintaggart, the use of double stakes or posts to form the outer walls was recorded at the Bronze Age sites of Clonfinlough, Co. Offaly, Platform 1,[27] and Skilganaban, Co. Antrim, Structure 1.[28]

Other Early Bronze Age occupation

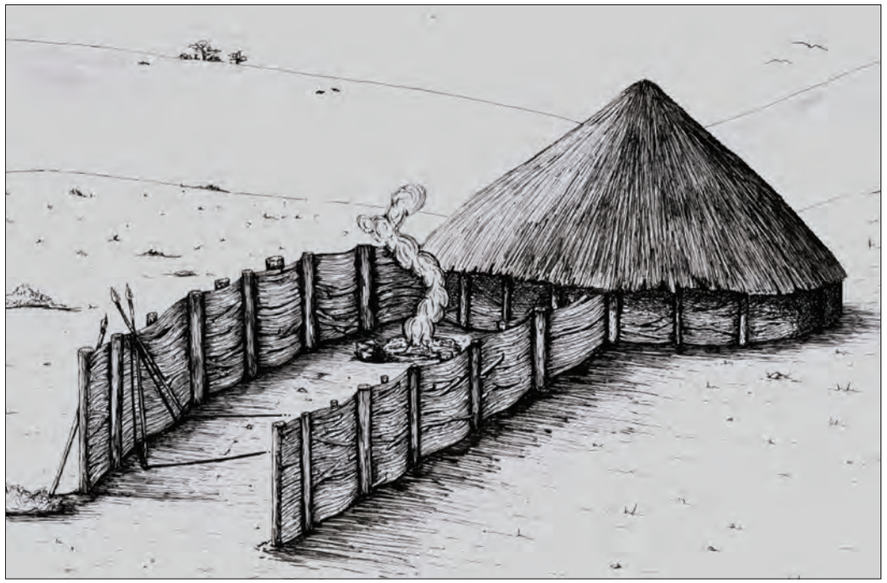
Several other sites on the Road Scheme contained evidence for domestic occupation; however, no specific structural elements could be defined. Carnmeen (Site 6) contained 36 pits and 35 stake and postholes. These were spread out over a large area and could not be resolved into any particular structures. The majority of the pits dated to 2471–2142 BC (UBA-12846; UBA-12847; UBA-12844) with only one being later, 1514–1417 BC (UBA-12845). A small quantity of Beaker pottery was recovered; this was consistent with the majority of the radiocarbon dates and suggests that the main phase of activity was in the Early Bronze Age.

Beaker pottery was recovered from two pits in a cluster of three at the northwest of Glasdrummond (Site 7). A radiocarbon date of 1296–1111 BC (UBA-14211) was obtained from one of these pits. Either the pottery was residual, or the pits were disturbed at a later date. Eleven of the sherds of pottery had comb-impressed decoration, typical of the Beaker period. This site also contained two Early Bronze Age ring barrows (UBA-14209; UBA-14220) which are discussed in detail below.

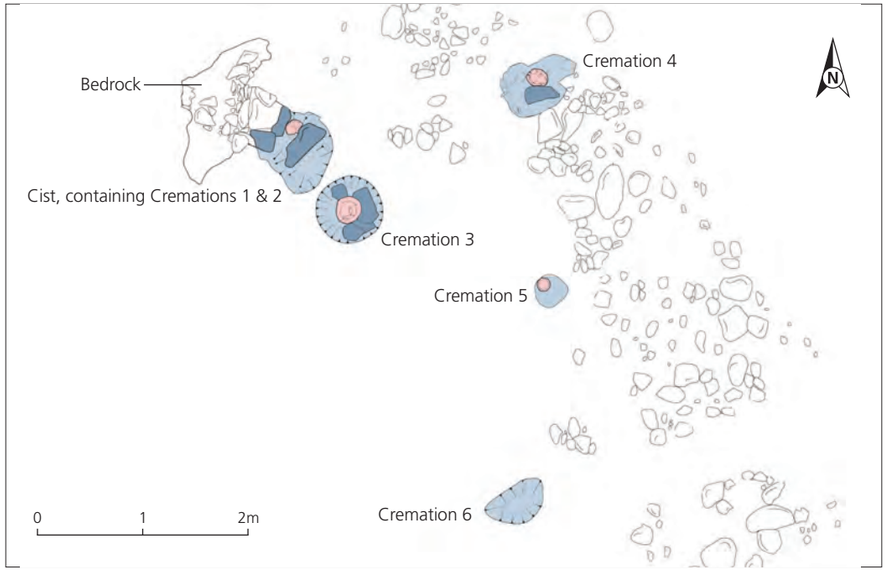
Glassdrummond (Site 10) was a multi-period occupation site with material dating from the Neolithic through to the post-medieval period. Four Bronze Age dates were obtained from pits in this area: two of these were Early Bronze Age (2127–2090 BC, UBA-14838; 2133–1941 BC, UBA-14841) and two were later Bronze Age (1388–1192 BC, UBA-14845; 1910–1691 BC, UBA-14847). The evidence suggests that the site was occupied periodically throughout the Bronze Age.

At Lisdrumliska and Carrivemaclone (Site 20) four pits were found in the western part of this area. One of the pits dated to 2142–2014 BC (UBA-14877). The pits contained a large amount of charcoal and showed evidence for *in situ* burning, indicating that they may represent hearths. Hazelnut shell and a vetch seed were recovered from the fill of one of the pits. Vetch is a wild member of the pea family with seeds which can be harvested from the middle of the summer; the fresh shoots of the plant can also be eaten raw or steamed.[29] Thirty-four further pits were found in the north of this area; these did not appear to form a structure and represent general Early Bronze Age activity (2479–2335 BC, UBA-14879; 2473–2334 BC, UBA-14880). No artefacts were recovered from any of the features in this area.

A few sherds of Encrusted Urn (c.2000–1740 BC) were recovered at Derrybeg (Site 12) in a shallow depression over which a Middle Bronze Age house structure was constructed (see below).



Early Bronze Age house at Ballintaggart. Reconstruction by Stephanie Godden



Early Bronze Age cremation cemetery at Derrybeg (Site 12)

Early Bronze Age burial - focus on Derrybeg (Site 12)

Early Bronze Age burial evidence came from the two ring barrows at Glasdrummond (discussed below) and a small cremation cemetery at Derrybeg (Site 12).

The cremation cemetery at Derrybeg (Site 12) was located on a raised area of bedrock at the western side of the site. Unfortunately, no specialist analysis has yet been undertaken for the cremation deposits found at this site; however, the association with funerary pottery vessels strongly suggests that the remains are indeed human. Six cremations were identified, four of which were in shallow pits (Cremations 3–6). Cremation 1 was within a cist which had been partly formed from bedrock, and Cremation 2 was a small cremation deposit on the surface of the capping stone of the cist. Cremations 1 and 3–5 were within upturned funerary vessels. The quantity of cremated remains indicates that except for Cremation 2 (the token deposit), complete individuals were buried. Three radiocarbon dates obtained from Cremations 1, 3 and 4 do not overlap and suggest a sequence of burial beginning with Cremation 1, then 2 then 3 (see Table 1). The dating of the urn types broadly agree with this sequence with Cremation 1 within a decorated Vase Urn (2000–1740 BC), Cremation 3 within a decorated collared Urn (1850–1700 BC), and Cremation 4 within a decorated Cordoned Urn (1730–1500 BC). Cremation 5 was also contained within a Vase Urn; however, this was undecorated and may be indicative of it being later in their period of use, when decoration is noted as being sparse.[30, 31] Cremation 6 cannot be added to the burial sequence as no dating evidence was obtained from it.

Cremation 1 within decorated Vase Urn at Derrybeg (Site 12) © ADS

While the radiocarbon dates for Cremations 3 and 4 correspond to the known dates of their urns, the date for Cremation 1 pre-dates that expected for Vase Urns by at least 144 years. This disparity could be explained by a phenomenon known as old wood effect. Old wood affect 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 burned a great quantity of wood. Inevitably a lot of this wood derives from mature trees, often oak trees, therefore skewing the dates. Overall, the evidence suggests an Early Bronze Age cemetery, with several phases of use. This Early Bronze Age cemetery is one of only three excavated in County Armagh; the other two comprise very poorly recorded examples at Roxborough and Slieve Gullion.[32]

Cremation 3 within decorated Collared Urn at Derrybeg (Site 12) © ADS

Middle and Late Bronze Age settlement

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.[33] 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 metal work in contemporary 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 clay moulds.[34] These clay moulds allowed a greater delicacy of metalwork, thereby facilitating the manufacture of highly ornate bronze 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.[35] From the tenth 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.[36] 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.

Top: Middle Bronze Age rapier recovered at Commons, Newry, Co. Down (BELUM.A3.1970) © NMNI Collection Ulster museum

Bottom: Socket-looped spearhead from Hillsborough, Co. Down (BELUM.A16.1924) © NMNI Collection Ulster museum

While many of the Late Bronze Age houses hitherto found in Ireland were isolated, development-led excavations since the 2000s have identified increasing numbers of house clusters which contain two or more dwellings.[37] These clusters are often associated with external features such as animal enclosures, large pits and fences (as identified at Derrybeg (Site 12). There is also a number of sites where prolonged occupation over a period of time is noted, as at Lough Gur for example.[38] 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.

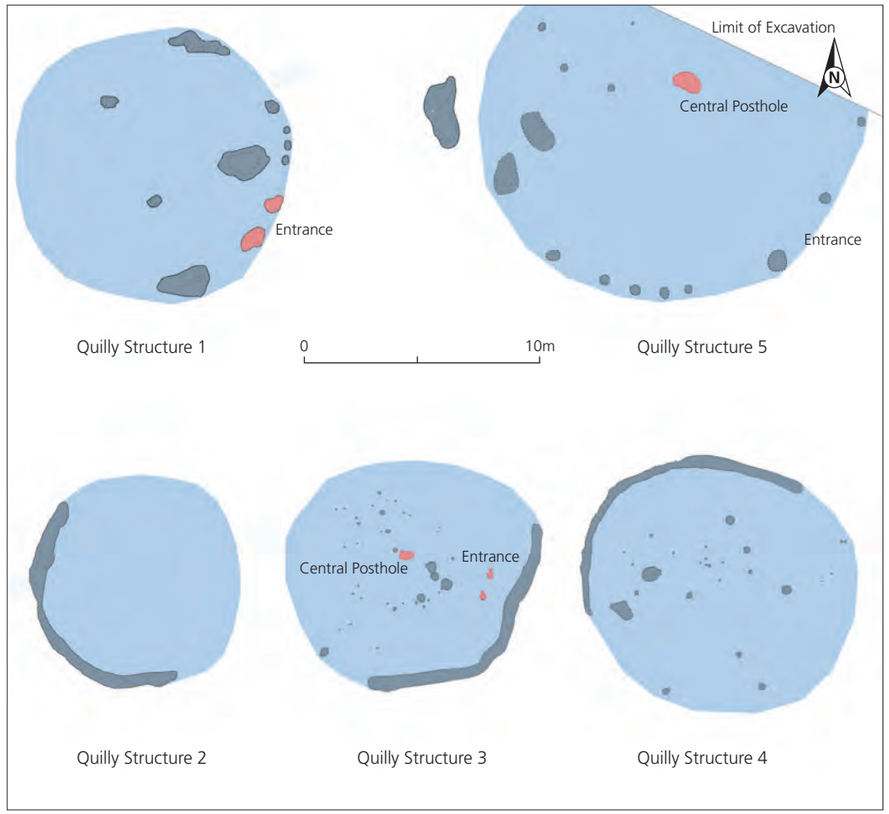
Ring barrows and urn burials show a degree of continuity in burial practices from the Early and Middle Bronze Ages; however, there is a marked decrease in their numbers towards the end of the 11th century BC.[39] This decrease corresponds with an increase in the deposition of hoards, and while only some 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 to have their roots in the latter part of the Bronze Age.

Middle and Late Bronze Age occupation - focus on Quilly and Derrybeg (Site 12)

Two areas provided substantive habitation evidence for the Middle and Late Bronze Age on the Road Scheme. These were at Quilly where five house structures dating between 1546 BC and 807 BC were excavated, and Derrybeg (Site 12) where four partially preserved circular stake-built structure dating between 1697 BC and 893 BC were recorded. Less substantive evidence for occupation in this period was also recorded at Carnmeen (Site 3) and Derrybeg (Sites 13 and 14).

Five structures were identified at Quilly. Four of these lay to the east of a series of ring barrows and cremations (discussed in detail in the proceeding section), while one was within the funerary area (Structure 1). Radiocarbon dating evidence would suggest that Structure 5 was constructed contemporaneously with, or potentially prior to, the ring barrows and cremations (1546–1425 BC; UBA-12645, 1517–1378 BC; UBA-12643). Structure 1 appears to have been constructed in the middle of the sequence (1401–1207 BC; UBA-12648), and the other three structures at the end of the funerary sequence (Structure 3: 1026–807 BC; UBA-12656; UBA-12654; UBA-12655; Structure 4: 1131–997 BC; UBA-12658; Structure 2 was not dated). However, with the overlap in dates this hypothesis cannot be categorically proven.

Quilly Structures 1–5



Structures 1 and 5 were of similar construction style, and contained the same type of pottery as the ring barrows and cremations. The remaining structures were of a different construction style and did not contain any artefacts. The radiocarbon dates indicated that they represented a later phase of occupation, potentially unrelated to any of the burials. Hazel was identified as the main structural timber used for all of the structures; it was often the favoured material for stakes, posts and wattling[40] as it is both flexible and easy to harvest.

Cremated fragments of human bone were recovered from the pits within Structure 5, and the central posthole of Structure 3. Deposition of human remains has been recognised in other dwellings of this period[41] and continued as a ritual tradition through the Iron Age. For example, at Knocksaggart, Co. Clare, three possible token cremations were identified in three separate postholes at the entrance to the structure.[42] At Charlesland, Co. Wicklow, pottery and cremated bone was recovered from several postholes, and it was suggested that these might have been placed as foundation deposits.[43]

Structure 5 was only partially excavated as the northern part of the structure lay outside of the area of the Road Scheme. It was 14m in diameter and was defined by nine postholes. At the southeast of the structure were two slightly larger postholes which contained packing stones. These probably held the door posts for the entrance into the structure. At the northwest of the structure there was a number of large pits which would have truncated any postholes in this area. Within the structure there were two smaller postholes and a stakehole which may have been part of an internal wall. A larger pit in the centre may have been a permanent roof support, or utilised as such during the construction of the roof.[44] This pit contained a partially cremated section of an adult burnt human long bone. Hulled barley grains, sloe seeds and hazelnut shells were recovered from the postholes and pits within the structure.

Structure 1 was truncated on the western side by later agricultural activity. It was 8.5m in diameter and was defined by seven postholes. As with Structure 5 there was an entrance defined by two large postholes at the southeast of the structure. A metalled surface found just inside the doorway would appear to have been a deliberately laid floor. The interior was damaged by a field boundary which may have removed some internal features; two of the postholes within the structure may have been roof supports. A burnt *in situ* hazel post was recovered from a posthole on the east side of the structure. This structure lay between several ring barrows and cremations (see below) and respected their positions; the other four structures were to the east of the funerary area.

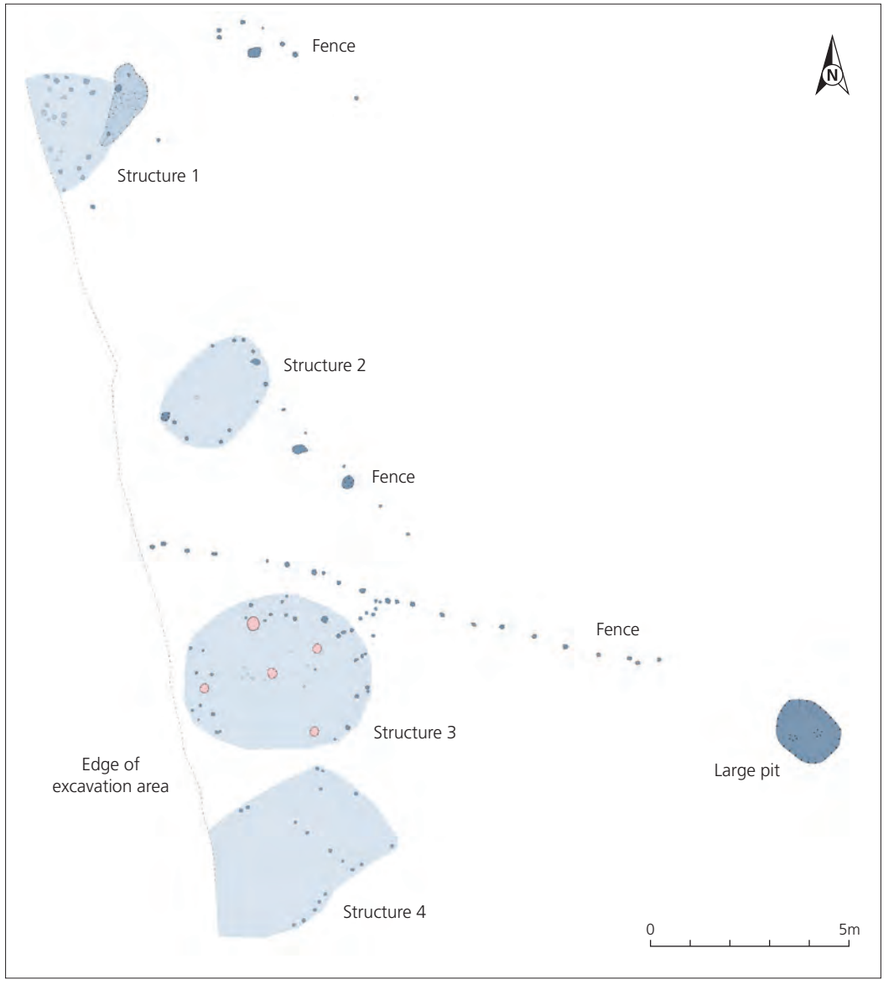
Structure 2 was badly disturbed by later agricultural activity and only survived as a semi-circular slot. The slot, if complete, would have been 8m in diameter. Unfortunately no suitable dating material was recovered from this structure.

Structure 3 was located immediately south of Structure 2. This structure was 10m long and 8m wide, and defined by a curving gully on its southeast side. A large number of postholes and stakeholes were associated. Two postholes in the east of the structure may have represented an entrance. These lay inside the slot, and as such would not have supported house walls. It is most probable that this was a drainage gully designed to divert water away from the house. A central posthole would have supported the roof; it contained cremated human bone from an adult, along with cereal and other plant remains.

Structure 4 was located on steep ground to the south of Structure 3. It was defined on the north and west by a crescent-shaped slot which enclosed an internal arrangement of pits, postholes and stakeholes. The slot would have enclosed an area c.12m in diameter but was truncated in the southeast and south by modern agricultural activity. The slot contained a layer of packing stones, which would have supported structural planks. The surviving internal features were defined as an arrangement of 11 postholes, 14 stakeholes and two pits. Two partially truncated but distinct parallel alignments of postholes, 3m apart, were identified in the interior. The stakeholes did not appear to form any

coherent pattern though it is possible that they may represent some type of internal divisions or partitions within the structure.

Structures 1 and 5 were consistent in form with Doodys (2000) 'Type 1' Bronze Age houses.[45] Structure 1 was similar in size, structure and date to the houses at Charlesland, Co Wicklow,[46] while Structure 5 was comparable in size, if not complexity of construction, with Structure 1B at Skilganaban, Co Antrim.[47] The other three structures cannot be so easily classified as, while all three have partial wall slots, or drip trenches indicating the presence of a roofed structure, the postholes and stakeholes within the area enclosed by the slot could not be resolved into specific wall or roof support elements.



Derrybeg (Site 12) stake-built structures (For clarity all modern features have been removed from this plan)

At Derrybeg (Site 12) four stake-built structures and a stake-built fence were recorded. Two further fences may have been connected to Structures 1 and 2; however, these were only partially surviving. Structure 1 was defined by 14 small postholes, was oval in shape and 2.3m wide at its widest point. The western section of Structure 1 lay outside the road-take. The entrance to Structure 1 may have been on its east side where there was a 1m wide gap in the postholes. A shallow pit lay between these postholes, this was possibly created by the occupants passing through the doorway. Several stake and postholes were located within the structure, the function of these was unclear as in such a small space internal divisions would seem to be unnecessary. Seven stakeholes and postholes immediately east of this structure may have been a short fence. Structure 1 was dated to 1013–893 BC (UBA-14850).

Structure 2 was extensively truncated by later agricultural activity but appeared to be defined by 12 stake and postholes, be oval in shape and to measure 2.5m wide at its widest point. Due to the truncation of the structure no entrance could be defined. A line of five evenly spaced stakeholes, 1m apart, ran southeast from this structure. These stakeholes were most likely to be part of a fence. Structure 2 was dated to 1697–1528 BC (UBA-14858). Sherds of Everted Rim ware (c.2000–1740 BC) were recovered from a pit overlain by the house, these may be contemporary to the house's construction or evidence of earlier activity in this area.

Structure 3 was the most complete of the houses, and was defined by c.30 stake and postholes. It was circular in shape and 3.8m wide at its widest point. Structure 3 had five internal postholes, one in the centre and the rest regularly spaced around its perimeter. These must have provided additional roof supports. There was a gap in the outer ring of stake and postholes to the northwest and south, unfortunately it was not clear which of these was the entrance. Structure 3 was radiocarbon dated to 1271–1028 BC (UBA-14859). A fence separated Structure 2 from Structure 3 and ran from the edge of the excavation area for 13m. A large pit, 1.7m long, 1.4m wide and 0.45m deep, may have been associated with Structure 3; its function was unclear.

The western edge of Structure 4 was located outside the road-take. However, the remains of the house were defined by 12 stakeholes. Structure 4 was sub-rectangular in shape and 2.9m wide at its widest point. Truncation in this area may have removed evidence for the position of the entrance, or the entrance lay to the west of the structure, outside of the road-take. Structure 4 was undated.

The radiocarbon dating evidence suggests that Structure 2 pre-dated Structures 1 and 3 by at least 100 years. The site appears to have been later occupied, with the construction of Structures 1 and 3 in the Middle–Late Bronze Age. Chronologically diagnostic artefacts were limited to the sherds of Everted Rim Ware. There was no evidence for rebuilding, and as the structures were slightly built, it is likely that they had a short lifespan, with a limited occupation period.

The majority of stake-built houses thus far identified in Ireland, including those excavated on this

scheme at Ballintaggart and Corcreeghy (Site 8), have been of Early Bronze Age date. There are, however, at least three broadly contemporary examples: Lough Gur, Co. Limerick[48] (c.850 BC), Little Ballymena, Co Antrim[49] (1120–910 BC), and Curraghatoor, Co. Tipperary[50] (1115–914 BC). The earliest phases at Lough Gur and Curraghatoor had multiple well-built post and wall slot buildings; however, both sites also had smaller stake-built structures constructed in their final occupation phases. At Lough Gur Phase 3, the stake-built structure was 1.8–2m diameter, while at Curraghatoor Hut 3 was 4m in diameter. The isolated hut from Little Ballymena was 2m in diameter. Doody suggests that stake-built structures could have taken the form of an upturned large wicker basket;[51] however, the presence of the internal posts within Structure 3 at Derrybeg (Site 12) suggests that this structure at least was more conventionally roofed on upright posts.

The final sites where settlement evidence was recorded were Carnmeen (Site 3) and Derrybeg (Sites 13 and 14). Sherds of a Middle to Late Bronze Age flat-based urn were recovered from the badly truncated remains of three irregular pits at Carnmeen (Site 3). The pits provided a radiocarbon date of 3635–3381 BC (UBA-14188), which pre-dates the pottery and must therefore relate to earlier activity in the area. Derrybeg (Site 13) had an isolated pit dated to 1196–1021 BC (UBA-14870). The pit contained burnt animal bone, hazelnut shell fragments, blackberry seeds, and three grains of hulled barley, perhaps food waste. Derrybeg (Site 14) had an isolated cluster of pits, one of which dated to the Bronze Age (1219–1052 BC; UBA-13463). The function of these pits was not clear.

Middle Bronze Age Burial - focus on Derrybeg (Site 12)

Middle Bronze Age burial evidence came from a timber circle with associated cremations at Derrybeg (Site 12), and isolated pits containing cremations at Carnmeen (Site 2) and Corcreeghy (Site 8).

At Derrybeg (Site 12) a Neolithic barrow (see Barrow 1 in previous chapter) was superseded by a circular, post-built structure. This comprised 23 posts, and had a diameter of just over 11m. The posts were very evenly spaced with two entrance gaps: one in the southeast (Entrance 1) and one in the southwest (Entrance 2). The southeast entrance gap was in the same position as the barrow entrance which suggests that the barrow was still a visible presence on the landscape when the structure was constructed. At the northeast interior of this ring there was a post and stake built rectangular structure 3m long and 2m wide, which contained a very large deposit of cremated bone in a pit. Five further cremations were found within the timber structure and two more outside. Three posts were located just inside and to the southwest of Entrance 1, one within the southwest quadrant of the circle and two outside of the barrow, to the northeast and north. A posthole with this structure was dated to 1464–1286 BC (UBA-14857).

Wooden structure overlying ring ditch at Derrybeg (Site 12) © Tony Corey, DOE:HED

This timber structure could be interpreted as a domestic house. However, several factors may suggest otherwise. Firstly, there are two distinct entrances where most prehistoric houses would only have one. Secondly, there was no evidence for the central support post which would have been needed in the construction phase of a roofed building of this size.[52] Thirdly, it would be expected that both pottery and flint would have been present with prolonged occupation; however, no pottery and only a few pieces of undiagnostic flint were recovered. Finally, the presence of the large number of pits containing cremated bone deposits also allude to a ritual function for the structure, as does the re-use of the barrow's location and entrance alignment (Entrance 1). Taking into account all these factors the structure would appear to have been a timber circle, rather than a house.

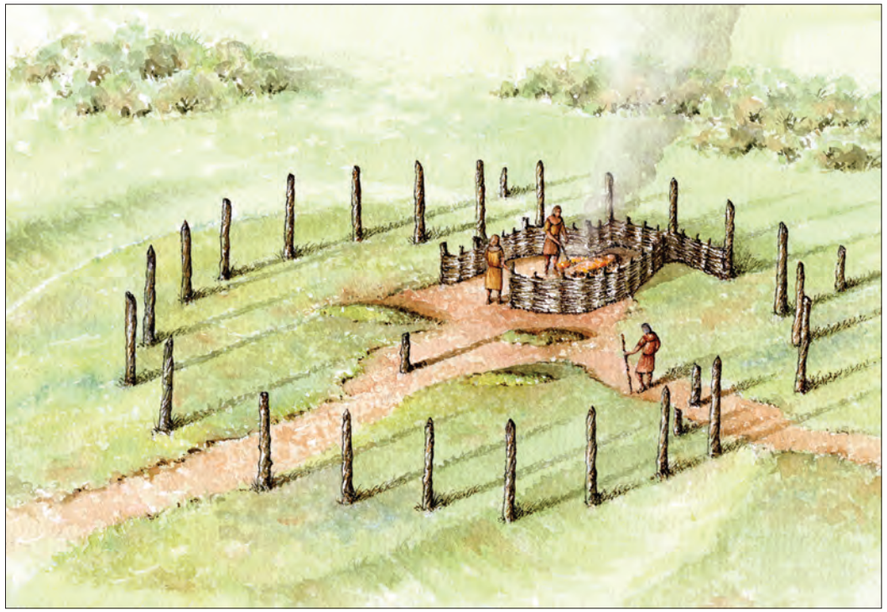
When interpreted as a timber circle the two entrance gaps in the ring then make sense, as they aligned with the winter solstice sunrise and sunset, respectively. The line of sight from these entrances and the centre of the circle also ran directly over two posts within the interior. The structure in the northeast of the circle was probably a mortuary house, potentially a demarcated place for the cremation of remains. The cremations found within and outside the timber circle marked several phases of ritual deposition.

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 in Co. Meath,[53] Woodhenge[54] and Durrington Walls in Wiltshire,[55] and Zwoll in the Netherlands[56]

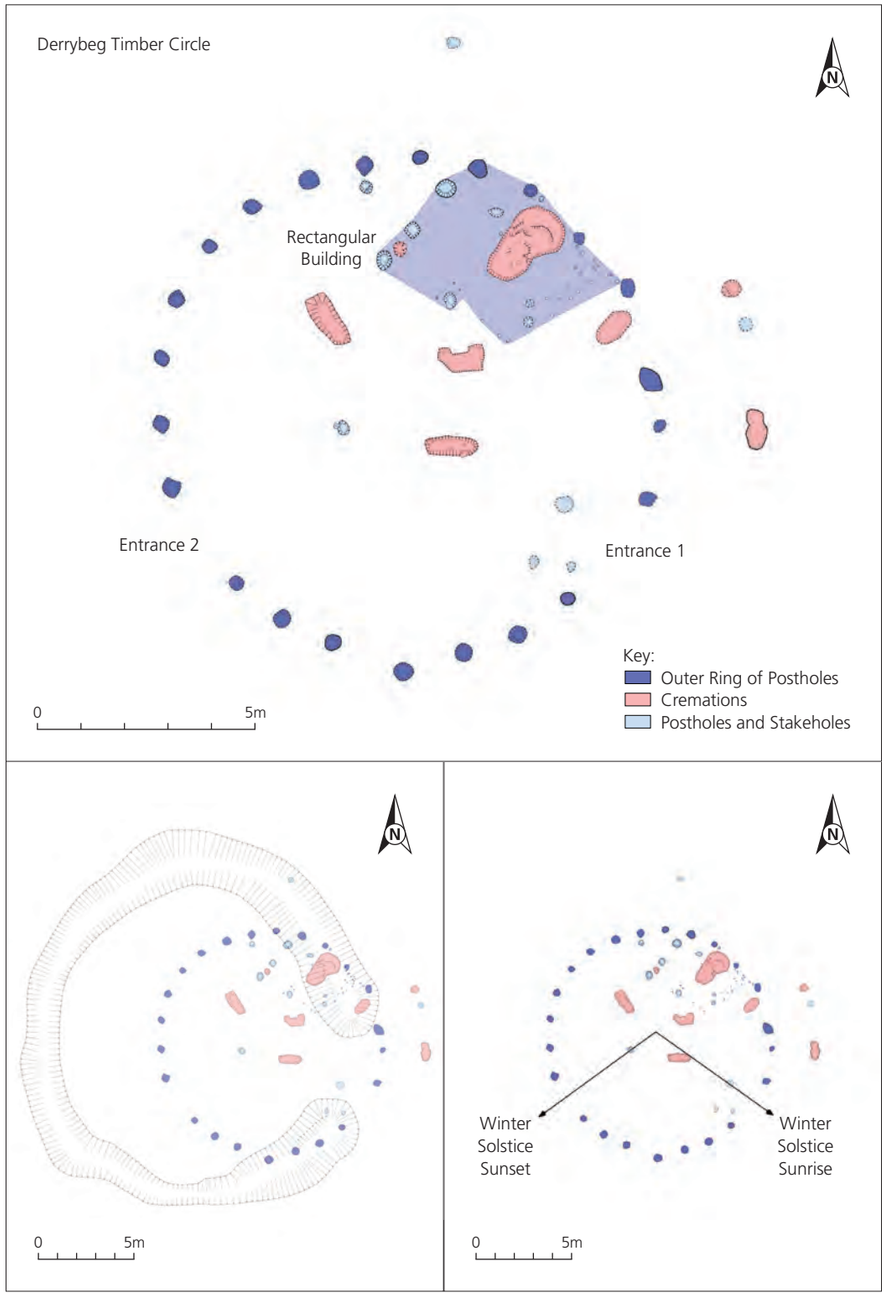
providing clear evidence for the significance of this astronomical event. Alignments associated with the sunset on the winter solstice, although less common, have been found on a number of sites, including the internationally significant sites of Stonehenge, also in Wiltshire,[57] and Goseck Circle in Germany.[58] It has been suggested that sunrise alignments are associated with 'new beginnings, life, light, fertility, feasting, water, and the earth,' while sunsets are linked to 'endings, death, darkness, quietness and the sky'.[59] Timber circles were constructed from around 3000 BC through to 900 BC[60] and as such, the radiocarbon date obtained for this timber circle of 1464–1286 BC (UBA-14857) places this site within the known date range for these features.

Other Middle to Late Bronze Age burial evidence

At Carnmeen (Site 2) a large pit c.4.2m long, 2m wide and 0.55m deep was excavated. It was almost completely filled with stones and contained some unidentifiable cremated bone and it is possible that this feature was the remains of a small cairn. The pit was dated to 1387–1195 BC (UBA-13500). Two circular pits were also associated with this stone feature. Corcreeghy (Site 8) contained a shallow isolated cremation pit. The bones found in this deposit were found to be the partial remains of one adult and one juvenile individual. The site was heavily truncated and it is likely that later agricultural activity had destroyed the remainder of this burial deposit. The cremation dated to 1236–1077 BC (UBA-14228).



The timber circle at Derrybeg (Site 12) at sunset on the winter solstice. Reconstruction by Philip Armstrong



Derrybeg (Site 12) timber circle showing site overlaid on Barrow 1 and Winter Solstice alignments

The ring barrow cemetery at Ballintaggart, Water Hill fort visible on the hill to the back. Ballintaggart was located on a ridge overlooking Loughbrickland to the north and Brown Bog to the south and east. The site contained eight ring barrows and a cremation surrounded by four posts. Some of the ring barrows were aligned on Water Hill Fort on Brickland Hill, 1km east of the excavation. This unexcavated site is probably a large barrow, some 25m to 30m in diameter, with a well-preserved ditch and outer bank. It is recorded in the NIEA Sites and Monuments Record as dating to the Bronze Age. Ballintaggart was a burial site for several hundreds of years with a potential period of use ranging from 1628 BC to 766 BC. Reconstruction by Philip Armstrong.

Ring barrows

Around 2500 BC we see the emergence of the round barrow as the major burial monument in the archaeological landscape of 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 the Bronze Age.[62, 63] Iron Age examples also occur but these tend to be much smaller (three Iron Age barrows identified on this Road Scheme 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 to a more individual 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, such as the central barrow at Carrowreagh, Co. Down and Brickland Barrow, Co. Down[65] (known locally as Water Hill Fort, located directly across from the excavation at Ballintaggart), but most were less than 30m. The majority of upstanding barrows have diameters of between 15m and 25m;[66] 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 were on the smaller scale, ranging from 0.8m to 9.2m internal diameter, with the majority having an internal diameter under 5m. Similar small ring barrows were excavated at Ballybeen, Co. Down,[67] and Castle Upton, Co. Antrim.[68]

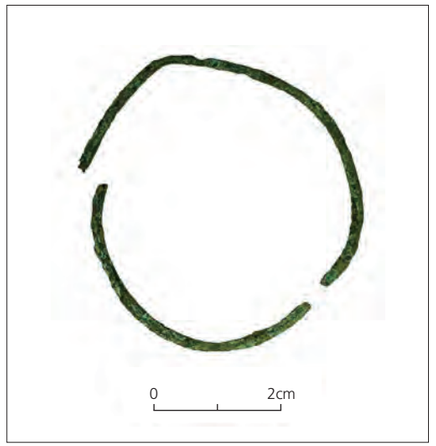
While they are considered to be burial monuments, not all are directly associated with human remains. Where human remains are present they are generally cremated, with inhumations in barrows a rarity. Cremations could be complete, or partial token deposits of bone, buried within a pit dug in the central mound or within its ditch. Urns were also used to hold the cremations prior to burial and these could be either placed upright, or upside down. Urns were generally located within the mound, rather than in the ditch. Urns could also be used for isolated burials with both practices in use at the same time, a feature particularly notable during the Road Scheme excavations at Quilly (see below).

Most of the cremated remains recovered on the Road Scheme did not appear to have been from complete individuals. Even allowing for later disturbance removing some of the material, it would appear that only token deposits were placed in the monuments with the remaining cremated bones deposited elsewhere. Some of the cremated bones, such as those from Cremation 15 at Quilly and Cremation 5 at Ballintaggart, had a weathered appearance which may suggest that the cremated bones had been exposed for some time prior to burial. The practice of depositing token burials within ring barrows has been noted at other sites, for instance, three token deposits of cremated bone were placed in the ditch at the northeast cardinal point of the ring barrow at Oran Beg, Co. Galway.[69]

None of the sites excavated on the Road Scheme displayed areas of extensive burning. This may mean that the remains had been cremated elsewhere and transported to the site,[70] but may also suggest that the heat produced by the fire was not sufficient to scorch the subsoil at the level in which the archaeological material survived. Hazelnut shells, cereal grains and other fruiting bodies were recovered from most of the ring barrows and cremations. These may have been the remains of offerings associated with the cremations or fuel and kindling for the pyres.[71]

Early Ring Barrows - focus on Glasdrummond (Site 7)

Glasdrummond (Site 7) contained three ring barrows, two of which dated to the Bronze Age, and one to the Iron Age (discussed in the proceeding chapter). Ring Barrow 1 survived as an intermittent ring of shallow ditches, up to 0.5m wide and 0.15m deep; the ring barrow had an internal diameter of c.3.4m. Unidentified fragments of cremated bone were recovered from within the ditch. The ditch was dated to 2469–2298 BC (UBA-14209). A broken penannular wire bracelet was found in a patch of soil next to Ring Barrow 1. The break in the bracelet displays the typical signs of a stress fracture which normally occurs in an area opposite the opening, and is caused by repeated bending, perhaps when putting on or taking off the bracelet.[72] Bronze Age bracelets usually have much more substantial hoops, rather than consisting only of thin plain wires. Bracelets like this one occur more frequently in the Late Bronze Age and Iron Age,[73] and in absence of further dating evidence it cannot be confirmed that this piece of jewellery is directly related to the ring barrow, and it may be of a later date.



Broken penannular bracelet from Glasdrummond (Site 7)

Ring Barrow 2 was located 130m south of Ring Barrow 1. It was pennanular (an almost complete ring) with a 1m-wide opening in its northwest side. The internal diameter of the ring barrow was c.3.4m, and the ditch was 0.4m wide and up to 0.16m deep. A pit in the centre of the barrow contained the cremated remains of an adult who was over 30 years old at the time of their death, and whose

spine displayed evidence for osteophytosis (a degenerative condition of the spine). An unusual and significant feature noted was the absence of any skull fragments among the remains. This suggests that the skull may have been buried or taken elsewhere. The basal fill of the ring barrow was dated to 1981–1746 BC (UBA-14220); the cremation was not dated. Five pits lay to the south and east of the ring barrow. The chronological relationship between these pits and the barrows is unknown; as one of the pits was dated to 1683–1531 BC (UBA-14222) they may be later.

Middle to Late Bronze Age barrows - focus on Ballintaggart, Derrycraw and Quilly

Three Middle to Late Bronze Age ring barrow cemeteries were excavated along the Road Scheme. These were at Ballintaggart, Derrycraw and Quilly; a further isolated ring barrow was recorded at Carnmeen (Site 3).

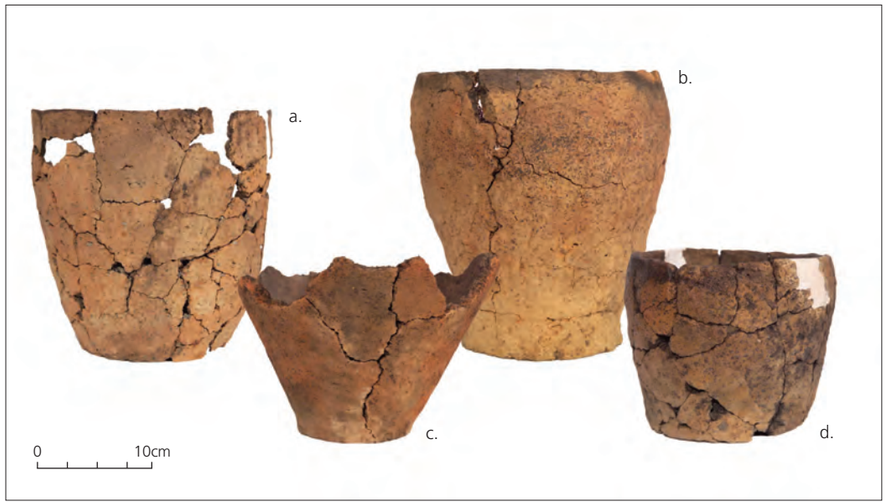
Excavations in progress at Ballintaggart barrow cemetery © Tony Corey, DOE:HED

Ballintaggart barrow cemetery

Ballintaggart was located on a ridge overlooking Loughbrickland to the north and Brown Bog to the south and east. The site contained eight ring barrows and a cremation surrounded by four posts. The barrow ditches ranged in internal diameter from less than 1m (Ring Barrow 3) to over 3m (Ring Barrows 2 and 6). The barrows were much smaller than the classic barrows of southern England,[74] but appeared to be similar in size to those found elsewhere in eastern Ulster.[75, 76] Prior to the archaeological investigations there was no surviving evidence of the barrows in the modern landscape as ploughing would have removed any upstanding remains. The ditches of Ring Barrows 1 and 5 were filled with material which had slipped from the inside of the ditch, indicating that these two barrows had an internal mound. The other barrow ditches did not provide conclusive evidence for either an internal or external mound.

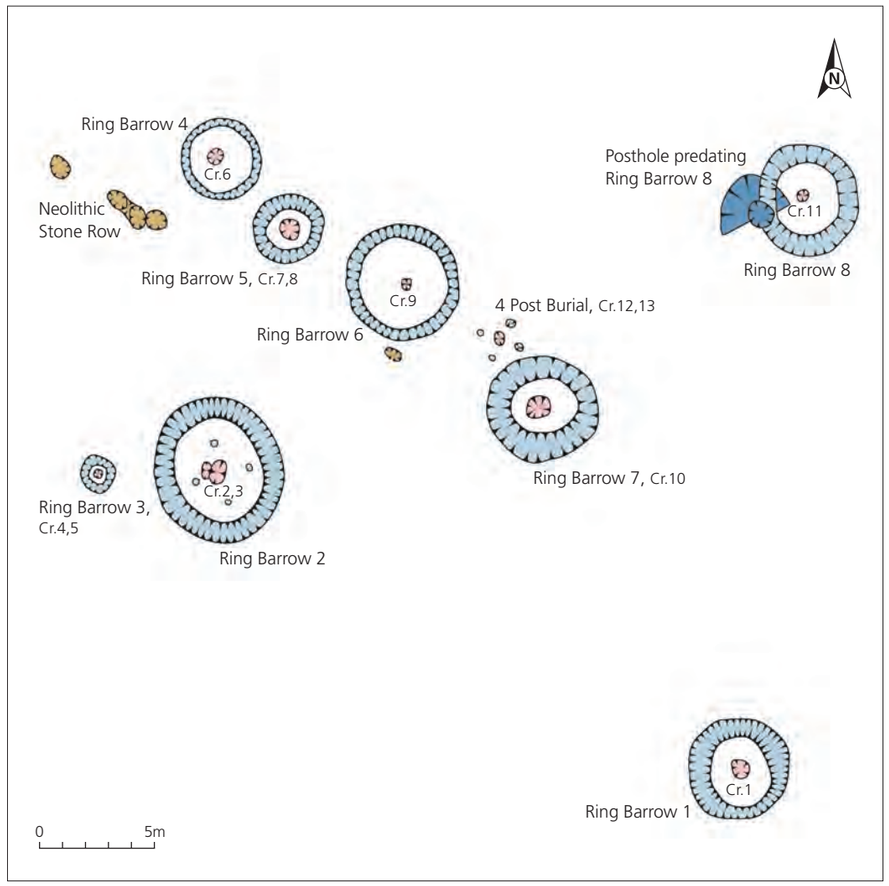
A four-post structure, Structure 1, lay between Ring Barrows 6 and 7, was respected by both, and was broadly contemporary with the row of barrows. Structure 1 contained a burial at its centre and it most likely represents the remains of a pyre structure upon which the dead were cremated prior to interment, a mortuary house, a cenotaph marking the burial, or an excarnation platform upon which the deceased were exposed to the elements prior to cremation or other disposal. A second four-post structure, Structure 2, lay 12m to the southwest, within Ring Barrow 2, indicating that it and the barrows were part of the same funerary process.

Ring Barrows 1, 4, 5, 6, and 7, and Structure 1 were aligned on a southeast to northwest axis. This alignment may have been associated with the lowest point in the nearby hillside to the southeast. The location of the remaining barrows may have been associated with Water Hill Fort on Brickland Hill,[77] 1km east of the excavation. This unexcavated site is probably a large barrow, some 25m to 30m in diameter, with a well-preserved ditch and outer bank. It is recorded in the NIEA Sites and Monuments Record as dating to the Bronze Age. This alignment respected the Neolithic stone row (discussed in the preceding chapter) suggesting that the stone row was in place during the construction of the barrows.



Pottery from Ring Barrows; a. Ring Barrow 4, b. Ring Barrow 7, c. Ring Barrow 8, d. Ring Barrow 1 © Tony Corey DOE:HED

Plan of the ring barrows at Ballintaggart



A large posthole was found beneath Ring Barrow 8. It was 1m in depth and was dug to hold a large upright timber which probably protruded 3–6m above the ground surface. This posthole had been intentionally backfilled before the ditch of Ring Barrow 8 was constructed and, as such, pre-dates it. A similar large posthole pre-dating a ring barrow was identified under Ring Barrow 2 at Derrycraw (see below). While there was no evidence for a burial in the posthole excavated at Ballintaggart, at Derrycraw the posthole contained a cremation within an urn. It is likely that the Ballintaggart posthole represents a grave marker.

All of the ring barrows had central cremations (see Tables 2 and 3). Ring Barrows 2, 3 and 5, and Structure 1 had evidence for two separate periods of cremation deposition. Ring Barrows 1, 4, 7, and 8 contained an individual funerary vessel. All the funerary ware was undecorated coarse ware,

Ballintaggart barrow cemetery looking north
© Tony Corey, DOE:HED

associated with the Middle to Late Bronze Age (1500–900 BC). Three different styles were represented: a Bucket-type Urn, a Vase and two Urns. Ring Barrows 2, 3, and 5 contained evidence of disturbance, which was consistent with the later insertion of a second burial. Several pathological conditions were uncovered. Degenerative joint disease was identified, in the form of osteophytes in vertebrae. There was also evidence of iron deficiency anaemia in the form of cribra orbitalia, a pathological lesion of the roof of the eye socket. This caused pitting, and porosity of the smooth bone in the orbit, and sometimes new thickened bone growth. It was particularly prevalent in children, and often is associated with dietary deficiencies.

Ballintaggart was a burial site for several hundreds of years with a potential period of use ranging from the earliest date obtained for Ring Barrow 3 of 1628–1384 BC and the latest for Ring Barrow 6 of 1018–766 BC. This gives a potential maximum period of use for these barrows from 1628 BC to 766 BC. This equates to some 35 to 40 generations (with a generation taken to be between 20 and 25 years). The cremations at Ballintaggart do not represent the whole population of the surrounding area for this period. It is likely that only certain select individuals were buried here, but with the mixture of old, young, male, and female it is hard to identify a pattern to the burial rites. Ring Barrow 3 may also pre-date the other barrows as the radiocarbon dates for this barrow do not overlap with the dates from the other barrows. This may indicate a break in continuity and, therefore, re-use of the location over time.

Derrycraw barrow cemetery

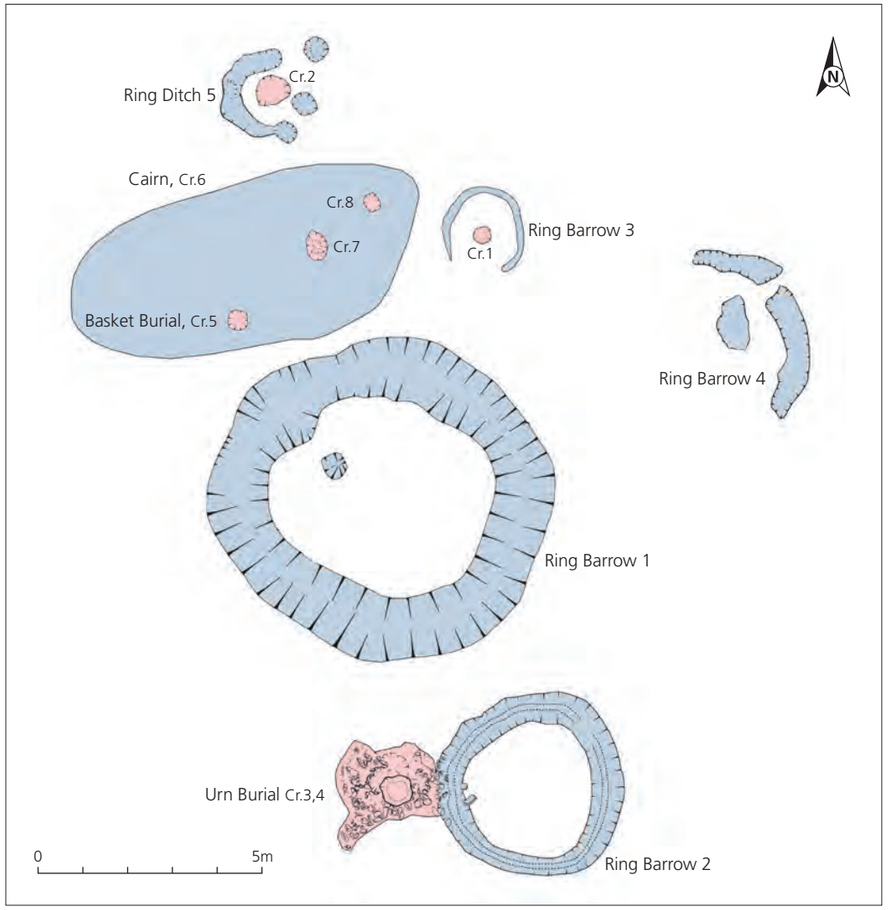
The site at Derrycraw was located on the eastern side of a drumlin near the base of a shallow north to south running valley. The hill on which the cemetery sat was surrounded to the west, east, and south by poorly drained land which may have been a lake or bog in the Bronze Age. The site contained five ring barrows, an urn burial in a large pit, and a cairn into which a basket burial, two cremation pits, and a token cremation deposit were inserted. The radiocarbon dating evidence from Derrycraw was inconclusive with each feature providing a wide range of dates. However, based on the inter-relating overlap of features identified during excavations it would appear that the urn burial was the earliest feature, followed by the cairn and then the barrows.

Ring Barrows 1 and 2 were annular, and Ring Barrow 5 was pennanular with three posts on its eastern open side. Ring Barrows 3 and 4 were badly truncated and it was not possible to identify their original form. Of the five ring barrows, two contained cremation burials in their interior (Cremation 1 in Ring Barrow 3 and Cremation 2 in Ring Barrow 5). Cremation 1 was a juvenile, aged 7–15 years old; Cremation 2 was an adult of undefined age who had been buried with two rubbing stones (see Table 4). Both cremations were within shallow pits and were not associated with urns. Cremation 2 was covered by a capstone. Unidentifiable burnt bone recovered from pits within Ring Barrows 1 and 4 may have been cremations. Ring Barrow 2 had a very narrow defined slot in its base. Portions of large burnt oak timbers were recovered from this slot. These would have formed a wall which delineated the internal space. It was the only barrow uncovered during the excavations on the Road Scheme to display such a feature. As no remains were found within this ring barrow the possibility exists that this particular barrow may have been a mortuary enclosure rather than a burial monument.

A large pit and posthole were located immediately west of Ring Barrow 2. The ditch of this barrow was constructed through the backfill of the pit, which showed that the ring barrow was a later feature. The pit was 1.7m long, 1.4m wide and 0.6m deep; and had a shelf partially cut into the side of the pit, on to which an undecorated Vase Urn had been placed. The urn was intact and capped with a large stone. It contained the complete cremated remains of an adult male aged between 25 and 45 years (Cremation 3). The urn was rounded, 24cm diameter at the top, and narrowing to 16cm at the base. The impression from a grain of wheat was found on the interior of the base. The vessel was from the latter stages of the Vase Urn Tradition, the period between 1830 and 1740 BC.[78] The fill of the pit was radiocarbon dated to 1772–1446 BC (Beta-216908), but, given the presence of the urn, it most likely dated to the earliest part of the radiocarbon range returned. Securely dated late Vase Urns are rare; however, a similar undecorated example was recovered from a grave at Magheraboy, Co. Antrim.[79]

The posthole which was contained within the pit was 0.6m wide and 0.9m deep. The posthole would have held a substantial wooden post: using a standard depth to height ratio of 3:1 this suggests that the post could have stood as much as 1.8m above the ground surface, thereby forming a significant marker on the landscape. A similar feature was identified at Ballintaggart, where it too pre-dated a ring barrow.

An oval cairn was located between Ring Barrows 1 and 5. It measured 6m long, 3m wide, and survived to a height of 0.3m. It was formed from a mix of stone and earth. It contained four token cremations, two of which were in pits (Cremation 7, a female aged between 25 and 35, and Cremation 8, a token deposit, dating to 1454–1110 BC; Beta-217344 and 1499–1217 BC; Beta-217348, respectively), one between the stones that made up the cairn (Cremation 6, a juvenile aged 13 to 17, dating to 1637–1390 BC; Beta-217347), and finally one within a burnt basket (Cremation 5, dating to 1623–1290 BC; Beta-213585).



Plan of Derrycraw barrow cemetery

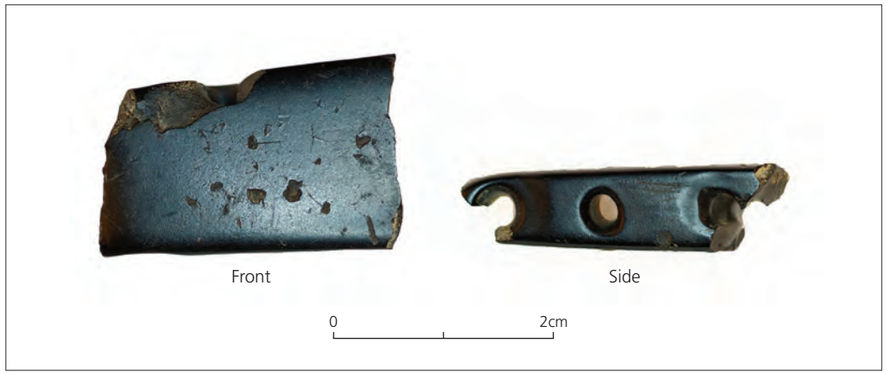
Excavations in progress at Derrycraw

Two artefacts were recovered: an undecorated Vase Urn dating to the Early Bronze Age and a jet spacer bead from a multi-strand necklace which could date to either the Early or Middle Bronze Age. The necklace would have been fashioned with jet beads with spacers to support the strands and give a crescent shape. A grave excavated at Keenogue, Co. Meath[80] contained 41 jet beads. Jet has the same chemical composition as lignite, but Irish sources of lignite are generally not of high quality. Therefore, most of the Early Bronze Age, Iron Age, and Early Christian material, especially the better quality pieces, were most likely of English manufacture or source, probably from the Whitby area of Yorkshire.[81] This indicates some form of long range trading contacts or "down-the-line" exchange. The presence of jet may also be indicative of a high status if found in an Irish grave.[82]

The basket burial was placed within a small pit on the southern edge of the cairn. The 'basket' primarily consisted of thin strands (5–10mm wide) of interwoven alder. Towards the base there were some larger concave pieces of possible bark. This bark may have lined or been woven into the 'basket' to provide a more secure container. Two strands of curved wicker found on the side of the basket may have been the remains of 'basket handles'. The basket was carbonised *in situ*, possibly from the cremation still being hot when it was placed in the pit. The identifiable wood was alder, which is not normally a basketry wood. The basket would have been straight sided, 0.35m in diameter and 0.3m deep. The cremation within this basket was of a young adult aged between 13 and 17.

Vase Urn in-situ at Derrycraw © Tony Corey, DOE:HED

Vase Urn from Derrycraw after Conservation



Jet Spacer bead found in the Cairn at Derrycraw

Reconstruction of Jet necklace by Stephanie Godden

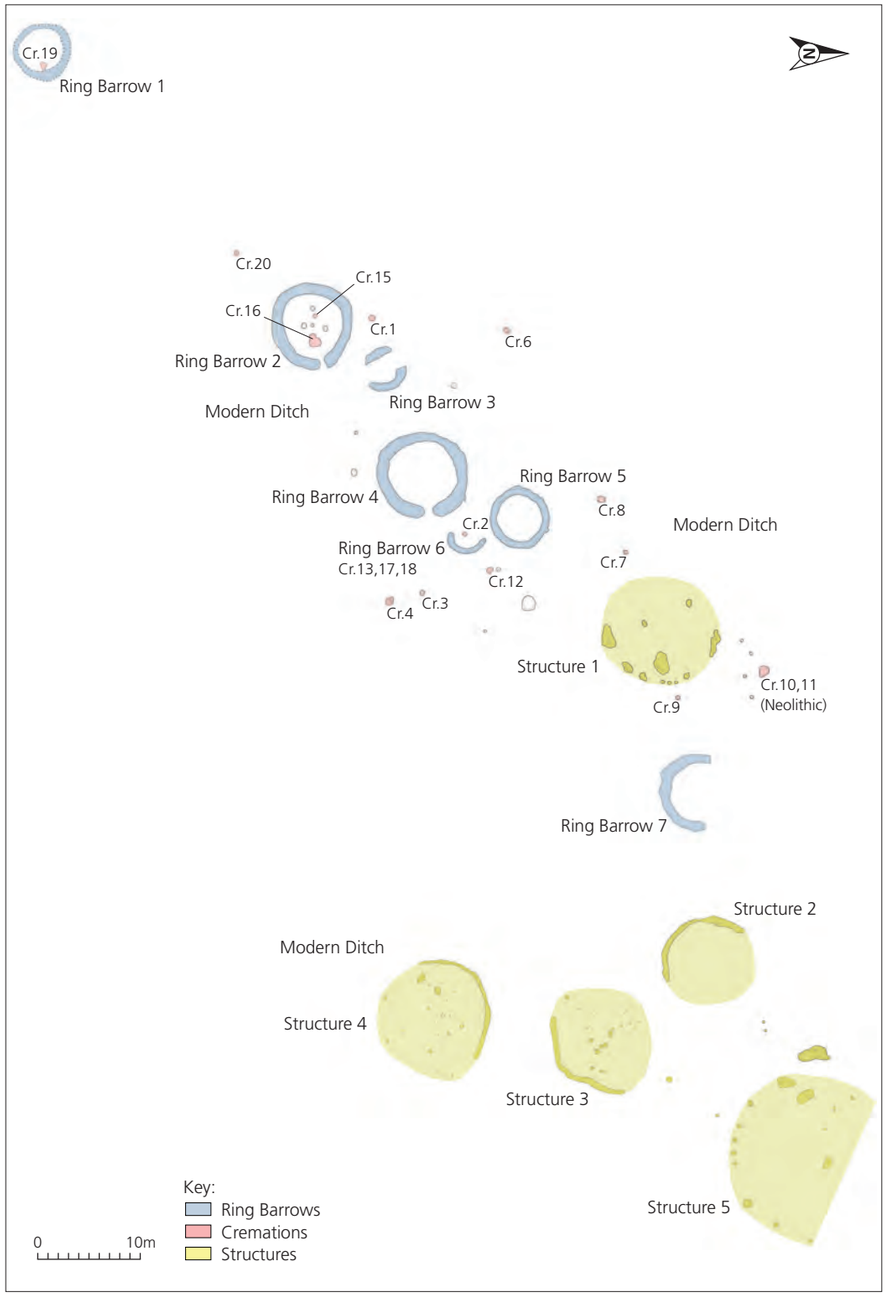
Quilly barrow cemetery

The site at Quilly lay on the crest of a ridge approximately 1.5km to the southwest of the town of Dromore. Extensive evidence for both a ritual and a domestic landscape was uncovered. In total there were seven ring barrows, 16 cremation burials, and five structures. The burial and ritual activity was focused on the west of the site, with the structures on the east. The dating evidence from the site indicated that these features were constructed from the Middle to Late Bronze Age, with the radiocarbon dates ranging from the 16th to the ninth centuries BC. The close relationship between dwellings and the ritual deposition of human remains in the Bronze Age has been noted on a large number of archaeological sites, for example Ballynamuddagh, Co. Wicklow,[83] and Kerlogue, Co. Wexford.[84] It has been suggested that from the Middle Bronze Age the separation between what we would consider secular and ritual acts becomes less well defined, and that the Bronze Age people did not separate ritual, esoteric practices, and secular, practical parts of daily life as we would today.[85]

The structural evidence from Quilly has been discussed previously in this chapter and the burial evidence is discussed here. Of the seven ring barrows, three contained cremation burials in their interior (Cremation 19 in Ring Barrow 1, Cremations 15 and 16 in Ring Barrow 2, and Cremation 2 in Ring Barrow 6). Ring Barrow 6 contained three cremations within its ditch (Cremations 13, 17, and 18). There was no evidence for burials associated with Ring Barrows 3, 4, 5, and 7; however, it should be noted that Ring Barrows 3 and 7 were heavily disturbed by modern agricultural ditches which may have destroyed internal features. Ring Barrows 2, 4, and 7 were all penannular with an opening in the east, and they were also the largest of the ring barrows. Only Ring Barrow 2 contained an internal structure, four posts which lay around the cremation, which was similar to Structures 1 and 2 noted at the Bronze Age cemetery at Ballintaggart (see Table 5).

The 15 Bronze Age cremation burials were either directly associated with ring barrows (Cremations 2, 13, 15, 16, 17, 18, and 19) or were placed in small pits in close proximity to them. Radiocarbon dates indicated that they were likely to have been contemporary to the ring barrows (see Table 6). Cremations 10 and 11, at the northern perimeter of the site were Neolithic in date, and have been previously discussed. Where the cremated remains could be identified they were found to be both children and adults. Cremations 1, 4, and 9 were found within flat-based, vertically walled vessels. Cremations 2, 3, 12, 13, 15, 17, and 18 were found with fragments of pottery of a similar style and it is possible that these were funerary urns which had been damaged by later agricultural activity. The diameter of the base of the burial urns varied from 13cm to 25cm.

The pottery identified here was from the final phase of the Cordoned Urn Tradition and was widely distributed across Ireland. Domestic assemblages of this type have been identified at Knockhouse, Co. Waterford,[86, 87] and Chancellorsland, Co. Tipperary.[88]



Plan of archaeology at Quilly

Quilly barrow cemetery
© Tony Corey, DOE:HED

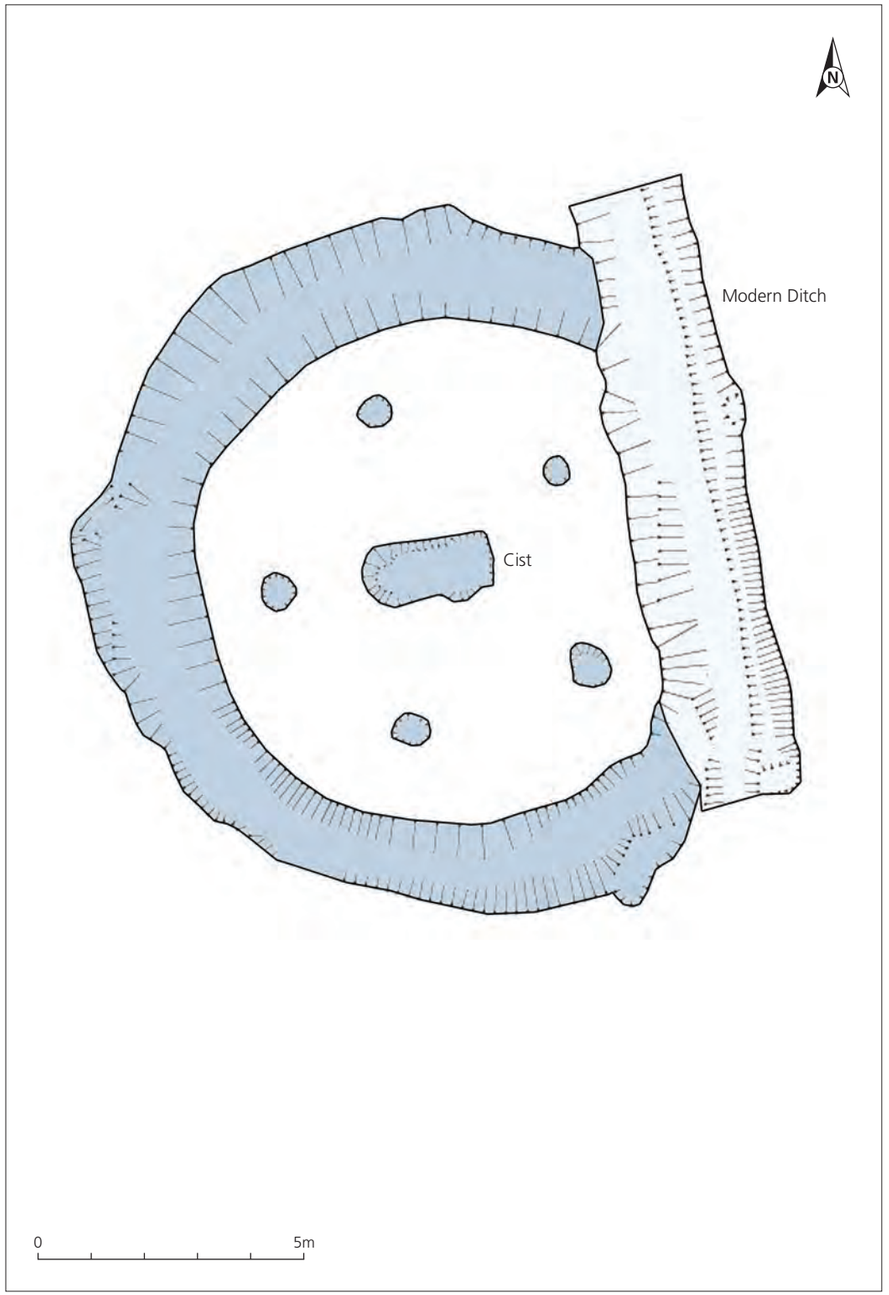
Isolated ring barrows – focus on Carnmeen (Site 3 and Site 23)

The final sites which contained ring barrows were at Carnmeen (Site 3 and Site 23). The barrow at Carnmeen (Site 3) was truncated on its east side by a modern ditch; however, it would appear to have been circular in form with an internal diameter of c.9.2m. The ditch was 1.5–2m wide and up to 0.65m deep. Five postholes were within the interior of the ring barrow; these encircled a rectangular, stone-lined cist in the centre of the feature. The cist was 2.1m long, 1.2m wide, and 0.42m deep, and would have contained a human burial; however, as no bone was recovered the presence of a burial in this feature could not be confirmed.

It was not possible to identify if there was a bank on the inside or outside of the ditch; however, as the cist would have been covered it is likely that the material from the ditch was deposited within the centre of the barrow. A sample of charcoal from the cist was dated to 1207–1007 BC (UBA-14202). The final sedimentation of the ring barrow occurred at 407–364 BC (UBA-14198).

The Barrow at Carnmeen (Site 23) was pennanular with a narrow opening, c.0.4m wide, on its southern side. The barrow had an internal diameter of 6.5m. The ditch was 1-1.5m wide and up to 0.3m deep. Hazel charcoal from the ditch was dated to 1532–1442 BC (SUERC-17635, SUERC-23988).

Ring Barrow at
Carnmeen (Site 3)



The burnt mound site at Derrybeg (Site 1). The hut would have been small, only 2m by 1.60m and constructed with a set of long flexible poles which were bent over and woven between, much like a coracle. Animal skins would have covered the frame. Given the size of the hut and its proximity to the trough, it may represent a sweat or steam house. In the centre of this hut was a perfect circle of stakeholes with a 45cm wide gap in the centre. To function as a sweathouse a pot filled with either hot water or hot stones could have been set in this gap. The trough outside is sufficiently large to have served as a hot bathing pool. Reconstruction by Philip Armstrong

Burnt mounds

Burnt mounds, also known as *fulachta fiadh*, are found with notable frequency in Ireland, with over 7000[89] so far recorded. They range in date from the Late Neolithic through to the early medieval period. Twenty-three such sites were identified during this Road Scheme; the majority dated to the Bronze Age.

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 of the stones cracks the stones, and they are then discarded with the waste from the fire, and create a 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.

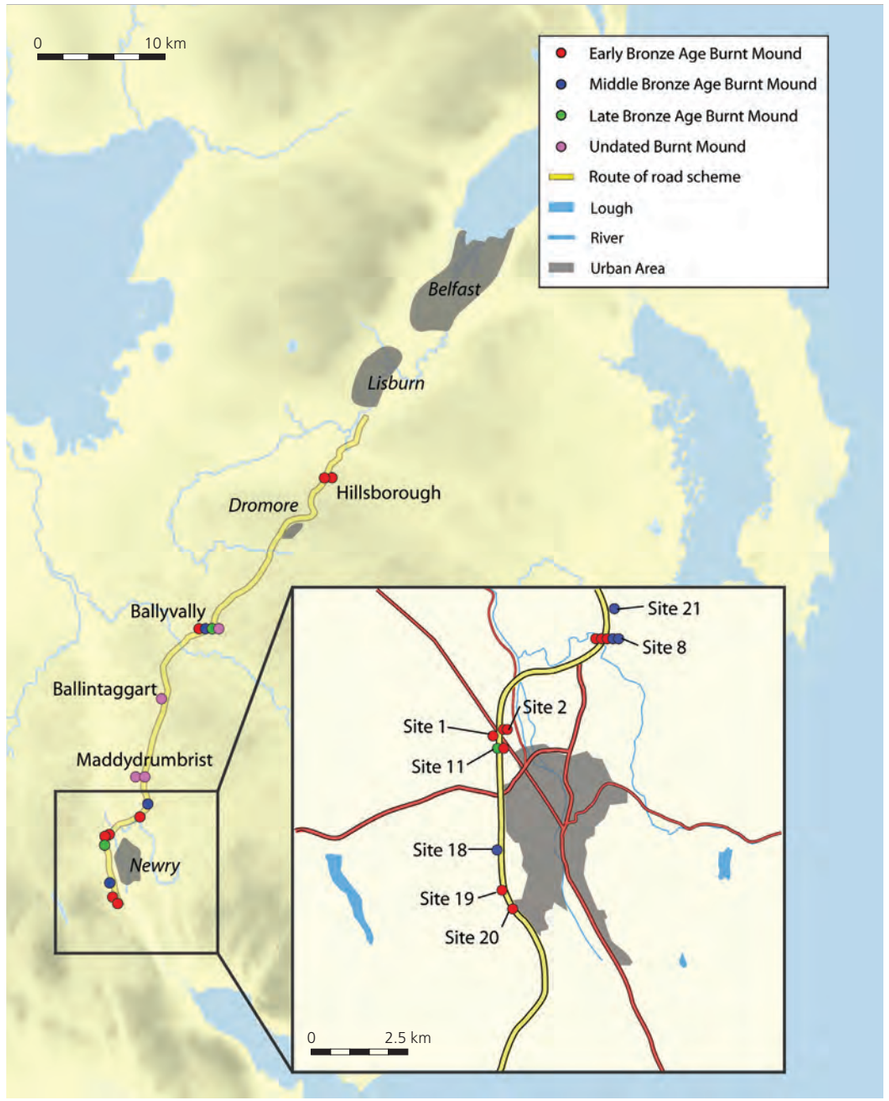
Due to the need for water on burnt mound sites they are almost exclusively found within flood plains, or next to river banks, with a few found on higher ground next to a natural spring. These sites were frequently re-used multiple times, with river silts deposited from flooding often found between the 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?

Within the last 10 years, as more burnt mounds have been excavated, it has become clear that although many of the sites appear to be similar, 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 hot water immersion and the utilisation of steam.

The earliest historical record for burnt mound sites in Ireland calls them *fulachta fiadh*,[90] which translates as a 'cooking pit for wild animals'. 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 bought 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.

Locations and dates of Bronze Age burnt mound sites found on the Road Scheme



However, for sites where evidence for cooking was not present, the wide range of activities which could have been undertaken make 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,[91] dying cloth,[92] fulling wool,[93] working leather,[94] building boats,[95] bathing, and even possibly spiritual experiences.[96]

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 deeper than the rectangular ones. On this Road Scheme a total of 31 troughs was found: 17 of which were circular and 14 of which were rectangular. It has previously been thought that there was a trend for circular troughs to be earlier than rectangular ones;[97] 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.[98] 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 used over a considerable length of time.[99] This is borne out by the size of the burnt mound spread associated with lined troughs as they tend to be larger than for their unlined counterparts.

A multi-period burnt mound (2022–854 BC) - focus on Derrybeg (Site 11)

Derrybeg (Site 11) on the northwest side of Newry was located 30m north of the Bessbrook River. The initial activity on the site was the construction of a rectangular trough with a small stake built structure 1.4m to the west. This structure has been interpreted as a hut. A radiocarbon date from the hut put its period of use as 2022–1888 BC (UBA-12851), and the trough was dated to the 1876–1661 BC (UBA-12849). It is likely that the trough and hut were in contemporary use and the later date from the trough was due to the larger timbers used to line this structure being subject to 'old wood effect'. A sherd of Vase Urn pottery, which dates to the period c.1930–1830 BC, was also recovered from the burnt mound spread.

The trough was 2.15m long, 1.2m wide, and 0.65m deep. It did not have any surviving wooden lining on the sides, although fragmented remains of wood were found in the base which suggests that it may have been plank lined. Around the top of the trough on the western side there was a series of stakeholes which appeared to represent a windbreak. This would not only have protected the hut from cinders carried by the wind from the trough but it would also have controlled access from the trough to the hut.

The hut was to the west of the trough, and is represented by a cluster of 97 stakeholes. The position of the stakeholes indicates that this hut was re-built, possibly more than once, which suggests seasonal re-use of the site. The hut would have been small, only 2m by 1.60m. Small stake-built structures such as these would have been constructed with a set of long flexible poles which were bent over

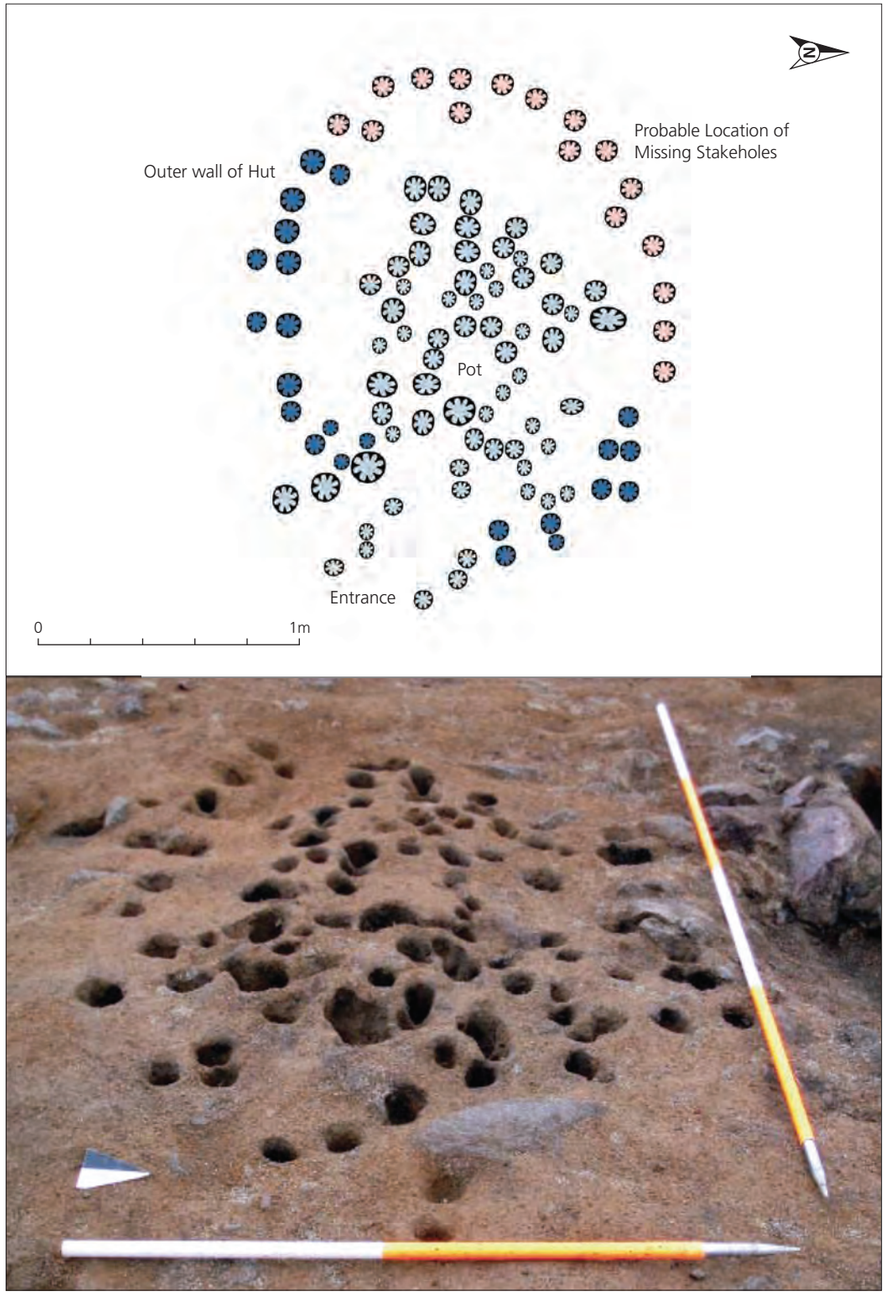
Stone lining of Late Bronze Age trough at Derrybeg (Site 11) © ADS

and woven between, much like a coracle, or with a series of robust, shorter poles, much like a tepee. Animal skins would have covered the frame. At Derrybeg (Site 11) the stakeholes for the hut were vertical which suggests that is was made from longer poles bent over. Given the size of the hut and its proximity to the trough, it may represent a sweat or steam house. In the centre of this hut was a perfect circle of stakeholes with a 45cm wide gap in the centre. To function as a sweathouse a pot filled with either hot water or hot stones could have been set in this gap. The trough outside is sufficiently large to have served as a hot bathing pool.

This area was then abandoned in the Middle Bronze Age for nearly 600 years. In the Late Age Bronze it was used again for the construction of a rectangular trough located 6m to the north of the previous area. The trough contained multiple fills, suggesting a prolonged period of use. The final phase of use of the trough was radiocarbon dated to 1006–894 BC (UBA-12850). This second trough was 2.15m long, 1.45m wide, and 0.6m deep and was stone lined with locally sourced granite. When these stones were removed during excavation it became apparent that the trough had previously been lined with wood, as under the stones in the base of the trough were seven stakeholes. Outside the trough, on the northwest side, was a series of stakeholes that may represent the remains of a windbreak.

The two troughs were located close together, and their associated burnt mounds were flattened out and had merged into a single spread which covered the whole area. This was a very large mound which measured 28.05m^3. Given the sizes of the troughs, and assuming they were used approximately the same number of times, there is enough material to indicate that the troughs were used at least 16 times each.

Plan and photo of the hut at Derrybeg (Site 11) © ADS



Late Neolithic and Early Bronze Age burnt mound sites – focus on Corcreeghy (Site 8)

At Corcreeghy (Site 8) there was a total of five burnt mound sites: two of which dated to the Early Bronze Age and three to the Middle Bronze Age (see below). The first of the Early Bronze Age burnt mounds was only evidenced by a small spread of burnt cracked stones c.5m in diameter and was dated to 1984–1877 BC (UBA-14233). The second Early Bronze Age burnt mound was much more significant. It was 5.5m long and 2.75m wide and overlay an oval trough 1.4m long, 0.9m wide, and 0.4m deep. This trough was lined with wattling constructed from interwoven hazel rods. A layer of moss had been placed between this lining and the edge of the trough to prevent soil filtering into the pit. The trough contained a large quantity of hazelnut shells and it is probable that it was used as an overwinter store, as hazelnuts will survive for several months if they are partially roasted and then immersed in water. This trough was dated to 1938–1771 BC (UBA-14239).

Other Late Neolithic and Early Bronze Age sites

At Hillsborough two burnt mound sites were located c.50m apart and beside a small stream. The first had a single rectangular trough measuring 1.4m long, 1.28m wide, and 0.44m deep. There was some evidence for a small structure, possibly a simple windbreak beside the trough. Trough 1 was dated to the Late Neolithic or very Early Bronze Age (2627–2395 BC, UBA-12635). The second had an oval trough measuring 2.2m long, 1.38m wide, and 0.44m deep. It was dated to the Middle Bronze Age (1693–1499 BC, UBA-12636) and as such was constructed some 1000 years after the first trough. There were a few small pits beside these troughs but no evidence for an associated structure. Neither trough had evidence for being lined, and neither appeared to have been used more than a few times as there was no build up of burnt, fire-cracked stones.

Glassdrummond (Site 1) was located beside a fast-flowing stream. On the stream's banks three burnt mound spreads were uncovered, two large and one small. These spreads were to the north of two rectangular- and one oval-shaped trough associated with a round pit. The troughs ranged in size from 1.80m long, 1.05m wide and 0.5m deep to 2.2m long, 1.8m wide, and 0.5m deep. Two of the troughs were dated to the Early Bronze Age (1977–1875 BC, UBA-12838; 2137–1959 BC, UBA-12837). A channel was found running from the larger rectangular trough to the stream; this was probably used to empty the trough after it had been used. The undated rectangular trough contained a large piece of charred wood, possibly the remains of a lining.

At Carnmeen (Site 2) three areas of activity separated by approximately 8m were uncovered. The northern area contained one oval pit which had a stake built windbreak to the west; it was beneath a large spread of burnt, cracked stones. It was associated with an Early Bronze Age trough (2036–1901 BC, UBA-13498). The central area contained three oval troughs, one of which was also Early Bronze Age (2131–1938 BC, UBA-13497). The southern area was earlier and dated to the Late Neolithic / Early Bronze Age transition. It contained one oval trough (2571–2462 BC, UBA-13496) with a series of intercutting pits. These three troughs ranged in size from 1.6m long, 1.25m wide, and 0.6m deep to 2.4m long, 2.1m wide, and 1m deep. The multiple phases of the site indicates the ongoing suitability of this location for burnt mounds. The third burnt mound was associated with an oval, timber plank-lined trough measuring 1.6m long, 1.25m wide, and 0.55m deep. This trough was dated to the Early Bronze Age (1927–1767 BC, UBA-13499).

At Lisdrumliska and Altnaveagh (Site 19) two areas of burnt mound material were located within a few metres of each other beside a small stream. Three small potential troughs were excavated, two of which lay under burnt cracked stones. Two of the troughs on the eastern side of the site were badly truncated by modern features and as such their original sizes cannot be assessed. The oval trough to the west measured 2m long by 1.8m wide, and 0.35m deep, it was radiocarbon dated to the Early Bronze Age (1981–1876 BC; UBA-13471).

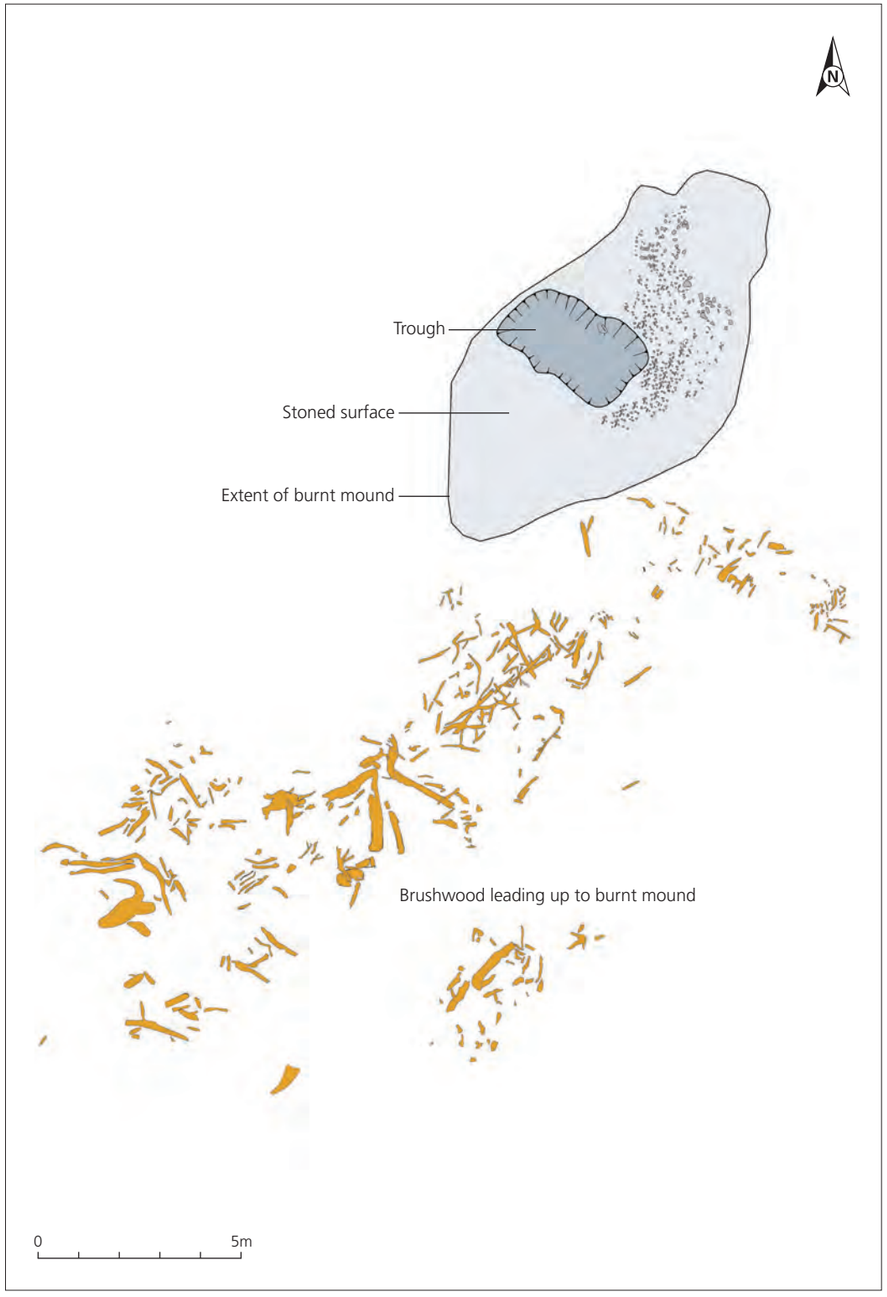
At Lisdrumliska and Carrivemaclone (Site 20) a single oval burnt mound trough was recorded underlying a large spread of burnt mound material. It was 3m long, 1.5m wide, and 0.52m deep and dated to the late Early Bronze Age (1743–1621 BC, UBA-14878). There was no evidence for a trough lining.

A trough underlying a burnt mound at Ballyvally was dated to the Early Bronze Age (2051–1877 BC, UBA-12607). The spread of burnt, cracked stones covered a trough 1.9m long, 1.7m wide, and 0.65m deep; there was no evidence for a lining. Four shallow pits were located around the main trough.

Middle Bronze Age burnt mound sites – focus on Ballyvally

The site at Ballyvally was located on a low area of ground, which would have been wet and boggy during the Bronze Age. The ground rose and improved to the southwest and west. The site consisted of a rectangular, plank-lined trough measuring 2.8m long, 1.5m wide and 0.4m deep, which was surrounded by a deliberately stoned surface. To the southwest of trough was a rough, informal brushwood path which led to the higher ground to the west. The trough and the brushwood path dated to the Middle Bronze Age (trough: 1465–1285 BC, UBA-12609; path: 1423–1156 BC, UBA-12612; UBA-12613). The brushwood was analysed and contained a range of different wood and plant species. Towards the trough the species were characteristic of low-lying, wet ground; for example, here the wood appeared to be made from the un-burnt elements of locally sourced wood, mostly alder, which was also being burnt to heat the stones. Towards the west, the wood became more typical of dryer ground, and consisted of oak, hazel and sloe, suggesting that it was bought here to make

Plan of the Burnt mound site at Ballyvally



walking from the hillside to the trough easier. Attached to the wood was a number of nuts and fruits including hazelnuts, acorns, alder fruits, and sloe stones. As the nuts and fruit were whole it is clear that the wood was collected for the path rather than for eating. The presence of fruit, nuts and seeds indicated that the wood was collected in the autumn, presumably as the site became even wetter. The wood showed no sign of rotting or insect damage which suggests that soon after the wood was laid the site became flooded. As there were no layers of burnt mound material overlying the alluvial silt which covered the brushwood path it appears that the site was abandoned after this flooding. Given the effort that went onto the construction of the plank-lined trough, the laying of a rough stone area around the trough, and the brushwood path it is probable that this area was designed to be used over a prolonged period; however, the burnt mound uncovered was very small and only represents approximately three to four uses.

A radiocarbon date from the Early Bronze Age period (2433–2133 BC, UBA-12611) was obtained from organic layers beneath the brushwood path. There was no indication that these organic layers were deliberately laid and were likely to have been deposited by one or more flooding events in this area.

Other Middle Bronze Age sites

At Corcreeghy (Site 8) three Middle Bronze Age burnt mound sites were found. These may all have been contemporary as their radiocarbon date ranges all overlapped; however, it is also possible that there were years or even centuries between their actual uses. The first of the sites had three troughs underlying a spread of burnt cracked stones measuring 8.5m long and 7.5m wide. Two of the troughs were roughly oval in shape; the largest was 2.5m long, 2m wide and 0.4m deep, the other 1.55m long, 1.3m wide, and 0.3m deep. The third trough was an irregular shape and was 3.4m long, 1.6m wide, and 0.26m deep; it returned a Middle Bronze Age date (1455–1289 BC, UBA-14234).

The second Middle Bronze Age burnt mound had an oval trough 2.2m long, 1.75m wide and 0.36m deep which underlay a spread of burnt cracked stones 3.3m long and 1.4m wide. Some wood planking at the base of this trough indicated that it was wood lined; it also returned a Middle Bronze Age date (1506–1411 BC, UBA-14236).

The third and latest Middle Bronze Age site had a large spread of burnt cracked stones 9.25m long and 6.5m wide which overlay two oval troughs. These troughs were 2.65m long, 2.2m wide, and 0.45m deep, and 2.7m long, 1.1m wide and 0.25m deep. Beyond the burnt mound spread was a small number of other pits and postholes which could conceivably have supported a small structure. The trough was also dated to the Middle Bronze Age (1437–1297 BC, UBA-14243).

At Lisdrumliska and Carnagat (Site 18) the remains of a badly truncated burnt mound spread and

two potential circular troughs were recorded. One of the troughs dated to the Middle Bronze Age (1408–1258 BC, UBA-13470).

At Corcreeghy (Site 21) there was a spread of burnt cracked stones c.10m long and 6m wide which covered a shallow oval trough 1.25m long, 1m wide, and 0.46m deep. The trough was Middle Bronze Age in date (1501–1414 BC, UBA-13503). The site was beside a boggy area with the high water table naturally filling the trough.

Late Bronze Age burnt mound sites

Only two Late Bronze Age burnt mound sites were uncovered. These were the above-mentioned site at Derrybeg (Site 11) which re-used an earlier burnt mound location, and a further example at Ballyvally. The site at Ballyvally had a rectangular trough 2.5m long, 1.6m wide, and 0.45m deep, with two postholes on either side of the trough at its northern edge. The trough was dated to the Late Bronze Age (932–828 BC, UBA-12618). There was also a cluster of stakeholes and postholes along this edge, representing the remains of a windbreak for the trough. To the south of the trough was a second large oval pit 3.1m long, 2.4m wide and 0.6m deep; however, it did not contain burnt cracked stones and may have served a different purpose. The pit was also dated to the Late Bronze Age (1056–903 BC, UBA-12617).

Undated burnt mound sites

At Ballintaggart a burnt mound was uncovered consisting of a spread of burnt cracked stones measuring c.8.5m diameter. It covered a large oval trough 2.5m in diameter and 1m deep. A modern drain cut through the centre of the trough and as this affected the integrity of the features no radiocarbon date was obtained for this particular site.

At Maddydumbrist material from at least two burnt mounds was discovered in topsoil by a small stream. There was no evidence for troughs and it is probable that the associated troughs lay outside the excavation area.

One of the burnt mound sites excavated at Ballyvally was undated. It consisted of patches of spread-out material overlying a series of shallow depressions in the ground. No troughs were present.

A burnt mound under excavation in Co. Down

Opposite: The Iron Age defensive earthwork known as The Dane's Cast or Black Pig's Glen, near Newry. Reconstruction by Philip Armstrong

The Iron Age

From around 700 BC to 400 BC[1] 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 what is termed 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 west of the road from Belfast to Newry, where extensive Iron Age activity has been recorded.

Location of Emain Macha (Navan Fort): the Iron Age capital of the Ulster, the defensive earthworks constructed in this area (The Dorsey, The Danes Cast, and the Lisnadill Danes's Cast[4]), and the Iron Age sites found on the Road Scheme

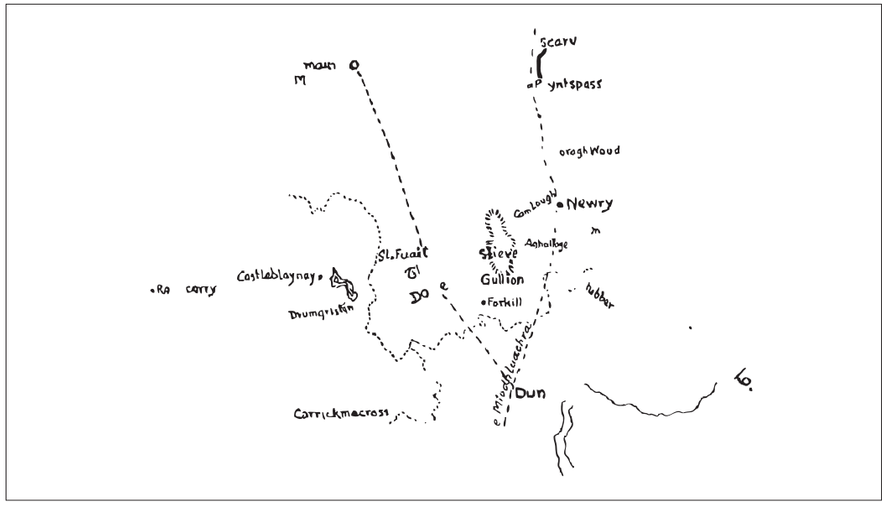
Historical evidence

The Greek geographer Ptolemy,[2] working from Greece in the second century AD, records two major tribes in this region. In south Antrim and north Down are the *Darini*, while in south Down and Armagh are the *Voluntii*. These names would have been recorded phonetically from the ancient Celtic language that these people would have spoken, which would have been written down in the language of the merchant or diplomat who met them, and then finally translated into Greek by Ptolemy. Linguistic analysis suggests that the *Darini* were descendents of *Darios* or *Dáire*: a traditional ancestor of the *Dál Riata* and *Dál Fiatach* who occupied much of Antrim and Down in the early medieval period. The tribal name *Voluntii* is interpreted as a Latin translation of the ancient Celtic *Uluti*, which later became *Ulaid* in Old Irish, and means Ulsterman. This tribe then gave its name to the whole of Ulster.[3]

The site *Emain Macha*, known more commonly as Navan Fort, lies 30km northwest of Newry and is marked on Ptolemy's map as *Isamnion*. The site has been interpreted and mythologized as the capital of the tribes of Ulster and the seat of the High Kings. At the end of the Bronze Age *Emain Macha* was occupied by a large roundhouse, most likely belonging to a local chief.[5] Later historical sources suggest that by 100 BC it had become the capital of Ulster, and remained so until around AD 450 when the tribes of Ulster withdrew and set up their new boundary near the current County Down border with Armagh.[6] In the early medieval period the records show that the kingship was shared between the tribes of the *Dál nAraidi*, *Dál Fiatach* and the *Uíbh Eachach*[7] and this system of shared high kingship may have been rooted in the Iron Age.

The Dane's Cast

According to early historical sources, the tribes of Ulster were forced east from their base in *Emain Macha* by the expansion of the *Airgialla* tribe[8] from the south and west. They retreated and set up a new boundary which was defined by a large earthwork called the Dane's Cast,[9] locally known as Black Pig's Glen.[10] The Dane's Cast was a defensive earthwork built from a rampart of soil upon which a palisade was constructed. It began at Carlingford Lough then looped around the southern foothills of Camlough Mountain to eventually meet Cam Lough. It began again on the north side of Cam Lough where it looped east and then north to run roughly parallel to the modern Newry to Belfast Road.[11] The Road Scheme crossed the path of the Dane's Cast to the south of Newry. However, there was no evidence for its presence, which shows that it had been removed in this area in antiquity, probably when the old Newry to Dublin Road was constructed.



Reproduced from Tempest's map[12] showing the defensive earthworks known as Dane's Cast and the Dorsey, Emain Macha (Navan Fort - the seat of the High Kings of Ulster) and *Slighe Miodhluachra*, the ancient road which ran from Tara (the Seat of the High Kings of Ireland) to the Giant's Causeway and is also believed to have branched westward to connect with Emain Macha

Slighe Miodhluachra (The Road from Tara)

All of the Iron Age sites recorded on the Road Scheme lie within a few kilometres, or in the case of Maddydrumbrist, a few hundred metres, from an ancient road network which linked Tara, the Seat of the High Kings of Ireland, in County Meath, to the four centres of power in Ireland.[13] These roads are recorded in The Irish Annals as having miraculously appeared on the night of the birth of the child who would become Conn of the Hundred Battles.[14] Conn was High King of Ireland in the second century AD and the originator of the name for the province of Connaught. It is, however, most likely that these roads were in fact prehistoric byways upon which a mythological story was added to increase the status of Conn. The road which passed close to the sites found during the excavations was called the *Slighe Miodhluachra*[15]. It began at the Hill of Tara, crossed the Boyne near Drogheda, and then passed Dundalk where it divided into two branches. These two branches are known as the *Bealach Moran Fheadhci*, The Great Road of the Wood, which went through Newtown Hamilton and ended at *Emain Macha*, and as the *Slighe Miodhluachra*, which passed just west of Newry and ended at Dunseverick, near the Giant's Causeway.

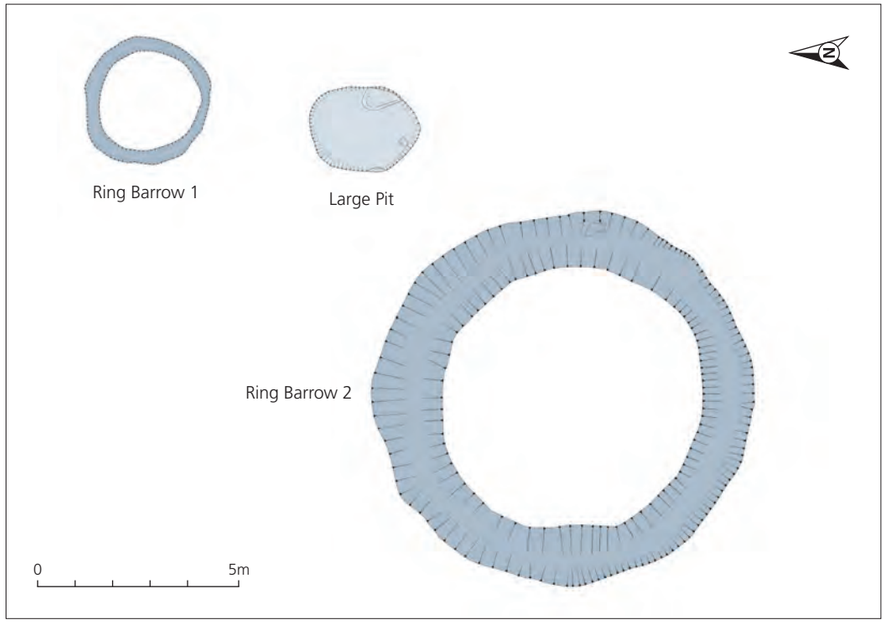
Iron Age burial sites

Cremation had been the dominant funeral rite during the Bronze Age, and continued during the Iron Age,[16] 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.[17] Iron Age barrows have a tendency to be smaller than their earlier Bronze Age counterparts.

Ring barrows - focus on Carnmeen (Site 5), Glassdrummond (Site 7) and Corcreeghy (Site 8)

Two Iron Age ring barrows were excavated at Carnmeen (Site 5); radiocarbon dating places their creation in the Middle Iron Age, the larger barrow dating to 180–49 BC (UBA-12843), the smaller to AD 140–336 (UBA-12841). A single barrow excavated at Glassdrummond (Site 7) was similarly dated to 158 BC–AD 50 (UBA-14215). The barrow at Corcreeghy (Site 8) was Early Iron Age, dating to 723–394 BC (UBA14242).

The barrows at Carnmeen (Site 5) were located side-by-side on a prominent hilltop, with excellent views in all directions; a large pit was located in between the barrows. Ring Barrow 1 had a 3.3m internal diameter; its ditch was 0.2m deep and 0.5m wide. Ring Barrow 2 was much larger, having a 6.5m internal diameter; its ditch was 0.6m deep and 1.6m wide. Cremated bone, unidentified as either animal or human, was found within both barrows along with charred hazelnut and raspberry seeds which may have been ritually deposited food offerings for the deceased. The pit which lay in between these barrows was 3m long, 2m wide and 0.9m deep; it contained no evidence for human burial and its function is unclear. It did, however, contain a flint scraper. A large number of pits and postholes was found to the east of the barrows; their association with the barrows is also unclear.



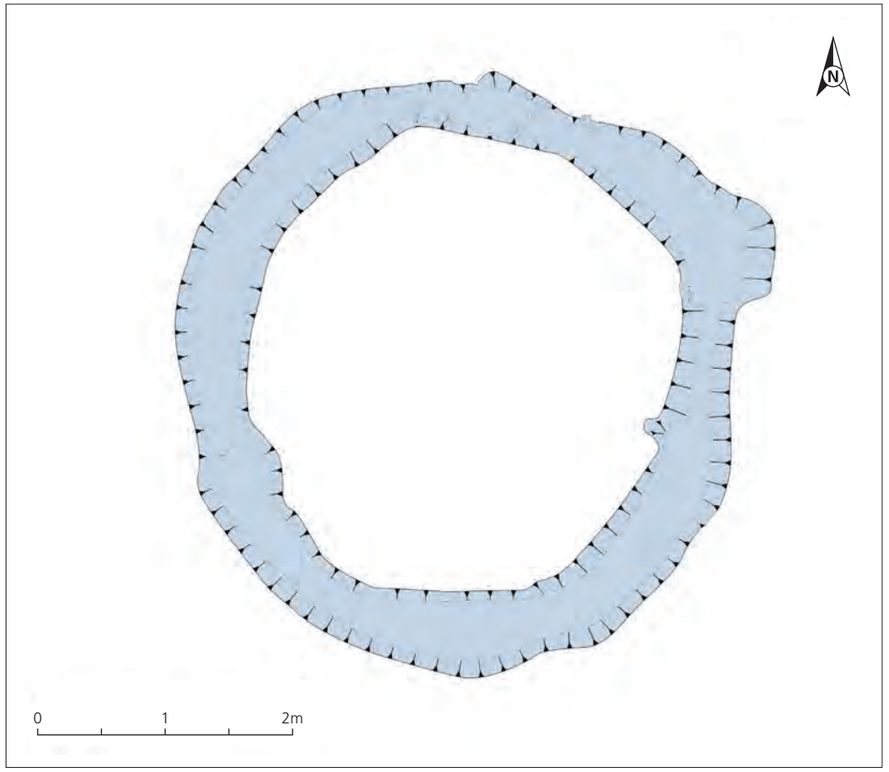
Iron Age ring barrows at Carnmeen (Site 5)

Looking west across Ring Barrow 2 at Carnmeen (site 5) showing the view down the valley from the hilltop © ADS

Glass, amber and bone beads from Iron Age burial at Glassdrummond (Site 7) © Tony Corey, DOE:HED

The ring barrow at Glassdrummond (Site 7) was located on a hillside which already contained two earlier Bronze Age barrows, and it is likely that this barrow was constructed here due to the established significance of this location. The ring barrow had a 3.3m internal diameter; its ditch was 0.2m deep and 0.5m wide. It is identical in size to Ring Barrow 1 at Carnmeen (Site 5). The ditch contained cremated human bone and 20 beads were recovered from the material around the cremation. The majority of the beads comprised green and yellow glass, but one was made from amber, and three were made from bone.

The final barrow excavated at Corcreeghy (Site 8) had a 4m internal diameter; its ditch was 0.26m deep and 0.75m wide. A large pit, 2m diameter and 0.3m deep was located under the remains of a stone cairn in the centre of the barrow. The pit contained the highly fragmented and crushed remains of one adult. The small size of the bone made further sex or age identification impossible.



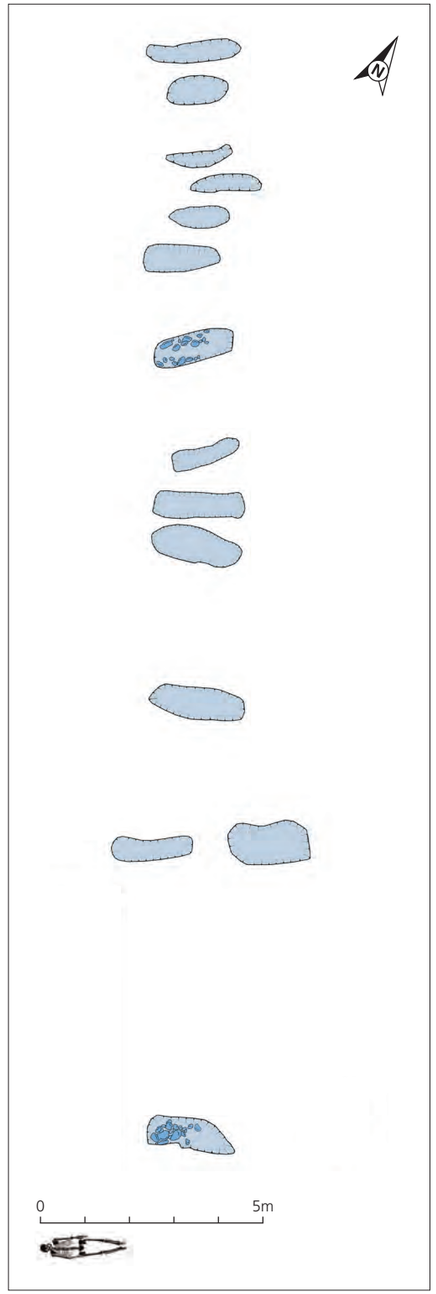
Ring barrow at Glassdrummond (site 7)

Inhumation cemetery – focus on Carnbane (Site 15)

Fourteen graves were found at Carnbane (Site 15). They were dated to the latter part of the Early Iron Age, in the period between 478–376 BC (UBA-13467). The majority were at least 1.5m long and 0.6m wide (6ft by 2ft), although the smaller graves probably held younger individuals. Two of the graves had stone linings, which may have supported either a stone or wood capping. The graves were quite shallow, most likely being truncated as a result of later agricultural activity. The lack of skeletons within the graves is most likely due to simple degradation over time as the relatively acidic clay subsoil in this area would have quickly degraded the bone. The graves were all orientated towards the northeast, facing downslope towards the Newry River. They also overlooked an un-excavated circular barrow,[18] which may also be Iron Age.

Left: Stone-lined burial at Carnbane (Site 15) © ADS

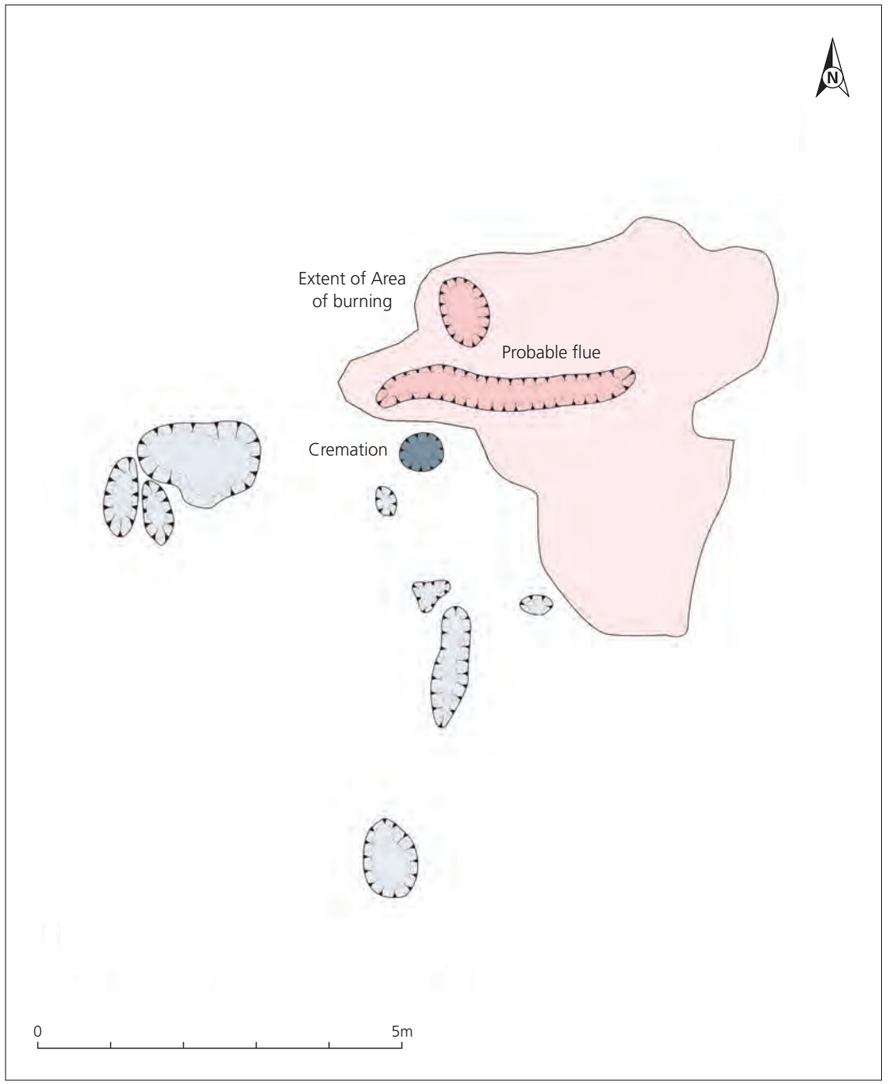
Right: Inhumation cemetery at Carnbane (Site 15), average males skeleton is shown for scale



The Newry River is a natural boundary which divides Counties Armagh and Down, and which may have been a tribal boundary during the Iron Age. If this was the case, then the siting of the cemetery may have also had a role in expressing an ownership of the land by the relatives of those buried in the cemetery. By burying their dead in a prominent position these people may have been strengthening a claim to this land while also acting as a warning to outsiders. This claim may have been further reinforced by burials occurring on a periodic basis, with any ceremonial rituals associated being clearly visible. It is probable therefore that the cemetery played a much more important role for the local society than simply a place to bury some of their dead.

Isolated cremation burials – focus on Derrybeg (Site 13)

The funerary site at Derrybeg (Site 13) was located on a rocky outcrop overlooking the Bessbrook River to the north and the Newry River to the east. A small cremation deposit was identified which lay in a pit between bedrock outcrops. The cremation was of an adult who was at least 30 years old; it was dated to the Middle Iron Age, the period 87 BC–AD 53 (UBA-14874; UBA-14876).



Plan of funerary site at Derrybeg (site 13)

There was also evidence for a large pyre on which the body had been cremated. This evidence took the form of an area, some 5m in diameter, of intensely burned subsoil and charcoal, beneath which was a long slot which had been dug into not only the subsoil, but also the bedrock. It is likely that wood was piled here and that the individual was then placed on top of it before it being set alight. The wind which crossed this exposed location would have blown down the long slot providing a draft to the pyre, which in turn allowed the wood to burn at a higher temperature, better cremating the bone. The function of the other pits which lay along this hill top was unclear; however, a Middle Iron Age date of 172–45 BC (UBA-14873) returned from the upper levels of one of the pits suggests that at least some of these features were broadly contemporary.

An isolated cremation of a single adult was found within the inhumation cemetery at Carnbane (Site 15). It was buried in a small pit some 300 years after the inhumations, and dated to the Middle Iron Age, 53 BC–AD 58 (UBA-13468). The final cremation discovered on the Road Scheme was found at Maddydrumbrist and, as with Derrybeg, it was located on a rock outcrop. It dated to the Late Iron Age, AD 140–430 (Beta-217345).

Other Iron Age evidence

Many sites in Ireland have produced evidence for Iron Age activity: principally pits, isolated hearths and postholes, but relatively few houses or structures have been uncovered.[19] Indeed, much of the Iron Age archaeology discovered to date consists of burial sites, such as the barrows and cremations found along this Road Scheme, or large enclosures, ritual sites, and linear earthworks.[20]

Excavations at Hillsborough revealed approximately 70 archaeological features spread across a c.50m^2 area. The features were mostly irregularly shaped shallow pits with only a few features that were deeper than 20cm. There was no indication that any of the features were postholes, and the width and irregularity of the pits precludes them from having held split timber walls. These pits appear therefore to relate to agricultural and industrial activities, rather than habitation.

The radiocarbon dates returned for this area were from the Early Bronze Age (UBA-12621), Late Bronze Age (UBA-12632), Early Iron Age (UBA-12633), and the Middle Iron Age (UBA-12628; UBA-12631). An Iron Age radiocarbon date (UBA-12634) was also obtained from a ditch, possibly a field boundary, located some 50m east of the settlement area. This is a multi-period site which, like the ring barrows at Glasdrummond (Site 7) demonstrates later Iron Age repeated use of a former Bronze Age site. No artefacts were recovered from these pits and therefore the function of this site remains unknown.

Carnmeen (Site 23) contained two figure-of-eight-shaped pits 2m long and 0.7m wide were also identified to the south of the souterrain. These were cereal-drying kilns which worked by a fire at one end being blown down a short flue to dry the damp cereal grains which were deposited at the far end. The kilns dated to AD 121–435 (SUERC-23939, SUERC-23943).

The remainder of the Iron Age material encountered along the Road Scheme was limited to isolated pits and hearths. At Glassdrummond (Site 10) the upper fill of a hearth dated to the Middle Iron Age, the period 163 BC–AD 0 (UBA-14844). This fill also contained sherds of pottery. These have not been analysed and are most likely to relate to the Bronze Age occupation of this site; however, in absence of further analysis it cannot be wholly discounted that this is a rare Iron Age ceramic find. The only other Irish site where Iron Age pottery has been tentatively dated is Ballycullen, Co. Dublin[21] (the period 375–47 BC). A little to the south of the hearth at Glasdrummond (Site 10) two whetstones were recovered, one of them from a pit which dated to the Middle Iron Age, the period 360–171 BC (UBA-14840). These would have been used to sharpen the knives, axes, and swords of the people living here.

At Glassdrummond (Site 7) a single isolated pit containing burnt animal bone was dated to the Middle Iron Age, 191–45 BC (UBA-14206). This date overlaps with the ring barrow found in this area and may be from contemporary activity on the site. Corcreeghy (Site 8) had a small isolated pit which dated to the Middle Iron Age, 352–109 BC (UBA-14240). There was also a small hearth at Derrybeg (Site 14) which proved to be Late Iron Age, the period AD 26–130 (UBA-13459). The function of these pits was not clear.

Whetstones from Glassdrummond (Site 10)

Opposite: Lisnagade Fort[1], a very large rath with three massive banks and ditches (trivallate) which is now planted with trees. This site lies 5km southwest of Banbridge © Tony Corey, DOE:HED

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.[2] 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.[3]

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 9th and early 10th centuries AD.

The Ui Echach Cobha: the tribal rulers of Down

At this time Ireland was divided into many small territories, known as *tuatha*. The majority of the Road Scheme fell within the territory of the *Ui Echach Cobha* tribe. The *Ui Echach Cobha* occupied most of modern County Down, with their territory extending from Hillsborough in the north to Newry in the south.[4] The name of this territory, Iveagh,[5] is preserved in the modern baronies of Upper and Lower Iveagh. The neighbouring territories were ruled by the *Dal nAraide* to the north, the *Dal Fiathach* on the east coast of Down and by the *Airthir* translated as 'easteners', to the west.[6] The *Dal nAraide* were part of the Kingdom of Ulster and as such there was less threat of attack from them. One of the three or four major groupings within the *Airthir* included the *Ui Niallain*, latterly O'Neill. The *Airthir* were a major threat to the *Ui Echach Cobha* and a linear bank and ditch earthwork known as the 'Dane's Cast' (discussed in the previous chapter) defined their border from the beginning of recorded Irish history to the plantation period.[7]

Map showing the territory of the Ui Echach Cobha and the neighbouring tribes[8], the location of the Dane's Cast, Lisnagade Fort and the Ecclesiastical sites found along the route of the Road

Christianity

The route of the Road Scheme passed close to a number of important early ecclesiastical sites. While none of these were directly affected by the Road Scheme, they provide important evidence for the arrival of Christianity to this area.

The most northerly of these along this Road Scheme can be found at Dromore. The town of Dromore was allegedly founded by St Colman or Colmoc in the mid-sixth century AD, on or near to the site of the modern Dromore cathedral.[9] The only known remains of the pre-Anglo-Norman ecclesiastical site consist of the fragmentary stone cross (moved from original position) and a cross-carved stone kept in the cathedral.[10]

The Road Scheme then passes through the parishes of Tullylish and Aghaderg. These parishes had early medieval churches dating to the early ninth and early seventh centuries AD, respectively.[11] The second of these churches was named *Tamlacht Menand* and is located some 1.5km west of Loughbrickland. The church is noted as the burial ground of three saints: Nasad, Beoan and Mennan.[12] The remains of this church survive as a rectangle of stones on a low mound above a small stream.[13]

Further south, the Road passes through the parish of Donaghmore. Before Dromore rose to prominence Donaghmore was the most important church in the territory. It was known as *Domnach Mor Maigi Coba*: 'the great church of Magh Cobha'. While no remains of this church have survived, the current graveyard of Donaghmore Church contains a well-preserved early medieval high cross. It is believed to have been erected in the 10th or 11th centuries AD and is the earliest surviving ecclesiastical evidence for this important site.[14]

Travelling south again, the Road Scheme passes to the west of Newry. While Newry appears to have been a location of considerable importance in the early medieval period, the early ecclesiastical history of Newry is somewhat obscure. It is recorded that a monastery was established in the fifth century AD, outside of which was 'a yew tree planted by St Patrick'.[15] St Malachy is said to have founded a new house for the Benedictines at Newry in 1144, while in 1153, a new abbey of Cistercian monks dedicated to Saints Mary and Patrick was founded at Newry by Maurice McLoughlin, King of Ireland. A small settlement developed around the abbey, although it is recorded that both the abbey and its library were destroyed by fire in 1162.[16]

The southernmost part of the Road Scheme is in the parish of Killevy. This is derived from *Cell Sleibhe Cuilinn*: 'the church of Slieve Gullion'. This was an extremely important early monastic site for nuns. It was founded by Darerca, who was also known as Monnena or Bline. Her festival is mentioned at 6th July in the Early Christian Irish martyrologies (Calendars) of Oengus, Tallacht, Gorman, and Donegal. She was allegedly brought up by St Bridgit. An early life of Conchubranus

incorporates very early hymns in her honour and a list of her successors as abbess.[17] The Irish annals mentioned an abbess of Killevy's death in AD 654.[18] The church was plundered by the Vikings of Strangford in AD 923.[19] Killevy continued as a nunnery into the 16th century. The later medieval church is upstanding and it is likely that it lies over the location of the early medieval nunnery.[20] The site remains a focus of religion and burial locally.

Donaghmore High Cross located within the graveyard beside Donaghmore Church. The cross dates to between the 10th and 11th centuries AD and is highly decorated with religious imagery including Christ, Adam and Eve, the Ark, David with a harp, and potentially the sacrifice of Isaac.[21]

Raths: Early medieval defended sites – focus on Carnmeen Townland (Sites 3 and 23)

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 called a raised rath. The majority of early medieval enclosures are roughly circular in shape. Recent excavations have, however, uncovered D-shaped, heart-shaped and, plectrum-shaped enclosures.[22] These non-circular enclosures, in general, have similar chronologies and apparently similar functions to raths.[23]

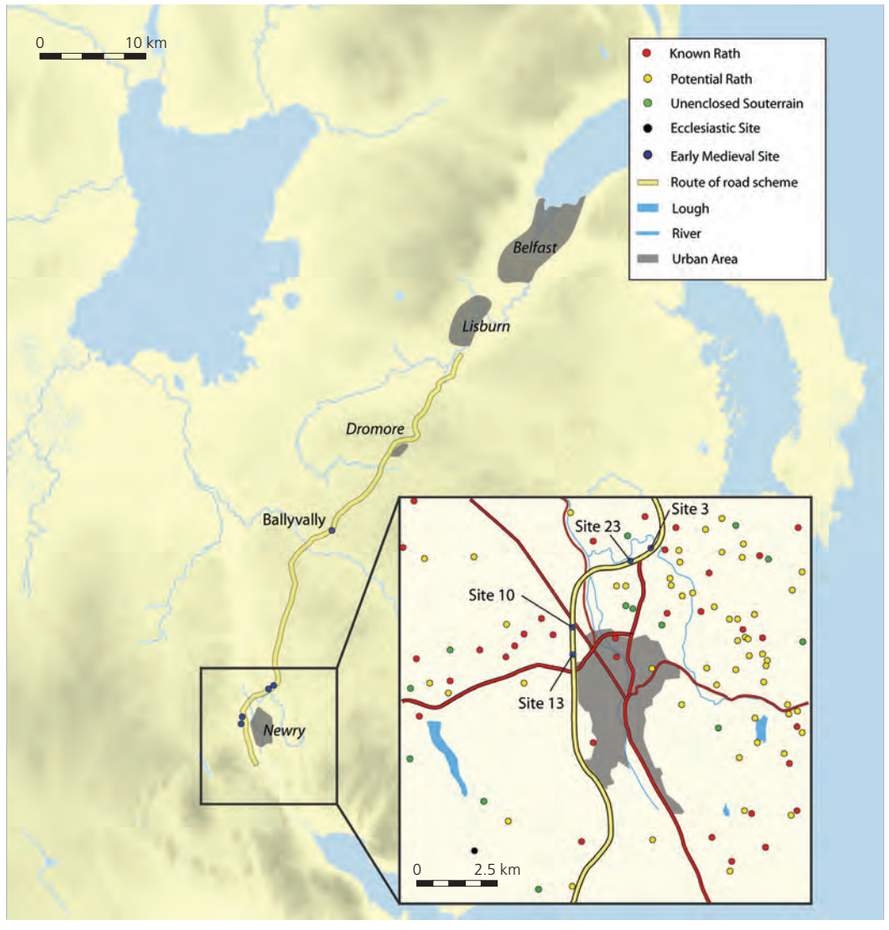
Within the enclosure there would generally be one or two small house structures and sometimes an underground passage capped with stone or wood, known as a souterrain. The houses tended to be round and built of post-and-wattle walls, with thatched roofs. They had a relatively short lifespan, 20–50 years, and at a number of sites there is evidence for rebuilding of houses over the footprint of a collapsed earlier structures. 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.[24]

Souterrains in Ireland are generally considered to be early medieval in date, with most dating to the period after AD 700,[25] but their function is a matter of debate. The most frequent explanations are that they were used either for food storage or for human refuge. 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.[26]

Two raths were identified within the townland of Carnmeen, these were at Sites 3 and 23. They were situated within a cluster of previously known raths and were inter-visible with a platform rath (DOW 046:003), located on high ground approximately 200m to the north. A pair of conjoined raths (DOW 046:001) is also located approximately 950m to the north-east in Corcreeghy townland, and a circular cropmark site (DOW 046:035), probably a destroyed rath, is located approximately 1km to the northwest in Cloghanramer townland.

The rath at Carnmeen (Site 3) was sub-circular and measured 53m long and 44m wide externally, which is comparable to the average dimensions of raths as recorded by Stout.[27] In the case of this site, the shape was probably a consequence of the topography, which falls steeply away from the ditch. Additionally, the length of ditch at the straighter western limb of the enclosure takes advantage of a natural escarpment, thereby increasing the prominence of a bank placed along it. The rath was

defined by a ditch between 3.5m and 5m wide and up to 1.45m deep. The associated bank would have been 4m wide and up to 2m high, possibly surmounted with a wooden palisade. A radiocarbon date obtained from charcoal in the base of this ditch returned a date of AD 772–953 (UBA-14193). A date of AD 964–1034 (UBA-14191) was returned for the upper fill of the ditch indicating that it had been backfilled in the 10th or early 11th centuries. In general, raths were constructed and occupied over a period from AD 600–900.[28] The rath at Carnmeen (Site 3) therefore fits within this chronological framework. Recent work by Kerr[29] has identified a slightly later date for raised raths: AD 750 to 950. On its west side the ditch replaced an earlier ditch which was 2.5m wide and 1.2m deep. This ditch provided a radiocarbon date of AD 126–254 (UBA-14200) and suggests that the rath was constructed on the location of an earlier enclosure.



Location of excavated early medieval sites on the Road Scheme and a detailed sample window showing the density of rath sites near to Carnmeen Sites 3 and 23

Rath at Carnmeen (Site 3) © ADS

Excavation revealed a 2.5m-wide entrance at the south side of the enclosure. The entrance had a shallow gully running across it which would have been used to divert water into the rath ditch and away from the entrance. A posthole set back some 4m from the entrance may mark the back edge of the bank and also a probable gateway into the rath.

The internal area of the rath was 44m long and 35m wide; however, when the bank was upstanding this would have been reduced to an open space of 35m long and 25m wide. There were only two features identified within this open space: a centrally located hearth, and a posthole 5m to the southwest of the hearth. While it must be considered likely that there was a house within the rath these two features do not provide enough evidence to attest for its presence, and as such they may be from either domestic or industrial activities within the rath. The absence of further archaeological features may be due to later agricultural activity truncating the site and removing shallow archaeological features.

At the northern end of the rath were two souterrains which would have lain partially under the bank. The larger of these (Souterrain 1) had its entrance at the rear of the probable house location and may have been accessed from inside the house. It was 12.4m long, 0.7m wide at its entrance where it gradually sloped down from the surface, widening to 1.3m where it opened into a chamber at its north end. The chamber was 5m long, 2.5m wide, and 1m deep and had an air vent leading off its east end. This would have allowed air to continue to enter the souterrain even if an attacker had blocked the main entrance. Even when the entrance was not blocked it would have allowed fresh air to flow

Souterrain 2 at Carnmeen (Site 3) © ADS

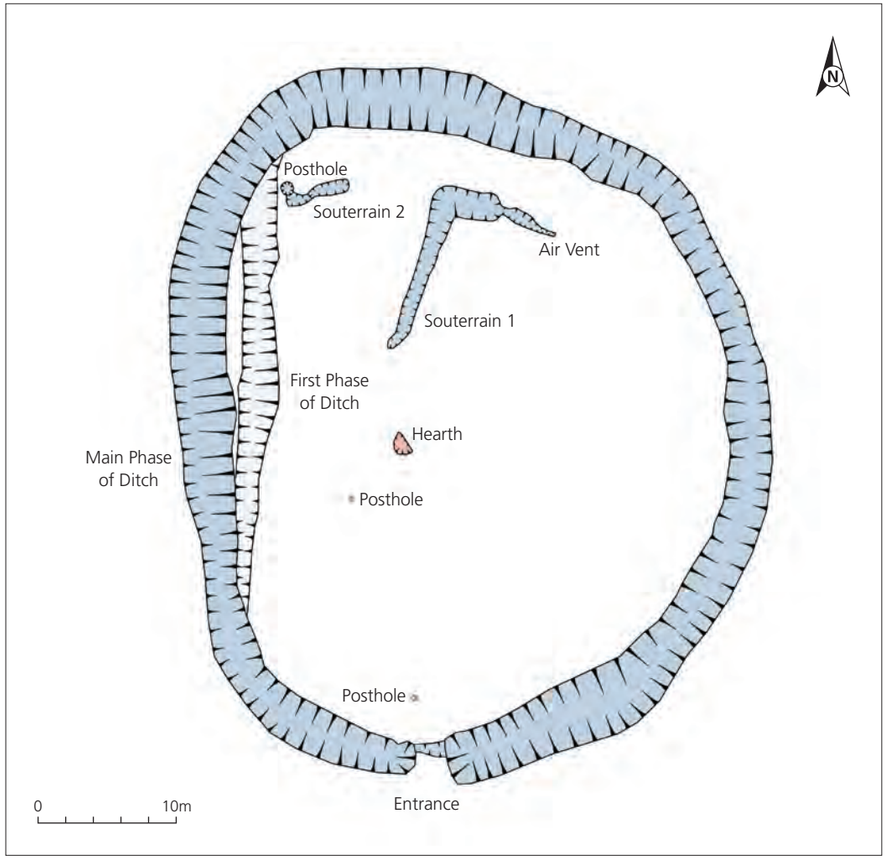
through the tunnel. Charcoal from the souterrain was radiocarbon dated to AD 882–995 (UBA-14196), which is consistent with the small number of sherds of Souterrain Ware pottery recovered from this feature.

A second smaller souterrain was present to the west of Souterrain 1. The entrance was stepped and the eastern side was stone lined. Souterrain 2 measured 2.8m long, 1m wide, and 0.65m deep. At its west end it stepped up in height and continued for 1.7m at a depth of 0.35m. At the end of this feature was a stone-lined pit measuring 0.9m in diameter and 0.6m deep. Souterrain 2 would have lain directly beneath the bank of the rath and the step would have resulted in restricted accessibility. There was no evidence for an air vent in this souterrain; however, it may have been destroyed by later agricultural activity. No radiocarbon dates were obtained from Souterrain 2.

It would appear that at least 30cm of soil was removed from the area around the souterrains by later agricultural activity and, as such, the original depths of these features would have been much greater. These souterrains may have been timber roofed as there was not enough stone in their fills to indicate a corbelled stone roof.

The rath at Carnmeen Site 23[30] was located c.1km west of Carnmeen Site 3. It was situated on top of a natural mound and encompassed an area 30m long and 29m wide. The site had been enclosed with a ditch and bank around the southern half of the hill while the northern half was defined by a natural steep slope. A small quantity of prehistoric artefacts (flint and pottery sherds) was recovered from

Plan of Rath at Carnmeen (Site 3)



the hilltop and its environs during the excavations. These artefacts could not be directly associated with any particular features and may represent scattered material from an earlier occupation phase disturbed during the early medieval period.

There were two clear phases of occupation. The first occupation phase was between the sixth and ninth centuries AD. During this period the ditch was constructed and the bank and the palisade were erected, along with one or more wooden buildings. The second phase occurred in the late 11th or early 12th centuries AD when a rectangular stone-built building was constructed on the hilltop.

Within the enclosure there was a souterrain, which may have been used during both phases of the rath's use. Outside the enclosure there were several areas of activity which included a second souterrain, two cereal-drying kilns, a metal-working area, a charcoal burning clamp, a furnace base, and some early field boundaries.

Aerial photo of Carnmeen (Site 23) under excavation © Headland

Carnmeen (Site 23) after excavation © Headland

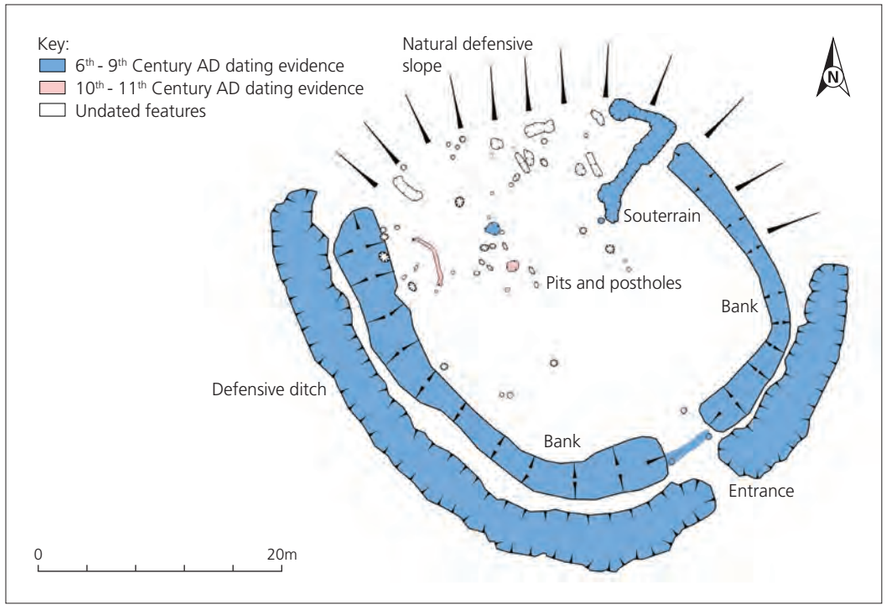
The rath was defended on the south and west sides by a ditch which measured 40m long, 3–4.9m wide, and up to 1.8m deep. Luminescence dating of the material within the ditch indicated that it was excavated at the end of the sixth century AD (SUTL-2168, SUTL-2170), with the last occupation deposits in the ditch dating to the mid-11th century AD (SUTL-2159). To the north a steep cliff face was utilised as the principal defensive feature. A stone and earth bank was located 1.5m to 3m inside the ditch. It survived to a width of 2–3.7m, and a maximum height of 0.4m. Running along the interior of the cliff edge there was a number of postholes and pits which may have represented the remains of a wooden palisade; however, this was not conclusive.

The entrance to the rath was to the southeast. In the first phase of the rath's use it was defined by a 2.5m-wide gap in the ditch and bank. Two postholes were directly associated with the entrance during this period: these were at the east and west sides of a shallow foundation trench which ran across the gap in the bank. The postholes were c.0.55m diameter and 0.55m deep, and may have supported a gate. The second phase of use saw the entrance widened to 5m (discussed below).

Early medieval occupation of the rath

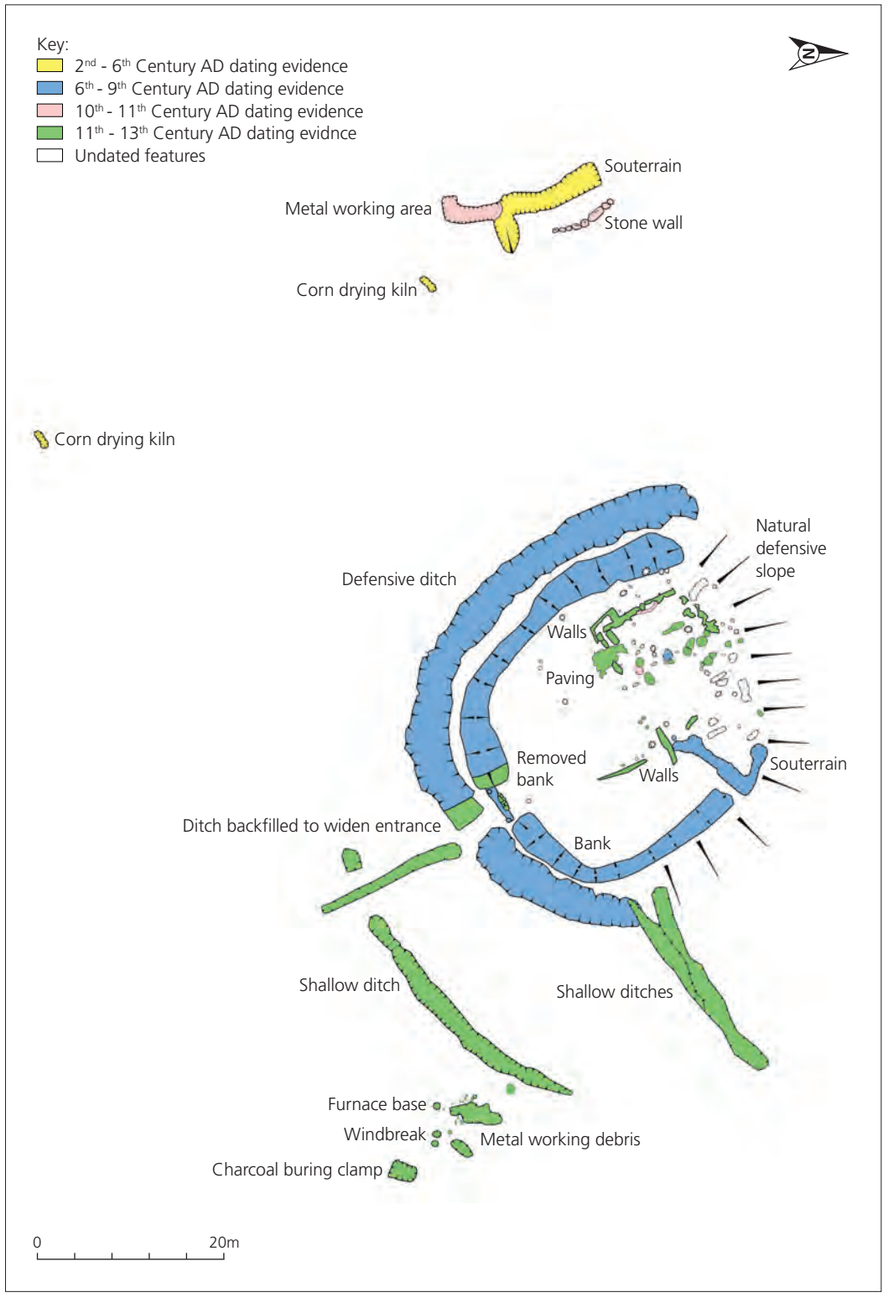
A total of five postholes and pits, a curvilinear gully and an L-shaped souterrain were dated to the early medieval period. A further c.50 postholes and pits may also have been from the early medieval occupation but were not individually dated. The postholes represent more than one structure, and may also be from replacement structures built on the same footprint. While it is not possible to clearly define each individual building, there is a concentration of postholes at the northern side of the interior which suggest that this was the main occupation area. The southeast edge of this concentration lay next to the western terminus of the souterrain. Here, two postholes could be marking an entrance into the souterrain. It should also be noted that the absence of more postholes may be due to the presence of rock outcroppings, making the insertion of posts in much of the hilltop difficult. The postholes may have been from houses, or possibly from smaller non-habitation structures, such as animal pens, outhouses, granaries, or windbreaks.[31]

A metalled surface ran around the western interior of the rath. This must have been laid to cover the soil in the rath, making it easier to walk around its interior. It would also have helped to stop shoes carrying mud into the buildings. This surface respected the postholes and pits from the first phase of buildings indicating that a different flooring was used within the buildings. This could potentially have been straw or reeds, as these would have decayed over time and would have left no trace in the archaeological record.



Phase 1 rath occupation at Carnmeen (Site 23) © Headland (amended by NAC)

Annotated plan of Carnmeen Site 23 © Headland (amended by NAC)



Souterrain within phase 1 rath at Carnmeen (Site 23) © Headland

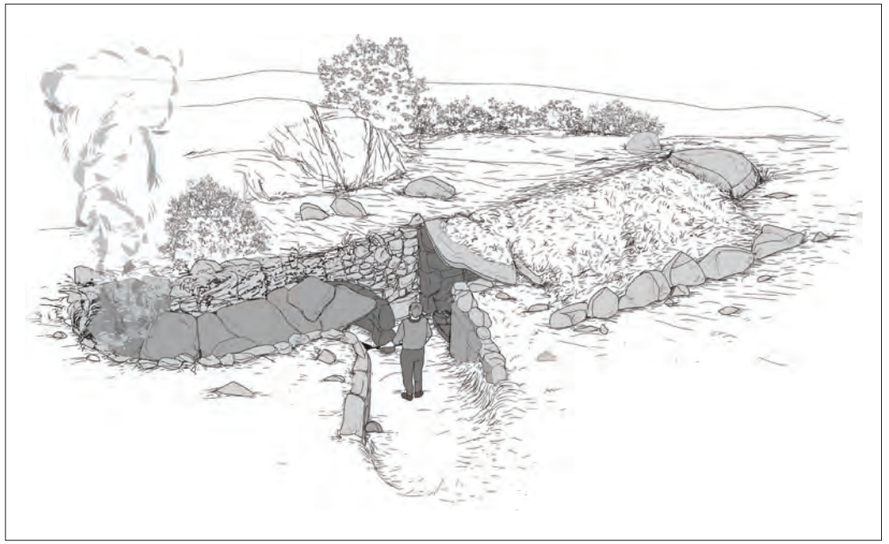
On the northern edge of the enclosure was an L-shaped souterrain which cut through bedrock and subsoil. The long arm of the L-shaped ditch was 9.7m long, 1–2m wide, and 1.1m deep with a small chamber towards the southern end on the western side. This chamber was 0.5m wide and 1m long and dry-stone walled. The shorter arm of the L-shaped ditch was 5.7m long, 1m wide, and 1.1m deep with a small circular chamber at the northern end which measured 2m in diameter. There was an entrance to the souterrain at the western terminus where the end of the tunnel had been rounded off. Towards the northeast end, near the corner, the walls of the souterrain were lined with dry-stone wall. These appear to have been built to stabilise the sides as the bedrock became patchy. The walls were slightly inset and angled out; where there was bedrock the walls were mostly vertical. The wider top suggests that the souterrain had a timber roof, rather than a corbeled stone roof, as corbeling would have necessitated a wide base narrowing at the top. The souterrain extended to the top edge of the cliff slope and it is likely that it could also be exited at this end. Charcoal from the souterrain dated to AD 535–768 (SUERC-23958, SUERC-23961). The construction of the souterrain was contemporary to the rath ditch and at least some of the postholes and pits found within this area. Artefacts recovered from within the in-fill of the souterrain indicated that it had been deliberately backfilled before the end of the 13th century.

Dating evidence from these early medieval features indicated that there were two phases of occupation, the first was from the late 6th century AD–9th century AD (rath ditch base; SUTL-2168, SUTL-2170, souterrain; SUERC-23958, SUERC-23961; and two of the postholes; SUERC-23978, SUERC-28018), the second phase in the 10th–11th centuries AD (rath ditch final early medieval occupation sediments, SUTL-2159, posthole, SUERC-23970, gully, SUERC-28019, and pit; SUERC-28020). There was a clear period of abandonment of the site between these two phases of occupation. This was identified as a layer of sterile soil which had built up over the first phase occupation material within the rath ditch, sealing it from the second phase occupation material above. This was followed by a medieval occupation phase and the construction of a stone building (see below).

Early medieval evidence outside the rath

A second souterrain had been partially constructed into a granite outcrop, 32m west of the rath. In its initial phase of use, the souterrain's main passage measured 17m long, 2m wide, and 1.8m deep. A dry-stone wall ran along the majority of its sides; it had collapsed in places. The northern and southern ends of the souterrain were slightly enlarged to form small chambers. A second passage ran south off the main arm of the souterrain; it was 3.5m long and 2m wide to the north, narrowing to 1m wide to the south where it had sloped up to the surface. This was the entrance to the souterrain; there was no indication of there being an exit point at either terminal. Immediately north of this entrance the passage was constricted by two large stones, on top of which a stone lintel would have rested. This narrowed the access into the northern part of the passage to 0.5m wide and 0.6m high. The souterrain's construction phase was dated to AD 377–542 (SUERC-23977, SUERC-23983) and suggests that it may pre-date the construction of the nearby rath.

The souterrain seems to have fallen out of use some years later. The northern section of the souterrain was blocked off, while the southern section was opened up and a set of lintels placed at a height of 0.2m above the floor. The exposed bedrock in this area had been oxidised and was covered in soot and a substantial quantity of carbonised cereal grains (principally oat, with lesser quantities of hulled barley and rye) was recovered. This evidence would indicate that the souterrain had been transformed into a large cereal-drying kiln. Multiple uses of the kiln was suggested by the presence of cleaned-out waste deposits behind the newly placed lintels. Charred grain from the kiln was dated to AD 884–1154 (SUERC-23957). A new entrance into the kiln was created on the east side of the souterrain to allow access to the kiln area. This entrance was defined by dry-stone walls formed from large stone blocks. Grain recovered from the entrance area dated to AD 1035–1155 (SUERC-23968, SUERC 23969). This dating evidence suggests that the cereal kiln was contemporary to the second early medieval occupation phase of the rath and was not used during the medieval occupation period.

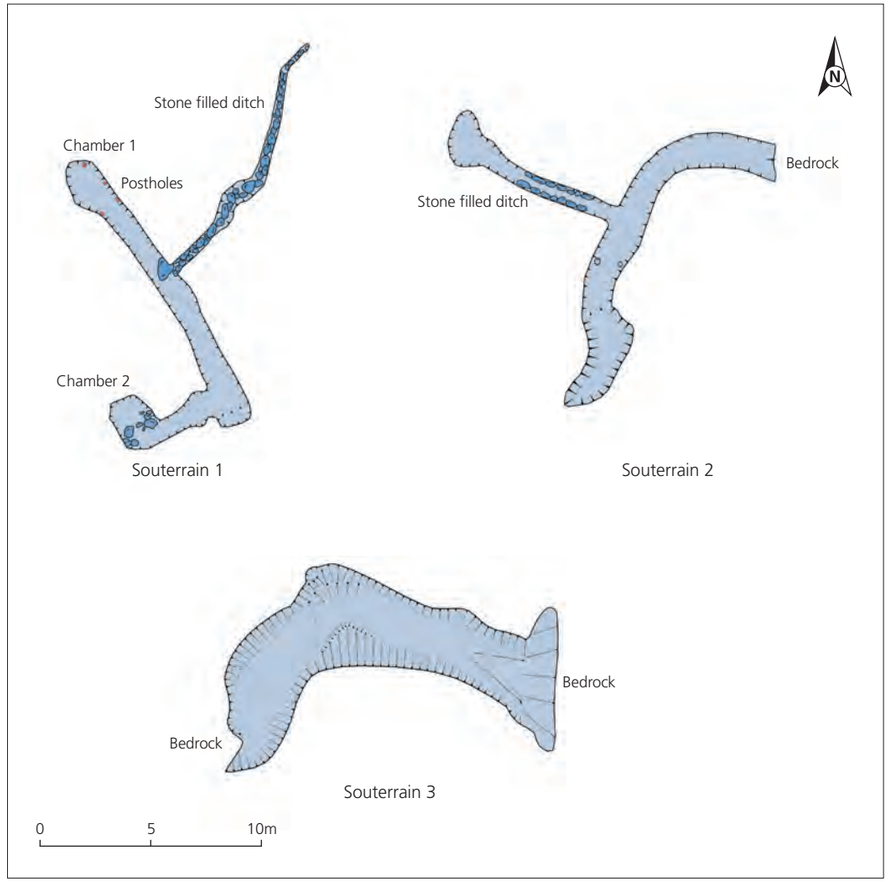


Reconstruction of cereal-drying kiln using the souterrain to the west of the rath at Carnmeen (site 23) © Headland

Immediately east of the souterrain, and running parallel to it, was a short section of wall 7m long, 0.60m wide, and up to 0.4m high. Two courses survived: the stones were all angular unworked field stones and shattered bedrock. The wall was of dry-stone construction, was contemporary to the cereal-drying kiln, and is likely to have utilised stones from the abandoned north end of the souterrain in its construction.

Souterrain to the west of the rath at Carnmeen (Site 23) © Headland

Souterrains at Glassdrummond (Site 10)



A defended hilltop – focus on the early medieval souterrains at Glassdrummond (Site 10)

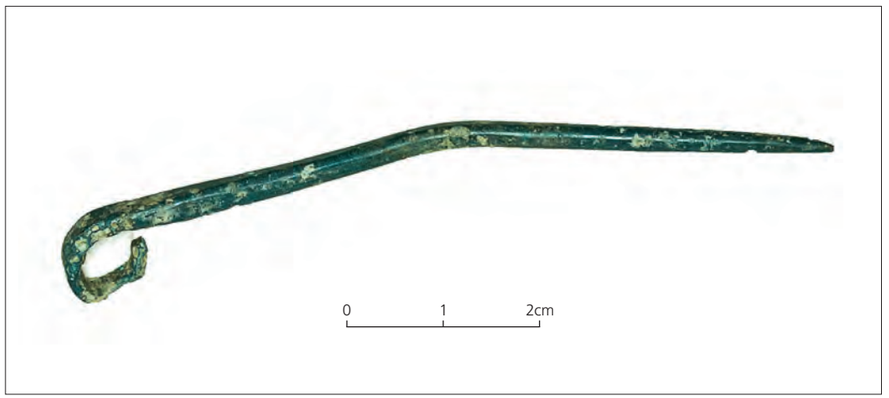
Glassdrummond (Site 10) was located across an exposed rocky outcrop with extensive views around the surrounding countryside. The site was first utilised during the Early Bronze Age, with evidence for sporadic occupation from this time, through the Iron Age and into the early medieval period.

In the early medieval period two substantial souterrains were constructed in the hollows between the bedrock outcrops. There was a small amount of evidence for structures beside these souterrains; however, with the bedrock so close to the surface any foundations would have been slight and have left no trace in the archaeological record.

It is likely that the occupants chose this location as they would have had good views over the surrounding terrain, and could have identified any potential threats from afar. This would have to some extent negated the need for a defensive enclosure ditch, a feature which would have been incredibly difficult to construct to any functional depth in this area due to the bedrock.

Souterrain 1 was located in the northern part of the Glassdrummond area. It was a 0.8m-deep, earth-cut, L-shaped tunnel with larger chambers at each end. The longest arm was 14m long and 1m wide, with the shorter arm being 7m long and 0.8m wide. Chamber 2 at the southern terminal was 2.5m long and 1.8m wide. Several large stones were found at the entrance to this chamber which may have been put in place to form a doorway. Chamber 1 at the northern terminal was 2.5m long and 1.6m wide. Four postholes found along the inside edge of this chamber may have held roof supports. As no large stones were found within the tunnel it may have been capped with timber, before being covered in soil. The main passage was radiocarbon dated to AD 770–901 (UBA-14848). An 11m-long narrow, stone-filled ditch capped with stones led off Souterrain 1 to the east. The function of this feature was unclear as it was too long to be an air vent. The basal fill of the air vent was dated to the period AD 656–768 (UBA-14846).

Several significant finds were recovered from the souterrain including two badly degraded iron knives and a loop-ended copper-alloy pin which was either part of pennanular brooch or a simple ring-pin. Brooches and pins were used to fasten garments, especially cloaks,[32] and though highly decorated examples do occur this artefact is of a very simple design. If this pin is part of a pennanular brooch it is Fowler's types A5 or H, thus suggesting a broad date range covering the early medieval period, possibly beyond the Anglo-Norman invasion.[33, 34, 35] Ring pins are found throughout the early medieval period and in absence of decoration a narrower typology for this example is not possible. Iron slag found within the infill of the souterrain showed that metalworking was being undertaken in the vicinity. Perhaps the two knives were manufactured at this site.



Ring-pin from Glassdrummond (Site 10)

On the same ridge, but 100m further south, there was a second souterrain. Souterrain 2 was also earth cut and dated to AD 675–770 (UBA-14839). Souterrain 2 was 16m long, 1.2m wide, and 0.75m deep. It curved northeast and rose to meet the bedrock at its eastern terminal; it is assumed that this was the entrance. The south end had a chamber 5m long, 1.6m wide, and 0.75m deep. Two postholes were located 7m north of this chamber and it is likely that they supported a door to seal off this end of the souterrain.

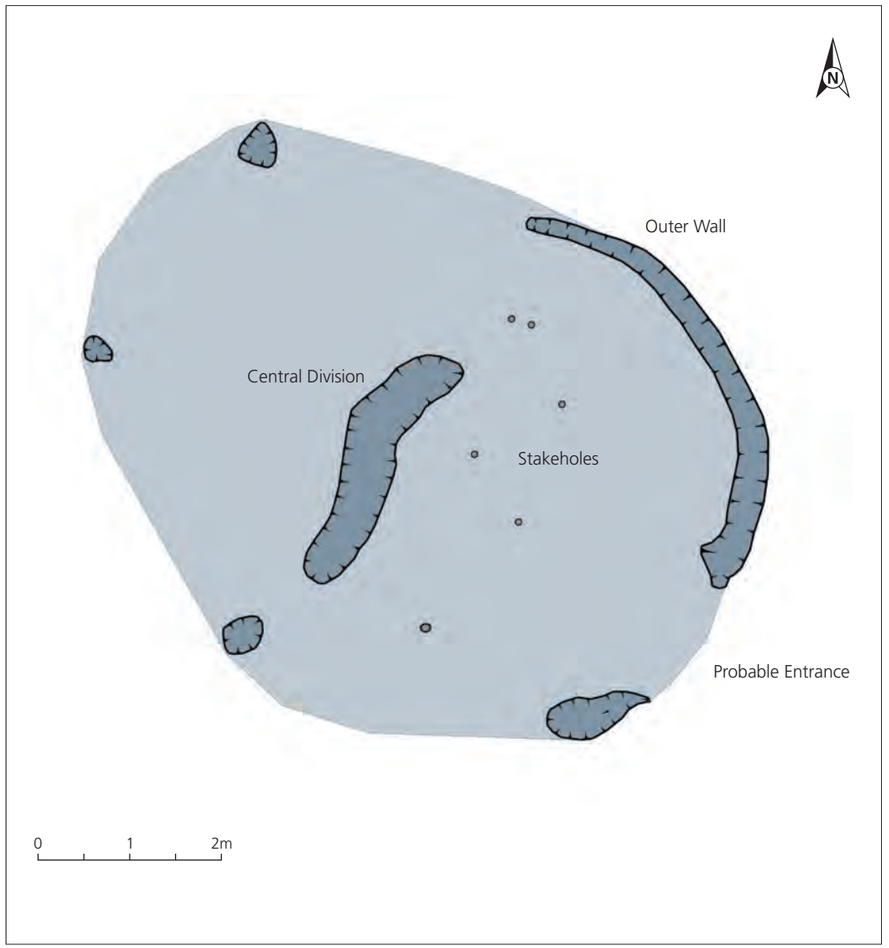
As with Souterrain 1, Souterrain 2 had narrow ditch running from it. This feature was lined and capped with stones, was 7m long, 0.6m wide, and 0.25m deep. A large pit beside the terminal of the feature provided an almost identical date, AD 671–770 (UBA-14842), to Souterrain 2. The precise function of this feature is also unclear. No evidence for any associated structure was identified in this area; most likely due to the presence of raised bedrock. Burnt animal bone, iron slag, and a large iron punch for hammering hot metal were recovered from the fill of these features. Although there is no archaeological evidence for house structures on this site it seems that the site was used for industrial activity, and people may also have been living here.

A third, earth-cut feature was located 50m to the south of Souterrain 2. This feature may have been a third souterrain. It was 14m long, 2.5–3m wide, and 0.82m deep, and was cut into the subsoil with no evidence for stone walling on the sides. It curved gently from west to east, rising in the east where it exited at the bedrock. A late Iron Age radiocarbon date in the period AD 241–359 (UBA-14843) was returned from within the fill of this feature. This pre-dates the known construction period for souterrains and suggests that the charcoal dated was either subject to old wood affect or came from earlier activity in the area. On balance it is most likely that this souterrain was also constructed in the early medieval period, however with its different construction morphology it may be from a different phase of occupation on the hilltop.

Other early medieval evidence

A house 8m long and 6m wide was excavated at Ballyvally. It was dated to AD 431–650 (UBA-12615), the start of the early medieval period and early in the currently dated range of early medieval house sites.[36] The house was defined by large, if irregularly shaped, postholes in the west and by a curving slot to the east, and it had a central division defined by a further slot. It is likely that the entrance was in the southeast corner to allow for maximum sunlight to enter the dwelling. The east side of the house was therefore the area where most activities occurred, with the west being either used for sleeping, storage, or possibly keeping animals safe at night. The arrangement of postholes with a single stretch of gully to form the house can also be seen in a small number of other early medieval houses, such as Drumadonnell, Co. Down.[37] The morphology and size of the house correspond with the early medieval radiocarbon dates. Indeed, during the early part of the early medieval period houses tended to be circular, before there was an increased trend towards rectangular examples.[38, 39]

Derrybeg (Site 13) provided limited evidence for early medieval agriculture with a small number of pits scattered across the site. One of these pits contained over 2000 burnt grains of barley. As the grains were burned beyond use it is likely that this was waste from an attempt to roast the grain in a cereal-drying kiln which went badly wrong. This material would not have been taken far from the kiln, and we can therefore assume that a cereal-drying kiln, must lie close to this site. The pit was dated to AD 425–544 (UBA-14867).



Plan of house at Ballyvally

Opposite: Loughbrickland Crannog[1] is a man-made island located in the centre of Loughbrickland Lough. The name Loughbrickland itself is derived from Loch Bricreann or 'Bricriu's lake'. The named individual appears in the tale 'Bricriu's feast', which is part of the Ulster Cycle of mythological tales, first written down in the early medieval era. The crannog itself may have been constructed as early as the Bronze Age and continued to be used sporadically until the 17th century AD when the Maginiss's (who could trace their lineage to the Ui Echach Cobha) may have re-fortified the island.

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.[2] The start of the medieval period is also marked by the Anglo-Norman invasion of Ireland which began in 1169.[3,4] The Earldom of Ulster was concentrated along the north and east coasts, taking in the land between Newry and Downpatrick, extending up the Ards Penninsula and incorporating all lands around Belfast Lough, the Glens of Antrim, and North Antrim.[5]

Even before the Anglo-Norman invasion people had begun to abandon the raths that had dominated the countryside previously. During the invasion the Anglo-Normans started to construct castles. While most of these took the form of the earth-built motte and baileys several stone castles, such as Dundrum Castle, Co. Down, and Carrickfergus Castle, Co. Antrim, were also constructed. A large number of towns and villages was also founded during this period, including Newry and Dromore. 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 5000 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, where the only significant medieval excavations were at Carnmeen (Site 24) where a rectangular stone building was located.

Medieval towns, villages, and defensive sites

Although the modern town of Dromore was established around 1610[7] its origins can be traced back to at least the medieval period. The records indicate that an abbey was established at Dromore by St Colman as far back as the 10th century AD.[8] Following the Anglo-Norman invasion a large motte and bailey was erected. Although the precise date of construction is unknown, reference is made to new buildings being constructed in the Pipe Rolls of John for 1211, suggesting the castle had already been standing for a number of years.[9] Undoubtedly a settlement would have been present at Dromore during this period, with some people serving the lord in the castle and others acting as a lay community for the church. By 1557 the town and the church lay in ruins.[10]

The first evidence for a settlement at Newry occurred during the earlier part of the medieval period when a Cistercian House was established. The precise date of the establishment of the house has been debated, though it appears to have been sometime between the 1140s[11] and the late 1150s.[12] During the Anglo-Norman conquest a castle was erected in Newry, guarding the road through the mountains.[13] It is believed that this first castle was destroyed by the remnants of the retreating Scottish, Bruce army following their defeat at the Battle of Faughart in 1318.[14, 15]

Dromore Motte and Bailey[16] © DOE:HED

Medieval socketed spearhead from Hillsborough, Co. Down (BELUMa50.1924) © NMNI Collection Ulster museum, medieval axe head from Magheravally, Co. Down (BELUMa42.1924) © NMNI Collection Ulster museum

A second castle was built on Mill Street,[17] and should not be confused with the later Bagenals Castle (see Chapter 9). This too was destroyed, this time by Shane O'Nial in 1480.[18] As with Dromore although there is no specific reference to a town at Newry during the medieval period, there clearly would have been some form of settlement that served both the castle and the abbey.

A range of other important medieval sites also lies in close proximity to the Road Scheme. These include Loughbrickland Crannog (Bronze Age to 17th century AD), Dromore Motte (early 13th century AD) and Drummiller 'Mount Mill' Motte[19] (12th/13th century), all of which are visible from the A1 Dual Carriageway. Medieval artefacts recovered in the area include a spearhead from Hillsborough and an axe from Magheravally.

Medieval re-occupation of a rath and its surroundings – focus on Carnmeen (Site 23)

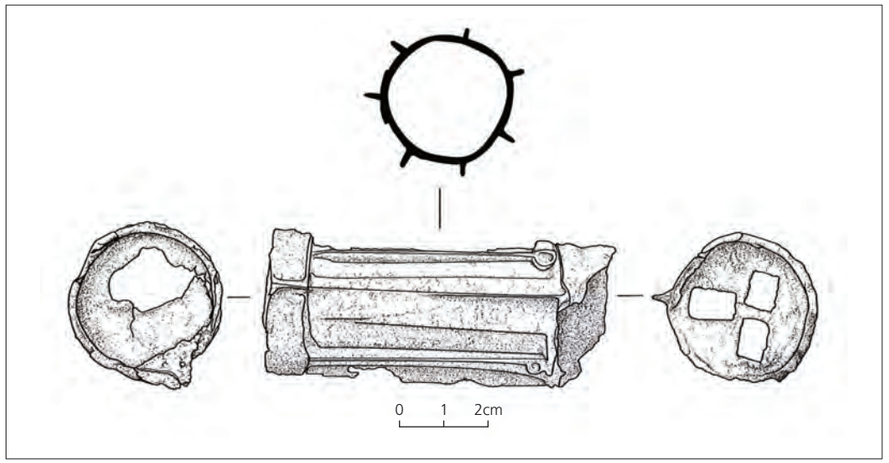
The rath at Carnmeen (Site 23) was constructed in the early medieval period. A layer of undisturbed soil developed within the ditch following the early medieval occupation. This layer indicates that there was a short period of abandonment. The site then underwent extensive re-use and renewed activity during the medieval period.

During the medieval period the access through the ditch was altered and a stone-built rectangular building was constructed on the western side of the hilltop. The entrance was widened to 5m by partially demolishing the bank at its western side. The foundation trench for the original gate was widened and a low stone ramp was added along its northeast edge. It is assumed that a new gate was fitted here and the stone ramp acted as a back stop to prevent it opening inwards. Everted rim ware pottery from within the rubble at the widened entrance suggested that this occurred during the 12th century AD. The material from the demolished bank was then used to fill the ditch, and was supported by a stone revetment wall within the ditch.

The walls of the building were 0.4–0.6m wide and constructed from granite blocks bonded with a poor quality lime mortar. The exterior faces of the stones in the walls had been roughly squared off. The main walls of the building ran north–south and east–west for 8.5m and 6.7m, respectively. In the southwest corner of the structure were six further walls which most likely represented the foundations of a small tower or the remains of stairs, indicating that this structure may have had two storeys. A gap in the main east–west wall located 3m from its junction with the north–south wall was most probably the door into the structure. Roughly worked stone paving slabs ran from the exterior of the house into the interior of the building through this doorway. It is probable that this structure was a hall-house as similar floor plan layouts were recorded in the early 13th century Anglo-Norman hall-houses at Kilmacduagh and Annaghkeen, both in Co. Galway.[20] A structure of similar size was also identified at Rathmullan, Co. Down.[21]

The interior of this structure was covered in an occupation layer which contained burnt clay (possibly daub: a wall covering made from mud, grass, and manure), as well as metallic waste, some burnt bone, and occasional charred cereal grains and nutshell. In total, 377 finds predominantly dating to the 13th century AD were recovered; these included pottery sherds that may represent a transition between souterrain ware and everted-rim ware Type A.

Stone building at Carnmeen (Site 23) © Headland



Medieval padlock recovered from Carnmeen (Site 23) © Headland

An Edward I silver penny dating to AD 1280–1282, a small gold off-cut, a metal chain, five glass beads, and toggles, and two copper stick-pins were found in close proximity to the house, as were the remains of at least five barrel padlocks. These were likely to be contemporary with the building's occupation and indicate not only the wealth of the occupants but the security precautions they were taking to secure this wealth. A small stone wall to the east of the rath was on the same alignment as this building. It is possible that it represents part of a second building; however, in absence of further structural elements this is not conclusive.

The uppermost layer of occupation material contained a large amount of charcoal. This could indicate that the end of the building's occupation was due to it being destroyed in a fire. A burnt hazelnut shell from this layer dated to AD 1190–1285 (SUERC-23963), confirming the evidence from the recovered artefacts. On balance, it is likely that the site was abandoned around the end of the 13th century and then reverted to farmland.

An iron-working area was identified to the south of the rath. A line of 18 stakeholes and two postholes ran across the centre of this area. These features may have held supports for a windbreak, or supported a roof. In the base of one of the postholes there was a quern stone, used for grinding grain to make flour. Other features in this area included the remains of a furnace base, a large shallow pit which contained metalworking debris, including pieces of crucible, iron slag, and pieces of kiln base, and a large rectangular pit that measured 3.20m long by 2m wide. This may represent a charcoal-burning clamp kiln. Charcoal was a vital component in the iron-working process and was used to heat the furnace to a high enough temperature to smelt the iron from the ore. It would also have been used to soften the iron when the blacksmith was working it.

Glass beads and toggles, Edward I silver penny dating to AD 1280–1282, and a small gold off-cut from inside the rath at Carnmeen (Site 23) © Headland

It has been noted that metalworking was mainly undertaken at a distance from main settlements.[22] This was due to increased risk of a fire from the smithing area accidently spreading to the houses in the settlement. Between this working area and the rath there were several shallow ditches; these were part of the second phase of activity on the site and may represent the remains of 11th - 12th century field boundaries contemporary to the later phase of occupation at this site. An oat grain from this area was dated to AD 1220–1306 (SUERC-23942) indicating its use was contemporary to the medieval occupation of the rath.

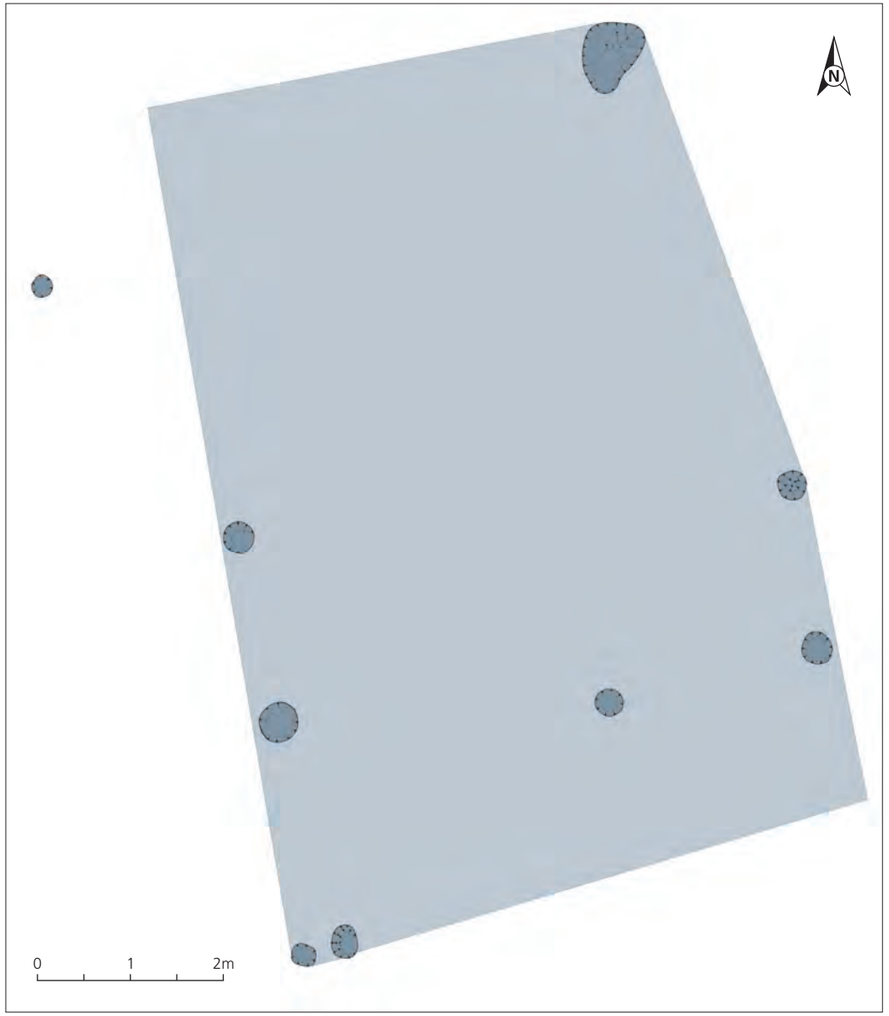
The medieval occupation of the rath at Carnmeen (Site 23) was part of a much wider medieval landscape, as exemplified by the presence of the Anglo-Norman Drummiller motte c.500m due west of the rath. Even though no excavation or precise dating of this motte has taken place, motte building did not extend beyond the 13th century[23] which would suggest that Drummiller motte and the possible hall-house at Carnmeen (Site 23) were contemporary. The two sites are also linked by the lands on which they were erected. During this period the lands around Carnmeen were held by the monastery in Newry. It is possible that both the motte and the hall-house were built by the monastery to house and protect the people who worked their land.[24]

Other medieval evidence

Among the Bronze Age features at Carnmeen (Site 5) one curving pit returned a radiocarbon date of AD 1317–1425 (UBA-12842). It is not clear what function this pit served but grains of oats, barley, and wheat as well as pieces of hazelnut shell were all recovered from the fill.

At Derrybeg (Site 14) hazel charcoal from an isolated pit returned a radiocarbon date of AD 1264–1385 (UBA-13465). This pit is likely to be the remains of a small campfire and is a clear indication of people moving through the landscape during the medieval period.

Finally at Quilly, on the outskirts of Dromore, the disturbed remains of a single late medieval structure were identified. The structure measured 7.60m long and 6m wide and had been built using posts. A piece of charcoal from one of the corner posts returned a radiocarbon date of AD 1443–1625 (UBA-12659). Unfortunately, there were no artefacts associated with this building so it is unknown if it was a house or a barn.



Plan of Structure at Quilly

Opposite: Craigmore Railway Viaduct[1] which was built between AD 1851 and 1852 by William Dargen for the Dublin and Belfast Junction Railway Company. It is formed from 18 arches, each spanning 60 feet and ranging from 70 to 140 feet in height. It was designed to carry trains across the Camlough River Valley and is still in operation today.[2]

Post-medieval to the present day

The post-medieval period in Ireland begins around the middle of the 16th century when the English monarchy began carrying out plantation schemes in Ireland. This period is notable for several long and bloody wars,[3] but it is also marked by the foundation of many of Ireland's towns, including Hillsborough, Banbridge and Loughbrickland, as well as for the growth of existing medieval settlements, such as Dromore and Newry, both of which were destroyed by war, and then rebuilt during the 17th century.

During the post-medieval period, industry reached its zenith during the Industrial Revolution when Ireland became a vitally important producer and manufacturer of goods for the British Empire. This period also saw extensive land clearance with more ground required for agriculture to feed an ever increasing population, which peaked at eight million people in Ireland immediately before the great famine.

As large road schemes tend to be carried out in open country, the post-medieval archaeology uncovered tends to be limited to either agricultural or rural industrial activities. This Road Scheme follows this trend with a 19th century mill race and ponds recorded at Carnmeen (Site 4), a 19th century field boundary at Carnmeen (Site 6), 19th century farm buildings at Derrybeg (Site 14), a 19th century stone drain at Derrybeg (Site 16) and a 19th century cottage at Carnmeen (Site 24). A range of important post-medieval sites also lies in close proximity to the Road Scheme. These include the Craigmore Rail Viaduct, Newry Canal,[4] and numerous mills associated with the linen and cereal processing industry.

Post-medieval sites discussed within this chapter

Towns and villages

The village of Hillsborough was originally established around the castle that was constructed during the 1650s.[5] In 1660 the castle was made a Royal Fortress by Charles II.[6] By 1744 the town was not only well-established, but the then Lord was already planning a new town based around a square with a large market house.[7] Clearly the lord carried through with these plans, and the village still maintains the open square and impressive market house today.

Although the town of Dromore can trace its origins back to the medieval period[8] it went through periods of dereliction and rebuild during the post-medieval period. At the start of the period the town had few houses and the church was in ruins.[9] By 1610 a castle or tower house had been constructed on Castle Street[10] but the town was destroyed during the Irish Rebellion of 1641.[11] The

Remains of the small castle or tower house on Castle Street, Dromore; which dates to AD c. 1610[12]

town was rebuilt and, with the erection of a market house, prospered with the linen industry that was so prevalent through the Lagan Valley.

The town of Banbridge was established at the beginning of the 18th century, and centred on a new crossing over the River Bann.[13] With the growth of the linen industry the town also grew in size and importance, with its market handling large quantities of linens from nearby mills.[14]

The village of Loughbrickland was established by Sir Marmaduke Whitchurch after receiving lands from Queen Elizabeth in 1585.[15] As with many towns and villages in this area Loughbrickland was destroyed during the Irish Rebellion of 1641[16] and it was not until 1688 that the church was rebuilt and the village improved.[17] Despite being situated on the main Belfast to Dublin Road Loughbrickland never grew beyond a village, mainly due to its close proximity to the market town of Banbridge.[18]

The first evidence for a settlement at Newry occurred during the earlier part of the medieval period when a Cistercian House was established. The date of the establishment of the house has been debated, though it appears to have been sometime between the 1140s[19] and the late 1150s.[20]

It was not until the 16th century and the arrival of Sir Henry Bagenal that the town really began to

Bagenal's Castle was constructed in the mid-16th century AD.[21] After falling out of use as a castle it was used as a warehouse and store, eventually becoming enveloped within the walls of McCann's Bakery. In 1996 the castle was rediscovered, and through careful restoration, it can now be visited as part of the Newry and Mourne Museum.

Newry Canal which was constructed between 1731 and 1742 to link Lough Neagh with Carlingford Lough.[22]

grow.[23] In the course of building the town Henry Bagenal also constructed a castle, named after himself, and St Patrick's church.[24] As with Dromore and Loughbrickland, Newry suffered in 1641 during the Irish Rebellion[25] and again in 1689 during the Williamite Wars.[26] In 1731 construction began on the Newry Canal, which linked Lough Neagh with Carlingford Lough, and was completed in 1742.[27] Even before the construction of the canal Newry was growing as a port, but with the canal bringing coal and goods into the town Newry rose to became one of the largest ports in Ireland by the 1770s.[28] With the port, industry and wealth also grew, and this wealth can be seen in many of the fine buildings which still stand in Newry today.

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 stage of the production of linen. Indeed, by the end of the Victoria era the north of Ireland was home to the largest linen industry in the world.[29] Two sites along the Road Scheme provided evidence for this industry, these were Carnmeen (Site 4) and Carnmeen (Site 24).

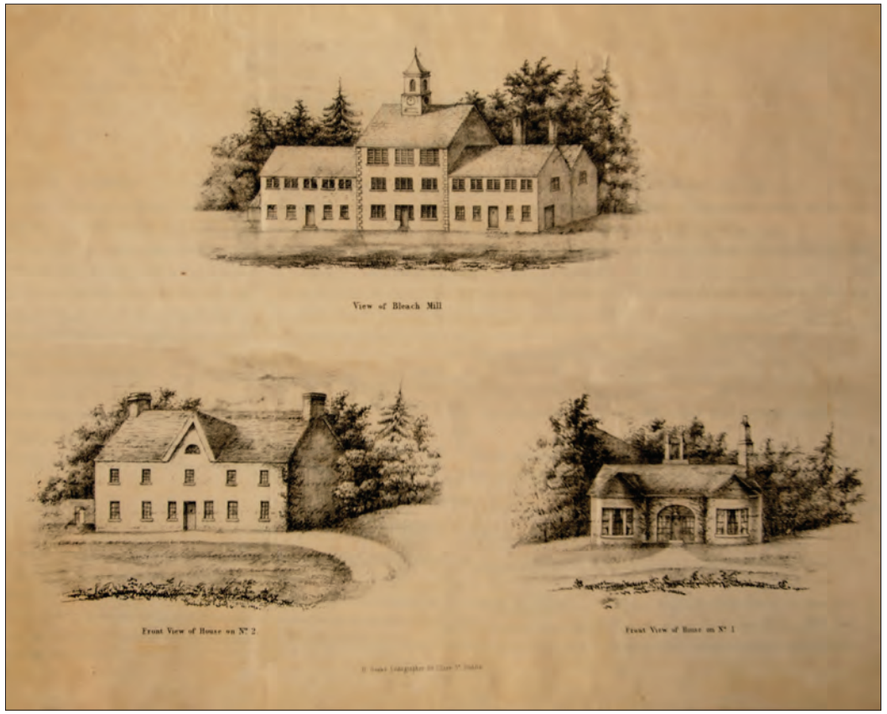
Carnmeen (Site 4) produced evidence for the early stages of linen production in the form of a pair of retting ponds. Retting ponds were large shallow ponds in which flax was laid, usually with heavy weights on top, and allowed to soak for about two weeks.[30] This caused the flax stems to start to rot and loosened the flax fibres from the harder, outer casing.[31] After they had been soaked, the flax was taken to a scutching mill where the flax stalks were broken down and the fibres were combed out.[32] These fibres were then spun into yarn and then woven into linen.[33] The retting ponds lay partially outside the area of the road take, and therefore their full extent was not excavated. However, it was clear from the ground topography that Pond 1 measured 5m long, 3.8m wide and 0.3m deep and Pond 2 measured 6m long, 4.4m wide and 0.3m deep. A series of channels ran off from the ponds. The purpose of these channels was to allow water to be let into the ponds and for the ponds to be drained. As the purpose was for the water to be still, some form of gate would have been employed to seal off these channels from the ponds when the retting process was taking place. No evidence of these gates was uncovered.

Carnmeen (Site 24) contained the most complete building that was excavated along the Road Scheme. This building was formerly known as Carnmeen Cottage. It was located on an estate, which included a bleach mill and a large estate house (Carnmeen House), and it is believed that the cottage was the residence for one of the mills principal managers.[34] While the large estate house has also been demolished the mill building, though derelict, is mostly intact.

Carnmeen Cottage was first recorded on the 1834 Ordnance Survey Map where it appeared as two separate buildings, the cottage and outbuildings. By the time that the 1859 Ordnance Survey Map was produced, the two buildings had been amalgamated to create one large building. The excavation uncovered most of the footprint of the cottage and only about half of the footprint of the outbuildings, the rest having been removed when the cottage was demolished.

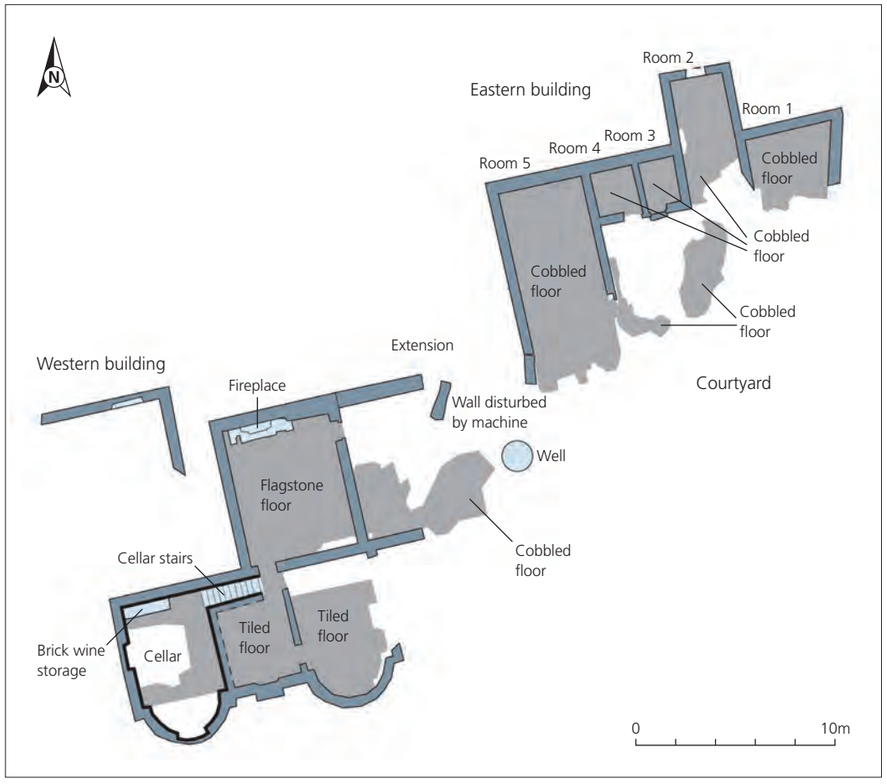
Carnmeen Cottage was constructed from large blocks of cut and faced granite. The front of the cottage had two large, south-facing, bay windows, which would have provided the occupants with superb views down the Newry River valley towards the town itself. The door was located centrally within the front of the house, with a bay window on either side. After passing through the front door there was a hall, which measured 4m^2, which had been tiled. To the east was a large room,

Pre-1853 lithograph of Carnmeen Cottage (bottom right), the estate house and the bleech mill. Image courtesy of © Newry and Mourne Museum



The upstanding remains of the bleech mill at Carnmeen (Site 24)

which measured 6.30m long and 4m wide. This room had one of the bay windows and the floor had been tiled in a similar fashion to the hall. This would probably have been the parlour. To the west of the hall there was a second large front room. This room had the same dimensions and a similar bay window to the eastern room, but the floor had been removed and an underlying cellar exposed. This room would have been used as a day-to-day living room by the family. The cellar was nearly 2m deep, and was accessed by a set of stone steps, which were located at the rear of the hall. Unlike the rest of the floors in the cottage, the floor of the cellar was cobbled. The remains of a vaulted brick-built structure would have provided storage space. Attached to the back of the hall was a large room, measuring 6m long and 4m wide, with a flagstone floor and a large fireplace; a second door was present in the western wall. Initially this led outside, to the outbuildings, and laterally into the extension. This room would have been the kitchen for the house. The remains of a wall and a possible wooden floor lay to the west. These would have formed further rooms, probably bedrooms as there is no evidence of a second storey. Access would have come through the hall, most likely at the rear and beside the family living room.



Plan of excavations at Carnmeen Cottage © Headland (amended by NAC)

Carnmeen Cottage western building © Headland

The extension that joined the cottage to the outbuildings differed from the cottage in that it was constructed from red brick as oppose to granite. The floor had originally been cobbled and had been covered in a layer of concrete at some later stage. A well was uncovered at the eastern end of this room. Given its position with access from the kitchen it is likely that this was the scullery, where preparation, laundry, and cleaning could be carried out. The presence of fragments of toilet bowl also suggests that a plumbed toilet was present within this area.

Like the cottage, the outbuildings had been constructed from cut and faced blocks of granite. On the maps the building was shown as a C-shaped structure with a courtyard in the centre. Five rooms were identified, all with cobble floors which had been covered with a layer of cement at a later date, the same as the scullery. All of the rooms varied in size and, with the exception of Room 3, provided no evidence for their use. The floor and walls within Room 3 had been stained black indicating that this had been used as the coal store for the cottage. The rest of the rooms would have been used for storage and some were undoubtedly used as stables.

The majority of artefacts from the cottage site came from the cellar in the cottage and from the large Room 5 in the outbuildings. The artefacts were all domestic in nature: pottery, cutlery, glass bottles, and jelly moulds.

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 many of the fields, as well as the farmhouses and barns that are dotted round the landscape. Post-medieval farming is also responsible for all of the post-medieval pottery that is uncovered in fields. It was common practice to manure the fields with all of the rubbish from a town or village. This is why it is very common for archaeologists to find broken pieces of pottery, glass, and clay pipe in fields when there are no towns nearby.

In addition to the Neolithic activity at Carnmeen (Site 6) (see The Neolithic chapter) evidence for farming in the post-medieval period, in the form of a series of shallow linear features, was uncovered. These linear features were the remains of a field boundary and plough marks. Throughout the post-medieval period fields were divided in a variety of different ways, including fences, ditches, and hedges. Archaeologists frequently come across the remains of these old boundaries, which have either fallen out of use, or been decommissioned. At Carnmeen the boundary took the form of a ditch which was over 25m long, 1.30m wide and 0.25m deep. It is likely that a small bank and a hedge would have run along the side of the ditch. Pieces of red brick from the fill of this boundary indicate that it dated to the post-medieval period.

Field drains are also common features of agricultural land, and often take the form of a simple linear cut filled with stones which is then covered over. At Derrybeg (Site 16) a large (15m long, 1.50m wide and 0.80m deep) and impressive 'French' style drain was uncovered.[35] These drains are named after the American who first wrote and discussed them. Such drains consist of a large trench which is cut across the field, then edged with stone walls, lined with a layer of small rounded stones, and finally capped with larger flat stones.

The remains of wall footings, believed to belong to old farm buildings, were excavated at Derrybeg (Site 14). These footings took the form of lines of stones, which would have supported the walls of a house or barn. Most of the buildings had been destroyed, the stone probably having been taken to be re-used elsewhere. As the site had been so badly disturbed it is not possible to tell what form this farm took, but it is probable there would have been a small cottage and several outbuildings.

Opposite: Excavations near completion at the Bronze Age stake-built structures at Derrybeg (site 12) © Tony Corey, DOE:HED

Conclusions

The archaeological investigations along the Road Scheme provided evidence for occupation from the middle of the Mesolithic period (c.6000 BC) through to the end of the post medieval period (c.AD 1914). Settlement was focused on drumlin ridges as they have freely draining soils which are suitable for growing crops. These areas proved to be so attractive that they had multiple phases of occupation throughout the prehistoric and historic periods. The hollows between these ridges were waterlogged and were principally utilised for the construction of burnt mounds in the Bronze Age period. The importance of agriculture, and in particular cereal production was identified; with oats, barley and wheat; as well as quern stones and rubbing stones, found on the majority of the domestic occupation sites excavated. Cereal-drying kilns were also recorded at the Bronze Age site at Carnbane (Site 9) and the early medieval site at Carnmeen (Site 23). These were used to dry the grain prior to grinding for flour.

Neolithic ring barrow and Bronze Age timber circle at Derrybeg (Site 12) © Tony Corey, DOE:HED

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 continuous occupation. These sites included the Neolithic settlement at Ballintaggart where three large rectangular houses were constructed, the Bronze Age settlement at Quilly which contained five roundhouses, and the rath at Carnmeen (Site 23) which was occupied in at least two phases during the early medieval period and again in the medieval. These sites provided a valuable insight into the changes in dwelling construction over time.

As well as settlement, there was also evidence for the burial practices of the prehistoric population in the area. A number of isolated cremations were recovered, including the Bronze Age urn cremation cemetery at Derrybeg (Site 12) and the isolated cremations placed close to the Bronze Age barrow cemetery at Quilly. There was also evidence for prehistoric inhumations from the Iron Age cemetery at Carnbane (Site 15). The main burial monument was, however, the ring barrow. Two very large Neolithic ring barrows were excavated at Derrybeg (Site 12), smaller Bronze Age barrows were found clustered in the barrow cemeteries at Ballintaggart, Derrycraw, and Quilly. Continuity of this tradition of burial practices was noted by the presence of Iron Age barrows at Carnmeen (Site 5), Glasdrummond (Site 7), and Corcreeghy (Site 8). No evidence was found for the burial practices of the early medieval and medieval population living in the area. However, this was to be expected, as at this stage inhumation without grave goods was the common practice and this leaves little surviving evidence in the archaeological record.

The only site where industrial activities were identified was Carnmeen (Site 23) where the medieval phase provided evidence for metal-working, including the production of gold objects. At this time the site may have contained a large number of valuable resources as five padlocks were recovered from the hilltop.

In conclusion, the excavations shed light on the nature of the dwellings the people lived in, the burial practices undertaken, the domestic and funerary artefacts they used, and on a few of sites the jewellery and ornamentation worn. This volume encapsulates the essence of the archaeological sites recorded, and provides a detailed summary of the findings of the 200 or so archaeologists who worked on the Road Scheme.

Removal of the last Bronze Age cremation at Ballintaggart © Tony Corey, DOE:HED

Chapter Notes

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The Bronze Age

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Tables

Table 1: Summary of cremations at Derrybeg (Site 12)

Feature	Pit/cist size	Pottery	Radiocarbon dates
Cremation 1 (Cist)	0.31 x 0.26 x 0.41m	Inverted decorated Vase Urn (2000–1740 BC)	2301–2194 BC (UBA-14865)
Cremation 2 (Cist)	Deposited on top of cist	None	No date
Cremation 3	0.63 x 0.63 x 0.45m	Inverted decorated Collared Urn (1850–1700 BC)	1953–1810 BC (UBA-14864)
Cremation 4	0.64 x 0.6 x 0.25m	Inverted decorated Cordoned Urn (1730–1500 BC)	1695–1612 BC (UBA-14866)
Cremation 5	0.3 x 0.38 x 0.35m	Inverted plain Vase Urn (2000–1740 BC)	No date
Cremation 6	0.49 x 0.45 x 0.13m	None	No date

Table 2: Summary of ring barrows at Ballintaggart

Feature	Internal Diameter	Ditch width	Radiocarbon dates
Ring Barrow 1	2.4m	0.4–0.7m	1306–1022 BC (Beta-216911)
Ring Barrow 2	3.7m	0.65–0.85m	1304–822 BC (Beta-213587, Beta 224301)
Ring Barrow 3	0.8m	0.2-0.4m	1628–1384 BC (Beta 213584)
Ring Barrow 4	2.7m	0.22–0.46m	1207–782 BC (Beta-216909, Beta-223392)
Ring Barrow 5	1.6m	0.6–0.7m	1130–803 BC (Beta-213589, Beta-217352, UBA-7287)
Ring Barrow 6	3.5m	0.3–0.4m	1018–766 BC (Beta-216906)
Ring Barrow 7	2m	0.8–1.2m	1217–1013 BC (UBA-7289)
Ring Barrow 8	2.5m	0.9–1m	1190–927 BC (UBA-7290)
Structure 1	2m	n/a	1129–929 BC (Beta-213586)

Table 3: Summary of cremations at Ballintaggart

Feature	Pit size	Pottery	Burial details
Cremation 1 (Ring Barrow 1)	0.7 x 0.7 x 0.2m	Upright Bucket Urn	1 female adult (aged 25–45)
Cremation 2 (Ring Barrow 2)	0.56 x 0.33 x 0.18m	Single Fragment	Partial of 1 adult male (over 35)
Cremation 3 (Ring Barrow 2)	0.94 x 0.58 x 0.22m	Single Fragment	Partial of 1 adult male (over 35)
Cremation 4 (Ring Barrow 3)	0.26 x 0.23 x 0.12m	No	Partial of 1 juvenile (aged 10–15)
Cremation 5 Ring Barrow 3)	0.26 x 0.23 x 0.12m	No	Partial of 1 adult (age unclear)
Cremation 6 (Ring Barrow 4)	0.6 x 0.6 x 0.35m	Upright Urn	Partial of 1 adult (aged 25–35)
Cremation 7 (Ring Barrow 5)	0.93 x 0.74 x 0.48m	No	1 juvenile (aged 8–14)
Cremation 8 (Ring Barrow 5)	0.55 x 0.55 x 0.23m	No	1 Adult (aged 25–45)
Cremation 9 (Ring Barrow 6)	0.42 x 0.16 x 0.17m	No	1 juvenile (aged 13–18)
Cremation 10 (Ring Barrow 7)	1.23 x 1.2 x 0.2m	Upright Urn	1 female adult (aged 25–45), 1 juvenile (aged 3–6), partial of 1 newborn
Cremation 11 (Ring Barrow 8)	0.4 x 0.4 x 0.3m	Upright Vase Urn (top missing)	1 female adult (aged 25–35)
Cremation 12 (Structure 1)	0.7 x 0.3 x 0.55m	No	Partial of 1 adult female (aged 25–45)
Cremation 13 (Structure 1)	0.7 x 0.3 x 0.55m	No	Partial of 1 adult male (aged 25-45)

Table 4: Summary of ring barrows at Derrycraw

Feature	Internal Diameter	Ditch width	Radiocarbon dates
Ring Barrow 1	5m	1–1.3m	1661–1278 BC (Beta-217351)
Ring Barrow 2	2.7m	0.4–0.7m	1502–1191 BC (Beta-213588)
Ring Barrow 3	1.5m	0.2–0.5m	1301–902 BC (Beta-217349)
Ring Barrow 4	3.5m	0.4–0.7m	No date
Ring Barrow 5	1.2m	0.3–0.7m	1543–1212 BC (Beta-216910)

Table 5: Summary of ring barrows at Quilly

Feature	Internal Diameter	Ditch width	Radiocarbon dates
Ring barrow 1	3.9m	0.5–1.2m	938–832 BC (UBA-12638)
Ring barrow 2	5.5m	0.9–1.3m	1426–1270 BC (UBA-12650, UBA-12657)
Ring barrow 3	2.4m	0.7–0.9m	1391–1188 BC (UBA-12649)
Ring barrow 4	6.8m	0.9–1.4m	1420–1222 BC (UBA-12644)
Ring barrow 5	4.6m	0.6–0.8m	1503–1292 BC (UBA-12640)
Ring barrow 6	2.6m	0.5–0.7m	1394–1156 BC (UBA-12653)
Ring barrow 7	5.5m	0.9–1.4m	1405–1191 BC (UBA-12642)

Table 6: Summary of cremations at Quilly

Feature	Pit size	Pottery	Burial details	Radiocarbon dates
Cremation 1	0.8 x 0.6 x 0.27m	Upright urn	2 adults, 1 juvenile (aged less than 12)	No date
Cremation 2 (Ring Barrow 6)	0.5 x 0.5 x 0.13m	Fragments	Partial of 1 adult	No date
Cremation 3	0.48 x 0.48 x 0.13m	Single Fragment	Partial of 1 adult	No date
Cremation 4	0.44 x 0.22 x 0.19m	Upright urn	1 adult	No date
Cremation 6	07 x 0.56 x 0.15m	No	Partial of 1 adult	No date
Cremation 7	0.34x 0.34 x 0.09m	No	1 adult female	1266–1006 BC (UBA-12639)

Feature	Pit size	Pottery	Burial details	Radiocarbon dates
Cremation 8	0.79 x 0.6 x 0.19m	No	Partial of 1 adult	1234–1011 BC (UBA-12641)
Cremation 9	0.45 x 0.45 x 0.18m	Upright urn	1 juvenile (aged at least 10)	No date
Cremation 12	0.76 x 0.5 x 0.3m	Fragments	Small fragments	No date
Cremation 13 (Ring Barrow 6)	Within ditch of Ring barrow 6	Fragments	Partial of 1 adult	No date
Cremation 15 (Ring Barrow 2)	0.3 x0.3 x 0.08m	Fragments	One adult	1408–1194 BC (UBA-12652)
Cremation 16 (Ring Barrow 2)	0.4 x 0.3 x 0.15m	Fragments	Small fragments	No date
Cremation 17 (Ring Barrow 6)	Within ditch of Ring barrow 6	Fragments	Small fragments	No date
Cremation 18 (Ring Barrow 6)	Within ditch of Ring barrow 6	Fragments	Partial of 1 adult	No date
Cremation 19 (Ring Barrow 1)	0.81 x 0.58 x 0.15m	No	Small fragments	No date
Cremation 20	0.76 x 0.68 x 0.08m	No	Partial of 1 adult	1121–928 BC (UBA-12651)

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), 337-360)

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

The First Settlers

Context description	Lab ID	Date BP	SD	$\delta^{13}C$	Material	Calibrated Sample date		Probability
Carnmeen (Site 3)						*Lower*	*Upper*	
Erroneous date from Early Medieval Ditch	UBA-14199	5703	32	-32.8	Hazel Charcoal	4653 BC 4617 BC	4640 BC 4458 BC	0.017 0.937
Carnmeen (Site 4)						*Lower*	*Upper*	
Isolated pit	UBA-12839	5602	37	-27.4	Hazel Charcoal	4502 BC	4353 BC	0.954
Carnmeen (Site 5)						*Lower*	*Upper*	
Isolated pit	UBA-12840	6861	28	-27.4	Oak Charcoal	5807 BC	5671 BC	0.954
Carnbane (Site 9)						*Lower*	*Upper*	
Isolated pit	UBA-14832	5989	30	-29.6	Hazel Charcoal	4957 BC	4792 BC	0.954
Isolated pit	UBA-14834	5408	29	-30.9	Oak Charcoal	4339 BC 4189 BC	4232 BC 4181 BC	0.942 0.012

The Neolithic

Context description	Lab ID	Date BP	SD	$\delta^{13}C$	Material	Calibrated Sample date		Probability
Glasdrummond (Site 1)						*Lower*	*Upper*	
Stake-hole from roundhouse	UBA-12836	4610	24	-27.6	Hazel Charcoal	3499 BC 3379 BC	3338 BC 3349 BC	0.556 0.398
Carnmeen (Site 2)						*Lower*	*Upper*	
Posthole, beside pits (no clear structure present)	UBA-13501	4980	30	-23.0	Hazel Charcoal	3913 BC 3804 BC 3683 BC	3878 BC 3692 BC 3663 BC	0.066 0.862 0.026
Carnmeen (Site 3)						*Lower*	*Upper*	
Shallow isolated pit containing pottery	UBA-14185	4796	27	-24.6	Hazel Charcoal	3646 BC 3604 BC	3622 BC 3523 BC	0.180 0.774
Glasdrummond (Site 7)						*Lower*	*Upper*	
Isolated pit	UBA-14204	5000	31	-32.2	Hazel Charcoal	3939 BC 3861 BC	3814 BC 3701 BC	0.241 0.713
Pit containing potential garden pea	UBA-14207	5056	31	-31.9	Willow Charcoal	3955 BC	3782 BC	0.954
Pit 1 of 4 pits in small cluster	UBA-14212	4137	29	-25.9	Hazel Charcoal	2873 BC	2620 BC	0.954

Context description	Lab ID	Date BP	SD	$\delta^{13}C$	Material	Calibrated Sample date		Probability
Pit 2 of 4 pits in small cluster	UBA-14213	4062	31	-32.3	Hazel Charcoal	2849 BC 2739 BC 2693 BC 2680 BC	2813 BC 2734 BC 2688 BC 2486 BC	0.092 0.003 0.004 0.855
Glasdrummond (Site 7)						*Lower*	*Upper*	
Spread covering 4 pits in small cluster	UBA-14217	4088	24	-27.4	Hazel Charcoal	2854 BC 2746 BC 2697 BC 2514 BC	2812 BC 2726 BC 2571 BC 2503 BC	0.189 0.032 0.724 0.019
Charcoal rich spread containing pottery and flint	UBA-14218	4960	34	-24.0	Hazel Charcoal	3890 BC 3798 BC	3886 BC 3655 BC	0.005 0.949
Posthole in House 1	UBA-14224	4078	24	-29.5	Hazel Charcoal	2851 BC 2743 BC 2695 BC 2524 BC	2812 BC 2730 BC 2566 BC 2497 BC	0.139 0.012 0.737 0.066
House 2 entrance posthole 1	UBA-14226	4116	25	-26.7	Hazel Charcoal	2864 BC 2760 BC 2711 BC	2806 BC 2717 BC 2578 BC	0.255 0.145 0.554
House 2 entrance posthole 2	UBA-14227	4162	29	-26.7	Hazel Charcoal	2880 BC 2820 BC	2832 BC 2633 BC	0.192 0.762
Pit predating House 2 construction	UBA-14228	4439	37	-28.1	Hazel Charcoal	3332 BC 3188 BC 3131 BC	3213 BC 3155 BC 2928 BC	0.320 0.058 0.577
Isolated pit	UBA-14229	4799	30	-29.9	Hazel Charcoal	3649 BC 3606 BC	3621 BC 3522 BC	0.198 0.756
Pit 5m east of House 2	UBA-14230	3988	22	-26.7	Hazel Charcoal	2570 BC 2502 BC	2514 BC 2468 BC	0.580 0.374
Isolated pit	UBA-14231	3996	31	-29.1	Hazel Charcoal	2577 BC	2467 BC	0.954
Pit with in-situ burning 5m east of House 2	UBA-14232	4107	32	-27.7	Hazel Charcoal	2866 BC 2774 BC 2508 BC	2804 BC 2572 BC 2506 BC	0.234 0.718 0.002
Carnbane (Site 9)						*Lower*	*Upper*	
Large pit containing pottery	UBA-14835	4883	29	-28.9	Hazel Charcoal	3706 BC	3638 BC	0.954
Curving ditch around a drumlin	UBA-14837	4209	29	-28.0	Hazel Charcoal	2899 BC 2814 BC 2730 BC 2687 BC	2850 BC 2740 BC 2693 BC 2680 BC	0.331 0.485 0.131 0.007
Derrybeg (Site 11)						*Lower*	*Upper*	
Isolated pit	UBA-12848	4064	31	-22.5	Hazel Charcoal	2850 BC 2741 BC 2694 BC 2680 BC	2812 BC 2731 BC 2687 BC 2487 BC	0.098 0.008 0.006 0.841
Derrybeg (Site 12)						*Lower*	*Upper*	
Barrow 2, pit dug into barrow slump	UBA-14853	4634	40	-28.8	Charcoal	3620 BC 3521 BC	3611 BC 3348 BC	0.008 0.946

Context description	Lab ID	Date BP	SD	$\delta^{13}C$	Material	Calibrated Sample date		Probability
Barrow 2, slump from internal bank	UBA-14854	4587	49	-26.8	Charcoal	3514 BC 3403 BC 3384 BC 3243 BC	3423 BC 3399 BC 3264 BC 3102 BC	0.267 0.003 0.355 0.329
Barrow 2, base of ditch	UBA-14855	5049	43	-31.7	Charcoal	3959 BC 3741 BC	3761 BC 3715 BC	0.919 0.035
Barrow 1, silting of ditch	UBA-14861	3982	39	-30.4	Charcoal	2618 BC 2583 BC 2424 BC 2381 BC	2609 BC 2432 BC 2402 BC 2348 BC	0.007 0.888 0.024 0.035
Erroneous date from silting of Neolithic ditch	UBA-14862	6606	43	-28.9	Charcoal	5618 BC	5486 BC	0.954
Derrybeg (Site 13)						*Lower*	*Upper*	
Pit 1 within cluster of pits and postholes (no clear structure present)	UBA-14868	4015	22	-24.8	Alder Charcoal	2576 BC	2476 BC	0.954
Pit 2 within cluster of pits and postholes (no clear structure present)	UBA-14869	4161	30	-29.3	Hazel Charcoal	2880 BC 2821BC	2832 BC 2632 BC	0.192 0.762
Pit 3 within cluster of pits and postholes (no clear structure present)	UBA-14871	4132	24	-29.6	Hazel Charcoal	2871 BC 2780 BC 2607 BC 2593 BC	2801 BC 2619 BC 2599 BC 2588 BC	0.278 0.660 0.010 0.006
Pit 4 within cluster of pits and postholes (no clear structure present)	UBA-14872	4095	24	-28.0	Hazel Charcoal	2858 BC 2749 BC 2699 BC	2811 BC 2723 BC 2573 BC	0.207 0.054 0.693
Pit 5 within cluster of pits and postholes (no clear structure present)	UBA-14875	4142	25	-29.7	Alder Charcoal	2872 BC	2627 BC	0.954
Carnbane (Site 15)						*Lower*	*Upper*	
Pit within cluster of pits and postholes (no clear structure present)	UBA-13466	4926	26	-36.8	Hazel Charcoal	3766 BC	3650 BC	0.954
Carnnagat (Site 17)						*Lower*	*Upper*	
Pit from cluster of eight pits	UBA-13469	4631	28	-27.6	Hazel Charcoal	3513 BC 3384 BC	3424 BC 3354 BC	0.735 0.219
Corcreeghy (Site 21)						*Lower*	*Upper*	
Pit within cluster of pits a hearth and a single posthole (no clear structure present)	UBA-13504	4358	25	-26.4	Hazel Charcoal	3080 BC 3026 BC	3070 BC 2906 BC	0.023 0.931
Quilly						*Lower*	*Upper*	
Cremation Deposit 1	UBA-12646	4071	28	/	Charcoal	2852 BC 2744 BC 2696 BC 2536 BC	2812 BC 2727 BC 2561 BC 2491 BC	0.119 0.015 0.682 0.138
Cremation Deposit 2	UBA-12647	4155	28	/	Charcoal	2878 BC 2821 BC	2831 BC 2632 BC	0.188 0.766

Context description	Lab ID	Date BP	SD	$\delta^{13}C$	Material	Calibrated Sample date		Probability
Ballintaggart						*Lower*	*Upper*	
Large pit containing pottery sherd's, and arrowheads	Beta 216905	4910	70	-24.4	Charcoal	3939 BC 3814 BC 3591 BC	3860 BC 3627 BC 3528 BC	0.077 0.81 0.067
Rectangular House 2	Beta 213590	4850	70	-25.1	Charcoal	3790 BC 3426 BC	3507 BC 3381 BC	0.916 0.038
Rectangular House 1	Beta 213591	4850	50	-24.2	Charcoal	3761 BC 3732 BC 3715 BC 3611 BC	3741 BC 3726 BC 3618 BC 3521 BC	0.018 0.004 0.610 0.322

The Bronze Age

Context description	Lab ID	Date BP	SD	$\delta^{13}C$	Material	Calibrated Sample date		Probability
Glasdrummond (Site 1)						*Lower*	*Upper*	
Burnt mound trough 1	UBA-12837	3561	25	-26.3	Hazel Charcoal	2011 BC 1977 BC 1843 BC 1798 BC	2000 BC 1875 BC 1817 BC 1780 BC	0.015 0.847 0.058 0.035
Burnt mound trough 1	UBA-12838	3667	29	-28.6	Hazel Charcoal	2137BC	1959BC	0.954
Carnmeen (Site 2)						*Lower*	*Upper*	
Burnt mound trough	UBA-13496	3978	25	-28.3	Hazel Charcoal	2571 BC 2504 BC	2513 BC 2462 BC	0.520 0.434
Burnt mound trough	UBA-13497	3643	24	-25.9	Hazel Charcoal	2131 BC 2051 BC	2086 BC 1938 BC	0.146 0.808
Burnt mound trough	UBA-13498	3620	25	-29.6	Hazel Charcoal	2112 BC 2036 BC	2103 BC 1901 BC	0.012 0.942
Burnt mound trough	UBA-13499	3524	24	-26.8	Hazel Charcoal	1927 BC	1767 BC	0.954
Pit, covered by a possible cairn	UBA-13500	3021	24	-28.9	Hazel Charcoal	1387 BC 1311 BC 1139 BC	1339 BC 1195 BC 1135 BC	0.169 0.780 0.005
Carnmeen (Site 3)						*Lower*	*Upper*	
Erroneous date from pits containing Bronze Age pottery	UBA-14188	4742	28	-25.5	Hazel Charcoal	3635 BC 3428 BC	3504 BC 3381 BC	0.779 0.175
Final sedimentation of ring barrow	UBA-14187	2314	23	-31.1	Hazel Charcoal	407 BC	364 BC	0.954
Cist within ring barrow	UBA-14202	2903	28	-32.7	Hazel Charcoal	1207 BC 1134 BC	1141 BC 1007 BC	0.174 0.780
Carnmeen (Site 6)						*Lower*	*Upper*	
Pit in cluster of 36 pits, and 35 stake and postholes	UBA-12844	3798	23	-26.4	Hazel Charcoal	2297 BC 2181 BC	2191 BC 2142 BC	0.808 0.146
Pit in cluster of 36 pits, and 35 stake and postholes	UBA-12845	3198	27	-28.4	Hazel Charcoal	1514 BC	1417 BC	0.954

Context description	Lab ID	Date BP	SD	$\delta^{13}C$	Material	Calibrated Sample date		Probability
Pit in cluster of 36 pits, and 35 stake and postholes	UBA-12846	3910	24	-28.8	Hazel Charcoal	2471 BC 2323 BC	2336 BC 2307 BC	0.914 0.040
Pit in cluster of 36 pits, and 35 stake and postholes	UBA-12847	3826	28	-26.6	Hazel Charcoal	2453 BC 2406 BC 2351 BC 2169 BC	2419 BC 2377 BC 2197 BC 2149 BC	0.032 0.043 0.855 0.024
Glasdrummond (Site 7)						*Lower*	*Upper*	
Ring Barrow 1 Basal fill	UBA-14209	3900	29	-29.6	Alder Charcoal	2469 BC	2298 BC	0.954
Pit containing Beaker pottery	UBA-14211	2979	30	-30.8	Hazel Charcoal	1371 BC 1296 BC	1359 BC 1111 BC	0.010 0.944
Ring Barrow 2 basal fill	UBA-14220	3540	45	-29.1	Hazel Charcoal	2016 BC 1981 BC	1996 BC 1746 BC	0.026 0.928
Pit east of Ring Barrow 2	UBA-14222	3328	25	-27.3	Hazel Charcoal	1683 BC	1531 BC	0.954
Corcreeghy (Site 8)						*Lower*	*Upper*	
Pit containing cremation of 1 adult and 1 juvenile	UBA-14228	2957	24	-26.8	Oak Charcoal	1260 BC 1236 BC 1065 BC	1241 BC 1077 BC 1058 BC	0.033 0.913 0.008
Burnt mound spread	UBA-14233	3571	27	-30.1	Hazel Charcoal	2022 BC 1984 BC 1841 BC 1795 BC	1992 BC 1877 BC 1822 BC 1782 BC	0.062 0.850 0.027 0.015
Burnt mound trough	UBA-14234	3123	34	-27.3	Hazel Charcoal	1493 BC 1455 BC	1481 BC 1289 BC	0.020 0.934
Burnt mound trough	UBA-14236	3183	29	-31.8	Hazel Charcoal	1506 BC	1411 BC	0.954
Stakehole from house	UBA-14237	3806	24	-30.1	Hazel Charcoal	2336 BC 2308 BC 2176 BC	2324 BC 2194 BC 2144 BC	0.017 0.848 0.089
Isolated pit, dug into same area as earlier house	UBA-14238	3026	24	-27.6	Hazel Charcoal	1390 BC 1320 BC	1338 BC 1208 BC	0.212 0.742
Wattle lined burnt mound trough	UBA-14239	3532	24	-29.6	Hazel Charcoal	1938 BC	1771 BC	0.954
Burnt mound trough	UBA-14243	3113	26	-32.2	Hazel Charcoal	1437 BC	1297 BC	0.954
Carnbane (Site 9)						*Lower*	*Upper*	
Hearth containing cereal grain	UBA-14829	3389	27	-30.0	Hazel Charcoal	1746 BC	1625 BC	0.954
Stakehole beside hearth containing cereal grain	UBA-14830	3773	26	-27.0	Hazel Charcoal	2289 BC 2074 BC	2134 BC 2064 BC	0.940 0.014
Posthole beside hearth containing cereal grain	UBA-14831	3369	33	-26.3	Hazel Charcoal	1747 BC 1582 BC	1607 BC 1560 BC	0.924 0.030
Kiln	UBA-14833	3716	27	-27.8	Oak Charcoal	2199 BC 2153 BC	2161 BC 2032 BC	0.169 0.785
Dumb-bell shaped kiln	UBA-14836	3617	23	-28.0	Alder Charcoal	2034BC	1907BC	0.954

Context description	Lab ID	Date BP	SD	$\delta^{13}C$	Material	Calibrated Sample date		Probability
Glasdrummond (Site 10)						*Lower*	*Upper*	
Pit, in multi-period occupation area	UBA-14838	3638	24	/	Hazel charcoal	2127 BC 2045 BC	2090 BC 1928 BC	0.120 0.852
Pit, in multi-period occupation area	UBA-14841	3648	25	/	Oak charcoal	2133 BC 2056 BC	2083 BC 1941 BC	0.199 0.755
Pit, in multi-period occupation area	UBA-14845	3018	25	/	Charcoal	1388 BC 1316 BC 1143 BC	1339 BC 1192 BC 1132 BC	0.152 0.788 0.014
Pit, in multi-period occupation area	UBA-14847	3482	43	/	Oak charcoal	1910 BC	1691 BC	0.954
Derrybeg (Site 11)						*Lower*	*Upper*	
Burnt mound trough beside hut	UBA-12849	3434	26	-25.9	Hazel Charcoal	1876 BC 1821 BC 1782 BC	1841 BC 1797 BC 1661 BC	0.107 0.041 0.806
Later trough in same burnt mound area	UBA-12850	2789	22	-25.5	Hazel Charcoal	1006 BC 871 BC	894 BC 854 BC	0.927 0.027
Stakehole from hut beside burnt mound	UBA-12851	3590	24	-26.6	Hazel Charcoal	2022 BC 1984 BC	1991 BC 1888 BC	0.138 0.816
Derrybeg (Site 12)						*Lower*	*Upper*	
Structure 1 stakehole	UBA-14850	2794	27	-30.2	Charcoal	1013 BC 875 BC	893 BC 850 BC	0.914 0.040
Timber circle posthole	UBA-14857	3127	40	-29.1	Charcoal	1496 BC 1464 BC	1472 BC 1286 BC	0.055 0.899
Derrybeg (Site 12)						*Lower*	*Upper*	
Structure 2 occupation spread	UBA-14858	3345	38	-24.0	Charcoal	1739 BC 1697 BC	1713 BC 1528 BC	0.064 0.890
Structure 3 posthole	UBA-14859	2952	39	-32.2	Charcoal	1271 BC	1028 BC	0.954
Cremation 3 within inverted decorated Collared Urn	UBA-14864	3548	22	-28.4	Charcoal	1953 BC 1846 BC 1804 BC	1870 BC 1810 BC 1776 BC	0.738 0.129 0.087
Cremation 1, within cist and Inverted decorated Vase Urn	UBA-14865	3805	23	-31.4	Charcoal	2334 BC 2301 BC 2176 BC	2325 BC 2194 BC 2144 BC	0.011 0.853 0.090
Cremation 4, within inverted decorated Cordoned Urn	UBA-14866	3360	22	-26.5	Charcoal	1736 BC 1695 BC	1716 BC 1612 BC	0.056 0.898
Derrybeg (Site 13)						*Lower*	*Upper*	
Isolated pit	UBA-14870	2914	20	-23.3	Oak Charcoal	1196 BC 1134 BC	1142 BC 1021 BC	0.211 0.743
Derrybeg (Site 14)						*Lower*	*Upper*	
Pit in isolated cluster	UBA-13463	2938	24	-35.3	Hazel Charcoal	1219 BC	1052 BC	0.954
Lisdrumliska and Carnnagat (Site 18)						*Lower*	*Upper*	
Burnt mound trough	UBA-13470	3059	27	-34.1	Hazel Charcoal	1408 BC 1245 BC	1258 BC 1233 BC	0.928 0.026

Context description	Lab ID	Date BP	SD	$\delta^{13}C$	Material	Calibrated Sample date		Probability
Lisdrumliska and Altnaveigh (Site 19)						*Lower*	*Upper*	
Burnt mound trough	UBA-13471	3568	28	-37.2	Willow Charcoal	2018 BC 1981 BC 1843 BC 1797 BC	1994 BC 1876 BC 1819 BC 1781 BC	0.051 0.836 0.042 0.025
Lisdrumliska and Carrivemaclone (Site 20)						*Lower*	*Upper*	
Probable hearth in cluster of 4	UBA-14877	3685	24	-25.4	Charcoal	2142 BC 1999 BC	2014 BC 1979 BC	0.909 0.045
Burnt mound trough	UBA-14878	3380	25	-31.9	Charcoal	1743 BC 1701 BC	1709 BC 1621 BC	0.208 0.746
Pit in cluster of 34, no clear structure	UBA-14879	3922	26	-30.9	Charcoal	2479 BC 2324 BC	2335 BC 2306 BC	0.922 0.032
Pit in cluster of 34, no clear structure	UBA-14880	3912	27	-25.4	Charcoal	2473 BC 2324 BC	2334 BC 2302 BC	0.898 0.056
Corcreeghy (Site 21)						Lower	Upper	
Burnt mound trough	UBA-13503	3181	27	-27.5	Hazel Charcoal	1502 BC	1414 BC	0.954
Carnmeen (site 23)						Lower	Upper	
Ring Barrow	SUERC-23987	3195	35	-25.5	Hazel Charcoal	1595 BC 1532 BC	1589 BC 1407 BC	0.006 0.948
Ring Barrow	SUERC - 23988	3210	35	-28.6	Hazel Charcoal	1605 BC 1545 BC	1584 BC 1414 BC	0.035 0.919
Oval burnt mound trough	UBA-12636	3313	45	/	Charcoal	1731 BC 1693 BC	1721 BC 1499 BC	0.011 0.943
Rectangular burnt mound trough	UBA-12635	3989	46	/	Alder Charcoal	2828 BC 2627 BC 2385 BC	2824 BC 2395 BC 2346 BC	0.003 0.909 0.042
Ballyvally						Lower	Upper	
Burnt mound trough	UBA-12607	3604	42	/	Charcoal	2131 BC 2051 BC 1840 BC 1793 BC	2086 BC 1877 BC 1826 BC 1784 BC	0.059 0.880 0.010 0.005
Ballyvally						*Lower*	*Upper*	
Burnt mound trough beside brushwood path	UBA-12609	3127	42	/	Charcoal	1497 BC 1465 BC	1471 BC 1285 BC	0.062 0.892
Organic layers predating archaeology	UBA-12611	3800	37	/	Charcoal	2434 BC 2404 BC 2350 BC 2080 BC	2421 BC 2379 BC 2133 BC 2061 BC	0.008 0.020 0.915 0.011
Brushwood path beside burnt mound	UBA-12612	3053	42	/	Charcoal	1423BC	1208BC	0.954
Brushwood path beside burnt mound	UBA-12613	3022	42	/	Charcoal	1402 BC 1147 BC	1156 BC 1128 BC	0.916 0.038
Pit beside burnt mound	UBA-12617	2827	29	/	Charcoal	1071 BC 1056 BC	1066 BC 903 BC	0.004 0.950
Burnt mound trough	UBA-12618	2746	23	/	Charcoal	968 BC 932 BC	963 BC 828 BC	0.001 0.944

Context description	Lab ID	Date BP	SD	$\delta^{13}C$	Material	Calibrated Sample date		Probability
Quilly						*Lower*	*Upper*	
Ring Barrow 1	UBA-12638	2753	23	/	Charcoal	972 BC 938 BC	959 BC 832 BC	0.034 0.920
Cremation 7	UBA-12639	2935	45	/	Charcoal	1266 BC	1006 BC	0.954
Ring Barrow 4	UBA-12640	3142	45	/	Charcoal	1503 BC	1292 BC	0.954
Cremation 8	UBA-12641	2931	40	/	Charcoal	1258 BC 1234 BC	1246 BC 1011 BC	0.016 0.938
Ring Barrow 7	UBA-12642	3028	40	/	Charcoal	1405 BC 1178 BC 1144 BC	1191 BC 1161 BC 1131 BC	0.909 0.021 0.023
Structure 5 posthole	UBA-12643	3164	40	/	Charcoal	1517 BC 1344 BC	1378 BC 1306 BC	0.881 0.073
Ring Barrow 4	UBA-12644	3065	40	/	Charcoal	1420 BC	1222 BC	0.954
Structure 5 posthole	UBA-12645	3221	32	/	Charcoal	1607 BC 1560 BC 1546 BC	1583 BC 1553 BC 1425 BC	0.054 0.010 0.890
Structure 1 posthole	UBA-12648	3033	31	/	Charcoal	1401 BC	1207BC	0.954
Ring Barrow 3	UBA-12649	3016	32	/	Charcoal	1391 BC 1321 BC 1182 BC 1145 BC	1337 BC 1188 BC 1159 BC 1129 BC	0.169 0.720 0.033 0.032
Ring Barrow 2	UBA-12650	3088	31	/	Charcoal	1426 BC	1270 BC	0.954
Cremation 20	UBA-12651	2862	31	/	Charcoal	1121 BC	928 BC	0.954
Cremation 15	UBA-12652	3034	37	/	Charcoal	1408 BC 1142 BC	1194 BC 1133 BC	0.943 0.011
Ring Barrow 6	UBA-12653	3017	37	/	Charcoal	1394 BC 1125 BC 1147 BC	1134 BC 1156 BC 1128 BC	0.190 0.723 0.041
Structure 3 posthole	UBA-12654	2725	37	/	Charcoal	971 BC 936 BC	960 BC 807 BC	0.017 0.937
Structure 3 posthole	UBA-12655	2769	37	/	Charcoal	1004 BC	832 BC	0.954
Structure 3 posthole	UBA-12656	2804	26	/	Charcoal	1026 BC	895 BC	0.954
Ring Barrow 2	UBA-12657	3087	26	/	Charcoal	1420 BC	1279 BC	0.954
Structure 4 posthole	UBA-12658	2890	26	/	Charcoal	1193 BC 1131 BC	1143 BC 997 BC	0.072 0.882
Ballintaggart						*Lower*	*Upper*	
Ring Barrow 3	Beta-213584	3210	60	-25.9	Charcoal	1628 BC 1340 BC	1384 BC 1311 BC	0.929 0.025
Structure 1 posthole	Beta-213586	2870	70	-24.5	Charcoal	1259 BC 1235 BC 873 BC	1244 BC 893 BC 851 BC	0.011 0.929 0.014
Ring Barrow 2	Beta-213587	2930	70	-28.5	Charcoal	1376 BC 1304 BC	1347 BC 929 BC	0.023 0.929
Ring Barrow 5	Beta-213589	2750	60	-25.7	Charcoal	1030 BC	803 BC	0.954
Ring Barrow 6	Beta-216906	2690	70	-29.6	Charcoal	1018 BC	766 BC	0.954
Ring Barrow 4	Beta-216909	2710	70	-27.4	Charcoal	1026 BC	782 BC	0.954
Ring Barrow 1	Beta-216911	2970	50	-27.9	Charcoal	1381 BC 1306 BC	1344 BC 1022 BC	0.044 0.910

Context description	Lab ID	Date BP	SD	$\delta^{13}C$	Material	Calibrated Sample date		Probability
Ring Barrow 5	Beta-217352	2810	70	-27.9	Charcoal	1191 BC 1161 BC 1130 BC	1177 BC 1144 BC 815 BC	0.012 0.014 0.929
Ring Barrow 4 cremation	Beta-223392	2860	50	-21.9	Bone	1207 BC 1196 BC 1134 BC	1204 BC 1141 BC 906 BC	0.002 0.075 0.877
Ring Barrow 2	Beta-224301	2790	50	-27.7	Charcoal	1073 BC 1057 BC	1066 BC 822 BC	0.006 0.948
Ring Barrow 5	UBA-7287	2800	35	-25.0	Charcoal	1043 BC 881 BC	889 BC 846 BC	0.893 0.061
Ring Barrow 7	UBA-7289	2921	34	-24.0	Charcoal	1217 BC	1013 BC	0.954
Ring Barrow 8	UBA-7290	2871	34	-21.0	Charcoal	1189 BC 1158 BC 1129 BC	1179 BC 1146 BC 929 BC	0.012 0.014 0.927
Derrycraw						*Lower*	*Upper*	
Cremation 5 in basket burial	Beta-213585	3190	70	-26	Charcoal	1623 BC	1290 BC	0.954
Ring Barrow 2	Beta-213588	3090	70	-25.3	Charcoal	1502 BC 1177 BC 1144 BC	1191 BC 1161 BC 1131 BC	0.932 0.011 0.011
Pit containing cremation in Vase Urn, predating Ring Barrow 2	Beta-216908	3330	70	-27.4	Charcoal	1862 BC 1772 BC	1851 BC 1446 BC	0.070 0.947
Ring Barrow 4	Beta-216910	3130	70	-27.5	Charcoal	1602 BC 1543 BC	1585 BC 1212 BC	0.010 0.944
Cremation 7	Beta-217344	3050	70	-27.1	Charcoal	1493 BC 1454 BC 1097 BC	1481 BC 1110 BC 1091 BC	0.006 0.944 0.030
Cremation 6	Beta-217347	3220	60	-23.7	Bone	1637 BC 1337 BC	1390 BC 1322 BC	0.943 0.011
Cremation 8	Beta-217348	3100	60	-23.9	Charcoal	1499 BC	1217 BC	0.954
Ring Barrow 3	Beta-217349	2920	70	-25.8	Charcoal	1373 BC 1301 BC	1357 BC 902 BC	0.01 0.943
Ring Barrow 1	Beta-217351	3200	80	-27.9	Charcoal	1661 BC	1278 BC	0.954

The Iron Age

Context description	Lab ID	Date BP	SD	$\delta^{13}C$	Material	Calibrated Sample date		Probability
Carnmeen (Site 5)						*Lower*	*Upper*	
Small Ring Barrow	UBA-12841	1777	23	-25.5	Hazel Charcoal	AD 142 AD 166 AD 209	AD 159 AD 196 AD 335	0.024 0.054 0.876
Large Ring Barrow	UBA-12843	2096	22	-27.7	Hazel Charcoal	179 BC	50 BC	0.954
Glasdrummond (Site 7)						*Lower*	*Upper*	
Isolated pit	UBA-14206	2088	28	-33.0	Hazel Charcoal	189 BC	43 BC	0.954
Ring Barrow	UBA-14215	2033	28	-33.3	Hazel Charcoal	157 BC 114 BC AD 38	136 BC AD 30 AD 50	0.030 0.902 0.022

Context description	Lab ID	Date BP	SD	$\delta^{13}C$	Material	Calibrated Sample date		Probability
Corcreeghy (Site 8)						*Lower*	*Upper*	
Isolated pit	UBA-14240	2149	21	-27.3	Hazel Charcoal	352 BC 229 BC 211 BC	298 BC 22 BC 109 BC	0.266 0.01 0.678
Ring barrow	UBA-14242	2392	33	-28.9	Hazel Charcoal	732 BC 661 BC 545 BC	690 BC 650 BC 396 BC	0.072 0.015 0.867
Glasdrummond (Site 10)						*Lower*	*Upper*	
Pit containing whetstone	UBA-14840	2180	25	/	Oak charcoal	359 BC 261 BC	274 BC 172 BC	0.561 0.393
Pit containing pottery	UBA-14844	2058	22	/	Hazel charcoal	163 BC 120 BC	129 BC AD 1	0.124 0.830
Derrybeg (Site 13)						*Lower*	*Upper*	
Pit beside pyre	UBA-14873	2085	23	-28.6	Hazel Charcoal	172 BC	46 BC	0.954
Cremation beside pyre	UBA-14874	2017	21	-25.8	Willow Charcoal	86 BC 55 BC	79 BC AD 52	0.013 0.941
Cremation beside pyre	UBA-14876	2004	21	-28.4	Alder Charcoal	46 BC	AD 53	0.954
Derrybeg (Site 14)						*Lower*	*Upper*	
Small hearth	UBA-13459	1920	24	-33.6	Hazel Charcoal	AD 25	AD 130	0.954
Carnbane (Site 15)						*Lower*	*Upper*	
Inhumation cemetery	UBA-13467	2336	23	-34.28	Hazel Charcoal	429 BC	368 BC	0.954
Isolated cremation within inhumation cemetery	UBA-13468	2008	24	-31.9	Hazel Charcoal	53 BC	AD 56	0.954
Maddydrumbrist						*Lower*	*Upper*	
Isolated cremation	Beta 217345	1730	60	-22.1	Charcoal	AD 136	AD 419	0.954
Hillsborough						*Lower*	*Upper*	
Large pit	UBA-12621	3851	22	/	Charcoal	2458 BC 2409 BC 2257 BC	2417 BC 2273 BC 2208 BC	0.106 0.678 0.170
Large pit	UBA-12628	2070	20	/	Charcoal	166 BC	41 BC	0.954
Large pit	UBA-12631	2182	20	/	Charcoal	358 BC 259 BC 236 BC	279BC 242 BC 176 BC	0.604 0.036 0.314
Large pit	UBA-12632	2738	20	/	Charcoal	920 BC	830 BC	0.954
Pit	UBA-12633	2551	20	/	Charcoal	801 BC 684 BC 637 BC 615 BC 576 BC	750 BC 667 BC 622 BC 590 BC 571 BC	0.801 0.060 0.020 0.068 0.005
Hillsborough						*Lower*	*Upper*	
Field Boundary	UBA-12634	2518	45	/	Charcoal	800 BC 500 BC	508 BC 491 BC	0.948 0.006

Early Medieval

Context description	Lab ID	Date BP	SD	$\delta^{13}C$	Material	Calibrated Sample date		Probability
Carnmeen (Site 3)						*Lower*	*Upper*	
Early ditch recut by rath ditch	UBA-14200	1820	26	-31.0	Hazel charcoal	AD 126 AD 302	AD 254 AD 315	0.936 0.018
Base of rath ditch	UBA-14193	1170	27	-29.9	Hazel charcoal	AD 772 AD 902	AD 902 AD 953	0.840 0.114
Souterrain within rath	UBA-14196	1109	27	-32.3	Hazel charcoal	AD 882	AD 995	0.954
Backfill of rath ditch	UBA-14191	1037	28	-32.3	Hazel charcoal	AD 902 AD 964	AD 920 AD 1034	0.034 0.920
Erroneous date from within rath ditch	UBA-14198	2959	29	-30.0	Hazel charcoal	1262 BC 1066 BC	1072 BC 1056 BC	0.939 0.015
Recut of rath ditch	UBA-14195	669	26	-29.5	Hazel charcoal	AD 1276 AD 1353	AD 1317 AD 1390	0.533 0.421
Corcreeghy (Site 8)						*Lower*	*Upper*	
Erroneous date from modern drain	UBA-14241	1559	24	-29.5	Hazel charcoal	AD 425	AD 554	0.954
Glasdrummond (Site 10)						*Lower*	*Upper*	
Souterrain 3	UBA-14843	1739	24	/	Oak charcoal	AD 241 AD364	AD 359 AD 381	0.899 0.055
Souterrain 2 main passage	UBA-14839	1277	21	/	Charcoal	AD 675	AD 770	0.954
Pit beside Souterrain 2	UBA-14842	1281	21	/	Oak charcoal	AD 671	AD 770	0.954
Souterrain 1 gully	UBA-14846	1316	25	/	Charcoal	AD 656 AD 741	AD 721 AD 768	0.727 0.227
Souterrain 1 main passage	UBA-14848	1178	28	/	Charcoal	AD 770 AD 921	AD 901 AD 951	0.881 0.073
Derrybeg (Site 13)						*Lower*	*Upper*	
Pit filled with burnt barley	UBA-14867	1566	20	-29.0	Oak charcoal	AD 425	AD 544	0.954
Carnmeen (Site 23)						*Lower*	*Upper*	
Cereal drying kiln 1	SUERC-23939	1655	35	-24.1	Hazel charcoal	AD 259 AD 323 AD 453 AD 487	AD 282 AD 435 AD 470 AD 534	0.038 0.811 0.016 0.089
Cereal drying kiln 2	SUERC-23943	1820	35	-26.3	Hazel charcoal	AD 87 AD 121 AD 282	AD 107 AD 259 AD 324	0.026 0.857 0.071
Souterrain to west of rath, kiln conversion	SUERC-23957	1040	55	-21.9	Charred spelt wheat	AD 884 AD 1068	AD 1059 AD 1154	0.825 0.129
Souterrain within rath	SUERC-23958	1480	35	-25.2	Hazel charcoal	AD 436 AD 472 AD 535	AD 447 AD 487 AD 650	0.012 0.018 0.923
Souterrain within rath	SUERC-23961	1345	35	-25.2	Hazel charcoal	AD 636 AD 740	AD 723 AD 768	0.827 0.127
Souterrain to west of rath, kiln conversion entrance	SUERC-23968	975	35	-23.3	Charred barley	AD 997 AD 1011	AD 1006 AD 1155	0.020 0.934

Context description	Lab ID	Date BP	SD	δ^{13}C	Material	Calibrated Sample date		Probability
Carnmeen (Site 23)						*Lower*	*Upper*	
Souterrain to west of rath, kiln conversion entrance	SUERC-23969	905	35	-27.4	Charred oat	AD 1035	AD 1209	0.954
Posthole within rath	SUERC-23970	955	35	-25.7	Oak charcoal	AD 1020	AD 1159	0.954
Souterrain to west of Rath first phase	SUERC-23977	1625	35	-25.9	Charred hazelnut	AD 347 AD 377	AD 370 AD538	0.051 0.903
Posthole within rath	SUERC-23978	1350	35	-25.6	Oak charcoal	AD 624 AD 742	AD 719 AD 767	0.853 0.101
Souterrain to west of Rath first phase	SUERC-23983	1615	35	-25.3	Hazel charcoal	AD 356 AD 381	AD 365 AD 542	0.013 0.941
Posthole within rath	SUERC-28018	1230	35	-25.0	Barley charcoal	AD 687	AD 884	0.954
Gully within rath	SUERC-28019	925	30	-24.7	Charred oat	AD 1026 AD 1176	AD 1170 AD 1182	0.945 0.009
Ballyvally						*Lower*	*Upper*	
Posthole within house	UBA-12615	1486	41	/	Charcoal	AD 431 AD 530	AD 492 AD 650	0.117 0.837

Medieval

Context description	Lab ID	Date BP	SD	δ^{13}C	Material	Calibrated Sample date		Probability
Carnmeen (Site 5)						*Lower*	*Upper*	
Bowl shaped feature	UBA-12842	554	21	-25.7	Hazel Charcoal	AD 1317 AD 1390	AD 1353 AD 1425	0.393 0.561
Carnmeen (Site 23)						*Lower*	*Upper*	
Field boundaries	SUERC-23942	725	40	-24.1	Charred oat	AD 1220 AD 1363	AD 1306 AD 1385	0.872 0.082
Occupation layer within stone building	SUERC-23963	775	35	-26.8	Charred hazelnut	AD 1190	AD 1285	0.954
Pit within rath	SUERC-28020	855	35	-24.8	Charred oat	AD 1048 AD 1123 AD 1149	AD 1086 AD 1138 AD 1261	0.106 0.028 0.820
Derrybeg (Site 14)						*Lower*	*Upper*	
Isolated pit	UBA-13465	698	27	-31.1	Hazel Charcoal	AD 1264 AD 1363	AD 1306 AD 1385	0.791 0.163
Quilly						*Lower*	*Upper*	
Structure 6 - Posthole	UBA-12659	387	26	/	Charcoal	AD 1443 AD 1575	AD 1522 AD 1625	0.717 0.237

Medieval H. Luminescence dating

Lab code: SUTL = Scottish Universities Thermo-Luminescence Dating Laboratory

Context description	Lab ID	Total Dosage rate (mGy/a)	Equivalent dosage (Gy)	Age (ka before AD 2007)	% error	Calendar date AD/BC
Carnmeen (site 23)						
Rath Ditch final occupation sediments	SUTL-2159	2.56 ± 0.06	2.51 ± 0.06	0.98 ± 0.03	3	AD 1030 ± 30
Rath Ditch base	SUTL-2168	3.15 ± 0.10	4.54 ± 0.10	1.44 ± 0.05	4	AD 570 ± 50
Rath Ditch base	SUTL-2170	3.50 ± 0.102	4.96 ± 0.10	1.42 ± 0.05	4	AD 590 ± 50

List of Archaeological Excavation Sites

Archaeological companies

NAC – Northern Archaeological Consultancy Ltd.
ADS – Archaeological Development Services Ltd.
Headland – Headland Archaeology (UK) Ltd.

Site name in text	Data Structure report (DSR) title	Townland & Irish Grid Ref.	Archaeology Licence	Licence Holder	Company
Glassdrummond (Site 1)	A1 Scheme 1 Site 1 Glassdrummond	Glassdrummond 307050E 329090N	AE/08/13	Ros O'Maolduin	ADS
Carnmeen (Site 2)	A1 Scheme 1 Site 2 Carnmeen	Carnmeen 307100E 329250N	AE/08/15	Lynsey Morton	ADS
Carnmeen (Site 3)	A1 Scheme 1 Site 3 Carnmeen	Carnmeen 309830E 331290N	AE/08/21	Patricia Ryan	ADS
Carnmeen (Site 4)	A1 Scheme 1 Site 4 Carnmeen	Carnmeen 309550E 331450N	AE/08/20 AE/08/107	Patricia Ryan Lynsey Morton	ADS
Carnmeen (Site 5)	A1 Scheme 1 Site 5 Carnmeen	Carnmeen 307650E 330650N	AE/07/172 AE/08/14	Peter Bowen Ros O Maolduin	ADS
Carnmeen (site 6)	A1 Scheme 1 Site 6 Carnmeen	Carnmeen 307900E 330725N	AE/08/16	Lynsey Morton	ADS
Glassdrummond (Site 7)	A1 Scheme 1 Site 7 Glassdrummond	Glassdrummond 307050E 328250N	AE/08/17 AE/08/108	James McKee Ros O Maolduin	ADS
Corcreeghy (Site 8)	A1 Scheme 1 Site 8 Corcreeghy	Corcreeghy 309550E 331600N	AE/08/106	Warren Bailie	ADS
Carnbane (Site 9)	A1 Scheme 1 Site 9 Carnbane	Carnbane 307050 329900N	AE/08/18	Deirdre Malone	ADS
Glassdrummond (Site 10)	A1 Scheme 1 Site 10 Glassdrummond	Glassdrummond 307000E 328950N	AE/08/19	Peter Bowen	ADS
Derrybeg (Site 11)	A1 Scheme 1 Site 11 Derrybeg Co. Down	Derrybeg 307022E 328768N	AE/08/03	Peter Bowen	ADS
Derrybeg (Site 12)	A1 Scheme 1 Site 12 Derrybeg	Derrybeg 307000E 328350N	AE/08/04	Deirdre Malone	ADS
Derrybeg (Site 13)	A1 Scheme 1 Site 13 Derrybeg	Derrybeg 307000E 328100N	AE/08/05	Deirdre Malone	ADS

Site name in text	Data Structure report (DSR) title	Townland & Irish Grid Ref.	Archaeology Licence	Licence Holder	Company
Derrybeg (Site 14)	A1 Scheme 1 Site 14 Derrybeg	Derrybeg 307025E 327750N	AE/08/06	Warren Bailie	ADS
Carnbane (Site 15)	A1 Scheme 1 Site 15 Carnbane	Carnbane 307020E 330172N	AE/07/172 AE/08/07	Peter Bowen Deirdre Malone	ADS
Derrybeg (Site 16)	A1 Scheme 1 Site 16 Derrybeg	Derrybeg 307100E 327400N	AE/08/08	Warren Bailie	ADS
Carnagat (Site 17)	A1 Scheme 1 Site 17 Carnagat	Carnagat 307110E 326975N	AE/08/09	Warren Bailie	ADS
Lisdrumliska and Carnnagat (Site 18)	A1 Scheme 1 Site 18 Lisdrumliska and Carnnagat	Lisdrumlisk and Carnnagat 307050E 326050N	AE/08/10	Warren Bailie	ADS
Lisdrumliska and Altnaveigh (Site 19)	A1 Scheme 1 Site 19 Lisdrumliska and Altnaveigh	Lisdrumliska and Altnaveigh 307200E 325000N	AE/08/11	Warren Bailie	ADS
Lisdrumliska and Carrivemaclone (Site 20)	A1 Scheme 1 Site 20 Lisdrumliska and Carrivemaclone	Lisdrumliska and Carrivemaclone 307500E 324500N	AE/08/12	Warren Bailie	ADS
Corcreeghy (Site 21)	A1 Scheme 1 Site 21 Corcreeghy	Corcreeghy 309850E 332350N	AE/08/155	Warren Bailie	ADS
Carnmeen (site 22)	A1 Scheme 1 Site 22 Carnmeen	Carnmeen 307770E 330730N	AE/08/155	Warren Bailie	ADS
Carnmeen (site 23)	Headland Sites 3-6. Also known as Carnmeen Ringfort	Carnmeen 308774E 330950N	AE/06/107 AE/06/254 AE/07/17	Paul Masser Paul Masser Magnar Dalland	Headland
Carnmeen (Site 24)	Carnmeen Cottage	Carnmeen 307640E 330630N	AE/06/107	Laura Scott	Headland
Ballyvally	A1 Scheme 2 Banbridge junction	Ballyvally 311619E 343925N	AE/07/191	Deirdre Malone	ADS
Hillsborough	A1 Scheme 2 Hillsborough junction	Hillsborough 323220E 358320N	AE/07/191	Deirdre Malone	ADS
Quilly	A1 Scheme 2 Dromore junction	Quilly 319011E 352438N	AE/07/191	Deirdre Malone	ADS
Ballintaggart	Area 2 Ballintaggart	Ballintaggart 310963E 340335N	AE/05/14	Simon Large	NAC
Derrycraw	Area 9 Derrycraw	Derrycraw 309468E 333524N	AE/04/77	Simon Large	NAC
Maddydrumbrist	Area 7 Maddydrumbrist	Maddydrumbrist 309457E 334716N	AE/04/55	Simon Large	NAC

Previous and Forthcoming publications

Site name	Company	Publication
Ballntaggart Derrycraw Maddydrumbrist	NAC	2009: Chapple, R.M. Dunlop, C. Gilmore, S and Heaney, L. Archaeological Investigations along the A1 Dualling Scheme, Loughbrickland to Beech Hill, Co. Down, N. Ireland (2005). BAR British Series 479.
Carnmeen (Site 23)	Headland	McMeekin, J. (Forthcoming) 'Excavations at Carnmeen Ringfort, Co. Down, 2006-7', Ulster Archaeological Monographs no. 1 Belfast
All other sites	ADS/Headland	Unpublished Data Structure Reports available at DOE: Historic Environment Division – Causeway Exchange 1-7 Bedford Street, Belfast

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The Archaeology of the A1 Road Schemes between Lisburn and Newry

Major developments by TransportNI have seen the A1 between Lisburn and the border with the Republic of Ireland upgraded. These developments presented an opportunity for archaeologists to uncover and investigate many features that were previously hidden. A large number of archaeological sites were recorded. These sites were both domestic and funerary, and ranged in date from the Mesolithic (8000–4000 BC) to the present day.

The excavations shed light on the nature of the dwellings the people lived in, the burial practices undertaken, the domestic and funerary artefacts they used, and on a few of sites the jewellery and ornamentation worn. This volume encapsulates the essence of the archaeological sites recorded, and provides a detailed summary of the findings of the 200 or so archaeologists who worked on the Road Scheme. To bring life to the archaeology detailed reconstruction drawings of both the artefacts and the most significant sites have been provided by artist Philip Armstrong.

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